WESTERN AUSTRALIA.

REPORT

OF THE

DEPARTMENT OF MINES

FOR THE YEAR

1905.

1906.

WESTERN AUSTRALIA.

REPORT

OF THE

DEPARTMENT OF MINES

FOR THE YEAR

1905.

PERTH:
BY AUTHORITY: A. CURTIS, ACTING GOVERNMENT PRINTER.

1906.

ANNUAL REPORT OF DEPARTMENT OF MINES, WESTERN AUSTRALIA, 1905.

TABLE OF CONTENTS.

DIVISION I.

	Page
PART I.—GENERAL REMARKS—	
Summary by the Secretary for Mines	2
General Remarks	2
Output of Gold during 1905	2
Value of Tin produced	4
Output of Coal	5
Copper Ore produced	5
Other Minerals	5
PART II.—MINERALS RAISED—	
Quantity and Value of Minerals produced, 1904-5	6
Gold Exported and Gold Received at Royal Mint	6
Number of Gold-producing Mines	7
Increase or Decrease in output of certain large producing Mines	8
Gold Ore raised and average per man employed	9
Output of Gold from the other States of Australia and New Zealand	9
Dividends paid by Mining Companies during 1904-5	10
Minerals other than Gold	11
Coal raised, value, number of men employed, and output per man	12
PART III.—	
Number and Acreage of Leases held for Mining	12
Number and Acreage of Gold Mining Leases for five years ending 31st December, 1905	13
Number and Acreage of Mineral Leases for five years ending 31st December, 1905	14
Number and Acreage of Mineral Leases, showing Minerals for which they are worked	15
Claims and Authorised Holdings existing on 31st December, 1905	16
Claims and Authorised Holdings under the Mineral Lands Act on the 31st December, 1905	17
Miners' Rights and Mining, Business, and Quarry Licenses issued during 1904-5	18
Number and Acreage of Miners' Homestead Leases	19
PART IV.—MEN EMPLOYED—	
Average Number of Men engaged in Mining	20
Men engaged in Mining different Minerals	21
Number of Men employed on Gold Mines in different Goldfields	21
Number of Alluvial Gold Workers	22
Arbitration Court Awards	23
PART V.—ACCIDENTS—	
Men Killed and Injured during 1904-5	24
Deaths from Accidents at Mines	25
Death Rate per thousand men employed, and per thousand tons of gold ore raised	2

	Page
PART VI.—STATE AID TO MINING—	
State Batteries	26
State Smelting Works	27
Assistance under the Mining Development Act	27
Water Supply	28
Geological Survey	28
PART VII.—REMARKS ON THE GOLDFIELDS AND MINING DISTRICTS, AND SUMMARIES OF WARDENS' AND OTHER OFFICERS' REPORTS—	
Ashburton Goldfield	29
Broad Arrow Goldfield	29
Collie Mining District	29
Coolgardie Goldfield	29
Donnybrook Goldfield	30
Dundas Goldfield	30
East Coolgardie Goldfield	30
East Murchison Goldfield	30
Gascoyne Goldfield	31
Greenbushes Mining District	31
Kimberley Goldfield	31
Mount Margaret Goldfield	31
Murchison Goldfield	31
Northampton and Yandanooka Mining Districts	31
North Coolgardie Goldfield	32
North-East Coolgardie Goldfield	32
Peak Hill Goldfield	32
Phillips River Goldfield	32
Pilbarra Goldfield	33
West Pilbarra Goldfield	33
Yalgoo Goldfield	33
Yilgarn Goldfield	33
Value of Mining Machinery, Stamps, and Mills	34
PART VIII.—EXISTING LEGISLATION	35
PART IX.—INSPECTION OF MACHINERY	35
Certificates granted to Engine-drivers under Machinery Act	35
PART X.—SCHOOL OF MINES	36
PART XI.—DEPARTMENTAL	37
Revenue for years 1904-5	37
Revenue collected under Mining Act and Expenditure in Administration for 1904-5	37
Revenue collected by Department under control of Minister for Mines, 1904-5	38
Correspondence	41
Surveys	41

DIVISION II.

Report by State Mining Engineer	43
Measures in case of "gasing" in Mines	61
Advances under "The Mining Development Act, 1902"	67
State Smelting Works, Phillips River	71
Coolgardie-Norseman Railway from a mining point of view	76
Report on Mead & West's reef, Helena River Valley, Darling Range	81
Report on Kurnalpi, Mulgabbie, Pinjin, Edjudina, Yarri, and Yerilla Districts	82
Occurrence of natural gas in Northern Associated Mines, Kalgoorlie	98
Report of the Board of Examiners for Colliery Managers' and Underground Managers' Certificates under "The Coal Mines Regulation Act, 1902"	99

DIVISION III.

	Page
Report by the Superintendent of State Batteries	100
Revenue and Expenditure	103
Expenditure from Consolidated Revenue Vote and Loan Funds on erection of State Batteries, and totals since inception	104
Tons crushed, gold yield, and average value per ton for year 1905	104
State Cyanide and Slimes Plants for 1905, showing tons treated, yield, and value	105
Tons crushed, Gold Yield, average per ton, and value since inception to December, 1905	105
Costs per ton for 1905	106
Profit and Loss Account of each Battery and Cyanide Plant for year	107
Statement of receipts and expenditure for year	108

DIVISION IV.

Report of Engineer for Mines Water Supply	110

DIVISION V.

Report of Government Geologist	119

DIVISION VI.

School of Mines	143
Report of the Director	143
Report of the Chairman of the Advisory Board	144

DIVISION VII.

Report of the Chief Inspector of Machinery	145

DIVISION VIII.

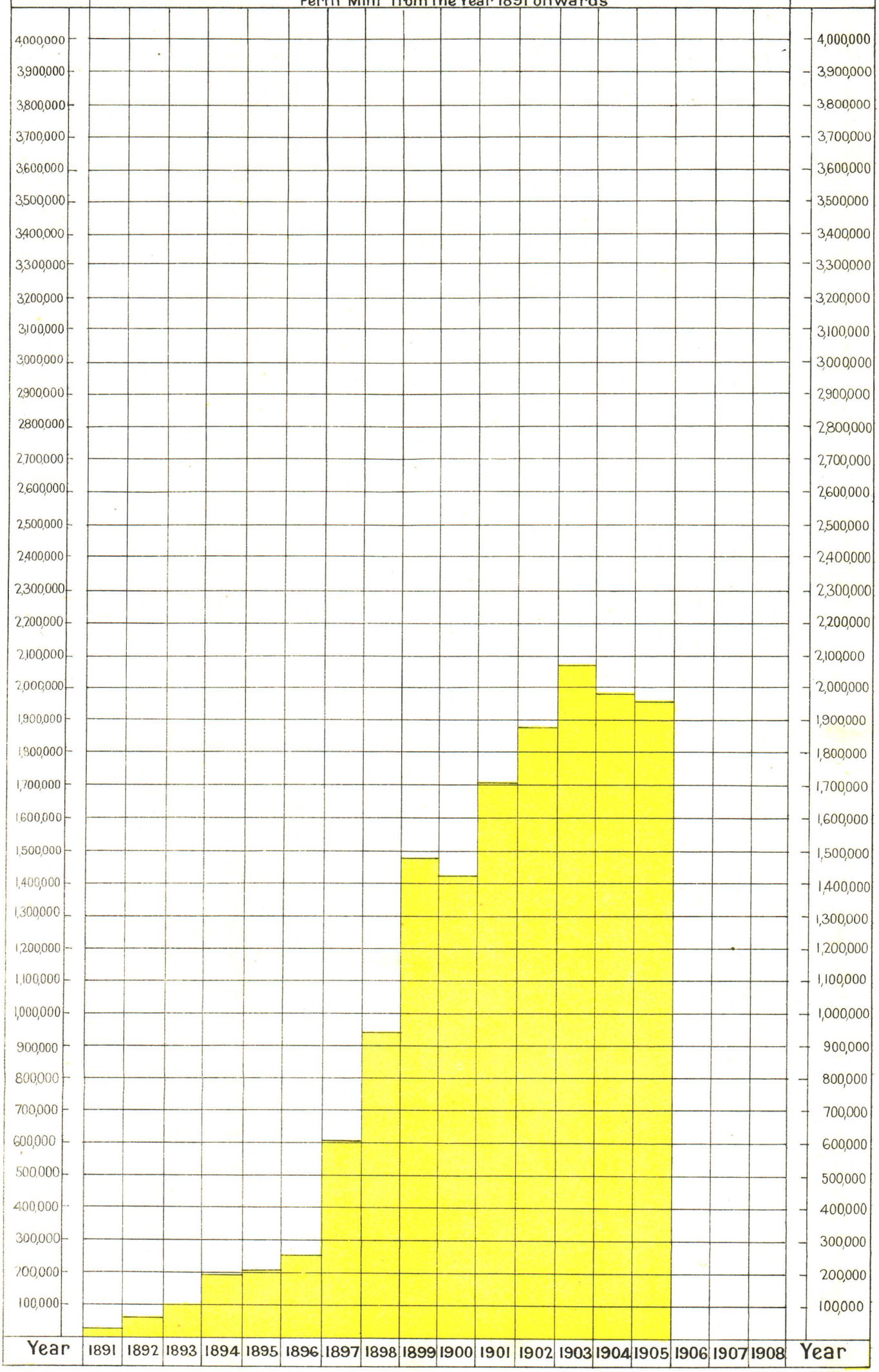
Report of the Chief Inspector of Explosives and Government Analyst	156

APPENDIX.

Mining Statistics	163

DIAGRAM

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



1906.

COMMONWEALTH OF AUSTRALIA.

STATE OF WESTERN AUSTRALIA.

Report of the Department of Mines for the State of Western Australia for the Year 1905.

To the Honourable the Minister for Mines.

SIR,

I have the honour to submit the Annual Report of the Department for the year 1905, 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.,

H. S. KING,

Secretary for Mines.

Department of Mines, Perth, 31st March, 1906.

DIVISION I.

Summary by the Secretary for Mines.

PART I.—GENERAL REMARKS.
II.—MINERALS RAISED.
III.—LEASES AND OTHER HOLDINGS UNDER THE VARIOUS ACTS RELATING TO MINING.
IV.—MEN EMPLOYED.
V.—ACCIDENTS.
VI.—STATE AID TO MINING.
VII.—REMARKS ON THE GOLDFIELDS AND MINERAL DISTRICTS AND SUMMARIES OF WARDENS AND OTHER OFFICERS' REPORTS.
VIII.—EXISTING LEGISLATION.
IX.—INSPECTION OF MACHINERY.
X.—SCHOOL OF MINES.
XI.—DEPARTMENTAL.

PART I.—GENERAL REMARKS.

The mineral production of this State for the year ending December, 1905, is valued at £8,555,841. The value of the gold produced is £8,305,654, or 97·08 of the total production. As compared with the year 1904 there is a falling off amounting to £130,916.

The dividends paid by the gold mining companies have been well maintained, the total for the year being £2,167,639, as against £2,050,547 in 1904.

To date the total recorded mineral production of Western Australia is £65,012,449; the total gold production is £63,170,911; while £13,739,842 has been paid in dividends.

GOLD.

The gold output for the State for 1905 is 1,955,316 fine ounces, valued at £8,305,654, which shows a decrease of £118,572; about 1½ per cent. on the output for 1904.

The largest decrease appears on the returns from the East-Coolgardie goldfield, it being about 5 per cent. lower than that for 1904. A decrease also appears in the yields of the majority of the goldfields, though in several of the principal fields slight increases are recorded.

The grade of ore treated has again fallen, the average value per ton of ore treated being 58·51 shillings, against 66·2 shillings for 1904, and 76·3 shillings for 1903. The value per ton of ore treated in East Coolgardie—the field responsible for over half the gold output—has decreased from 77·62 shillings in 1904 to 65·50 shillings for the year under review, while on the Murchison the value has fallen over 14 shillings.

Although the returns as herein summarised do not compare favourably with those of the previous year, there is no reason to doubt the soundness of the gold mining industry of the State. The magnificent dividend list from the East Coolgardie field, amounting to £1,584,281, shows that handsome profits can be made from ore which, considering its refractory nature, may be termed low-grade; and in view of the steady improvements in mining methods and machinery there can be no doubt that, although

the output from the State at large may not for a time compare favourably with the large output of previous years, the many low-grade deposits that exist will be worked at a profit, and will give employment to a much larger number of men than heretofore.

The prosperity of the industry may, to a great extent, be gauged by the number of men employed in it, and the returns for the year show that there has been practically no diminution in their number, 16,848 being employed in 1904, while 16,832 were employed in 1905.

The area of leases held for gold mining has also been fairly maintained. Considering that for some time past, owing to the liberalisation of the mining regulations, it has been possible to acquire and hold prospecting areas on much easier terms than formerly—a concession which has been freely taken advantage of—the fact that the area held under lease has not decreased to any extent is an encouraging one.

Several promising finds have been reported during the year, but until further development work is done it is impossible to speak with any certainty as to their value.

In the Murchison field promising reefs are being opened up at Barrambie, near the rabbit-proof fence, and a ten-head mill is about to be erected. At Gum Creek, between Cue and Wiluna, a battery is being erected; and several reefs that have been worked by prospectors for some time past will be thoroughly tested. At Meekatharra, in the same goldfield, developments have been encouraging, and, given a good water supply, this centre should have a good future before it. Surveys are now being made with the object of bringing water to this centre. A new auriferous area has been discovered near Eelya, about twenty miles east of Cue, but so far little is known as to its value. At Boogardie the year has been a prosperous one, the State battery being kept well employed. Throughout the Murchison field it is encouraging to note that many old mines are being reworked.

In the East Murchison field considerable activity has been shown in the Black Range district, and while several mines are being systematically developed, and are giving good returns, a considerable amount of prospecting is also going on. The State battery has been kept well supplied with ore, and would have crushed considerably more but for the temporary shortage of water.

In the Lawlers district, and in the country extending northwards to Lake Way, development has been proceeding quietly. At the latter place the State battery has done good work, but the temporary suspension of work on a number of leases held by a company has made this centre somewhat quiet. At Lake Darlôt mining has proceeded steadily; the revival caused by the establishment of the State battery has been maintained.

In the Mount Margaret goldfield, with its numerous mining centres, work has proceeded with varying results. This field can boast of many good mines, and there are considerable tracts of auriferous country that should pay for further prospecting. There are five State batteries at work in this field, which, during the year, have crushed 14,807·7 tons of stone for the public, for a yield of 21,670·81ozs.

In the North Coolgardie goldfield a considerable amount of work has been done at new centres. Around Pingin a good many leases have been worked and excellent returns obtained from parcels of ore treated at the State battery. At Yarri, also, the erection of a State battery has caused a good deal of mining, prospectors having previously had no facilities for crushing. At Yerilla, too, a centre that had been practically deserted for some time, the Department took over a battery which has immensely assisted mining in the district. In the North Coolgardie goldfield there are nine State crushing and cyanide plants, which have, during the year, treated 24,966·3 tons of ore and 25,860 tons of tailings and slimes for a total return of £118,681 9s. 1d.

In the Broad Arrow field, although mining has been quiet, a number of men have maintained themselves by working alluvial.

On the North-East Coolgardie field, as a whole, progress has been maintained, although some centres have been somewhat depressed.

On the East Coolgardie goldfield the output has somewhat fallen off, although the same number of men have been engaged in mining: 1,288,954 tons were treated in 1905, as against 1,147,270 tons in 1904, but the grade, as previously pointed out, has fallen 12s. per ton. Nevertheless, the dividends paid show that the field remains a most profitable one, and there is no reason to doubt its permanency. Some very favourable developments have occurred during the year on several of the large mines. Prospecting on the northern end of the field has been continued in some cases with good results.

On the Coolgardie goldfield the gold output has been maintained, and the prospects in several of the outlying centres are bright. Some very promising reefs have been found at Higginsville, on the road to Norseman, and a 10-head battery is shortly to be erected.

Mining on the Dundas goldfield, although quiet, has been prosecuted with fair success; but the very dry season has done much to retard development.

On the Yilgarn goldfield a good deal of prospecting has been going on to the south-east of Southern Cross; several batteries have been erected, and some promising shows are being opened up. To the south of Parker's Range some leases have been taken up at a place known as Cheriton's, and water having been located, a good test of this locality should be possible. A lode, said to offer good prospects, has been worked within half-a-mile of Enuin, well known at one time as the place where gold was first discovered on the Eastern Goldfields, but which has been deserted for many years.

The rainfall on the goldfields has been very light during 1905; many of the tanks and soaks that have been relied on for years past have failed, and this has interfered not only with established mines but also with prospecting shows and prospecting generally. Fortunately, towards the latter end of the year, thunderstorms relieved the shortage in many places; but a general downfall is badly wanted.

Tin.

The increase in the price of tin has been responsible for increased activity in this branch of mining. Both the Greenbushes and Pilbarra tinfield show an increased output, the former of 110 tons and the latter of 115 tons. The number of men engaged in tin mining has also increased by 195 during the year.

A very promising discovery of lode tin was made during the year at Wodgina, on the west branch of the Turner River, and in the Pilbarra Goldfield. The distance of the field from Port Hedland is about 74 miles. The Government Geologist, in his special report on this locality, which will be found with the report of the Geological Survey, states that the tin lodes are numerous, and occupy a considerable area of country, but, although the district promises to be an important one, a considerable amount of work must be done before its future is assured.

Tantalite.

Tantalite, in small quantities, has been found in the Greenbushes tinfield for many years past, but the recent discoveries on the Wodgina tinfield show that considerable quantities of it exist in that locality, a well-defined lode having been located a little to the North of the tin leases. The Government Geologist is of the opinion that the area over which the mineral occurs will be extended.

To the end of the year 73 tons of this mineral were reported to have been raised, $2\frac{1}{3}$ tons from Greenbushes and 71 tons from Wodgina, the value being estimated at £10,515. Early in 1906, however, it was found that the supply of this mineral largely exceeded the demand, and there was practically no market for it.

Coal.

During the year the output from the Collie Coalfield decreased to the extent of 11,186 tons, principally owing to the decreased tonnage used on the Government railways. Towards the latter end of the year, however, fresh arrangements were made, under which the Railway Department is, for three months in the year, to use 70 per cent. of Collie coal to supply its requirements, while for the remainder of the year 80 per cent. will be used. This arrangement does not apply to the lines between Albany and Wagin and between Geraldton and Nannine. In the year 1904 108,485 tons of Collie coal were used on the Government railways, while for the year 1905 only 92,921 tons were taken.

The number of men employed at coal mines during 1905 was 351, being only seven less than in 1904.

Tests have proved that coal from this field is specially suitable for the generation of producer gas, and inquiries are being conducted with a view of determining the most suitable plant for the purpose.

The boring operations undertaken on the Geraldton-Cue railway line, between Greenough and Mullewa, were discontinued during the year. The bore hole, which was carried to a depth of 1,418 feet, under considerable difficulties, owing to the nature of the ground, failed to locate any coal seams. It has, however, been decided to have a further geological examination of the district made, and further boring will probably be done.

Copper.

Although the market price of copper was particularly high during the year, the output of copper ore shows, as compared with 1904, a decrease of 1,580 tons, valued at £8,914.

Only 60 tons were raised from the Mount Margaret goldfield; 440 tons less than in 1904. The Phillips River field, however, shows the most considerable decrease, 1,140 tons less having been produced during 1905 than in 1904. This is to some extent accounted for by the closing down of the State Smelting Works on the latter field, as the plant, started in October, 1904, proved inadequate for this work; and in November, 1905, it was decided to dismantle it and erect a new furnace on another site. The amount of ore purchased by the Government in 1904 was 3,845 tons, while in 1905 it was 2,219 tons. The development work on the majority of the mines in this field rendered it impossible for them to maintain the output, and a few of the principal producing mines were, towards the latter end of the year, taken over by an English company, which started systematic development work, the effect of which has been to restrict the present output, although it will doubtless be to the ultimate benefit of the field.

Other Minerals.

The value of silver, obtained as a by-product, is less by £1,634 than that reported in 1904.

The value of ironstone raised from mineral leases and used for fluxing purposes is greater by £708 than in 1904, while the value of the limestone similarly obtained and used has decreased by £479.

PART II.—MINERALS RAISED.

TABLE I.

Quantity and Value of all the Minerals produced during 1904 and 1905.

Description of Mineral.	1904.		1905.		Increase or Decrease for Year compared with 1904.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
		£		£		£
1. Black Tin (raised), statute tons... ...	855	58,817	1,079	86,840	+ 224	+ 28,023
2. Coal (raised) do.	138,550	67,174	127,364	55,312	− 11,186	− 11,862
3. Copper Ore (raised) do.	3,969	25,180	2,389	16,266	− 1,580	− 8,914
4. Gold (export and mint), fine ounces ...	1,983,230	8,424,226	1,955,316	8,305,654	− 27,914	− 118,572
5. Ironstone raised, statute tons ...	1,441	577	3,213	1,285	+ 1,771	+ 708
6. Limestone (raised) do.	13,397	1,699	9,145	1,220	− 4,252	− 479
7. Pig Lead (exported)	5,352	63,170	2,730	34,471	− 2,622	− 28,699
8. Plumbago Ore (exported) do.	†	2	...	...	...	− 2
9. Silver (exported), fine ounces	399,190	45,912	359,744	44,278	− 39,446	− 1,634
10. Tantalite (raised), statute tons	...	...	73	10,515	+ 73	+ 10,515
Total Values	...	8,686,757	...	8,555,841	...	− 130,916

† 1cwt.

The above table shows that the total value of the mineral output for 1905 has decreased, as compared with that for 1904, by £130,916. The principal decrease is in the gold output, which has fallen to the extent of £118,572. Decreases also appear in the value of the outputs for coal, copper, pig lead, tin, silver, and limestone, while substantial increases appear in that of tin and ironstone. Tantalite appears for the first time as a separate product from the State, 73 tons, valued at £10,515, having been raised during the year.

TABLE 2.

Summary of Gold Exported and received at the Perth Branch of the Royal Mint during 1904 and 1905, compared with the yields reported to the Mines Department; also the percentage of the latter for the several Goldfields, and the average value of Gold per ton of Ore treated.

Goldfield.	Export and Mint.		Reported Yield.					
					Percentage for each Goldfield.		Average Value of Gold per ton of Ore treated.	
	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.
	fine ozs.	fine ozs.	fine ozs.	fine ozs.			shillings.	shillings.
1. Kimberley	32	**546**	206	**496**	·01	**·03**	24·34	**151·66**
2. Pilbarra	6,931	**13,402**	8,030	**11,474**	·42	**·62**	158·98	**162·87**
3. West Pilbarra	4,321	**1,165**	3,428	**801**	·18	**·04**	75·04	**109·37**
4. Ashburton	126	**42**	510	**208**	·03	**·01**	...	...
5. Gascoyne	11	**21**	...	...	...	...	...	...
6. Peak Hill	17,475	**13,497**	14,113	**13,587**	·74	**·74**	25·62	**21·69**
7. East Murchison	85,847	**90,612**	93,591	**84,926**	4·89	**4·61**	40·44	**38·24**
8. Murchison	217,916	**224,398**	214,403	**206,735**	11·20	**11·23**	87·52	**73·39**
9. Yalgoo	2,796	**4,626**	2,353	**4,743**	·12	**·26**	36·58	**63·43**
10. Mt. Margaret	183,071	**188,153**	183,523	**188,712**	9·59	**10·25**	52·50	**48·04**
11. North Coolgardie	141,133	**146,809**	145,064	**148,771**	7·58	**8·08**	53·02	**54·13**
12. Broad Arrow	20,980	**15,904**	22,180	**18,584**	1·16	**1·01**	66·62	**61·23**
13. North-East Coolgardie... ...	33,317	**42,407**	50,955	**52,947**	2·66	**2·88**	55·82	**53·86**
14. East Coolgardie	1,139,597	**1,092,358**	1,050,923	**997,193**	54·91	**54·18**	77·62	**65·50**
15. Coolgardie	62,173	**62,244**	63,200	**63,664**	3·30	**3·46**	54·96	**63·47**
16. Yilgarn	29,994	**25,291**	25,509	**19,292**	1·33	**1·05**	32·74	**34·16**
17. Dundas	33,181	**28,736**	31,830	**25,961**	1·67	**1·41**	77·72	**68·23**
18. Phillips River	2,984	**3,519**	4,017	**2,563**	·21	**·14**	53·20	**77·50**
19. Donnybrook	...	...	...	...	...	...	...	...
Goldfields generally	1,345	**1,586**	...	...	...	...	...	...
Total and averages	1,983,230	**1,955,316**	1,913,835	**1,840,657**	100·00	**100·00**	66·20	**58·51**

In the above table the reported yields are most reliable when the relative outputs of the various fields are being considered, as they are compiled from the detailed

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 1905.

Fig. 1

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

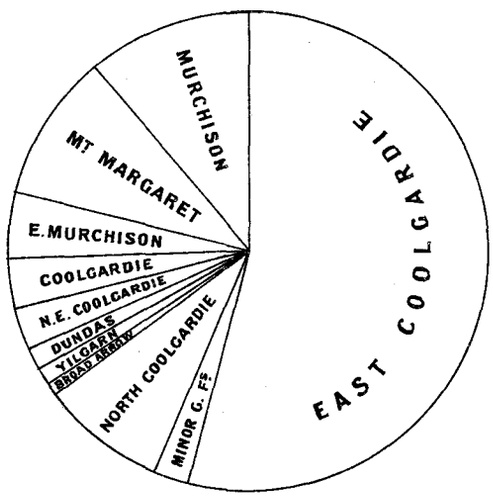


Fig. 2

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

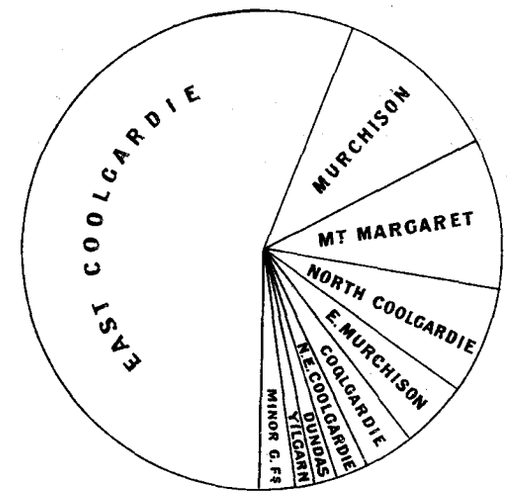


Fig. 3

Value of Gold and other Minerals.

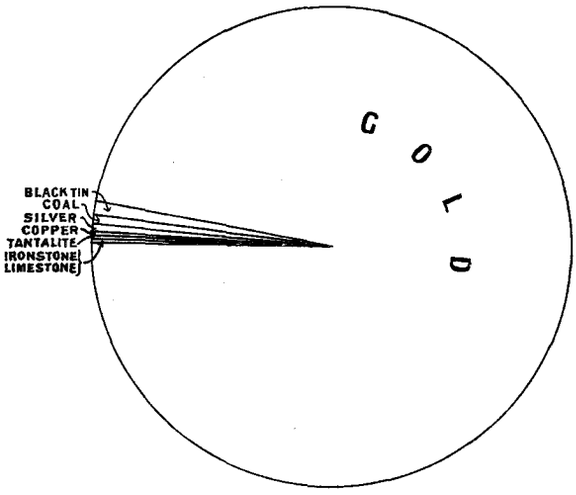


Fig. 4

Value of Minerals other than Gold.

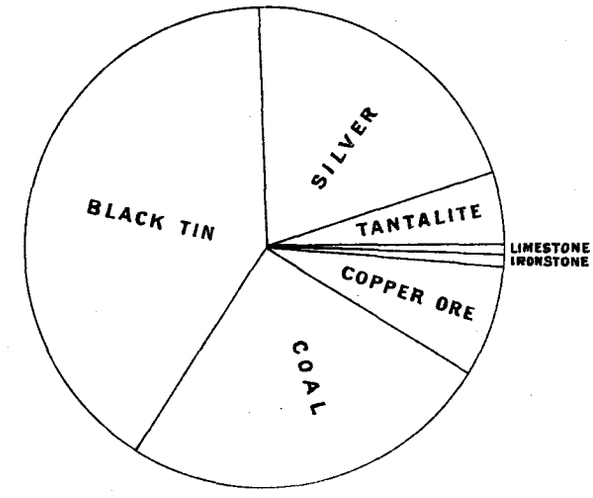


Fig. 5

Areas of Land leased for Goldmining on various Goldfields.

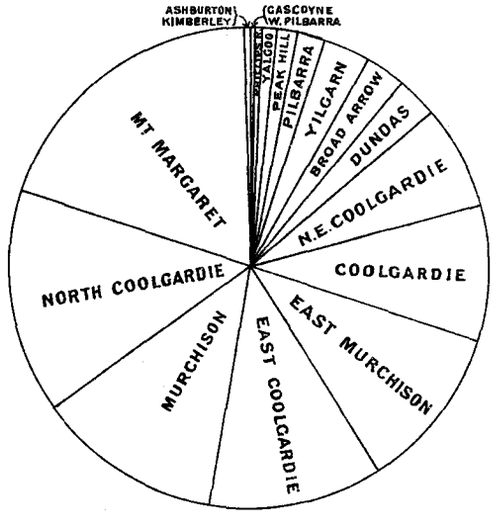
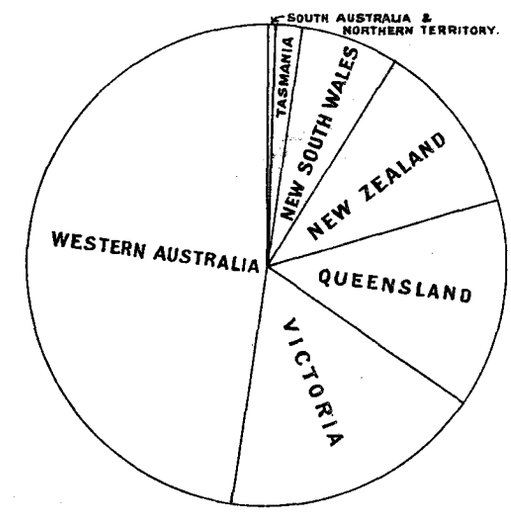


Fig. 6

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



statements sent in by the principal working mines. The export and mint returns, however, give a more reliable total, as practically all the gold, reef and alluvial, produced either finds its way to the mint, or, failing that, is exported.

Of the Northern goldfields, both Kimberley and Pilbarra show an increased yield, but West Pilbarra, Ashburton, and Gascoyne have fallen off. The gold from the two latter is either alluvial or dollied gold, no crushing plants being in existence.

The Peak Hill goldfield shows a small decrease, and decreases also appear in the yields from the Murchison, East Murchison, Broad Arrow, East Coolgardie, Dundas, Yilgarn, and Phillips River goldfields, while the Yalgoo, Mount Margaret, North Coolgardie, North-East Coolgardie, and Coolgardie goldfields show an increased yield.

The average value per ton of ore milled has fallen from 66·2 shillings in 1904 to 58·5 shillings for the year under review.

TABLE 3.

Number of Gold-producing Mines in the several Goldfields and Districts during 1904 and 1905.

Goldfield.	District.	1904.		1905.		
		District.	Goldfield.	District.	Goldfield.	
Kimberley	... ...	...	1	...	1	=
Pilbarra	Marble Bar ...	13	23	9	25	+ 2
	Nullagine	10		16		
West Pilbarra	... ...	...	2	...	2	=
Peak Hill	... ...	...	11	...	10	− 1
East Murchison ...	Lawlers	68	111	66	128	+ 17
	Black Range ...	43		62		
Murchison	Cue	55	197	59	180	− 17
	Nannine	57		54		
	Day Dawn ...	19		18		
	Mt. Magnet ...	66		49		
Yalgoo	... ...	...	9	...	7	− 2
Mt. Margaret ...	Mt. Morgans ...	31	179	34	180	+ 1
	Mt. Malcolm ...	66		75		
	Mt. Margaret ..	82		71		
North Coolgardie ...	Menzies	99	295	84	234	− 61
	Ularring	59		42		
	Niagara	74		51		
	Yerilla	63		57		
Broad Arrow	... ...	...	37	...	40	+ 3
North-East Coolgardie	Kanowna	36	72	44	92	+ 20
	Bulong	32		44		
	Kurnalpi	4		4		
East Coolgardie	... ...	...	80	...	92	+ 12
Coolgardie	Coolgardie ...	82	119	81	114	− 5
	Kunanalling ...	37		33		
Yilgarn	... ...	...	41	...	40	− 1
Dundas	... ...	...	36	...	40	+ 4
Phillips River	... ...	...	15	...	14	− 1
Donnybrook	... ...	...	...	...	...	...
		...	1,228	...	1,199	...

It will be noticed that the number of producing mines has decreased by 29, as compared with the number in 1904.

The greatest increases are shown in the Black Range district, where 19 more mines are producing gold, and in the North-East Coolgardie Goldfield, where there are 20 more than in 1904.

The largest decrease is in the North Coolgardie Goldfield, where a falling off of 61 appears, every district in that goldfield showing less gold-producing mines.

TABLE 4.

Increase or Decrease in Output of certain large producing Mines in 1905, as compared with 1904.

	Goldfield.	District.	Name of Mine.	Production.		Increase or Decrease for Year, compared with 1904.
				1904.	1905.	
				fine ozs.	fine ozs.	fine ozs.
1.	Peak Hill		Peak Hill Goldfield, Ltd.	13,705·83	12,785·16	— 920·67
2.	East Murchison	Lawlers	Bellevue Proprietary, Ltd.	15,540·75	15,497·41	— 43·34
3.	Do.	do.	London and Western Australian Exploration Co., Ltd.	21,604·89	18,328·91	— 3,275·98
4.	Do.	do.	Gwalia Consolidated, Ltd.	3,624·64	6,740·21	+ 3,115·57
5.	Do.	do.	Leinster leases	4,811·23	1,736·46	— 3,074·77
6.	Do.	do.	Vivien G.M. Co., Ltd.	10,305·24	8,300·19	— 2,005·05
7.	Do.	Black Range	Adelaide leases	5,142·90	7,408·82	+ 2,265·92
8.	Murchison	Cue	Victory United G.M. Co., N.L.	1,696·46	2,704·06	+ 1,007·60
9.	Do.	Nannine	New Alliance	2,767·90	2,741·41	— 26·49
10.	Do.	Day Dawn	Great Fingall Consolidated, Ltd.	156,702·30	159,774·97	+ 3,072·67
11.	Do.	Mt. Magnet	Morning Star Quartz Co., N.L.	3,466·57	3,217·59	— 248·98
12.	Yalgoo		Phœnix G.Ms., Ltd.	82·13	2,036·80	+ 1,954·67
13.	Mt. Margaret	Mt. Morgans	Westralia Mt. Morgans G.Ms. Co., Ltd.	38,357·81	15,095·15	—23,262·66
14.	Do.	Mt. Malcolm	Merton's Reward G.M. Co., Ltd.	4,772·78	11,865·51	+ 7,092·73
15.	Do.	do.	Sons of Gwalia, Ltd.	62,049·91	63,628·42	+ 1,578·51
16.	Do.	Mt. Margaret	Craiggiemore Proprietary, Ltd.	3,958·59	7,640·44	+ 3,681·85
17.	Do.	do.	Ida H. G.M. Co., Ltd.	12,369·96	11,902·52	— 467·44
18.	Do.	do.	Lancefield G.M. Co., Ltd.	10,734·01	15,383·22	+ 4,649·21
19.	North Coolgardie	Menzies	Lady Shenton G.M., Ltd.	675·87	3,872·82	+ 3,196·95
20.	Do.	do.	Menzies Consolidated G.Ms., Ltd.	8,972·58	10,134·44	+ 1,161·86
21.	Do.	do.	Menzies Mining and Exploration Corporation, Ltd.	4,184·20	4,063·72	— 120·48
22.	Do.	do.	Queensland Menzies G.M. Co., N.L.	6,874·46	8,241·21	+ 1,366·75
23.	Do.	Ularring	Golden Pole G.M. Co., Ltd.	9,614·36	25,960·86	+16,346·50
24.	Do.	do.	Lady Gladys G.M. Co., N.L.	3,392·94	1,262·35	— 2,130·59
25.	Do.	do.	Westralia Waihi G.Ms., N.L.	128·40	5,072·68	+ 4,944·28
26.	Do.	Niagara	Englishman: Cosmopolitan Proprietary, Ltd.	42,961·18	33,876·54	— 9,084·64
27.	Do.	Yerilla	Neta leases	2,322·39	3,487·09	+ 1,164·70
28.	Do.	do.	Potosi Consolidated, Ltd.	9,100·77	7,121·94	— 1,978·83
29.	Broad Arrow		New Standard Exploration Co., Ltd.	5,594·10	6,789·71	+ 1,195·61
30.	N.E. Coolgardie	Kanowna	North White Feather G.Ms., Ltd.	7,589·08	13,297·23	+ 5,708·15
31.	Do.	do.	Queen Margaret G.M. Co., Ltd.	5,109·02	4,042·05	— 1,066·97
32.	Do.	do.	White Feather Main Reefs, Ltd.	11,236·71	6,551·78	— 4,684·93
33.	Do.	Bulong	Queen Margaret G.M. Co., Ltd.	7,220·00	3,850·90	— 3,369·10
34.	East Coolgardie		Associated G.Ms. of W.A., Ltd.	72,409·40	57,411·53	—14,997·87
35.	Do.		Associated Northern Blocks (W.A.), Ltd.	36,134·74	43,853·10	+ 7,718·36
36.	Do.		Brown Hill Consols leases	6,370·72	6,508·14	+ 137·42
37.	Do.		Golden Horseshoe Estates Co., Ltd.	179,222·43	160,440·10	—18,782·33
38.	Do.		Golden Ridge Proprietary leases	9,783·98	9,959·20	+ 175·22
39.	Do.		Great Boulder Perseverance G.M. Co., Ltd.	137,117·09	105,836·47	—31,280·62
40.	Do.		Great Boulder Proprietary G.Ms., Ltd.	132,473·23	128·305·91	— 4,167·32
41.	Do.		Hainault G.Ms., Ltd.	12,349·07	20,452·35	+ 8,103·28
42.	Do.		Ivanhoe Gold Corporation, Ltd.	126,252·00	125,755·00	— 497·00
43.	Do.		Kalgurli G.Ms., Ltd.	46,471·25	59,598·00	+13,126·75
44.	Do.		Lake View Consols, Ltd.	48,090·47	46,067·53	— 2,022·94
45.	Do.		Oroya-Brownhill Co., Ltd.	153,225·63	155,001·02	+ 1,775·39
46.	Do.		South Kalgurli G.Ms., Ltd.	8,647·86	19,600·75	+10,952·89
47.	Coolgardie	Coolgardie	Burbanks Birthday Gift G.M., Ltd.	1,930·18	6,383·01	+ 4,452·83
48.	Do.	do.	Redhill Westralia G.Ms., Ltd.	3,869·31	7,587·02	+ 3,717·71
49.	Do.	do.	Westralia and East Extension Mines, Ltd.	16,482·23	13,680·38	— 2,801·85
50.	Dundas		Cumberland G.M. Co., N.L.	5,724·46	7,059·08	+ 1,334·62
51.	Do.		Lady Mary G.M. Co., N.L.	1,214·41	1,115·55	— 98·86
52.	Do.		Princess Royal G.M. Co., N.L.	17,531·16	12,174·93	— 5,356·23
53.	Yilgarn		British and Foreign Development Syndicate, Ltd.	5,836·88	5,343·61	— 493·27
54.	Phillips River		Ravensthorpe G.M. Syndicate, N.L.	516·38	659·98	+ 143·60
				1,518,322·84	1,497,205·23	—21,117·61

Of the above 54 mines, 26 produced 136,259 fine ounces less, and 28 produced 115,142 fine ounces more than in 1904, being a net decrease of 21,118 fine ounces.

TABLE 5.

Averages of Gold Ore raised and treated, and Gold produced therefrom, per man employed on the several Goldfields of the State, during 1904 and 1905.

GOLDFIELD.	1904.				1905.			
	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	100·00	60·00	28·67	17·20	107·00	71·33	191·02	127·35
2. Pilbarra	31·29	21·04	58·56	39·37	51·23	27·75	98·22	53·20
3. West Pilbarra	322·91	322·91	285·27	285·27	37·14	21·67	47·82	27·89
4. Ashburton	...	...	...	...	...	...	...	...
5. Gascoyne	...	...	...	...	...	...	...	...
6. Peak Hill	449·95	186·43	135·71	56·23	715·86	299·29	182·76	76·41
7. East Murchison	305·48	149·92	146·49	71·40	328·79	160·99	148·00	72·46
8. Murchison	277·14	133·11	285·55	137·15	332·60	165·95	287·33	143·36
9. Yalgoo	165·55	82·77	71·30	35·65	102·32	55·17	76·41	41·19
10. Mt. Margaret	271·76	150·50	167·96	93·02	284·51	150·71	160·89	85·23
11. North Coolgardie ...	231·90	132·78	144·78	82·90	207·90	119·01	132·46	75·83
12. Broad Arrow	153·27	86·44	120·22	67·80	133·79	82·84	96·43	59·71
13. North-East Coolgardie ...	156·43	102·99	102·80	67·68	150·95	93·84	95·70	59·49
14. East Coolgardie	353·11	183·42	322·64	167·59	384·30	206·03	296·30	158·85
15. Coolgardie	114·54	65·79	74·12	42·57	154·13	92·95	78·86	47·56
16. Yilgarn	366·90	167·64	141·45	64·62	301·67	151·31	121·29	60·83
17. Dundas	127·60	72·68	116·73	66·49	122·60	73·00	98·47	58·63
18. Phillips River	156·75	84·73	98·18	53·07	79·13	44·67	72·19	40·75
19. Donnybrook	...	...	...	...	...	...	...	...
Total Averages ...	272·60	144·36	212·44	112·50	291·32	157·05	200·63	108·16

The average tonnage of ore raised per man employed, above and under ground, has increased by 13·7 tons, but on the average every such man has produced but 108·16 fine ounces of gold, as compared with 112·5 in 1904.

Although the tonnage raised per man is remarkably high in the Peak Hill Goldfield, there is but a small number of men employed. Considering the number employed on the East Coolgardie Goldfield (6,256), the number of tons raised per man is high, and speaks much for the class of men employed and the methods in use.

TABLE 6.

Output of Gold from the several States of Australia and the Colony of New Zealand during 1905.

State.	Output of Gold.	Value.	Percentage of Total Value of Output.
	Fine ozs.	£	
1. Western Australia	1,955,316	8,305,654	47·04
2. Victoria	747,664	3,175,875	17·98
3. Queensland	592,620	2,517,290	14·26
4. New South Wales	274,267	1,165,012	6·60
5. Tasmania	73,541	312,382	1·77
6. South Australia and Northern Territory ...	20,330	86,356	·49
7. New Zealand	492,954	2,093,936	11·86
Total	4,156,692	17,656,505	100·00

Table 7.

Dividends paid by Western Australian Gold Mining Companies during 1904 and 1905.

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

Goldfield.	Name of Company.	Par Value of Shares.	Paid up to	Nominal Capital.	No. of Shares issued.	1904.			1905.		
						No. of Dividends paid.	Total Amount paid.	Total for each Goldfield.	No. of Dividends paid.	Total Amount paid.	Total for each Goldfield.
		£ s. d.	£ s. d.	£	£		£	£		£	£
Dundas	Cumberland G.M. Co., N.L.	0 10 0	0 6 0	40,000	80,000	...	...	...	3	6,000	...
	Princess Royal G.M. Co., N.L.	0 10 0	39,803 fully paid, 40,197 con. (6/6 paid)	40,000	80,000	3	12,000	12,000	...	...	6,000
East Coolgardie ...	Associated Gold Mines of W.A., Ltd.	1 0 0	1 0 0	500,000	495,364	2	111,457	...	1	49,536	...
	Associated Northern Blocks, Ltd.	1 0 0	1 0 0	350,000	350,000	...	...	...	2	87,500	...
	Brown Hill Extended G.M. Co., Ltd.	1 0 0	1 0 0	100,000	100,000	1	5,000	...	...	...	...
	Golden Horseshoe Estates Co., Ltd.	5 0 0	5 0 0	1,500,000	300,000	3	270,000	...	3	270,000	...
	Golden Ridge G.M. Co., N.L.	1 0 0	0 16 0	31,200	30,900	5	1,925	...	1	1,545	...
	Great Boulder Perseverance G.M. Co., Ltd. ...	1 0 0	1 0 0	1,500,000	1,400,000	3	245,000	...	3	122,500	...
	Great Boulder Proprietary G.M., Ltd.	0 2 0	0 2 0	175,000	1,750,000	4	284,375	...	4	284,375	...
	Hainault G.M., Ltd.	1 0 0	1 0 0	130,000	125,750	1	6,038	...	2	12,575	...
	Ivanhoe Gold Corporation, Ltd.	5 0 0	5 0 0	1,000,000	200,000	4	225,000	...	4	240,000	...
	Kalgurli Gold Mines, Ltd.	1 0 0	1 0 0	120,000	120,000	4	60,000	...	4	60,000	...
	Lake View Consols, Ltd.	1 0 0	258,754 fully paid, 91,246 con. (5/- paid)	350,000	350,000	1	26,250	...	1	17,500	...
	Oroya-Brownhill Co., Ltd.	1 0 0	1 0 0	450,000	450,000	4	281,250	1,516,295	5	438,750	1,584,281
East Murchison ...	Black Range G.M. Co., N.L.	10 0 0	10 0 0	80,000	6,750	...	...	...	4	8,438	8,438
Mount Margaret ...	Ida H. Gold Mining Co., Ltd.	0 5 0	0 5 0	60,000	216,000	3	13,500	...	4	13,500	...
	Mikado G.M. Co., Ltd.	5 0 0	5 0 0	15,000	1,035	...	...	...	4	46	...
	Sons of Gwalia G.M. Co., Ltd.	1 0 0	1 0 0	350,000	325,000	2	97,500	...	3	73,125	...
	Westralia Mount Morgans G.M. Co., Ltd. ...	0 5 0	0 5 0	125,000	480,000	3	30,000	141,000	...	...	86,671
Murchison	Great Fingall Consolidated Gold Mines, Ltd....	0 10 0	0 10 0	125,000	250,000	4	337,500	337,500	4	387,500	387,500
North Coolgardie ...	Cosmopolitan Proprietary, Ltd.	1 0 0	1 0 0	400,000	400,000	1	20,000	...	1	20,000	...
	Golden Pole Gold Mines, Ltd.	0 2 0	0 2 0	20,000	200,000	3	15,000	35,000	9	60,000	80,000
North-East Coolgardie	North White Feather Gold Mines, Ltd. ...	0 10 0	0 10 0	200,000	399,850	...	...	...	1	9,996	...
	Queen Margaret G.M. Co., Ltd.	1 0 0	1 0 0	100,000	95,050	1	4,752	...	1	4,753	...
	White Feather Main Reefs, Ltd.	1 0 0	1 0 0	160,000	160,000	1	4,000	8,752	...	...	14,749
	Totals	...	...	7,921,200	8,365,699	...	2,050,547	2,050,547	...	2,167,639	2,167,639

It will be noted that the dividends paid during 1905 exceeded those paid in 1904 by £117,092.

From the mines on the East Coolgardie Goldfield the dividends amounted to £1,584,281, or 73 per cent. of the total amount of dividends for the State. This amount is £67,986 in excess of that for the year 1904, for the East Coolgardie Goldfield. One mine, the Oroya Brownhill, paid £438,750 in dividends during last year, and two other mines paid over a quarter of a million each.

The Black Range G.M. Co. appears on the list for the first time, with four dividends, totalling £8,438.

In the Murchison Goldfield the Great Fingall paid four dividends, totalling £387,500; while in the North-East Coolgardie Goldfield the North White Feather Gold Mines paid its first dividend of £9,996.

TABLE 8.

Quantity and Value of Minerals, other than Gold, reported to the Mines Department during 1905.

Goldfield, District, or Mineral Field.	Quantity.	Value.	Increase or Decrease for year compared with 1904.	
			Quantity.	Value.
	tons.	£	tons.	£
BLACK TIN.				
Greenbushes Mineral Field	643·52	52,960	+ 109·88	+ 18,498
Pilbarra Goldfield (Marble Bar District) ...	435·74	33,880	+ 114·88	+ 9,525
Total	1,079·26	86,840	+ 224·76	+ 28,023
TANTALITE.				
Greenbushes Mineral Field	2·34	1,590	+ 2·34	+ 1,590
Pilbarra Goldfield (Marble Bar District) ...	70·95	8,925	+ 70·95	+ 8,925
Total	73·29	10,515	+ 73·29	+ 10,515
COPPER ORE.				
Mt. Margaret Goldfield (Mt. Malcolm District)	60·00	674	— 440·00	— 226
Phillips River Goldfield	2,329·04	15,592	— 1,139·85	— 8,688
Total	2,389·04	16,266	— 1,579·85	— 8,914
IRONSTONE.				
From State generally	3,212·60	1,285	+ 1,771·10	+ 708
LIMESTONE.				
From State generally	9,144·60	1,220	— 4,252·60	— 479

The above table shows a substantial advance in the output of black tin for the year, both on the Greenbushes and Pilbarra fields. Nearly 200 more men were engaged in this industry than in 1904, the increase being about evenly divided between the two fields.

There is only one producing copper mine in the Mount Margaret Goldfield, and the output from this fell off very considerably during 1905; the mine being practically closed down.

In the Phillips River Goldfield, though there were a number of mines raising copper, the output has fallen off, partly on account of the temporary closing of the State Smelter, partly from want of systematic development work; and, further, because several of the principal mines are confining their operations to development work only.

TABLE 9.

Quantity of Coal raised during 1904 and 1905, 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	1904	138,550	67,174	75	283	490	387
	1905	127,364	55,312	90	261	488	363

The tonnage of coal produced during 1905 has fallen about 8 per cent., as compared with the 1904 output. The number of men employed has varied but little; 358 being employed in 1904 and 351 in 1905.

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

TABLE 10.

Total Number and Acreage of Leases held for Mining on 31st December, 1904 and 1905.

Description of Leases.	1904.		1905.	
	No.	Acreage.	No.	Acreage.
Gold mining leases on Crown land	2,471	32,362	2,447	32,273
„ „ „ private property ...	17	168	...	...
Mineral leases on Crown land	180	23,589	226	26,443
„ „ private property	...	...	2	50
	2,668	56,119	2,675	58,766

It will be seen that the total number of leases held for mining has increased during 1905, as compared with 1904, and the acreage is greater by 2,647 acres.

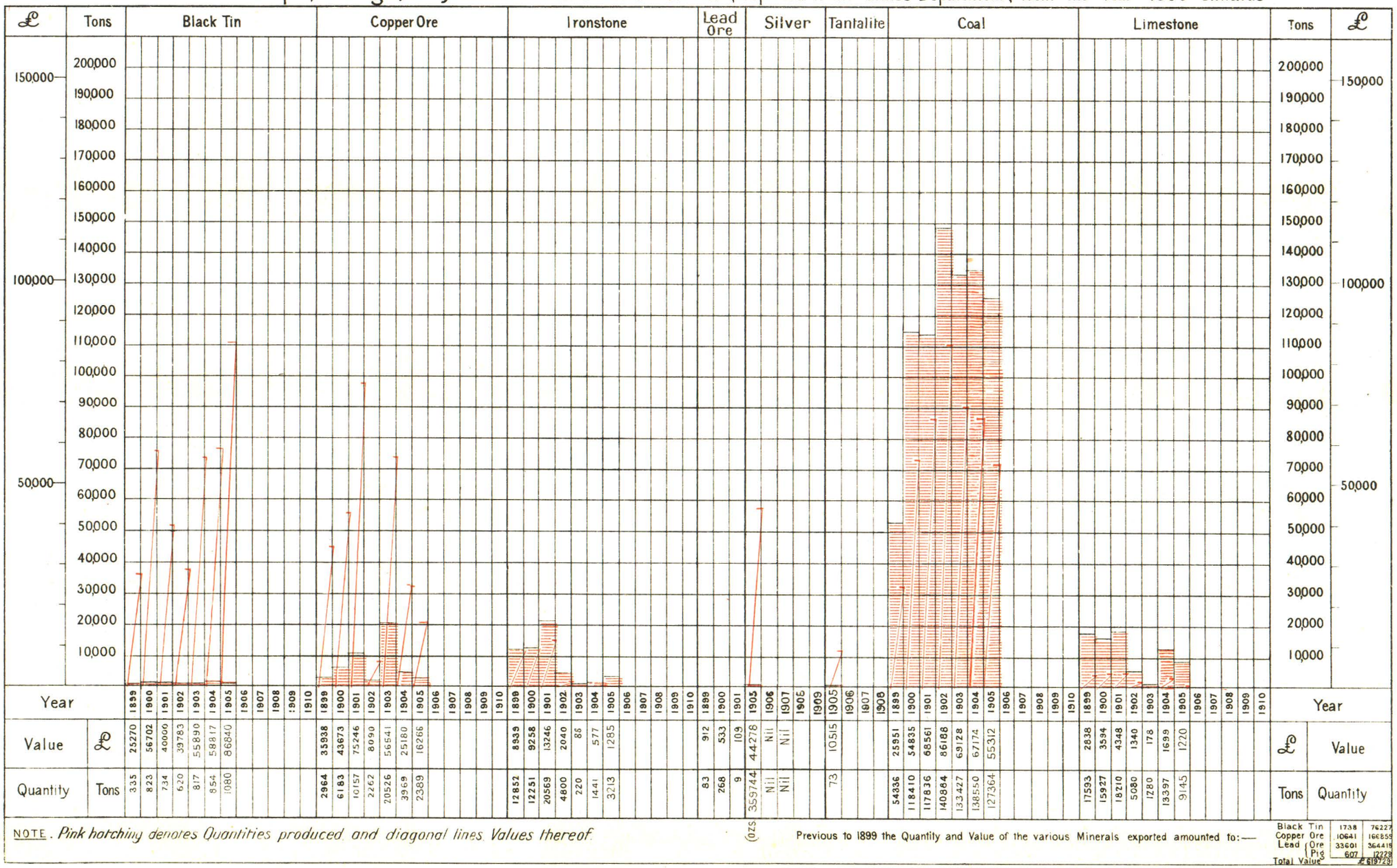
The number of leases for gold mining has decreased by 24, and their area by 89 acres—a small falling off.

The acreage held under mineral lease has increased by 2,904 acres, and the number of leases is greater by 48 than in 1904.

No gold mining is now being done on private property.

DIAGRAM

of the Mineral Output, showing Quantity & Value of Minerals other than Gold, reported to the Mines Department, from the Year -1899- onwards



NOTE. *Pink hatching denotes Quantities produced and diagonal lines Values thereof.*

Previous to 1899 the Quantity and Value of the various Minerals exported amounted to:—

	Tons	£
Black Tin	1738	76227
Copper Ore	10641	166855
Lead { Ore	33601	364419
Lead { Pig	607	12278
Total Value		£619729

Table 11.

Number and Acreage of Gold Mining Leases in force each year for the Five Years ending 31st December, 1905.

Goldfields.		Districts.		1901.		1902.		1903.		1904.		1905.		Percentage of Total Acreage.		Increase or Decrease for 1905 compared with 1904.		Goldfields.
Name.	Proclaimed.	Name.	Proclaimed.	Leases.	Acreage.	Leases.	Acreage.	Leases.	Acreage.	Leases.	Acreage.	Leases.	Acreage.	1904.	1905.	Increase.	Decrease.	
																acres.	acres.	
Kimberley ...	20-5-86	... ...	...	3	19	3	19	3	19	2	13	**2**	**13**	·04	**·04**	...	...	Kimberley
Yilgarn	1-10-88	... ...	...	32	497	37	584	74	985	62	861	**61**	**924**	2·65	**2·86**	63	...	Yilgarn
Pilbarra	1-10-88	Marble Bar ...	6-11-96	36	316	28	256	27	258	20	204	**22**	**267**	1·50	**1·83**	99	...	Pilbarra
		Nullagine ...	6-11-96	16	193	22	252	20	244	24	286	**30**	**322**					
Ashburton ...	11-12-90	... ...	...	...	...	...	...	...	...	...	...	**1**	**12**	...	**·04**	12	...	Ashburton
Murchison ...	24-9-91	Cue	10-1-96	92	800	95	933	89	810	113	1,007	**110**	**1,152**	12·02	**12·43**	102	...	Murchison
		Nannine ...	7-12-94	75	891	82	973	93	1,114	98	1,187	**119**	**1,291**					
		Day Dawn ...	10-1-96	96	1,099	117	1,281	112	1,209	98	1,058	**98**	**1,035**					
		Mount Magnet	7-12-94	91	840	116	1,044	94	834	77	656	**66**	**532**					
Dundas	31-8-93	... ...	...	85	986	68	733	72	793	88	913	**84**	**956**	2·80	**2·96**	43	...	Dundas
Coolgardie ...	6-4-94	Coolgardie ...	1-9-97	197	2,464	188	2,274	170	2,076	167	2,104	**173**	**2,273**	9·18	**9·15**	...	34	Coolgardie
		Kunanalling ...	1-9-97	96	1,195	86	1,097	73	908	72	882	**55**	**679**					
East Coolgardie ...	21-9-94	... ...	...	295	4,665	254	3,936	231	3,469	246	3,579	**258**	**3,708**	11·00	**11·49**	129	...	East Coolgardie
Yalgoo	23-1-95	... ...	...	41	512	35	417	28	365	27	284	**32**	**344**	·87	**1·07**	60	...	Yalgoo
North Coolgardie	28-6-95	Menzies ...	20-3-96	95	1,155	100	1,364	129	1,508	135	1,649	**106**	**1,335**	15·63	**14·89**	...	280	North Coolgardie
		Ularring ...	23-9-96	129	1,766	85	1,105	81	937	77	909	**83**	**1,016**					
		Yerilla ...	20-3-96	48	852	49	838	96	1,539	81	1,232	**86**	**1,366**					
		Niagara ...	12-3-97	109	1,312	119	1,431	121	1,455	111	1,297	**88**	**1,090**					
East Murchison ...	28-6-95	Lawlers ...	...	151	2,133	190	2,960	192	2,746	164	2,392	**155**	**2,144**	10·48	**11·25**	221	...	East Murchison
		Black Range ...	...	...	...	...	...	...	...	89	1,017	**118**	**1,486**					
West Pilbarra ...	20-9-95	.. ..	...	3	36	7	96	6	66	5	78	**6**	**102**	·20	**·32**	24	...	West Pilbarra
North-East Coolgardie	20-3-96	Kanowna ...	13-11-96	112	1,336	112	1,322	89	1,118	82	1,073	**89**	**1,151**	8·51	**7·10**	...	476	N.E. Coolgardie
		Bulong ...	13-11-96	59	798	73	887	67	909	74	1,084	**64**	**944**					
		Kurnalpi ...	13-11-96	5	73	4	54	...	...	27	612	**11**	**198**					
Broad Arrow ...	17-11-96	... ...	...	97	1,251	89	1,151	86	1,098	88	1,144	**76**	**943**	3·51	**2·92**	...	201	Broad Arrow
Peak Hill ...	19-3-97	... ...	...	98	1,334	66	747	59	693	62	719	**47**	**492**	2·21	**1·52**	...	227	Peak Hill
Mount Margaret	12-3-97	Mount Margaret	12-3-97	222	3,970	169	2,767	132	2,089	159	2,454	**172**	**2,676**	17·77	**19·50**	524	...	Mount Margaret
		Mount Malcolm	12-3-97	161	2,939	140	2,515	103	1,836	143	2,384	**144**	**2,467**					
		Mount Morgans	2-4-02	...	...	41	720	33	614	55	933	**74**	**1,152**					
Gascoyne	25-6-97	... ...	...	1	12	2	36	2	36	5	66	**4**	**54**	·21	**·17**	...	12	Gascoyne
Donnybrook ...	11-11-99	Crown Land ...	...	10	141	8	123	8	123	5	56	...	...	·58	...	...	56	Donnybrook
		Private Property	...	21	306	18	236	16	206	13	132	...	...	...	...	...	132	
Phillips River ...	21-9-00	... ...	...	27	607	21	419	17	298	15	229	**13**	**149**	·73	**·46**	...	80	Phillips River
Greenbushes ...	...	... ...	...	...	...	...	...	1	24	...	...	...	...	...	...	...	...	Greenbushes
Newcastle ...	...	Private Property	...	...	...	...	...	4	36	4	36	...	...	·11	...	...	36	Newcastle
Totals ...	...	... ...	...	2,503	34,498	2,424	32,570	2,328	30,415	2,488	32,530	**2,447**	**32,273**	100·00	**100·00**	1,277	1,534	

41 Leases: 257 acres decrease for 1905.

More land is held under gold mining lease in the Mount Margaret Goldfield than in any other, 19·5 per cent. of the total land leased being in that field; the North Coolgardie field comes next with 14·89 per cent., then the Murchison with 12·43 per cent., followed closely by the East Coolgardie field with 11·49 per cent.

The increase in the acreage of coal mining leases is 1,919 acres on the Collie field; on the Greenbushes and Pilbarra fields slight increases appear, and in no case is there any substantial decrease.

TABLE 12.

Number and Acreage of Mineral Leases in force 31st December each year, for the Five Years ending 31st December, 1905.

Mining Districts.		Sub-Districts.		1901.		1902.		1903.		1904.		1905.		Increase or Decrease for 1905, compared with 1904.		Districts.
Name.	Proclaimed.	Name.	Proclaimed.	Leases.	Acreage.	Leases.	Acreage.	Leases.	Acreage.	Leases.	Acreage.	Leases.	Acreage.	Increase.	Decrease.	
														acres.	acres.	
Kimberley ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Kimberley
Ashburton ...	11-12-90	...	...	2	80	7	286	...	...	...	...	...	...	...	...	Ashburton
		Cue	7-12-94	...	...	...	...	...	...	...	...	...	...	...	...	Cue
		Nannine ...	7-12-94	...	...	...	...	...	...	...	...	...	...	...	...	Nannine
Murchison ...	24-9-91	Day Dawn ...	10-1-96	3	16	...	...	...	...	1	6	1	6	...	...	Day Dawn
		Mount Magnet	7-12-94	2	10	2	10	2	10	...	...	...	...	...	...	Mt. Magnet
Greenbushes ...	7-4-92	...	...	100	2,259	54	1,192	38	703	30	597	39	706	109	...	Greenbushes
Pilbarra	16-6-92	Marble Bar ...	16-6-92	20	655	7	176	3	80	4	180	11	290	110	...	Marble Bar
		Nullagine ...	6-11-96	1	10	1	10	...	...	...	...	...	...	...	...	Nullagine
Yalgoo	23-1-95	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Yalgoo
Yilgarn	22-3-95	...	...	3	30	3	21	1	6	1	60	1	3	...	57	Yilgarn
Coolgardie ...	22-3-95	Coolgardie ...	22-3-95	2	14	1	12	2	22	3	42	2	22	...	20	Coolgardie
		Kunanalling ...	1-9-97	...	...	...	...	...	...	...	...	...	...	...	...	Kunanalling
East Coolgardie ...	22-3-95	...	...	20	156	15	110	13	180	11	130	10	55	...	75	East Coolgardie
East Murchison ...	28-6-95	...	...	1	2	3	14	1	2	3	14	2	12	...	2	East Murchison
		Menzies ...	15-4-96	1	12	1	12	1	12	1	12	...	...	...	12	Menzies
North Coolgardie	16-8-95	Ularring ...	15-4-96	...	...	...	...	...	...	1	10	1	4	...	6	Ularring
		Yerilla ...	15-4-96	...	...	...	...	...	...	...	...	...	...	...	...	Yerilla
		Niagara ...	1-3-97	1	10	...	...	1	1	...	...	...	...	...	...	Niagara
West Pilbarra ...	1-11-95	...	...	20	564	10	358	8	284	3	194	3	194	...	...	West Pilbarra
Dundas	27-12-95	...	...	1	6	1	6	1	6	1	6	1	6	...	...	Dundas
Collie	21-2-96	...	...	96	29,785	94	29,145	94	29,145	68	20,975	74	22,894	1,919	...	Collie
		Kanowna ...	15-4-96	...	...	...	...	...	...	...	...	...	...	...	...	Kanowna
North-East Coolgardie	15-4-96	Bulong ...	15-4-96	...	...	...	...	...	...	...	...	...	...	...	...	Bulong
		Kurnalpi ...	15-4-96	1	12	1	12	...	...	...	...	...	...	...	...	Kurnalpi
Broad Arrow ...	20-11-96	...	...	1	20	1	20	...	...	1	20	1	48	28	...	Broad Arrow
Northampton ...	1-1-97	...	...	6	68	4	50	5	125	1	20	...	...	...	20	Northampton
Peak Hill ...	1-4-97	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Peak Hill
		Mt. Margaret	1-4-97	1	3	3	11	2	6	1	3	1	3	...	...	Mt. Margaret
Mount Margaret	1-4-97	Mt. Malcolm ...	1-4-97	21	452	20	538	14	317	10	145	8	51	...	94	Mt. Malcolm
		Mt. Morgans ...	2-4-02	...	...	1	6	1	6	...	...	3	55	55	...	Mt. Morgans
Gascoyne ...	15-4-97	...	...	...	...	...	...	...	...	...	...	...	...	...	...	Gascoyne
Yandanooka ...	1-12-97	Crown Lands	...	1	20	2	90	13	855	1	65	2	40	25	...	Yandanooka
		Private Property	...	...	...	...	...	...	...	...	...	2	50			
Phillips River ...	1-7-99	...	...	65	2,099	67	2,122	39	1,093	31	839	28	754	...	85	Phillips River
Donnybrook ...	27-11-99	...	...	4	78	4	78	...	...	2	31	...	...	...	31	Donnybrook
Crown Land ...	...	Cane River ...	...	...	...	1	40	...	...	...	...	...	...	...	...	Cane River
		Other Localities	...	1	50	5	420	5	230	6	240	38	1,300	1,060	...	Other Localities
Totals ...	...	...	...	374	36,411	308	34,739	244	33,083	180	23,589	228	26,493	3,306	402	

48 leases; 2,904 acres increase for 1905.

Table 13.

Number and Acreage of Mineral Leases in force on 31st December, 1905, showing Minerals for which they are worked.

Minerals.	Ashburton.		Murchison.		Greenbushes.		Pilbarra.				Yilgarn.		Coolgardie.		East Coolgardie.		East Murchison.		North Coolgardie.				Dundas.		West Pilbarra.		Peak Hill.	
	Uaroo.		Day Dawn.				Marble Bar.		Nullagine.				Coolgardie.						Menzies.		Ularring.							
	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.
Tantalite and Tin	...	...	..	...	3	50	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Antimony	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gypsum	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Coal	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Copper	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	194	...	...
Ironstone	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Limestone	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	6	...	...	...	...
Copper, Silver, and Lead	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Copper and Ironstone	...	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tin	...	...	...	...	36	656	11	290	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Silver	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...	...	...	...	...
Silver and Lead	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Copper and other Minerals	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	...	...
Copper and Silver	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Clay	...	...	1	6	...	...	...	...	...	...	1	3	1	12	10	55	2	12	...	...	1	4	...	...	...	...	...	...
Building Stone	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Building Stone and Mica	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lime	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Copper and Lead	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Copper, Lead, and Blend	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lead	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Opal	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Graphite	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mica	...	...	...	...	...	...	...	...	...	...	...	...	1	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Asbestos	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Totals	...	...	1	6	39	706	11	290	...	...	1	3	2	22	10	55	2	12	...	...	1	4	1	6	3	194	...	...

Minerals.	Collie.		North-East Coolgardie.		Broad Arrow.		North-ampton.		Mt. Margaret.						Yandanooka.		Phillips River.		Donnybrook.		Crown Lands outside proclaimed Mining Districts.		Total acreage.	Increase or Decrease for 1905 compared with 1904.	
			Kurnalpi.						Mt. Margaret.		Mt. Malcolm.		Mt. Morgans.												
	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.	Leases.	Acres.		Increase.	Decrease.
Tantalite and Tin	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	50	50	...
Antimony	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gypsum	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	80	80	...	...
Coal	74	22,894	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	22,894	1,919	...
Copper	...	...	...	...	...	...	...	...	...	...	...	...	2	40	4	90	26	669	...	...	1	150	1,143	...	379
Ironstone	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	60
Limestone	...	...	...	...	...	...	...	...	...	...	1	10	...	...	...	...	...	...	...	...	...	...	16	...	13
Copper, Silver, and Lead	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Copper and Ironstone	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tin	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	946	219	...
Silver	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Silver and Lead	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Copper and other Minerals	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	85	...	...	...	...	85	85	...
Copper and Silver	...	...	...	...	...	...	...	...	...	...	...	...	1	15	...	...	...	...	...	...	...	...	15	15	...
Clay	...	...	...	...	...	...	...	...	1	3	4	15	...	...	...	...	...	...	...	...	...	...	110	12	...
Building Stone	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	56
Building Stone and Mica	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lime	...	...	...	...	...	...	...	...	...	...	2	16	...	...	...	...	...	...	...	...	...	...	16	14	...
Copper and Lead	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Copper, Lead, and Blend	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Lead	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Opal	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	20
Graphite	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	13	400	400	390	...
Mica	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	10	20	10	...
Asbestos	...	...	...	...	1	48	...	...	...	...	1	10	...	...	...	...	...	...	...	...	...	...	58	58	...
Plumbago, Graphite, and Blacklead	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	160	160	160	...
Plumbago and Graphite	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	11	420	420	420	...
Graphite and Tin	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	60	60	60	...
Plumbago	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	20	20	20	...
Totals	74	22,894	...	...	1	48	...	...	1	3	8	51	3	55	4	90	28	754	...	...	38	1,300	26,493	..	...

Table 14.

Claims and Authorised Holdings under "The Mining Act, 1904," and Regulations, existing on 31st December, 1904 and 1905.

Claims, etc.	*Kimberley.		Yilgarn.		Pilbarra.				*Ashburton.		Murchison.								Dundas.		Coolgardie.				East Coolgardie.		Yalgoo.		North Coolgardie.							
					*Marble Bar.		Nullagine.				Cue.		Day Dawn.		Nannine.		Mt. Magnet.				Coolgardie.		Kunanalling.						Menzies.		Ularring.		Yerilla.		Niagara.	
	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.
Water Rights ...	...	...	9	9	...	...	7	7	...	...	11	12	24	25	4	3	3	3	27	19	36	16	49	10	45	40	...	...	30	19	15	15	9	10	22	18
Area of Water Rights	...	...	35	37	...	...	7	7	...	...	31	36	68	74	4	3	8	8	197	191	198	61	142	50	1055	931	...	...	815	91	59	64	19	21	59	61
Quartz Claims ...	...	...	...	1	...	...	26	24	...	...	2	2	...	1	3	4	2	1	11	...	114	15	38	11	4	46	4	...	2	...	2	2	...	...	...	...
Alluvial Claims ...	...	...	...	...	...	...	...	...	...	...	1	1	2	1	1	3	...	...	...	...	...	...	...	...	27	40	...	...	1	...	...	...	...	...	...	...
Reward Claims ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Prospecting Areas...	...	...	7	26	...	...	...	...	...	...	5	22	5	5	14	13	4	13	11	25	18	25	3	26	42	30	18	11	51	46	13	13	24	31	32	19
Residence Areas ...	...	...	23	9	...	...	9	8	...	...	12	16	7	10	13	16	20	26	35	...	3	45	...	4	615	82	8	10	119	119	...	...	...	...	6	2
Business Areas ...	...	...	13	20	...	...	5	7	...	...	6	7	...	...	13	14	6	7	3	3	10	10	22	6	48	3	14	15	7	10	47	47	80	52	6	4
Machinery Areas ...	...	...	...	1	...	...	2	2	...	...	3	3	3	3	1	1	3	3	4	3	10	5	11	3	6	4	2	1	...	...	1	...	2	2	3	5
Tailings Areas ...	...	...	12	12	...	...	1	1	...	...	2	2	1	1	3	3	2	2	4	2	4	2	1	...	5	8	2	2	...	...	...	...	1	2	4	5
Garden Areas ...	...	...	4	7	...	...	3	3	...	...	5	4	7	8	6	5	7	10	...	2	23	9	...	...	46	41	1	2	4	3	...	...	...	...	8	8
Tunnelling Areas ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Poultry Farms ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	7
Lode Claims ...	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...	3	4	2	...	...	...	...	...	20	13	...	...	2	...	...	...	3	8	7	9

Claims, etc.	East Murchison.				*West Pilbarra.		North-East Coolgardie.						Broad Arrow.		Peak Hill.		Mount Margaret.						Gascoyne.		Donnybrook.		Phillips River.		Outside Goldfields.		Total.		Increase or Decrease for 1905 compared with 1904.	
	East Murchison.		Black Range.				Kanowna.		Bulong.		Kurnalpi.						Mount Margaret.		Mount Malcolm.		Mount Morgans.															
	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	In-crease.	De-crease.
Water Rights	27	36	3	2	2	...	9	9	10	11	...	...	15	17	13	14	31	23	58	50	20	28	...	...	...	...	11	12	...	...	491	408	...	83
Area of Water Rights ...	48	72	3	2	13	...	52	48	43	46	...	...	51	58	143	142	115	79	208	234	92	94	...	...	...	...	57	67	...	...	3523	2477	...	1046
Quartz Claims	7	2	...	...	...	...	73	84	48	48	16	11	17	12	...	...	5	5	29	5	11	2	...	...	...	...	6	10	...	...	428	286	...	142
Alluvial Claims	...	...	3	1	...	...	211	214	41	42	3	3	...	...	...	...	4	8	...	...	2	...	...	...	...	...	2	...	...	...	298	313	15	...
Reward Claims	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	1	1	...	...
Prospecting Areas	6	24	9	10	...	...	72	13	13	14	20	1	9	16	...	...	23	51	51	47	11	37	1	...	...	...	13	5	...	...	479	523	44	...
Residence Areas	19	21	...	6	6	...	10	11	61	60	4	4	...	...	16	20	92	26	31	2	...	5	...	...	...	...	...	...	...	...	1118	502	...	616
Business Areas	27	20	3	9	...	...	13	7	5	5	5	2	16	16	3	7	47	39	38	11	6	31	1	...	...	...	1	2	...	...	459	354	...	105
Machinery Areas	7	6	2	4	...	...	9	10	6	6	2	2	6	5	1	1	6	2	1	3	1	1	...	...	...	...	1	1	...	...	98	78	...	20
Tailings Areas	4	3	...	...	...	...	3	2	2	2	...	...	4	5	...	...	2	2	1	2	...	1	...	...	...	...	...	...	...	...	58	59	1	...
Garden Areas	23	32	2	2	...	...	3	2	...	...	...	...	4	6	3	2	8	8	14	13	3	2	...	...	...	...	15	15	...	...	200	184	...	16
Tunnelling Areas	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Poultry Farms	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	7	1	...
Lode Claims	...	...	...	...	...	...	...	...	...	...	...	...	...	12	...	...	3	3	...	...	...	...	...	...	...	...	1	...	...	...	42	50	8	...

* No returns received.

TABLE 15.

Claims and Authorised Holdings under the Mineral Lands Acts, and Regulations, existing on 31st December, 1904 and 1905.

Claims, etc.	Day Dawn.		Geeenbushes.		Pilbarra.		East Coolgardie.		Mt. Margaret.	
	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.
Water Rights	...	...	47	39	...	...	...	...	...	...
Area of Water Rights	...	...	35	30	...	...	...	...	...	...
Lode Claims	...	...	...	...	...	...	2	2	1	1
Alluvial Claims	...	...	47	52	1	1	...	1	...	...
Reward Claims	...	...	...	...	...	...	...	...	...	...
Prospecting Areas	...	1	...	...	...	...	3	1	...	...
Residence Areas	...	..	44	30	...	...	...	...	...	...
Business Areas	...	...	3	3	...	...	...	...	...	...
Machinery Areas	...	...	7	6	...	...	...	...	...	...
Tailings Areas	...	...	6	6	...	...	...	...	...	...
Garden Areas	...	...	4	3	...	...	...	...	...	...
Washing Areas	...	...	...	...	...	...	...	...	...	...
Pipe Tracks	...	...	...	...	...	...	...	...	...	...

Claims, etc.	Phillips River.		Crown Lands.		Totals.		Increase or Decrease for 1905, compared with 1904.	
	1904.	1905.	1904.	1905.	1904.	1905.	Increase.	Decrease.
Water Rights	...	...	...	...	47	39	...	8
Area of Water Rights	...	...	...	...	35	30	...	5
Lode Claims	...	...	...	...	3	3	...	...
Alluvial Claims	...	...	...	...	48	54	6	...
Reward Claims	...	...	...	...	...	...	...	...
Prospecting Areas	17	6	10	6	30	14	...	16
Residence Areas	...	...	...	...	44	30	...	14
Business Areas	...	...	...	...	3	3	...	...
Machinery Areas	...	...	...	...	7	6	...	1
Tailings Areas	...	...	...	...	6	6	...	...
Garden Areas	...	...	...	...	4	3	...	1
Washing Areas	...	...	...	...	...	...	...	...
Pipe Tracks	...	...	...	...	...	...	...	...

TABLE 16.

Miners' Rights and Mining, Business, and Quarry Licenses issued during 1904 and 1905.

PLACE OF ISSUE.	MINING ACTS.						MINERAL LANDS ACTS.							
	Miners' Rights.		Consolidated Miners' Rights.		Business Licenses.		Mining Licenses.		Consolidated Mng. Licenses.		Quarry Licenses.		Business Licenses.	
	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.
Albany	8	7	...	...	...	..	...	...	...	...	...	...	...	...
Ashburton	37	...	...	...	...	...	...	...	...	...	...	...	...	...
Black Range ...	102	243	...	...	...	...	...	...	...	...	...	...	...	...
Broad Arrow ...	230	235	...	...	...	...	1	...	...	...	...	...	...	...
Broome	...	6	...	...	...	...	...	...	...	...	...	...	...	...
Bulong	193	145	1	1	...	...	...	...	...	...	...	...	...	...
Bunbury	3	3	...	...	...	...	...	...	...	...	...	...	...	...
Busselton	1	3	...	...	...	...	...	...	...	...	...	...	...	...
Carnarvon	16	16	...	...	...	...	...	...	...	...	...	...	...	...
Collie	11	3	...	...	...	...	...	...	...	...	...	...	...	...
Coolgardie	497	549	...	...	1	...	...	...	...	...	...	...	...	...
Cue	375	369	...	...	2	...	2	...	...	...	...	...	...	...
Derby	4	8	...	...	...	...	...	...	...	...	...	...	...	...
Esperance	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gascoyne*	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Geraldton	8	7	...	...	...	...	...	...	...	...	...	...	...	...
Greenbushes ...	187	341	1	...	...	...	51	...	...	...	...	...	3	...
Kalgoorlie	1,210	1,483	...	...	1	...	2	...	...	...	...	...	...	...
Kanowna	433	450	...	...	...	...	...	...	...	...	...	...	...	...
Katanning	5	4	...	...	...	...	...	...	...	...	...	...	...	...
Kimberley	26	22	...	...	1	...	...	...	...	...	...	...	...	...
Kookynie	427	403	...	...	...	...	...	...	...	...	...	...	...	...
Kurnalpi	44	53	...	...	...	...	...	...	...	...	...	...	...	...
Lawlers	352	319	...	...	8	...	...	...	...	...	...	...	...	...
Marble Bar	282	350	...	1	1	...	6	...	...	...	...	...	...	...
Menzies	300	295	...	...	...	...	...	...	...	...	...	...	...	...
Mt. Magnet	234	133	...	...	3	...	...	...	...	...	...	...	...	...
Mt. Malcolm ...	307	385	1	1	2	...	1	...	...	...	...	...	...	...
Mt. Margaret ...	383	338	...	...	2	...	...	...	...	...	...	...	...	...
Mt. Morgans ...	230	245	...	...	1	...	...	...	...	...	...	...	...	...
Nannine	245	290	...	...	3	...	...	...	...	...	1	...	...	...
Newcastle	1	1	...	...	...	...	...	...	...	...	...	...	...	...
Norseman	286	289	...	...	5	...	...	...	...	...	...	...	...	...
Northam	4	...	...	...	...	...	...	...	...	...	...	...	...	...
Northampton ...	...	4	..	...	...	...	...	...	...	...	...	...	...	...
Nullagine†	137	132	...	...	...	...	...	...	...	...	...	...	...	...
Peak Hill	91	76	...	...	...	...	...	...	...	...	...	...	..	...
Perth	135	163	...	...	...	...	3	...	...	...	...	...	...	...
Phillips River ...	116	85	...	...	...	...	2	...	...	...	...	...	...	...
Pinjarrah	1	...	...	...	...	...	...	...	...	...	...	...	...	...
Southern Cross ...	151	140	...	...	1	...	...	...	...	...	...	...	...	...
Ularring	114	94	...	...	1	...	...	...	...	...	...	...	...	...
West Pilbarra ...	53	68	...	...	1	...	1	...	...	...	...	...	...	...
Williams	31	3	...	...	...	...	...	...	...	...	...	...	...	...
Yalgoo	81	93	...	...	...	...	...	...	...	...	...	...	...	...
York	2	...	...	...	...	...	...	...	...	...	...	...	...	...
Total ...	7,353	7,853	3	3	33	...	69	...	...	...	1	...	3	...

* Ashburton. † *See* Marble Bar.

NOTE.—Since 1st March, 1904, Business Licenses, Mining Licenses, Consolidated Mining Licenses, and Quarry Licenses have ceased to be issued by the Department.

Under the new Mining Act, Mining Licenses (which were issued under the Mineral Lands Acts) were abolished; and a Miner's Right gives the same privileges. In 1904 the total number of Miners' Rights and Mining Licenses issued was 7,353; while in 1905 the total was 7,853—an increase of 500.

TABLE 17.

Number and Acreage of Miners' Homestead Leases in force on 31st December, 1904 and 1905.

Goldfield.	District.	1904.		1905.		Increase.		Decrease.	
		Leases.	Acreage.	Leases.	Acreage.	Leases.	Acreage.	Leases.	Acreage.
Pilbarra ...	Pilbarra	...	...	2	25	2	25	...	...
	Nullagine	...	...	1	20	1	20	...	...
Dundas	... ...	17	804	21	1,043	4	239	...	...
Broad Arrow	... ...	6	140	5	120	...	...	1	20
Yilgarn	... ...	7	118	9	153	2	35	...	...
Mt. Margaret ...	Mt. Morgans ...	3	140	5	100	2	...	...	40
	Mt. Malcolm ...	14	2,540	12	2,320	...	...	2	220
	Mt. Margaret ...	6	320	9	495	3	175	...	...
Murchison ...	Cue	7	1,373	9	1,403	2	30	...	...
	Day Dawn	6	80	10	105	4	25	...	...
	Nannine	17	2,470	16	1,984	...	...	1	486
Coolgardie ...	... ...	36	3,830	43	5,215	7	1,385	...	...
	Kunanalling ...	1	20	1	20	...	...	...	...
East Coolgardie ...	... ...	38	1,884	53	2,377	15	493	...	...
Phillips River ...	... ...	35	3,273	41	3,653	6	380	...	...
Peak Hill	... ...	10	1,793	12	1,863	2	70	...	...
North-East Coolgardie	Kanowna	20	655	21	667	1	12	...	...
North Coolgardie	Menzies	5	650	6	630	1	...	...	20
	Yerilla	1	5	1	10	...	5	...	...
	Niagara	7	410	7	410	....	...	...	...
East Murchison	... ...	4	545	2	520	...	...	2	25
	Black Range ...	2	560	4	1,070	2	510	...	...
		242	21,610	290	24,203	54	3,404	6	811

Increase for 1905: 48 leases; 2,593 acres.

PART IV.—MEN EMPLOYED.

TABLE 18.

Average Number of Men engaged in Mining during 1904 and 1905.

Goldfield.	District.	Reef or Lode.		Alluvial.		Total.	
		1904.	1905.	1904.	1905.	1904.	1905.
1. Kimberley	...	5	3	12	10	17	13
2. Pilbarra	Marble Bar	59	89	46	44	105	133
	Nullagine	118	103	27	27	145	130
3. West Pilbarra	...	11	12	104	38	115	50
4. Ashburton	...	...	...	22	6	22	6
5. Gascoyne	...	...	...	...	...	...	...
6. Peak Hill	...	251	177	6	4	257	181
7. East Murchison	Lawlers	1,300	850	196	56	1,496	906
	Black Range		308		125		433
8. Murchison	Cue	231	309	15	17	246	326
	Nannine	204	189	161	154	365	343
	Day Dawn	715	744	23	16	738	760
	Mt. Magnet	399	183	20	13	419	196
9. Yalgoo	...	66	115	14	16	80	131
10. Mt. Margaret	Mt. Morgans	476	355	6	35	482	390
	Mt. Malcolm	780	1,029	29	33	809	1,062
	Mt. Margaret	705	821	47	41	752	862
11. North Coolgardie	Menzies	575	602	19	18	594	620
	Ularring	273	427	66	54	339	481
	Niagara	581	554	49	29	630	583
	Yerilla	307	370	*135	66	442	436
12. Broad Arrow	...	305	260	90	102	395	362
13. North-East Coolgardie	Kanowna	486	645	80	97	566	742
	Bulong	184	143	†211	213	395	356
	Kurnalpi	12	26	68	19	80	45
14. East Coolgardie	...	6,255	6,256	262	103	6,517	6,359
15. Coolgardie	Coolgardie	1,130	1,057	175	150	1,305	1,207
	Kunanalling	329	248	36	31	365	279
16. Yilgarn	...	394	317	3	2	397	319
17. Dundas	...	460	435	25	25	485	460
18. Phillips River	...	74	62	9	6	83	68
19. Donnybrook	...	...	...	...	...	...	...
Goldfields generally	...	163	143	...	...	163	143
	Total—Gold Mining ...	16,848	16,832	1,956	1,550	18,804	18,382
MINERALS OTHER THAN GOLD.							
Tin	Greenbushes M.F. ...	...	...	‡115	‡208	115	208
	Marble Bar D. ...	...	...	‡169	‡271	169	271
Copper	Mt. Malcolm D. ...	75	1	...	...	75	1
	Phillips River G.F. ...	94	124	...	...	94	124
Coal	Collie River M.F. ...	358	351	...	...	358	351
Tantalite	Marble Bar D. ...	...	3	...	...	...	3
	Greenbushes M.F. ...	...	2	...	...	...	2
	Total—Other Minerals ...	527	481	284	479	811	960
	GRAND TOTAL ...	17,375	17,313	2,240	2,029	19,615	19,342

* Alluvial rush at Mt. Howe. † Alluvial rush at Woodline. ‡ Classified elsewhere as employed at mines.

The above table shows that the number of men engaged in all classes of mining, as compared with the previous year, decreased by 273.

The total number engaged in gold mining has decreased by 422; the decrease in the number of alluvial miners accounts for 406 of the total decrease; the men engaged in reef and lode mining having decreased by 16.

Tin mines found employment for 195 more men than in 1904.

In copper mining, only one man was employed in the Malcolm district during the year, while in the Phillips River Goldfield 30 more men were working.

TABLE 19.

Average Number of Men employed at Mines during 1905.

Mineral.	Above ground.	Under ground.	Total.	Percentage of total men employed.	Increase or decrease compared with 1904.
Tin	* 410	69	479	2·69	+ 195
Coal	90	261	351	1·97	— 7
Copper	73	52	125	·70	— 44
Gold	7,758	9,074	16,832	94·61	— 16
Tantalite	5	...	5	·03	+ 5
Total	8,336	9,456	17,792	100·00	+ 133

* 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 classifies the men employed in various forms of mining, but does not include alluvial gold workers, the number engaged in this class of mining being always hard to estimate. The figures given in the table are taken from periodical returns required from the mines. In gold mines 94·6 per cent. of the total number were employed, a slightly lower percentage than in 1904.

TABLE 20.

Average Number of Men employed at Gold Mines during 1905, 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 1904.	Percentage of total men employed.	
					1904.	1905.
1. Kimberley	1	2	3	— 2	·03	·02
2. Pilbarra	88	104	192	+ 15	1·05	1·14
3. West Pilbarra	5	7	12	+ 1	·06	·07
4. Ashburton	...	...	...	...	...	...
5. Gascoyne	...	...	...	...	...	...
6. Peak Hill	103	74	177	— 74	1·49	1·05
7. East Murchison	591	567	1,158	— 142	7·72	6·88
8. Murchison	714	711	1,425	— 124	9·19	8·47
9. Yalgoo	53	62	115	+ 49	·39	·68
10. Mt. Margaret	1,037	1,168	2,205	+ 244	11·64	13·10
11. North Coolgardie	835	1,118	1,953	+ 217	10·30	11·60
12. Broad Arrow	99	161	260	— 45	1·81	1·55
13. North-East Coolgardie ...	308	506	814	+ 132	4·05	4·84
14. East Coolgardie	2,902	3,354	6,256	+ 1	37·13	37·17
15. Coolgardie	518	787	1,305	— 154	8·66	7·75
16. Yilgarn	158	159	317	— 77	2·34	1·88
17. Dundas	176	259	435	— 25	2·73	2·58
18. Phillips River	27	35	62	— 12	·44	·37
19. Donnybrook	...	...	...	...	...	...
Goldfields generally	143	...	143	— 20	·97	·85
Total	7,758	9,074	16,832	— 16	100·00	100·00

While the number of employees varies but little from the number in 1904, the distribution is somewhat different. The Murchison and East Murchison fields have lost 124 and 142 workers respectively, while the Mount Margaret and North Coolgardie fields have gained 244 and 217. The Coolgardie field has lost 154 men, while the North-East Coolgardie has gained 132.

TABLE 21.

Alluvial (Gold) Workers.

Goldfield.	1904.	1905.	Increase or decrease compared with 1904.
1. Kimberley	12	10	— 2
2. Pilbarra	73	71	— 2
3. West Pilbarra	104	38	— 66
4. Ashburton	22	6	— 16
5. Gascoyne	...	...	...
6. Peak Hill	6	4	— 2
7. East Murchison	196	181	— 15
8. Murchison	219	200	— 19
9. Yalgoo	14	16	+ 2
10. Mt. Margaret	82	109	+ 27
11. North Coolgardie	269	167	— 102
12. Broad Arrow	90	102	+ 12
13. North-East Coolgardie	359	329	— 30
14. East Coolgardie	262	103	— 159
15. Coolgardie	211	181	— 30
16. Yilgarn	3	2	— 1
17. Dundas	25	25	=
18. Phillips River	9	6	— 3
19. Donnybrook	...	...	...
Total	1,956	1,550	— 406

In only three fields—viz., Yalgoo, Mount Margaret, and Broad Arrow—have the number of alluvial workers increased; in all others decreases are shown.

Table 22.

Table containing Extracts from Awards delivered by the Court of Arbitration and Industrial Agreements made between Parties in Gold Mining Industrial Disputes, showing the Daily Wage, etc., provided for in each Award or Agreement in force on 31st December, 1905.

Locality in which Award or Agreement has effect.	Date of Award or Agreement.	Term.	Rock-drill men and Chuck men in shafts.	Rock-drill men and Chuck men in rises.	Rock-drill men and Chuck men elsewhere.	Miners (Hammer and Drill men).	Miners (wet ground) extra allowance.		Bracemen and Platmen.	Skipmen.	Mullockers and Shovellers.	Truckers filling and trucking.	Truckers from Shoots.	Men working in Cyanide Vats and Filter-presses.	Timbermen.	Surface Labourers.	Boiler Cleaners.	Horse-driver (including looking after horses).	Drill and Tool Sharpeners.	Mechanics' Labourers.	Oilers and Greasers.	Riggers.	Firemen.	Pipe Fitters (under ground).	Pitmen.	Fitters, Turners, and Blacksmiths.	Patternmakers.	Engine-drivers.					Hours of work per week.	
							Per week.	Per shift.																				Main Shaft.	All other classes of Engines.	Overtime. Ordinary Day. Up to 4 hours.	Overtime. Ordinary Day. After 4 hours.	Overtime. Sunday.	Men on Surface.	Underground men.
			s. d.	s. d.	s. d.	s. d.		s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s.	s. d.	s. d.	s. d.	s. d.	s. d.					
* Kalgoorlie	18-11-05	1st September, 1905, to 1st January, 1907	14 4	13 10	13 4	11 8	...	...	11 8	...	10 6	10 6	10 0	11 8	13 4	10 0	...	...	...	10 0, 10 6, 11 0	10 6	...	11 8	...	...	‡13 0	‡14 0	...	...	...	...	...	48	47
* Cue-Nannine ...	17-10-04	18 months from 29-7-04	14 6	14 0	13 4	12 6	...	0 10	12 0	...	11 4	11 4	11 4	12 0	13 4	10 10	12 6	11 10	13 9	...	...	...	...	...	...	...	...	...	...	...	...	48	47
Abbotts	19-11-04	From 29-7-04 to 31-1-06	15 0	14 6	13 10	13 0	...	0 10	12 6	...	11 10	11 10	11 10	12 6	13 10	11 4	13 0	12 4	14 3	...	...	...	...	...	...	...	...	...	...	...	...	48	47
Peak Hill	19-11-04	From 29-7-04 to 31-1-06	15 6	15 0	14 4	13 6	...	0 10	13 0	...	12 4	12 4	12 4	13 0	14 4	11 10	13 6	12 10	14 9	...	...	...	...	...	...	...	...	...	...	...	...	48	47
Dundas	16-12-04	18 months from date thereof	15 0	14 6	14 0	13 4, 12 10, and 12 4	...	1 8	12 4	...	11 4	11 4	11 4	12 4	14 0	10 10	12 6	11 10	13 4	11 10	...	...	...	...	...	‡13 6	‡14 6	†14 0	†13 0	1½ time	1½ time	...	48	47
Broad Arrow, Paddington, and Kanowna	19-12-04	18 months from date thereof	14 4	13 10	13 4	11 8	...	1 8	11 8	...	10 6	10 6	10 6	11 8	13 4	10 0	11 10	11 0	12 8	...	...	...	...	...	...	...	‡13 0	‡14 0	...	...	...	...	...	48	47
Menzies	19-12-04	18 months from 29th August, 1904	14 9	14 3	13 9	12 0	...	1 8	12 0	...	11 0	11 0	11 0	12 0	13 9	10 6	12 0	11 6	13 0	11 6	...	...	§11 8	...	...	‡13 0	‡14 0	15 5	14 0	1½ time	1½ time	...	48	47
Leonora, Kookynie, Laverton, etc.	19-12-04	18 months from 29th August, 1904	15 0	14 6	14 0	12 4	...	1 8	12 4	14 0	11 6	11 6	11 6	12 4	14 0	11 0	12 6	12 0	13 4	12 0	...	...	§11 8	...	...	‡13 0	‡14 0	15 9	14 6	1½ time	1½ time	...	48	47
* Nullagine, Mosquito Creek	16-1-05	1st February, 1905, 1st February, 1907	...	...	...	14 2	...	1 8	14 2, 13 4	...	...	13 4	13 4	14 2	16 8	13 4	...	...	16 8	...	...	...	...	...	...	...	||16 8	||15 0	...	...	...	44	44
Black Range	4-7-05	12 months from 1st August, 1905	...	...	...	13 4, 12 10, and 12 4	...	1 3	12 4	...	11 4	11 4	11 4	12 4	14 0	10 10	12 6	11 10	13 4	...	...	...	...	...	13 0	‡13 6	‡14 6	...	...	...	...	...	48	47
Lawlers and Mt. Sir Samuel	10-7-05	From 1-8-05 to 1-1-07	13 4	12 10	12 4	12 8, 12 4, and 12 0	...	1 3	12 0	12 0	11 4	11 4	11 4	11 8	13 0	10 10	12 0	11 10	13 4	11 0	11 0	11 8	11 8	11/-	12 6	‡13 6	‡14 6	...	...	...	...	...	48	47
Bulong	13-7-05	From 1-8-05 to 31-12-05	14 4	13 10	13 4	11 8	...	...	11 8	...	10 6	10 6	10 6	11 8	13 4	10 0	...	...	...	...	10 6	...	...	•...	...	‡13 0	‡14 0	...	...	...	...	...	48	47
Southern Cross ...	13-7-05	18 months from 1-8-05	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	12 0	13 0	...	...	...	...	...	48	...

* Industrial Agreement. † New classification independent of position of engine. ‡ Term of Award as stated in Southern Cross Award. § Under Firemen's Award, operating from 1st August, 1905, until 28th February, 1906.
|| Hours of Engine-drivers and Battery-feeders agreed at 47 per week.

COAL MINING.—The award of the 23rd December, 1903, in this industry, made in respect of the Wallsend mine at Collie having expired, on the applications of the parties a new award was made on the 28th day of June, 1905, having operation over the whole of the Collie River Coal Mining District, which directed payment of the following mimimum rates and wages:—Hewing rate, 3s. 6d. per ton, where height of seam is 5 feet and selling price is 11s. per ton, such hewing rate to be increased or decreased at the rate of 1d. per ton for every 3d. in rise above or fall below 11s. per ton: Provided that minimum hewing rate shall be 2s. 6d. per ton. In addition, there shall be paid, for turning away bords 12 feet wide, 4s. per lineal yard; for opening up bords from 12 to 24 feet, a lump sum of 15s.; for cutting out bords from 9 to 24 feet, a lump sum of 20s.; bords turning away 9 feet wide shall be paid for as headings. For headings not more than 9 feet wide, there shall be paid a yardage rate of 6s., if one shift is employed; 6s. 6d., if two shifts; and 7s., if three shifts. Cut throughs, not more than 9 feet wide, to be paid for as headings. Bords more than 12deg. on the cross to be paid extra for, as follows:—From 12deg. to 20deg., 1d. per ton; from 20deg. to 30deg., 2d. per ton; and from 30deg. to 45deg., 3d. per ton. Bords worked 2 shifts shall be paid for at 1d. per ton, and 3 shifts 2d. per ton, in addition to the hewing rate. Refuse up to 3 inches in width shall be paid for at 1d. per ton extra, and anything over 3 inches at ½d. per ton after the first 3 inches. Additional pay for wet places to be settled by the Mining Inspector. Timbering shall be paid for at 1s. for each slab and 2s. for each bar. *Underground Workers:* Shiftmen, 10s. 6d. per day; Water Bailer and Pumper, 8s.; Man in charge of Electric Pump, 9s.; Wheeler, 9s. *Coal-Cutting Machines:* Man in charge, 12s. 6d.; Man not in charge, 11s.; Shot Firer and Borer, 11s.; Filler, 8s. 6d.; Off Clipper, 8s.; Spragger and On-setter, 8s. *Surface Workers:* Weighman, 10s.; Screenman, 8s. 6d.; Tipper, 8s.; Gantryman, 8s.; Carpenter, 10s.; Blacksmith's Labourer, 8s. 6d.; Horsekeeper, 9s.; Fitter's Labourer, 8s. 6d.; other Labourers, 8s. (The wages of workers exceeding 9s. per day are liable to increase or decrease at rate of 1d. per day for every 3d. in rise above or fall below the selling price of 11s. per ton, but decrease in any circumstances not to exceed 6d. per day.)

PART V.—ACCIDENTS.

TABLE 23.

Men Killed and Injured in Mining Accidents during 1904 and 1905.

Goldfield.	Killed.		Injured.		Total Killed and Injured.	
	1904.	1905.	1904.	1905.	1904.	1905.
1. Kimberley	...	...	...	...	...	...
2. Pilbarra	...	1	...	1	...	2
3. West Pilbarra	...	...	...	...	...	...
4. Ashburton	...	...	...	...	...	...
5. Gascoyne	...	...	...	...	...	...
6. Peak Hill	1	...	2	6	3	6
7. East Murchison	2	3	4	15	6	18
8. Murchison	3	3	12	23	15	26
9. Yalgoo	1	...	...	2	1	2
10. Mount Margaret	3	3	18	36	21	39
11. North Coolgardie..	6	1	13	21	19	22
12. North-East Coolgardie	2	1	9	7	11	8
13. Broad Arrow	...	1	1	2	1	3
14. East Coolgardie	20	14	76	139	96	153
15. Coolgardie	1	3	9	8	10	11
16. Yilgarn	...	3	2	...	2	3
17. Dundas	2	1	2	6	4	7
18. Phillips River	...	...	1	1	1	1
19. Donnybrook	...	...	...	...	...	...
MINING DISTRICTS.						
Northampton	...	...	...	...	...	...
Yandanooka	...	...	...	...	...	...
Greenbushes	1	...	...	1	1	1
Collie	...	...	4	2	4	2
Total	42	34	153	270	195	304

It is very gratifying to note that the fatal accidents during 1905 have decreased by eight, as compared with those during 1904.

The number of men injured has increased by 117, as compared with that for the previous year. This increase is attributable to the fact that mine managers are more careful to report accidents, which though comparatively trivial are sufficient to keep the sufferer off work for more than 14 days.

Detailed remarks on accidents will be found in the report of the State Mining Engineer.

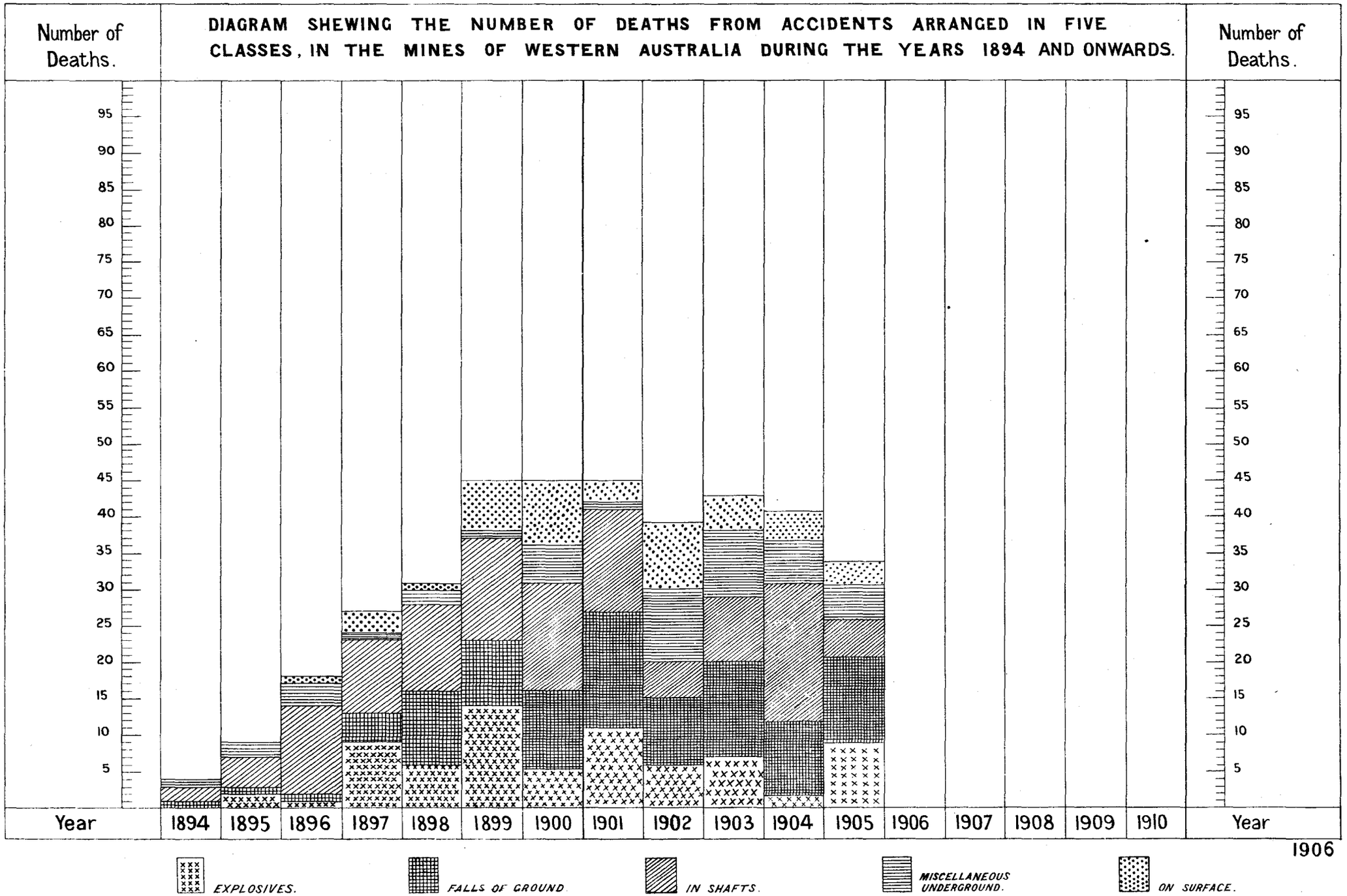

Number of Deaths.
DIAGRAM SHEWING THE NUMBER OF DEATHS FROM ACCIDENTS ARRANGED IN FIVE CLASSES, IN THE MINES OF WESTERN AUSTRALIA DURING THE YEARS 1894 AND ONWARDS.
Number of Deaths.
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
Year
1894
1895
1896
1897
1898
1899
1900
1901
1902
1903
1904
1905
1906
1907
1908
1909
1910
Year
1906
EXPLOSIVES.
FALLS OF GROUND
IN SHAFTS.
MISCELLANEOUS UNDERGROUND.
ON SURFACE.

TABLE 24.

Deaths from Accidents at Mines during 1904 and 1905.

KIND OF MINES.	1904.						1905.					
	Number of Persons killed.			Death Rate per 1,000 Persons employed.			Number of Persons killed.			Death Rate per 1,000 Persons employed.		
	Above ground.	Under ground.	Total.	Above ground.	Under ground.	Total.	Above ground.	Under ground.	Total.	Above ground.	Under ground.	Total.
Coal mines	...	...	...	...	...	...	...	...	...	...	...	...
Men employed ...	...	...	...	(75)	(283)	(358)	...	...	...	(90)	(261)	(351)
Gold mines	4	37	41	·50	4·15	2·43	3	31	34	·38	3·41	2·02
Men employed ...	...	...	...	(7,926)	(8,922)	(16,848)	...	...	...	(7,758)	(9,074)	(16,832)
Other mines	...	1	1	...	7·58	2·21	...	...	...	...	...	...
Men employed ...	...	...	...	(321)	(132)	(453)	...	....	..	(488)	(121)	(609)
Total for all mines	4	38	42	·48	4·07	2·38	3	31	34	·38	3·41	2·02

Another year has passed without any fatal accidents in coal mines.

In gold mines the death rate per thousand has substantially decreased. In "other mines" no fatal accidents have occurred.

TABLE 25.

Deaths from Accidents in Gold Mines during 1905, and the Death Rate per 1,000 Men employed, and per 1,000 Tons of Gold Ore raised during 1904 and 1905.

GOLDFIELD.	Number of Deaths.			Death Rate per 1,000 Men employed.				Number of Deaths per 1,000 Tons of Gold Ore raised.	
	1905.			1905.			1904.		
	Above ground.	Under ground.	Total.	Above ground.	Under ground.	Total.	Total.	1905.	1904.
1. Kimberley	...	...	...	...	...	...	...	...	...
2. Pilbarra	...	1	1	...	9·61	5·21	...	·18	...
3. West Pilbarra	...	...	...	...	...	...	...	...	...
4. Ashburton	...	...	...	...	...	...	...	...	...
5. Gascoyne	...	...	...	...	...	...	...	...	...
6. Peak Hill	...	...	...	...	...	...	3·98	...	·02
7. East Murchison	...	3	3	...	5·29	2·59	1·54	·02	·01
8. Murchison	...	3	3	...	4·21	2·10	1·94	·01	·02
9. Yalgoo	...	...	...	...	...	...	15·15	...	·18
10. Mount Margaret	...	3	3	...	2·57	1·36	1·53	·009	·01
11. North Coolgardie	...	1	1	...	·89	·51	3·46	·004	·01
12. Broad Arrow	...	1	1	...	6·21	3·84	...	·04	...
13. North-East Coolgardie ...	...	1	1	...	1·97	1·22	2·93	·01	·03
14. East Coolgardie	1	13	14	·34	3·87	2·23	3·20	·01	·02
15. Coolgardie	...	3	3	...	3·81	2·29	·69	·02	·01
16. Yilgarn	2	1	3	12·65	6·28	9·46	...	·06	...
17. Dundas	...	1	1	...	3·86	2·30	4·35	·03	·06
18. Phillips River	...	...	...	...	...	...	...	...	...
19. Donnybrook	...	...	...	...	...	...	...	...	...
Totals and Averages ...	3	31	34	·38	3·41	2·02	2·43	·01	·02

It will be seen that in most of the principal goldfields a reduction in the death rate per thousand has obtained, especially in the North Coolgardie and the East Coolgardie fields. In the deaths per thousand tons of ore raised there has been a gratifying decrease.

—	1904.		1905.	
	Fatal.	Serious.	Fatal.	Serious.
Explosives	2	8	9	13
Falls of ground	10	36	12	61
In shafts	20	40	5	15
Miscellaneous underground	6	21	5	91
Surface	4	48	3	90
Total	42	153	34	270

Comparing the accidents for the year 1905 with those in 1904:—Fatalities by explosives show an increase of seven (7); injuries, an increase of five (5); fatalities by falls of ground, an increase of two (2); the number of injuries, an increase of twenty-five (25); fatalities in shafts show a decrease of fifteen (15), and injuries a decrease of twenty-five (25). In miscellaneous underground accidents one man less was killed in 1905, but injuries show an increase of seventy (70). On surface, one man less was killed; injuries, an increase of forty-two (42).

The great increase in the number of serious accidents is mainly due to its now being more widely known that all serious accidents must be reported, and consequently a great many cases of slight injuries—but sufficient to prevent a man working for 14 days—are now recorded which formerly would have been disregarded.

More detailed references will be found in the report of the State Mining Engineer.

Part VI.—STATE AID TO MINING.

The expenditure in State aid—direct and indirect—to mining may be classified under the following heads:—(1) State Batteries; (2) State Smelting Works; (3) Assistance under the Mining Development Act, under which advances are made to assist companies and persons in developing and equipping mines, and boring for lodes and alluvial is carried out; (4) Water supply and track cutting; (5) Expenditure on the Geological survey.

State Batteries.

The number of State batteries has been increased annually since 1898, when the system was first inaugurated. At the end of 1905 there were 29 batteries working, as against 22 at the close of 1904, and 24 cyanide plants and one slimes plant, as against 13 cyanide plants and one slimes plant, a tin-dressing plant having been worked in both years. The number of stamps at the end of 1905 had increased by 61, as compared with 1904.

To the end of 1905, 314,176 tons of gold ore have been crushed, the gold resulting therefrom being valued at £1,344,629; 165,470 tons of tailings, returning gold to the value of £155,801; and 9,222 tons of tin ore, giving tin to the value of £10,337. The total value of gold and tin recovered by State plants was £1,510,767.

The tonnage treated by the State plants has increased year by year, 85,018 tons having been milled during 1905, as against 71,616 tons in 1904; the tonnage of sands and slimes cyanided during the same periods being 61,448 and 43,942 tons respectively.

The revenue from State batteries, cyanide, and tin-dressing plants for 1905 has been £82,326 17s. 8d., and the expenditure £78,984 11s. 2d., the excess of revenue over working expenses being £3,342 6s. 6d., a more satisfactory result than for several years past.

To the end of 1905 £129,999 6s. 6d. has been spent from loan on State treatment plants and £87,082 1s. 6d. from revenue, giving a gross total of £217,081 8s., and so far the total results of their operation have shown a net loss of £11,090, no account being taken of interest on capital expenditure and depreciation of plants.

But little more can be said in this report than has been in previous ones as to the effect of this form of State aid.

The physical conformation of the goldfields of Western Australia is favourable to the erection of central crushing plants, as in most cases the country on the goldfields being gently undulating the conveyance of ore for some miles is comparatively cheap, so that by erecting a battery in a central position it is, as a rule, possible to serve a good many mines.

A detailed report of the operations at the various batteries, with statements giving details of revenue and expenditure and crushing and cyaniding costs, will be found in the report of the Superintendent of State Batteries.

State Smelting Works.

Phillips River Goldfield.

These works, erected in 1904, and started in October of that year, continued running with few intermissions until the end of October last, when it was found that the water-jacket furnace was no longer fit for work. It was a small plant, and, although it had done fairly good work, the costs of smelting were high. On its collapse it was considered that a larger and better plant was warranted, and accordingly instructions were given for its erection at a site somewhat nearer the town; this should be running about May, 1906.

From January 1st to the closing down in October, 5,784 tons of copper ore were smelted, returning 1,147 tons of matte and 36½ tons of black copper, containing 789½ tons of copper, 6,741 ounces of silver, and 1,160 ounces of gold.

The action of the Government in erecting this smelter when no private individual or corporation was prepared to do so has undoubtedly directed attention to the district, and will, it is hoped, result in the opening up of several good copper mines.

Details of the year's work will be found in the appendix to the State Mining Engineer's report.

Assistance under the Mining Development Act.

The following statement shows the sums that have been expended during the year, under the Mining Development Act:—

	£	s.	d.
Advances in aid of Mining Work	3,479	16	8
Advances in aid of Boring	1,274	13	5
Advances in aid of Water Supplies to Mines ...	810	2	0
Advances in aid of Crushing Plants	505	8	0
Subsidies to private Crushing Plants	3,018	9	4
Purchase of Boring Plants	1,879	10	1
Providing means of Transport	339	4	10
	£11,307	4	4

The advances in aid of mining work were nearly all made to small parties of miners, assistance having been given in 13 cases.

Four parties were assisted in boring, four in obtaining water, while in one case assistance was given to put a battery in order, conditionally on its being available for public crushing.

Twenty-five crushing plants were subsidised from 1s. to 2s. per ton, conditionally on their crushing for the public at certain fixed rates. During the year 38,998 tons have been crushed at these batteries.

The receipts under the Mining Development Act, exclusive of interest payments, amounted to £909 17s. 7d., made up as follows: —

	£	s.	d.
Refunds of advances	256	15	0
Sales of Plant	653	2	7

Only one refund, £22, by Messrs. Robb, Blake, and others, of Mulgabbie, was made in respect of money advanced for mining development work; this is the first refund made since the Act bas been in force. The balance of the £256 15s. shown above represents moneys refunded in connection with assistance given to obtain water supplies.

It is to be regretted that the money advanced for mining work has not been more productive of good. In a great many cases when the Government assistance is exhausted mining work is stopped principally for want of capital, and it is impossible under the Act, even if it were desirable, to continue assistance to an indefinite extent.

The State Mining Engineer's report gives full particulars of the various cases in which assistance has been given.

Water Supply.

It is hard to over-estimate the importance of this form of State aid to mining, especially on goldfields where there are no rivers, where few natural supplies of surface water exist, and where the rainfall is light. Since the year 1893 the work of water conservation, well-sinking, and road-clearing has been steadily carried on, with the result that living and mining conditions have vastly improved, and are continuing to improve year by year.

The report of the Engineer for Mines' Water Supply, whose branch has the care and construction of waterworks on the goldfields—apart from the Coolgardie Pumping Scheme—gives details of the work done during the year, but it may be summarised as follows:—

Number of bores put down, 174; total depth, 9,091 feet; at costs varying from 6s. 6d. to 8s. 6d. in the Eastern and the Murchison Goldfields respectively, to 11s. 6d. in the Northern Goldfields.

Number of wells sunk, 34; total depth, 1,828 feet. These wells are capable of supplying a quarter of a million gallons of fresh water per day, and the cost, including equipment, has averaged £3 5s. per foot.

Wells, to the number of 31, have been deepened, relined, or otherwise improved.

Six tanks, with a capacity of about 16,750,000 gallons have been completed, or nearly so, and several of these have been lined and roofed; the most important one is that near Menzies, which has been sunk for mining and railway supplies.

In addition to the before-mentioned works roads have been surveyed and cleared and condensing plants erected.

Geological Survey.

The results of the year's work have been summarised by the Government Geologist in the report of the Geological Survey published with this volume. In addition to the annual report, information collected is issued in the form of bulletins, so that it may be available to the public as early as possible. Three of these bulletins have been issued during the year.

The principal geological examinations and surveys made during the year have been: (*a*) in the North-Western Division of the State, in the Pilbarra and West Pilbarra Goldfields; (*b*) a geological survey of the Menzies district; (*c*) a geological survey of the Mount Margaret district, and (*d*) a geological survey of the Norseman district.

In addition to the above, various inspections and reports have been made of different localities, including reports on applications for assistance under the Mining Development Act.

Part VII.—Remarks on the Goldfields and Mineral Districts, and Summaries of Wardens and other Officers' Reports.

Ashburton Goldfield.

The output for this field was 208 fine ounces, as against 510 fine ounces for the preceding year, a decrease of 302 fine ounces.

In August a discovery of amethysts at a locality about 15 miles south-east from Peak Station and some 300 miles from Onslow was reported. The prospector was assisted by the Government in the way of providing him with an outfit to enable him to further develop his find. A collection of specimens has been despatched to the Agent General for the purpose of obtaining expert opinion as to their value and suitability for the market. His report is awaited with interest as determining the value of the discovery.

Gold mining in this field is practically at a standstill.

Broad Arrow Goldfield.

The output of gold for the year was 18,584 fine ounces, as against 22,180 fine ounces for the preceding year, a decrease of 3,596 fine ounces.

A fair amount of prospecting in formerly abandoned alluvial workings was done. As regards leases held by companies, in only one instance, that of the Slug Hill G.M. Co. at Vettersburg, was any development work carried out. An alluvial lead was discovered in close proximity to the Paddington railway station from which most of the alluvial gold raised during the year was obtained.

Mining matters on this field are quiet.

Collie Mining District.

The output of coal for the year was 127,364 tons, as against 138,550 tons for the preceding year, a decrease of 11,186 tons.

Two serious accidents occurred, neither of which was fatal.

Coolgardie Goldfield.

The output of this field was 63,664 fine ounces, as against 63,200 fine ounces for the preceding year, an increase of 464 fine ounces.

Many leases taken up by small parties of working miners are now adding steadily to the gold yield.

During the year a new find was made in the locality known as Higginsville, about 20 miles south-south-east of Widgiemoultha, the prospects of which are most encouraging, and a large number of leases have been applied for.

A battery is about to be erected on a property belonging to a local company known as the Sons of Erin Gold Mining Co., No Liability, and will be the means of helping to prove the district, as by an agreement with the Mines Department public crushing will be done.

Throughout the field generally a large number of prospecting areas were registered, due in a great measure to the very liberal regulations now obtaining with regard to the acquisition of same. A considerable amount of alluvial mining is also being done.

The progress of the field has been satisfactory and the future outlook is hopeful.

Donnybrook Goldfield.

With the exception of a small amount of prospecting for coal, mining in this field has been at a complete standstill.

The only holdings in existence are two prospecting areas for coal, both of which were taken up during the year. It is stated that on one of these exploratory work has resulted in some encouraging indications, but apart from this there is little hope of revival of mining in the immediate future.

Dundas Goldfield.

The progress of this field during the year compares favourably with the preceding year, but unfortunately an abnormally dry season and consequent shortage of water resulted in the partial closing down of some of the producing mines, which accounts for the lessened gold output, this year's figures being 25,961 fine ounces, compared with 31,380 fine ounces for the preceding year, a decrease of 5,419 fine ounces.

The State battery exceeded the tonnage of 1904 by 350 tons.

A large number of prospecting areas were acquired during the year, an evident indication of increased activity on the part of prospectors.

East Coolgardie Goldfield.

The gold output for the year was 997,193 fine ounces, as against 1,050,923 fine ounces for the preceding one, a decrease of 53,730 fine ounces.

Prospecting at the Northern end of the field has been vigorously continued, but results have not come up to expectations; this prospecting was the direct outcome of sensational returns from the Hidden Secret Lease, which, however, have not been maintained, but the mine is now being systematically opened up in the deeper levels, the result of which, it is hoped, will justify the good opinion entertained regarding it when the upper levels were being worked.

Mining generally throughout this field has been of a steady progressive character.

East Murchison Goldfield.

The output from this field was 84,926 fine ounces, as against 93,591 fine ounces for the preceding year, a decrease of 8,665 fine ounces, accounted for in a measure by an amendment of the boundaries of the goldfield, which omitted Wilson's Patch and Mt. Clifford now included in the Mt. Margaret Goldfield.

Very little alluvial mining is going on, only a few fossickers being left.

The Black Range district is the centre of much activity, and gives promise of future prosperity.

The outlook for the field in general is hopeful, and an increase in the gold yield for the coming year may be anticipated.

Gascoyne Goldfield.

As in the preceding year no gold has been reported from this field and there are no indications of any immediate future activity in mining.

Greenbushes Mining District.

The output of black tin for the year was 644 tons, valued at £52,960, as against 534 tons, valued at £34,462, for the preceding year, an increase of 110 tons, valued at £18,498; this increase is somewhat gratifying when it is added that last year was a record year for this field.

There has been a general all round improvement, and the number of men employed at mining has considerably increased, and is still increasing. Both lode and alluvial mining have been vigorously prosecuted. The prosperity at present being enjoyed will, it is hoped, continue.

Kimberley Goldfield.

The output reported from this field was 496 fine ounces, as against 206 fine ounces for the preceding year, an increase of 290 fine ounces. Mining is practically at a standstill.

Mt. Margaret Goldfield.

The gold output for the year was 188,712 fine ounces, as against 183,523 fine ounces for the previous one, an increase of 5,189 fine ounces.

Though the results of mining operations have, as regards one or two centres, been most disappointing, notably at Mt. Morgans, nevertheless in view of the satisfactory conditions existing at other centres it is justifiable to conclude that the field as a whole has shown considerable progress and advancement for the year. The future is looked forward to with confidence.

Murchison Goldfield.

The output for the year was 206,735 fine ounces, as against 214,403 fine ounces for the preceding year, a decrease of 7,668 fine ounces; this is accounted for by the falling off of the yield for the Mt. Magnet district.

Twenty-six thousand eight hundred and twenty-four fine ounces of silver were also reported, nearly all produced by the Great Fingall mine.

Prospecting for copper has been prosecuted on this field, but so far without any satisfactory results being reported.

The number of prospecting areas held and worked has largely increased on this goldfield as on most others.

The Mt. Magnet district has not been as bright as could be hoped, but the other districts have maintained their reputations, and the future prospects are encouraging.

Northampton and Yandanooka Mining Districts.

At Northampton this year was the worst from a mining point of view yet experienced, but towards its close the favourable price for copper and lead, with the prospects of a continued permanence, resulted in many inquiries for payable propositions, and justifies the conclusion that the outlook for the coming year is encouraging. For the same reasons the prospects of the Yandanooka district are brighter.

North Coolgardie Goldfield.

The output for the year was 148,771 fine ounces, as compared with 145,064 fine ounces for the previous year, an increase of 3,707 fine ounces. This increase is partly in the Menzies district and is very gratifying, as, although many of the larger mines held by companies are doing little or nothing, the activity in prospecting has had this desirable result.

At Comet Vale, a centre about 20 miles from Menzies, a good deal of prospecting has been done during the year with encouraging results. At Woolgar, and in the vicinity of Menzies itself, the outlook is promising. Niagara and Yerilla districts both show a decrease in the output, due principally to the falling off in the returns of the Cosmopolitan and Potosi mines. In the Yerilla district the Pingin centre gives much promise. The Ularring district shows a substantial increase in the output, the Davyhurst centre showing good progress. Mulline and Riverina are quiet.

A large amount of prospecting is going on throughout the whole field, and the outlook is encouraging.

North-East Coolgardie Goldfield.

The output from this field was 52,947 fine ounces, as against 50,955 fine ounces for the preceding year, an increase of 1,992 fine ounces.

With the exception of an alluvial discovery on the timber tram-line, about six miles west of Kalpini, there was no occurrence of any note.

Peak Hill Goldfield.

The output for this field was 13,587 fine ounces, as against 14,113 fine ounces for the preceding year, a decrease of 526 fine ounces.

There has been no improvement in mining matters during the year, and towards its close it was announced that the Peak Hill Company, owning the one large mine in the field, intended to apply for 6 months' exemption for the purpose of raising further capital. Althongh this had the effect of throwing a large number of men out of work it is understood that operations will be resumed at the expiration of period mentioned.

There is not much indication of any great increase of prosperity for this field unless further capital be introduced.

Phillips River Gold and Mineral Field.

The output of gold for this field was 2,563 fine ounces, as against 4,107 fine ounces for the previous year, a decrease of 1,544 fine ounces; this is due to the closing down of certain mines on account of hardness of the country, scarcity of water, etc., and most of the development work being confined to mineral leases.

At Kundip, about 12 miles south-east of Ravensthorpe, some promising gold leases are now being worked, and the future of this centre is full of promise.

The output of copper was 2,329 tons, valued at £15,592, as against 3,469 tons, valued at £24,280, for the preceding year.

During the year it was decided to dismantle the Government Smelter and remove it to a more suitable site, and this naturally affected the output. The unusually small rainfall in a measure retarded development, but the acquisition of several leases by a strong English company, and their thorough exploitation, is very satisfactory, and the future prospects are hopeful.

Pilbarra Goldfield.

The output from this field was 11,474 fine ounces as against 8,030 fine ounces for the preceding year, an increase of 3,444 fine ounces.

In the Marble Bar district the output was 4,535 fine ounces, an increase of 1,405 fine ounces, due partly to the fact that several hitherto abandoned leases and claims had again been taken up and worked with successful results. This revival is largely due to the subsidising of the Stray Shot battery.

Tin mining has, however, been the mainstay of the district, the yield of black tin for the year being 436 tons, valued at £33,880, as against 321 tons, valued at £24,355 for the year 1904. The greatest activity in tin mining has been at Moolyella, where some claims have been giving excellent results. There are about 160 men engaged at this centre. At Wodgina a discovery of tantalite attracted considerable attention, but operations have been quiet owing to there being no present demand for it. A new find of tin and tantalite was reported from Chingamong, about 20 miles north-east of Wodgina, and several leases taken up, but nothing of any importance has so far been reported. In the Nullagine district, which comprises the south-eastern portion of the Goldfield, the output of gold was 6,940 fine ounces, an increase of 2,039 fine ounces over the preceding year, being the best year on record for this district. This is probably accounted for by the opening of the State battery at 20-Mile Sandy, and the miners holding over crushings till the battery started operations.

The seasons for the last three years have not been favourable to the progress of the mining industry; nevertheless the whole field has been on the upgrade and the outlook is promising.

West Pilbarra Goldfield.

The output for this field was 801 fine ounces, as against 3,428 fine ounces for the preceding year, a decrease of 2,627 fine ounces.

Mining is practically at a standstill. During the year a mineral reward lease for ochre, seven prospecting areas, and five mineral leases were applied for.

Yalgoo Goldfield.

The output for this field was 4,743 fine ounces, as against 2,353 fine ounces for the preceding year, an increase of 2,390 fine ounces.

During the year the various centres of this field, excepting the immediate neighbourhood of Yalgoo itself, have shown signs of improvement.

At Wodgingarra a very promising discovery of copper was made, and a mineral reward lease of 24 acres applied for.

On the whole the future outlook of this field is promising.

Yilgarn Goldfield.

The output for this field was 19,292 fine ounces, as against 25,509 fine ounces for the preceding year, a decrease of 6,217 fine ounces.

In some portions of the field there have been decided improvements, in others just the reverse. New finds have been made about 60 miles north of Southern Cross, also about three miles east of Jacoletti, and at a locality about 20 miles south of Parker's Range. Notwithstanding the shrinkage in the gold output the prospects of the field are considered good.

TABLE 26.

Value of Mining Machinery and Number of Stamps and other Mills, erected on the 31st December, 1905, compared with the previous Year.

Goldfield.	District.	Value of Mining Machinery.		Batteries. Number of Stamps.		Prospecting Batteries.		Mills. 1904.								Mills. 1905.							
		1904.	1905.	1904.	1905.	1904.	1905.	Ball Mills.	Krupp Ball Mills.	Griffin Mills.	Huntington Mills.	Salford Mills.	Tremain Mills.	Flint Mills.	Other Crushers.	Puddlers.	Ball Mills.	Krupp Ball Mills.	Griffin Mills.	Huntington Mills.	Salford Mills.	Tremain Mills.	Flint Mills.	Other Crushers.	Puddlers.
		£	£																						
1. Kimberley		5,500	7,500	25	50	...	...	...	...	..	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...
2. Pilbarra	Marble Bar	19,266	21,018	45	55	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...
	Nullagine	15,900	16,171	40	40	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3. West Pilbara		3,500	3,200	20	20	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4. Ashburton		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5. Gascoyne		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6. Peak Hill		106,242	103,690	50	50	1	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
7. East Murchison	Lawlers	277,485	245,898	245	250	2	2	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	7	...
	Black Range	11,106	16,622	15	26	1	1	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...
8. Murchison	Cue	41,650	45,699	90	110	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Nannine	93,789	94,150	204	159	1	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Day Dawn	277,845	267,873	175	160	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Mt. Magnet	71,719	41,633	120	115	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1	...	1	...	...	...
9. Yalgoo		30,560	27,870	75	75	1	1	..	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10. Mt. Margaret	Mt. Morgans	163,012	201,462	90	143	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...
	Mt. Malcolm	177,930	13,893	266	255	...	...	...	...	...	...	...	2	...	...	...	...	...	...	1	...	1	...	...	...
	Mt. Margaret	105,455	136,725	150	182	2	1	...	...	...	...	...	...	...	...	...	...	...	1	2	...	...	...	1	...
11. North Coolgardie	Menzies	143,511	78,571	180	155	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
	Ularring	48,150	43,999	80	80	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
	Niagara	148,940	101,479	120	130	...	...	...	...	...	...	...	1	...	...	2	...	...	...	...	...	1	...	...	...
	Yerilla	32,163	35,116	55	60	...	1	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...
12. Broad Arrow		91,855	73,231	220	175	2	...	...	1	...	...	...	...	...	1	1	...	1	...	1	...	...	...	1	...
13. North-East Coolgardie	Kanowna	88,596	90,275	195	196	5	2	...	...	...	2	...	...	...	...	5	1	...	...	1	...	...	...	...	6
	Bulong	16,240	19,051	40	40	...	...	...	...	1	1	...	...	...	...	...	...	...	...	1	...	...	...	2	...
	Kurnalpi	250	270	5	5	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14. East Coolgardie		1,711,935	1,760,121	655	655	1	2	11	39	25	8	...	...	13	7	4	...	35	28	9	...	...	23	16	8
15. Coolgardie	Coolgardie	220,564	154,718	359	319	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Kunanalling	36,087	34,590	140	135	1	1	2	...	...	...	...	1	...	1	...	2	...	...	...	...	...	...	...	...
16. Yilgarn		88,543	116,831	170	185	...	...	...	...	3	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...
17. Dundas		101,970	89,173	120	120	...	...	...	...	...	...	1	...	...	3	...	2	...	...	...	1	...	...	1	...
18. Phillips River		32,150	25,150	45	40	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19. Donnybrook		10,000	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
State Generally		65,000	55,945	...	...	...	...	1	...	...	...	...	...	...	3	...	...	1	...	...	...	...	...	3	...
Total Gold-extracting Machinery		4,236,913	4,043,154	3,999	3 988	23	22	14	40	29	15	1	6	13	15	12	6	37	32	18	1	5	23	35	13
Total Machinery, other than Gold-extracting		108,067	81,684	10	10	...	...	...	...	...	...	...	...	...	3	12	...	...	...	...	...	...	...	2	13
TOTAL MINING MACHINERY		4,344,980	4,124,838	4,009	3,998	23	22	14	40	29	15	1	6	13	18	24	6	37	32	18	1	5	23	37	29

Part VIII.—EXISTING LEGISLATION.

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

(1.) The Mining Act, 1904.
(2.) The Sluicing and Dredging for Gold Act, 1899.
(3.) The Mines Regulation Act, 1895.
(4.) The Mines Regulation Act Amendment Act, 1899.
(5.) The Sunday Labour in Mines Act, 1899.
(6.) The Mining Development Act, 1902.

It was proposed to introduce during the year a Consolidating Mines Regulation Bill, which, if passed, would have repealed the Acts numbered 3, 4, and 5, above. It is now intended to introduce it during the coming Session. The new Regulations under "The Mining Act, 1904," were framed and came into force throughout that portion of the State South of the 24th parallel of latitude on the 1st August, and throughout the remainder of the State on the 1st September.

Part IX.—INSPECTION OF MACHINERY.

The Inspection of Machinery Act, 1904, came into operation on 1st March, 1905, superseding the Steam Boilers Act, 1897.

Under the latter Act, only inspection of steam boilers was carried out, but the Machinery Act provides, in addition, for the inspection of factory and mining machinery, machinery on river and harbour steamers plying for hire, and for the granting of certificates to engine-drivers, including that class of drivers who were previously certificated under the Mines Regulation and the Coal Mines Regulation Act.

The number of steam boilers registered at the end of 1905 was 3,060, as against 2,884 at the close of 1904. It may be noted with interest that the number of boilers locally manufactured, though small, is steadily increasing.

The number of plants registered under the Machinery Act since 1st March has been 1,549, and of these 1,495 have been inspected, while the boilers and machinery of steamers and oil launches, to the number of 28, have been inspected.

As showing the amount of travelling involved in carrying out the inspections under the Act, it may be mentioned that 41,967 miles have been travelled by the various inspectors during the year.

The following return shows the total number of certificates granted to engine-drivers under the Machinery Act during the year:—

Return Showing Total Number of Certificates Granted (all Classes).

1st Class Competency	4
2nd „ „	5
3rd „ „	34
1st „ Service	5
2nd „ „	127
3rd „ „	163
Locomotive and Traction Competency	3
„ „ Service	53
Traction Drivers' Competency	*Nil*
„ „ Service	11
Marine „ Competency	2
Marine (without Examination)	20
Interim Certificates	19
Copies of Lost and Destroyed Certificates	13
Total Certificates Granted	459

PART X.—SCHOOL OF MINES.

The Director reports that the second year of the School has been a successful one, and the examination results show a marked improvement over the work of the previous year. The School equipment has been increased, and in every department facilities provided to enable the students to acquire a thorough practical training in the subjects of the School courses. Although the majority of the students attending the classes are engaged in connection with the mines and mills of the field, and their time for study is thus necessarily limited, it is gratifying to find that the greater number of those who joined during the first term continued class work to the end of the year, and by regular attendance and attention to their studies show that they are appreciating the benefits to be derived from a course of study at the School.

The Scholarships offered by the Department have not yet attracted the amount of competition which they deserve, but the three successful candidates handed in exceptionally good examination papers. Several students acquitted themselves creditably at the Examination for Engine-drivers' Certificates held in October, two students heading the list for the whole State for First Class Certificates and two for Second and Third Class Certificates, respectively.

The Practical Electricity and Mechanical Engineering Workshops erected during the year have been partially fitted up with machines, tools, and apparatus to an extent sufficient to allow of a class of instruction being commenced, and practical classes have been regularly conducted and well attended. The class of work embraced by this workshop is greatly required by workers on the fields.

The School has proved of considerable benefit to prospectors, as shown by the fact that during the year a total of 627 free assays and determinations of minerals were made.

PART XI.—DEPARTMENTAL.

TABLE 27.

Summary of Revenue for Years 1904 and 1905.

	1904.	1905.
	£ s. d.	£ s. d.
Mines (Revenue under Mining Act)	50,157 18 7	46,706 11 0
Geological Survey	112 15 6	216 4 3
State Batteries	64,129 11 3	82,023 1 11
Water Supply (Mines)	6,888 14 8	9,362 10 5
Purchase and Treatment of Copper Ore	...	54,107 3 1
Mining School	813 3 3	622 9 0
Explosives and Analytical	4,866 7 2	4,004 16 4
Inspection of Machinery	3,327 15 0	5,182 19 0
	£130,296 5 5	£202,225 15 0

The above Return excludes "Gwalia Hotel" Revenue.

These figures show all Revenue belonging to their respective years although not brought to account in the Treasury books prior to the closing of the year.

TABLE 28.

Return showing Revenue collected under the Mining Act and Expenditure in Administration for Years 1904 and 1905.

FIELD.	Revenue, 1904.	Percentage of gross Revenue, 1904.	Revenue, 1905.	Percentage of gross Revenue, 1905.	Expenditure, 1904.	Percentage of gross Expenditure, 1904.	Expenditure, 1905.	Percentage of gross Expenditure, 1905.
	£ s. d.		£ s. d.		£ s. d.		£ s. d.	
Ashburton ...	13 7 0	·027	39 16 6	·085	...	...	...	...
Broad Arrow ...	1,585 12 3	3·16	1,222 0 6	2·60	578 11 3	1·21	510 9 0	1·07
Coolgardie ...	4,156 5 0	8·29	3,988 11 3	8·53	3,350 5 1	7·00	2,878 15 7	6·06
East Coolgardie ...	5,930 17 11	11·82	5,438 8 10	11·64	3,354 19 5	7·00	2,953 7 9	6·21
North Coolgardie	6,861 10 3	13·69	6,003 1 9	12·83	4,111 15 8	8·58	3,792 10 7	7·98
N.E. Coolgardie ...	3,090 0 9	6·16	2,735 7 2	5·85	1,888 19 9	3·94	1,672 11 6	3·51
Dundas	1,564 2 0	3·12	1,277 11 9	2·73	968 4 2	2·02	1,004 2 9	2·11
Gascoyne	29 12 0	·059	55 0 6	·12	...	...	...	...
Kimberley ...	38 4 6	·076	29 17 0	·06	3 0 0	·006	26 15 7	·06
Mt. Margaret ...	7,314 18 3	14·58	6,942 14 3	14·86	3,414 14 3	7·11	3,323 8 2	7·00
Murchison ...	5,518 5 7	11·01	5,282 19 0	11·31	3,750 4 2	7·83	3,816 3 5	8·03
East Murchison ...	5,048 10 3	10·06	4,307 16 3	9·22	2,818 13 2	5·88	2,507 17 9	5·27
Peak Hill	1,135 10 7	2·26	884 11 5	1·80	809 16 10	1·7	810 2 6	1·70
Pilbarra	988 2 3	1·97	1,457 1 3	3·12	1,894 15 1	3·95	1,703 1 10	3·59
West Pilbarra ...	226 15 6	·45	342 3 0	·73	7 0 0	·014	5 0 0	·01
Yalgoo	441 16 9	·88	476 11 11	1·02	664 7 5	1·38	582 17 10	1·23
Yilgarn	1,192 3 9	2·37	1,275 4 3	2·71	764 10 1	1·6	718 3 0	1·51
Phillips River ...	800 12 6	1·59	1,145 10 3	2·44	973 0 11	2·03	873 11 2	1·84
Collie	3,029 9 1	6·04	2,357 17 7	5·26	219 14 9	·46	163 5 3	·35
Northampton ...	50 10 0	·108	82 0 0	·175	154 10 8	·32	103 0 0	·21
Greenbushes ...	770 17 3	1·54	694 14 6	1·49	498 16 4	1·05	509 18 0	1·07
Head Office ...	370 15 2	·74	667 12 1	1·42	17,684 10 11	36·92	19,577 13 3	41·19
	50,157 18 7	100·00	46,706 11 0	100·00	47,910 9 11	100·00	47,532 14 11	100·00

"Mining School" and "Inspection of Machinery" Revenue and Expenditure, which in previous Annual Reports have been included in above return are omitted in this instance, the above figures being "Revenue collected under Mining Act and Expenses of Administration.

TABLE 29.

Comparative Return showing Revenue collected during the Years 1904 and 1905 by Departments under control of the Minister for Mines.

	Mining.													
	Gold Mining.						Other Minerals.							
	Lease Rentals.		Other Rentals.		All other Sources.		Lease Rentals.		Other Rentals.		All other Sources.			
	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.		
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.		
Perth Head Office, Registrar ...	18 10 0	4 10 0	59 8 0	58 5 0	46 16 0	46 18 6	74 0 0	194 11 3	14 7 6	4 3 0	2 15 0	25 7 6		
Do. Machinery ...	...	...	...	...	...	...	...	...	...	...	...	...		
Do. Water Supply ...	...	...	...	...	...	...	...	...	...	...	...	...		
Do. Explosives ...	...	...	...	...	...	...	...	...	...	...	...	...		
Do. Geological ...	...	...	...	...	...	...	...	...	...	...	...	...		
Broad Arrow	1,002 7 0	812 14 3	136 10 3	157 11 9	65 4 0	70 1 6	14 0 0	...	0 10 0	...	1 6 6	...		
Coolgardie	2,815 9 0	2,547 9 9	322 14 9	442 19 0	254 17 3	254 19 0	10 15 0	10 10 0	1 10 0	...	...	2 2 0		
E. Coolgardie—Kalgoorlie	3,386 6 3	3,550 18 0	771 14 6	739 12 0	363 8 5	490 18 1	35 2 6	13 16 0	1 0 0	...	...	...		
N. Coolgardie { Menzies ... Mulwarrie ... Kookynie ... }	4,421 15 6	3,804 9 0	645 10 0	835 5 6	233 5 6	289 3 6	19 13 0	0 10 0	0 5 0	...	0 12 6	...		
N.E. Coolgardie { Kanowna ... Bulong ... }	1,899 17 0	1,678 4 9	309 6 6	341 7 6	242 1 9	205 17 11	...	...	...	...	...	...		
Collie	0 6 0	...	2 15 0	...	0 2 6	0 9 6	1,033 16 0	863 7 6	...	0 15 0	1,807 15 7	1,353 4 4		
Dundas	875 11 6	776 4 6	199 12 0	190 5 9	69 0 0	41 15 0	1 10 0	1 13 0	...	...	...	...		
Greenbushes	133 12 6	...	3 0 0	...	1 5 0	...	162 0 9	192 12 0	131 9 6	153 17 9	71 6 0	58 18 6		
Mt. Margaret { Laverton ... Mt. Malcolm ... Mt. Morgans ... }	4,403 8 9	4,175 11 9	937 9 4	1,135 8 3	364 15 0	496 19 0	40 8 6	29 8 6	0 10 0	...	3 17 6	15 0 0		
Murchison { Cue ... ... Mt. Magnet ... Nannine ... ... }	3,114 17 3	2,998 4 6	496 16 6	484 16 9	405 5 7	438 15 6	3 17 6	1 10 0	2 12 6	...	...	...		
E. Murchison { Lawlers ... Black Range ... }	3,218 1 0	2,555 14 0	363 5 3	425 19 0	259 10 0	344 18 9	3 6 0	...	0 10 0	...	...	...		
Peak Hill	548 14 7	408 11 8	178 15 0	153 2 3	157 14 0	23 6 0	...	...	...	...	...	0 2 0		
Phillips River	275 0 0	311 4 3	60 12 0	70 10 0	24 1 6	18 7 0	213 13 0	286 0 6	3 5 0	4 0 0	27 18 6	29 17 0		
Yalgoo	258 11 9	262 4 9	77 10 3	94 12 9	17 16 6	17 13 11	...	0 10 0	0 5 0	...	...	...		
Yilgarn	755 4 0	651 9 0	117 2 9	168 3 0	67 12 0	71 6 0	15 0 0	0 15 0	...	...	...	...		
State Smelter, Ravensthorpe... ...	...	...	...	...	...	...	...	...	...	...	...	...		
Kalgoorlie School of Mines	...	...	...	...	...	...	...	...	...	...	...	...		
Pilbarra { Marble Bar ... Nullagine ... ... }	447 2 9	415 7 6	211 10 6	276 17 6	73 11 6	51 13 6	34 10 0	153 19 6	4 5 0	2 15 0	0 5 0	8 12 6		
W. Pilbarra—Roebourne	90 19 6	103 4 0	48 15 0	68 16 6	0 7 0	8 4 0	51 8 6	78 5 0	0 14 6	6 15 0	0 5 0	3 0 0		
Northampton	...	...	...	...	0 7 6	...	14 0 0	40 10 0	...	1 0 0	4 6 0	21 8 0		
Kimberley—Hall's Creek	13 0 0	13 0 0	25 0 0	15 11 0	...	1 0 0	...	...	...	...	...	...		
Gascoyne—Carnarvon	11 5 0	47 5 0	4 5 0	5 15 0	0 12 0	...	...	...	...	0 10 0	...	...		
Ashburton—Onslow	...	9 10 0	11 5 0	15 0 0	...	0 12 6	...	2 5 0	...	1 10 0	...	...		
Total	27,689 19 4	25,125 16 8	4,982 17 7	5,679 18 6	2,647 13 0	2,872 19 2	1,727 0 9	1,870 3 3	161 4 0	175 5 9	1,920 7 7	1,517 11 10		

TABLE 29—*continued.*

Comparative Return showing Revenue collected during the Years 1904 and 1905 by Departments under control of the Minister for Mines—continued.

—	Other.		Survey Fees.		Exemption Fees.		Examination Fees.		Total Mining Revenue.		Government Geologist and Assayer.		State Batteries.	
	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.
	£ 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.
Perth Head Office, Registrar ...	31 13 8	49 6 10	74 10 0	227 10 0	10 0 0	50 0 0	38 15 0	7 0 0	370 15 2	667 12 1	...	...	...	150 0 0
Do. Machinery ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Do. Water Supply	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Do. Explosives ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Do. Geological ...	...	...	...	...	...	...	...	...	...	...	112 15 6	216 4 3	...	...
Broad Arrow	2 16 6	1 8 0	154 10 0	83 10 0	208 8 0	96 15 0	...	...	1,585 12 3	1,222 0 6	...	...	...	...
Coolgardie	12 0 0	10 5 6	454 0 0	555 10 0	267 4 0	163 11 0	17 15 0	1 5 0	4,156 5 0	3,988 11 3	...	...	2,889 10 5	5,197 19 4
E. Coolgardie—Kalgoorlie ...	48 1 3	40 19 3	636 10 0	412 8 0	626 0 6	188 12 6	62 14 6	1 5 0	5,930 17 11	5,438 8 10	...	...	...	...
N. Coolgardie { Menzies ... Mulwarrie Kookynie }	20 8 3	15 16 3	842 13 6	726 0 0	657 7 0	331 17 6	20 0 0	...	6,861 10 3	6,003 1 9	...	...	25,264 10 11	29,120 10 11
N.E. Coolgardie { Kanowna Bulong }	9 12 0	7 17 0	471 10 0	367 0 0	157 13 6	135 0 0	...	...	3,090 0 9	2,735 7 2	...	...	...	1,596 0 0
Collie	0 13 0	1 11 3	15 10 0	12 0 0	160 16 0	126 0 0	7 15 0	0 10 0	3,029 9 1	2,357 17 7	...	...	...	...
Dundas	4 14 6	4 11 0	170 3 0	155 0 0	229 18 6	108 2 6	13 12 6	...	1,564 2 0	1,277 11 9	...	...	3,151 10 0	2,861 5 6
Greenbushes	2 13 0	7 13 9	156 10 0	198 10 0	109 0 6	83 2 6	...	...	770 17 3	694 14 6	...	...	792 5 7	999 13 1
Mt. Margaret { Laverton Mt. Malcolm Mt. Morgans }	17 0 2	14 9 9	1,248 9 0	757 7 0	271 10 0	318 5 0	27 10 0	0 5 0	7,314 18 3	6,942 14 3	...	...	10,630 2 7	16,133 6 10
Murchison { Cue ... ... Mt. Magnet Nannine ... }	21 18 3	19 14 3	947 7 0	874 13 0	491 1 0	464 15 0	34 10 0	0 10 0	5,518 5 7	5,282 19 0	...	...	10,587 9 2	10,536 2 5
E. Murchison { Lawlers ... Black Range }	10 1 0	9 19 6	686 3 0	698 0 0	426 16 6	273 5 0	80 17 6	...	5,048 10 3	4,307 16 3	...	...	8,176 12 11	11,851 4 7
Peak Hill	3 8 0	1 14 6	95 0 0	79 10 0	137 4 0	218 5 0	14 15 0	...	1,135 10 7	884 11 5	...	...	197 18 0	761 12 8
Phillips River	4 1 6	4 11 6	145 0 0	325 0 0	47 1 0	96 0 0	...	...	800 12 6	1,145 10 3	...	...	...	...
Yalgoo	2 5 3	1 15 6	48 10 0	77 0 0	36 18 0	22 15 0	...	...	441 16 9	476 11 11	...	...	...	...
Yilgarn	5 4 6	6 11 3	163 11 0	275 0 0	62 12 0	101 15 0	5 17 6	0 5 0	1,192 3 9	1,275 4 3	...	...	2,439 11 8	607 16 2
State Smelter, Ravensthorpe ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kalgoorlie School of Mines ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pilbarra { Marble Bar ... Nullagine ... }	8 9 6	10 10 9	103 10 0	410 15 0	104 18 0	126 10 0	...	...	988 2 3	1,457 1 3	...	...	...	2,207 10 5
W. Pilbarra—Roebourne ...	1 18 0	1 9 6	20 10 0	42 10 0	11 18 0	29 19 0	...	...	226 15 6	342 3 0	...	...	...	...
Northampton	0 8 6	0 12 0	8 0 0	18 10 0	23 8 0	...	...	...	50 10 0	82 0 0	...	...	...	...
Kimberley—Hall's Creek ...	0 4 6	0 6 0	...	...	...	...	...	...	38 4 6	29 17 0	...	...	...	...
Gascoyne—Carnarvon	...	0 0 6	13 10 0	...	...	1 10 0	...	...	29 12 0	55 0 6	...	...	...	...
Ashburton—Onslow	0 2 0	0 9 0	2 0 0	9 5 0	...	1 5 0	...	...	13 7 0	39 16 6	...	...	...	...
Total	207 13 4	211 12 10	6,457 6 6	6,304 18 0	4,039 14 6	2,937 5 0	324 2 0	11 0 0	50,157 18 7	46,706 11 0	112 15 6	216 4 3	64,129 11 3	82,023 1 11

TABLE 29—*continued.*

Comparative Return showing Revenue collected during the Years 1904 and 1905 by Departments under control of the Minister for Mines—continued.

—	Water Supply.		State Smelter.		Mining School Fees.		Inspector of Explosives and Government Analyst.		Inspection of Machinery Act.		Totals.		Increase or Decrease for 1905 compared with 1904.	
	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	1904.	1905.	Increase.	Decrease.
	£ 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.
Perth Head Office, Registrar ...	...	...	...	...	...	...	...	...	...	...	370 15 2	817 12 1	446 16 11	...
Do. Machinery ...	...	...	...	...	...	...	...	...	1,183 10 0	2,452 4 0	1,183 10 0	2,452 4 0	1,268 14 0	...
Do. Water Supply	6,888 14 8	9,362 10 5	...	...	...	...	...	...	...	...	6,888 14 8	9,362 10 5	2,473 15 9	...
Do. Explosives ...	...	...	...	...	...	...	4,866 7 2	4,004 16 4	...	...	4,866 7 2	4,004 16 4	...	861 10 10
Do. Geological ...	...	...	...	...	...	...	...	...	...	...	112 15 6	216 4 3	103 8 9	...
Broad Arrow	...	...	...	...	...	...	...	...	...	...	1,585 12 3	1,222 0 6	...	363 11 9
Coolgardie	...	...	...	...	...	...	...	...	360 15 0	490 7 6	7,406 10 5	9,676 18 1	2,270 7 8	...
E. Coolgardie—Kalgoorlie ...	...	...	...	...	...	...	...	...	797 0 0	1,029 12 6	6,727 17 11	6,468 1 4	...	259 16 7
N. Coolgardie { Menzies ... Mulwarrie Kookynie }	...	...	...	...	...	...	...	...	3 0 0	89 0 0	32,129 1 2	35,212 12 8	3,083 11 6	...
N.E. Coolgardie { Kanowna Bulong }	...	...	...	...	...	...	...	...	5 10 0	...	3,095 10 9	4,331 7 2	1,235 16 5	...
Collie	...	...	...	...	...	...	...	...	...	...	3,029 9 1	2,357 17 7	...	671 11 6
Dundas	...	...	...	...	...	...	...	...	18 10 0	45 0 0	4,734 2 0	4,183 17 3	...	550 4 9
Greenbushes	...	...	...	...	...	...	...	...	...	...	1,563 2 10	1,694 7 7	131 4 9	...
Mt. Margaret { Laverton Mt. Malcolm Mt. Morgans }	...	...	...	...	...	...	...	...	492 0 0	509 0 0	18,437 0 10	23,585 1 1	5,148 0 3	...
Murchison { Cue ... ... Mt. Magnet Nannine ... }	...	...	...	...	...	...	...	...	324 0 0	423 0 0	16,429 14 9	16,242 1 5	...	187 13 4
E. Murchison { Lawlers ... Black Range }	...	...	...	...	...	...	...	...	71 15 0	110 0 0	13,296 18 2	16,269 0 10	2,972 2 8	...
Peak Hill	...	...	...	...	...	...	...	...	17 15 0	28 15 0	1,351 3 7	1,674 19 1	323 15 6	...
Phillips River	...	...	...	...	...	...	...	...	...	...	800 12 6	1,145 10 3	344 17 9	...
Yalgoo	...	...	...	...	...	...	...	...	...	6 0 0	441 16 9	482 11 11	40 15 2	...
Yilgarn	...	...	...	...	...	...	...	...	54 0 0	...	3,685 15 5	1,883 0 5	...	1,802 15 0
State Smelter, Ravensthorpe ...	...	...	...	54,107 3 1	...	...	...	...	...	...	...	54,107 3 1	54,107 3 1	...
Kalgoorlie School of Mines ...	...	...	...	...	813 3 3	622 9 0	...	...	...	...	813 3 3	622 9 0	...	190 14 3
Pilbarra { Marble Bar ... Nullagine ... }	...	...	...	...	...	...	...	...	...	...	988 2 3	3,664 11 8	2,676 9 5	...
W. Pilbarra—Roebourne ...	...	...	...	...	...	...	...	...	...	...	226 15 6	342 3 0	115 7 6	...
Northampton	...	...	...	...	...	...	...	...	...	...	50 10 0	82 0 0	31 10 0	...
Kimberley—Hall's Creek ...	...	..	...	...	...	...	...	...	...	...	38 4 6	29 17 0	...	8 7 6
Gascoyne—Carnarvon	...	...	...	...	...	...	...	...	...	...	29 12 0	55 0 6	25 8 6	...
Ashburton—Onslow	...	...	...	...	...	...	...	...	...	...	13 7 0	39 16 6	26 9 6	...
Total	6,888 14 8	9,362 10 5	...	54,107 3 1	813 3 3	*622 9 0	4,866 7 2	4,004 16 4	3,327 15 0	5,182 19 0	130,296 5 5	202,225 15 0	76,825 15 1	4,896 5 6

* Not including revenue from Coolgardie School. Transferred to Education Department.

Correspondence.

Table No. 30.

Letters, Telegrams, etc., despatched during 1905.

Branch.	Letters.	Telegrams.	Circulars and Advices.	Statistics and Publications.	Total.
				*	
Analytical and Explosives...	2,390	73	...	...	2,463
Chief Accountant	5,919	178	4,027	...	10,124
Correspondence	8,050	1,540	4,742	12,250	14,332
Drafting	231	17	...	...	248
Geological Survey	1,176	48	...	7,019	1,224
Inspection of Machinery ...	8,493	374	320	...	9,187
Mines Water Supply ...	3,470	604	...	...	4,074
Registration	6,229	696	...	...	6,925
State Batteries	5,192	492	3,294	64	8,978
Statistical	416	143	328	7,200	887
Survey	597	28	...	...	625
	42,163	4,193	12,711	* 26,533	59,067

* The figures in this column are not included in the totals column.

Inward Correspondence.

Branch.	1904.	1905.
Correspondence registered.		
Correspondence	7,600	8,200
Analytical and Explosives	1,904	1,905
Geological Survey	1,014	1,500
Mines Water Supply	4,611	4,290

By comparison with 1904, as appearing at page 40 of 1904 Departmental Report, it will be seen that with regard to letters, telegrams, etc., despatched, there is an increase of 10,036 against the increase for the previous year of 5,422.

Surveys.

The following tables furnish a statement showing the number of Surveys executed for the Mines Department during the year 1905, and compared with the year 1904:—

Table 31.

	1904.		1905.	
	No.	Area.	No.	Area.
Surveys on Eastern Goldfields	638	11,347	812	11,969
Surveys on Central Goldfields	342	4,592	240	3,023
Surveys on all other Fields	100	3,683	125	2,131
	1,080	19,632	1,177	17,123

The above Table does not include groups of Business and Residence Areas.

TABLE 32.

Traverses, Roads, Special Surveys, etc.

	1904.		1905.	
	Traverses, etc.	Cost.	Traverses, etc.	Cost.
	M. C.	£ s. d.	M. C.	£ s. d.
Eastern Goldfields	22 20	74 3 8	110 71	457 15 8
Central Goldfields	74 77	279 17 5	54 77	200 0 8
All other Fields	9 24	31 0 4	2 49	8 13 2
	No.		No.	
Business and Residence Areas	136	145 12 0	177	188 8 0

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

H. S. KING,
Secretary for Mines.

Department of Mines,
Perth, 31st March, 1906.

DIVISION II.

Report of the State Mining Engineer for the Year 1905.

To the Secretary for Mines, Perth.

Mines Department, Office of the State Mining Engineer,

SIR, Perth, 17th January, 1906.

For the information of the honourable the Minister for Mines, I have the honour to submit the following report of the work of my office for the year 1905 :—

Inspection of Mines under "The Mines Regulation Act, 1895" (with amendments), and "The Coal Mines Regulation Act, 1902."

During the year 1905 there has been no change in the stations and duties of the various Inspectors of Mines, except in the Phillips River Goldfield, where the manager of the State Smelting Works, who acts as Inspector of Mines for the present, has been changed, Mr. John Provis having resigned and been succeeded by Mr. John Dunstan.

PILBARRA AND WEST PILBARRA GOLDFIELDS.

Mr. P. C. Riches, Inspector of Mines, reports for the year 1905, under date 3rd January, 1906:—

"On the whole the year just ended has been an exceedingly quiet one. The principal cause of this has been the continuous dry weather that has been experienced. On the 10th of February next it will be four years since good summer rains fell; by good rains I mean sufficient to run the rivers and fill the permanent water-holes. Heavy rain provides both feed and water and allows prospectors to push out back.

"The principal development on the Pilbarra field has been the tin and tantalite find at Wodgina. A mild rush set in, and has resulted in about 26 leases being applied for at Wodgina and surrounding district. At one time the local price of tantalite reached over £300 a ton, but when I visited the field early in December it appeared a difficult matter to dispose of the mineral at any price. Mr. Maitland last year dealt fully with this field, therefore it is unnecessary to make any further remarks. At Mount York (Chingamong), some 20 miles east of Wodgina, a small tin and tantalite find has occurred. The increased output of tin from the Pilbarra district is a most satisfactory one. The present high price of the tin allows ground to be worked that was previously too poor to touch. The output of alluvial tin from the whole district is between 40 and 50 tons a month. At Moolyella one claim, the Birnies Flat Syndicate, has, during the past 12 months, shipped 150 tons of tin. During the past week rumours have reached here of a new lead having been found at Moolyella, but so far there has not been any means of verifying this. The erection of the State battery at 20-mile Sandy has proved a great boon, and has allowed a lot of stone to be crushed that, under other circumstances, would still be lying at the various claims. The partial failure of the water supply has been a great drawback, continuous pumping having drained the well. Further deepening is now in progress, and it is to be hoped a better supply will be obtained.

"During the past year three accidents have occurred: one fatal, one serious, and one minor; with the exception of the minor accident, these occurred on prospecting shows. There have been no accidents through faulty explosives, the general quality of the explosives used being good.

"With the exception of the State battery, crushing operations have been of a limited character, various causes having necessitated the hanging up of the different plants. At Marble Bar the subsidised battery (the Stray Shot) has crushed all the stone raised locally.

"The work carried out at the various centres does not call for special comment; in West Pilbarra all mining has been practically at a standstill."

CENTRAL GOLDFIELDS.

The Inspector of Mines, Mr. F. J. Lander, reports on 3rd January, 1906:—

"Mining, on the whole, in the Murchison district, looks much brighter at present than it has for some years past. There is but one exception to the general prosperous outlook, and that is in connection with the Cue One Mine. This mine has been sunk to a depth of 540 feet, a short crosscut driven, and a large formation, 30 feet in width, has been cut; the formation consists of a combination of schist, slate, granite, and quartz. The walls are of granite. The quartz is patchy, and not well defined. It is more regular, however, in the bottom of the level. This leads one to think that the lode was struck right on a break. The formation has been driven on for a distance of 135 feet. Eleven tons of the ore were put through the battery for a return of 2dwts. to the ton.

"During the year the Salisbury Mine has erected a 10-head mill. The hopes of the Cue people run very high in relation to this mine.

"In the early part of November last a rich lode was struck in the Agamemnon Mine, owned by Mr. E. L. Lloyd. At the 100-feet level to the east of the old workings a lode three feet thick was discovered when sinking an old prospecting shaft to a greater depth. When driving on this lode (which is entirely new) it opened out to a width of five feet, and is said to average about an ounce to the ton. It is too early to say anything definite about the developments at the Rubicon and East Fingall Mines. The Rubicon has been sunk to a depth of 811 feet and is being opened up at the 800-feet level. The East Fingall main shaft has been sunk to a depth of 518 feet, and is being opened out at the 500-feet level. This shaft passed through the lode in sinking, and for a width of three feet on the hanging-wall side the values were said to be between two and three ounces per ton; the formation, of which this three feet forms part, is about 25 feet wide.

"The Crême d'Or mine is adjacent to the East Fingall and has been sunk on the underlay to a depth of 160 feet, and a considerable amount of stoping has been done. The average values of the ore taken out equal 30dwts. per ton. This mine is held by a local syndicate of four men, and so well pleased are they that they are now engaged in sinking a vertical shaft to a depth of 400 feet. They have also erected a five-head battery, with machinery complete.

"The Victory United G.M. (Cuddingwarra), which for a long time has been a disappointment to all concerned, has now developed into one of the most promising mines in the district. During this year 762 tons have been crushed for a return of 815 ounces 2dwts. over the plates and 118 ounces from cyanide. The main shaft is now 640 feet deep, and the manager proposes sinking another 600 feet. There is a considerable amount of prospecting going on in the district.

"During the year the Cue One battery has treated 6,491 tons for 5,411 ounces (public crushing).

"The Great Fingall G.M. is still keeping sinking and development well in advance of the general workings.

"*Copper Find.*—A large reef, containing from 10 to 15 per cent. of copper, has been discovered near the north-east portion of the Rubicon Mine, at Day Dawn. A main shaft has been sunk 110 feet and some driving done. A parcel of five tons was put through the smelter at Fremantle, and gave a return of 4dwts. of gold per ton and 15 per cent. of copper.

"In the Mount Magnet district the Morning Star Mine is looking much better than it has done for several years. During the year a lode of 20 feet wide was cut in the 300-feet level, which averages 17dwts. per ton. I understand that the management are contemplating sinking another 100 feet. Mining generally in the Mount Magnet district is looking well. Boogardie has a very rich group of mines, of which the following are a few:—Hesperus Dawn, The Sirdar, Elliott's two quartz claims, The Saturn, Neptune, and Jupiter.

"At Field's Find the Field's Reward Mine is again working after being idle a considerable time. A new main shaft is being sunk about 600 feet east of the old main shaft.

"At Gullewa a good deal of prospecting is being done, and things look decidedly brighter. The Phœnix G.M. has been on payable gold during the last 12 months.

"North of Cue, at Stake Well, the Koh-i-noor South Mine has been purchased from the original prospectors. A main shaft has been sunk to a depth of 100 feet, and arrangements have been made for the erection of a 10-head mill. There is a big lode, carrying good gold, which, I understand, averages about an ounce to the ton. In this district there are several other small properties, all of which look encouraging.

"*Burnakurra.*—Mining at Burnakurra is looking very healthy. Here the New Alliance Mine is erecting a 10-head mill, in addition to the one they have. The Federal City, a 24-acre lease, held by a local syndicate, has a shaft 110 feet deep to water level; 360 tons of stone have been crushed for an average of 30dwts. per ton. This ore was taken from drives. This is a most promising mine.

"At Abbotts the New Murchison King is employing about 40 men. Some very rich specimens have been broken in the bottom level, and the mine looks promising.

"*Gum Creek.*—Since I reported on the Gum Creek Leases a five-head mill has been erected on the Gladsome Lease. A battery will also be erected at Barambie in the near future. The leases in this district are opening up well.

"*Meekatharra.*—Meekatharra has made very rapid progress during the past 12 months, every month shows a better result than the previous one. This district is showing such high values that it is impossible to form an estimate as to its future. Nowhere in my district are the prospects so promising as at Meekatharra. In connection with the district I must mention the Commodore, a lease of 18 acres, which was taken up during the past year, and has crushed 48 tons of ore for a return of 209 ounces. There are three reefs on this lease, the smallest of which is three feet wide, another five feet, and a third 20 feet. Then there is the Fenian, from which crushings have been taken averaging over 40 ounces to the ton. A number of other good mines are being worked by the original prospectors, and very high values are being obtained. With a better water supply at the public battery, Meekatharra should be the most prosperous town on the Murchison.

"*New Finds.*—A new find was made during the year by Messrs. Beasley and party at Eelya, about 20 miles from Cue. A parcel of 10 tons has been treated from this find, and I understand the result was about 3ozs. per ton.

"*Day Dawn.*—A new lease has been taken up about two miles south of Day Dawn (No. 398D.) This lease looks very promising, and the owners are very well satisfied with the stone met with.

"*Mindeloo.*—Eighty miles from Cue. A new find has been made at this place, but so far I have not had an opportunity of visiting the district. A parcel of five tons has been treated at the Cue One Battery for a return of 6ozs. to the ton. Prospectors are somewhat handicapped owing to the scarcity of water, and also the heavy charges for cartage, the nearest battery being Cue.

"In the administration of the 'Mines Regulation Act, 1895,' I have tested all cages for side catches, examined the safety detaching hooks, and carefully inspected the ropes. In almost every case the side catches have acted promptly; only in one case have I had to stop winding operations, and this was on account of a weakness in the rope. The rope was replaced by a new one that had just arrived on the mine before I left the district. Strict attention has also been paid to ventilation, timbering, and the filling of the stopes.

"In one or two cases new magazines had to be built, as the old ones, which answered for a small quantity of dynamite, were inadequate when a larger quantity had to be stored.

"*Prosecutions.*—I have had two prosecutions during the year, one action against a company and one against an employee of a company.

"*Accidents.*—The number of accidents during the year has been 26; three fatal, and 23 non-fatal. The first fatal accident happened at the Great Fingall Consolidated, Ltd., Day Dawn, when J. Fanti was killed. I was in Cue at the time, and reported fully on the accident. The second fatal accident happened at Gum Creek, at the North Cardigan G.M., whereby Robert Sloane (owner) was killed by a fall of earth. I was absent at the time, and the accident was reported on by Messrs. Avidson and Harrison. The third fatal accident happened at the Crême d'Or Mine, Day Dawn, which caused the death of George Cairns (part owner). Death resulted through suffocation. Cairns went below where dynamite had been burning, and was overcome with the fumes while descending the ladder. I was at Nannine when the accident happened, and returned to Cue for the inquest. The other 23 accidents were all reported upon as they happened, with full particulars."

Mount Margaret and East Murchison Goldfields.

Mr. W. M. Deeble, Inspector of Mines, reports on 2nd January, 1906:—

"During the year I made 392 inspections at the different centres, but owing to the distances separating the mines on these goldfields I have not been able to visit each mine as frequently as I would like. I have travelled by buggy during 1905 7,225 miles, or a distance of 18·43 miles for each mine inspected.

"At the north-west of this district, in the East Murchison Goldfield, there has been a considerable improvement in the mining prospects and an increase in the gold returns during the year. The most north-west is what is known as Berrigrin, which includes Montague Range. Most of the reefs at the Montague Range are large, and some of the prospectors may reasonably expect to have secured what will develop into good mines.

"The chief difficulty the prospector has to contend with is the heavy inflow of water met with at shallow depths of from 20 to 60 feet from surface. A Tremayne mill has been put on the Eldorado G.M., and driven by a horizontal engine 12in. x 8in., steam being supplied by a portable tubular loco. type boiler 10ft. 6in. x 2ft. 8in.—80lbs. steam pressure. Only one crushing had been put through the battery at the time of my last visit, this was 31 tons from the New Year's Gift G.M., which returned 77·52ozs. gold. The furthest advanced mine in this part is the Pelerin G.M., which had just completed a crushing of 131 tons for 328·3ozs. of gold. Altogether I saw 15 mines working and several prospectors at Berrigrin and around it.

"*40 Mile.*—This place is situated about 40 miles north-west of Black Range on the Berrigrin-road; some very good prospects were obtained at this place, but the leaders worked appeared to be very small and erratic.

"*Black Range.*—The mines at this place form several groups, each group being different to the others. The Black Range G.M. is about the centre of the main group. This mine, together with the Wanderie G.M. and what are generally known as the 'Sandstone' leases, have been giving regular and payable returns during the year. The sandstone leases include the Golden Key, Golden Lock, Golden Gate, Sandstone, Kingoonya, Undaunted West. An option has lately been secured over these by a large mining company and they are now known as the Oroya Junior.

"Another group of mines to the south of Black Range about one mile is being worked in a spasmodic manner. Judging from returns two of these at least would pay if worked in a systematic way.

"Other places are being worked by small parties on small leaders, and, on the average, are giving good payable returns.

"About 18 miles east of Black Range are a number of leases and prospecting shows. The main mine in this group is the Maninga Marley. On this mine a five-head stamper battery will soon be erected, and, judging from returns obtained from parcels taken into the State battery at Black Range, this mine should soon be giving highly remunerative returns. To the west of the Maninga Marley is the Havilah G.M. on which a shaft has been sunk 60 feet; the reef is large and the owners informed me the prospects taken from the reef were more than payable. About 80 miles east of the latter place is the Lawlers district. When travelling over this 80 miles I have been surprised that more prospecting has not been done on it.

"*Lawlers.*—Mining at this centre has not improved as much as I anticipated, but it has been holding its own and at present its outlook appears better. Two of the main mines are at present opening up some large ore bodies with fair prospects. To the north of Lawlers several reefs have been found which are very promising, so it can reasonably be expected that mining will soon revive around this district.

"*Sir Samuel.*—The chief mine in this district is the Bellevue G.M., in which the reef is large and the ore contents very refractory. I understand the treatment difficulty has been overcome by concentration and roasting and amalgamation. Other mines in this district do not seem to have the same trouble in the treatment of their ore as the Bellevue G.M. Tailings from a five-head battery at the Condor G.M., and tailings from a five-stamper mill on the Vanguard G.M., were treated by cyanide, but this was not practicable on the Bellevue G.M., and it is satisfactory to note that the difficulty has been overcome. Generally this district appears to be very much the same as it was at the beginning of last year.

"*Kathleen Valley.*—The main mines in this place are the Yellow Aster and the Nil Desperandum, both of which are worked by tributers, with fairly satisfactory results to them.

"Taking it from another view—that of the failure of the place—it is not so satisfactory, as they are gradually exhausting the payable ore opened up.

"*Darlot.*—There are now a large number of men prospecting and working in this district. During my last visit the owners of the St. George G.M. crushed at the State battery 25 tons for 750ozs. of gold. The reef worked is patchy. Around this part of Darlot appears to be worth prospecting further.

"About two miles west of this are the three main mines of the place, and are known as the Filbanduit, Zangbar, and Monte Christo G.Ms. These mines have given fairly satisfactory returns during the year, and as the reef which runs through the three is large the owners of the Zangbar and Monte Christo have decided to each erect 10-head mills. The Amazon G.M. is at the Darlot townsite, five miles east of the above. Fair returns are being obtained, but the leader, where worked, at present is small.

"*Wilson's Patch.*—There is only one mine working at this place, and is owned by a small syndicate. A 10-head battery and a winding engine were erected last year. During this year the discovery of a new chute of ore and favourable developments in the old has induced the syndicate to erect an air compressor and instal rock drills. Owing to these developments quite a small town has sprung up near the mine. About 10 miles from Wilson's Patch on the Mount Clifford-road a new find has been made by a party of prospectors; 1cwt. of stone dollied gave 180ozs. of gold. When I visited this place on the 20th December the owners were engaged raking up the loose quartz on the surface to have a trial crushing. The stone dollied was picked up from among the loose floaters. A small reef has been found, which shows fair gold in the stone, but not near so rich as the stone dollied. Around this place is a very large area of very promising-looking country, which I called attention to in my last annual report.

"*Mount Clifford.*—A 10-head battery was started at this place during the year, but unfortunately there has not been sufficient water available for crushing purposes. The two main producers at this place are the Victory and Emancipator G.Ms., and have been giving good returns. Two other shows which promise to develop into mines have lately been discovered about five miles south-east of Mount Clifford. From this, through Mt. Stirling to Diorite, are a number of prospectors working small shows, but in neither of them is there anything worth noting.

"*King of the Hills.*—About 2½ miles east of the Old King of the Hills G.M. a discovery was made a few months ago and a crushing taken out, which gave a result of 14dwts. per ton over the plates and 15dwts. in the sands. The lode the stone was taken from appears to be large, but as the crushing was taken out of a hole about 6 feet wide by 10 feet deep and 12 feet long and no walls showing, it was not possible to tell the width of the lode when I saw it. Four other leases have been taken up around it.

"*Leonora.*—This place has very much improved during the year. There are now 45 stampers more working than there were in the beginning of the year. As in the past the Sons of Gwalia has held pride of place, and continued to keep up its regular yields during the year. The Great Tower Hill Co. has erected a 40-head mill with cyanide plant. The laying out of the plant has been carefully thought out with the view of treating large quantities of ore cheaply. The lode in the mine is the largest in the district, and under the conditions low-grade ore should pay well and the cost of mining be low. The Harbour Lights Co. have erected a five-head mill on their property, and I understand are going to add a cyanide plant. The lode material in the mine is soft, and as the lode is fairly large where being worked, low-grade ore should meet expenses. North of the Harbour Lights are the Boston, Leonora Main Reefs, Trump, and Leonora Gold Blocks. The three latter have batteries and cyanide plants on them, and have been working with varying results during the year.

"*Malcolm.*—Mining has been very quiet at this place, and at present the Richmond Gem is the only mine working near the town.

"*Pig Well.*—Twelve miles north of Malcolm, has gone down considerably during the year, and at present only one mine, the Gambier Lass, is giving regular and payable returns.

"*Mertondale.*—The Merton's Reward Gold Mine at this place is the only mine worth mentioning doing any practical work, and this mine has been greatly hampered by a shortage of water for battery purposes; it is expected this difficulty will be shortly got over.

"*Randwick.*—The Randwick, Anglo Saxon, and East Lynne Gold Mines are about 10 miles east of Mertondale. They have been getting some small rich patches. The Randwick has been shut down until lately, when two small crushings were taken out and good returns obtained. Following on the same line of country from Mertondale, and through Randwick to the Australia United, the country seems to be the same character.

"*Australia United.*—A number of rich crushings have been taken out from time to time from this place. A few months ago Mr. Hill, owner of the Malcolm Mines, visited this place and took up the Princess Iris Gold Mine, and the developments have been so satisfactory that he is now erecting a 20-head mill on it.

"*Murrin Murrin.*—This place has continued to improve during the year. The Malcolm Gold Mines and the Princess Alix Gold Mine have batteries erected on them, and are producing regular payable returns. The Elbe Gold Mine, adjoining the Malcolm Gold Mines, has also been giving regular returns from high-grade ore. There are a number of shows working on leaders, from which small parcels of rich stone have from time to time been crushed. The Malcolm Proprietary Gold Mine is being worked by a party of tributers who have made more than the usual miners' wages during the year.

"*Mount Morgans.*—The Westralia Mount Morgans Gold Mine is the chief mine at this place, but unfortunately has been going in a very erratic manner during the year; the difficulty appears to be mainly with the machinery on the surface. In the mine there are large ore bodies. I cannot speak of my own knowledge of the values of the ore, but it would be very strange if the values were to cut out at the different faces. At the same time I am quite satisfied that when the machinery has been put in order the mine will take its place as a producer again. The Ramornie Gold Mine, east of the Westralia Mount Morgans, has developed during the year so satisfactorily that the owners have erected a five-head battery and winding plant on it. The Sons of Gowrie Gold Mine has a winding engine on it, and is working at a deeper level, with payable results. The owners of the other shows in this district, from which good stone has been obtained, are not showing much energy.

"*Euro.*—At Euro a syndicate are working the mine there and have erected a 10-head battery. The results now being obtained are very satisfactory. This has induced others to take up some of the abandoned ground around this district, that formerly gave fair returns, and give them another trial.

"*Laverton.*—Mining generally appears to be on the improve in and around this place, although at present the returns are considerably lower on account of the Lancefield G.M. battery, of 40 stampers, being hung up. I understand the extraction of gold from the ore has been very low for some time, and the stoppage is for the purpose of installing a more suitable process. The stoppage of this mine may, therefore, be considered only temporary. Other mines are holding their own as far as future prospects and output are concerned. The Augusta G.M., which was abandoned by former owners, has been taken up by a syndicate, who are getting highly payable returns. Their work is mostly confined to the lower level, and out of a winze sunk 30 feet below the bottom level £5,000 worth of gold has been taken. At the time of my last visit a drive was being put along the reef from the bottom of the winze, and was in 20 feet. Specimen stone could be seen from about 15 feet down the winze and in places along the back of the drive.

"About six miles east of Laverton I saw some prospectors working on ground that was at one time known as the Scotland Yet. One reef being worked is large, but on account of the way it is being worked it cannot be said what is the real width. Stone taken from this and on the dump was estimated by the owners to be worth one ounce per ton. If it yields anything near the estimate it will certainly induce others to try the surrounding country, where there is a large area upon which very little prospecting appears to have been done. From Laverton to Mistake Creek, a distance of 50 miles, a number of prospectors are working, and in several cases are getting fair returns. The three mines working in this part are the Little Doris, Caledonia, and the Mistake G.Ms. These mines have been working with varying results during the year.

"*Duketon.*—I regret to report that mines have not turned out up to expectations in this part during the year. The best mines have had to contend with a heavy inflow of water, and as they are owned and worked by prospectors the handicap has been too much for them.

"*Mulga Queen.*—There has been a slight improvement in this place, and quite a small town has sprung up near the mines. The Mulga Queen, Famous, and Famous Blue are the main producing mines of the district, but a new find was made lately three miles east, which promises to turn out well by the prospects from work already done. During the last quarter of this year there have been 110 less stampers at work in the Mount Morgans and Laverton centres on account of the temporary stoppage of the Westralia Mount Morgans and Lancefield G.Ms., but even with this the gold return has not dropped proportionately, which goes to show that generally there must be a slight improvement in this goldfield.

"*Accidents.*—During the year there have been three fatal and 36 non-fatal accidents in the Mount Margaret goldfield, and three fatal and 15 non-fatal in the East Murchison goldfield. Two miners killed in the East Murchison were by premature explosion. I tested all the fuse in the magazine in the mine at the time the accident occurred, in the presence of the manager, a representative of the family of one of the persons killed, and the police. I was unable to find one defective piece. The other fatal accident was to a prospector at Black Range caused by a fall of earth.

"Of the fatal accidents on the Mount Margaret Goldfield, one was caused by premature explosion caused by the deceased using a steel drill to tamp a hole. The two others were by falls of rock. One sufferer was the shift boss of the Lancefield G.M., who went to examine a piece of ground in the stopes, and after examining stood looking at some men working near. A large rock fell on him, killing him instantly. The other was a timberman sent to put in timber against ground that did not appear safe. Whilst clearing away for the foot of a piece of timber to be put in, a rock fell from the back.

"In the non-fatal accidents two were by explosions and one by being burnt with dynamite. One was reported to me as premature explosion. I tested all the fuse in use on the mine but did not find any defective. This happened when firing out a second round of machine holes and the second lot were all lit up and the man was coming away. The other explosion was caused by a miner charging two holes of which he only lit one. When the one went off he returned to light the other, when it went off just as he got to it. The accident to miner burnt by dynamite was caused by him using a plug to cut off pieces to put in the fuses to spit them. Having about half a plug over he put it into his pocket. He then started lighting the fuse, when a spark fell into his pocket on the dynamite. During the year I have made careful inquiries about defective or burning explosives. I find it is very rare that explosives burn away in hard ground, but often in soft.

"Safety appliances are now fitted to all cages where men are allowed to be lowered or raised by machinery, with the one exception of the Sons of Gwalia G.M., where the shaft is on the underlay and goes down on the average angle of 42°. There has not been any safety appliance suitable for underlays, but before the end of next year I hope to see this overcome. In all other underlay shafts the men have to walk down, as they are all shallow.

"In the absence of safety catches I considered it advisable to have the wheels on the skips turned so that the outside of the tread will be $\frac{1}{4}$ inch less diameter on the outside than at the flange. The engineer of the Sons of Gwalia mine states this works very satisfactorily and always keeps the skip in a central position. I have examined the inside of the rails since and find there is no mark on the flanges of the wheels touching the inside of the rails as there was before the alteration, which shows the skip is not likely to mount the rails.

"*Speed Indicators.*—I consider that speed indicators should be put on all engines where men are raised or lowered to and from their work. The Mines Regulations place a limit on the speed men shall be lowered or raised, yet the engine-driver has to guess, in a considerable number of cases, when he is driving, at the limit."

North Coolgardie Goldfield.

The annual report of the Inspector of Mines, Mr. W. F. Greenard, is dated 2nd January, 1906. He says:—

"During the year a systematic routine inspection of all mines has been maintained. Where defects and contraventions of the Act have been noticed and a willingness to comply with the Act shown, a reasonable time has always been given to remedy said defects; but where culpable negligence has been clearly demonstrated, instant action has been taken, and fines from £1 to £10 inflicted by the Court.

"Filling stopes in vertical reefs has been insisted upon strenuously. With regard to underlie reefs, a system of leaving pillars of solid ore every 30 or 40 feet has been tried with good results.

"No accidents have arisen through the breaking of wire ropes, and the system of cleaning and oiling with hot castor-oil (or some vegetable oil free from acid) has clearly demonstrated its efficacy in preventing internal corrosion and keeping the rope in good order.

"Careful attention has been paid to ventilation, and there is still trouble with dead ends, winzes, and rises, where large quantities of dynamite are used in firing machine holes; when miners are returning to these places I insist on them taking the air-hose, which permits them to return with safety

"Sanitation has been strictly enforced, but crib-places continue to be a source of trouble.

"Safety Hooks are cleaned every six months and copper rivets renewed.

"Safety Cages are dropped every week and examined by the management; they are also dropped and tested by me on every visit of inspection.

"The number of accidents for the year is extremely small—the lowest ever recorded; one fatal, 21 serious, 29 minor. To avoid these minor accidents as well as serious, I have given considerable attention to their occurrence.

"The accidents in using dynamite by Peddie at Mount Ida, and Camp at Edjudina, point to the necessity for a large measure of care on the part of the men themselves.

"*Mining Generally.*—The developments at Menzies for the year have renewed confidence in the permanency of the lodes in this district. The Menzies Consolidated mine, Yundaga, has continued to open up splendidly at a depth of 800 feet, one ounce values having been disclosed in a large ore body: the manager proposes to re-equip this mine with a new shaft and machinery, which will permit considerable economy in the handling of the ore. The Queensland Menzies Company have purchased the Goodenough mine, and with proper equipment this mine should give a good account of itself. The Lady Shenton and several other mines in close proximity have been worked on tribute during the year. Considering the excellent results obtained from these mines in the past, and during this year, it is almost incomprehensible that the owners do not work these mines on a sound basis.

"At *Comet Vale* several large reefs have continued to develop well, carrying good values. This place should progress rapidly this year.

"*Davyhurst.*— Good values continue to be obtained at a depth of 400 feet in the Golden Pole mine, and if the shoot of ore has not considerably contracted or pinched in length at this level in the hard country, a renewal of confidence should soon be restored to this excellent little mine. Some adverse comments have I believe been made as to the insecurity of this mine. The day after the present manager took charge I inspected this mine from top to bottom and found the stopes well filled and the ventilation good. The system of winzing permits, as soon as a connection has been made from the shaft, good ventilation. There has been no accident in the mine from falls of ground for the year; the only accident that did occur was due to a machine bar slipping. Having a winze down on the pay ore and the system of obtaining mullock from a large open cut on the surface at the Golden Pole, allows any portion of the mine to be filled when necessary. The developments at the 300-feet level of the Westralia Waihi mine are of a reassuring nature. The smaller mines at Davyhurst are also giving good results.

"At *Mulwarrie* developments have not been up to expectations, but Messrs. De Baun and Wilkinson are working energetically, and good results may be anticipated.

"At *Mulline* developments are of a more reassuring nature than last year. The Lady Gladys and Cooladdie and several other leases have given good results, and the future is extremely promising.

"*Niagara.*—The work done on most of the prospecting leases has given good result. Hannan's Main Reef Company have started crushing and fair results have been obtained. Mr. Bright has

continued to do good prospecting work on the Eagle Hawk Heather mine, and the cheap crushing done by this company has had a good effect on the industry, and demonstrates beyond any doubt that the actual cost of crushing with a properly-erected 10-stamp mill is not more than 5s. per ton. Mr. Bright's charges are 6s. for low-grade material and 8s. for high-grade or over 10 dwts.

"*Kookynie* has been under a cloud for some time, but recently fair developments have taken place in the 9, 10 and 11 levels of the Cosmopolitan mine to the south of the shaft. The lowest level is down over 1,500 feet on the underlie, but the values are low and great care has to be taken to make ends meet.

"*Yundamindera* is practically at a standstill; cheaper crushing would give some of the smaller shows a chance to develop further, but without that the outlook is not too good.

"*Yerilla* has been visited by a number of prospectors during the year and a half-hearted test given some of the reefs with results not too promising, but nevertheless could cheaper crushing be obtained a payable centre could be established.

"*Yarrie* has gone ahead considerably, and had the battery been able to crush all the stone available the returns would have been considerable and a large amount of confidence given the place.

"*Edjudina.*—The Neta has continued to work with satisfactory results. The Senate recently struck the reef in their lowest level, carrying good values. Edjudina line of reef has not been worked very energetically during the year; cheaper crushing appears to be the only thing that will permit these places to exist. Pinjin, with the advent of the State battery, has given quite a number of excellent crushings of one, two, and three ounces to the ton, and the stone has been obtained from a large area. The discovery of large lode formations carrying fair values at Pinjin is of considerable importance and will eventually make Pinjin an important centre."

North-East Coolgardie and Broad Arrow Goldfields.

Mr. George Jenkyn, Inspector of Mines, reports, on 6th January, 1906:—

"*Mine and Lease Inspection.*—Each mine being worked in the above goldfields has been inspected by me about once in every two months, and in many cases, as, for instance, when a new shaft was being sunk, more frequently. During the year I have made 424 inspections of mines and 20 inspections of leases in the North-East Coolgardie Goldfield, and 209 inspections of mines and 15 of leases in the Broad Arrow Goldfield.

"*Development Work.*—In order to be able to forward you particulars of the development work being carried out in the principal mines of the districts, I requested the various managers to supply me with an approximate account of the work done during the year. The following is a tabulated list of the figures supplied by them:—

North-East Coolgardie Goldfield.

Name of Mine.	Sinking.	Driving.	Crosscutting.	Rising.	Winzing.
White Feather Main Reefs	70	848	368	468	53
Commonwealth	166	620	20	142	...
Robinson	225	...	318	280	...
North White Feather	153	974	386	510	...
Total	614	2,442	1,092	1,400	53

Broad Arrow Goldfield.

Name of Mine.	Sinking.	Driving.	Crosscutting.	Rising.	Winzing.
Star of W.A.	...	180	60	70	380
New Slug Hill	989	2,952	870	72	...
Total	989	3,132	930	142	380

"*Mining Generally.*—I regret to have to report that the mining outlook is at present far from bright. Most of the mines owned by companies are being worked by tributers. Some of these parties are on good gold, but in most cases the veins being worked by them are small and would not prove remunerative to a company.

"*Accidents.*—During the year 11 accidents have occurred. Of this number two terminated fatally, the remainder being serious. There were also several classed as minor accidents, being merely slight cuts and bruises, the injured men returning to their work in a very short time.

"*Safety Appliances.*—Each winding shaft on these goldfields, where in any way practicable, has either one or two safety cages, fitted with safety appliances and safety hook, together with a winding-rope of proper dimensions. These cages and safety appliances have been periodically inspected by me;

19 tests of cages and ropes in the North-East Coolgardie Goldfield and nine in the Broad Arrow Goldfield having been made. On only two or three occasions have I found it necessary to condemn any of them. At the present time they are all working to my entire satisfaction.

"*Ventilation.*—Ventilation is, as a rule, quite satisfactory.

"*Sunday Labour in Mines Act.*—I have satisfied myself that this Act is being observed in such a manner as to satisfy all reasonable persons, and I am pleased to be able to report that I have received no complaints during the year on this account. I have granted 14 permits in all during the 12 months, these being principally for mullocking up stopes, but no permit has been granted by me unless considered absolutely necessary. These permits have all been indorsed by the Sergeant of Police since receiving instructions to this effect.

"*General.*—During the year several small plants have been erected at Kanowna by private parties with a view to the treatment of pug and the crushing of lode matter. I regret to report that most of these proved unremunerative and have already been abandoned. At the present time the plant being worked by Messrs. Sims & Sons on the North Lead is the only one which is treating pug successfully. There have of late been many men on the ground who claim to be able to treat the pug scientifically at a small cost, but so far they have not done anything to prove the truth of their statements."

East Coolgardie Goldfield.

Mr. George Lightly, Inspector of Mines, furnishes a report, dated 19th January, 1906, thus:—

"Speaking generally of the mines on this field, there was but little increase in the depths attained in them as compared with the depths that have been reached in the previous year. Nor were there any sensational finds recorded. But the output for the 12 months was kept well up, although in some instances ore of low grade only had to be dealt with. That meant the treatment of an increased quantity of ore by the most economic of methods in order that the monetary value of the output at certain of the mines might be maintained at something like uniformity.

"The promise that had been held out in 1904 of successful results being likely to attend the development of at least some of the leases that had been taken up at the northern end of the belt, was not altogether borne out in 1905. But it does not follow from that that payable mines may not yet be opened up in that locality. It is quite possible that such will be the case. At the close of the year good grade ore was still being raised at the Fair Play, while at the Hidden Secret, although the phenomenally high value of the stuff had not been maintained, the condition of the mine was considered sufficiently good to warrant the erection of steam machinery, in order that development work might be carried on at greater depths than had till then been possible. Towards the close of the year new machinery was also erected at the Devon Consols South Extended, which is now owned by the North End G.M. Co. Throughout the year operations were continuously and successfully carried on at the Golden Ridge mine, the bulk of the ore that was treated having come from the Waterfall leases.

"As far as I was personally concerned there were two prosecutions in 1905. On the first, two men were proceeded against for having ridden in a cage in which steel was stacked, the consequence having been that one of the men was injured. That was at the Ivanhoe mine. Judgment was given in favour of the Department. The second prosecution was in respect of a man having been struck on the head by a falling stone in a stope at the Great Boulder Proprietary mine, the height of the stope having been considered to be excessive. The case was dismissed by the Bench.

"At the close of the year the shafts at some of the larger and more important mines were still not equipped with return signals, while at others the system had been successfully in operation for a considerable time and under sufficiently varying conditions to prove its efficiency. There is no apparent reason now, unless it be that of expense, why electric return signals should not be brought into general use, at least at the larger of our mines. In these days of rapid hauling, direct communication between the engine-driver and the platman might be thought to be a matter to which managers of large mines would give their earnest attention. The plea of delay in the rate of hauling can hardly be brought into consideration as being adverse to the system.

"In 1905 there were 13 fatal accidents, involving the loss of 14 lives. They resulted from the following causes:—

Falls of ground	3
Falls down shafts	2
Explosions	5
Fall in pass	1
Bursting of tank	1
Fall in winze	1
Fall of sand at surface dump	1
	—14

"and they occurred at the following mines:—

Hannan's Star	1
North Boulder	1
Lake View Consols	3
Great Boulder Perseverance	2
Oroya Brownhill	1
Golden Horseshoe	1
South Kalgurli	1
Associated Northern	1
Ivanhoe	1
Associated	1
	—13"

Mr. J. O. Hudson, Inspector of Mines, reports, on 15th January, 1906, as follows:—

"During the year I have been principally engaged on underground inspections. The mines have been visited regularly, and considerable improvement has been made in the working conditions. There is still room for further improvement, and every endeavour is being made to bring them to a satisfactory condition. Altogether 289 mines were inspected during the twelve months ended 31st December, 1905.

"*Developments.*—The Oroya chute was located in the 1,000-feet level of the Associated mine, at which point it passed out of the Oroya mine. The Associated also located the chute at the 1,200-feet level, and have connected the two levels by rising and winzing on the ore body.

"*Great Boulder Proprietary.*—Edward's shaft has been taken from the 1,200-feet level, and is now connected with the working at No. 16 level. The sinking of this shaft is being continued and will, in addition to the main shaft, prove very beneficial in regard to the ventilation and general working of the mine. The main shaft has not been extended during the year, but is still the deepest point reached on this field, viz., 1,976 feet.

"*Hamilton's Shaft.*—This shaft has reached a depth of 1,273 feet. At 1,000 feet a plat was cut, and by the aid of several diamond drill holes, a lode carrying good values has been located, which from its position is considered to be an extension of the east lode being worked in the Ivanhoe G.M. This is a very important discovery as this lode was supposed to have disappeared several hundred feet inside the Ivanhoe boundary.

"*Great Boulder Perseverance.*—No. 6 shaft has been taken from No. 7 to No. 9 level. The main shaft has reached a depth of 1,470 feet. A new lode has been located on the east boundary and is being developed. This promises to be a very important discovery.

"*South Kalgurli.*—After developing for a considerable time the mine is now in full work. The mill has been remodelled, and the mine is returning very satisfactory results.

"*Brownhill Extended.*—A new main shaft has been started from surface to admit the working of the East Lode, which was discovered by a long crosscut at the 700-feet level. This shaft has now reached a depth of 520 feet.

"*Hidden Secret.*—A vertical shaft was sunk to a depth of 200 feet and the lode located. The old workings were connected with the main shaft, thus overcoming the defects in ventilation. A winze was sunk on the lode below the 200-feet level, the rich chute being lost at a depth of about 80 feet, evidently having dipped to the south. The main shaft has been stripped and close timbered, being now 10 feet x 4 feet in the clear, and in three compartments. A winding-engine and head-gear has been erected, and the shaft will be taken to a depth of 300 feet.

"*Devon Consols South Extended.*—This lease was floated into a company, which is known as the North End G.M. Co. Fifteen heads of stamps, winding engine, cyanide plant, and other necessary equipment have been erected. Should the results prove payable it will no doubt cause renewed activity in the vicinity.

"*Alluvial.*—A number of claims have been taken up on the Adeline lead, and the parties are obtaining payable results, treating the bottoms and headings, which were not considered payable when the lead was worked.

"*Brownhill Lead.*—Grose and party, who were granted a lease of 48 acres, sank a good shaft and gave the ground a good trial without obtaining anything like payable results.

"*Ventilation.*—The ventilation of mines on this field has been generally satisfactory during the past year, but there are cases where improvements are necessary.

"*Explosives.*—The Magazines have been regularly inspected and the provisions of the Act rigidly enforced.

"*Winding-ropes.*—A great improvement has been effected in the inspection of and attention to winding-ropes by the mines on this field. It is pleasing to note that on all the larger mines competent men are now employed to inspect and report on the ropes in use.

"*Prosecutions.*—During the year four prosecutions were instituted by me against persons for breaches of the Mines Regulation Act, in all of which judgment was given in favour of the Department."

Coolgardie, Yilgarn, and Dundas Goldfields.

The annual report of the Inspector of Mines, Mr. J. Crabb, is dated 2nd January, 1906. He says:—

"*Accidents.*—During the year under review 7 fatal, 14 serious, and 31 minor accidents occurred, the whole of which, with the exception of the minor accidents, have been fully reported on. All of them seem to have been brought about in such a manner that, I think, it would not be practicable to further legislate to prevent others of a similar character occurring. Generally speaking the management of the various mines have paid considerable attention to the securing of the underground workings, which is evident from the fact that only one serious accident occurred through falls of ground; and I may say the work of securing the ground which fell was in progress.

"*Prosecutions under the Act.*—I regret to state that it was found necessary to prosecute one mine manager for non-compliance with the Act, relating to the storage of explosives. With very few exceptions very little difficulty has been experienced in having the Act complied with, as the mine managers almost invariably desire to comply with it as closely as possible.

"*Ventilation.*—The whole of the mines have, apart from the places where rock drilling machines were used, been kept in a good healthy condition.

"*Explosives.*—The general rules relating to the storage of explosives have been, with the exception of a few instances, reasonably observed.

"*Underground Excavations.*—As the underground excavations in the majority of the mines do not require much supporting, very little trouble has been experienced in complying with the requirements of the Act. In some mines the conditions have been so favourable, blocks of ore have been stoped out between levels without any filling or timbering being required beyond an occasional prop here and there where required.

"*Signalling.*—The signalling on the mines is now fairly uniform. It was customary on some to treat all interlevel signals as life-signals, *i.e.*, 'Men on,' but having pointed out the dangers attending such a practice and that by so doing a breach of the Act was being committed, it has been discontinued in favour of the safer and more practical method set out in the Act.

"*Hoisting-ropes.*—During the year six hoisting-ropes were condemned. In some cases the ropes became defective through internal corrosion, whilst in others the defects were caused through buckling and undue bending stress.

"*Cages.*—It was found necessary to temporarily condemn three cages owing to defects caused by ordinary usage.

"*Mines Regulations Amendment Act, 1904.*—I have found that the power given by the above Act has been a great assistance in having defects remedied, which we had no power to have done under the Principal Act.

"*Sunday Labour on Mines.*—Only two Sunday labour permits were granted, both of which were for mines on the Dundas Goldfield.

"*Mining Generally.*—While the year just closed seems to have been in a sense one of the most uneventful in the history of the above-mentioned Goldfields, it has, nevertheless, represented a period of substantial and important developments. These developments have not caused much of an increase in respect to tonnage or gold output up to the present, but it may be reasonably expected when the veins, which, as yet, can only be said to have been tapped, are systematically opened up, and additional machinery is erected on them as proposed, a proportionate increase, both in tonnage and gold, will follow.

"More attention is now being directed towards efficiency of working, the reduction of costs, and to convert to commercial account low grade ores which were heretofore regarded as valueless. This change is due, in a great measure, to the action of the Mines Department in affording timely relief by assisting in supplying water, sinking of shafts, etc., and also erecting batteries, thereby reducing the cost of crushing the ore raised by prospectors.

"Very good progress was made on the Yilgarn Goldfield during the latter part of the year. Forty-five head of stamps were erected and brought into operation, with the result that places that were scarcely inhabited twelve months ago have developed into centres that now present the appearance of considerable activity and prosperity.

"The reaction that set in upon the epidemic of speculative fever which spread throughout the Coolgardie Goldfield a few years ago, when wild-catting raged supreme, has been decisive and uncompromising, it being a very hard matter to secure much needed capital, even for the most meritorious undertakings. Of late, however, there have been signs of improvement in this respect, and at present the prospects of the mining industry are, in my opinion, looking much brighter than they did a year or so ago."

Phillips River Goldfield.

The Inspector of Mines (Mr. J. Dunstan), reports, on 20th January, 1906:—

"During the past year the field has made very slow progress, partly on account of the leaseholders being dissatisfied with the price received for their copper ore and partly owing to the negotiations for the sale of some of the most important leases, several of which are still under option to an English company. As is usual in a new field, the prospectors have taken out a good deal of the easily got and best quality ore and neglected the opening up of their mines, with the result that they are mostly suffering from want of funds for development work. Fortunately this difficulty is being relieved by the operations of the Kauffman Syndicate in the district, they having already accepted working options on several leases, out of which they have purchased three of the most promising ones, namely, Mount Benson, Mount Cattlin, and Marion Martin. They are still holding other options and testing the mines, amongst which the Mount Desmond promises well. With this strong syndicate at work in the field, the copper-bearing portion should soon develop into a prosperous district. The promised new tariff at the Government Smelting Works has caused an improvement in the prospecting work generally, several of the old prospectors making fresh efforts to find new properties, besides which several of the old leases have been taken up. The gold mines at the north end of Ravensthorpe have done very little work, the two properties that are

equipped with plants being practically idle throughout the year. At Kundip, however, there are better prospects, as many of the leases are on fairly good gold, but unfortunately the water supply is inadequate for battery purposes, and several parcels of payable stone already raised are waiting for rain to supply the local battery with water.

"Recently a good deal of prospecting has been done about four miles west of the township of Ravensthorpe, and although nothing is yet assured, several leases are on good gold. Many of the leases are held by prospectors who work their own shows, and are inclined to take risks and do their work under dangerous conditions, as they consider if an accident occurs they are themselves the only sufferers. This, together with the few companies who hold leases in the district being short of funds, makes it somewhat difficult to enforce compliance with the Regulations in all their details.

"The fact, however, that no mining accident has been reported must be taken as evidence that good judgment and care is taken by those in charge of the mining operations throughout the district."

Collie Coalfield, Donnybrook Goldfield, and Greenbushes Mineral District.

Mr. T. D. Briggs, Inspector of Mines, reports, on 5th January, 1906:—

"*Collie Coalfield.*—The output of coal for the year was 129,086 tons, being a decrease in the output of the preceding year. The number of men employed averaged about 322. Coal-cutting machines of the "Jeffrey" type were in operation at the Proprietary, Cardiff, and Scottish Collieries. At the two former mines they have proved a pronounced success, but at the latter the machine was only used intermittently, and during the latter part of the year was not in operation.

"No fatal accidents occurred during the year. Of the non-fatal accidents, only two were reported to me by the managers as serious accidents, and these resulted in serious injury to two persons. One of these accidents occurred to a youth, who was not an employee, but who went down the Proprietary Mine without permission, and was caught in some machinery. He was afterwards prosecuted by the manager of the mine for trespass and convicted.

"In addition to the accidents referred to, 50 were reported for the purpose of entitling the same number of sufferers to the benefits of the Accident Relief Fund. Of this number 21 were disabled for a period of 14 days, and more than 29 for periods ranging from three to 13 days.

"On the 11th October a fire was discovered in the underground workings of the Scottish Colliery but it was extinguished without any serious consequences. The supposed cause of the fire was spontaneous ignition of small coal in a 'stopping.'

"There were no prosecutions for breaches of 'The Coal Mines Regulation Act, 1902.'

"Only on one occasion have the employees availed themselves of the provision of the Act (Rule 50) with regard to periodical inspections on behalf of the workmen by Check Inspectors. This was at the Cardiff Colliery, but no report was made by the Check Inspectors in accordance with the Act and no report was sent to me by them, which should be done in the event of any apprehended existence of danger.

"*Greenbushes Mineral District.*—My inspection of this field has been restricted to three visits, as owing to my duties as Coal Inspector it is very difficult for me to spare the necessary time required to make a thorough inspection of the field. The conditions of work obtaining, however, do not necessitate such a thorough and decided administration of the Mines Regulation Act as would be necessary were the mines worked on a larger scale. Nearly all the claims are being worked by small numbers of men, and in many cases are practically prospecting claims, consequently the enforcement of all the provisions of the Act, some of which are framed to meet the requirements of more extensive mining work, would possibly hamper operations.

"Only two accidents were reported, one serious and one minor.

"Owing to work on the Donnybrook goldfield being at a standstill it has not been necessary for the Inspector to visit it during the year."

Mining Accidents.

The Mining Accidents for the year ended 31st December, 1905, are tabulated in Tables 21, 22, and 23 attached to the Annual Report of the Secretary for Mines, with those of 1904, for the sake of comparison. The fatal accidents in every year since 1894 are also shown graphically in the diagram attached to that report.

Table 21 shows 34 persons killed during 1905, or eight less than in 1904, when the fatal accidents numbered 42. On the other hand 270 accidents were recorded in 1905, as against 153 in 1904, attended with "serious injury," which is taken as meaning a sufficient amount of injury to prevent the sufferer from resuming work within 14 days of his being hurt. This great increase is due mainly to its now being more generally known that all serious accidents must be reported, and consequently a great many cases of slight injuries, yet sufficient to prevent a man working for 14 days, are now recorded which formerly would have been disregarded. Table 21 also shows the distribution of the accidents in the various Goldfields and Mineral Districts.

Table 22 shows the death rate for 1904 and 1905 per 1,000 men employed. The rate for 1904 was ·48 for persons employed on surface, or 2·38 for all employees. For 1905 the figures are a good deal better, being ·38 for surface men, 3·41 for underground men, and 2·02 for all workers.

Table No. 23 gives the same information for Gold Mines only, also the figures of deaths by accident per 1,000 tons of gold ore raised for 1904 and 1905, and shows the distribution of such accidents in the various goldfields.

Hereunder is a general table showing the numbers of men killed and seriously injured by accidents in the various goldfields and mineral districts, and giving a classification of the causes of the accidents:—

Classification of Fatal and Serious Mining Accidents that have occurred during 1905.

Goldfield.	Explosions.		Falls of Ground.		In Shafts.		Miscellaneous Underground.		Surface.		Total.	
	Fatal.	Serious.	Fatal.	Serious.	Fatal.	Serious.	Fatal.	Serious.	Fatal.	Serious.	Fatal.	Serious.
East Coolgardie	6	2	3	28	2	4	2	51	1	54	14	139
Mount Margaret	1	1	2	8	...	1	...	15	...	11	3	36
Murchison	...	2	1	4	...	5	2	7	...	5	3	23
East Murchison	2	2	1	2	...	...	...	5	...	6	3	15
Coolgardie	...	1	2	4	1	2	...	...	...	1	3	8
Yilgarn	...	...	...	...	1	...	...	...	2	...	3	...
North Coolgardie	...	2	...	8	...	2	1	5	...	4	1	21
North-East Coolgardie ...	...	2	1	4	...	...	...	1	...	...	1	7
Broad Arrow	...	...	1	2	...	...	...	...	...	...	1	2
Dundas	...	1	...	...	1	1	...	2	...	2	1	6
Pilbarra	...	...	1	1	...	...	...	...	...	...	1	1
Peak Hill	...	...	...	...	...	...	...	2	...	4	...	6
Yalgoo	...	...	...	...	...	...	...	2	...	...	...	2
Phillips River	...	...	...	...	...	...	...	...	...	1	...	1
Collie	...	...	...	...	...	...	...	1	...	1	...	2
Greenbushes	...	...	...	...	...	...	...	...	...	1	...	1
Total for year	9	13	12	61	5	15	5	91	3	90	34	270

The above includes serious machinery accidents that have occurred on mines and which necessitated the injured person being away from his work for over 14 days. There were also a number of accidents classified as "Minor," the injured man returning to his work within 14 days after the occurrence. A fatal mining machinery accident, the only one for the year, is included in the Yilgarn total.

Fatal Accidents.

Explosions.—No less than seven fatal accidents, causing the death of nine men, were due to explosions. In one case the accident seems most likely to have been due to bad fuse causing a premature explosion, one of a round of charges in a stope exploding before the last man had left the face. This case was noteworthy for the conspicuous bravery displayed by Edward Nicholls, who climbed up the "rill" immediately after the shot had gone off and rescued his mate, Bentley, who had been knocked down by it, having first to roll away a large stone which had fallen on him and then to drag and carry him down the steep slope of the "rill" into safety. The fuses of the other charges were all burning and any of them might have exploded at any moment; in fact Nicholls and his injured comrade were hardly clear of danger when the rest of the charges did explode. The injured man died of his wounds. It is pleasing to record that the gallant conduct of Nicholls has been recognised by the award to him of the Albert Medal of the Second Class, and of the Royal Humane Society's Medal.

The death of two men from an explosion in the Bellevue Mine at Mount Sir Samuel was also ascribed to defective fuse, but the evidence of faultiness in the fuse was not at all conclusive, and it may have become ignited accidentally without the men noticing it.

In another case where two men were unfortunately killed in the Lake View Consols Mine there is no certainty as to the cause of the accident, but it seems probable that the men either returned too soon to a missed shot which had hung fire, or were trying to scrape out or re-fire a missed hole.

The exact cause of another explosion is also unknown. The man who was killed was sitting in the level right away from the face where he had been firing, when an explosion took place, evidently of explosive which he had with him. It seems most probable that his candle or pipe must have accidentally ignited the explosive.

A fatal accident at the Associated Northern Mine was due to the deceased using a steel drill to try to clear a hole which had been fired but had not done its duty. The use of the drill was a clear contravention of General Rule 2, clauses G and H of section 23, of the Mines Regulation Act.

Another similar case took place in the Richmond Gem mine, at Malcolm, an Italian miner being killed through using a steel drill to tamp a charge.

The breaking through of a rise to the level above caused the death of one man in the Ivanhoe Mine, Boulder. He was one of the party making the rise, which was on the point of breaking through, and came down after lighting the fuses to the level beneath, then climbed up to the level above to give warning to men there. The charges exploded and broke through just as he passed along the level over them, causing his death.

Falls of Earth and Rock.—Eleven fatal accidents occurred from falls of rock in underground workings, and one at surface from a fall of sand from the side of a cut into a tailings dump. In most of these cases all reasonable care seems to have been taken to support the ground and to try it frequently by sounding, and the fatalities must be considered as due to the risks inseparable from the miner's work, but in one case in the Pilbarra District the deceased seems to have been greatly to blame for not putting in sufficient timber. In another at Coolgardie the deceased and his companion were engaged in prospecting some old workings, and did not take the same precautions as to timbering as they would doubtless have used had they been working the ground regularly.

In Shafts.—Five fatal accidents were recorded under this heading. One man was killed by falling from the bucket in the deep shaft of the Princess Royal Central Mine, Dundas Goldfield. This case was referred to more fully in last year's report. Another was caught between the skip and the shaft timbers in the Red Hill Mine. A third fell down the North Boulder Main Shaft, but how he came to do so is not known; he was the mine accountant and not in the habit of going underground, and had gone down by himself when the accident happened. Another bad accident was due to the deceased, while travelling in the cage of the Lake View Consols, becoming caught under one of the shaft timbers and crushed, apparently through allowing his body to project too far. The fifth accident took place in the Leviathan Mine, Yilgarn, a man falling from the ladder while getting on to it at the plat, through losing his hold, or else by grasping a stage board which was loose and came away with him. In all these cases no blame was considered attachable to any person.

Miscellaneous Underground.—Five fatal accidents are included in this group. One was due to a sudden rush of water down a sand pass in the Great Fingall Mine, whereby two men were driven over a sand dump underground by which a stope was being filled, and one of them was drowned or smothered. The men seem to have lost their presence of mind, for they ran the wrong way to escape the water, and even if they had stayed where they were, it did not rise high enough in the level to do them any harm.

Another fatality came about through a man incautiously going into the fumes resulting from the firing of seven holes charged with gelignite, in the bottom of a small underlay shaft. Subsequent examination showed that the charges in two holes must have burned instead of exploding, thus filling the bottom of the shaft with poisonous fumes. The deceased went down in the evening by himself to see if the shots had done their work, and was not missed until next morning, when he was found dead, hanging head downwards from the ladderway, caught by one foot in the ladder. About five pounds of gelignite had probably been burned.

A third accident was occasioned by a man falling into an ore bin underground in the Menzies Consolidated Mine, while emptying a truck into it, the fall being due in a large measure to his own want of proper carefulness. The injuries did not seem serious at first, but a month later the man died suddenly from syncope.

On Surface.—Three fatal accidents were recorded. One was from breakage of a rope by which poppet legs were being hoisted. Some ropes became twisted, and the deceased climbed up to put them right, when the rope broke and allowed the whole to fall, injuring him so badly that he died shortly afterwards. The second was from the bursting of a large, square, concrete tank, full of water. This was found to be leaking at two corners of the front wall and the deceased had gone with the foreman bricklayer to see what should be done to stop the leak. The foreman went away for a short time, leaving deceased close to the wall, which suddenly burst right out, overwhelming him. The third fatality was due to the man being caught in the driving gear of a battery and crushed to death.

Non-fatal Accidents.—The accidents attended with serious injury to persons during 1905 were, as shown in above table, 270 in number, classified as in the table.

The accidents from explosions seem, in most instances, to be due to incautious actions of the men themselves. Two resulted from picking saw-dust out of detonators, and one from using unnecessary force in pushing the fuse into a detonator. One was occasioned by the head of a match, which was being struck to light a fuse, flying off into the damaged powder which the injured man was about to destroy. Two resulted from using unnecessary force in charging, in one case by striking the charging stick, which had become jammed, with a hammer, and the other from using a heavy copper rod in charging.

The accidents from falls of ground were such as are inseparable from the miner's occupation, due to stones falling from the back and walls of the workings. Many took place while men were purposely knocking down the loose rock after firing. In a few cases it appears that more care might have been taken, but no negligence was shown that the Inspectors' of Mines considered necessitated prosecution of any person. Many of the injuries were of somewhat trivial nature, cuts and bruises, though sufficient to prevent the sufferers from returning to their work within fourteen days.

Of the accidents in shafts three were caused by fall of material down the shaft, two by men falling in shafts, two by men being hurt by cages in motion, one while tipping a sinking bucket, and one by the fall of a ladder.

The accidents under the heading "Miscellaneous Underground" were due to a great variety of causes. The most common were those due to rolling stones, and stones moving while being handled, causing cuts and bruises on hands and feet. Several were caused by machine drills, men getting fingers jammed, being struck by the bar falling, falling from the stage, falling while carrying the machines, and so on. A good number were due to sundry falls in the workings, on flat sheets, in the stopes, down rills, and into winzes and passes. Several were due to handling trucks, men getting hands and feet jammed. Falls of timber, while timbering, splinters of rock flying from the hammer, stones flying from explosions, fumes of explosives, and a sudden outburst of water were responsible for several more accidents. In the majority of cases the injuries were not very serious.

Even more various were the causes of accidents "on surface." The commonest were accidents due to machinery in motion, men being caught by cog wheels, belts and belt fasteners, belt conveyors, moving parts of engines, shafting, and so on. Several were due to falls through slipping or tripping, and falls from stages and trestles, and others to falls of firewood, timber, and other material being handled. There were a number of cases of men getting burnt on hands or feet by hot ore in conveyors or thrown out on the floor beside roasting furnaces. Several men were injured while working about stamps, through stamps falling unexpectedly, through fingers being jammed by dies, and through being struck by revolving cams. The handling of trucks was attended with occasional injury to men, hands and bodies becoming jammed. One very curious accident was due to an Italian drinking caustic soda from the tanks used to store it, this being somewhat difficult to climb up to and plainly marked "caustic soda."

Prosecutions under "The Mines Regulation Act, 1895," and Amendments thereof.

There were not many prosecutions during 1905 for breaches of the Mines Regulations Acts. In the East Coolgardie Field they were instituted in four instances. The first was against the manager and the underground manager of the Boulder Deep Levels Mine for neglect to keep the winding rope in good order and condition, and negligence, as a result of which one Albert Sergeant was killed. The manager was fined £25, with costs, £11 17s., and the underground manager £10 on each of two charges, with costs, £11 17s. The second case was against three men charged with riding in the same cage with tools. Each man was fined 6d. and costs, 9s. The third charge was against a miner for careless handling of explosives, and resulted in him being fined 5s. and costs, 23s. The last case was against the manager of the Great Boulder Mine for not working a certain stope in a safe manner. In this instance the magistrate did not consider the charge proved, and dismissed the case, with costs, £3 3s., against the department.

In the North-East Coolgardie Field two men were prosecuted for removing timber from an old shaft. One was fined £1 and costs, but the case against the other was dismissed, no costs being allowed. A charge of negligence against the manager of the White Feather Main Reefs Mine was not substantiated, and was dismissed, with costs, £3 10s. A fourth charge was against a man for removing timber from the Government water shaft, Kanowna; he was fined 5s., made to pay the value of the timber, and costs, 10s. 6d.

In the North Coolgardie Goldfield there was only one prosecution, the manager of the Red Leap Mine being proceeded against for working with a defective wire rope and permitting explosives to be carried into the mine contrary to the Regulations. He was fined £1 and costs on each plaint.

In the Central Goldfields there were two prosecutions, the first being against a miner for continuing to work in a dangerous place. The offence was proved, and the offender discharged with a caution. The second was against the Great Fingall Consolidated Co., for having an incomplete plan of their workings. It was shown that the defect in the plan was due to the present owners not being aware of the existence of an old level made by their predecessors, and they really suffered for the fault of these, being fined £1, and cost 6s. 6d.

In the Coolgardie Field three informations were laid against the manager of the Queen's Cross Mine for using a cage without safety catches, for allowing detonators to be improperly stored, and for improper storage of blasting powder. The first charge was withdrawn. On the other two the manager was fined 10s., and costs 23s., in each instance.

There were no prosecutions in any of the other fields during 1905.

One case of neglect of duty by an engine-driver was considered to be best referred to a Board of Inquiry under "The Inspection of Machinery Act, 1904," and not dealt with under the Mines Regulation Act. The charge being sustained, the driver's first-class certificate was suspended for two years, and costs, £6 6s., were levied.

Sunday Labour in Mines Act.

Under this Act there was one prosecution during 1905, the manager of the Westralia and East Extension Mines, Bonnievale, being proceeded against by the police for carrying out work underground on Sunday which was not strictly necessary. A fine of 10s. and costs was inflicted.

Men Working alone in Mines.

Objection has been made on behalf of the workers more than once during the past year to the practice of men working alone in portions of mines where they are without ready assistance in case of an accident. Accidents are quoted where the injured men were in danger of being left lying for hours before their plight would be discovered. There is evidently a good deal of reason in the demand that such a possibility should be minimised, but it hardly seems feasible that any general rule should be laid down by law requiring men to work only in company. There are cases where this would be very unsatisfactory to all concerned. It is usual in the principal mines to give assistance to men working alone when they are firing and when engaged in any dangerous work, and beyond this it does not seem desirable to go much further than perhaps requiring by regulation that when men are working alone some person shall communicate with them at frequent intervals.

Frequency of Inspection of Mines.

During the past year there have been several complaints from time to time through the Press and otherwise that the mines are not sufficiently often inspected by the Inspectors of Mines. The complaint is not confined to the outlying districts, such as Peak Hill and Lake Way, which the Inspectors may not be able to visit oftener than twice a year, but is also frequently made in Kalgoorlie, where every considerable mine is usually visited at least once a month, and often much more frequently. It appears to me to be founded on a misconception of an Inspector's duties and functions, and pays no regard whatever to cost. It is manifest that if monthly inspection is not sufficient, such districts as the Murchison and Mount Margaret Fields would each require several Inspectors, to enable more frequent visits to be made to each mine, and the expense of mine inspection would be intolerable.

The misconception to which I refer is the idea that an Inspector should make such frequent visits to all the mines in his district that he can be personally responsible for all the workings being maintained in a safe condition at all times. A moment's consideration shows that this is utterly impossible, as nothing less than daily presence in each mine would be necessary. In the larger mines even the underground manager cannot visit all the workings each day, and has to depend on his shift-bosses and on the miners themselves to see that the workings are safely carried on. Furthermore, the Inspector cannot take responsibility for work of which he has not the direction and for men over whom he has not the control.

The responsibility of carrying out the every-day operations of mining in a safe manner must rest on the manager and his officers, and on the miners themselves.

The duties of an Inspector are to visit the various mines often enough to make sure that the work is being carried out properly by the managers and men, and especially that safe methods are being employed and proper machinery, tools, and appliances provided; to make special inquiry into the circumstances of accidents in order to prevent similar mishaps from occurring again; to enforce the provisions of the Mines Regulation Act by requiring attention to them and by prosecuting offenders, and to make thorough investigation of the truth of complaints as to the safety of the mines sent to him by persons engaged therein. He cannot see how things are done in the mine every day, and therefore must judge the work by the samples of it seen at each visit. If these are satisfactory he has a right to conclude that the work is being done properly also on the other days when he is not present. If it is not so the blame rests as much with the miners themselves, who fail to inform him of any dangerous practices, as with anyone else.

The question of frequency with which an Inspector ought to visit each mine therefore turns upon how often he must go in order to form a correct judgment as to the manner in which the provisions of the Mines Regulation Act are attended to. In the case of a mine which he has found to be carefully and conscientiously managed, he might safely visit less often than such in which he finds a disposition to neglect proper precautions. It ought not to be laid down how often he should visit each mine in the course of a year, but left largely to his own judgment. Monthly to quarterly inspections, according to the importance of the mines, should be sufficient, and in the case of far outlying mines considerations of expense may require even fewer visits to be paid.

One important aspect of the question is that too much Government inspection is injudicious, as it has the effect of largely taking away the responsibility for safe working of the mines from the mine managers who have the control of the work and placing it upon the Inspectors who have not that control.

Use of Cross-Heads in Shafts.

Referring to my remarks on this head in last year's Annual Report, attention may be called to an accident which happened during 1905 while sinking a well at Meekatharra. A "monkey" was in use, and while two men were descending on the bucket it caught on the skids and then fell some seven feet on to their heads, inflicting wounds on both men which fortunately did not prove very serious. Luckily also neither of the men was knocked off the bucket. The "monkey" had stuck before at the same place but the man in charge of the work and one of the injured men had attended to the defect and made all, as they thought, quite safe. This was a narrow escape from a very serious accident.

Fumes of Explosives.

Several instances of men being overcome by the fumes of explosives have been reported to the Inspectors of Mines during 1905, but in only one case was there any serious result, namely in that above-mentioned wherein one man lost his life. The danger of going into the gases resulting from incomplete explosions of nitro-glycerine compounds is not sufficiently recognised by most miners, nor are the measures for treatment of sufferers so well known as they should be. In Appendix No. I I have therefore appended to this report extracts from a valuable paper on this subject recently read before the Chemical, Metallurgical, and Mining Society of South Africa by Drs. Macaulay and Irvine, who have taken special interest in such cases.

Effects of High Temperatures in Mines.—The report of the Royal Commission on the Ventilation and Sanitation of Mines gave a great deal of information as to the effect on the men working in mines of high temperatures, especially where the air was loaded with moisture. A very valuable paper on this subject has been published in the "Journal of Hygiene" of October, 1905, by Dr. J. S. Haldane, M.D., F.R.S., embodying the results of a series of well-devised experiments. The following extract sums these up shortly in their application to mining conditions:—

"The bearing of these experiments on the question as to the rise in temperature allowable on economic or humanitarian grounds in places where persons have to work continuously will be sufficiently evident. It is clear that in still and warm air what matters to the persons present is neither the temperature of the air, nor its relative saturation, nor the absolute percentage of aqueous vapour present, but the temperature shown by the wet-bulb thermometer. If this exceeds a certain point (about 78° F. or 25·5° C.) continuous hard work becomes impracticable; and beyond about 80° F. or 31° C. it becomes impracticable for ordinary persons to stay for long periods in such air, although practice may increase to some extent the limit which can be tolerated. In moving air, on the other hand, the limit is extended upwards by several degrees. The men working a rock-drill in a hot 'end' or 'rise' in a mine, for instance, have the great advantage that the air is kept in constant motion by the exhaust from the drill, and that as this exhaust air is very dry the wet-bulb temperature at the working place is considerably reduced, even if the rock be wet or damped by a jet or spray of water to prevent dust."

It is to be carefully noted that the 78° F. referred to by Dr. Haldane is by wet-bulb thermometer, not the ordinary dry-bulb reading.

Removal of Timber from Abandoned Shafts.

The need for preventing the timber being removed from abandoned shafts was well exemplified during the year in the case of the old "Kingsley Hall Consolidated" shaft (290w) at Smithfield. A prospector who had known this mine when it was being worked several years ago went out to take it up again, believing that he could readily get the stone which would now be payable. He found however that the timber had all been taken out of the shaft in 1900, rendering it unsafe, so he was unable to proceed with his project without sinking a new shaft.

Safety Skips for Underlay Shafts.

During the year several communications have been received regarding safety catches for skips used in underlay shafts, and a small model of a truck was submitted by Mr. C. Cannell of St. Mary's, Tasmania, through Mr. Briggs, Inspector of Mines at Collie. The catch in this case consisted of sprags under the truck held up from the ground so long as the hauling rope was in tension, but forced down into the track between the rails by means of springs so soon as the tension was relieved. The device does not however appear to me well suited to mining conditions where the angle of inclination of the shaft is often pretty steep; it would be more useful on surface tramways where the inclination is usually much less. It might be useful in mining shafts provided, in addition to the rails, there were strong side guides which would prevent the skips from being thrown violently off the track by the action of the sprags. In Mr. Cannell's device there was no provision for automatic dumping of the skips at surface, as is required in most of the skips used on our mines.

A more promising appliance has been brought forward by Mr. Martin F. Taylor of the Sons of Gwalia mine, of which a drawing is attached. A working model of this was tried more than once in the presence of Mr. W. M. Deeble, Inspector of Mines for the district, and several improvements suggested by the experiments were made. Mr. Deeble describes the latest improved form thus:—

"The safety appliances are fixed on the sides at the back or lower end of the skip, and when the skip is being lowered or raised, are kept open by the pull on the bridle. The bridle is slotted at the lower end, and works on studs on the side of the skip. When the springs of the safety appliances are pulled to the point required, and the grippers open, the ends of the slots then fit on the side studs and pull the weight of the load on them. At this point there is a very ingenious fixing. At the end of the slot a sheave has been put in, and the slot is carried through the sheave to the centre to correspond with the slot in the side strap of the bridle; the side strap is enlarged so as to form a strap or band round the sheave. The side of the sheave is connected with the safety appliances which keep the slotted part in it always in the one direction. The action of this is: when the skip is pulled to the top of the bins to tip a load of rock the bridle keeps on in a straight line and the skip follows the rails; the bridle by altering the position of the slotted part locks the safety appliances and keeps the grippers open until the skip is lowered to the place where the skip would leave the side guides and enter them again, and the weight of the skip then being on the springs the grippers would remain open. I made several tests with the model over different angles and found each satisfactory. The skeleton shaft made for the trial was on an angle of 50° from the horizontal.

"I found the model acted perfectly on this. I then altered it to 60°, then 40°, then 35°, and found each equally satisfactory. I tried 30° from the horizontal and found there had not been sufficient length of thread left on the bolts to let out the springs on the grippers to allow it to work on less grades. I have not seen anything before examining this that has given me any confidence in it, or would in my opinion be practicable, but I am now satisfied Mr. Martin Taylor's appliance for underlay shafts would act satisfactorily in most cases."

It will be seen that Mr. Taylor's device requires that the shaft should be provided with side skids similar to those used in vertical shafts. The fixing of these is an appreciable item in the cost of the shaft, and a safety appliance which would do without them would be much preferable if practicable. In steeply-inclined underlay shafts it might be best in many cases to dispense with the ground rails, and to run the skip entirely on side skids, which offer a better opportunity for the action of safety catches.

The side skids in underlay shafts could be made of much service in preventing accidents arising from the skip becoming derailed by arranging shoes on the side of the skip body under the bridle which would slide on the skids if the wheels left the rails. That such an accident is possible is shown by actual experience of one in the Sons of Gwalia shaft on 30th October last, when a loaded skip left the rails through these having become driven a little too far apart. The skip travelled about 28 feet after leaving the rails, pulled out two centering legs, became much twisted, and had its front end forced hard against the bottom wall plate of one of the shaft timber sets and the bottom end against the cap piece, the body being turned as nearly upside down as the space would permit. When the skip came off the rails the width between them was 3 feet $3\frac{1}{4}$ inches, in other places it was 3 feet $2\frac{1}{4}$ inches. A slight spreading of the track through continued use or a little carelessness in laying the rails is very likely to lead to derailment of the skips, and may easily be overlooked. Certainly I think that the adoption of side skids would be a good step towards the best solution of the difficulties attendant on attaching safety appliances to skips in underlay shafts.

Advances under "The Mining Development Act, 1902."

During 1905 advances were made to various parties as set out in detail in Appendix No. 2 hereto, to the total amount of £11,307 4s. 4d. Thirteen parties were assisted in mining work, four in boring, four in obtaining water supplies, and one in improving a battery. Subsidies were given to 25 private crushing plants in order to induce them to crush for the public. Additions were made to the diamond drilling and hand boring plants, and assistance was afforded to several parties of prospectors by providing them with camels and horses.

The advances for mining work were in most instances made to individual owners of leases and small working parties of partners, very few applications having been received from companies. Experience of the working of this system of State aid has not been very satisfactory, owing mostly to the inability of the applicants to continue development work after the Government assistance is completed. Unless the subsidised work has put them in a position to break out payable ore they are rarely able to go on out of their own resources. Further advances are then asked for, with a possibility of success if they are granted and a certainty of entire loss of the money already advanced if they are not. The system has a strong tendency therefore to involve the Government far more deeply than was originally intended. The fact is

that individual owners frequently set themselves a task far beyond their powers in attempting to open up mines, without capital, and if the Government were to undertake to finance them the sums advanced would require to be much greater than those permitted under the Act.

While individual ownership of mines presents many advantages, and is in theory perhaps the best for insuring economy in management and the minutest attention to all details of the work, it is far more common than not to find that the owner of a prospecting mine is not really capable of handling it so as to bring it to its full producing capacity. Many excellent prospectors are very poor miners and have little idea of how to develop a mine to advantage. As a mine opens up therefore there frequently comes a time when managers are required of more experience and skill than the owner himself possesses, and when it is for the advantage of the mine that it should be taken in hand by a company. Where there are several partners in the ownership of a mine it becomes even more necessary, as development proceeds, to organise the counsels and regulate the interests of the owners by forming a company so that a systematic policy may be laid down and followed, instead of having the constant possibility of everything being brought to a standstill by disagreements among the partners and the failure of some to carry out their proper share of the work. It has been strongly impressed upon me therefore that although assistance may properly be given in preliminary prospecting, as contemplated in Part III. of the Act, to individual miners, in all more important undertakings it would be an advantage to require that the concern should be in the form of a registered company before State assistance is given to it, so that the financial position of the mine-owner may be ascertainable and his ability gauged to complete the work undertaken; that there may be some guarantee that a capable manager is placed in charge of it, and that the caprices of individual members of the party of owners will be subject to the rules of company organisation. If monetary assistance were given by the State (in cases involving more than say £300 as provided for by Part III. of the Act) only to organised companies able to prove their ability to carry out the works proposed, with a substantial margin for unexpected contingencies, on well-considered schemes of development and carefully-detailed estimates of cost, I feel sure that much more satisfactory results would be obtained than at present, and that the maximum amount permissible to be advanced could be safely and advantageously raised to a much higher figure.

State Smelting Works—Phillips River Goldfield.

The manager of the State Smelting Works, Mr. John Dunstan, has forwarded the following report of the year's work, under date 19th January, 1906:—

"During the year considerable difficulty has been experienced with the small plant owing to its fragile construction and its somewhat indifferent arrangement, making it very costly to handle the material used in smelting. The cost of running has therefore been considerably higher than it would have been with a slightly larger furnace of better construction. The treatment has however been persevered with, and carried on sufficiently long to clean up the bulk of the ore accumulated at the purchasing floors.

"The steel jacket of the furnace eventually became eaten through by the use of dense water, and being irreparable, together with the fact that a better plant would effect such saving in treatment costs as would soon pay for itself, and (the old plant having done sufficient to demonstrate that the field warranted the Government in its effort to assist) a better site having been selected, practically a new plant is being erected, and as much of the old plant as is possible is being used. The new machinery consists of a Babcock & Wilcox boiler, a 40-h.p. engine, an electric lighting plant, and a new water jacket furnace, for the erection of which most of the excavations are completed. The boiler, engine, and lighting plant are partly erected and together with the dust chamber and stack will be completed by the time the new furnace is delivered, which is contracted for to be delivered in about six weeks' time. A shaft is being sunk at the new site for the purpose of a water supply; it is at present 45 feet deep and has just reached water-level, and I am very hopeful of getting a permanent supply for the furnace in another 10 to 15 feet of sinking. The whole of the offices and the weighbridge have been removed to the new site and temporary ore-floors laid for the reception of ore. When all is complete, and given a fair supply of ore, I expect to reduce the smelting costs to about 45s. per ton, especially if a fair proportion of sulphides is available.

"The ironstone quarry continues to produce first-class stone for flux.

"The new tariff which has just been published should induce a fair supply of ore, as under the present price of copper anything over 8 per cent. will pay for smelting.

"During the first period of the past year, January to June, 1,280 tons of auriferous copper were purchased, and from July to December 939 tons, making a total of 2,219 tons for the year. The falling-off in the latter half was due mainly to the fact that the leaseholders were dissatisfied with the terms on which their ore was being purchased. The number of tons smelted from January to June was 3,897 at an average cost of £3 12s. 6d., while from July to December 1,977 tons were smelted at the cost of £2 15s. 10½d. per ton. The extraction under each period was as follows:—

	January to June.	July to December.
Copper	79·48 per cent.	86·6 per cent.
Gold	91·65 „	100 „
Silver	80·66 „	80 „ „

In the Annual Report of the Department for 1904, full particulars were given of the returns from the Smelting Works up to 30th June, 1905. Further figures now available, showing the results of the ore purchase and smelting operations to the end of 1905, are appended hereto. (Appendix No. 3.)

Mining Centres Visited.

During the year the greater part of my time has been taken up in Perth with office work, which has prevented my going round the mining districts as frequently as is desirable. Most of January and February was occupied in the work of the Royal Commission on the Ventilation and Sanitation of Mines.

Early in March I accompanied the late Minister for Mines, Mr. Hastie, to the Phillips River Goldfield, and on return to Perth prepared a full report on the progress of the field and of the State Smelting Works. This being ready prior to the issue of last year's annual report of the department was published therein, though not belonging to the year 1904.

Towards the end of May I proceeded to the Norseman district in company with the Engineer-in-Chief and the District Traffic Superintendent for the purpose of reporting on the proposed scheme of making a railway from Coolgardie to Norseman. A joint report was furnished to the Honourable the Premier, to which were attached separate reports by each officer on the proposition from his own departmental point of view. As my report contains some information as to the state of the mining industry at the time of our visit, it is appended hereto. (Appendix No. 4.)

In September I made a short visit to Kalgoorlie and Bulong on official business, but made no general report. On 10th October a short visit was made to a quartz reef in the Helena River Valley near Gooseberry Hill, on which a report (Appendix No. 5) has been furnished.

In November I made a visit to the Kurnalpi, Mulgabbie, Pinjin, Edjudina, Yarri and Yerilla districts, a report on which is appended (Appendix No. 6). I also visited Malcolm and Kalgoorlie in connection with requests for assistance under the Mining Development Act, 1902.

Sluicing Dry-blown Alluvial Areas.

An extensive trial has been made during the year 1905 of the sluicing method of treatment of alluvial ground by the West Australian Sluicing Syndicate, Ltd., at Coolgardie. The machinery, consisting of a large boiler, compound engine, and two large centrifugal pumps, is carried on a barge or pontoon, which floats in a dock excavated for it, at the lower side of the paddock of ground about to be worked. One centrifugal pump sluices the "wash" down close to the barge, and another then elevates it to sluice-boxes and washing apparatus, from which the tailings are discharged behind the barge. The latter is moved up the paddock as the face of work extends, and the tailings follow filling up the excavation. The apparatus therefore very closely follows the gold-dredging practice of Victoria. The first run lasted nine and a half weeks and treated 15,000 cubic yards of dirt; the second seven weeks for an output of 12,530 yards, being an average weekly treatment of 1,668½ cubic yards. The cost of the work averaged 1s. 4·9d. per yard; but while the first run cost 1s. 7·82d. the second was only 1s. 1·46d., and it is expected that with longer running the costs will not exceed 9d. per yard. The ground proved very poor, the two first runs only returning 7·1d. per yard, the first giving 6¼d. and the second 8¼d. per yard. Better ground is stated to have been found in the next paddock to be worked, tests on a large scale having given from 1s. to 2s. per yard, so there are good prospects of profits being soon obtained.

The method adopted seems rather cumbrous for dry, shallow alluvial ground, especially where there is difficulty in getting a sufficient supply of water to float the barge. I am inclined to the opinion that a more generally suitable plant would be one having a central generating station from which electric power could be carried by wires to light barges on wheels or skids, carrying the centrifugal pumps and electric motors.

From the results already obtained it seems probable that many alluvial areas throughout the State may be successfully worked by sluicing at a yield of from ¼ to ½ dwt. of gold per cubic yard. The further working of the syndicate's dredge will be worth following with close attention by mining investors.

I have, etc.,

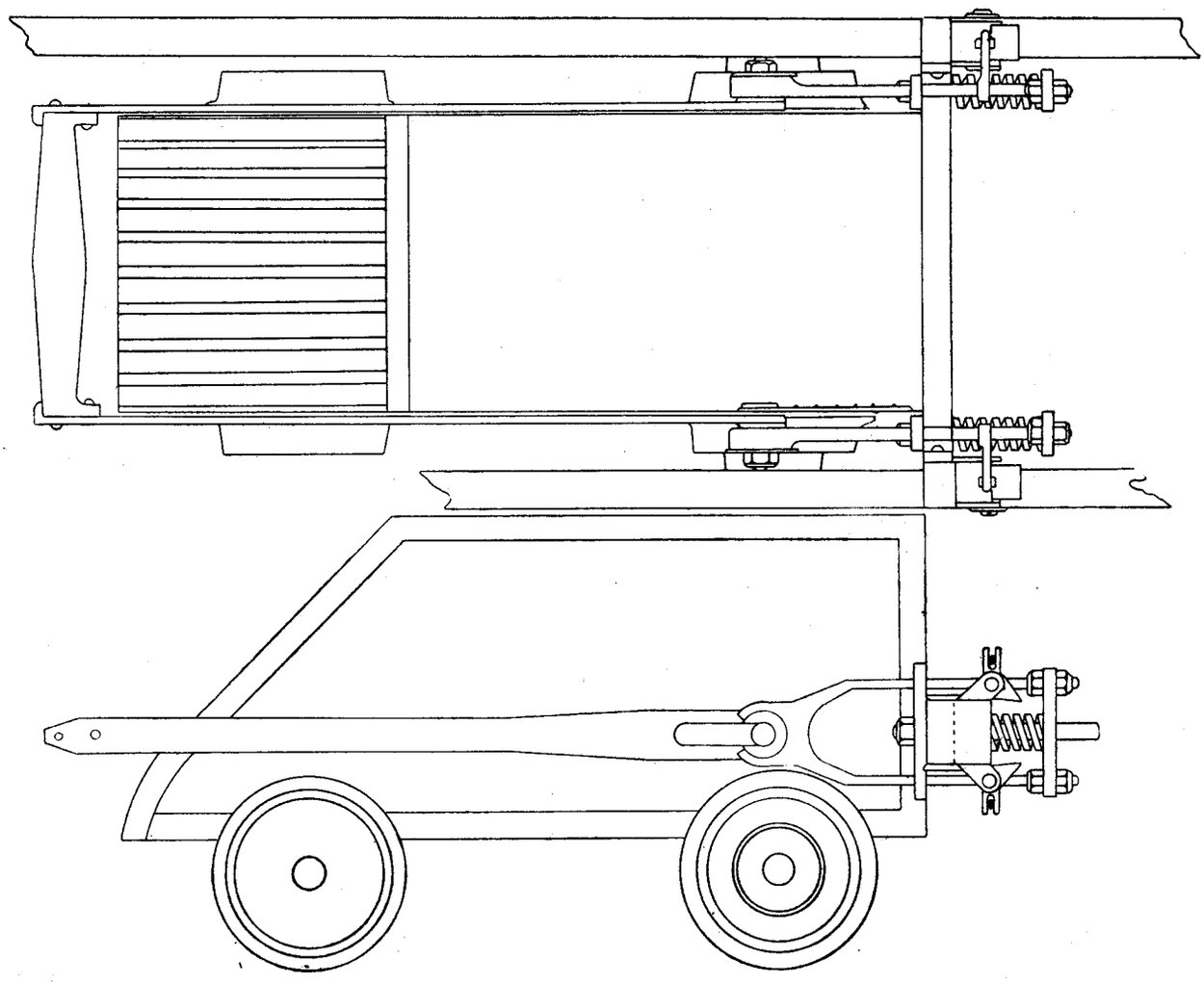
A. MONTGOMERY, M.A., F.G.S.,

State Mining Engineer.

—M. TAYLOR'S—
—— SELF-DUMPING SKIP ——
—WITH—
—— SAFETY CATCHES ——

Four 0 Four

—Scale—



Appendix No. 1.

Measures in Cases of "Gassing" in Mines.

The following interesting notes on this subject are extracted from a valuable paper by Drs. Macaulay and Irvine on "Safety Measures in Mining," published in the Journal of the Chemical Metallurgical and Mining Society of South Africa, of November, 1905:—

"The poisonous gases which rise in our mines, and which for practical purposes need here be considered, are CO_2, CO, and NO_2.

"CO_2, the 'choke damp' of collieries, arises from a variety of causes in all mines; in metalliferous mines large quantities may result from an accumulation of the gas derived from a complete detonation of nitro-glycerine explosives, which has not been dispersed by adequate ventilation. Poisoning from this gas alone is rare. The presence of dangerous quantities is revealed by the extinction of the flame of a candle.

"CO is produced in collieries as the result of explosions or fires; while in metalliferous mines it results, along with varying quantities of NO_2, from the incomplete detonation or the combustion of nitro-glycerine explosives. Poisoning by these gases is very common, and frequently fatal. It is necessary, therefore, that miners should be made clearly to understand (1) the precautions which must be taken when persons are about to proceed to places where an accumulation of these gases is suspected, together with the simple means for detecting their presence; (2) the measures to be adopted when cases of poisoning actually occur.

"1. *Precautions when persons are about to proceed to places where gas is suspected.*—The recent lamentable loss of life at the Vereeniging Collieries seems to prove that the necessity for special precautions is little appreciated in this country; and the frequency with which "gassing" occurs among miners and the unskilled workers under their care can only be attributed to ignorance or a more culpable carelessness. The story of the Vereeniging disaster, as related in the report of the Inspector of Mines, reveals a heroic devotion to duty, coupled with an utter disregard of the most elementary precautions which can hardly be surpassed. Knowing that a portion of the mine was on fire, and knowing that several natives and white men had already suffered severely from gassing by what their experience must have taught them could only be CO, and without testing as they went for dangerous quantities of the gas, or providing themselves with any safety appliances or keeping themselves in touch with safety by means of a chain of men, four responsible, highly-trained and experienced mine officials flung themselves into the jaws of death. Several others who attempted to go to their rescue were no less careless, and some no less unfortunate. And yet the verdict of the Inspector of Mines and of the examining magistrate was that 'there was no breach of the regulations.' Surely, then, it is high time the mining regulations were so amended that carelessness of this nature, even if heroic and in the discharge of duty, should constitute a grave breach. In two particulars, at least, they stand in need of amendment:—

"(*a.*) It should be provided by law that at every mine some kind of safety appliance, such as the one I show you, should be supplied. This is the Vajen Bader safety helmet, which is very simple in its construction, very efficient in its action, and not too cumbersome to wear. I am enabled to show you this specimen through the courtesy of the General Fire Appliances Co., one of whose officials will demonstrate it to you. It possesses the advantages that ordinary atmospheric air is compressed into the reservoir, that it does not require O_2, or any apparatus more complicated than a bicycle pump to fill it, and that it has no rubber bags or tubes to perish or go out of order. It is made in two sizes, to run for one or three hours.

"There are numerous similar devices in the market, such as the Walcher Gaertner respiration bag with O_2 bottle and soda flask, and Neupert's apparatus. Others are made by Wallach & Co. and by Zimmer & Co., of London.

"Of some such device two at least should be kept on every mine, a single person being useless for rescue work. And it is important that all points respecting the fitting out and performance of rescue work, together with instruction in the use of this or that appliance, should be accurately defined and practised beforehand. Many of the mines, benefiting by recent experiences, are providing fire plant and appliances, and forming their men into an organised fire brigade under the charge of the resident engineer. The fitting out and performance of underground rescue work should naturally form part of the instruction and drill of such an organisation.

"With regard to respiration masks generally, it is well known that even men who are skilled in their use are only too prone to open the air inlet valve unduly wide, thus inducing too high a pressure inside the mask, and thereby increasing the difficulty of breathing and necessarily shortening the working period of the apparatus. (Wabner.)

"On receipt of the signal that an accident has occurred on a level, this respiration apparatus, together with an O_2 cylinder, should accompany the stretcher equipment already described. This should always be the rule, as time is only lost by waiting for a detailed account of the nature of the accident which has occurred.

"(*b.*) The second provision which should be made in the law is that a supply of white mice should be kept at all collieries. They would frequently be useful also at metalliferous mines. It is well known that these animals are peculiarly susceptible to poisoning by CO, their susceptibility being so great that they can be employed as a reliable test for dangerous quantities of the gas. The respiration exchange in a mouse is 20 times as rapid as in man, and consequently the mouse exhibits symptoms of blood saturation much more rapidly. Dr. Haldane proved that with 0·4 per cent. CO in the air a mouse gave symptoms of illness—staggering gait—in one and a half minutes, and that it became unconscious in three minutes, whereas he himself did not feel discomfort for half an hour. This gives a sufficient interval to allow a miner to escape. Haldane lays down the rule that air must be regarded as dangerous the moment the test mouse becomes incapable of motion. The law should, therefore, provide that whenever there is a suspicion of an accumulation of CO in collieries or metalliferous mines these animals should be used as a test.

"It is quite certain that had the officials of the Vereeniging Colliery worn safety helmets like the Vajen Bader, and carried with them test mice, they would have been able to explore the mine with perfect safety to themselves, and have located dangerous accumulations of gas, and so not risked the lives of their workmen.

"Nitrous fumes fortunately reveal their presence by their peculiar pungent odour. But there is great and urgent necessity that mine officials and miners should be made to realise the danger of exposure to even small quantities of these gases; for the reason that exposure to the diluted gas for several minutes may cause little or no initial distress, and yet give rise several hours after in the fresh air to the most grave symptoms, frequently ending fatally. For instance, a man under our care, who was not even conscious of having been gassed, developed typical symptoms of the irritant pneumonia which follows inhalation of these fumes, and died after an illness of nine hours. Another of our cases, a contractor in his anxiety for a big cheque at the end of the month, disregarded the warning of the shift boss, who suspected burning dynamite, and returned to the drive one hour after blasting. Ten minutes there sufficed to produce a typical illness which nearly cost him his life, and enabled us to test the method of treatment to which previous less fortunate cases had given the clue. It should therefore be laid down that no man should attempt or be allowed to work in an atmosphere where red fumes are perceptible to the smell. White men must be rigorously careful in this respect, not only for their own sakes, but also for the sakes of the natives or Chinamen working under them, who are, through excusable ignorance, more heedless of the dangers into which they are introduced. Our experience goes to show that fatal gassing from this cause which has passed unrecognised is more common amongst the unskilled workers than has hitherto been realised.

"2. *Measures in known cases of gassing.*—Before discussing the measures which should, in every instance of gassing, be systematically adopted, pending the arrival of medical assistance, it is well to briefly describe the salient features of poisoning by the three gases commonly found in our mines:—

"(*a.*) *Symptoms of CO_2 Poisoning.*—CO_2 is irrespirable and incapable of supporting life; it renders arterial blood rapidly venous, and is in itself a narcotic poisoning.

"When air contains an undue proportion of CO_2 the effects are not very noticeable until the proportion reaches three per cent. The breathing then becomes deeper, and any exertion causes unusual panting. The depth and frequency of the respiration increase with the percentage of the gas present. At five per cent. there is marked panting during rest; at 7-8 per cent. there is great oppression and greater panting. At 10 per cent. the difficulty is very severe. At a slight increase beyond this stage suffocation ensues, and consciousness is lost, not, however, necessarily with fatal results if the subject is removed to fresh air. It must be carefully remembered that resuscitation is possible long after the stage of insensibility.

"Loss of consciousness is preceded by headache with great pressure in the temples, giddiness, a drowsiness with loss of muscular power, profuse perspiration and nausea, singing in the ear, and a pungent sensation in the nose, similar to that experienced in drinking gaseous drinks.

"A person poisoned presents livid discolouration, especially about the eyelids, lips, and throat.

"The amount of CO_2 in air sufficient to extinguish the flame of a candle is variously stated by different observers as from five to seventeen per cent. It depends on a large measure on the percentage of O_2 in the mixture, thus Haldane found that 75 per cent. CO_2 did not extinguish the flame, if the remaining 25 per cent. consisted of O_2. In any case it may be laid down as a rule that an amount sufficient to extinguish a flame will prove a lethal dose to man.

"Pure poisoning from this gas is rare in metalliferous mines, but it may occur in blind ends after blasting.

"(*b.*) CO is a colourless, tasteless, and inodourless, but combustible gas, with a sp. gr. of 0·967. Being imperceptible to any of the senses, it is extremely insidious and dangerous. It is a virulent poison, on account of its chemical avidity for hemoglobin, which is stated to be 200 to 250 times greater than that of O_2. Symptoms are produced where 0·05 per cent. is present in air; and fatal results with 0·5 to 1 per cent. With one per cent. CO in air saturation of the blood takes place in not longer than five to six minutes; and when blood has reached 79 per cent. of saturation death is inevitable.

"The symptoms of poisoning with this gas are a feeling of discomfort, with throbbing of the blood vessels, followed by headache, giddiness, and great muscular weakness; there may be sickness and vomiting. A drowsy feeling creeps on, gradually ending in unconsciousness. Respiration is accelerated and laboured. More or less extended patches of bright colour make their appearance on the anterior part of the body. But it is a mistake to look on a poisoned person who is still alive for the red, rosy, healthy appearance which is so characteristic a feature in the dead body, on account of the brilliant appearance of COHB blood. On the contrary, in a poisoned person the skin is dusky, and the lips and extremities blue.

"(*c.*) *Poisoning by Oxides of Nitrogen-Nitrous Fumes.*—The conditions under which the various gases are produced in the mines render it probable that almost all cases are to some extent cases of mixed poisoning. Yet in practice we find the symptoms of one or other predominate, sometimes to the exclusion of the appearance of poisoning by any other gas. Thus, poisoning by nitrous fumes has come to be regarded and recognised by us as a distinct entity, deserving of every careful consideration.

"There is a history in almost all cases seen alive, of having been, as the miners term it, 'gassed,' *i.e.*, they are conscious of having been exposed to a vitiated atmosphere:—

(1.) From the smell of the air;

(2.) From some immediate distress in breathing and a longing for air;

(3). From a feeling of thirst.

"We have not known of a case being immediately overpowered, and succumbing underground, as so frequently happens with CO_2 and CO; and there is no difficulty in effecting an escape. We wish, however, to lay great stress on this point, that the initial distress is not so marked as to give a danger signal to effect an escape as soon as possible. As the period of exposure required to ultimately produce serious poisoning is very short, miners must be trained to recognise red fumes and to appreciate their intensely poisonous nature. In one of our cases, where most serious symptoms supervened, the patient was present in a blind end one hour after blasting, for less than 10 minutes; and Dr. Arlidge has recorded a fatal case where the fumes of burning dynamite were inhaled for five minutes.

"For a considerable time after removal to fresh air (an interval amounting in some cases to as much as eight hours) there are no noticeable symptoms; and men who are poisoned are able to ascend a mine, wash, change, and partake of their food without conscious discomfort. But when after this quiescent interval the distinctive symptoms supervene, they do so with alarming rapidity. There is first a difficulty in getting wind, followed by so great a distress in breathing as to produce a fear of impending death; a cough at first dry, but speedily accompanied by the expectoration of a copious watery blood-stained mucus. With this there are the feelings and signs of profound collapse. The symptoms are those of an intensely acute irritant œdema of the lungs. Death, which usually takes place in a few hours, may be due to asphyxiation from water-logging of the lungs or to sudden heart failure.

"The insidious and dangerous nature of poisoning by this gas is illustrated by the common history of native cases which have come under our notice. It has been the rule that so little attention has been paid to the amount of gassing they are suffering from, that they are allowed to go the compounds without any medical assistance; they are usually found dead or moribund several hours afterwards.

"We have also reason to believe that many of the reputed pneumonias which contribute so largely to underground native mortality may have their origin in this manner.

"This delay in the development of the symptoms of poisoning by nitrous fumes suggests the first rules we would lay down for systematic adoption in every case of gassing—

"(1.) Every case of gassing must at once be reported by the observer to the shift boss, by whom it is to be reported to the manager direct, or through the mine captain. There should be no relaxation of this rule allowed on any mine, or in any case, however apparently trivial.

"(2.) Steps must immediately be taken to bring the sufferers to fresh air, and at the same time the medical officer must be sent for.

"(3.) All cases, white and native, must be kept under observation. Native cases should invariably be sent to the compound hospital, and there detained and kept under observation for at least twelve hours. This should be the rule, no matter how slight their initial symptoms. White men should similarly be kept under the observation of the medical officer for the same term. It would be easy to multiply cases in illustration of the importance of this rule, but two will suffice. In an instance with which we had to deal, where the history is very precise, the gassing occurred at 3·10 p.m., when two white men and three natives were gassed under the following circumstances:—They were working at the end of the drive, at right angles to which, 100 feet or so from the blind end, was a crosscut. By accident the men working in the crosscut blasted their round of holes before the men at the end of the drive had left. These latter were thus imprisoned for three-

quarters of an hour by the gases issuing from the crosscut. They felt, as they described it to us, that they were being gassed, and turned on the full pressure of the compressed air to give them fresh air. They had no difficulty when the air cleared somewhat in making their way to the surface, apparently none the worse for their recent experience. The white men washed, changed, and proceeded to the mine boarding-house for their evening meal, which they partook of heartily. Thereafter they retired as usual to their rooms. Urgent symptoms came on very suddenly at 10·30 p.m., seven hours after the inhalation of the gas. They were seen at 11 p.m, and were then so ill that there were serious doubts as to the possibility of removing them with safety to the mine hospital, less than 300 yards away. The three natives who came to the surface at the same time proceeded to the compound, where they had their evening meal between 5 and 6 p.m., thereafter retiring to their quarters. It was not reported that they had been gassed; and nothing was known about them until next morning. When the morning shift was being turned out, between 5 and 6 a.m., one was found dead, one moribund, and the third very ill and in great distress.

"In another of our cases, the gassing, also as in the above cases, from nitrous fumes, occurred on Friday night. He was brought to the hospital moribund, about 12·30 on Sunday morning. He was very ill on the Saturday, his friends thinking he had a bad cold, which they treated in the usual mine fashion, with liberal doses of whisky. He died on Sunday morning.

"(4.) Having thus emphasised the necessity for reporting cases however trivial, and of keeping them under skilled observation, we wish, before detailing the systematic measures which should be employed in every case, to enter a protest against a practice which is only too common, that of treating cases of gassing externally with cold water, and internally with whisky.

"Cold water, liberally applied, is popularly supposed to have a wonderful restorative effect in all kinds of fainting, and is on that account generally used as the readiest and easiest means to overcome the unconsciousness of the victims of gassing.

"Now in any severe injury, whether due to a visible and tangible cause, as physical violence, as in ordinary surgical injuries, or to an invisible or none the less potent cause as in gassing, one of the principal constitutional effects is the condition called 'shock.' Shock is characterised by three important symptoms:—

(1.) Weakening of the heart's action;

(2.) General exhaustion of the nerve centres;

(3.) Lowering of the body temperature.

"These symptoms are present in every case of gassing and the third, the lowering of the body temperature, is particularly noticeable, this being due, not merely to shock, but also to the fact that CO_2 and CO directly, and NO_2 indirectly, affect the oxygenation of the blood. Hence it is very obvious that any measure, such as the application of cold water, which will further increase shock and lower the body temperature, must be carefully avoided, and that, on the contrary, every effort must be made to maintain and rise the body temperature. All cases of gassing must be therefore immediately taken to a warm place if at hand and kept warm by the application of warm clothing and other external means.

"The immediate administration of whisky or brandy we also deprecate. It has been clearly proved by Mummery (Hunterian lectures, 1905), that alcohol increases surgical shock, and the physiology or shock being the same, whatever its cause, it is certain that it will do the same in shock from gassing.

"The necessity of giving this warning against these two venerable customs (which have the authority of nearly every text-book) has been frequently impressed on us. Here, again, it would be easy to multiply instances, but one will make our point abundantly clear. One night on one of our mines a white miner and three natives were badly gassed, the chief poison being CO. The natives were overpowered first, and the white man, as he fortunately always does, heroically dragged them out of the danger zone, being himself ultimately overpowered. They were all rescued and brought to the surface. When the medical officer arrived he found them lying in an open shed unconscious, with the misguided but anxious well-meaning friends treating them liberally with douches of cold water and attempting to force whisky down their throats. It was a bitterly cold winter night, and anything better calculated to increase the shock from which they were suffering, and, in the event of their having inhaled any NO_2, the risk of pulmonary trouble it is difficult to imagine. A warm engine-room was quite close to the shaft, to which the victims could quite as easily have been carried.

"It is also no uncommon experience to find the subjects of poisoning by nitrous fumes who have been under the solicitous care of their friends for several hours, brought to a hospital in an advanced alcoholic condition. In these cases it may safely be said that there is certain death in the bottle.

"(5.) The immediate steps to be taken in a case of gassing are as follows:—

"(*a.*) In every case of gassing where the act of swallowing is voluntarily possible an emetic should be at once administered; and for this purpose we recommend that at every shaft a solution of sulphate of zinc, containing thirty grains to the ounce, should be kept. This is to be administered in ounce doses every ten minutes until emesis is produced. The advantage of emptying the stomach and of emptying the lungs of mucus, and of any unabsorbed gas in their ultimate recesses, which the act of vomiting does more effectively than any voluntary effort, more than counterbalance the momentary depressing effect of the emetic.

"It is a common experience that natives when gassed (short of unconsciousness) always attempt to make themselves sick, and that if successful they are greatly relieved immediately afterwards.

"(*b*) We recommend that at every pit-head a supply of *sal volatile* (aromatic spirits of ammonia) be kept, and that a dose of two drachms (two spoonfuls in water) be given to every patient who can swallow, immediately after the completion of the preceding manœuvre. Ammonia is the only defensible stimulant. It acts more quickly than alcohol, and has chemical reasons in its favour as well.

"(*c*) At every pit-head, or at the mine or compound hospitals where these are within reasonable distance of the shaft, there should be kept two cylinders of oxygen with masks. Oxygen should be administered in every severe case of gassing, and where artificial respiration is required this should be performed in an oxygenated atmosphere. Mine officials should be trained in the proper and economical use of this simple apparatus. The remarks we made about unduly opening the air valves of respiration apparatus apply equally here.

"The value of O_2 in poisoning by gases has been abundantly proved. Perhaps in no case is its beneficial effect more marked than in the terrible distress of the pulmonary œdema of nitrous fumes poisoning. Again it has been found that CO, which, as you know, has a very strong hold of the Hb of the blood, is eliminated five times as rapidly in an atmosphere of O_2 as in air. The exhibition, therefore, in a concentrated form of this elixir of life not only hastens immediate recovery, but largely helps to obviate the remote ill effects of carbon monoxide poisoning.

"(*d*) In every case of gassing which is so profound as to cause deep coma and arrest of the respiration, artificial respiration must be started immediately, and persevered with so long as there are any indications of life. There must be no delay in thinking of or trying other remedies. It must be remembered that resuscitation is possible long after the stage of insensibility.

"Artificial respiration is performed as follows (Sylvester's methods):—

"The patient is to be placed flat upon his back, with chest and arms bare, and all tight clothing opened or removed; the head kept low, the chin being drawn well up, or, preferably, the tongue pulled out with forceps, if at hand; the chin is raised by a pad, such as a coat rolled up, being placed under the shoulders. The operator, standing at the head of and looking at the patient, grasps the patient's arms just above the elbow, one in each hand, and draws them with a sweep to above the head, counting 1, 2, 3. This movement expands the chest and air enters the lungs. He then brings them down to the front sides of the chest, against which he presses them very firmly. At the same time it is very useful that an assistant should press the abdominal viscera upwards towards the diaphragm to complete expiration. After a pause of four or five seconds, the movement is begun again, and gone through in the same way. The operation is repeated at the rate of 15 times a minute; not more. The common mistake made by laymen in performing artificial respiration is in their eagerness and hurry to attempt too many respirations. We have seen as many as 50 or 60 a minute. As soon as the patient commences to make slight convulsive efforts to himself to get his breath, the greatest care must be taken not to interfere with them.

"Great patience is required in performing artificial respiration; and it should not be discontinued for an hour if there are any hopes of life. So long as the heart continues to beat, however feebly, there is always hope of resuscitation.

"(*e.*) Poisoning by nitrous fumes, which is much more common in our mines than is generally supposed, and which is caused by contact with an atmosphere vitiated by the products of the combustion or incomplete detonation of nitro glycerine explosives, has its symptoms so long delayed that the treatment of its chief symptoms falls entirely to the medical

officer. But we again repeat our warning about the insidious nature of this poison, and the consequent necessity of keeping every case of gassing under observation. The initial measures we have recommended should not be omitted in this case also.

"For immediate treatment of authenticated cases, a method originated and devised by a distinguished member of this society has attained to some notoriety; we mean the chloroform method of Mr. Weiskopf. So little was previously known of the way of treating these cases that Mr. Weiskopf's method came to be readily adopted both on the Continent of Europe and, we find also, in America. Mr. Weiskopf calls his treatment the chloroform antidote method. This, however, is a misnomer, because it lays stress on the least important element in his mixture. The mixture which he recommends consists of equal parts (eight drops) of chloroform and strong ammonia in water, to be given in frequent doses. For the suggestion to immediately use ammonia, and also for his suggestion to employ as soon as possible an alkaline spray for inhalation, he deserves the greatest credit, for ammonia has strong chemical and physiological reasons in its favour. But chloroform possesses neither chemical, physiological nor pharmacological properties to recommend it as an antidote to poisoning by nitroso-nitric acids.

"The manner in which the chloroform is supposed by its advocates to act can hardly recommend it to those to whom the physiological action of chloroform is familiar. Mr. Weiskopf himself says that it is well known that chloroform in small doses acts as a distinct excitant on the heart, and the blood will be much more energetically circulated throughout the system thereby. That it has this action in the doses recommended we admit, but we maintain that ammonia is much more powerful, and has none of the drawbacks of chloroform. On the other hand we find Dr. Seyffert, of Troisdorf, ascribing the supposed beneficial action of chloroform to its well-known power to inhibit, or at least to decrease convulsive conditions or conditions of reflex irritability. Convulsions are said to occasionally occur after the inhalation of nitro-sonitric acid vapours, and are explained by Dr. Seyffert as a 'reflex effect of the inhaled vapours upon its smallest sensory nerve endings in the respiratory tract. If these convulsions affect the heart, lung, or diaphragm, or if long continued, death may ensue.' The beneficial action of chloroform is supposed to be in inhibiting or decreasing these. In the first place, convulsions have not been observed by us in a considerable experience of these cases. Convulsions very frequently precede death from various causes and it is possible that in explosive factories, where large quantities of concentrated vapours may be inhaled, producing rapidly fatal asphyxia, convulsions may occur. To subdue these, the administration of chloroform would have to be pushed to the stage of profound anæsthesia, which is clearly not the intention of the internal doses recommended. The danger in nitrous fumes poisoning, as occurring in mines, is the irritant inflammation of the lungs, which is the characteristic clinical feature, and the invariable cause of death. The exhibition of a remedy which would in any way tend to diminish the already weakened expulsive power of the water-logged lungs would, in such circumstances, only aggravate the mischief. One can only suppose that the amount of chloroform in Mr. Weiskopf's mixture is not sufficient to produce this result.

"To our mind, the proper treatment of nitrous fumes poisoning is the immediate and repeated administration of ammonia (in the form of *sal volatile*, as already recommended) acting both as an antidote and a stimulant. Shock may have to be counteracted by saline transfusions; and should the symptoms of the irritant inflammation of the lungs supervene, venesection and liberal blood letting may have to be performed, and oxygen inhalations employed, in conjunction with the above remedies. But these fall within the province of the medical officer.

"Finally, in our opinion, a knowledge of these simple safety measures should be required of all managers and overseers, be embodied in the mining regulations, and form part of the State examination."

The chloroform method of treating persons affected by nitrous fumes referred to in Drs. Macaulay and Irvine's paper as due to Mr. Weiskopf is more fully described in Appendix V. to 29th Annual Report of His Majesty's Inspectors of Explosives (Great Britain), in which the dose is stated to be three to five drops of chloroform in a glass of water, administered as a drink every ten minutes. The maximum single dose of chloroform (kept carefully from the action of light) is given as 0·5 gram. and the maximum daily dose is 1·5 gram. "Special weighings show that the weight of three drops of chloroform is 0·045 gram. and of five drops is 0·078 gram.; so that, following the Pharmacopoca, 33 doses of three drops or 18 doses of five drops may be administered in one day without danger to the workman."

Appendix No. 2.

Advances granted during 1905, under "The Mining Development Act, 1902."

Mining.

1. *W.E.G., G.M.L.* 505G, *Niagara.*—Particulars of this case, up to the end of 1904, were given in my last Annual Report. Early in 1905 the owners had to call a meeting of their creditors, at which the latter resolved to carry on the mine themselves until their claims were satisfied. No further accounts for deepening the shaft have, however, been received since by the Department.

2. *Carbine, G.M.L.* 33s, *Kintore.*—Last Annual Report shows the position of this advance at the end of 1904. In February, 1905, the owners reported to the Inspector of Mines that the lode formation had been cut in the crosscut at the 400-feet level, about 60 feet from the shaft, carrying very fair values, some of the samples tried being estimated at about an ounce to the ton. No water was encountered, but it was expected that a supply would be obtained when the crosscut was advanced another 70 or 80 feet. In May it was reported that the crosscut was in 250 feet from the shaft, and that some rich ore had been struck at that point, but no water had been encountered. The total amount advanced during 1905 was £300.

3. *White Flag Consols, G.M.L.* 682, *Wilson's Patch.*—Work on this mine was in progress at the end of 1904, as recorded in last Annual Report, but early in 1905 the venture was abandoned and no further advances were paid.

4. *President Loubet, G.M.L.* 611U, *Callion*—Particulars of this advance were given in my reports for the years 1903 and 1904. The shaft has been sunk to a depth of 193 feet and the amount expended during 1905 was £140, making a total of £232 10s. advanced by the Department in connection with the work. Six months' exemption was granted on 23rd August, and since that date no further work has been reported.

5. *Oversight, G.M.L.* 957Y, *Bulong.*—This advance was mentioned in last year's report, and up to the end of 1904 the sum paid was £200. The party were down 300 feet in the shaft and had started to drive on the reef. Final payment of the balance of the £300 authorised was made on 17th August, 1905, and on 9th September the syndicate asked for further assistance to enable them to continue crosscutting east and west at the 300 feet level. After examination of the mine, a further advance under Part III. of the Act was made to them of a moiety of their working expenses, but not to exceed £2 per foot, in continuing their 300 feet level crosscut, either east or west, or in driving on the lode, up to a total of £300. It was reported that up to 20th September the syndicate had expended £2,894 17s. 2d. on the lease, and that work was proceeding very satisfactorily. The total expenditure during 1905 was £250, making a total of £450 since the beginning of the work.

6. *Mulgabbie Perseverance, G.M.L.* 260K, *Mulgabbie.*—An application, towards the end of 1904, from the owners of this lease for assistance in sinking their main shaft having been favourably reported on, an advance up to £200 was authorised, at the rate of £2 per foot sunk below the 100 feet level. In March, 1905, a payment was made of £22 for 11 feet sunk, and in September a claim was put in for another 58 feet of sinking; but before this was paid the owners declined further assistance, having had good returns from their ore, and refunded the advance of £22 that had been made to them, with interest.

7. *The Ninety-eight, G.M.L.* 951Y, *Bulong.*—Particulars of this advance should have appeared in the Annual Report for 1904, but were overlooked. An advance of £150 was granted, at the rate of 10s. a foot on work done in crosscutting and driving from shaft B, and 20s. a foot in sinking shaft A. The whole of the advance was expended in 1904 in working from shaft B, the owner doing a large amount of work in addition to that on which subsidy was paid. The prospects were very encouraging for a time, but nothing payable was found. A further advance of £100 was then authorised for sinking shaft A, and when it was down to 170 feet the owner of the mine was permitted to crosscut to the reef at that depth instead of sinking to 200 feet, as originally stipulated. The expenditure by the Government in 1905 was £38 6s. 2d., making a grand total from the start of £188 6s. 2d.

8. *The Lady Florence, G.M.L.* 1265, *Cue.*—Messrs. Chesson and Haydon, owners of the Cue One mine, being desirous of sinking a deep shaft in their adjoining Lady Florence lease to cut the Cue One reef at a considerable depth, applied to the Government for assistance, under Part II. of the Act. After report on the proposition by the Government Geologist, an advance of £1,000 was granted for sinking the shaft from its then depth (256 feet) to 600 feet, if the reef were not sooner cut, at the rate of £3 10s. per foot. At 549 feet the reef was cut, and a crosscut to the east showed it to be 30 feet wide. The owners have since done considerable driving along the reef, obtaining a little gold; but, so far, nothing payable. The shaft is 10ft. x 4ft. in the clear, close timbered, and equipped with winding plant. The machinery and sinking cost about £12,000, including the Government advance of £1,000. The whole of the advance was expended during 1905.

9. *Pakeka, G.M.L.* 1221W, *Broad Arrow.*—An advance of £150 was authorised to assist the owners of this lease to unwater their mine, which had been flooded, and to construct protection against stormwater again finding its way into the workings. The advances were made at the rate of £1 for £1 expended by the owners, the total advanced being £148.

10. *Mount Ida Battery Lease, G.M.L.* 36U, *Mount Ida.*—This lease belongs to the Government, the Mount Ida State battery being upon it, and the mine is let on tribute. Towards the end of 1904 the

tributers, Messrs. Milling and Dolan, applied for an advance of £300 for the purpose of further prospecting it. They proposed to sink a new main shaft to a depth of 200 feet. The Inspector of Mines reported favourably on the property, and an advance of £300 was authorised, under Part III. of the Act, to be expended at the rate of £1 for £1 in sinking and necessary pumping. Work was carried on satisfactorily, and a total amount of £294 1s. was advanced by the Department; but in October, 1905, the tributers gave up their tribute, having been unable to make the mine pay.

11. *Battlers' Hope M.L.* 364, *Greenbushes.*—On 1st March, 1905, the owner of this lease applied for an advance of £150, to enable him to sink a shaft on it to test the deep alluvial ground. This was granted at the rate of £1 for £1 expended by the applicant. The shaft was sunk to a depth of 110 feet, striking the bottom of the deep alluvial ground at 80 feet. A drive was put in 100 feet, 70 of which was timbered, and a rise to the wash. There was a little tin in the "wash," but nothing payable was met with, and the owner, on 29th September, was granted three months' exemption. The total sum advanced by the Government was £116 11s. 3d.

12. *The Brooklyn G.M.L.* 573M, *Mount Magnet.*—In May, 1905, an advance of £260 to the owners of this mine was authorised, £100 to be expended at the rate of £1 for £1, in purchase of machinery and up to £160 in sinking a shaft, but not to exceed 32s. per foot sunk. In August the reef was cut at the 200 feet level, 42 feet from the shaft, and found to be worth about 30dwts. per ton, but the flow of water was more than the party could cope with until they obtained an oil engine and pump. After obtaining these, work proceeded more satisfactorily. The whole advance of £260 was expended.

13. *The Monkland G.M.L.* 1127X, *Gindalbie.*—In July, 1905, the owners of this lease obtained an advance of £1 for £1, up to £300, to assist them in sinking their shaft from the 154 feet level to 254 feet. The mine had a fair equipment of winding machinery and a five-head battery, and had been a payable proposition, but required capital for further development. After sinking 84 feet, a crosscut was put in at the 196-feet level 30 feet, and the reef was cut 20 inches wide, and estimated to be worth an ounce to the ton. A further advance of £100 was then authorised, to assist in putting the owners in a position to begin crushing. Up to the end of 1905 the total expenditure by the Government was £363 13s. 9d., and work was still in progress.

14. *Sunbeam G.M.L.* 1121X, *Kanowna.*—This mine has had a good record of production from the shallower ground, but the owners, finding themselves unable without assistance to open it up at deeper levels, applied for and obtained an advance of £1,000, £350 to be expended at the rate of £1 for £1 in purchase of machinery, and £650 in sinking a new shaft to 250 feet and driving at the 250-feet level. At the end of 1905 good progress had been made with the erection of the machinery and sinking the main shaft, and a total sum of £472 4s. 6d. has been advanced.

15. *Chadwick's Reward, G.M.L.* 641, *Yilgarn.*—A new discovery having been made about 35 miles North-East of Southern Cross, assistance was sought by the Reward lease owner in having a crushing of 100 tons at the Southern Cross State Battery. Six tons were brought in and crushed, yielding a little over half an ounce to the ton, which was not payable on account of the cost of carting. An advance of £1 for £1, up to £100, was then granted towards sinking a shaft 100 feet. This work was completed before the end of the year; but, owing to the inability of the Inspector of Mines to visit the mine and give the final certificate, final payment could not be made. The expenditure for 1905 amounted to £5 for payment of crushing charges and £75 advance in aid of sinking.

Boring.

16. *Westralian Mining and Oil Corporation; Boring for Petroleum at Warren River.*—Full particulars of this work are given in my Annual Reports for 1903 and 1904. During 1905 payments were made by the Government amounting to £485 15s., making a total expenditure on the work of £748 13s. 7d. The company went into liquidation in March, 1905.

17. *Boring on Admiral G.M.L.* 245P, *Peak Hill.*—Particulars of this work to end of 1904 were given in last year's Annual Report. No. 1 bore (1904) went to a depth of 965 feet, and No. 2 to 982 feet, the total cost of 1,947 feet of boring being £1,446 3s. 9d., or 14s. 10¼d. per foot. In No. 2 bore lode-matter was cut at 743 feet, but was very poor in gold, the highest assay obtained being 4dwts. 17grs. per ton from the core from 841 to 844 feet. The total expenditure by the Government for 1905 was £532 1s. 1d., making grand total £718 1s. 10d.

18. *Messrs. McIver, Stuart, and Rollo. Boring at Kanowna.*—This work was referred to in last year's report, but little had then been done. Early in 1905, Messrs. McIver and Stuart withdrew from the syndicate, and the work was carried on by Mr. Rollo. Three bores were put down; No. 1 to 147 feet, No. 2 to 165 feet, and No. 3 to 178 feet. The first bore went to a depth of 147 feet, passing through the following strata:—

Ferruginous clay	0 feet	to	25 feet
„ „ and kaolin	25 „		35 „
Ironstone cement	35 „		38 „
Kaolin, with ironstone	38 „		40 „
White kaolin	40 „		78 „
Sub-angular quartz fragments at	78 feet		
White kaolin	78 feet	to	90 feet
Quartz fragments at	90 feet		
White kaolin	90 feet	to	115 „
Bluish quartz, sub-angular	115 „		117 „
White kaolin	117 „		136 „
Bluish quartz in large sub-angular pieces at	136 feet		
Yellowish-white kaolin	136 feet	to	147 feet

Only occasional colours of gold were obtained.

The second bore gave:—

Red clay soil	0 feet to	15 feet
Ironstone cement	15 „	30 „
Quartzose ironstone	30 „	46 „
Mottled kaolin	46 „	68 „
Red kaolin	68 „	86 „
Ferruginous cement	86 „	96 „
Yellow and blue clay	96 „	100 „
Cement	100 „	106 „
Bluish clay and wash	106 „	132 „
Dark blue clay, with quartz	132 „	165 „

According to Mr. F. B. Allen, Director of the School of Mines of W.A., who supervised the boring, the cores given to him from 130 to 144 feet in this bore gave assays of about ½oz. of gold to the ton.

The section of the third bore is:—

Red soil	0 feet to	15 feet
Ironstone cement	15 „	25 „
Ironstone	25 „	40 „
Kaolin, with grit	50 „	60 „
Yellow clay	60 „	63 „
Red clay	63 „	73 „
Yellow clay and wash	73 „	81 „
Cement	81 „	87 „
Kaolin and wash	87 „	98 „
Blue clay	98 „	100 „
Kaolin	100 „	104 „
Light blue clay	104 „	114 „
Dark blue clay	114 „	126 „
Blue clay (auriferous)	126 „	140 „
Blue clay	140 „	178 „

Mr. Allen's assays of the cores from 126 to 140 feet gave an average of 7dwts. of gold per ton.

The expenditure by the Government for 1905 was £193 19s. 11d., making a total on the work of £235.

19. *Heath and Party. Boring on North Lead, Kanowna.*—The loan of a boring plant, and foreman in charge thereof, was made to this party, they paying all other expenses, to enable them to prospect ground on the North Lead, near the junction of Wilson's Lead. Eight bores were put down, of depths 109, 105, 107, 106, 121, 106, 96, and 112 feet, striking the bedrock at 109, 95, 106, 106, 101, 100, 91, and 100 feet respectively. The ground passed through consisted of layers of clay, ironstone, pug, pipeclay, and drift, with some "wash." The amount expended by the Department was £62 17s. 5d.

Water Supply.

20. *Iron King, G.M.L.* 4053, *Bulla Bulling.*—As mentioned in last year's report, a sum of £25 was authorised to assist the owners of this lease to obtain a supply of water from the G.W.S. The amount was paid during 1905.

22. *Great Ophir, G.M.L.* 613U, *Davyhurst.*—A line of pipes was laid and meter fixed for this company, valued at £696, to connect their mine with the Government water supplies of fresh and salt water at Davyburst, the company undertaking to pay for the water at 7s. per 1,000 gallons, and to repay the cost of the pipe line by monthly instalments of £29, the pipes to become their property when fully paid for.

23. *Haddon, G.M.L.* 552, *Yilgarn.*—Assistance was given to the owner of this mine to enable him to get Goldfields Water Supply water cheaply for the crushing of very low-grade ore by supplying water at the rate of 62,000 gallons a week up to a total of 500,000 gallons on condition of his doing certain development work. This is reported to have led to the discovery of a valuable new make of ore. The sum spent by the Government during 1905 in purchase of water from the Goldfields Water Supply Administration for this mine was £12 6s.

24. *West Australian Sluicing Syndicate, Coolgardie.*—In order to assist this company with their experiment of treating alluvial ground at Coolgardie by sluicing, it was arranged that the Goldfields Water Supply Administration should supply water at 1s. per 1,000 gallons, the Mines Department paying 6d. per 1,000 gallons as an advance in aid under the Mining Development Act. A sum of £125 was authorised for this purpose, and to the end of 1905 the actual amount expended was £76 16s.

Aid to Crushing Plants.

25. *Little Doris, G.M.L.* 771T, *Erlistoun.*—To enable the owners of the battery on this lease to repair and improve it, a sum of £505 8s. was granted to them by way of loan, on condition that the plant in return should be available for crushing for the public at prescribed rates for 12 days in each month.

26. *Subsidies to Private Crushing Plants.*—The policy of giving tonnage subsidies to privately-owned batteries to induce them to crush for the public on terms and at rates prescribed by the Minister for Mines has been continued during 1905, the expenditure amounting to £3,018 9s. 4d., an increase of £1,963 13s. 9d. on the amount paid in the previous year. Twenty-five private batteries were so subsidised, and 38,982 tons of stone were crushed. The crushing charges on two small parcels of stone amounting to 16 tons, crushed free at State batteries, were also paid under this heading to the State Batteries Branch.

The following table shows the recipients of subsidies, tonnage crushed, rates of subsidy, and amount paid :—

Battery Owner.	Place.	Tons.	Rate.	Amount.
				£ s. d.
Weber & Newman	Marble Bar ...	19	5s.	4 15 0
Cooper, W. H.	Do. ...	284	5s.	71 1 9
Clark & Evans	Do. ...	53	5s.	13 5 0
Robb and Harrison	Do. ...	104	5s.	26 0 0
Browning and Party	Do. ...	38	5s.	9 10 0
Swanson Bros.	Do. ...	27	5s.	6 15 0
State Battery	Southern Cross ...	6	16s. 8d.	5 0 0
State Battery	Lennonville ...	10	6s. 6d.	3 5 0
Paddington Slimes Works ...	Paddington ...	871	1s. 6d.	65 6 6
Carter, F. F.	Do. ...	1,386½	1s. 6d.	103 19 9
Plomley, E. T.	Do. ...	899	1s. 6d.	67 8 6
Friedman, N. A.	Do. ...	7,644	1s. 6d.	573 6 0
Hallahan, J. P.	Kanowna ...	1,361	1s.	68 1 0
Kanowna Acquisition Syndicate	Do. ...	521	1s.	26 1 0
Reidel & Norton	Do. ...	4,435	1s.	221 15 0
Martin, James	Do. ...	4,358¾	1s.	217 18 9
Berry, J.	Randalls ...	236½	2s.	23 13 0
Westralia Mt. Morgans	Mt. Morgans ...	2,595	2s.	259 10 0
Gull, W. E.	Tampa	186½	2s.	18 13 0
Oades, W. H.	Devon Consols ...	4,360	2s.	436 0 0
Pauley & McCoy	Edjudina ...	1,038	2s.	115 16 0
Smith & Langford	Lawlers	1,535	1s. and 2s.	141 16 6
Poole, H.	Do.	2,354	2s.	235 8 0
Bow, F. W.	Coolgardie ...	1,766½	1s. 6d.	132 11 8
Thomas, F. L.	Kunanalling ...	941	1s. 6d.	70 11 11
Gild & Co.	Black Range ...	10½	6s.	3 3 0
Cornell, G. A.	Kanowna ...	1,958	1s.	97 18 0
Total		38,998¼	...	£3,018 9 4

Purchase of Boring Plant.

27. The following is the expenditure in 1905 on purchase of boring plant:—

	£ s. d.
Purchase of Portable Drilling Plant	479 18 0
Repairs and further fittings to Diamond Drill	32 3 1
Purchase of Carbons	895 2 6
Purchase of boring plant parts	471 16 6
	£1,879 0 1

Providing means of Transport.

28. The amount expended during 1905 in purchase and maintenance of camels and horses was £339 4s. 10d.

Summary.

		£ s. d.	Expenditure during 1905. £ s. d.
Advances in Aid of Mining Work.			
(2.) Carbine	Kintore ...	300 0 0	
(4.) President Loubet	Callion	140 0 0	
(5.) Oversight	Bulong	250 0 0	
(6.) Mulgabbie Perseverance	Mulgabbie ...	22 0 0	
(7.) Ninety-Eight...	Bulong	38 6 2	
(8.) Lady Florence	Cue	1,000 0 0	
(9.) Pakeha	Broad Arrow ...	148 0 0	
(10.) Mt. Ida Battery Lease	Mount Ida ...	294 1 0	
(11.) Battler's Hope	Greenbushes ...	116 11 3	
(12.) Brooklyn	Mount Magnet	260 0 0	
(13.) Monkland	Giudalbie ...	363 13 9	
(14.) Sunbeam	Kanowna ...	472 4 6	
(15.) Chadwick's Reward	Yilgarn ...	75 0 0	
			3,479 16 8
Advances in Aid of Boring.			
(16.) Westralia Mining and Oil Corporation	Warren River ...	485 15 0	
(17.) Admiral	Peak Hill ...	532 1 1	
(18.) McIver, Stuart, and Rollo	Kanowna ...	193 19 11	
(19.) Heath and Party	Kanowna ...	62 17 5	
			1,274 13 5
Advances in aid of Water Supply to Mines.			
(20.) Iron King	Bulla Bulling	25 0 0	
(22.) Great Ophir	Davyhurst ...	696 0 0	
(23.) Haddon	Yilgarn ...	12 6 0	
(24.) W.A. Sluicing Syndicate	Coolgardie ...	76 16 0	
			810 2 0
Advances in Aid of Crushing Plants.			
(25.) Little Doris	Erlistoun		505 8 0
(26.) *Subsidies to Private Crushing Plants*			3,018 9 4
(27.) *Purchase of Boring Plant*			1,879 0 1
(28.) *Providing means of Transport*			339 4 10
	Total		£11,306 14 4

Appendix No. 3.

State Smelting Works—Phillips River Goldfield.

Table I.—*Total Amount of Ore Purchased from 2nd July, 1903, to 31st December, 1905.*

—	Total from 2nd July, 1903, to 22nd April, 1905, as per Annual Report for year 1904.							Total from 22nd April, 1905, to 31st December, 1905.							Grand Total to 31st December, 1905.						
	Net weight.				Amount paid.			Net weight.				Amount paid.			Net weight.				Amount paid.		
	tons	cwt.	qrs.	lbs.	£	s.	d.	tons	cwt.	qrs.	lbs.	£	s.	d.	tons	cwt.	qrs.	lbs.	£	s.	d.
Elverdton	1,847	19	0	26	5,976	19	0	219	11	0	17	930	17	0	2,067	10	1	15	6,907	16	0
Mary	676	2	1	7	2,564	16	3	53	4	3	3	245	5	2	729	7	0	10	2,810	1	5
Mary (Phillips River Smelting Co.)	0	2	2	20	7	17	11		...			...			0	2	2	20	7	17	11
Marion Martin	609	11	0	14	2,886	4	6	192	4	0	2	700	13	10	801	15	0	16	3,586	18	4
Last Chance	525	2	3	16	2,652	19	2	75	11	3	3	382	3	10	600	14	2	19	3,035	3	0
Sunset	393	7	3	20	1,469	11	4	45	5	2	25	78	6	0	438	13	2	17	1,547	17	4
Mount Benson	283	13	2	3	1,267	0	6	318	8	1	9	1,714	17	7	602	1	3	12	2,981	15	1
Mount Stennett	165	13	1	6	775	2	7		...			...			165	13	1	6	775	2	7
Surprise	153	19	2	13	726	8	9	61	8	1	19	275	8	1	215	8	0	4	1,001	16	10
Mount Desmond	148	5	2	3	710	13	6	45	16	0	12	302	12	11	194	1	2	15	1,013	6	5
Mount Cattlin	102	3	2	11	437	17	3	82	6	1	25	181	11	9	184	10	0	8	619	9	0
Mount Cattlin (Phillips River Smelting Co.)		...			...			0	1	0	4	...			0	1	0	4	...		
Emily Hale	50	18	1	21	208	6	6	29	11	1	12	172	11	2	80	9	3	5	380	17	8
Kilmore	70	15	1	15	308	3	3	2	0	2	7	4	16	8	72	15	3	22	312	19	11
Zealandia	23	19	2	8	48	6	2		...			...			23	19	2	8	48	6	2
Great Oversight	34	10	2	21	165	17	4		...			...			34	10	2	21	165	17	4
Mosaic	47	10	2	14	284	1	0	5	19	0	8	45	14	2	53	9	2	22	329	15	2
Last Chance Proprietary	19	7	1	15	55	1	10	10	10	1	27	39	8	5	29	17	3	14	94	10	3
Red, White, and Blue	92	7	3	7	995	8	11	70	2	0	3	558	16	7	162	9	3	10	1,554	5	6
Welcome Stranger	18	1	2	2	78	11	4		...			..			18	1	2	2	78	11	4
Australia	11	19	3	0	89	9	11		...			...			11	19	3	0	89	9	11
Omaha	9	3	0	0	60	18	6		...			...			9	3	0	0	60	18	6
British Flag	18	2	3	5	134	7	0		...			...			18	2	3	5	134	7	0
Harbour View	99	8	0	12	852	0	6	94	17	3	0	725	3	1	194	5	3	12	1,577	3	7
Rio Tinto	6	10	0	2	40	3	4		...			...			6	10	0	2	40	3	4
Blue Ribbon	11	6	3	18	69	7	9		...			...			11	6	3	18	69	7	9
Mount McMahon	5	0	1	12	22	11	7		...			...			5	0	1	12	22	11	7
Federal	8	13	1	10	24	17	2		...			...			8	13	1	10	24	17	2
Grimsby	9	19	3	26	15	10	10		...			...			9	19	3	26	15	10	10
O.K.	9	19	3	22	49	19	6		...			...			9	19	3	22	49	19	6
Mount Pleasant	3	18	1	1	15	6	1		...			...			3	18	1	1	15	6	1
Duke of York	1	16	1	6	0	9	1		...			...			1	16	1	6	0	9	1
Nil Desperandum	9	7	2	27	11	18	11		...			...			9	7	2	27	11	18	11
Flag Mining Company	40	5	0	12	415	13	11		...			...			40	5	0	12	415	13	11
Puzzler	32	18	3	13	136	9	9	9	17	0	14	39	18	4	42	15	3	27	176	8	1
C.D.C.	25	18	2	14	121	12	4	10	11	1	24	63	14	6	36	10	0	10	185	6	10
Mount Garritty	15	0	0	16	120	1	1		...			...			15	0	0	16	120	1	1
Christmas Gift	17	3	0	17	201	1	1	10	16	0	15	45	2	1	27	19	1	4	246	3	2
Copper Horseshoe	12	6	0	3	48	2	3	1	4	3	26	8	10	1	13	11	0	1	56	12	4
Marnoo	9	7	0	8	53	2	6		...			...			9	7	0	8	53	2	6
P.L.P.	22	1	1	18	107	8	2	25	3	1	5	142	9	2	47	4	2	23	249	17	4
Jas. Henry	6	0	3	22	38	9	2		...			...			6	0	3	22	38	9	2
Turn of the Tide	4	4	1	0	...				...			...			4	4	1	0	...		
D. Sutherland	2	17	0	2	5	15	6		...			...			2	17	0	2	5	15	6
Lady Jessie	0	16	1	21	11	18	10		...			...			0	16	1	21	11	18	10
Kundip	1	4	2	0	12	5	0		...			...			1	4	2	0	12	5	0
Whittaker Bros.	1	6	2	22	6	0	1		...			...			1	6	2	22	6	0	1
Red Hill	0	15	0	17	3	8	1		...			...			0	15	0	17	3	8	1
Afric	6	0	1	5	21	1	0		...			...			6	0	1	5	21	1	0
Acrasia	5	7	1	4	32	3	9		...			...			5	7	1	4	32	3	9
Content	5	2	1	6	13	16	3		...			...			5	2	1	6	13	16	3
Mount Desmond Extended	5	8	0	11	47	0	6		...			...			5	8	0	11	47	0	6
Mount Benson Extended		...			...			2	11	0	0	17	6	2	2	11	0	0	17	6	2
Tattersalls	4	19	3	26	46	11	9	2	12	3	19	17	9	5	7	12	3	17	64	1	2
Walter Dunn's P.A.		...			...			6	16	0	13	14	4	8	6	16	0	13	14	4	8
Birthday		...			...			11	15	2	10	57	15	3	11	15	2	10	57	15	3
Total	5,688	3	0	4	24,448	8	3	1,388	7	2	22	6,764	12	11	7,076	10	2	26	31,213	1	2

TABLE II.—*Ore Smelted during First and Second runs of Furnace, and in Stock on 31st December, 1905.*

	Gross Weight.	Net Weight.	Metal Contents by Assay.			Metal Contents paid for.			Gross Value.	Net Value.
			Copper.	Gold.	Silver.	Copper.	Gold.	Silver.		
	T. C. Q. L.	T. C. Q. L.	T. C. Q. L.	oz. dwt. gr.	oz. dwt.	T. C. Q. L.	oz. dwt. gr.	oz. dwt. gr.	£ s. d.	£ s. d.
Smelted in First run of Furnace	3,298 3 2 10	3,098 9 0 22	510 9 3 15	449 5 4	2,911 1	417 9 1 1	148 0 3	...	21,411 14 8	11,924 11 2
Smelted in Second run of Furnace	3,719 19 3 25	3,471 16 2 18	592 12 0 17	1,047 15 12	6,169 19	489 4 0 7	677 15 20	1,554 5 16	27,117 8 8	16,842 8 2
Total amount Smelted ...	7,018 3 2 7	6,570 5 3 12	1,103 2 0 4	1,497 0 16	9,081 0	906 13 1 8	825 15 23	1,554 5 16	48,529 3 4	28,766 19 4
Shipped to Perth for trial of Head's "Reliance" Furnace ...	31 11 2 0	29 19 3 19	5 1 0 4	3 8 0	28 0	4 2 0 0	...	...	205 0 1	115 0 4
In Stock on 31st December, 1905	510 10 1 18	476 4 3 23	74 4 2 26	284 10 15	797 5	60 5 3 11	228 11 22	8 14 0	3,929 14 5	2,331 1 10
Grand Total Purchased	7,560 5 1 25	7,076 10 2 26	1,182 7 3 6	1,784 19 3	9,906 5	971 1 0 19	1,054 7 21	1,562 19 6	52,663 17 10	31,213 1 6

TABLE III.—*Extraction of Metals by Smelting.*

Net tons of Ore smelted, 6,570·2929.	Copper.			Gold.			Silver.		
	Tons.	Per cent. of Total.	Per ton of Ore.	Ounces.	Per cent. of Total.	Per ton of Ore.	Ounces.	Per cent. of Total.	Per ton of Ore.
			per cent.			ounces.			ounces.
Metal contents according to ore assays	1,103·1018	100·00	16·79	1,497·0333	100·00	0·228	9,081·00	100·00	1·38
Return from smelting according to Works assays of furnace products	899·1519	81·50	13·69	1,279·0270	85·44	0·195	7,358·00	81·03	1·12
Metal finally sold (last shipment estimated)	869·6902	78·84	13·24	1,321·0890	88·25	0·201	7,275·70	80·12	1·11
Total loss of metal	233·4116	21·16	3·55	175·9443	11·75	0·027	1,805·30	19·88	0·27
Loss in smelting	203·9499	18·49	3·10	218·0063	14·56	0·033	1,723·00	18 97	0·26
				gain.	gain.	gain.			
Loss in realisation	29·4617	2·67	0·45	42·0620	2·81	0·006	82·30	0·91	0·01

TABLE IV.—*Shipments and Sales of Furnace Products.*

Vessel.	Date of shipment at Albany.	Date of arrival at Liverpool.	Weight Shipped.		Weight Sold.							Loss of Weight.				Metal Contents according to Smelting Works Assays, Ravensthorpe.							
						Tare.										Copper.				Gold.		Silver.	
			Gross.	Net.	Gross.	Moisture.		Bags.		Total.		Net.	On gross weight shipped.		On net weight shipped.		Assay.	Fine metal.	Assay less 1·3 units.	Fine metal.	Assay.	Ounces.	Assay.	Ounces.
			tons.	tons.	tons.	tons.	% of gross.	tons.	% of gross.	tons.	% of gross.	tons.	tons.	%	tons.	%	%	tons.	%	tons.	ozs. per ton.		ozs. per ton.	
Reported in Annual Report, 1904	...	...	481·5179	472·8844	478·8250	·3638	·08	7·7460	1·60	8·1098	1·68	470·7152	10·8027	2·24	2·1692	0·459	66·98	316·7482	65·68	310·6007	·5678	268·485	3·96	1,872·2
Wilcannia	22-5-05	22-7-05	190·5776	186·6586	189·6410	·1192	·06	3·4875	1·84	3·6067	1·90	186·0343	4·5433	2·38	0·6243	0·334	62·92	117·4400	61·62	115·0190	·6650	124·095	3·15	587·4
Afric	30-6-05	14-8-05	142·8928	140·0500	141·5214	·1018	·07	2·9353	2·07	3·0371	2·14	138·4843	4·4085	3·08	1·5657	1·118	64·265	90·0033	62·965	88·1825	·8100	113·407	5·23	732·1
Suevic	21-7-05	6-9-05	107·5781	105·8000	107·7084	·0603	·06	2·2705	2·11	2·3308	2·16	105·3776	2·2005	2·04	0·4224	0·399	65·95	69·7793	64·65	68·3997	·7540	79·837	4·34	459·4
Persic (Matte)	26-8-05	13-10-05	33·0790	32·4885	33·0071	·0138	·04	0·6322	1·91	0·6460	1·95	32·3611	0·7179	2·17	0·1274	0·392	66·81	21·7055	65·51	21·2832	·7730	25·114	7·20	233·9
Runic	16-6-05	6-11-05	52·9264	51·9815	52·5844	·0219	·04	1·0884	2·07	1·1103	2·11	51·4741	1·4523	2·74	0·5074	0·976	66·81	34·7289	65·51	34·0531	·7730	40·1817	7·20	374·2
Medic	19-10-05	5-12-05	174·7196	171·5900	173·6210	·0728	·04	3·3973	1·95	3·4701	2·00	170·1509	4·5687	2·61	1·4391	0·838	70·82	121·5190	69·52	119·2883	·8890	150·753	8·72	1,497·6
Total Matte (of which full returns are available) ...	...	...	1,183·2914	1,161·4530	1,176·9083	·7536	·06	21·5572	1·84	22·3108	1·90	1,154·5975	28·6939	2·42	6·8555	0·590	66·46	771·9242	65·16	756·8265	·6904	801·873	4·96	5,756·8
Torrhead (partly estimated) ...	28-12-05	...	141·6500	139·1750	...	...	...	...	...	...	...	**138·3539**	...	...	**·8211**	**0·590**	67·26	93·6107	65·96	91·8014	1·2310	171·345	9·02	1,255·5
Grand Total Matte (partly estimated)	...	...	1,324·9414	1,300·6280	...	...	...	...	...	...	...	1,292·9514	...	...	7·6766	0·590	66·55	865·5349	65·25	848·6279	0·7483	973·218	5·39	7,012·3
Persic, Black Copper	26-8-05	13-10-05	36·5800	36·5800	36·5768	...	...	...	...	...	...	36·5768	0·0032	0·009	0·0032	0·009	91·90	33·6170	90·60	33·1415	8·3600	305·809	9·45	345·7
GRAND TOTAL (estimated figures included)... ...	...	...	1,361·5214	1,337·2080	...	...	...	...	...	...	...	1,329·5282	...	...	7·6798	...	...	899·1519	...	881·7694	...	1,279·027	...	7,358·0

NOTE.—Figures in heavy type are estimated from averages of previous shipments.

Table V.

Shipment.	Net Weight Sold.	Metal Contents and Value Realised.													Amount realised from Sale of Bags, etc.	Total Value realised. (Gross).
		Copper.				Gold.				Silver.						
		Assay, less 1·3 units (sale assay.)	Fine Copper.	Price realised (B.S. Copper) per ton.	Value.	Assay per ton.	Fine Gold.	Price realised per ounce.	Value.	Assay per ton.	Fine Silver.	Price realised per ounce.	Value.			
	Tons.	%	Tons.	£ s. d.	£ s. d.	ozs.	ozs.	£ s. d.	£ s. d.	ozs.	ozs.	s. d.	£ s. d.		£ s. d.	£ s. d.
Reported in Annual Report, 1904	470·7152	64·95	305·7542	70 11 8·65	21,581 19 7	0·51	239·292	4 1 7·75	976 17 2	4·3	2,014·439	2 2·8	224 19 10		18 5 6	22,802 2 1
Wilcannia	186·0343	58·98	109·7206	72 2 6	7,913 12 0	0·66	122·543	4 2 0	502 8 6	2·7	499·302	2 $3\frac{3}{16}$	56 11 3		10 11 9	8,483 3 6
Afric	138·4843	62·98	87·2164	74 3 9	6,470 7 4	0·80	110·483	4 2 0	452 19 7	4·9	675·716	2 $3\frac{9}{16}$	77 11 11		8 18 0	7,009 16 10
Suevic	105·3776	63·83	67·2660	76 5 0	5,129 0 8	0·76	79·684	4 2 0	326 14 1	4·1	430·395	2 $4\frac{1}{16}$	51 9 7		6 16 10	5,514 1 2
Persic (matte)	32·3611	69·60	22·5233	76 17 6	1,731 9 7	0·72	23·300	4 2 0	95 10 7	7·1	228·793	2 $4\frac{1}{2}$	27 3 5		1 18 0	1,856 1 7
Runic	51·4741	64·82	33·3655	77 3 9	2,575 8 0	0·70	36·032	4 2 0	147 14 7	6·7	344·876	2 $5\frac{1}{8}$	41 17 0		3 5 7	2,768 5 2
Medic	170·1509	70·06	119·2024	84 16 3	10,109 17 1	1·15	195·150	4 2 0	800 2 4	8·5	1,449·881	2 $5\frac{3}{8}$	177 9 2		10 3 7	11,097 12 2
Total Matte (of which full returns are available) ...	1,154·5975	64·53	745·0484	74 10 2	55,511 14 3	0·70	806·484	4 1 $10\frac{3}{4}$	3,302 6 10	4·9	5,643·402	2 $3\frac{15}{16}$	657 2 2		59 19 3	59,531 2 6
Torrhead (estimated) ...	**138·3539**	...	**90·3510**	**82 0 0**	**7,408 15 8**	...	**171·345**	**4 2 0**	**702 10 3**	...	**1,255·5**	**2 6**	**156 18 9**		**8 18 0**	**8,277 2 8**
Grand Total Matte (partly estimated)	1,292·9514	...	835·3994	...	62,920 9 11	...	977·829	...	4,004 17 1	...	6,898·9	...	814 0 11		68 17 3	67,808 5 2
Persic—Black Copper ...	36·5768	93·75	34·2908	77 5 0	2,648 19 2	9·38	343·260	4 2 0	1,407 7 4	10·3	376·8	2 $4\frac{9}{16}$	44 16 10		...	4,101 3 4
Grand Total (figures in heavy type included) ...	1,329·5282	...	869·6902	...	65,569 9 1	...	1,321·089	...	5,412 4 5	...	7,275·7	...	858 17 9		68 17 3	71,909 8 6

Note.—Figures in heavy type are estimated, thus:—

Torrhead Estimate:—

Net Weight shipped, 139·175 tons.
Less 0·59 per cent. loss in transit, ·8211 tons.
Net Weight sold taken as, 138·3539 tons.

Copper according to works assays = 93·6107 tons.
Average return = 96·52 per cent. of works estimate = 90·351 tons.
Value taken at B.S., £82 per ton.

Gold according to works assays = 171·345ozs, Silver = 1255·5ozs.
Average return previous shipments, Gold, 100·58 per cent.; Silver, 98·03 per cent.
Gold and Silver for estimate taken at works return, Silver at 2s. 6d. per oz.

TABLE VI.—*Realisation Expenses from Albany.*

Shipment.	Fine Copper sold.	Freight and Shipping Expenses.		Insurance.		Commission.		Weighing, Sampling, and Assaying.		Interest and Exchange.		Telegrams.		Returning Charges.		Total.	
		Per ton of fine Copper sold.	Total.	Per ton of fine Copper sold.	Total.	Per ton of fine Copper sold.	Total.	Per ton of fine Copper sold.	Total.	Per ton of fine Copper sold.	Total.	Per ton of fine Copper sold.	Total.	Per ton of fine Copper sold.	Total.	Per ton of fine Copper sold.	Total.
	tons.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Reported in Annual Report, 1904	305·7542	2 10 1	765 12 2	0 3 3	50 1 5	0 8 1	122 18 10	0 4 4	66 15 0	0 8 1	123 7 2	0 1 7	24 16 11	9 2 10	2,794 13 10	12 18 3	3,948 5 4
Wilcannia	109·7206	2 16 10	311 15 3	0 3 4	18 5 3	0 6 10	37 15 1	0 3 7	19 14 0	0 13 0	71 7 11	0 0 7	3 1 10	8 10 0	932 12 6	12 14 2	1,394 11 10
Afric	87·2164	1 17 0	161 10 2	0 3 4	14 7 2	0 7 2	31 6 10	0 4 2	18 1 0	0 14 5	62 18 6	0 0 5	1 15 11	8 10 0	741 6 9	11 16 6	1,031 6 4
Suevic	67·2660	1 16 6	122 19 1	0 3 4	10 16 11	0 7 4	24 14 3	0 3 3	10 19 0	0 9 1	30 10 9	0 0 5	1 7 8	8 10 0	571 15 6	11 9 11	773 3 2
Persic (Matte)	22·5233	1 13 6	37 13 11	0 2 7	2 18 3	0 7 5	8 6 5	0 6 2	6 18 6	0 9 4	10 11 1	0 1 5	1 12 5	8 10 0	191 9 1	11 10 5	259 9 8
Runic	33·3655	1 16 6	60 16 5	0 3 2	5 6 6	0 7 6	12 10 1	0 3 9	6 3 8	0 10 7	17 13 9	0 1 4	2 4 7	8 0 0	266 18 6	11 2 10	371 13 6
Medic	119·2024	1 13 6	199 10 3	0 2 11	17 11 5	0 8 6	50 14 5	0 2 11	17 2 2	0 13 9	82 2 4	0 0 5	2 12 3	8 0 0	953 12 5	11 2 0	1,323 5 3
Total Matte	745·0484	2 4 7	1,659 17 3	0 3 2	119 6 11	0 7 9	288 5 11	0 3 11	145 13 4	0 10 8	398 11 6	0 1 0	37 11 7	8 13 3	6,452 8 7	12 4 4	9,101 15 1
Persic (Black Copper)	34·2908	1 9 10	51 3 11	0 3 11	6 14 7	0 11 2	19 2 8	0 17 2	29 9 1	0 15 5	26 7 8	0 0 11	1 12 1	8 0 0	274 6 6	11 18 5	408 16 6
Total	779·3392	...	1,711 1 2	...	126 1 6	...	307 8 7	...	175 2 5	...	424 19 2	...	39 3 8	...	6,726 15 1	...	9,510 11 7
Torrhead (estimated)	**90·3510**	**1 15 6**	...	**0 3 2**	...	**0 7 9**	...	**0 4 0**	...	**0 10 8**	...	**0 1 0**	...	**8 0 0**	...	**11 2 1**	**1,003 5 6**
GRAND TOTAL (partly estimated) ...	869·6902																10,513 1

NOTE.—Figures in heavy type are estimated.

	£	s.	d.
Total gross value realised (Table 2)	71,909	8	6
Total realisation expenses from Albany	10,513	17	1
Net value at Albany	£61,395	11	5
Total realisation expenses Smelter to Albany	4,101	10	6
Net value at Smelting Works	£57,294	0	11

Appendix No. 4.

The Coolgardie-Norseman Railway.

From the Mining Point of View.

The route of the proposed railway from Coolgardie, *via* Burbanks, Londonderry, and Widgiemooltha to Norseman, traverses country more or less favourable for the occurrence of gold throughout its entire length, and a little gold has been found at several points along it, but without any very important discoveries having yet been made. The district round Burbanks, besides the larger mines, contains several smaller ones of considerable promise, but this district is so close to the existing railway that the facilities for opening up its mines will be very little bettered if the proposed line to Norseman is made. They would doubtless contribute a small amount to the revenue of the railway, especially for supplies of firewood and mining timber, but it is hardly likely that the construction of the line would affect the cost of working to any extent which would act as an appreciable stimulus to their further development. This district would therefore receive some little benefit from the railway and would contribute a small amount of traffic, but neither of these considerations is of itself of such importance as to be seriously taken into account in coming to a decision as to whether the railway ought to be constructed.

At Londonderry there is no mining of consequence in progress, but as the district is recorded as having produced close on 15,000 ounces of gold, it is one which is sure to attract attention from prospectors, and may again come into prominence at any time. The construction of the railway would doubtless encourage renewed prospecting in this locality, and would enable machinery to be put there more cheaply than is now possible. At present, however, the Londonderry district is negligible as a factor in the success of the railway.

At Widgiemooltha there are several lodes known to be gold-bearing, and gold has been found over a considerable area. Some of the lodes are of fairly large size, and a good deal of work has been done in testing them. So far as they have been tried they have given a rather low average return, but some good bunches of ore have been obtained at times. At present there are about 28 men on the field engaged in breaking out quartz, and the State battery has lately been running pretty constantly. The recorded production of this district is:—

	Alluvial.	Dollied and specimens.	Ore crushed.	Gold obtained.	Average per ton treated.
	ozs.	ozs.	tons.	ozs.	ozs.
To end of 1903	6·20	416·49	6,100·15	2,499·66	·41
During 1904 (fine)	...	12·09	556·60	719·35	1·3
Total	6·20	428·58	6,656·75	3,219·01	·48

It is only lately that there has been any cyanide treatment of the tailings from the crushings, so it is probable that the average returns in a fully equipped mill would have been 12 to 15 dwts. per ton. The production up to date is small, but it is likely that if the railway were constructed some of the reefs would be worked more vigorously, and machinery placed upon them. This is a locality that would, without doubt, receive much benefit from the construction of the railway, and in return would supply a certain amount of traffic for it. It is 50 miles from Coolgardie, and under present circumstances it is a costly matter to put machinery on the mines, but with the advent of the railway I have little doubt that these would receive a good deal of attention, and there seems much likelihood that at least one or two of them would be worked on a considerable scale. Widgiemooltha at its present population cannot be regarded as offering much support to the railway, but there is much reason for hoping that it will greatly increase in importance if the railway is made.

The mining centres between Burbanks and Norseman being as yet of small importance it is evident that the case for the construction of the line almost entirely depends on the prospects of the latter field. I have given a fairly full report on the district in my annual report for 1903, published in the annual report of the Department of Mines for that year, and would refer to it for remarks on the structure of the field and notes upon several of the mines. The developments of the last two years have not made any great difference in the general position of affairs as then described. The statistics of the Mines Department show the following as the production of the district:—

	Alluvial.	Dollied and specimens.	Ore crushed.	Gold obtained.	Average per ton treated.
	ozs.	ozs.	tons.	ozs.	ozs.
To end of 1903 (bullion) ...	1,871·76	2,349·18	249,674·88	253,146·18	1·01
During 1904 (fine)	118·50	1,227·68	33,431·50	30,584·09	·91
Total	1,990·26	3,476·86	283,106·38	283,730·27	1·00

Total gold ... ... 219,197·39ozs.
Add fine silver, 1904 ... ... 3,162·88ozs.

Total bullion ... ... 292,360·27ozs. equal at its average value of £3 11s. 6½d. per ounce (1903) to a total value of £1,045,492·5.

Of the above return over half is due to two companies, the Princess Royal G.M. Co., N.L., and the Norseman Gold Mines, Limited, the production from which is recorded thus :—

	Ore treated.	Gold produced.	Average per ton treated.
Princess Royal G.M. Co., No-Liability.			
	tons.	ozs.	ozs.
To end of 1903	89,768·50	112,791·53	1·26
During 1904	22,261·00	20,221·91	·91
Total	112,029·50	133,013·44	1·19
Norseman Gold Mines, Limited.			
To end of 1902	75,831·50	48,714·19	·64
During 1904	155·50	171·46	...
Total	75,987·00	48,885·65	·64

The Break-o'-Day (11,533·36 fine ounces to end of 1904) and Lady Mary mines and leases (19,605·35 fine ounces) have also been considerable producers of gold, and during the last two years the Cumberland mine, including Mt. Benson leases (13,639·56 fine ounces) has also come to the front. Outside of these, however, there has been a balance of, roundly, 60,000 ounces of gold bullion from a large number of smaller mines scattered over a belt of country some 32 miles in length, extending from Dundas on the south to the Peninsula on the north. Many of these are very promising prospecting propositions, only requiring active development to become important mines. The general average return from the whole field is seen to be the very satisfactory one of an ounce of gold to the ton of quartz, but this has been due to the fact that under existing circumstances a fairly high return is necessary in most cases to pay working expenses, and only the best ore could, therefore, be milled. All over the field there are abandoned workings which have not proved payable, but which, under more favourable circumstances, would give a good profit. With better facilities for working, it is probable that the average yield of the field would fall to from 10 to 15dwts. of gold per ton, but the tonnage crushed would increase very greatly. There can be no question that the construction of the railway would enormously facilitate and stimulate the working of these lower-grade mines, enabling many of them to become important producers.

The Princess Royal mine has paid in dividends to 31st October, 1904, a total of £112,000. The deepest level from the main shaft is at 500 feet, but a winze has been sunk from this to the 600 feet level. At the 500 feet level the reef has been driven along for a long distance, both north and south, but the value of the ore has not been so satisfactory as in the upper levels, being very patchy. There is some very good ore but not the large bodies of good grade material that were found higher up. This unfavourable turn has caused many gloomy prognostications as to the future of the mine, but it does not seem to me that there is yet any great reason for over-anxiety, there being much hope that the lower levels will show improvement again. For the present, however, the mine is compelled to go in for an excessive amount of development work, in proportion to the ore breaking, in the endeavour to open up fresh reserves of milling stone, and its prospects are not so bright as they were before the No. 5 level was opened.

The testing of the Princess Royal reef at the lower levels is fortunately being carried on energetically by the Princess Royal Central Company, who hold ground to the south of the Princess Royal leases, into which the reef passes in depth on account of its somewhat flat underlay. They have sunk a fine main shaft 974 feet deep, which cut the reef at 940 to 950 feet. At 950 feet a level has been opened, and driving begun, both north and south. At this level the reef is a strong one, six to eight feet wide from wall to wall, with well-smoothed walls and every appearance of permanency. Some of the ore is very good looking, and a little gold has been seen, but at the time of my visit very few tests had been made as to the value of the ore. Some of it was stated to be worth 9dwts. to the ton, but no milling tests had been completed. From the position of the shaft, it had been expected that it would strike the reef in a poor place, between the two principal shoots of ore known in the Princess Royal mine, and the results obtained are regarded as very encouraging. Driving north at this level, the boundary of the Princess Royal ground is again soon reached, and I understand that negotiations are in progress between the two companies whereby the Princess Royal may extend the level into their own ground, working from the Central shaft. Driving south, the Princess Royal Central Company have the reef in the lease for a long distance, and expect to pick up the southern shoot of gold, which has been the mainstay of the older company. Developments are, therefore, just now in a very interesting stage, and it will soon be known whether the Princess Royal reef is of value in depth. Should it prove so, the future of both companies is assured, and there will be a great improvement in this portion of the Norseman field. An amalgamation of the two companies is very desirable in the best interest of both and of the field.

The Norseman Gold Mines, Limited, have been doing very little development work for about three years past, the mines having been principally in the hands of tributors. The value of the ore is reported to have fallen off at the lower levels, and the country became very hard, the cost of working eventually overtaking the returns from the gold. The "Mildura" shaft is down 500 feet on the underlay of the reef, but only a very short distance has been driven on the course of the reef at the 500 feet level. The walls are well marked, but at this point the lode channel is much filled with "horses" of somewhat altered country, with only bunches and strings of quartz. In the shaft the lode runs from 4 to 10 feet in width between the walls, and contains a good deal of altered country. Fair values are stated to have been

obtained from some of the quartz in the lower part of the shaft, but no body of good ore. The test is nevertheless altogether insufficient to condemn the mine upon, as the values in it run in "shoots," and it is quite probable that the shaft happens to be in poor ground outside of one or more of these. The reef cannot be regarded as tested at all until a considerable distance has been driven along it at the bottom level. There seems to me to be every inducement to go to the expense of thus testing the ground, and very good hope that payable ore would be discovered.

The "Viking" shaft is down 575 feet on the underlay, on the same reef as the "Mildura" shaft, and shows a lode four to eight feet wide, with well-marked walls, and composed of quartz and altered country. The values obtained in this, also, were, I understand, somewhat poor and erratic, and no driving has been done at the bottom of the shaft. In the upper levels the tributors continue to obtain fair stone, and there seems no reason to fear as to the deeper ground if it were well opened up.

The company appear to have become discouraged on account of their operations resulting in a small but continual loss, the poor values obtained in the two shafts, and the hardness of the lower levels, and therefore ceased their efforts to open up the reef. There seems to me, nevertheless, much reason for resuming work, there being, in my opinion, still a very good chance of success if development is gone on with energetically. According to Mr. Thomas, M.L.A., the manager of the company, the loss in working averaged only about £24 6s. 6d. a month, equal to 2½d. per ton on the average monthly output of 2,300 tons. At present rates for labour and cyanide of potassium, both of which are now considerably cheaper than when the mine was working, there would have been no loss, but a small surplus. The prospects of reopening this mine would be very much improved if there were railway communication with Norseman.

In the Valkyrie mine the main shaft is some 270 feet deep on the underlay, but the work now going on is being done at the 140 feet level. Some very rich ore has recently been got from this reef, which deserves to be worked on a much larger scale than at present.

On the Mararoa reef, there has been a good development at the 80-feet level, the reef being found to be from 25 to 30 feet in width. Crushings, taking the stone as it comes, are stated to have averaged 12dwts. per ton. This mine, in my opinion, appears to be a very promising venture, and should be worked on a larger scale, with a battery on the spot. It has been worked in a small way for some five years past, by the present owners, with payable results, and should be much more profitable if worked on a larger scale.

Between Norseman and Princess Royal, several mines are being worked in a small way with, on the whole, fair results. There are two men on the "Bethnal Green" on about three feet of stone, said to be of half-ounce value; two on the "Northern Star," raising quartz worth about two ounces to the ton, but taking only six to 18 inches of a reef averaging three feet in width; three on the "St. Patrick," raising rock returning two and a-half ounces per ton, but also saving only the best portion of their reef; two on the "Iris," sinking for the underlay of the St. Patrick reef; four on the "Kyneton," working about four feet of stone, which has returned from nine to 15 pennyweights per ton by amalgamation alone; four on the "Venture," with 18 inches to four feet of stone, from which 400 tons are said to have yielded over an ounce of gold per ton; and five on the "Desirable," who expect their ore to yield about half an ounce to the ton. All these mines could be worked on a much larger scale with benefit, but require machinery and development, for which capital is at present not available. There are also several other reefs in this part of the field that have been abandoned as not payable just now, but which have given yields that lead to the belief that they might turn out well if properly opened up.

The Cumberland G.M. Company, N.L., has, during the last two years become a considerable employer of labour and producer of gold from its mine on the old Mount Benson lease, but has not latterly done much work on the reef described in my 1903 report. The main shaft is down 410 feet on the underlay, which is at 70 degrees from the horizontal, and levels have been opened at 142 feet, 245 feet, and 343 feet. The reef is somewhat small, averaging about 2½ feet of quartz, and is of the fissure type, with well-marked walls. In the lowest level the country becomes very hard. There are several reefs in the Mount Benson lease which have been worked in a small way in the softer ground near surface, but have been abandoned by the prospectors when the rock became hard. Some of these are being opened at greater depth by the present owners. The average yield from the mine, so far, has been satisfactory, the return being about 28dwts. per ton of quartz, and the mine seems to be in a fair way to hold its own. About 50 men are employed. The mine has its own battery and cyanide works, but no slimes-treatment plant.

In the Break-o'-Day mine, a little work has lately been done, which resulted in finding some very good ore near the bottom of the main underlay shaft, where previously the stone had all been very poor. It was not clear at the time of my visit whether this find was portion of the foot wall part of the reef that had been overlooked, and so an important discovery, or merely a bunch of richer ore in the foot wall, but it was encouraging as showing that the values do not entirely die out in depth in this reef, as had previously seemed to be the case. There seems a good chance of this mine again coming into prominence.

On the Ironstone Hills line of country very rich ore has been got in "Ziegler's," the "Lucky Call," and the "Alphadar" mines, which are worked by small parties of men without machinery. The Ironstone Hills are really a large "lode formation," and where this is traversed by cross veins and later fissures, there seems to have been often very rich bunches of gold ore deposited in these. A good deal of the alluvial gold in the district has been got in gullies running into these hills, and rich patches of "specimens" repeatedly found in them. At the "Lady Miller" mine the formation is itself auriferous over what has now been proved to be a considerable area. In my 1903 report this mine was described under its then name of "Alickizander," but considerable progress has since been made. A shallow tunnel about 12 feet wide has been driven into the formation a distance of over 80 feet, and the whole of the excavated material has been crushed. A cart is taken into the tunnel, and the ore is thrown down

into it through a shoot, being thus easily obtained. The ore is rubbly jaspery quartz veins, and much brown oxide of iron, and is stated to have returned 7½dwts. of gold per ton by amalgamation, with tailings assaying 5dwts. per ton. The old "Alickizander" shaft has been sunk to 135 feet, and a drive put in southwards 146 feet. The material from this work is reported to have yielded half-an-ounce of gold per ton by amalgamation, with tailings assaying 7dwts. per ton, a width of four or five feet of ore being taken. It is evident that there is a very large body of stone in the vicinity of these workings carrying more or less gold, and the results obtained are good enough to excite strong hopes that this deposit can be successfully worked on a very large scale. At present the ore is carted to the Lady Mary battery.

There are many other small mines throughout the field which are being worked by small parties of men, and a great many reefs are known and have been partially tested, but are not at present working. Enough, however, has been said to show that the district does not depend on one or two reefs, but has a very large number as yet undeveloped to fall back upon in the event of failure of some of the better-known mines. This fact puts it in a much stronger position in asking for a railway than if there were only two or three principal mines.

The Norseman field suffers very severely on account of its isolated position in several important particulars. There are two days' expensive travelling by coach from Coolgardie, or four days' walking to be undertaken by men wishing to try there for employment, and consequently the supply of casual labour is very limited. Skilled workmen and mechanics have usually to be engaged in the larger centres and brought down to the field at the expense of the mine, and it becomes a serious matter to obtain their services unless constant work can be secured to them for a considerable time. The difficulty of access also hinders prospectors from coming to the district, and deters investors from visiting it. It is a somewhat serious matter for busy men to spare the time to go to such an out-of-the-way place, and they therefore pass it by in favour of others that are more readily reached. The high freights on goods of all sorts make the cost of living perceptibly greater than in more favourably situated places, and the amount brought to the field is limited to the minimum that will serve. On mining machinery and supplies the freight becomes a very heavy tax indeed, as the following examples quoted by Mr. Ridgway, manager of the Princess Royal mine, will show:—

	£	s.	d.
Five tons Coke @ 82s. 6d.	20	12	6
Railage, Fremantle to Coolgardie	8	2	6
Agency and Charges	3	15	0
Cartage @ £6	30	0	0
	£62	10	0

= £12 10s. a ton, *i.e.*, coke costing £4 2s. 6d. in Fremantle costs £12 10s. in Norseman.

Similarly, cement costing 12s. 6d. per barrel in Fremantle costs £2 16s. per barrel in Norseman, and fire-bricks costing £8 17s. 6d. per 1,000 at Fremantle cost £34 19s. per 1,000 delivered on the mines.

For the 16 months ended April 30th, 1905, the Princess Royal Company paid for cartage from Coolgardie:—

	£	s.	d.
On Stores, Materials, etc., 164 tons 8cwts.	1,173	6	8
Explosives, 34 tons	238	0	0
Local Stores, 10 tons	70	0	0
208 tons 8cwts.	£1,481	6	8
	or £7 2s. 2d. a ton.		
On Machinery, 92 tons 13cwts.	£753	17	6
	or £8 2s. 9d. a ton.		

For the period in question, the cost of freight, as above, amounted to about 1s. 7½d. per ton of ore crushed.

Mr. Thomas, M.L.A., has supplied the following figures from the books of the Norseman Gold Mines, Limited, which serve further to show the importance of the question of carriage of stores and machinery to mines in this district:—

	£	s.	d.
Amount spent in wages to 31st May, 1902	106,525	18	4
Amount spent in stores (apart from plant)	50,934	19	2
Amount spent in plant and machinery	39,768	10	0
Total expenditure (not including Coolgardie or London)	£197,229	7	6
Amount spent in carriage	£17,707	14	7

The carriage was on 1,320 tons, or at the average rate of £13 8s. 3d. a ton, but some of the goods came from Esperance, not from Coolgardie. Railage to Coolgardie, at about £3 10s. a ton, is not included in the carriage figures.

The tonnage crushed was 73,407 tons, on which the cost of carriage, £17,707 14s. 7d., constituted a charge of 4s. 10d. a ton. Had there been railway communication the cost would have been under 5d. per ton, and the mine would have made a substantial profit.

The actual cost of freight is by no means the whole of the handicap the mines suffer from, as delay in obtaining goods often is almost equally serious. The carriers' teams are at times, especially in wet weather, very much delayed on the road, taking often over three weeks on the journey from Coolgardie. The manager of the Princess Royal Central Mine stated that he had a casting six weeks on the road between Coolgardie and Norseman and would have saved £300 expended in struggling to carry on work without it if it could have been promptly delivered. All foundry work which cannot be done locally is very slow in being obtained, and often heavy costs are incurred in consequence, on which no definite figures can be

placed. The grave importance and cost of delays in obtaining mining necessaries is obvious to any practical man, being often far more serious than the whole cost of the goods themselves.

That the railway to Norseman would be of enormous benefit to the field goes almost without saying, and there can be little question that its construction would lead to a great expansion of mining there. The field is easily able to support ten times its present population, and there are numerous promising reefs waiting the attention of companies with capital to give them a proper mining equipment and see them through the initial development stages, out of which several important mines may be expected to eventuate. Under existing circumstances, the cost of equipping a mine with machinery is so excessive that it can hardly be wondered at that investors direct their attention elsewhere. But while I am personally of opinion that the district has a future which would soon justify the construction of a railway and make it a paying line, it cannot be denied that on the traffic at present in sight there is no chance of its paying even working expenses. There would, however, be a saving to the State of the labour of the men and animals at present engaged in the carrying trade which would be turned into other more productive channels. This saving would amount to from £5 to £6 a ton on all goods carried, and, in my opinion, the State is entitled to credit itself with this saving as a set-off to the interest and working cost of the railway, inasmuch as the unnecessary labour so employed at present is set free to do other work. Looked at in this light, the line would even now be a profitable concern to the country, although it might not be visibly returning actual working expenses, the gain being in the improvement of the public estate through the increased facilities allowing it to become more fully developed.

While very confident that the Norseman field will eventually develop into one of much more importance than at present, I would point out that the construction of the railway might not be at once attended with any considerable expansion of mining in it. The state of the mining market is a factor which has to be taken very seriously into account, for so long as it remains dull there is little investment of capital anywhere. Capital is required at Norseman, in addition to the railway, and without its introduction the position will not be greatly altered for the better, as small holders are, in most cases, not able to open up the mines on the scale which they require to make them successful. A revival of investment in mining in this State seems, therefore to me, to be necessary before this railway will become a paying one, and its probability has to be risked in making the line. We here come upon purely speculative ground, and the extent to which risk should be run by the State in anticipation of better times in mining must be a matter for individual judgment of members of Parliament in coming to their final decision. The fact of the railway being made would doubtless do a good deal towards bringing about a revival of interest in the Norseman field, and, at any rate, if it were constructed, the field would be put in a position to take advantage of a mining revival when it took place. Without the line it would be apt to be passed by for more accessible localities.

Appendix No. 5.

Report on Messrs. Mead and West's Reef, in the Helena River Valley, Darling Range.

The reef which Messrs. Mead and West have discovered lies about a mile and a-half north-easterly from Gooseberry Hill station, on the Upper Darling Range Railway, but low down in the valley of the Helena River, probably 500 or 600 feet below the station. The country is granite, with occasional greenstone dykes, and appears to be quite similar to that a little higher up the Helena River, which has been mapped by the Geological Survey in a coloured topographical and geological map published in the Annual Report of the Department of Mines for 1903. In this map several quartz reefs are shown at intervals along a line running about W.N.W. by E.S.E. Mead and West's reef is seen outcropping for only a short distance, its course being about N. 60 deg. W., with underlay to the north. Only a shallow hole, which has become partly filled up, has been sunk on the outcrop, and the reef has not been cut through, so neither its width nor its underlay are clearly visible. It appears to be strong body of rather glassy-looking quartz, much stained with oxide of iron, and is probably not less than three feet in thickness at the point where the hole has been sunk. By panning off a large dish of the rubbly portion of the reef, I was able to obtain a few very minute "colours" of gold, and assay samples brought away by me yielded, when tested by the Government Mineralogist and Assayer, as follows:—

(2.) From hole on reef—Gold, 10 grains per ton.
(3.) From outcrop to east of hole—Gold, 15 grains per ton.

Three stones from the outcrop previously brought to me by Mr. Mead were also assayed separately:—

(*a.*) Gave gold, 5 grains per ton.
(*b.*) ,, ,, *Nil.*
(*c.*) ,, ,, 5 grains per ton.

From these tests, it is evident that there is a minute quantity of gold in this reef, but, so far as opened, it is quite unpayable.

About three chains to the north-east from the outcrop a narrow belt of schist is seen running about N. 50° E., and, apparently, dipping to the south-east. This line of schist is traceable across country a long distance, and seems to me a line of fault in the granite, along which it has been converted into schist by pressure and friction of the walls of the fault. Such a line might, under favourable conditions, become a lode, and, if any more prospecting is done in the locality, I should recommend some attention be given it, and especially to its intersection with Mead and West's reef.

Some three hundred yards or so S.S.E. from Mead and West's reef there is a large, bold outcrop of quartz, traceable for some distance along a line running a little to the east of north. This quartz is granular in structure, and would often be classed as quartzite, but seems to be of the nature of a lode. It does not appear very promising for gold, though appearances are not to be relied on in a new district. A sample, taken by chipping a number of stones over the outcrop, was assayed by the Government assayer, with result—

Gold,—seven grains per ton.

The occurrence of traces of gold in these reefs of the Darling Range is interesting, but, as yet, of no practical value. There is no inherent improbability about gold being found in country of the geological structure of the Darling Range, and it is quite possible that payable reefs may be discovered sooner or later. The traces of gold are, however, not sufficient to justify any expense in opening up these reefs.

Mead and West's reef is on private land, the property of Mr. Morrison.

Appendix No. VI.

Report on the state of Mining Progress in the Kurnalpi, Mulgabbie, Pinjin, Edjudina, Yarri, and Yerilla Districts.

To the Secretary for Mines, Perth, W.A.

Mines Department, Office of the State Mining Engineer,
Perth, W.A., 12th December, 1905.

Sir,

1. I have the honour to report, for the information of the Hon. the Minister for Mines, having made a short visit to the above fields, in accordance with your instructions, for the purpose of ascertaining the state of progress of the mining industry and the conditions under which it is being carried on in them, and advising as to what can be done by the Mines Department to assist their development.

2. Leaving Kanowna on 31st October I went to Kurnalpie, a distance of about 40 miles, by the road *via* the "Bullock Holes," "Penny's Find," and the "Jubilee." This is a fairly good road, but owing to the very dry season there was very little water to be had. The "Bullock Holes," about 17 miles from Kanowna, are deep holes in a natural water-course, and have been fenced and fitted with a pump and trough, but were quite dry when I saw them. The water-course has an excellent catchment (ironstone gravel country), and is deeply scoured out by running water, showing that during heavy rains there must be a strong stream running through it, and a large dam could doubtless be filled very readily. A dam at this point would be of great value to teams travelling on the road. There was no water obtainable until the Jubilee Hotel was reached, 28 miles from Kanowna, where the supply of fresh water was almost run out, and Mr. Vivian was in consequence erecting a condenser.

3. No work was going on at "Penny's Find," a place about 19 miles from Kanowna, where gold was obtained some years ago. Several small shafts have been sunk, and there is much loose quartz lying about the surface of the ground. A good deal of dry-blowing has been done here at one time and another.

4. Nothing was done at the "Jubilee" either, though I was informed that there was some prospect of work being resumed in a small way. A good deal of mining work had been done in this locality some years ago, and one of the mines had considerable machinery. The country is somewhat hilly, the hills being of rather hard greenstone, seamed with numerous veins of quartz. A lot of the surface ground has been worked by dry-blowers. From information given to me I am inclined to believe that this locality deserves further attention from prospectors and investors.

Kurnalpie.

5. This once famous alluvial field is at present almost deserted, there being only two prospectors working on it at the time of my visit. Some 30 to 40 dry-blowers however are still employed round about Kurnalpie and the Jubilee. The alluvial deposits lie mostly in flat valleys on the higher ground and are fairly extensive, but have been well worked over. They often contain rounded water-worn pebbles, and seem to be of truly alluvial origin. A large area of this ground has been applied for on lease by a syndicate for the purpose of hydraulic sluicing, the intention, I understand, being to pump water from Lake La Page and use a dredge similar to that now in use at Coolgardie by the West Australian Sluicing Syndicate, Limited. Several pits have been sunk to test the ground, but I am not aware what results were obtained; according to local information they were satisfactory. If the Coolgardie sluicing venture is profitable it is likely that the Kurnalpie deposits will be worked also, as they are extensive enough to provide the large amount of workable ground required for a sluicing proposition, and their history shows that a very large amount of gold was obtained from them by the first diggers. The ground lies fairly well for working by the dredging method, especially in the upper part of the lead, which is pretty flat. Towards the south-west the ground becomes steeper, and there may be some difficulty in cleaning up after sluicing owing to roughness of the ragged rocky bottom, which there is of hard greenstone. Higher up the lead the bottom appears to be much smoother and more clayey. The stuff to be sluiced appears to contain a good deal of clay and would probably therefore use up more water than the brown ironstone material at Coolgardie. In parts there is a good deal of cemented stuff.

6. There are a large number of reefs in the vicinity of Kurnalpie on which some mining work has been done, but owing to their being abandoned I did not spend time going round the whole of them. There is only one battery in the district, a small one of five stamps, about three miles west of the townsite. This was worked till lately by its owners, McKenna and party, who were testing some leases held by them and trying also various old dumps. They did not crush for the public. They have now left the district and the battery is idle.

7. On the "*Hope*" *lease* (281K), formerly known as "Brophy's Kurnalpie Consols," several shafts have been sunk, one of them a whim shaft. The country is greenstone schist, much weathered near surface. There is a large amount of quartz all over the surface. One big body of quartz, four to six feet wide, runs about N. 15 deg. W. with underlay eastward somewhat flatter than one in one. A lot of stone has been broken out but has evidently not been considered worth carting to the battery. Some fair stone was, however, raised by McKenna and party from it, taking only one portion of its width. This reef is traceable southwards for a considerable distance.

8. To the south of the "Hope," on the road to the Government Well, there is another strong reef on which a lot of work has been done. It runs N.W. and S.E., and is nearly vertical where seen at the outcrop. A crushing is said to have returned 8dwts. per ton by amalgamation only.

9. The "*Queen of Sheba*" *lease* (297K) has a reef running N. 80 deg. E. underlaying north about one in three, about two feet six inches wide, which gives fair prospects, and has been traced for about 300 feet in length. They have worked down on the underlay for 50 feet, with a winze 25 feet deeper, and were sinking a vertical shaft at the time of my visit. The stone contains a good deal of pyrites. These prospectors were much troubled as to how they would get their stone crushed.

10. Towards the north-east corner of the ground taken up by the Sluicing Syndicate there is an old shaft sunk in the greenstone rock in search of cobalt ore, which occurs there, in small veins and joints through the rock, as cobaltiferous oxide of manganese or asbolite. Most of the veins seem very small, but I was told that a quantity of ore had been bagged and shipped to Europe for sale. My informant did not know the price realised. I do not think that these small veins could be profitably mined.

11. Large reefs exist on the old "Nil Desperandum" (1354E) and "Scottish Lass" (185E) leases, and on the latter there is a main shaft said to be 300 feet deep. On the "Nil Desperandum" some good dollying stone has lately been found in a leader.

12. On the "*Billy Billy*" *lease* (280K) there is a reef running N.N.W. by S.S.E. and underlying westward, which has been worked till quite lately by McKenna and party. They had three whip shafts down about 80 feet, and the reef averaged from 18 to 24 inches in width and crushed from 1 to 2 ounces per ton. It is said to have cut out in the bottom and the party could not sink deeper.

13. The Kurnalpie District (including Jubilee and Mulgabbie) is recorded as having produced to end of 1903 10,804·80ozs. (gross) of gold from alluvial workings and 469·89ozs. from leases, etc. During 1904 and the first nine months of 1905 the production recorded from Kurnalpie and Jubilee is shown in the following table:—

Lease.		1904.		1905.	
No.	Name.	Tons.	Fine Ozs.	Tons.	Fine Ozs.
	Alluvial	...	226·14	...	218·62
280K ...	Billy Billy	631·00	564·97	179·00	156·73
281K ...	Hope	33·00	35·94	...	...
Unregistered	Vivian & Party	8·50	9·54	...	...
299K ...	Kurnalpie Main Reef	...	...	80·00	25·69
Unregistered	G. Summers	...	...	D & S	4·25
		672·50	836·59	259·00	405·29

Probably as usual a great deal of the alluvial gold obtained was not recorded. The district has been noted for the occurrence of heavy nuggets, Bulletin No. 6 of the Geological Survey, Table 11, recording four weighing 197ozs., 168ozs., 109½ozs., and 51ozs. respectively. The reefs are numerous and strong, but so far as they have been tried are rather poor, and seem unlikely to have been the source of the heavy gold. My inspection was a very cursory one, but it seemed to me that the attention of prospectors had been directed to the quartz reefs only, without much search being made for softer "formations," which might equally well be the source of the alluvial gold. It seems improbable that in a field which has produced so much alluvial gold better reefs do not exist than those as yet discovered, and this locality therefore deserves great attention from prospectors.

14. As regards the prospects of the quartz reefs, I am at a loss to form a decided opinion for want of definite information as to values. They are evidently not barren, as more or less payable crushings have been taken from some of them, but the fact that the party owning the battery left the district after trying many of them does not speak well for their richness. Some of the local residents were nevertheless of opinion that if there were a public battery on the field a great many of the reefs would receive a further trial. It is obviously impossible for prospectors to send their ore 40 miles to Kanowna for treatment, and the first requisite to induce a fresh trial of the reefs is therefore that a battery should be available. The only one already there has not hitherto been open for public crushing, but no doubt its owners would be willing to make terms for its use now that they are not crushing with it themselves. I would therefore recommend that arrangements be made with them whereby it will not be removed from the field within, say, two years, and will be available for crushing for all comers at reasonable rates. This seems the most practical means of assisting the district at the present juncture.

15. Failing being able to insure the retention of the battery in the district, and getting it made available for public crushing, the erection of a State battery would come up for consideration. With the information in hand, however, this could not be recommended, as there is a strong presumption that none of the reefs except, perhaps, the "Queen of Sheba," are able to supply payable stone from existing workings. More prospecting must be done, and payable stone developed and raised before the erection of a State battery would be justified. The position, then, comes to be that the prospectors must work for months trying the reefs and getting out stone in the hope that they will be able to make such a showing that a State mill will be granted to them. But "while the grass is growing the steed is starving."

16. This case is a very common one throughout the fields, and how best to handle it is not an easy problem. Direct pecuniary assistance to prospectors is a dangerous expedient, liable to be very grossly abused. In my opinion, it is very rarely justifiable, unless some definite and measurable piece of work is to be done that will have a permanent value in opening up likely ground. But, even if restricted

to these latter cases, there are so many reefs in this State requiring prospecting that to make advances to all deserving parties would require a very large expenditure in subsidies and a great deal of cost in supervision. I can see no practicable means of discriminating among deserving applicants for assistance, and if it is given to one it would be claimable by all as a matter of right. The amount to be distributed annually would, therefore, have to be fixed by Parliament, and assistance could only be given to as many applicants as the sum voted would cover.

17. Assistance in other ways than by direct grants of money is much preferable, and one of the best ways in which the Government can assist mining is by publication of full information about the fields, whereby prospectors may know what has been found already and where there are the best chances of making new discoveries, and investors may learn the opportunities that exist for opening up mines. But while this is done to a considerable extent already by the maps and reports of the Geological Survey and the records of out-turn of gold published by the Mines Department, it has hitherto been considered inadvisable for Government officers to undertake obtaining the most important information of all from a prospector's and investor's point of view, namely, the values as shown by systematic sampling. That there are grave objections to Government officers doing this work I am well aware, as the Government becomes more or less responsible for the correctness of their results, and at times it is conceivable that there might be a severe strain on the integrity of the sampler, but after all no more risk is run than in the case of a private person or firm who send out men to do the same class of work. Thorough sampling is the course found necessary by mining investors and their engineers before they purchase mining properties, and is the business course for the Government also to follow before launching out into considerable expenditure for the benefit of a district unless it is being proved otherwise by actual working returns. Over and over again when considering propositions for Government expenditure in mining districts, I have found myself gravely handicapped by want of assured knowledge of values, and in need of the sampling that would be undertaken as a matter of course by a private investor in the same predicament. But sampling is a slow and tedious process, requiring both much time and expense, and cannot be attempted in a brief visit to a field. In the case of a district of considerable extent it involves the employment of a sampler and two assistants, who will camp on the field and regularly and thoroughly test the lodes, and make plans on which the results are recorded. This course would be most useful in old fields where a good deal of work has been done and where most of the leases have reverted to the Crown. The ground to be sampled could be reserved from occupation for mining purposes until the results of sampling were published, and might then be put up for public competition in case of there being more than one applicant for the same portion of it. The results would direct attention to the reefs that showed some likelihood of being workable, and would help to prevent time being lost in trying over and over again those that are hopeless. As a general rule it would be best to confine the sampling as much as possible to reefs on Crown lands, but tests of those on holdings might also be necessary in districts applying for the establishment of a State battery, railway, or expensive water supply, in order to enable the officer reporting on the proposition to have full information as to the condition and probable future of the mines on whose success that of the proposed work would depend.

18. In the case of the Kurnalpi district a thorough sampling of the known reefs, followed by a descriptive and geological report on the district by an officer of the Geological Survey, would put before the public all obtainable information, and would in my opinion do a great deal to reviving mining there. The sampling would also show if there was any prospect of success for a State battery, and would indicate whether any necessity is likely to arise in the near future for provision of a larger fresh water supply, the most important requisite for existence of a population in an arid district. The wells that serve the few residents now in the locality would not suffice if the number of people increased very much, and a large dam might become necessary.

19. There is a good supply of mining timber in the vicinity of Kurnalpi and for about nine miles further east. The country all the way from Kanowna is greenstone (amphibolite, diorite, etc.) and greenstone schist, but about nine miles east of Kurnalpi granite country comes in and continues to about four miles west of Pinjin, with the exception of another smallish belt of greenstone running through Mulgabbie. On the granite country there is as usual much sand, rendering the road very heavy in places. Travelling from Kurnalpi to Mulgabbie by road, though only about 34 miles' actual distance, is in consequence a rather toilsome day's journey for horses. At Yowie, about 9½ miles from Kurnalpi, there is a gnamma hole in flat granite rock which has been fitted with a pump. The water was low in the hole at the time I saw it and the pump out of order. The catchment was good and a large earth dam could be constructed if required. At about 20 miles from Kurnalpie there is another water supply at Gilgarna Rock, a large bare outcrop of purplish porphyritic granite. Here a small tank has been blasted out of the rock and fitted with pump and trough, and had been filled the week before my visit by a passing local thunder shower. A much larger supply could readily be obtained here by putting catchment drains round the rock and leading the water into a tank excavated in the earth clear of the rock. The granite here was of large crystalline texture and good colour, and would be of value for ornamental building purposes if more accessible.

Mulgabbie.

20. This district has been mapped and fully described by the Assistant Government Geologist, Mr. C. F. V. Jackson, in Bulletin No. 18 of the Geological Survey. His visit to the field was early in 1904, and since then little or no work has been done except on a few of the mines on the "Mulgabbie Perseverance" line of lode. The alluvial ground has been fairly rich, but has been very thoroughly worked over, and only a few men now remain engaged in dry-blowing. The alluvial ground is stated to have yielded a good deal of gold in "specimens" requiring dollying, and to have been richest close up to the outcrops of the reefs. Some of the gold was very fine, and may have been due to decomposition of telluride ores in the weathered portions of the lodes.

21. The owners of the "*Mulgabbie Perseverance*" *lease* (260K) have a vertical shaft down 190 feet, and were still sinking at the time of my visit. This party received an advance under Part III. of the Mining Development Act, 1902, in aid of their sinking, of two pounds per foot sunk, but not to exceed £200. After receiving the first instalment of £22, they had a good return from ore raised, and repaid the advance with interest, declining further assistance. The lode runs roughly N.W. and S.E., with underlay to the S.W. In the bottom of the shaft it was the full width of the excavation, about four feet, without showing any defined walls, the lode stuff consisting of crushed silicified country, sometimes almost entirely converted into dark massive quartz, sometimes schistose, impregnated with much pyrites, pyrrhotite, and chalcopyrite. The assays were stated to be very variable in value, but the stuff was considered by the owners to average fairly well. Two good bunches of telluride ore were found in sinking this shaft, together with much free gold. The lode matter is of similar type to that of the principal mines of Kalgoorlie, and the occurrence of telluride ores strengthens the resemblance. The lode appears to be a strong one in the bottom of the shaft, but requires to be driven upon to give some idea of the length of the ore chute. In the shallower workings in the oxidised country the lode is seen to underlay slightly to the S.W., and to have well-smoothed walls in places. Without sampling this mine right through one cannot form any decided opinion as to its future, but the appearance of the lode, the rich gold and telluride ore that have been got from it, and the size in the bottom of the shaft, all impressed me with a very favourable idea of it as being likely to turn out well. At the time of my visit an option had been taken over the mine by a Kalgoorlie investor, and there was expectation that he would develop it more vigorously than the prospectors have been able to do. Owing to the heavy mineralised nature of the ore and the occurrence of tellurides of gold, this ore will require more complex treatment than mere stamp milling, probably either roasting or fine grinding and bromo-cyaniding.

22. "*Ironclad*" *lease* (266K).—On this lease a vertical shaft has been sunk 190 feet, but owing to an unfortuate accident by which the owner was severely injured while working in it, nothing has been done for several months past. The rock on the dump of this shaft is massive crystalline greenstone, with a little pyrites in joints and veins. I saw nothing that would indicate that a lode had been cut, and crosscutting will probably be necessary before it is found. A short distance west of the deep shaft there are some workings on a quartz lode from which a bunch of very good stone was taken.

23. In "*Cables*" *lease* (263K) a shaft is down 100 feet on the telluride lode, which here seems small. Some very good ore was got in the upper workings, but the lode was poor in the bottom at the time of my visit. The lode stuff here is much ironstained quartz.

24. The "*Hope*" *lease* (303K, formerly quartz claim 34K) has two or three shafts down to about 70 feet depth, the present workings being all in the oxidised shallower ground. Some very rich ore has been got here in dark-coloured quartz and iron oxide, mostly in rich leaders.

25. The "*Mulgabbie Lucknow*" *lease* has two shafts 105 and 100 feet deep, in which the ore is similar in appearance to that in the Perseverance lode, but has not yet yielded tellurides, though sulphides are plentiful in it. About a chain to the west there is another lode in a shaft about 40 feet deep, said to yield about 5dwts. of gold per ton, the ore being a mixture of schist and veins of quartz, with a good deal of pyrites.

26. During 1904 and the first nine months of 1905 the production recorded from Mulgabbie is shown in the following table:—

Lease.		1904.		1905.	
No.	Name.	Tons.	Ounces.	Tons.	Ounces.
260K ...	Mulgabbie Perseverance	3·50	192·93		
	" "	D. & S.	49·43		
303K ...	Hope	2·50	14·83		
	"	D. & S.	25·97	D. & S.	31·01
		6·00	283·16	D. & S.	31·01

(The alluvial gold from this centre is included in Kurnalpie return. *See* page 8.)

27. Mining is certainly at a very low ebb just now at Mulgabbie, and unlikely to recover unless the option over the "Mulgabbie Perseverance" leads to that mine being worked on a larger scale by a company. There is still a good deal of shallow ground to be worked by the prospectors in which rich ore may be obtained similar to that which has hitherto kept the mines alive, but when this is gone there is not much chance of working-parties successfully handling the sulphide ore from the hard ground. I do not see that very much can be done to assist them. There is no considerable amount of stone in sight to justify the erection of a State battery, and as soon as the sulphide ore is reached an ordinary mill would not be effective. At present all the crushing is done either in dolly-pots or at a small 3-head prospecting battery situated about four miles south of the mines on the edge of the lake. The charge is £2 a ton for crushing, and the party crushing has to do all the work except driving the battery and finding firewood. The water is very dense. Boiler water has to be carted from the Mulgabbie dam, or, if condensed, costs 25s. per 100 gallons. The battery is stated to crush about one ton of hard stuff per 24 hours through 1,200 screens. Soft material has been crushed at a rate per hour, instead of per ton, for about £1 per ton, three tons going through an 800 screen in 24 hours. It is evident that only very rich stuff will pay under such circumstances.

28. The fresh water supply of Mulgabbie is obtained from a dam about four miles from the mines, which was well filled when I saw it. It is an excavation in the earth, without lining, but holds

well. There is a large catchment, and a much larger dam could be readily filled. The great evaporation during this summer will, however, in all probability dry this supply up unless rain falls, or at any rate will reduce it very low. There would be danger of getting salt water and probably bad holding ground if the dam were deepened, and enlarging its area is of little use as regards loss by evaporation. Some of the residents think that fresh water could be got in a "Cork Tree" flat between the dam and the mines, but I am afraid the chance is not a very good one. Should the field revive it will be necessary to try this flat by boring, and, failing a supply of fresh water from a well, it would probably be best to put down a deep cemented tank at the dam.

29. At the Mulgabbie dam I met a party of prospectors who were about to try some country some 30 miles to the S.E. across the lake which lies south of Mulgabbie. One of the party had been over and thought the country promising, but could not do anything for want of water. The party were trying to get camels to go out again. At Pinjin also there were prospectors who had been south to about the same position, and thought well of the chances of the place, but had likewise been unable to remain through want of water. It seems rather probable from this that the Pinjin belt of auriferous country continues a long way to the south.

30. The road from Mulgabbie to Pinjin is heavy and sandy for several miles, passing close to the north edge of the lake. The bed rock seems mostly to be granite. About seven miles from Mulgabbie there is fresh water at the Galvalley rock, in a not very large gnamma hole. There is a fair catchment here if guiding furrows were made to lead the water, and an earth dam could probably be got in a clay-pan to the south of the rock-hole. This is a useful water supply, as it is the junction of roads to Edjudina and Pinjin. There is another gnamma hole in flat granite rocks about eight miles from Pinjin, which could also be improved by increasing the leading-in drains. I understand, however, that a direct road is being surveyed from Pinjin to the Gilgarna rock, which will pass a long way south of the roundabout road *via* Mulgabbie. This new road will enable Pinjin to be reached in two days' driving from Kanowna.

31. Half-way between Mulgabbie and Pinjin the salmon-gum timber becomes scarce and confined to narrow belts, and is mostly very crooked and of poor quality for mining and fuel purposes. The mulga timber which covers most of the country round Pinjin is, however, of fair size and quality.

Pinjin.

32. In the Pinjin district, which has been attracting much attention lately, gold was discovered several years ago, and a good deal of work was done. A crushing plant was erected on much the same site as is now occupied by the State battery, and the well used by the latter was originally sunk for the old mill. The field at that time, however, had only a short life, and was abandoned till about two years ago when prospectors from Edjudina again turned their attention to it; they carted several crushings to the Edjudina battery with such success that many other prospectors went out, and there has been a strong revival of mining. A State battery of five heads of stamps and three cyanide leaching vats has been erected and is fully occupied, with every prospect of being kept running constantly for months to come. A townsite has been surveyed, and a hotel, stores, and several other buildings are being erected.

The field as at present prospected is about seven miles in length and perhaps two miles in width, along a range of low hills running more or less NNW. by SSE. The country is greenstone schist, but $2\frac{1}{2}$ miles north of the townsite on the road to Edjudina I noticed a strong outcrop of intrusive quartz porphyry. On coming on to the greenstone country by the road from Mulgabbie, probably about two miles west of the Edjudina road, there is a large amount of dark laminated jasperoid quartz all over the surface, together with a good deal of white quartz, indicating the presence near the contact of the greenstone country with the granite of a belt of the jasperoid material seen so strongly developed on both sides of the Edjudina line of reefs. The Pinjin mineralised belt of ground is on the line of strike of the Edjudina reefs and is probably a continuation of the same auriferous zone. The jasper "formation" is however not nearly so prominent as at Edjudina, but on the other hand the small quartz reefs of the latter place are represented at Pinjin by wide and extensive lodes. There seem to be several lines of these, running parallel to one another on a course 10 to 15 degrees west of north. Some of the local prospectors who have been tracing up the lodes consider that there are three principal lines, one passing through the "Harbour Lights" and "Pinjin Queen," a second through Coulson's "Shamrock" and the "Pinjin King," and the third through the "Anglo-Saxon" and "Anglo-Saxon North." While this may be true in a general sense, I do not think that a survey will show distinct continuity of the lodes along these lines, or even very distinct "runs" or belt-like groups of lodes. The whole field appears to be seamed with more or less parallel "formations" or zones of shattered and mineralised rock, having been evidently greatly fissured along roughly north and south lines for a considerable width, and gold is liable to be found anywhere in the fissured area where the conditions for its deposition happen to have been favourable. The surface of the ground is much covered with ironstone and quartz rubble, often carrying gold, derived from the very numerous veins in the underlying country. In many places the superficial debris is much cemented together, forming a hard crust which covers the bedrock and hinders prospecting a good deal. The water-level seems generally to be from 100 to 150 feet below the surface, and the country is weathered and oxidised down to it.

33. "*Harbour Lights*" (816R) and "*Harbour Lights Extended*" (817R).—A large "formation" runs through these leases, which lie about one and a half miles SSW. from the State battery on some low hills thickly covered with nodular oxide of iron and fragments of quartz. A shaft has been sunk 60 feet, and crosscuts driven from it 47 feet east and 68 feet west. The crosscuts pass through regularly laminated brown schist striking N. 15° W., with a very slight underlay eastward. In the east end a very greasy talc schist is met with. Several quartz veins with a little gold in them occur in the crosscuts, and there is said to be a little gold obtainable by crushing the schist itself from end to end of the drives. The best prospects are obtainable from a vein of rubbly quartz up to four feet wide in the shaft, and from

the schist on each side of it, the owners stating that about 14 feet of this material is in their opinion payable. About three feet of the brown schist on the east side of the shaft is said to be particularly good, and I saw some very nice prospects washed from it. There is no defined wall to the richer gold-bearing material, and the whole width of schist in the crosscuts may in a sense be regarded as a "lode formation," being a zone of rock laminated and rendered schistose by pressure and movement of the country along a line of yielding or faulting, and which has allowed subsequent passage through it of mineralising solutions. The valuable portion however will probably be confined to the vicinity of the main quartz vein seen in the shaft.

34. The owners of this mine were about to continue sinking to the water-level, which is unquestionably the proper course to pursue to establish its future. In the oxidised shallow stuff there is a certain fear that the gold may be more or less of superficial origin, similar to that found in the bedrock under portions of the Kanowna Deep Lead, and to prove that there is a permanent ore body it is necessary to get down into the parts of the lode which have not been affected by superficial agencies. Should the hard green schist below water-level be found to carry gold in payable quantities there will be great hope of the the mine being a good one. The auriferous brown schist is just such as would result from the oxidation of a body of lode schist carrying pyrites and gold such as is seen in parts of the Sons of Gwalia mine at Leonora, where the auriferous schist is often indistinguishable from the "country" except by assay.

35. The owners of the "Harbour Lights" had not had a crushing at the time of my visit, but had a lot of good auriferous material ready to send to the mill.

36. About 250 feet south from the "Harbour Lights" shaft there is a shallow hole cut into the outcrop of a body of quartz four feet wide, the value of which was estimated by the prospectors at 6 to 7 dwts. of gold per ton. Still farther south some costeening has been done, showing numerous quartz and ironstone veins in schist. Hard diorite country is seen a short distance east and west of the schist belt, and the jasper "formation" is said to lie about a mile to the west. North from the shaft there is much quartz and ironstone on the surface, and a little gold is said to be obtainable almost anywhere on the line of the lode, and good prospects occasionally. The schist "formation" is traceable for a long distance on the surface.

37. *"The Oaks"* (796R).—On this 18-acre lease there are about nine parallel veins or small reefs of quartz from a few inches in width up to three feet, running NNW. with underlay to ENE. about 1 in 6. The veins are pretty well defined, but very variable in size. The stone is clean quartz, somewhat stained with oxide of iron and carrying a little pyrites. There is also at times a small amount of a heavy yellowish-green mineral, which on examination by the Government Mineralogist proved to be scheelite (tungstate of lime). There are several shafts on this lease, the deepest about 60 feet on the underlay. A good deal of stone has been raised, and a large amount could readily be got from shallow workings. Some of the stone raised has been of good quality, but the owners did not expect very much from a good deal of it. The first 25 tons, carted to Edjudina, are stated to have returned 25ozs. 12dwts. of gold by battery treatment without cyaniding. The gold was of good quality, selling for £4 1s. 6d. an ounce. Belonging to the group of lodes running through this lease there are also some outcrops on the next one to the east, the lode-bearing belt of country being here close on 700 feet in width. The ground between the lodes does not here seem to be so much broken and mineralised as in some of the leases farther to the north, which have lodes probably belonging to the same "formation" or group.

38. *"Pinjin Consols"* (761R).—On this lease there is a shaft down 90 feet, partly on the underlay, on a small and rather broken reef running NW. westerly and underlaying eastward about one in four. The outcrops of several other parallel lodes have been cut into, but little done on them. Mr. Hack, who was working this lease, also has another one a considerable distance farther east, on a different group of veins, running more east and west than those of this line.

39. *"Silk's P.A. 135."*—This holding lies farther north along the same line of lodes as in the Pinjin Consols and The Oaks, and has two shafts down about 30 feet. The veins are small, but some rich stone has been got. There is much quartz all over the surface of the ground for a considerable width and apparently several parallel lines of reefs.

40. *"Anglo-Saxon South"* (742R).—On this lease a shaft has been sunk 90 feet, and crosscutting was in progress to cut the Anglo-Saxon lodes, but nothing had been found at the time of my visit.

41. *"Anglo-Saxon"* (729R).—This ground was part of that worked at the first opening of the Pinjin field some years ago, and was taken up again by the prospectors who have brought it once more into notice. There is an underlay shaft, 150 feet deep on the underlay, and a vertical shaft 140 feet deep. At the 100-feet level a reef is seen running about N. 10° W. and underlying one in six to the east, and there is also a very flat-lying reef which in one place seems to be cut through by the other reef and in another to break through it. Both lodes have carried good values. At the deepest level reached (140 feet) the ground remains quite dry, but the rock is becoming much harder and less weathered. Crosscuts which have been driven show numerous strings of quartz through rather broken country, and in one to the east another lode has been struck. It seemed to me that the whole of the workings were in a wide shattered zone of the country, through which numerous quartz veins have been formed of rather irregular size and shape. The quartz is often somewhat difficult to follow in consequence. A little gold is sometimes found in the casing of the quartz veins. There is a strong likelihood, in my opinion, that perseverance in tracing out the quartz veins will result in finding them make into bodies of ore more regular than they appear to be at present. The quartz from the deeper levels contains a little pyrites.

42. About 100 feet west of the 140-feet shaft there is a parallel reef about 8 inches wide on which there is a shaft 60 feet deep. Thirty tons of ore from this returned 21dwts. per ton by

amalgamation treatment at the Edjudina battery. Another parallel reef to the east contributed 12 tons to a crushing of 26 tons at Ejudina that returned 2ozs. 12½dwts. per ton, and was considered from panning tests to be of about equal value with the other 14 tons crushed. About 200 feet east of the main workings there is a shaft down 35 feet on another vein, 15 to 18 inches wide, and about the same distance again to the east there is still another parallel reef about the same size, both carrying gold.

43. About five chains east of the main shaft there is also a large outcrop of rather flinty quartz, and a deep hole, sunk by the original prospectors years ago, on a schistose "lode formation." East of these there are outcrops of laminated quartz with ironstone bands. The whole of these veins run a little west of north and form a group or system which is best regarded, not as so many distinct and separate lodes, but as parallel veins in one large zone or "formation."

44. *Anglo-Saxon North* (438R).—The reef-bearing zone continues northward from the Anglo-Saxon leases through this lease and presents very similar features. There are eight lines of quartz veins from which payable stone has been taken, but nearly all are small. Three shafts have been sunk, two of them 100 feet deep, being connected by a crosscut at the bottom. The vein is small, only about 18 inches, and becomes broken and poor in the bottom of the workings. Two crosscuts, one 140 feet in length, show the schist country very regularly laminated but with a good many quartz strings traversing it. At surface a big "formation" of kaolin and quartz leaders was worked out by the original prospectors of the field for 20 feet long, 15 feet deep, and 12 feet wide, and is said to have averaged 8dwts. to the ton in the old battery. This stuff seems to have been much iron-stained kaolinised schist.

45. Towards the north end of the lease there is a tributers' shaft down 44 feet on the underlay of a rather flat-lying vein, 6 to 15 inches thick, dipping eastward, which appears to lie to the west of the line of the veins worked farther south. Some fair stone had been got out by the tributers. The whole of the Anglo-Saxon North lease seemed to me to be full of veins, and capable of yielding a large amount of easily won stone from shallow workings, with good chances that some of the veins would develop into permanent ore bodies of considerable size. A close watch should be kept for "soft formations" carrying gold, as these are very likely to exist in a large zone of mineralisation such as this is.

46. *Pinjin Main Lode* (760R).—On this lease some cuts have been made into the outcrop of a strong lode three or four feet wide of laminated dark quartz and brown oxide of iron of a somewhat jasperoid appearance. This is traceable north into Lease 751R, where it has been worked upon more extensively.

47. *Pinjin Main Reef* (751R).—Here there is a shaft sunk 100 feet on the underlay of one of a pair of strong reefs of dense laminated quartz with silicious brown ironstone veins. The reefs are 30 feet apart at surface and 10 feet at the 100-feet level. The strike of the lode is N. 20° W., with underlay 1 in 7 to the east. Going down the shaft the eastern vein cuts out but makes again lower down, but it is poor in the bottom. The western reef at the bottom is a strong body of stone, dark rubbly quartz with much iron oxide, but poor. In depth these lodes will doubtless carry much pyrites. Some fair ore was got near the surface. There is an outcrop of a similar lode a little to the west of these workings, and to the east of them a little work has been done on a small vein on the Anglo-Saxon line carrying some fair gold.

48. *Australasia* (739R).—On this lease a quartz reef about a foot wide has been worked out along its outcrop for about 100 feet. Its strike is N. 20° W., and underlay to the east. A shaft has been sunk on it 50 feet on the underlay. Forty-six tons from this mine yielded 22 ounces of gold in the State battery. This lode lies to the west of the Main Reef and Anglo-Saxon lines.

49. *Cardjella King* (772R) and *Fairplay* (824R).—A lode running N. and S. has been traced in these two leases up to eight feet wide, of quartz carrying a good deal of radiated actinolite in parts, and ironstone. There are a lot of shallow workings and shafts 60, 55, 40, 30, and 15 feet deep. A little driving was done at the bottom of the 60-feet shaft, but the quartz cut out. The stone is rather poor and patchy according to the owner's statement. The reef is a strong one, and seems worth testing thoroughly.

50. Almost on the townsite a holding has been taken up by Mr. Ladbury, who has sunk several holes on the outcrop of a strong line of silicified schist carrying a little gold. This "formation" has veins of quartz and iron oxide through it, and in places becomes hard laminated quartz. It seems fairly wide, but too little has been done to it to enable any judgment as to its real size and value.

51. *Shamrock* (832R).—Unfortunately there was no one on this mine when I visited it and I did not get down the shaft. Three shafts 80 feet, 60 feet, and 50 feet deep have been sunk on a nearly vertical lode running N. 15° W., from which a recent crushing of 49 tons returned 23dwts. of gold to the ton. The lode stuff consists of silicified schist and some laminated quartz, some of it strongly reminding me of the schistose ore of the Sons of Gwalia mine. The "formation" is said to be 40 feet wide in the workings at the bottom of the shaft. This mine appears to be very well thought of locally, and if the values shown by the first crushing are maintained, should be an important discovery. The lode stuff is of very promising character.

52. *Furey's P.A.* 136R.—Some very good ore has been got on this holding, on which there are two shallow shafts about 30 feet deep on a vein of quartz 12 to 18 inches wide running N. 15° W. This seems to be on the Western zone of lodes, and there is an auriferous schist "formation" with the quartz vein, the schist being much charged with silica and brown oxide of iron. A little to the west of the workings schist country crops out, very distinctly laminated, and quartz veins seem numerous in it. About 100 feet west of the shaft there is a vein 6 to 12 inches wide of quartz parallel to the first-mentioned reef, but poorer though gold-bearing. These workings are only lately started, and not very much has yet been done.

53. *"Pingin King"* (754R).—This lease is on the low hills to the north of the Trig. Station. There seems to be several lines of reef traversing it, and the surface of the ground is much covered with quartz and silicious brown ironstone. Two shafts have been sunk, one of 90 feet vertical depth being connected at the 70 feet level with the bottom of the other one, which is on the underlay of the hanging wall portion of the reef. At 20 feet down in the vertical shaft the reef is 13 feet wide of ironstained quartz of fair value, but about 5 feet below this a "horse" divides the reef, and it is doubtful if the foot-wall branch has yet been seen in the lower workings. In these the stone is poor, but the reef seems to branch into two going southwards, and it is probable that the big body of stone in which the gold is being got on the junction of the two branches is pitching to the north. Driving southward at the bottom level and crosscutting are much required. The whole of the ore from the big face at the 20-feet level was being taken to the State battery at the time of my visit, the crushing of 50 tons resulting in a return of 35ozs. 17dwts. of gold. The length of this ore body had not been ascertained. The course of this reef is about N. 10° to 15° W., and there is a slight underlay to the west. In places the quartz is replaced by schist in the lode-filling, very similarly as in the Wallaby line at Yarri.

54. To the east side of the line of the main lode a small vein has been cut to the north of these workings containing very much ironstained quartz said to prospect about an ounce to the ton. To the west there is another strong outcrop of quartz, but poor in gold and not worked therefore. There seems every appearance of the occurrence in this lease of another wide zone of shattered schist country full of quartz veins similar to the Anglo-Saxon one, and a good deal of work will have to be done by costeening on surface and crosscutting below, before it will be known how many of these veins are worth working.

55. *Prospecting Area* 126R (Kingsbury's).—This lies north of the Pinjin King, and has only lately been prospected. Three small leaders six to twelve inches wide, carrying gold, had been cut in shallow trenches, showing the presence in the holding of a parallel group of auriferous veins which seems likely from its position to be a continuation of the Pinjin King zone.

56. *Pinjin Queen* (812R).—In this lease there is a group of lodes lying to the west of the Pinjin King group and corresponding in position and direction very well with the Harbour Lights group. Three parallel lines of reef have been opened, striking about N. 8° W. with underlay to west. The principal work has been done on the middle reef, where a shaft has been sunk some 60 feet. The lode seems to be about three feet wide between its walls, with about 18 inches of quartz. The country is greenstone schist. Crushings at Edjudina and at the Pinjin State battery have all returned over an ounce to the ton.

57. *Cole and party* were working another lease on about the same line, some three-quarters of a mile farther north, but I was unable to visit this find. *Exile* (810R) and *Yellow Boy* (811R) to the south of the Trig. Station had also to be omitted from examination, and probably there were others not visited about which I was not informed.

58. *Deep Alluvial Ground.*—About a mile south (S. 15° E.) from the Trig. Station some shafts have been sunk which show that there is deep alluvial ground in this field. One shaft was sunk 60 feet and the bottom was still found to be dipping westward. The stuff on the dump showed cemented sub-angular waterworn "wash," but I am informed that no gold worth mentioning was obtained. This lead crosses the belt of auriferous country, and should therefore carry gold in parts, and it seems worth more attention than has hitherto been given to it.

59. The Pinjin district seems to me a very promising one, with good chances of developing some permanent mines. There is a large extent of auriferous country, and though most of the veins of quartz as yet worked are small and many of them have become poor when followed downwards, they are so numerous that a large amount of gold can be won from them from shallow workings. The water-level being from 100 to 150 feet below the surface, working parties have a good chance of following the veins to the limit of windlass work without the expense of machinery, and sooner or later I have much confidence that more permanent ore bodies will be developed. The "lode formations" of auriferous schist are interesting and important, but they require to be opened up below the water-level before any certainty can be felt as to their permanency as gold-bearing lodes.

60. Since the starting of the Pinjin State battery the following crushings have been put through it, up to the end of November:—

Date.	Name.	Tons.	ozs.	dwts.	grs.
1905.					
October 11	Australasia	46	22	0	0
„ 27	Shamrock	49	55	0	0
„ 28	Binberry	14	5	5	0
„ 31	Pinjin Queen	43½	66	12	0
November 6	Pinjin King	50	35	17	0
„ 10	Exile	24	11	10	0
„ 12	Carajella	50	14	14	0
„ 16	Anglo-Saxon	50⅔	317	16	0
„ 23	P.A. 93	36	24	12	0
„ 28	Anglo-Saxon North	51·8	76	0	0
„ 30	P.A. 121R	23·15	9	9	0

61. The water supply of the Pinjin district is not as yet at all satisfactory. There is a fair amount of water in the public well close to the townsite, which is fit for stock but too heavily charged with sodium and magnesium chlorides, sulphates, and nitrates for human consumption. People have

been using it for want of better, but the following report from the Analyst of the Geological Survey shows that its use should not be continued for any length of time:—

"The following is the analysis of the sample of water from the Pinjin domestic supply well:—

	%	grs. per gallon.
Sodium chloride, NaCl	·2989	209·23
Potassium chloride KCl	·0036	2·52
Magnesium chloride, $MgCl_2$	·0286	20·02
Magnesium sulphate, $MgSO_4$	·0652	45·64
Calcium sulphate, $CaSO_4$	·0220	15·40
Calcium carbonate, $CaCO_3$	·0382	26·74
Sodium nitrate, $NaNO_3$	·0157	10·99
Alumina, Al_2O_3) Iron oxide, Fe_2O_3)	·0005	·35
Silica, SiO_2	·0032	2·24
	·4759	333·13

"This water is totally unfit for human consumption, as the large proportion of sodium nitrate and magnesium salts present would cause the water to have a severe effect on the human economy."

It seems not very likely that good freshwater will be got in a well in this locality without going some distance away from the townsite on to the granite country. There is good fresh water in a bore well about 10 miles from Pinjin on the road to Edjudina, and a well is being sunk at this spot, but it is unlikely that there is a large supply at this well, and the distance is too great. For immediate requirements a condenser at the State battery would, in my opinion, be the best solution of the domestic water supply difficulty, but unless boring discovers a good fresh water well within short distance of the townsite, the construction of a storm water dam will have to be considered.

62. From Pinjin to Edjudina the road is good for the whole distance, about 30 miles. The new well mentioned in the last paragraph will be a great boon to all travellers.

Edjudina.

63. I have not a great deal to say about this field in addition to what has been already published in the Government Geologist's report (Bulletin No. 11 of the Geological Survey, 1903) and my previous report in the Annual Report of the Department for 1903. This district has retrograded rather than advanced since my visit in 1903, due mainly to the more accessible stone becoming worked out and the prospectors being unable to cope with the water met with below water-level without machinery.

64. The principal settlement at Edjudina is not on the surveyed business areas shown on the lease plan, but a little over two miles farther north, close to the Neta and Senate mines. The water supply is obtained from a Government well and a dam. The well water is rather salt and only usable by stock. At the time of my visit the dam had been dry for a long time. Domestic water is obtained from condensers at the mines and from rain water tanks. Should settlement increase to any noteworthy extent, a storm water storage dam would become necessary. The water in the mines is considerable and battery supplies are therefore well provided for, but it is too salt for domestic purposes though usable in boilers with care.

65. There are three batteries on the field, the "Neta" mine having five heads of stamps and a fair cyanide plant, the "Senate" five heads of stamps without cyanide plant, and Messrs. Pauley & McCoy ten heads of stamps and a cyanide plant. At both cyanide plants the slimes are dried in the sun, then pulverised, mixed with the sands, and treated by percolation in leaching vats.

66. *Bunyip G.M.* (826R), formerly Glengarry.—This old Glengarry mine was abandoned by its owners in 1903 not long after I saw it in that year, and the battery was sold to the Government and taken to Yarri to be erected there as a State battery. Lately there has been some new prospecting a little to the south of the old mine, resulting in finding a reef with some good stone in it. The prospectors are now working this, and have raised a good many tons of quartz towards a crushing.

67. *Crow's Nest* (576R).—North from the Bunyip no work was going on on the Edjudina line of reefs for over two and a half miles. At the Crow's Nest the reef is still being worked, but the owners have not much ground above water-level left to them to take out unless they find other reefs parallel to those worked. The principal reef has been worked out for about 1,000 feet in length, to a depth of from 60 to 70 feet. The stone was of the so-called "kidney" mode of occurrence, and would average over 12 inches in width, but has been as much as eight feet wide. The good values have been almost continuous for the whole length worked. The stone in the bottom of the workings is stated to be of good quality, and if so, there is every reason for putting machinery on this mine and working it below the water-level.

68. About a mile north of the Crow's Nest on the line of reef, two men have been working, and had got out some stone of the usual "kidney" character, but as no one was on the ground when I visited it I was unable to get much information as to the amount of work done.

69. *Success* (774R).—On this lease four men were working. The middle reef has been worked out to water-level for nearly 600 feet, and is said to have averaged four feet in width. The party are at present working above water-level on the west reef, which has good stone in it, but rather too much scattered for profitable work, the gold-bearing "kidneys" being separated by stretches of dead ground. They have sunk a shaft 98 feet, or 34 feet below the water-level, and crosscut to the middle reef, which was good where cut, but were unable to continue on account of the influx of water. They have a Tangye's vertical boiler and a Cameron steam-pump, but the boiler was not able to supply enough steam for the work. This lease has a good record for gold produced, and there is every reason to think that if

equipped with proper machinery the mine would be a good one. The water is formidable to a working party of prospectors, being stated to be about 1,200 gallons an hour, but this would be of little consequence if the mine were being extensively worked.

70. Two men (Thomas and Mate) have been working lately a short distance south of Pauley & McCoy's battery. Some fairly deep work has been done, but these men seem lately to have been working close to the surface. There was no one on the work when I visited it.

71. *Neta Extended* (418R).—Five parallel lines of reef have been worked more or less on this lease, and several shafts have been sunk to water level. The reefs are small, probably not averaging more than a foot in width, though sometimes up to five feet wide. Some of them are said to be stoped out to water level for about 400 feet in length. Tributers were working at the time of my visit in a shaft 50 feet deep on one of the Western lines of lode, and had a small amount of ore at grass.

72. *Gawler* (497R).—The same lines of reef have been worked in much the same way in this lease. There are a lot of older workings, but at present operations are confined to a shaft about 100 feet deep between the No. 1 and 2 lines of reef and a 40 feet shaft on one of the western reefs. In the crosscut from the 100 feet shaft a dyke of weathered quartz porphyry is met with, about six feet thick, and carrying spots of brown oxide of iron, evidently derived from oxidation of pyrites crystals. The porphyry lies nearly parallel to the lodes, and has a slightly schistose structure conformable with the enclosing schist; dykes similar to this are seen in the "Senate" and "Neta."

73. Though the lodes in the Gawler and Neta Extended mines are small in size they are not too far apart to be worked by crosscuts from one shaft. To minimise dead work it would be necessary to open levels from such a shaft at longer intervals than usual in the case of larger reefs, say 200 feet apart, with use of intermediate levels opened from the connecting winzes in the parts of the ground found worth stoping. There seems to me to be very good hope that these and other like reefs along this line of reef can be profitably worked by small companies operating on a scale not too extensive for the output of quartz possible for them.

74. *Senate* (539R).—Good progress has been made on this lease since last reported upon, the main shaft having been sunk to the 200 feet level and machinery for winding and pumping placed on it. A battery of five stamps has also been provided. The pump is of Cornish type, 6-inch working barrel, 7-inch water column. At the 100 feet level the lode has been opened for over 1,000 feet in length, about 800 feet being on stone worth stoping. Nearly all of this has been worked out above this level. Below the water level the soft weathered schist country gave place to hard green schist which would best be worked with machine drills. About 40 feet above the 200 feet level the shaft struck a hard dyke of quartz porphyry, much charged with pyrites, which continued to the bottom of the shaft, coming in from the west side, and was also in the west crosscut for some feet. This dyke, much smaller and greatly decomposed to soft kaolin, is seen also in one of the crosscuts at the 100 feet level. At the bottom level only a small string of quartz was cut where the reef was expected, but there is some doubt if this really represents the latter. To make sure, a winze is being sunk from the 100 feet level and driving at the 200 feet is being carried on to meet it. I have much confidence that this pinch in the lode is only an unimportant incident and that it will be found to live just as strongly in the hard country as in the oxidised zone. It has, however, been disappointing to the owners, who have had some difficulty in providing and erecting the machinery, and in consequence find themselves in a bad position to do dead work where they had hoped to get on to pay ore at once. The mine has been opened out of profits from the upper levels, and the party have made a very creditable attempt to advance it from the rank of a prospecting venture to that of a permanent mine.

75. *Geneve* (500R).—On this there are two shafts sunk 114 feet to water level, on the No. 1 and No. 2 reefs worked by the Neta Company in the next block to the North. On the No. 1 lode there has been good stone worked for 200 feet in length, averaging about 12 inches wide. There was some good stone, estimated to return two ounces per ton, in the north end at the time of my visit. On the No. 2 lode there is about 80 feet of driving on a body of stone nearly two feet wide, worth about 12 dwts. per ton according to the manager. This mine belongs to the same owners as the Neta and Neta Extended.

76. *Neta* (401R).—The battery and cyanide plant on this mine have been greatly improved, the latter especially. The treatment of the slimes by sun-drying them and mixing them with the sands is said to be quite successful. The main shaft is down 200 feet, at which level the width of stone of good value on No. 2 lode is stated to have averaged fully two feet. In No. 1 lode the size is very variable. There is a good deal of water, about 30,000 gallons a day, which is too great to permit further sinking with the present plant. At the time of my visit the stoping from the No. 2 level had reached to within 30 feet of the 100 feet level. At times the reef has been six and eight feet wide and it has maintained a very good average value. The stoping ground is being rapidly worked out, and it will be necessary for the owners to sink to another level as soon as possible. The mine seems to me very well worth the introduction of enough capital to give it a better winding and pumping outfit, also machine drills, and to put developments a safe distance in advance of the ore breaking. I understand that the whole of the existing work and plant has been paid for from the produce of the mine, except that the owners had the benefit of some work done down to the 100 feet level some years ago by the first company who owned the ground.

77. About 400 feet west of the Neta main shaft there are two shafts about 200 feet apart, the south one 60 feet deep, the north one 100 feet, on a reef showing about 14 inches of quartz of the usual "Kidney" mode of occurrence. This is being stoped out, but has been rather poorer below 60 feet than in the shallower ground.

78. The mining statistics give the total returns from the Edjudina district to end of 1903 as 14,071·25 tons crushed for a return of 18,426·10 ounces of gold (gross). During 1904 and the first nine

months of 1905 the returns, according to the monthly returns published in the *Gazette*, have been as under:—

Lease.		1904.		Part 1905.	
No.	Name.	Tons.	Fine Ozs.	Tons.	Fine Ozs.
713R ...	Federal	19·00	21·69	...	...
773R ...	Box of Tricks	89·50	69·05	29·00	14·92
793R ...	Lyon Glen	36·00	32·09	...	...
401R ...	Neta	1425·00	2322·39	1333·00	3105·41
715R ...	Never Can Tell...	63·00	87·74	...	...
712R ...	Triumph South...	60·00	62·01	...	...
711R ...	Orphan Boy	48·00	35·43	...	...
774R ...	Scotchman	54·00	43·16	53·00	16·27
725R ...	Broken Hill North	56·00	67·49	...	...
539R ...	Senate	179·00	377·43	483·50	859·27
Unregistered	Thomas and Quinn	45·00	27·27	...	...
686R ...	Bella	33·00	31·35	...	...
667R ...	Bulger	8·00	3·66	...	...
576R ...	Crow's Nest	84·00	115·65	103·00	130·78
605R ...	Triumph	44·00	51·01	...	...
Unregistered	Haack	20·00	30·74	...	...
658R ...	Yale Lock	25·00	12·89	...	...
	London and Coolgardie Exploration, Limited	54·00	104·30	24·00	35·55
782R ...	Perseverance	25·50	20·73	19·50	11·93
P.A. 65 ...	Clow and Party	15·00	9·89	...	...
	Sundry parcels...	14·00	11·32	...	...
813R ...	Coster	...	...	70·00	44·25
		2,397·00	3,537·29	2,115·00	4,218·38

From these returns it will be seen that this district has a very good average yield. Notwithstanding their small size, I think there is a really good opportunity for the investment of capital on the Edjudina line of reefs. They are rapidly passing out of the stage in which they can be successfully handled by working parties of miners, and now require equipment with machinery for working them to a depth.

79. *Beyer's P.A.*—About eight miles south of Edjudina and Yarri and some seven miles due east from Mt. Walbrook some prospecting has been done on lodes which are probably on the southward continuation of the Yarri belt. A road has been cleared by the prospectors to Edjudina and another to Yarri. On the road from Edjudina the country is mostly greenstone schist, but a large dyke of massive greenstone is met with about half a mile to the east of Beyer's workings which seems likely to be the same belt of this rock which is found to the east of the Wallaby line of reef at Yarri. There are three lodes in Mr. Beyer's holding on which a little work has been done. They are in granite country, in a belt of the rock which is quite schistose in some places but less in others. It appears to me that the granite for a considerable width has been rendered schistose by pressure along a line of yielding, the more schist-like portions being those where the yielding has been most pronounced. The east lode is the principal one, and has been traced through the length of the ground held. The quartz vein is often very small but several bulges occur up to three feet in width. The lode strikes N.12°W. with dip to east about 70°. The walls are well defined and smooth. The lode matter is quartz and sericite schist with quartz in the laminations, and carries a little pyrites. The eastern lode is on the west side of a belt of schistose granite about 100 feet in width which probably represents the main line of yielding of the granite. The middle and eastern lodes are smaller and less well defined and are accompanied by only narrow bands of schist. I regard the main schist belt as the most likely matrix for any mineral deposits of value that may exist in this vicinity. The schist contains numerous veins of quartz, and in consequence there is much loose quartz all over the surface of the ground. To the south-west of the holding there is a large outcrop of white quartz running more or less parallel to the lodes but the prospectors have not been able to find more than traces of gold about it.

80. The prospectors propose to sink a shaft to 100 feet depth east from and opposite the workings on the eastern reef, where the reef has been best in size and value, which will afford a much better test of the lode than any of the shallow work done hitherto. The returns from the crushings that have been made were given to me as follows:—

	tons	ozs.	dwts.	grs.	per ton.
At Pauley and McCoy's Battery, Edjudina	11 ...	0	23	0	„ „
„ „ „ „	8 ...	0	14	0	„ „
„ „ „ „	17 ...	0	21	12	„ „
„ „ „ „	19 ...	0	23	12	„ „
At State Battery, Yarri	43 ...	0	17	20	„ „

Fifty tons of the tailings from the Edjudina battery are stated to have given a bulk assay of 8½dwts. per ton. These figures show that there is some good ore in these lodes, and give encouragement to continue prospecting. The granite country is very hard, but the schist belt seems softer and not too difficult ground to work.

81. There are a few other prospectors working between Beyer's P.A. and the Yarri leases, some of whom have had bunches of rich stone. Some prospecting was also reported to be going on near Mount Walbrook.

YARRI.

82. The Yarri Field is referred to in the reports above quoted on the Edjudina district, and has lately become much more active than formerly owing to the establishment of a State battery, and to the impetus given to mining by the fact of the Lake View South Co. of 'Kalgoorlie having taken an option over the Wallaby Central and Wallaby North Mines, and erected winding plant and installed rock-drills on the first mentioned.

83. The State battery has 10 stamps, rock breaker, skip elevator, challenge feeders, a large tailings wheel, and an outfit of cyaniding tanks. It is supplied with water from a well one and a-half miles distant lying north of the townsite, which has a good supply of nearly fresh water fit for horses to drink. At the time of my visit the battery was not working, the rock breaker, and also the pump at the well being in want of repairs.

84. *Yarri South* (737R).—On this lease there are three shafts 60 feet, 100 feet, and 50 feet deep, the deepest being to water level. A chute of good ore has been worked for about 100 feet in length, some of it yielding 3½oz. to the ton. In the bottom of the deep shaft the stone is said to be five feet wide, of value 1oz. to the ton. The lode has fairly well defined walls, but includes much broken greenstone country as well as quartz between them. The lease is all on rather hard crystalline greenstone (amphibolite to diorite) country, which continues about a quarter of a mile further west to its contact with the granite. The quartz in the lode has been rather broken and irregular, and carries a little copper pyrites and indigo copper occasionally. The present owners told me they had crushed 170 tons for 512ozs. of gold. A crushing from the north shaft is stated to have returned about 18dwts. per ton. About 200 feet west of the principal workings there is another parallel line of reef underlying pretty fast to the east, which should in depth join with the western lode, which is nearly vertical. A shaft has been sunk 40 feet. The stone is 3 feet to 4 feet wide, but rather patchy in value, and the present owners have done very little upon this lode.

85. *Queen's Birthday South* (614R).—This lease was not working when I passed. A crushing of 50 tons is reported to have been crushed at Pauley & McCoy's battery for a return of 15dwts. per ton by amalgamation.

86. *Queen's Birthday* (585R).—On this lease there is a shaft down 108 feet to water (fresh) level. Very good gold was got down to the 40 feet level, but not much below that. Some 250 tons crushed are reported to have yielded about 1,000ozs. of gold. At the 80 feet level the stone is small and the lodes seem broken. The owners were stripping and crushing surface dirt along the outcrop of the lodes when I saw them, and getting a few coarse pieces of loose gold in doing so. Some remarkably rich stone has been got from the lodes on this reef, and it deserves more systematic opening up than is being given to it at present. The country is greenstone.

87. *Star of Yarri* (831).—This lease lies east of the Wallaby line of reef, and about 260 feet from the latter a shaft has been sunk 50 feet on a reef running N. 35° W. and underlaying east. The reef seems strong and well defined in the shallow workings, but at the bottom of the shaft there was mullock between the walls. In driving north and south, however, quartz has come in at both faces a short distance from the shaft, but rather patchy in value. Some 24 tons are stated to have been crushed for a return of 23ozs. of gold.

88. *Hidden Treasure* (766R) formerly "Wild Dog."—A good deal of work has been done on the two western reefs on the Wallaby line, but nothing more than mentioned in my former report on the eastern ones. The western reefs lie about 30 feet apart, and between them there is a "formation" of silicified schist carrying much pyrites. A small speck of bluish mineral in a piece taken by me was found to be Molybdenite when tested by the Analyst of the Geological Survey. Some 250 tons are said to have been crushed for 184oz. of gold by amalgamation. To get this the western reef has been stoped out about 18 inches wide for 120 feet in length down to the 40 feet level. The formation between the lodes has not been cut through, but seems to me to be worth special attention, being lode matter closely approaching the Kalgoorlie type.

89. *Wallaby* (581R).—On this lease there were four men working, sinking a shaft near the south end of the lease. A long open-cut working has been made on the outcrop of the western reef to about 20 feet depth. I was informed that 500 tons had been crushed for a return of over 860ozs. of gold, and the owners have quite 300 tons of stone waiting to be crushed. This property deserves more active development.

90. *Wallaby Central* (580R).—This is at present the most interesting mine on the field, as it has been taken in hand on option by the Lake View South Company, of Kalgoorlie, and is being vigorously opened up in a workmanlike manner with aid of substantial machinery. The owners of the lease, I understand, continue to work the upper levels until the company decide finally to purchase or not, the latter confining themselves to sinking a main shaft to 200 feet and crosscutting to the lodes and testing them. The shaft was down 175 feet at the time of my visit, and had got into a "formation" of silicified greenish schist strongly impregnated with pyrites. I was informed that this rock assays from 1dwt. to 5dwts. of gold per ton, and that the sulphides concentrated from it return up to 2ozs. per ton, and though the stuff is too poor to work it is of great interest as showing the presence of auriferous schist in the walls of the quartz lodes. At 200 feet it is intended to crosscut east through the latter, when future action will be determined. The results of this work are eagerly looked forward to by all interested in the district, as they will be of the utmost importance in indicating the probable permanency of the reefs below the water level. There was little water met with in this shaft up to the time I was there, but probably a good deal will be met on cutting the reefs. In the upper levels the reefs continue strong and good looking, and satisfactory crushings have been obtained.

91. *Wallaby North* (579R).—This mine is also under option to the Lake View South Company, but the owners continue to work it in the meantime. They have sunk a shaft 106 feet, and are continuing

sinking until water is met with, probably about 130 feet. At 50 feet there is a crosscut west, 9 feet to the wall of the reef, and then 14 feet through it; 10 feet of the hanging wall side proved of fair value, giving 6½dwts. per ton by amalgamation with tailings assaying 3½dwts. At the 100 feet level the reef has been driven on to the north for 40 feet and south 25 feet. The full width is not seen, but it is not less than 14 feet. The crushings reported to me by the owners were 126 tons for 8dwts. 23grs. per ton, and tailings assaying 2dwts. 14grs. per ton, and 105 tons for 6dwts. 14grs. per ton by amalgamation, and tailings assaying 2dwts. 6grs. per ton. In all some 403 tons have been crushed from this mine with fairly payable results if there were a battery close at hand. Some of the crushings had to be carted to Edjudina. In a crosscut 80 feet east at the 56-foot level, a "formation" was cut 31 feet from the shaft carrying a little gold.

92. *Great Banjo* (801R).—This lease lies about four miles N.N.W. from Yarri, and is on a huge outcrop of laminated quartz, striking straight for the Wallaby leases. The quartz is very similar in appearance and structure to that on the Wallaby line, and there seems every likelihood that this outcrop is another large development of stone on the same main line of fissuring of the country. The outcrops are seen standing out for several chains in length, and many feet in width, but are not clearly cut through, so that their width can be positively stated. Two shafts have been sunk 40 feet—one vertical, one on the underlay, which is easterly. A big body of stone has been followed and partly stoped out 10 to 12 feet wide for between 100 and 120 feet. A crosscut 180 feet eastward into the wall of the lode shows shattered and silicified schist (a sort of "formation"), for some distance, then brown, clayey material, which, probably, is greenstone in depth. On surface a little gold has been got along the outcrop, and there has been a good deal of dry-blowing work done. The owners informed me that they had had 56 tons crushed at Edjudina for 17dwts. per ton, and 25 tons for 24dwts. per ton, the sands from these two crushings giving assays of 6dwts. gold per ton. Another crushing of 46 tons at the Yarri battery yielded 12dwts. per ton. Cartage to the Yarri battery costs 7s. 6d. per ton. I was much taken with this reef, and think it deserves much more attention than has been given to it as yet. It is much too large to be properly prospected by only two men, as at present.

93. *Yes-No* (787R).—This lease lies three miles north-west of the townsite, in greenstone schist country, and the lode worked on it presents some unusual features. It runs about north 20° west, and has been worked from shallow shafts up to 25 feet in depth for a distance of several chains. In these workings, small "pipes" of quartz, or rod-shaped masses of flattened oval cross-section, 2 to 3 feet thick, have been followed, dipping endlong at a very flat angle to the north, and succeeding one another in "splices" more or less overlapping at the ends. They seem to lie between the walls of a lode fissure, and probably represent a variation of the mode of formation which brought about the lenticular "kidneys" of quartz in the Edjudina reefs. In this case sinking on the lode "formation" would probably reveal a succession of the "pipes," one below the other. So far only those visible at surface have been followed. The stone is of good quality, 41 tons crushed having returned 74ozs. 16dwts. of gold. Cartage to Yarri battery is 7s. a ton. A similar "pipe" formation was also worked in another lease about a mile further south-east, but no one was on this when I passed.

94. The returns to the end of 1903 of production from the Yarri district, as published in the Mining Statistics, are 1,332·25 tons crushed for 2,050·44ozs. (gross) of gold. From the monthly returns published in the *Gazette*, the following table has been compiled showing further figures to end of September, 1905:—

Lease.		1904.		Part 1905.	
No.	Name.	Tons.	Fine Ozs.	Tons.	Fine Ozs.
797R ...	Puzzle	22·00	31·02	...	...
580R ...	Wallaby Central	430·00	574·06	333·00	388·50
P.A. 41R ...	Beyer's	8·00	4·21	...	...
805R ...	Right Bower	20·00	40·52	33·00	39·01
581R ...	Wallaby	175·50	273·07	241·00	244·29
766R ...	Hidden Treasure	49·50	50·76	113·00	65·31
719R ...	Yarri	5·00	5·36	...	...
746R ...	Golden Wallaby	5·00	4·55	...	...
736R ...	Homeward Bound	17·00	15·30	...	...
585R ...	Queen's Birthday	Alluvial	6·30	100·00	315·16
737R ...	Yarri South	100·00	296·35	51·00	99·94
823R ...	Britisher	13·00	11·88	...	...
801R ...	Great Banjo	25·50	25·55	46·00	20·81
757R ...	Gwydir	24·00	8·47	106·00	38·21
P.A. 49R ...	Beyer's and Madden	34·00	16·43	...	...
P.A. 50R ...	Sparks	19·00	22·08	...	...
P.A. 55R ...	Sefton and Party	34·50	6·02	...	...
P.A. 64R ...	Middleton and Party	18·00	16·70	...	...
P.A. 68R ...	Selbourne and party	...	...	5·00	12·29
777R ...	Penola	15·00	47·80	64·00	56·67
784R ...	Kismet	...	...	39·00	23·62
P.A. 69R ...	Leach	...	...	16·00	6·36
P.A. 97R ...	Madden	...	...	98·00	31·02
579R ...	Wallaby North	...	...	105·00	29·33
P.A. 77R ...	R. Lenstner	...	...	40·00	28·07
P.A. 92R ...	W. Ogilvie	...	...	35·00	8·12
P.A. 104R ...	H. Derrick	...	...	34·00	4·03
P.A. 107R ...	T. Beyers	...	...	43·00	31·55
P.A. 110R ...	J. Saunders	...	...	7·50	6·21
P.A. 120R ...	R. Marshall	...	...	14·00	11·23
P.A. 124R ...	S. Scott	...	...	7·00	20·04
		1,015·00	1,456·43	1,530·50	1,479·77

95. The crushings at the Yarri battery from the commencement of operations in July, 1905, to 8th November are as under :—

Name.	Tons.	ozs.	dwts.	grs.
Prospecting Area	74	15	6	0
Wallaby Central	463	392	10	0
Kismet	39	26	12	0
Yarri South	51	121	6	0
Wallaby North	231	92	0	0
Prospecting Area 69R	16	7	4	0
Prospecting Area 72R	15	16	18	0
Hidden Treasure	190	126	14	0
Yilgangie	30	15	0	0
Penola	54	26	0	0
Right Bower	33	49	2	0
Wallaby	241	256	0	0
Prospecting Area 77	40	31	16	0
Canteen	13	22	16	0
Prospecting Area 92R	35	11	10	0
Queen's Birthday	100	347	15	0
Prospecting Area 154R	7	22	8	0
Gwydir	106	48	2	0
Great Banjo	46	27	4	0
Prospecting Area 102R	14	13	5	0
Prospecting Area 107R	43	38	6	0
Prospecting Area 97R	33	31	18	0
Prospecting Area 110R	7½	8	16	0
Holy Moses	34	5	16	0
Sunday Gift	4	18	5	0
Golden Wallaby	10	3	6	0
Yes-No	41	74	12	0
Birthday Gift	103	25	16	0

96. There is a good road from Edjudina right into Kookynie, passing through Yarri and Yerilla. It is well provided with water at fairly easy distances for teams travelling along it. The very dry weather, however, has almost dried up the supply at Yilgangie Soak. This is a very convenient water station, being near the junction of one of the roads to Karowna, and as there is a large and good catchment a dam could be readily filled in wet weather. The present supply is taken from a big hole in a natural water course, which could be enlarged and deepened without much cost. This soak is about 16 miles from Yarri, and eight miles further on there is a good supply of water in Jones' well, which is fitted with windlass and buckets and a horse trough. There is water again in wells at Mount Catherine, about 15 miles from Jones' well, and at Yerilla, five miles further on. There is also a well between Yerilla and Kookynie.

Yerilla.

97. There are now about 70 men on this field, which has revived very much since the establishment of the State battery. This battery was erected by the Melba Consols Co. with the aid of a loan from the Government, under the Mining Development Act, and was subsequently taken over by the Mines Department as a State battery. It has five head of stamps, a tailings wheel, and a small cyanide plant. There is a good supply of water from an old shaft 125 feet deep close at hand in which the "Queen of the Earth" lode was cut. The plant is not so well arranged for economical treatment as it might be, but appears to be doing good work.

98. The telegraph line to Yundamindera passes through Yerilla, and it would be a great public convenience if a telephone station were established there, not only for the people round Yerilla, but for those of Yarri, Edjudina, and Pinjin, who could thereby save about 24 miles in getting to a telegraph station.

99. Around Mount Catherine several parties have lately been working, mostly trying over again old "shows" that have been abandoned. Most of these are held as prospecting Areas, and do not appear on the Lease maps. On one of these, known as the "*Tin Dog*," about a mile and a half north of Mount Catherine, a little work has been done lately on a reef running north 65deg. west, and underlaying to N.E. There is an old shaft, said to be about 110 feet deep, with water level at 100 feet, on this reef, which seems a fairly strong body of rather rubbly ironstained material and white quartz. Recent prospecting seems to have been all near the surface. On the old "Daisy" lease, a little further to the S.E., there is a large bold outcrop of somewhat laminated quartz running north 50deg. west. It has been broken into a good deal but the broken quartz has not been removed, so is presumably not worth sending to the battery. There is an old shaft over 100 feet in depth, with water in the bottom of it, close to the outcrop. About two feet in width of a vein of quartz on the west side of the outcrop is now being worked, from which two crushings are reported to have been taken, one of 19 tons returning 7dwts. 16grs. gold per ton, and another of 27 tons 8dwts. per ton. A good deal of alluvial work, some of it said to have been at depths of 20 feet and over, has been done in the flat ground to the N.W. of this show.

100. On the old Mount Catherine mine a large amount of work was done some years ago on a big outcrop of quartz 20 to 30 feet wide running nearly N. and S., with slight underlay to the E. There was a battery on the mine, but a good deal of the quartz broken has evidently been too poor to crush and is still lying at surface. There are several shafts sunk, one being a large main shaft, the dump of which shows that very hard massive greenstone must have been encountered in it. The principal work done appears to have been a large open cut on the outcrop. Two men are now working on the outcrop following somewhat irregular veins of better stone which traverse the outcrop. A crushing of 12 tons returned them 14dwts. 15grs. of gold per ton.

101. *P.A.* 139.—Some distance south-west of Mount Catherine, Donovan and party were working on a reef running N.N.E. and S.S.W., with underlay of about 1 in 2 easterly. The walls of the lode are about three feet apart, and well defined. The country is weathered greenstone, turning pretty hard in the bottom of the shaft. A fair amount of driving has been done, and the party were preparing to sink deeper. They told me they had had three crushings, one of 70 tons returning 16dwts. per ton, 12 tons giving 28dwts. per ton, and 38 tons 16dwts. 10grs. per ton.

102. *Yerilla Central* (684R) and *Viola* (752R) are two leases on the same reef, which is one running east and west and underlying 1 in $3\frac{1}{2}$ to the north. The Viola shaft is down 90 feet vertically, and in the bottom shows a nice body of good stone about three feet in width. In the Yerilla Central lease there are three shafts on this reef: one on the underlay; the other 60 feet vertical to cut the reef, and then on the underlay; the third a vertical shaft down to the water level at 101 feet. In the workings there is a fine body of stone up to six feet in thickness, and averaging three to four feet, but there are places where the space between the lode walls is filled with mullocky material instead of quartz. Some very rich stone has been got, the party telling me that they had crushed 389 tons for 1,232 ounces by amalgamation alone. The tailings have been stacked for subsequent cyanide treatment. In the bottom of the workings the owners value the stone at two ounces to the ton. This reef is a new discovery, and one of much importance to the district. It is close alongside the State battery. About 400 feet south of these workings there are a lot of old workings on a parallel reef, which was the one worked by the old Yerilla Central Company. A party of tributers are working on this and have cut the lode at 90 feet, underlaying north 1 in 1. The width of stone is said to have averaged about two feet in the old workings, but the tributers have only eight or nine inches as yet. Before finding the new reef the owners crushed from this one two parcels of 23 and eight tons, for an average return of 25 dwts. per ton. Previous crushings by other parties are said to have given 2ozs. 3dwts. per ton. The country is oxidised greenstone schist.

103. *Lady Ailsa* (682R) late Melba Consols.—A good deal of work has been done in this lease on a lode, in granite country, running north-north-west and south-south-east, and underlaying about 1 in 1 westerly. There is a vertical shaft 94 feet deep down to water level, and above this level the ore chute has been pretty well worked out for about 150 feet in length. The stone is about 15 inches wide but occurs in a curious series of disjointed step-like masses, having apparently been broken by a number of small step-faults. The average return was given to me as about 17dwts. of gold per ton. In the north end the reef runs into a large white quartz reef seen out-cropping strongly at surface, and running more north and south. Whether this faults the gold-bearing reef or not is not visible, but there is a good deal of probability that it does. The auriferous reef has not yet been found on the other side of it. In the south end the reef passes from the granite into the greenstone country, the south shaft being in the latter. To work the Lady Ailsa mine deeper, a new main shaft would require to be put down, with machinery to deal with a considerable influx of water. The big quartz outcrop to the north has had bunches of fair ore in it, but so far is not payable to take as a whole. The best outlook for this mine appears to me to be in finding the westward continuation of the Yerilla Central east and west lode, and tracing it to its junction with the Lady Ailsa and "Queen of the Earth" reefs, which are running more or less north and south through the western portion of the ground.

104. *King of the South* (704R).—The owners of this lease are working a small vein six to eigh inches wide parallel to the Queen of the Earth old workings, and to the east of them. The shaft is down 30 feet, and some fair stone had been got.

105. *P.A.* 72R (formerly McGregor North).—This is an old mine which has again been tried. The lode runs about north and south with slight underlay to the east, and is a strong one six to 10 feet wide between its smooth well-defined walls. The country is greenstone schist much softened by weathering down to the water level. The lode has been worked for about 600 feet in length, and there are several shafts on it. The present owners are working from a vertical shaft 85 feet deep, at the bottom of which there is an underlay shaft about 20 feet deep down to the water level. In the upper workings there are three veins of quartz, but they come together at the water level to a solid body of quartz six feet wide. Crushings of 83 tons for 57 ounces 12 dwts. of gold, and 13 tons for 14 ounces 15 dwts. have lately been

put through the State battery. This reef impressed me very favourably as a strong distinct good-looking lode, and it seems well worth prospecting thoroughly with a view to re-opening it by means of a main shaft and machinery below the water level.

106. The Mining Statistics to end of 1903 give the production of Yerilla as:—

Gold dollied from specimens ... ... 3,439·67 gross ounces
Stone crushed ... ... 3,468·96 tons for 2,524·25 gross ounces.

No alluvial gold is returned, though there has been a large amount of dry-blowing done and a good deal of gold obtained therefrom. From 1904 and the first nine months of 1905, the monthly returns in the *Gazette* give the production thus:—

Lease.		1904.		Part 1905.	
No.	Name.	Tons.	Fine Ozs.	Tons.	Fine Ozs.
	Middleton's Works	sands. 1775·00	306·36		
684R ...	Yerilla Central	74·00	136·77	369·00	809·68
682R ...	Melba Consols	308·00	174·57	326·00	135·86
95R ...	G. Robertson	...	...	15·00	14·06
P.A. 72R ...	J. Robertson	...	...	96·00	58·66
P.A. 105R ...	O'Halloran and Party...	...	...	86·00	71·84
P.A. 100R ...	Grayson and Party	...	...	39·00	12·62
P.A. 78R ...	Gray and Eddy	...	...	56·00	18·66
P.A. 115R ...	Hopkins and Party	...	...	16·00	3·23
P.A. 118R ...	W. Chambers	...	...	11·00	1·15
P.A. 133R ...	S. Parry	...	...	20·00	6·59
P.A. 87R ...	French and Party	...	...	14·00	2·48
P.A. 80R ...	J. B. Millar	...	...	96·00	28·47
P.A. 98R ...	Dent and Party	...	...	15·00	4·41
P.A. 91R ...	P. Fitzpatrick	...	...	41·00	9·14
807R ...	Red Cross	...	...	14·00	4·99
752R ...	Viola	D. and S.	2·22	18·00	13·46
P.A. 87R ...	Cornell and Party	...	...	46·00	8·44
P.A. 112R ...	G. Dent	...	...	11·00	4·53
		382·00	619·92	1,289·00	1,208·37

107. The following list gives the crushings at the Yerilla State Battery from its start in May, 1905, to end of November, 1905:—

Name.	Tons.	ozs.	dwts.	grs.
P.A. 72R	112	85	0	0
Lady Ailsa	386½	272	14	10
North Star Pros. Area 105R	97	97	17	19
Pros. Area 100, R. Grayson	39	16	10	0
Pros. Area 78R, Gray and Eddy	56	15	15	0
Pros. Area 87R, French and Party	70	17	13	0
Pros. Area 80R, J. B. Miller	108	43	16	4
Pros. Area 98R, Dent and Party	15	5	7	4
Yerilla Central	328	925	14	0
Viola, W. Duncan	38	45	11	0
Red Cross	14	6	5	18
Pros. Area 91R	41	11	3	12
Pros. Area 115R	16	4	3	0
Pros. Area 97R, G. Robertson	15	18	10	11
Pros. Area 112R, Dent and Party	21	6	10	0
Pros. Area 118R, W. Chambers	11	1	10	9
Pros. Area 133R, S. Perry	39	14	16	5
Pros. Area 139R	38	31	15	0

Appendix No. 7.

Occurrence of Natural Gas in the Northern Associated Mine at Kalgoorlie.

On 14th May, 1905, an unusual occurrence was met with in the Northern Associated Mine at Kalgoorlie while boring with a diamond drill at the 1,048 feet level, there having been a fairly strong outburst of inflammable gas. The "country" in which the Kalgoorlie lodes exist being igneous rocks of great geological age (probably pre-Cambrian), it is difficult to suggest a satisfactory explanation of this phenomenon. It is possibly connected with the common occurrence of graphite in the so-called "graphite slates" of the district, which appear to be the filling of fault fissures, and are most probably formed by the attrition of the walls of the faults one against the other. These "slates" are often highly impregnated with very finely divided pulverulent graphite. The existence of carbonaceous matter in the country may have some connection with the genesis of gold in the lodes of Kalgoorlie, and the following notes on the outbreak of gas are put on record as being possibly of use in future investigations on that problem. The outburst of gas is described by Mr. J. O. Hudson, Inspector of Mines, thus:—

"The gas was located in a bore-hole at the 1,048 feet level, in a crosscut, 310 feet west. The hole had an inclination of 60 degrees to the east.

"About 3 o'clock, 14th ultimo, the drill had reached a depth of 687 feet, when a rush of gas occurred and, coming in contact with one of the candles, became ignited. It burned for a considerable time. The men escaped, one being very slightly burnt on the arm. The foreman of the drill states that the pressure rose from 80lbs. to 200lbs. per square inch. The following morning the pressure was 20lbs., the gas coming away in rushes.

"Safety lamps were obtained from the School of Mines and the rods drawn, while doing so the gas forced the water from the bore about 10 feet in height. The odour of the gas was identical with naphtha, and it gave a blue flame. The drill core, where the gas was tapped, is mineralised greenstone with small quartz seams. After the drill was withdrawn, an endeavour was made to fill the hole with water, but this was found impractible. The hole having previously been overflowing this points to the existence of a cavity, but the drill did not locate one. This morning the hole was again overflowing, and a sample of gas was obtained. The position of the drill should be in close proximity to a band of graphite schist, according to the position of this in the upper levels."

Two days later there was still a little gas issuing from the bore, but it soon ceased. The samples of gas collected were analysed by Mr. E. A. Mann, Government Analyst, with the following result:—

(1.) The gas was inflammable, burning with a blue flame with the formation of carbon di-oxide and water, but it was odourless.

(2.) On dilution with air the mixture was mildly explosive, *i.e.*, burnt *en masse*, but without detonation.

(3.) On analysis, it gave the following results:—

- (*a.*) Slight absorption with K.O.H. solution; presence of CO_2.
- (*b.*) Absorption with alkaline pyrogallate; presence of O_2.
- (*c.*) No absorption by fuming sulphuric acid; absence of heavy hydro carbons.
- (*d.*) No absorption by cuprous chloride; absence of CO.
- (*e.*) Contraction on combustion by glowing wire.
- (*f.*) Further absorption by K.O.H. after combustion equivalent to half the contraction; presence of methane.
- (*g.*) No combustion with palladium; absence of hydrogen.

The quantitative analysis of the samples differed somewhat, that contained in a bag (gas) was probably altered by diffusion, and that in the bottle may also have been effected through being collected over water.

These differences due to methods of sampling are not, however, of great importance.

Composition of Gas.	In Bag.	In Bottle.
Carbon Di-Oxide	·28	·33
Oxygen	5·36	7·70
Methane	56·50	42·50
Nitrogen (by difference)	37·86	49·47
	100·00	100·00

The core from the bore was examined by Mr. L. K. Ward, Lecturer in Mineralogy at the School of Mines, W.A., Kalgoorlie, who says:—

"The portion of the core immediately preceding that from the gas-bearing zone, consists of a dense fine grained, sericite schist, where sericite forms practically the whole of the rock mass. Through it run minor veins of dolomite, and there are sparsely disseminated crystals of iron pyrites.

"The core from the gas-bearing zone itself is quite different in structure. It consists of sericite schist which has been greatly crushed, and of which the angular fragments have been recemented by an infiltration of silica and carbonate (varying from almost pure calcite to a ferriferous dolomite) with veinlets of chlorite. In this composite cementing material are sporadic crystals of iron pyrites; but none are to be seen in the fragments of the unaltered schist, in those sections which I have examined.

"In spite of a careful examination of all the constituents of this brecciated zone, under the highest powers of the microscope, I fail to recognise any remarkable percentage of gaseous inclusions. Neither do I find any trace of graphitic matter in those portions of the core which I have sliced.

"Therefore, I am forced to the conclusion (which, of course, may quite possibly be reversed by subsequent examination) that the gases have their origin outside this brecciated zone of schist; into which they have penetrated on account of their readier access that would be afforded by the crushed zone rather than by the uncrushed rock.

"As to the source of the gases I cannot hazard a guess, but consider it likely that they have penetrated upward from greater depths."

Another curious occurrence of carbonaceous material which may bear some relation to this discovery of natural gas was made some three or four years ago in a stope over the 350 feet level of the Queen Margaret mine at Bulong, where a bunch of about 10lbs. weight of black coal-like material was found, carrying gold freely through its mass, and with rich free gold and telluride of gold in close proximity to it. Analysis showed this to be carbon with 9·3 per cent. of ash; specific gravity 1·76 after boiling.

Occurrence of graphite and petroleum in auriferous lodes have been recorded from several localities in the world, and it has been suggested that petroleum may have acted as a precipitant for gold in some cases.

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

To the Secretary for Mines, Department of Mines, Perth.

Mines Department, Office of the State Mining Engineer,
Perth, 1st March, 1906.

SIR,

I have the honour to forward to you, for the information of the Honourable the Minister for Mines, the following Report of the above Board for the year 1905:—

The Board held three meetings during the year, on the 5th January, 19th April, and 18th October, to decide as to the granting of Certificates to various applicants eligible for such without examination, and to arrange for examinations in other cases. First Class Certificates of Competency were granted to Messrs. C. E. White, William Hutchinson, and Henry Wright, who proved themselves to be holders of First Class Certificates of Competency granted in Great Britain. Some other applications were adjourned pending further proof of eligibility of the candidates.

No candidates presented themselves for examination either in April or October.

I have, etc.,
A. MONTGOMERY, M.A., F.G.S.,
State Mining Engineer, Chairman.

DIVISION III.

Report by the Superintendent of State Batteries for the Year 1905.

To the Secretary for Mines, Perth.

SIR,

I have the honour to submit my eighth Annual Report on the State Batteries and Cyanide Plants, for the information of the Hon. the Minister for Mines.

At the close of the year 1904, there were 21 batteries, 1 Huntington mill, 14 cyanide, 1 slimes and 1 tin dressing plant in operation; this number has been increased to 29 batteries (including Huntington mill), 1 tin dressing plant, 24 cyanide and 1 slimes plant.

The number of stamps now working total 276, as against 215 last reported.

The districts furnished with crushing facilities during the year were:—

Duketon	10-head and Cyanide Plant	
Randalls	do.	do.
Yarri	do.	do.
Sandy Creek (Nullagine)	do.	do.
Yerilla	5-head	do.
Pin Gin	do.	do.
Siberia	do.	do.
Black Range	6-head	do.
Pig Well	Cyanide plant only	
Yundamindera	do.	do.

Of the above, the first four (4) named and Black Range cyanide plant were in course of construction at the close of last year, the remainder all having been started and completed during the present 12 months.

PLANTS STARTED DURING THE YEAR.

Duketon (June).—Tons crushed, 2,160·5, yielding 1,766·18ozs., valued at £6,378·21; cyanide treatment, 1,155·5 tons, yielding 139·97oz., valued at £387·6.

The district has not come up to expectations, and all the available stone was practically crushed during the first two months' run, since when the mill has been mostly hung up for want of stone. This is unfortunate, as the plant is the most up-to-date of the State battery system, being provided with elevators and automatic feeders, and the shortness of stone has not allowed a comparison to be made against hand-fed batteries.

The reports from the manager do not indicate that an increased supply of stone may be looked for during the coming year.

Randalls (June).—Tons crushed, 2,519·2, yielding 984·3ozs., valued at £3,517·05; cyanide treatment, 623 tons, yielding 49·54ozs., valued at £148.

This quantity has not nearly been sufficient to keep the mill running even half-time, and the low value obtained from the bulk of the ore crushed has caused many of the leases to become abandoned.

With one or two exceptions the properties now worked do not promise well.

Cyanide operations were discontinued after a short trial, as it was found that the treatment of the sands immediately after crushing did not prove a success. They are now being allowed to "weather," but the general values are so low that it is questionable if they will ever pay for treatment.

Yarri (July).—Tons crushed 2,074·5, yielding 1,876·2ozs., valued at £6,754·32; cyanide treatment, 1,728 tons, yielding 234·43ozs., valued at £831·13.

At this plant progress was not so satisfactory as anticipated, and although the mill started well, running soon became intermittent, as it was discovered that owing to faulty supervision during construction a thorough overhaul was necessary before the plant could give satisfactory results. The battery was closed down in November to allow of the alterations and repairs, and these being now nearing completion, I hope that the re-starting and results will justify expectations.

Sandy Creek (Nullagine, N.W.) (May).—Tons crushed, 1,687, yielding 3,803ozs., valued at £13,791·66; cyanide treatment, 826·05 tons, yielding 486·11ozs., valued at £1,556·55.

After the stone at grass was crushed, the supply became gradually less, until at the present time the ore coming forward does not represent one shift daily. The averages have come down much below anticipation, and the water supply has also considerably decreased.

Yerilla (May).—Tons crushed, 1610·5, yielding 1809·16ozs., valued at £6,512·95.

This plant was erected by a private company under assistance from the Department, but failing to carry on operations the Department was compelled to take over the plant at a valuation, less the amount of money advanced. The mill was only five head, and in very bad order. No cyanide plant was attached, and upon the Department taking over, the battery was overhauled, and a cyanide plant erected. Although the working costs have been high the district has benefited, being supplied with crushing facilities which otherwise it would have been deprived of.

The cyanide plant started in December, the sands being therefore now only under treatment.

Pin Gin (October) *and Siberia* (November).—*Pin Gin*—Tons crushed 780·4, yielding 966·78ozs., valued at £3,480; cyanide sands treated 556 tons, yielding 88·11ozs., value £285·78. *Siberia*—Tons crushed 307, yielding 124·07ozs., valued at £446·65.

These plants, which are each five head, commenced operations late in the year, and at present very little can be said about them.

The first-named district, from present appearances, is promising, and the quantity of stone booked is encouraging.

Black Range Cyanide Plant (July).—This plant has successfully treated 2,137 tons of sands for 1,044·78ozs., valued at £3,748.

Black Range.—This district warranted an increase in crushing power, and four single stamp boxes were removed to make room for two new 5-head boxes. The original design of the mill facilitated this addition without having to alter the existing cam shaft and driving gear. New cams were placed in position to make up for the additional stamps added, and the middle single stamp not having been interfered with, the plant became 11-head.

The mill has crushed 4,936·75 tons of stone for a return of 5,986ozs. during the year.

Pig Well Cyanide Plant.—This plant started operations in August last, and for the remainder of the term did very satisfactory work, treating 1,734 tons for 439·98ozs. at a low rate of costs per ton.

Yundamindera Cyanide Plant.—Although the inducement to erect a cyanide plant was not great, a small one has been placed there and started to treat sands during December.

This field has remained very quiet, and there is not much promise that even with the addition of this plant the prospects will show much improvement.

Tin Dressing Plants.

Greenbushes.—During the year 3,697 tons of stone were treated for a return of 63·49 tons of Black Tin.

The increase in tonnage warranted the Department in granting the district an extra plant, and it was decided to erect another of a different type. At about four miles north of the old plant (Bunbury end), a paddle conveyor and grinding pan is now in course of erection, and will be started early in the coming year, when it is hoped that the lower grade ore will be treated more cheaply and with success.

Mulline Slimes Plant.

At the close of last year only 691 tons had been treated, but during this year very satisfactory work has been done, 7,028 tons having been dealt with. At time of starting this plant, records had been kept representing the assay value of 5,588 tons from prospectors' crushings. The total due them (prospectors) amounted to £5,231 10s. 6d., and during the year this amount has been paid over, and the accumulated heap is now being operated upon.

The charge made to prospectors has been 10s. per ton, but this has not covered expenses, which were 12s. 5d. per ton, or a loss on working of £859. From the accumulated heaps, however, £1,015 has been cleared, so that, since the inception of the plant, a profit of £156 has been made.

Direct Purchase of Tailings.

The system introduced mainly as an experiment at four different batteries, whereby prospectors had the option of accepting a direct payment on a basis of 75 per cent. of the assay value of the sands, was not only much appreciated in some quarters, but it was found the principle, while facilitating early settlement, did not seriously interfere with the results obtainable. The option has been extended, and with one or two exceptions, where tailings are admittedly not amenable to cyanide treatment, at all batteries are similar privileges granted.

Leased Plants.

Those leased during the previous year still occupy a similar position, viz., Tuckanarra and Widgiemooltha.

At the former arrangements were made whereby stone from Nannine would be treated by the lessee at Government rates, but departmental control was not exercised, owing to the lessee giving general satisfaction and, the want of knowledge as to the amount of stone that would be forthcoming from Nannine, the Department paying freight from the latter to Tuckanarra.

At *Widgiemooltha* no noted advancement has been made, the Department still giving a representative body of the local prospectors the free use of the mill to enable them to try and revive the place, unfortunately their efforts do not seem to meet with success.

Batteries Closed.

Southern Cross was closed down in August; the wants of the public being amply met by private plants.

Laverton, November.—Temporarily, owing to shortness of stone.

Water Supply.

This has proved a stumbling block to progress at several places, notably, Meekatharra and Black Range.

At the first named place, repeated efforts by this branch to establish a permanent supply have not been successful, and the work is now receiving the attention of the Mines Water Supply Engineer, who anticipates that the water will require to be brought some considerable distance.

Black Range.—Although the same amount of work was not done in the battery shaft as was the case at Meekatharra, sufficient was accomplished to satisfy the Department that for a permanent supply another line of country would require to be tapped. This work is also engaging the attention of the Engineer Mines Water Supply, and it is hoped with success, as the district is offering a fairly large quantity of stone for crushing.

Darlôt.—The water was obtained from the main shaft of the Ballangarry lease. The supply failing, an agreement was entered into, whereby the owners of the lease were provided with a vertical boiler and steam winch, in consideration of which they were to sink and drive for water until an equivalent cost up to £300 had been expended in labour. This work is still proceeding, with every prospect of success.

Greenbushes.—Further driving in the main shaft was found necessary, and at present the supply is adequate for two shifts.

Nullagine.—The supply at this plant has been short throughout, and although the Mines Water Supply have had the matter in hand, the water available is not in excess of one shift's requirements. Water in this locality has always been difficult to obtain.

Year's Operations.

The quantity of stone milled for the year amounted to:—

Tons	85,018
Yielding ozs.	92,327
Valued at	£333,013

Average per ton, 1·08ozs.

For a working expenditure of £51,286 18s. 10d., or not including leased plants, 81,098 tons were crushed for £50,014 9s. 5d.

The total tonnage cyanided for the year amounts to 54,420, of which 52,704·55 tons yielded 14,406·75ozs., valued at £50,480; the remaining tons of sands not being cleaned up.

£21,289 0s. 9d. has been paid to owners of tailings.

Working expenditure was £19,688 19s. or 7s. 3d. per ton. While 7,028 tons of slimes cost for treatment £4,257 5s. 9d.

Output.

This has increased in each instance. The following figures show interesting comparison:—

Milling.

	tons.	ozs.
Up to 1901	68,719	77,533
1902	39,517	57,255
1903	49,233	58,305
1904	71,616	78,309
1905	85,018	92,327

Cyaniding.

	tons.
Up to 1902	29,255
1903	32,369
1904	43,251
1905	54,420

Slimes.

	tons.
1904	691
1905	7,028

Revenue and Expenditure.

Full details of this for 1905 are given in the tabulated statements at the conclusion of this report.

Separate Profit and Loss Accounts for each battery, costs per ton, working expenditure and additions and improvements, have all been carefully compiled.

The operations show that a net profit of £3,342 6s. 6d. has been made, which must be considered satisfactory.

	£ s. d.	£ s. d.
1905.—*Renenue from*—		
Batteries	50,311 15 2	
Cyanide and Slimes Plants	31,086 2 6	
Tin Plant	929 0 0	
Total	...	82,326 17 8
1905.—*Expenditure on*—		
Working Account, Batteries	51,286 18 10	
Do. Cyanide and Slimes Plants	23,946 4 9	
Do. Tin Plant	1,056 19 11	
Additions and Improvements	2,694 7 8	
Total	...	78,984 11 2
Profit for the Year	...	3,342 6 6

	Expenditure.	*Receipts.*
	s. d.	s. d.
Milling, per ton	12 4	12 2·5
Cyaniding, per ton	7 3	9 8·5
	£	£
To *1904*—		
Loss on Batteries	24,039	
Profit on Cyanide	9,607	
Loss on System (as per previous reports)	...	14,432
For *1905*—		
Profit on Cyaniding and Slimes	6,279	
Loss on Batteries and Tin Plant	2,937	3,342
Since inception, Total Loss on Working Expenses	...	£11,090

STAFF.

The clerical staff of this branch has undergone considerable changes during the year. As at present constituted, the work is being done in a very satisfactory manner, and although a continual increase in returns is found necessary, I predict that the officers are capable of retaining the same, if not greater, promptitude in the future than it was found possible in the past.

DAVID H. WHITE,

Perth, 16th March, 1906. Superintendent of State Batteries.

No. 1.—*Expenditure from "Consolidated Revenue Vote" and "Loan Funds" on erection of State Batteries for Year ending 31st December, 1905, and Totals since inception.*

Batteries.	From Revenue.	From Loan Funds.	Totals.
	£ s. d.	£ s. d.	£ s. d.
Harriston Leases	78 3 0	...	78 3 0
Niagara	0 6 0	1 2 6	1 8 6
Yarri Well	226 14 10	43 4 6	269 19 4
Duketon	2,356 18 3	1,577 18 2	3,934 16 5
Yundamindera	591 12 6	17 14 9	609 7 3
Black Range (cyanide)	905 10 7	510 16 4	1,416 6 11
Sandy Creek	1,457 13 1	1,200 14 3	2,658 7 4
Pig Well	536 2 11	229 0 11	765 3 10
Yerilla	1,045 2 2	207 1 6	1,252 3 8
Darlôt (winding plant)	152 14 11	147 5 1	300 0 0
Siberia (water supply)	179 5 3	3 16 1	183 1 4
Greenbushes (water supply)	187 10 0	...	187 10 0
Pin Gin	2,698 11 2	1,190 15 9	3,889 6 11
Yarri	2,417 18 11	2,031 16 0	4,449 14 11
Randalls	1,974 18 1	2,643 19 9	4,618 17 10
Greenbushes	1,844 0 1	...	1,844 0 1
Do.	0 6 0	77 19 3	78 5 3
Siberia	3,139 10 8	1 15 0	3,141 5 8
Embleton Mill	21 11 11	...	21 11 11
Additions, etc., Meekatharra	328 18 1	...	328 18 1
Coolgardie	247 7 11	76 2 5	323 10 4
Norseman	50 0 9	...	50 0 9
Burtville	23 1 10	...	23 1 10
Head Office	115 8 6	...	115 8 6
Lennonville (improvements)	18 16 9	33 5 2	52 1 11
Lake Darlôt	42 14 9	4 19 1	47 13 10
Expenditure for 1905	20,640 18 11	9,999 6 6	30,640 5 5
Erection of State Batteries—			
Expenditure to 31st December, 1904 ...	66,441 2 7	...	...
Loan Expenditure to 31st December, 1904	...	120,000 0 0	186,441 2 7
Gross Totals	87,082 1 6	129,999 6 6	217,081 8 0

No. 2.—*Return showing the Number of Tons Crushed, Gold Yield, and Average Value per Ton, for Year ending 31st December, 1905.*

Batteries.	Tons crushed.	Gold Yield. Ozs.	Average per Ton in Shillings.
Black Range	4,936·75	5,986·31	87·12
Boogardie	5,786	2,786·72	34·56
Burtville	4,324·25	13,327·64	221·76
Coolgardie	6,119·5	5,279·22	61·92
Darlôt	5,470	5,665·42	74·16
Duketon	2,160·5	1,766·18	59·04
Laverton	985	718·43	52·56
Lennonville	2,124	2,468·24	83·52
Leonora	4,592	3,786·29	59·04
Meekatharra	4,301·75	8,007·9	133·92
Menzies	4,138·5	4,524·75	78·48
Mount Ida	1,895·5	2,571·85	97·92
Mulline	5,808	5,876·4	72·72
Mulwarrie	1,400·4	1,503·2	77·04
Niagara	5,654	4,717·89	59·76
Norseman	3,561·15	3,912·52	79·20
Nullagine	1,687·65	3,803·24	162·00
Pig Well	2,746	2,072·27	54·00
Pin Gin	780·40	966·78	89·28
Randalls	2,519·44	984·3	28·08
Ravelstone	1,570·	728·53	33·12
Siberia	307	124·07	28·80
Southern Cross	641	282·17	31·68
Tuckanarra	2·350·25	1,653	50·40
Wiluna	3,870	3,642·3	67·68
Yarri	2,074·5	1,876·2	64 80
Yerilla	1,610·5	1,809·16	80·64
Yundamindera	1,604·5	1,485·93	66,96
Total	85,018·54	92,326·91	77·76
Tin Plants.		Tons Black Tin.	
Greenbushes	3,697	63·49	

WESTERN AUSTRALIA.

No. 2A.—*Return for State Cyanide and Slimes Plants for Year ending 31st December, 1905, showing Tons Treated, Yield, and Value.*

Plants.	Tons treated.	Yield (ozs.)	Value (£).
Black Range	2,137	1,044·78	3,748·03
Boogardie	3,753·5	1,423·94	5,514·61
Burtville	2,746·5	1,312·03	4,464·41
Coolgardie	3,487	797·01	2,474·13
Darlôt	3,814	674·55	2,425·27
Duketon	1,155·5	139·97	387·6
Laverton	900	177·20	574·25
Lennonville	428	163·23	635·59
Leonora	7,050	1,855·45	6,378·18
Meekatharra	3,225	787·81	3,074·66
Menzies	3,350	978·06	3,036·62
Mulline	3,360	1,272·09	4,278·42
Mulwarrie	1,859	436·36	1,641·56
Niagara	7,341	1,417·45	5,294·98
Norseman	1,851	521·34	1,933·11
Pig Well	1,734	439·98	1,401·9
Pin Gin	556	88·11	285·78
Randalls	623	49·54	148·00
Sandy Creek, N.W.	826·05	486·11	1,556·55
Siberia	...	...	...
Southern Cross	780	107·31	395·27
Yarri	1,728	234·43	831·13
Yerilla	...	...	...
Yundamindera	...	...	...
	52,704·55	14,406·75	50,480·05
Mulline (Slimes)	6,893	2,910·57	10,603·35
	59,597·55	17,317·32	61,083·4
Sands still under treatment	1,850·45	...	...
	61,448	**17,317·32**	**61,083·4**

No. 3.—*Return showing the number of Tons Crushed, Gold Yield, Average per Ton, and Value since inception, to 31st December, 1905.*

—	Tons crushed.	Gold Yield.	Average.	Value.
		ozs.	ozs.	£
Black Range	8,495·40	10,751·92	1·26	38,941·57
Boogardie	11,432·50	5,615·85	·49	21,709·01
Burtville	9,323	24,615·26	2·64	89,920·76
Coolgardie	10,230·50	9,136·02	·89	32,946·90
Darlôt	15,515·25	25,514·47	1·64	95,280·91
Duketon	2,160·50	1,766·18	·81	6,358·21
Laverton	7,458·75	7,248·88	·97	27,267·72
Lennonville	19,452·84	28,592·20	1·46	107·988 72
Leonora	22,934	21,143·88	·92	79,698·37
Meekatharra	20,475·60	24,985·35	1·22	92,626·80
Menzies	9,206·25	9,241·78	1·00	33,107·16
Mt. Ida	17,031·40	21,190·26	1·23	79,587·13
Mulline	45,202·70	58,558·35	1·29	209,991·20
Mulwarrie	15,500·65	18,954·44	1·22	71·492·70
Niagara	23,650·50	24,495·95	1·02	90,480·49
Norseman	20,905·65	21,998·01	1·04	82,371·37
Nullagine	1,687·65	3,803·24	2·25	13,791·66
Pig Well	3,452·50	2,557·34	·74	9,206·41
Pin Gin	780·40	966·78	1·23	3,480·10
Randalls	2,519·20	984·30	·39	3,517·05
Southern Cross	4,399·10	2,228·57	·506	8,239·44
Siberia	307	124·07	·404	446·65
Wiluna	7,280·50	5,874,52	·806	21,293·46
Yarri	2,074·50	1,876·20	·90	6,754·32
Yerilla	1,610·50	1,809·16	1·12	6,512·95
Yundamindera	4,408	5,425·67	1·23	20,123·51
Ravelstone	7,422	6,878·80	1·29	25,934·93
Tuckanarra	7,909·85	10,236·79	·92	38,376·23
Widgiemooltha	3,239·50	1,312·40	·406	4,985·59
Batteries closed	8,110	5,842·94	·72	22,197·84
Total	314,176·19	363,729·58	1·15	1,344,629·16
Cyanide	**165·470**	...	...	**155,801·4**
		Tons Black Tin.		
Greenbushes (Tin Plant)	9,222·5	244·69	...	10,337

STATE BATTERIES AND CYANIDE PLANTS.

No. 4.—*Costs per Ton for the Year ending 31st December, 1905.*

PLANT.	Tons Milled.	MILLING.			PLANT.	Tons Treated.	CYANIDING.		
		Wages.	Repairs and Maintenance.	Total.			Wages.	Repairs and Maintenance.	Total.
		s. d.	s. d.	s. d.			s. d.	s. d.	s. d.
Black Range	4,937	7 9·84	4 9·12	12 6·96	Black Range	2,137	5 1·24	2 8·10	7 9·34
Boogardie	5,786	5 6·00	5 10·56	11 4·56	Boogardie	3,784	5 7·24	2 4·72	7 11·96
Burtville	4,324	7 10·08	4 10·56	12 8·64	Burtville	2,747	5 5·33	2 6·58	7 11·91
Coolgardie	6,119	6 0·96	4 9·60	10 10·56	Coolgardie	3,487	4 5·54	3 0·24	7 5·78
Darlôt	5,470	6 11·52	4 1·82	11 1·34	Darlôt	3,842	4 11·59	2 7·72	7 7 31
Duketon	2,161	6 11·04	2 10·03	9 9·07	Duketon	1,155	3 10·56	4 4·99	8 3·55
Laverton	985	13 0·72	9 6·48	22 7·20	Laverton	900	5 1·29	2 1·92	7 3·21
Lennonville	2,124	8 8·88	6 3·84	15 0·72	Lennonville	428	7 1·44	3 2·80	10 4·24
Leonora	4,592	3 11·76	3 5·76	7 5·52	Leonora	7,140	3 6·36	1 8·04	5 2·40
Meekatharra	4,302	6 3·00	4 11·40	11 2·40	Meekatharra	3,575	5 10·39	1 11·01	7 9·40
Menzies	4,138	6 5·52	4 8·16	11 1·68	Menzies	3,380	5 8·62	1 8·63	7 5·25
Mt. Ida	1,896	9 10·80	3 4·27	13 3·07					
Mulline	5,808	6 4·08	4 3·36	10 7·44	Mulline	3,455	5 0·02	3 6·90	8 6·92
Mulwarrie	1,400	9 6·96	6 0·72	15 7·68	Mulwarrie	1,880	6 6·24	3 9·22	10 3·46
Niagara	5,654	7 1·45	3 8·88	10 10·33	Niagara	7,341	4 2·59	1 10·33	6 0·92
Norseman	3,561	6 10·06	6 7·58	13 5·64	Norseman	1,920	5 8·23	3 3·48	8 11·71
Nullagine (20 M. Sandy)	1,688	10 0·45	8 0·00	18 0·45	Nullagine (20 M. Sandy)	1,084	7 6·85	2 3·72	9 10·57
Pigwell	2,746	8 2·59	4 6·53	12 9·12	Pigwell	1,734	3 6·40	1 6·38	5 0·78
Pingin	780	10 2·40	4 2·40	14 4·80	Pingin	556	4 0·38	2 0·65	6 1·03
Randall's	2,520	9 9·84	3 6·24	14 4·08	Randall's	695	7 3·64	2 2·20	9 5·84
Southern Cross	641	10 0·00	5 4·56	15 4·56	Southern Cross	780	4 9·38	2 11·23	7 8·61
Siberia	307	8 2·40	3 2·40	11 4·80	Siberia	180	3 11·54	1 9·62	5 9·16
Wiluna	3,870	7 9·60	5 4·80	13 2·40					
Yarri	2,074	6 6·48	7 6·72	14 1·20	Yarri	1,728	3 3·19	1 6·55	4 9·74
Yerilla	1,610	11 4·32	5 0·96	16 5·28	Yerilla	255	3 5·32	2 8·28	6 1·60
Yundamindera	1,605	15 3·36	7 5·52	22 8·88	Yundamindera	237	4 5·13	2 5·31	6 10·44

No. 5.—*Profit and Loss Account of each Battery and Cyanide Plant for the Year ending 31st December, 1905.*

Goldfield.	Plant.	No. of Stamps.	Milling.				Plant.	Cyaniding.			
			Expenditure.	Receipts.	Profit.	Loss.		Expenditure.	Receipts.	Profit.	Loss.
			£ s. d.	£ s. d.	£ s. d.	£ s. d.		£ s. d.	£ s. d.	£ s. d.	£ s. d.
E. Murchison ...	Black Range	11	3,109 13 6	3,309 0 0	199 6 6	...	Black Range	831 5 3	873 9 9	42 4 6	...
Murchison ...	Boogardie	10	3,296 3 1	3,149 7 0	...	146 16 1	Boogardie	1,513 8 1	1,910 4 10	396 16 9	...
Mt. Margaret ...	Burtville	10	2,751 14 8	2,990 3 5	238 8 9	...	Burtville	1,099 6 2	1,413 6 5	314 0 3	...
Coolgardie ...	Coolgardie	10	3,334 7 5	3,704 8 10	370 1 5	...	Coolgardie	1,305 19 8	1,355 16 1	49 16 5	...
E. Murchison ...	Darlôt	10	3,040 19 0	3,348 17 7	307 18 7	...	Darlôt	1,462 7 1	1,321 15 1	...	140 12 0
Mt. Margaret ...	Duketon	10	1,058 6 3	1,296 8 0	238 1 9	...	Duketon	479 2 9	409 13 7	...	69 9 2
Do. ...	Laverton	10	1,113 10 6	616 2 0	...	497 8 6	Laverton	327 4 2	338 12 3	11 8 1	...
Murchison ...	Lennonville	10	1,600 2 3	1,288 0 5	...	312 1 10	Lennonville	221 12 2	225 11 5	3 19 3	...
Mt. Margaret ...	Leonora	10	1,712 19 6	2,125 6 7	412 7 1	...	Leonora	1,856 14 11	4,418 19 7	2,562 4 8	...
Murchison ...	Meekatharra	10	2,409 4 6	2,244 1 3	...	165 3 3	Meekatharra	1,391 7 0	1,617 13 5	226 6 5	...
N. Coolgardie ...	Menzies	10	2,308 6 3	2,584 8 5	276 2 2	...	Menzies	1,256 19 7	1,823 0 3	566 0 8	...
Do. ...	Mt. Ida	10	1,256 0 4	1,222 7 3	...	33 13 1					
Do. ...	Mulline	20	3,089 2 4	3,420 1 6	330 19 2	...	Mulline	1,481 13 11	1,815 19 10	534 5 11	...
Do. ...	Mulwarrie	10	1,096 7 1	870 18 7	...	225 8 6	Mulwarrie	967 2 3	1,068 19 10	101 17 7	...
Do. ...	Niagara	10	3,071 3 8	3,592 13 2	521 9 6	...	Niagara	2,230 15 10	3,708 3 9	1,477 7 11	...
Dundas ...	Norseman	10	2,398 11 6	2,102 1 8	...	296 9 10	Norseman	861 14 4	1,025 8 10	163 14 6	...
Mt. Margaret ...	Pigwell	10	1,752 5 0	1,697 8 10	...	54 16 2	Pigwell	439 5 7	890 3 2	450 17 7	...
N. Coolgardie ...	Pingin	5	562 9 11	469 8 10	...	93 1 1	Pingin	169 4 7	191 17 3	22 12 8	...
Coolgardie ...	Randall's	10	1,682 16 9	1,426 11 0	...	256 5 9	Randall's	329 14 7	152 14 8	...	176 19 11
Pilbarra ...	Sandy Creek, Nullagine	10	1,522 10 7	1,665 6 2	142 15 7	...	Sandy Creek, Nullagine	535 12 4	682 6 5	146 14 1	...
Coolgardie ...	Siberia	5	175 5 4	153 4 5	...	22 0 11	Siberia	51 17 8	61 4 0	9 6 4	...
Yilgarn ...	Southern Cross	10	493 7 5	333 11 10	...	159 15 7	Southern Cross	301 1 0	321 8 10	20 7 10	...
E. Murchison ...	Wiluna	10	2,564 4 1	2,599 16 10	35 12 9	...					
N. Coolgardie ...	Yarri	10	1,464 14 4	1,236 9 5	...	228 4 11	Yarri	415 17 2	589 5 5	173 8 3	...
Do. ...	Yerilla	5	1,324 1 2	996 13 7	...	327 7 7	Yerilla	78 4 9	114 15 0	36 10 3	...
Do. ...	Yunamindera	Htgdon. Mill	1,826 3 0	1,108 3 7	...	717 19 5	Yundamindera	81 8 2	81 2 9	...	0 5 5
			50,014 9 5	49,551 0 2	3,073 3 3	3,536 12 6		19,688 19 0	26,411 12 5	7,109 19 11	387 6 6
	Leases—										
Peak Hill ...	Ravelstone	10	1,111 17 9	599 0 10	...	512 16 11	Mulline Slimes	4,257 5 9	4,674 10 1	417 4 4	...
Murchison ...	Tuckanarra	10	157 11 8	161 14 2	4 2 6	...					
Coolgardie ...	Widgiemooltha	10	3 0 0	...	...	3 0 0					
		276									
	Tin Plant—										
	Greenbushes	5	1,056 19 11	929 0 0	...	127 19 11					
			52,343 18 9	51,240 15 2	3,077 5 9	4,180 9 4		23,946 4 9	31,086 2 6	7,527 4 3	387 6 6

STATE BATTERIES, TIN

Statement of Receipts and

LOCALITY OF PLANT.	MILLING.																					
	Tons.	Management.			Wages.			Stores.			Repairs.			Sundries.			Total Working Expenses.			Per Ton.			Receipts.			Per ton.	
		£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	s.	d.
Black Range ...	4,937	300	15	4	1,633	17	5	798	3	6	323	0	1	53	17	2	3,109	13	6	0	12	7	3,309	0	0	13	5
Boogardie	5,786	282	15	9	1,308	2	1	1,459	9	11	215	16	8	29	18	8	3,296	3	1	0	11	5	3,149	7	0	10	11
Burtville	4,324	442	3	11	1,252	17	7	691	2	1	337	7	5	28	3	8	2,751	14	8	0	12	9	2,990	3	5	13	10
Coolgardie	6,119	428	6	3	1,437	5	9	1,360	19	11	97	6	8	10	8	10	3,334	7	5	0	10	11	3,704	8	10	12	1
Darlôt	5,470	305	8	4	1,599	11	1	901	18	8	188	1	3	45	19	8	3,040	19	0	0	11	1	3,348	17	7	12	3
Duketon	2,161	180	14	5	568	15	10	272	19	9	26	1	0	9	15	3	1,058	6	3	0	9	9·5	1,296	8	0	12	0
Laverton	985	240	4	0	403	15	3	218	3	1	239	1	1	12	7	1	1,113	10	6	1	2	7	616	2	0	12	6
Lennonville... ...	2,124	223	19	8	704	11	3	485	15	1	154	18	0	30	18	3	1,600	2	3	0	15	1	1,288	0	5	12	1·5
Leonora	4,592	263	0	2	650	10	0	603	18	9	187	11	10	7	18	9	1,712	19	6	0	7	5·5	2,125	6	7	9	3
Meekatharra ...	4,302	330	7	0	1,014	10	2	773	14	10	285	14	5	4	18	1	2,409	4	6	0	11	2·5	2,244	1	3	10	5
Menzies	4,138	293	4	2	1,046	8	6	830	17	3	120	14	2	17	2	2	2,308	6	3	0	11	2	2,584	8	5	12	6
Mt. Ida	1,896	394	9	6	545	9	9	291	19	0	5	11	2	18	10	11	1,256	0	4	0	13	3	1,222	7	3	12	11
Mulline	5,808	376	14	11	1,466	2	11	751	11	11	464	1	6	30	11	1	3,089	2	4	0	10	7·5	3,420	1	6	11	9
Do. (Slimes) ...	...	...			...			...			...			...			...			...			...			...	
Mulwarrie	1,400	228	2	9	442	19	3	267	5	6	145	5	0	12	14	7	1,096	7	1	0	15	8	870	18	7	12	5
Niagara	5,654	398	18	1	1,614	13	4	930	5	4	94	15	2	32	11	9	3,071	3	8	0	10	10	3,592	13	2	12	8·5
Norseman	3,561	289	5	11	928	6	6	772	11	6	389	0	8	19	6	11	2,398	11	6	0	13	6	2,102	1	8	11	10
Pig Well	2,746	287	9	11	840	12	3	377	16	7	193	1	8	53	4	7	1,752	5	0	0	12	9	1,697	8	10	12	4
Pin Gin	780	53	2	7	345	3	6	120	11	10	3	3	4	40	8	8	562	9	11	0	14	5	469	8	10	12	0·5
Randalls	2,520	255	14	7	983	3	1	299	1	7	115	7	6	29	10	0	1,682	16	9	0	13	4	1,426	11	0	11	4
Sandy Creek, N.W.	1,688	239	17	6	607	6	10	566	1	8	102	10	6	6	14	1	1,522	10	7	0	18	0·5	1,665	6	2	19	9
Siberia	307	32	19	1	93	5	0	49	0	3	...			0	1	0	175	5	4	0	11	5	153	4	5	10	0
Southern Cross ...	641	170	5	7	150	12	1	117	5	7	5	13	0	49	11	2	493	7	5	0	15	5	333	11	10	10	5
Wiluna	3,870	386	9	6	1,143	1	10	854	18	7	165	8	9	14	5	5	2,564	4	1	0	13	3	2,599	16	10	13	5
Yarri...	2,074	136	12	10	542	17	8	380	0	7	401	16	0	3	7	3	1,464	14	4	0	14	1·5	1,236	9	5	11	11
Yerilla	1,610	197	11	11	717	5	10	292	6	3	102	12	8	14	4	6	1,324	1	2	0	16	5	996	13	7	12	4·5
Yundamindera ...	1,605	350	9	7	876	7	0	479	2	7	110	1	5	10	2	5	1,826	3	0	1	2	9	1,108	3	7	13	10
	81,098	7,089	3	3	22,917	11	9	14,947	1	7	4,474	0	11	586	11	11	50,014	9	5	0	12	4	49,551	0	2	12	2·5
Ravelstone	1,570	...			...			...			...			...			1,111	17	9	...			599	0	10	...	
Tuckanarra... ...	2,350	...			...			...			...			...			157	11	8	...			161	14	2	...	
Widgiemooltha ...	...	...			...			...			...			...			3	0	0	...			...			...	
	85,018	...			...			...			...			...			51,286	18	10	...			50,311	15	2	...	
Tin Plant.																											
Greenbushes ...	3,697	...			...			...			...			...			1,056	19	11	...			929	0	0	...	
	88,715	...			...			...			...			...			52,343	18	9	...			51,240	15	2	...	

SUMMARY.

	Expenditure.			Additions, Etc.			Total Expenditure.			Receipts.			Loss.			Profit.			
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	
Batteries	51,286	18	10	1,638	0	10	52,924	19	8	50,311	15	2	2,613	4	6	...			
Cyanide plants ...	23,946	4	9	860	3	6	24,806	8	3	31,086	2	6	...			6,279	14	3	
Tin plant	1,056	19	11	196	3	4	1,253	3	3	929	0	0	324	3	3	...			
	76,290	3	6	2,694	7	8	78,984	11	2	82,326	17	8	2,937	7	9	6,279	14	3	= Profit, £3,342 6 6

AND CYANIDE PLANTS.

Expenditure for Year 1905.

Cyaniding.											Additions to Plant Paid from Revenue.	
Tons.	Management.	Wages.	Assays.	Stores.	Repairs.	Sundries.	Total Working Expenses.	Per Ton.	Receipts.	Per Ton.	Battery.	Cyanide.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	s. d.	£ s. d.	s. d.	£ s. d.	£ s. d.
2,137	98 18 9	379 9 6	66 19 0	201 2 11	11 4 2	73 10 11	831 5 3	7 9	873 9 9	8 2	435 15 11	243 9 10
3,784·5	185 11 1	647 13 2	227 7 2	362 16 8	17 9 6	72 10 6	1,513 8 1	8 0	1,910 4 10	10 1	179 8 1	13 13 7
2,746·5	266 14 6	327 4 2	154 7 7	242 19 5	31 12 5	76 8 1	1,099 6 2	8 0	1,413 6 5	10 3·5	30 6 2	...
3,487	243 17 2	491 14 9	42 10 9	479 17 6	25 3 6	22 16 0	1,305 19 8	7 6	1,355 16 1	7 9	173 16 7	...
3,842	286 0 9	633 2 3	34 19 11	413 13 3	14 12 8	79 18 3	1,462 7 1	7 7	1,321 15 1	6 10·5	261 19 5	2 12 5
1,155·5	73 8 10	150 13 4	140 17 1	101 3 5	2 10 0	10 10 1	479 2 9	8 3·5	409 13 7	7 1	20 9 2	1 6 0
900	98 17 1	111 4 2	19 17 5	74 7 8	12 11 4	10 6 6	327 4 2	7 3	338 12 3	7 6	...	...
428	26 13 5	104 13 4	21 0 9	41 19 4	10 12 2	16 13 2	221 12 2	10 4	225 11 5	10 6·5	15 0 0	...
7,140	255 15 6	690 17 3	313 7 11	451 4 2	21 13 3	123 16 10	1,856 14 11	5 2·5	4,418 19 7	12 4·5	...	95 4 10
3,575	177 6 4	700 1 8	171 5 2	292 1 8	7 6 3	43 5 11	1,391 7 0	7 9	1,617 13 5	9 0·5	12 14 4	...
3,380	197 16 3	568 1 11	200 10 5	250 2 7	11 12 6	28 15 11	1,256 19 7	7 5	1,823 0 3	10 9·5	75 9 0	...
...	...	...	...	...	...	...	...	...	...	...	8 17 10	...
3,455	179 19 2	571 0 11	113 1 2	479 9 3	58 3 2	80 0 3	1,481 13 11	8 7	1,815 19 10	10 6	30 0 1	15 11 8
7,028	369 7 5	2,017 5 3	216 15 3	1,347 6 4	235 5 5	71 6 1	4,257 5 9	12 1	4,674 10 1	13 3·5	...	...
1,880	208 1 6	325 15 6	79 0 8	318 7 1	7 0 0	28 17 6	967 2 3	10 3·5	1,068 19 10	11 4·5	38 0 0	184 9 0
7,341	320 6 11	911 14 6	315 11 1	620 12 5	3 6 9	59 4 2	2,230 15 10	6 1	3,708 3 9	10 1	88 12 4	...
1,919·5	141 8 1	239 2 8	165 6 7	248 4 11	47 2 9	20 9 4	861 14 4	9 0	1,025 8 10	10 8	14 5 0	...
1,734	95 18 10	203 15 10	6 14 5	103 2 9	...	29 13 9	439 5 7	5 1	890 3 2	10 3	19 0 9	125 9 1
556	31 5 11	74 3 4	6 13 6	50 10 6	...	6 11 4	169 4 7	6 1	191 17 3	6 11	3 3 4	...
695	84 11 9	152 7 11	16 17 0	55 1 9	8 3 1	12 13 1	329 14 7	9 6	152 14 8	4 5	42 5 3	...
1,084	113 6 4	234 9 9	62 10 5	121 12 6	...	3 13 4	535 12 4	9 10·5	682 6 5	12 7	96 17 7	9 11 6
180	12 11 3	21 13 11	1 8 3	16 4 3	...	...	51 17 8	5 9	61 4 0	6 10	24 9 2	...
780	111 1 10	55 9 7	19 19 10	98 14 6	...	15 15 3	301 1 0	7 9	321 8 10	8 3	10 10 0	145 13 11
...	...	...	...	...	...	...	...	...	...	...	3 6 2	...
1,728	93 4 3	162 10 0	26 11 5	103 4 7	...	30 6 11	415 17 2	4 10	589 5 5	6 10	16 10 0	...
255	26 11 9	17 6 8	...	27 0 0	...	7 6 4	78 4 9	6 2	114 15 0	9 0	37 4 8	23 1 8
237	23 14 0	25 2 4	3 13 0	28 18 10	...	...	81 8 2	6 10·5	81 2 9	6 10	...	...
61,448	3,722 8 8	9,816 13 8	2,427 5 9	6,529 18 3	525 8 11	924 9 6	23,946 4 9	7 3 *a*	31,086 2 6	9 8·5*a*	1,638 0 10	860 3 6
...	...	...	...	...	...	...	...	12 1 *b*	...	13 3·5*b*	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	196 3 4	...
61,448	3,722 8 8	9,816 13 8	2,427 5 9	6,529 18 3	525 8 11	924 9 6	23,946 4 9	...	31,086 2 6	...	1,834 4 2	860 3 6

a Cyanide only. *b* Slimes only.

PROFIT AND LOSS ACCOUNT.

Dr.			Cr.		
To Receipts—Batteries ...	...	£50,311 15 2	By Expenditure — Batteries ...	...	£51,286 18 10
„ Do. Cyanide plants	...	31,086 2 6	„ do. Cyanide plant	...	23,946 4 9
„ Do. Tin plant ...	...	929 0 0	„ do. Tin plant ...	...	1,056 19 11
			„ Additions, etc.—Batteries ...	...	1,638 0 10
			„ do. Cyanide plants	...	860 3 6
			„ do. Tin plant ...	...	196 3 4
			„ Balance	...	3,342 6 6
		£82,326 17 8			£82,326 17 8

DIVISION IV.

Report of the Engineer for Mines Water Supply.

To the Secretary for Mines.

Mines Department, Water Supply Branch,
Perth, 31st January, 1906.

For the information of the Hon. Minister, I herewith I submit my Annual Report for 1905.

The work, as in previous years, has been of a varied and miscellaneous character, comprising the construction of reservoirs for the conservation of water; boring for water; for deep alluvial leads; sinking wells; improvements to soaks, lagoons, etc.; surveying and clearing roads; examination of water rights; maintenance of existing watering stations; collection of revenue from sale of water; reporting on requests and petitions from public bodies relating to water supply, etc.

The attached statements show particulars of principal works done during the year. These works range in cost from a few hundred pounds to £23,000.

The rainfall return, showing readings at 18 stations on Eastern fields, gives an average for 1905 of seven inches. The year's rain was made up of many light showers, of no use for conservation and of little benefit to bush feed. For high temperatures and low rainfall, 1905 may be placed among the three worst years since the opening of the fields; that is, for pioneer work. Similar conditions prevailed on the Murchison and Pilbarra goldfields.

The revenue return shows £9,449, an increase of £2,635; and expenditure, £13,630, an increase of £834; the latter largely due to extra work, such as condensing, trucking water, etc., during the drought.

Six hand-boring plants and one h.p. percussion drill loaned to private prrties. As many applications for loan of boring plants have been received lately, I am recommending three or four plants be kept specially for loan; this will save some expense to the department and time and much inconvenience to the fields officers.

Water stations leased	28
Caretakers employed	9
Pumpers	7

Correspondence.	Inwards.	Outwards.
Letters	3,729	3,470
Telegrams	561	604

P. V. O'BRIEN, A.M. Inst. C.E.,
Engineer for Mines Water Supply.

MINES WATER SUPPLY BRANCH.

WORKS COMPLETED, UNDERTAKEN, AND INITIATED DURING YEAR 1905.

Schedule No. 1.

BORING.

Item.	Class of Work.	Locality.	General Description.	Remarks.
		Eastern Goldfields District.		
1	Boring for water ...	On Pingin-Edjudina Road ...	3 bores—In previous Report ... = 126 feet In Report, 1905 = 132 „ Total ... 258 „	Bottom in granite; fair supply fresh water. Well sunk on No. 3
2	Do.	At Workman's Leases, near Mertondale	2 bores = 220 feet ...	Fair supply
3	Do.	3 miles N.E. of Mt. Howe ...	3 „ = 186 „ ...	Good supply fresh water. Well sunk on No. 3
4	Do.	Between Goongarrie and Davyhurst	8 „ = 410 „ ...	No water located
5	Do.	Near Mulga Queen Townsite ...	6 „ = 524 „ ...	Fair supply. Well sunk on No. 6
6	Do.	At Koolyanobbing	8 „ = 520 „ ...	Bottom on diorite; small supply salt water
7	Do.	At Christmas Gift Leases ...	6 „ = 592 „ ...	do. do.
8	Do.	Station Creek, near Leonora ...	9 „ = 450 „ ...	Bottom on diorite, broken country; very heavy supply fresh water
9	Do.	Lady Gladys Lease, Mulline ...	2 „ = 270 „ ...	Botton on hard diorite; no water
10	Do.	Waverley...	13 „ 12 in Report, 1904 ... ... 467 feet 1 in Report, 1905 ... 32 „ Total ... 499 „	Bottom on granite; good supply of salt water
11	Do.	Carbine	10 bores = 910 feet ...	In progress
12	Do.	Binaronca Rock, Higginsville...	45 „ = 808 „ ...	Bottom on granite; no water
13	Do.	Cashman's Soak, Siberia ...	3 „ = 225 „ ...	In progress
14	Do.	Gilgarna Rock, Kanowna-Pingin Road	2 „ = 109 „ ...	In progress
15	Do. mineral ...	Kanowna	8 „ = 820 „ ...	Foreman and plant supplied by Department; Labour by Heath and party
		Murchison District.		
16	Boring for water ...	Meekatharra	1 bore = 172 feet ...	Bottom on diorite and quartz; no water
17	Do.	do.	5 „ = 387 „ ...	In progress. Battery water supply
18	Do.	Nunngarra-Montague Road, at Bob's Soak	3 „ = 235 „ ...	Good supply. Well sunk on No. 3
19	Do.	Nunngarra-Montague Road, at Berrigrin	2 „ = 93 „ ...	Bottom on granite; fair supply, fresh. Well sunk on No. 2
20	Do.	Nunngarra-Montague Road, at Montague	3 „ = 210 „ ...	Good supply. Well sunk on No. 3
21	Do.	Barrambie Hills	2 „ = 300 „ ...	Good supply, fresh. Well sunk on No. 2
22	Do.	Legacy Leases	4 „ = 338 „ ...	Good supply, fresh. Well sunk on No. 4
23	Do.	Nunngarra	4 „ = 447 „ ...	Fair supply. Well sunk on No. 4. For battery water supply
24	Do.	Eelya Find, near Cue	4 „ = 235 „ ...	Good supply fresh water. Bore cased and equipped as a bore well.
		Pilbarra District.		
25	Boring for water ...	Wodgina Tinfields	2 bores = 100 feet ...	Good supply fresh water. Wells sunk on both bores
26	Do.	Cooglegong Tinfield	5 „ 134 „ ...	Good supply fresh water. Well sunk on No. 3
27	Do.	Smith Well „	4 „ = 77 „ ...	Good supply fresh water. Well sunk on No. 3
28	Do.	Old Shaw's „	5 „ = 84 „ ...	Good supply fresh water. Well sunk on No. 5
29	Do.	Coongan „	2 „ = 71 „ ...	Good supply fresh water. Well sunk on No. 1

Summary.

Number of bores.	Total feet.	Average cost per foot.
174	9,091 feet.	Coolgardie District, 6/6. Murchison „ 8/6. Pilbarra „ 11/6.

Schedule No. 2.

Well Sinking.

Item.	Class of Work.	Locality.	General Description.	Remarks.
		Coolgardie District.		
1	Well Sinking ...	At 47-Mile Peg, Kookynie-Yerilla Road	5 x 3 shaft, depth 110 feet	Fair supply fresh water
2	Do.	3 miles N.E. of Mt. Howe ...	5 x 3 „ „ 50 „	Very good supply fresh water
3	Do.	¼ mile E. of Mulga Queen Townsite	6 x 4 „ „ 73 „	Fair supply fresh water
4	Do.	12 miles from Leonora, on Darlôt Road	5 x 3 „ „ 71 „	Fair supply; acquired and repaired
5	Do.	14 miles from Mt. Margaret, on Tampa Road	5 x 3 „ „ 66 „	Good supply; purchased and repaired
6	Do.	2 miles S. of Kurnalpi Townsite	6 x 3 „ „ 93 „	Poor supply stock water; acquired and repaired
		Murchison District.		
7	Well Sinking ...	8 miles S.W. of Meekatharra ...	5 x 3 shaft, depth 51 feet	Good supply fresh water
8	Do.	18 miles N. of Nunngarra ...	5 x 3 „ „ 49 „	Very good supply fresh water
9	Do.	18 miles N. of Nunngarra ...	5 x 3 „ „ 77 „	Good supply fresh water
10	Do.	50 miles N. of Nunngarra ...	5 x 3 „ „ 62 „	do. do.
11	Do.	At Montague Leases	5 x 3 „ „ 60 „	do. do.
12	Do.	Barrambie Hills	5 x 3 „ „ 125 „	Very good supply fresh water
13	Do.	On Day Dawn-Black Range Road	5 x 3 „ „ 40 „	do. do.
14	Do.	Lake Way-Nannine Road ...	5 x 3 „ „ 89 „	Poor supply fresh water
15	Do.	At Legacy Leases	5 x 3 „ „ 70 „	Fair supply fresh water
16	Do.	Nunngarra Townsite	Acquired and repaired, depth 75 feet	Fair supply; purchased
17	Do.	8 miles S. of Lake Way ...	Acquired and repaired, depth 41 feet	Good supply
		Pilbarra District.		
18	Well Sinking ...	24 miles from Port Hedland, on Tambourah Road	5 x 3 shaft, depth 40 feet	Fair supply fresh water
19	Do.	Near Nullagine	6 x 4 „ „ 92 „	Good supply fresh water
19	Drive	do.	6 x 4 drive, 64 feet ...	For battery purposes
20	Well Sinking ...	At Shaw's Crossing	4 x 3 shaft, depth 10 feet	Heavy supply, fresh
21	Do.	14 miles from Marble Bar, on Cooglegong Road	4 x 4 „ „ 10 „	do. do.
22	Do.	20 miles from Marble Bar, on Cooglegong Road, No. 1	3 x 3 „ „ 10 „	do. do.
23	Do.	30 miles from Marble Bar, on Cooglegong Road, No. 2	5 x 3 „ „ 32 „	do. do.
24	Do.	Marble Bar-Nullagine Road ...	5 x 3 „ „ 20 „	Good supply, fresh
25	Do.	McKinnon's Flat, Cooglegong Tinfields	5 x 3 „ „ 45 „	Fair supply, fresh
26	Do.	Stock Paddock at Marble Bar ...	5 x 3 „ „ 30 „	Good supply, fresh
27	Do.	At Shark's Gully	Acquired and repaired, depth 27 feet	do. do.
28	Do.	On Old Shaw Tinfield	5 x 3 shaft, depth 11 feet	Heavy supply, fresh
29	Do.	On Old Shaw Tinfield, Coongan Belt	5 x 3 „ „ 31 „	do. do.
30	Do.	At Nullagine	5 x 3 „ „ 48 „	Good supply, fresh
31	Do. No. 1	At Wodgina	5 x 3 „ „ 45 „	do. do.
32	Do. No. 2	do.	5 x 3 „ „ 45 „	Heavy supply, fresh
33	Do.	Cooglegong Tinfield	Acquired and repaired, depth 41 feet	Purchased; fair supply, fresh
34	Do.	25 miles W. of Lalla Lookh ...	5 x 3 shaft, depth 25 feet	Heavy supply, fresh

Summary of Wells.

No. of Wells.	Total Depth.	Average Cost per foot (including Equipment).
34	1,828 feet	£3 5s.

Representing ¼ million gallons per day, fresh water.

Schedule No. 3.

IMPROVEMENTS TO WELLS, ETC.

No.	Class of Work.	Locality.	General Description.	Remarks.
		Coolgardie District.		
1	Drive in Well ...	Near Pingin Townsite	Drive 6ft. 6in. x 4in., length 26ft.	
2	Do.	Near Yarrie Townsite	Drive 7 x 5, length 23ft.	
3	Deepening Well ...	14 miles N. of Widgiemooltha	Shaft 6 x 4, deepened 8ft.	
	Driving Well ...	do. do. do.	Drive 6 x 3, length 16ft.	
4	Deepening Well ...	2 miles N. of Waverley ...	Shaft 6 x 4, deepened 38ft.	
5	Do.	At 5-mile Post, Davyhurst-Menzies Road	Shaft 6 x 4, deepened 12ft.	
6	Equipping Well ...	3½ miles N. of Leonora, on Lawlers Road	Equipped with whip, pole, tank, and troughing	For stock route and Road Supply
7	Do.	15-Mile Diorite King, Leonora-Lawlers Road	do. do. do.	
8	Do.	28-Mile Lawlers-Leonora Road	do. do. do.	
9	Repairs to Concrete Wall	Niagara Reservoir	Cracks filled with asphalt and covered with brick-work	In hand
10	Repairs to Tank ...	Bulong Tank	Tank cleaned and painted	
11	Equipping Well ...	At Yundamindera	Windmill and elevated 10,000 gallon tank	
12	Deepening Well ...	Jacoletti	Shaft 6 x 4, deepened 8ft.	
	Driving Well ...	do.	Drive 6 x 4, length 12ft.	
		Murchison District.		
13	Deepening Well ...	At Meekatharra...	Shaft 5 x 3, deepened 7ft.	
14	Equipping Well ...	Gabanintha	Erection of windmill, 2,000gal. tank and stand	
15	Do.	Boogardie	Erection of 10,000gal. tank and stand	
16	Do.	do.	Erection of 9ft. timber brace on stock well	
17	Drive Well	Meekatharra	Drive 6 x 4, length 11ft.	
		Pilbarra District.		
18	Equipping Well ...	Port Hedland-Marble Bar Road	Windmill and elevated 5,000gal. tank	
19	Do.	Stock Paddock, Marble Bar ...	Windmill and elevated 2,000gal. tank	
20	Re-lined Well ...	At Trig Hill	Lined with galvanised iron from brace to 13ft. 6in.	
21	Do.	Turkey Camp	Lined with galvanised iron from brace to 20ft.	
22	Do.	Pindan	Lined with galvanised iron from brace to 13ft.	
23	Deepening Well ...	Lalla Rookh	Shaft 5 x 3, deepened 10 feet	
24	Do.	Big Shaw Soak	„ 5 x 3 „ 8 „	
25	Do.	Box Creek	„ 5 x 3 „ 8 „	
26	Do.	Strelly Creek	„ 5 x 3 „ 2 „	
27	Do.	Turkey Camp	„ 5 x 3 „ 7 „	
28	Do.	Little Shaw	„ 5 x 3 „ 16 „	
29	Do.	12 miles from Condon	„ 5 x 3 „ 8 „	
30	Do.	13 miles S.W. of Marble Bar ...	Shaft 3ft. 6in. x 3ft. 6in., deepened 7ft.	
31	Do.	20 miles „ „ „ ...	Shaft 3ft. 6in. x 3ft. 6in., deepened 7ft.	

Schedule No. 4.

MISCELLANEOUS WORKS.

No.	Class of Work.	Locality.	General Description.	Remarks.
		Coolgardie District.		
1	Road Survey ...	Pingin to Edjudina	Theodolite survey made 20 miles	Not cleared.
2	Road Clearing ...	Parker's Range-Yelladine ...	Theodolite survey made 24 miles, cleared 12ft. wide	
3	Road Making ...	At Londonderry Tank	Road crossing over bywash	
4	Tank Survey ...	Edjudina	Site of tank surveyed and plans prepared	
5	Rabbit-proof Fence	At Woodgiemooltha Tank ...	Wire netting fence erected round tank with swinging gates to inlet and bywash	
6	Do.	Menzies Tank	do. do.	
7	Do.	Wingarnie Tank	do. do.	
8	Do.	Norseman Tank	do. do.	
9	Do.	Dundas Tank	do. do.	
10	Condensers	At Norseman	20 boilers erected and 8 in course of erection when rain came	
11	Do.	Gindalbie	2 Fulton boilers erected	
12	Do.	Davyhurst	10 boilers erected	
13	Survey	Norseman	Survey of pipe line from service tank to Cumberland G.M.	
		Murchison District.		
14	Fencing Camel Pool	Near Meekatharra	Post and wire fence	
		Port Hedland.		
15	Police Stables ...	At Nullagine	6-stall stable, also fodder and harness room	
16	Repairing 17 Wells	Port Hedland-Marble Bar-Nullagine Road	Repairing, fencing, troughing, brace and windlass stands, and cleaning out same	
17	Do. 3 „	Forty-Mile Country	do. do.	
18	Do. 5 „	Marble Bar-Condon Road ...	do. do.	
19	Do. 3 „	Marble Bar-Bamboo Road ...	do. do.	
20	Water Supply ...	Marble Bar	1½in. main connecting hospital with town water supply	

Schedule No. 5.

WORKS FOR CONSERVATION OF WATER.

No.	Class of Work.	Locality.	General Description.	Remarks.
		Coolgardie District.		
1	250,000-gallon tank	Near Mt. Jackson Townsite ...	Lined with asphalt compo. and roofed with iron. Equipped with pump, etc., and fenced with post and wire	
2	500,000 do. do.	About 1½ miles South of Gindalbie Townsite	do. do.	
3	8,000,000 do. do.	At Menzies Townsite	do. do. ...	In progress
4	7,000 do. do.	Gilgarna Rocks, Kanowna-Pingin Road	Excavated in rock and roofed with local timber	
5	8,000 do. do.	Red Cliffs, Kanowna-Edjudina Road	do. do.	
6	6,000,000 do. do.	Norseman	Excavation	In progress

Schedule No. 6.

INSPECTION AND REPORT.

No.	Class of Work.	Locality.	General Description.	Remarks.
		Coolgardie District.		
1	Water supply ...	Erliston to Carr-Boyd's Find ...	Efficiency of supply for present requirements	Reported upon 15-5-05
2	Well sinking ...	Norseman-Esperance road ...	Providing water supply ...	do. do. 17-11-05
3	Do.	Red Hill	do. do. do. ...	do. do 3-7-05
4	Water supply ...	Comet Vale	Erection of tank to receive water per train	do. do. 6-11-05
5	Road clearing, etc. ...	Gilgarna-Pingin road	Providing water supply, surveying road and clearing same	do. do. 7-8-05
6	Water supply ...	Edjudina	Domestic supply from new tank	do. do. 22-9-05
7	Do.	Mt. Jackson-Southern Cross road	Providing concrete tanks by Roads Board being subsidised	do. do. 3-3-05
8	Do.	Leonora Station Creek	Pumping plant, pipe line and service tanks	do. do.
9	Do.	Mt. Morgans	Do. do.	do. do. 26-4-05
10	Well sinking ...	Koolyanobbing	Providing water supply ...	do. do. 15-6-05
11	Water supply ...	Yilgangie	Improvements to catchment, etc. Water holes	
12	Boring	Mt. Morgans	Diamond drill	do. do. 20-4-05
13	Water supply for route	Leonora-Peak Hill	... ...	do. do. 20-4-05
14	Inspections	Coolgardie and Eastern Goldfields District	Water rights	55 inspections, 49 granted, 6 objected to
		Murchison District.		
15	Well sinking ...	Field's Find	Providing water supply ...	Reported upon
16	Water supply ...	Mt. Magnet	Providing and laying 3" main through streets	do. do. 11-9-05
17	Do. for route	Cue-Ophthalmia Range ...	Inspection of well ...	do. do.
18	Inspection	Gum Creek	Pastoral area	do. do. 3-50-5
19	Water supply ...	Quinn's	... ...	do. do. 18-11-05
20	Do.	Nannine-Chesterfield road ...	Probable requirement and stages to provide water supply on road	do. do 27-7-05

Schedule No. 7.

Coolgardie and Eastern Goldfields Districts.

Rainfall in Points for the Year ending December 31st, 1905.

100 Points = 1 inch.

Station.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total for Year.
Niagara	35	17	1	43	296	48	92	46	10	23	48	42	701
27-Mile Condenser	58	*Nil*	*Nil*	80	409	47	87	98	*Nil*	18	52	31	880
Menzies	27	9	7	89	200	37	122	21	27	35	40	110	724
Mulline	40	6	14	60	251	49	30	37	19	8	9	19	542
Davyhurst	*Nil*	48	13	13	229	42	73	52	55	75	7	56	663
Siberia	19	55	30	—	265	43	48	51	20	20	10	170	731
Goongarrie	20	16	23	23	166	40	81	44	43	63	37	50	606
Broad Arrow	23	44	30	30	200	35	33	47	45	52	23	222	784
Black Flag	*Nil*	55	13	26	191	20	40	50	20	41	28	208	692
Kanowna	17	53	50	46	87	26	48	55	49	25	26	140	622
Bulong	28	53	15	39	150	37	40	92	101	58	36	167	816
Kunanalling	19	72	9	45	168	37	38	70	34	26	22	160	700
Coolgardie	39	53	31	51	159	37	31	44	68	54	24	133	724
Woodgiemooltha	53	77	59	50	180	24	33	36	67	50	36	116	781
Wingarnie	41	87	*Nil*	65	129	33	29	38	111	58	30	200	821
15-Mile Condenser	46	106	6	70	183	13	16	35	121	45	53	396	1,090
Norseman	56	107	*Nil*	114	220	21	10	46	40	55	50	235	954
Yarri Well	161	*Nil*	*Nil*	32	393	17	61	52	10	*Nil*	27	61	814

Schedule No. 8.

COOLGARDIE AND EASTERN GOLDFIELDS DISTRICTS.

Return showing Water Conserved, etc., in ten of the Principal Reservoirs.

Remarks.	Contents on 31st December, 1904.	Conserved during 1905.		Used and Lost during Year.			Total Loss.	Contents on 31st December, 1905.
		From Catchment.	From Rainfall on Surface of Tank.	Sales and Issue.	Evaporation.	Absorption.		
	gallons.	gallons.	gallons.	gallons.	gallons.	gallons.	gallons.	gallons.
Niagara	*Nil*	8,564,650	371,539	1,294,750	2,504,202	4,639,130	8,438,082	512,250
Menzies	571,567	976,145	62,583	636,552	454,415	186,602	1,280,244	329,045
Mulline *	11,931	320,997	20,980	73,388	120,898	146,867	341,153	*Nil*
Siberia †	200,182	1,893,403	27,960	...	293,188	...	1,428,471	693,062
Goongarrie *	552,629	214,011	48,326	274,041	471,354	69,565	814,960	*Nil*
Davyhurst	2,427,209	2,656,484	42,264	1,163,738	659,137	1,046,520	2,698,755	*Nil*
Kunanalling	375,658	773,917	22,067	308,558	306,006	192,472	807,036	364,611
Bulong	1,024,652	409,454	94,004	371,861	731,741	175,792	1,289,394	238,735
Woodgiemooltha	2,650,000	1,572,736	95,458	...	1,201,690	...	2,159,035	2,159,159
Norseman * ‡	2,131,400	635,736	102,857	1,623,549	507,316	...	2,285,756	584,236

* Empty from November and December. † Leased; sales, etc., unknown. ‡ Evaporation and absorption together as this tank is roofed.

DIVISION V.

ANNUAL PROGRESS REPORT

OF THE

GEOLOGICAL SURVEY

FOR THE YEAR 1905.

(WITH TWO FIGURES.)

Annual Progress Report of the Geological Survey for the Year 1905.

TABLE OF CONTENTS.

Title.	Page
Table of Contents ...	121
Administrative Report ...	123-6
The Staff ...	123
Fieldwork ...	123
Laboratory Work ...	124
Geological and Mineral Collection ...	124
Publications ...	125
Principal Results of the Year's Field Operations ...	126-40
Mineral Resources ...	126
Pilbara Goldfields ...	126
Wodgina Tinfield ...	126-8
Mount Margaret Goldfield ...	128
New Find 60 miles E.N.E. of Duketon ...	129
Windanya Group of Leases, Broad Arrow Goldfield ...	130-2
Wagin District ...	132-4
Sunbeam Lease, No. 1121x, Kanowna ...	134
Northam District ...	135
Recent Mining Developments at Greenbushes ...	136
Boring for Coal near Mullewa ...	137
Miscellaneous Mineral Notes ...	138-40
Index to Names of Places, Mines, Reefs, etc. ...	141-2

FIGURES IN THE TEXT.

Fig. I.—Plan of the Geological Museum ...	125
Fig. II.—Geological Sketch Map of part of the Wodgina Tinfield ...	126

Annual Progress Report of the Geological Survey for the Year 1905.

The Secretary for Mines, Perth.

Geological Survey Office,
Beaufort Street, Perth,
26th January, 1906.

SIR,

I have the honour to submit, for the information of the Hon. the Minister for Mines, the Progress Report of the Geological Survey for the calendar year 1905. Field work has been carried out in different portions of the State, on the lines adopted in former years.

As has been the case in the past, numerous reports in connection with the alienation of mineral lands (a matter in which important geological considerations are involved) have occupied the attention of the staff. Reports of this nature have numbered 88, in addition to 11 special reports in connection with subsidies under the Mining Development Act.

THE STAFF.

The work of the Department has been carried out during the year with the same numerical staff as heretofore. The position rendered vacant by Mr. C. F. V. Jackson, to which allusion was made in last year's report, has been filled by the appointment of Mr. H. P. Woodward, whose intimate knowledge of the State renders him well fitted for the post. Mr. Woodward's appointment dated from the 1st of April.

FIELD WORK.

The work of the field staff has been distributed as usual over the length and breadth of the State, in so far as the requirements of the public seemed to demand.

A. GIBB MAITLAND.—In addition to duties connected with the preparation of my own reports, the editing of the various official publications, and the general routine of the Department, a considerable portion of my own time has been devoted to work in the field. The period between the 10th of February and the 2nd of March found me in the Irwin River District in connection with the boring for coal along the Murchison Railway; whilst that between the 25th of June and the 28th of November was devoted to the completion of the examination of the mining districts in the North-West Division of the State. During the year I was employed 186 days in the field. In my capacity as a member, I attended the meetings of the Colliery Managers Examining and the School of Mines Advisory Boards, in addition to giving scientific evidence before the Royal Commissions on (*a*) the Collie Coalfield and (*b*) Immigration.

H. P. WOODWARD.—The 8th to the 14th of April found this officer engaged upon an examination of the Wagin neighbourhood, in connection with some supposed phosphatic deposits and the prospects of the existence of coal in the vicinity. On the 4th of May, this officer left Perth for the purpose of commencing a geological survey of Menzies district, which was continued with more or less interruption and the fieldwork finally completed on the 20th October. Owing to the necessity for Mr. Woodward remaining in touch with the office during my absence and paying short visits to different portions of the State for specially urgent purposes, the Menzies survey could not be carried out continuously. A few days in the early part of May were devoted to an examination of Windanya; the 21st to the 23rd of June was occupied on the Collie Coalfield in connection with several applications for the alienation of land; a short visit was paid to Kanowna in July, for the purpose of reporting upon an application for a subsidy under the terms of the Mining Development Act; the 24th to the 30th of August was devoted to field work in connection with a report upon the possible auriferous character of the Northam District; the 20th to the 25th November was spent in visiting the site of the Government bore at Mullewa. During the year this officer was employed 125 days in the field.

W. D. CAMPBELL.—The major portion of this officer's time was devoted to the office work connected with the geological survey of Norseman, alluded to in last year's report. From the 6th of February to the 26th of March was devoted to mine surveys and inspections at Norseman; between the 14th and the 22nd of November visits were paid to Northampton and Arrino in connection with inquiries regarding the alienation of mining lands; and a short visit was paid to Greenbushes, in December, to report upon recent mining developments. During the year Mr. Campbell was employed 56 days in the field.

C. G. GIBSON.—Up to the end of January this officer acted as *locum tenens* for the Mineralogist and Assayer, as alluded to in last year's Annual Report. Returning from leave on the 13th of April, Mr. Gibson resumed his duties as Assistant Geologist, and on the 15th May took the field and was continuously employed in the Mount Margaret Goldfield until the 26th of November. During the year this officer was employed 196 days in the field.

H. W. B. TALBOT.—This officer was engaged in the Pilbara and West Pilbara Goldfields, assisting me in the survey then in progress. Mr. Talbot was absent from Perth from the 12th of April to the 19th of December, and during the year under review was engaged 251 days in the field.

LABORATORY WORK.

The Laboratory has, as usual, with the exception of the month of January, been in charge of Mr. E. S. Simpson, the Mineralogist and Assayer, throughout the whole period covered by this report.

From the table prepared by the officer in charge, showing in detail the routine work in the laboratory during 1905, it appears that the total number of samples dealt with has amounted to 1,234, being the heaviest yet experienced.

The following table gives a detailed statement of the work performed during the year:—

Table showing details of Assays, etc., made in the Geological Survey Laboratory during 1905.

Classification.	Public.		Official.		Totals.
	Pay.	Free.	Geological Survey.	Other Departments.	
Total Samples dealt with	202	411	214	153	980
Mineral and Rock Determinations ...	4	148	102	44	298
Assays for					
Gold	142	185	77	66	470
Silver	23	58	2	8	91
Platinum	...	1	...	...	1
Copper	1	35	4	1	41
Lead	...	11	1	1	13
Zinc	...	...	...	1	1
Tin	9	40	3	3	55
Iron	2	7	2	...	11
Nickel	...	1	...	...	1
Cobalt	1	...	1	...	2
Tantalum	13	14	3	2	32
Niobium	13	14	3	2	32
Cadmium	...	...	1	...	1
Tellurium	...	1	1	...	2
Lime	...	3	...	...	3
Analyses—					
Complete	5	8	21	17	51
Partial	1	6	2	...	9
Proximate	19	16	...	5	40
Miscellaneous	8	28	36	8	80
Totals	**241**	**576**	**259**	**158**	**1,234**

Reporting upon the work of the year, Mr. Simpson observes:—

"Owing to the inadequate strength of the staff, two very important special investigations which had been begun have had to be temporarily abandoned. These were (1) an examination of the mineral constituents of the soils along the Goldfields Water Supply pipe-track, with a view to discovering the causes of corrosion of the pipes on the outside, and checking this action; (2) an examination of the more or less heavily mineralised boiler waters used at the State Batteries, in order to prolong the life of the boilers and prevent the recurrence of such disasters to them as have occurred during the past year at Leonora and Black Range. Both these investigations are of great importance to the State, and the results of them would save in maintenance and renewals far more than the cost of the extra assistance needed to carry them out. An addition to the staff is also highly desirable in order to ensure the promptness in the issue of assay reports, which is impossible in the present congested state of the work."

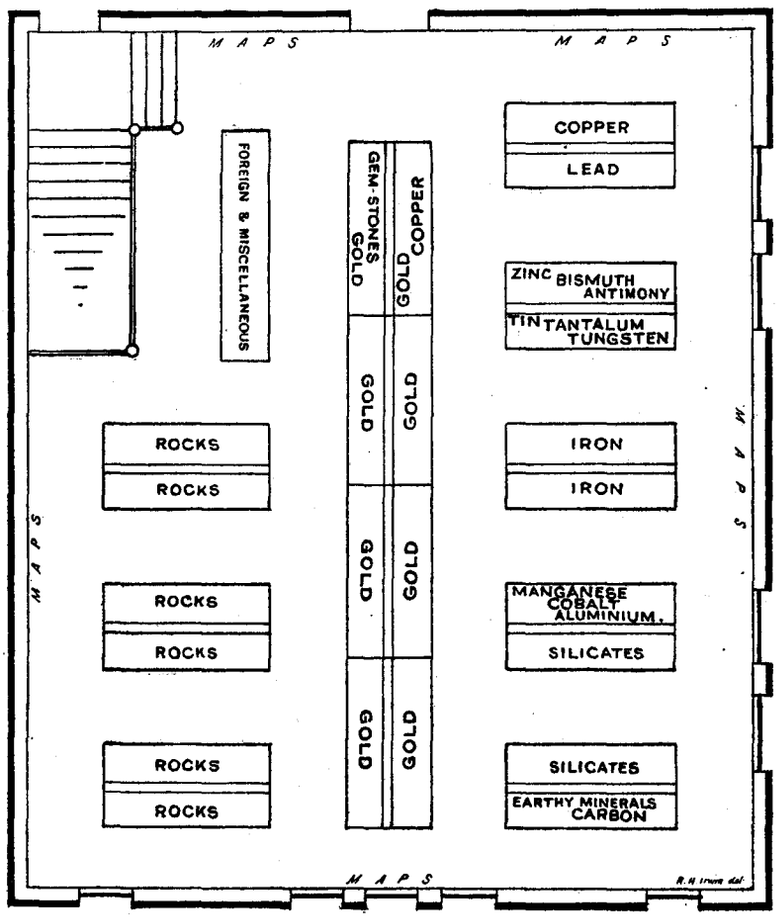
GEOLOGICAL AND MINERAL COLLECTION.

The additions to the survey collection during the year 1905 amounted to 714, bringing the total number registered up to 6,571.

The additions comprised 305 minerals, 337 rocks, and 72 fossils; with a few exceptions the minerals and rocks are in triplicate. Of microscope slides 102 were prepared during the year, and added to the collection, bringing the total number in the books up to 618.

The new show cases urgently required for the Departmental Museum having been placed in the building, a considerable portion of the time of the Mineralogist and Assayer was devoted to overhauling the collection and re-arranging those already on exhibition. The geological museum, which has been

arranged in the manner shown in the plan which forms Fig. I., now presents a fine illustration of the various mineral resources of the State, as well as of the matrices of the ores in those districts which have been examined in detail by the officers of the Department. One of the most interesting exhibits is a fine collection of local ores of tantalum, to which reference is made in a later page.



PLAN OF GEOLOGICAL MUSEUM

FIG. I.

Kalgoorlie being the typical home of telluride minerals it seems strange that the official collection is so poor in respect of them, especially when one remembers the magnificent specimens sent by the Government to the Exhibitions at Paris and Glasgow, all of which were either sold or given away, none being retained for the museums of the State itself.

Mineral collections were prepared for two exhibitions, viz., at Adelaide and Melbourne. It would appear advisable to keep a floating collection solely for exhibition in this way from time to time as opportunity offers.

PUBLICATIONS.

During the past year, the following publications were issued to the public:—

Annual Progress Report for the year 1904.

Geological Features and Auriferous Deposits of Mount Morgans, Mount Margaret Goldfield; and Notes on the Geology and Ore Deposits of Mulgabbie, North Coolgardie Goldfield, by C. F. V. Jackson.

Minerals of Economic Value, by E. S. Simpson.

Further Report upon the Geological Features and Mineral Resources of the Pilbara Goldfield, by A. Gibb Maitland.

The Bulletin on Minerals of Economic Value, by Mr. Simpson, contains a very considerable amount of valuable information with regard to the character, mode of occurrence, impurities, etc., in minerals of commercial importance. As explained in the introduction:—

"For many years gold was almost the only mineral which attracted the attention of the lay and expert public in Western Australia, but recently more frequent inquiries have been made with regard to other sources of mineral wealth. In order to meet these, and if possible interest a larger number of prospectors and others in our latent possibilities in other directions, the original (private) notes have been considerably enlarged and cast into a suitable form for publication."

The publications of the Geological Survey have a fairly wide circulation, but in order to increase their usefulness arrangements have been made whereby they may be distributed in such a way as to be more easily available to prospectors and others than has been the case in the past.

In addition to the publications previously alluded to, there have been lithographed the following mining and geological plans, which are designed to accompany the report upon the Norseman District, which has now been completed:—

Plan and Section of the Princess Royal Gold Mine. Scale, 100 feet per inch.
Plan and Section of the Norseman Gold Mine. Scale, 100 feet per inch.
Plan and Section of the Cumberland Gold Mine. Scale, 100 feet per inch.
Plan and Section of the Lady Mary and Valkyrie Gold Mines. Scale, 100 feet per inch.
Geological and Topographical Map of Norseman. Scale, 20 chains per inch.
Section from Lake Cowan to Dundas. Scale, 20 chains per inch.

PRINCIPAL RESULTS OF THE YEAR'S FIELD OPERATIONS.

Mineral Resources.

Pilbara Goldfields.—A more or less detailed examination of the mining centres of Glenroebourne and Weerianna was made by Mr. Talbot, the field assistant, and a full report upon the districts is in course of preparation. The mining centres of Station Peak, Tambourah, Western Shaw, Just-in-Time, and the newly opened tinfield of Wodgina were also investigated, and in addition a traverse from Croydon Station southward to the Hamersley Range afforded an invaluable opportunity for ascertaining something of the structural relationships of the different formations and the natural resources of a portion of the State of which little is known geologically. Full details as to the districts visited will be found in the report which is in course of preparation.

Wodgina Tinfield.—In accordance with telegraphic instructions conveyed to me at Whim Creek, I proceeded to Wodgina and in due course submitted the following interim report on my observations on the field, the examination of which occupied my close attention for about a month:—

The Wodgina Tinfield is situated on the headwaters of the western branch of the Turner River, and within the limits of the Pilbara Goldfield, about 74 miles from Port Hedland.

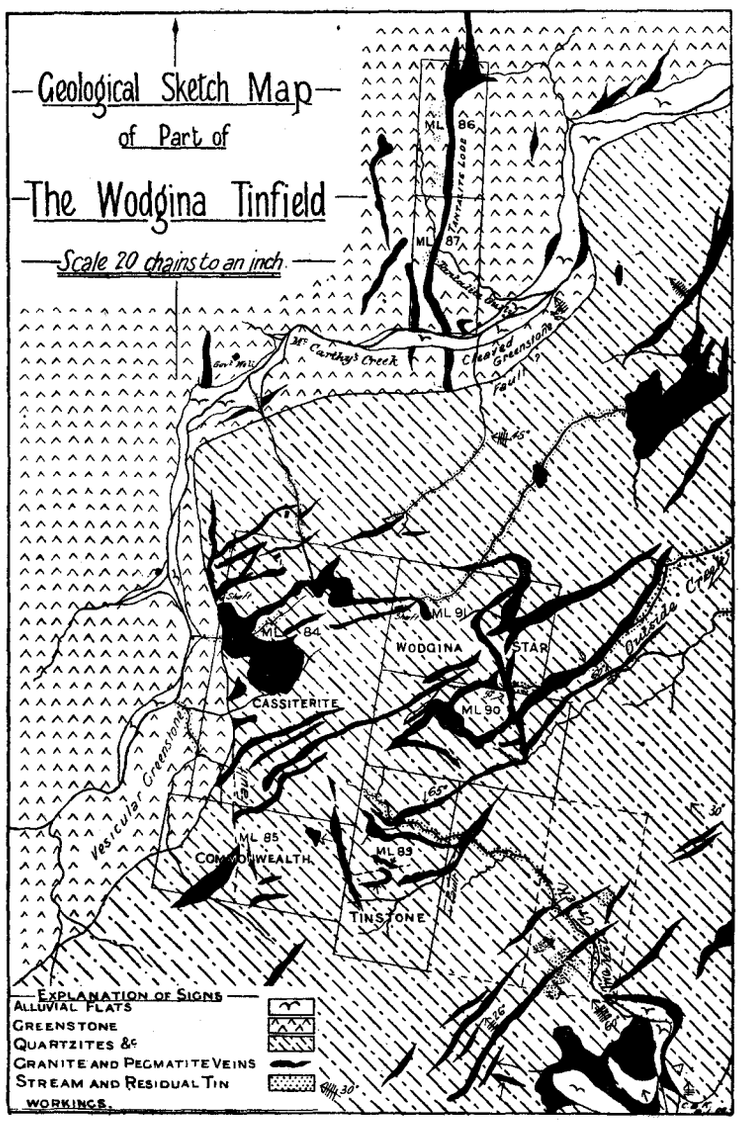


Fig. II.

Geologically, the field consists of a series of sedimentary and bedded igneous rocks, skirting an extensive granite mass which occupies a very large area of country. These sedimentary beds are very much faulted and have a prevailing dip to the west; they occupy a very rugged range, which rises to considerable altitudes above the level of the surrounding plains.

The sedimentary rocks are pierced by granite and pegmatite veins (in reality offshoots from the mass previously described), which invariably form the matrices of the tin and tantalite ores.

Wherever the pegmatite veins have been opened up it is invariably found that the tin occurs on either wall of the vein, in a band (of more or less width) consisting of mica and tourmaline in varying proportions, though in one case the occurrence of tin ore in the vein itself was noticed. The bed of the ravines and the slopes on the hill sides carry detrital and residual tin and tantalite everywhere over the whole area occupied by the granite and pegmatite veins. These latter have been mapped in some detail, and should afford a valuable guide to those engaged in mining operations on the field. Attached to this report is a copy of the material portion of the geological and mining plan of Wodgina. A careful inspection of the surface and plan (Fig .II.) attached shows that the tin lodes are numerous, and occupy a considerable area of country; it, however, yet remains to be proved whether they can be profitably mined, for operations have yet hardly gone beyond the most rudimentary prospecting stages, and no material progress can be made without capital to provide the necessary equipment for properly opening up and mining the lodes.

From a careful examination I am of opinion that the district bids fair to rise to importance, and that it will continue to be a tin and tantalite producer.

A very important feature of the Wodgina field is the tantalite lode, the position of which is accurately shown on the plan which forms Fig. II. The "lode" traverses the whole length of two of the leases applied for, viz., 86 and 87. Upon the most southerly of the two not much work has been done, operations having been confined to dryblowing the surface along the outcrop and in the vicinity of the pegmatite vein. The principal activity is centred upon the ground embraced within the limits of M.L. 86. The pegmatite vein (the lode) has been opened up for a length of 45 feet, but only to a depth of three or four feet, and exposes coarse fragments and crystals of tantalite; one fragment weighed a little over four hundredweight. To the west of the open cut its width is 41 feet, whilst 264 feet farther its width is 34 feet. It is not possible from the amount of work done to ascertain the thickness of the vein, nor the actual amount of its underlie. A commencement has been made with the sinking of a shaft in the open cut, and as operations proceed definite information upon these material points should soon be available. It may be mentioned that the lode is in "greenstone country" and not in sedimentary rocks as is the case with the tin lodes yet opened up. A considerable amount of dryblowing is being carried out upon the slope of the hill adjoining and to the west of the lode. Several tons of tantalite (some of it being very coarse) have been obtained in this manner, and it is estimated that about 18 tons of the mineral have been taken from the surface of the lease. This detrital tantalite results from the disintegration of the rich chute in the vein adjoining.

Owing to the kindness of Messrs. McGuinness and Naysmith, the representatives of the lessees and the dryblowers respectively, the departmental collection has been enriched by about 1cwt. of tantalite specimens now in the Survey Museum.

About 300 feet to the west of the main tantalite lode is a smaller pegmatite vein, containing tantalite. Dryblowers have been at work near the southern end and have obtained about 1cwt. of the fine-grained mineral.

What may be called the tantalite group of lodes has been followed with more or less interruption for about a mile to the north of the Tantalite Lease 86; it eventually merges into the granite underlying the plains. A fair quantity of detrital tantalite has been obtained from this locality, and I have every reason to believe that the area over which the mineral occurs will be extended. I did not deem it necessary to devote any further time to the mapping of the extension of these veins, seeing that other portions of the district required attention, and the field season was rapidly passing away.

Having due regard to the uses to which recent scientific research has proved the metal can be put, provided the tantalum-bearing minerals can be obtained in sufficient quantities, the find at Wodgina is of considerable importance and should be the means of encouraging prospecting in other districts in which identical geological conditions prevail. An analysis of the tantalite from Wodgina appears on page 21 of the Annual Report for the year 1904.* It is unnecessary for me to add that tantalite has been known in Greenbushes for a number of years, and full particulars of which have been available to the public in several of the Bulletins of the Survey.

According to the letter of the Warden accompanying Ministerial instructions of the 20th of June, and his letter to me of the 29th of the same month, it appears that some objection has been raised to the granting of leases on the grounds that "it is alluvial country." My attention was naturally directed to this question, and for the purpose of your guidance a copy of a portion of the Geological and Mining Map of Wodgina, which it was essential should be prepared, is attached (Fig. II.). Upon this map there have been indicated:—

(*a.*) The water-courses, and the portions which have been worked;
(*b.*) The tin and tantalite lodes (*i.e.*, the pegmatite and granite veins);
(*c.*) The only lease granted, M.L. 84;
(*d.*) The leases surveyed but not approved, *e.g.*, 91, 90, 89, 85, 86, and 87;
(*e.*) Certain leases applied for but not yet surveyed or approved; and
(*f.*) That portion of the field, as yet unapplied for, which I should advise being withheld from lease, until such time as some competent officer certifies that the alluvial ground thereon has been worked out.

* Further particulars regarding tantalite will be found on page 138 of this report.

(For the purpose of considering the objections raised to the granting of mineral leases, it is necessary to bear in mind that "alluvial ground" is that which is defined in the Mining Act.) There is only a very limited area of detrital deposits in the gullies and ravines and such are only narrow, and in no case of any depth. On the low slopes of the main range, to the east of the Cassiterite lease, there are numerous veins, which have shed a fair quantity of tin (and a little tantalite), which now lies not far from its parent source, and should, I think, be withheld from lease until such time as some competent officer certifies that the ground (which is but shallow) has been worked out.

Despite the fact that the surface of the country is traversed by lodes and contains more or less tin set free by their disintegration, the field cannot be said to constitute an alluvial field, differing in this respect (and geologically) from that of Moolyella previously reported on.

Mt. Margaret Goldfield.—During his work on the Mt. Margaret Goldfield, Mr. Assistant Geologist Gibson examined and reported upon the following centres:—Laverton (including Lancefield and Ida H.), Burtville, Erlistoun, Duketon, and Mulga Queen, in addition to which a brief examination was made of the country between these centres. Geological sketch maps have been prepared, on a scale of 20 chains to an inch, of Laverton, Lancefield, Ida H., and Burtville, and black and white maps on a similar scale, showing the position of the principal lines of reef at the centres of Erlistoun, Duketon, and Mulga Queen. In addition to this work an examination was made of the country at the Cosmo Newberry Ranges and thence to Mounts Shenton, Venn, and Warren, and on to the Ulrich Range at the south end of Lake Wells. Mr. Gibson has prepared the following brief description of the salient geological features of the principal centres examined:—

"Laverton (including Lancefield and Ida H.).—This centre is the present terminus of the Eastern Railway. The salient geological features are practically identically similar to those of Mt. Morgans, which has already been dealt with in detail by Mr. Jackson in Bulletin No. 18. The staple formation consists of a series of basic and acidic rocks, of which the basic occupy by far the larger area. The basic rocks, the greenstones, are essentially hornblendic and occur both massive and schistose, being similar to those usually found forming the auriferous series of the Eastern Goldfields. It is within these greenstones that the auriferous reefs and lodes are found to occur. The acidic rocks vary through felsites, felspar-porphyries and granites, and occur chiefly as dykes and intrusive masses, being most largely developed at the north end of the district in the vicinity of Lancefield. A few small deposits of laterite (ironstone conglomerate) occur, forming the cappings of low greenstone hills and ridges, but is mostly of an inferior grade. The greater part of the area under examination is covered by a varying depth of recent detrital deposits, which render detailed mapping extremely difficult, and on this account many of the geological boundaries may be looked upon as purely arbitrary. The ore deposits, like those of Morgans, can be divided into two classes:—

"(*a.*) Lodes which are genetically similar to the banded and hematite-bearing quartz lodes which form so conspicuous a feature of the Murchison and Mt. Margaret Goldfields.

"(*b.*) Gold-bearing quartz reefs of the normal type.

"Most of the principal mines are working on deposits of the first class. The district as a whole is well watered, but timber is not too abundant and is rapidly becoming exhausted.

"Burtville.—This centre differs from the majority of West Australian mining districts as yet opened up, in that the majority of the auriferous quartz reefs are found in an area of granitic rocks. This area occupies a roughly circular extent of between one and two miles in diameter, and is situated entirely within the greenstones, into which it appears to be intrusive; it has also apparently been subjected to the same strains as the greenstones, and the reefs in it almost without exception run parallel to those found in the adjoining greenstones. The greenstones, which occupy the larger portion of the field, are of the usual type and consist both of massive and foliated varieties. Both they and the granites are very much decomposed and weathered, such weathering continuing well below the deepest mine workings (about 200 feet). The greater part of the district is covered with recent detrital deposits, often to a depth of 20 or 30 feet, and this renders accurate detail mapping almost impossible; very few of the reefs outcrop; floaters are picked up on the surface and the reefs are found by deep costeaning, or sinking and crosscutting, the soft nature of the country rendering this a fairly easy undertaking. The reefs are of white quartz and are numerous, but small (4 to 10 inches), and almost invariably rich—five and 10 ounce crushings being of common occurrence. This fact, taken together with the soft nature of the country, renders it an ideal district for prospectors but not of much use to companies, there not being sufficient stone procurable to keep any sized crushing plant continuously at work. Fresh water is abundant on the field, but timber is scarce.

"North Erlistoun.—This district embraces the centres of Erlistoun, Duketon, and Mulga Queen. Mining is very slack, with the exception of the last centre. The salient geological features are much the same as those of most of the other mining centres of the Eastern fields. At Erlistoun are found the banded and hematite-bearing quartz lodes traversing the greenstones in a general north and south direction. Here, although auriferous, they have not proved sufficiently so to pay for working. The reefs being worked throughout the three centres are white quartz reefs of the normal type; they are usually of fair size and often of considerable length. They occur without exception in the greenstones, and at Duketon appear to be along the junction of the greenstone schists with a granitic rock, though the country is so decomposed and rotten that it is almost impossible to discriminate between the two classes of rock. There is an abundant supply of fresh water throughout the district, and timber of good quality is fairly abundant.

"Cosmo Newberry Ranges and Mounts Shenton, Venn, and Warren.—A detailed examination was made of the country at these centres, as well as of the country at the Ulrich Range on the south end of Lake Wells.

"At the Cosmo Newberry there is an area of country some ten miles long and three to five miles wide, consisting for the most part merely of a series of small lenticular gashes in the greenstones, and from their appearance are not likely to live continuously to any great depth; their gold contents, too, are mostly low. A good deal of surface prospecting has been done here, but no work of any importance; several potholes have been put down, and one shaft has been sunk to a depth of about 30 feet.

"There is a Government well at the Ranges, but the supply of water is small, due to the well not being deep enough.

"Mount Shenton is the highest point on a north and south range of hills formed by a large belt of hematite-bearing quartz reefs; this belt is in greenstones, and the whole extent of the probable auriferous country is only some 10 miles by 2 (including Mt. Venn, which is the southerly extension of the range). This hematite-bearing quartz belt is some three miles long, but as far as tested is practically non-auriferous. Near Mt. Venn the belt dies out, but there is a larger extent of greenstone country. These greenstones are mostly massive, and are intruded by masses of porphyry; a few quartz reefs occur, but they are mostly small and irregular and low in gold contents.

"At Mt. Warren are a series of rough greenstone ranges extending over an area of some six or eight square miles; these greenstones appear to be similar to those usually comprising the auriferous series of our goldfields, but as far as could be seen in a cursory examination (owing to scarcity of water) quartz reefs are conspicuous by their rarity.

"A full detailed account of these districts will be given in the report now in course of preparation."

New Find 60 miles E.N.E. of Duketon.—Mr. Gibson prepared the following preliminary report upon this district:—

"I have visited the new find, situated on the south-east side of Lake Wells, in the vicinity of the Ulrich Range, and about 60 miles east-north-east of Duketon, and have made an examination of it as to its extent and probable resources.

"The workings are situated on the north-eastern side of a low rough ridge of greenstone hills, trending in a general north-west and south-easterly direction for five or six miles, and having a maximum width of a little over a mile, tapering to nothing at either end; these hills are entirely surrounded by sand plains and spinifex. The rocks which comprise this ridge consist of fine to coarse-grained massive and foliated greenstones (amphibolite), similar to those usually found forming the auriferous series of the Eastern fields, and are traversed by a large number of acidic dykes, varying from a coarse-grained granite to a fine, compact, quartz porphyry, the latter type being by far the more prevalent. These dykes vary greatly in size, and run in all directions, though the majority of them have a general north and south trend; they also appear to be newer than the quartz reefs which they frequently cut through; the greenstones are usually considerably crushed and foliated in close proximity to them. The north-eastern fall of the hills is into a long narrow arm of salt lake—probably part of Lake Wells—lying from about two miles away.

"This lake runs past the north-western end of the hills, and then turns and runs southerly, being crossed by the road about six miles west of the 'find.'

"The present workings are situated on a small gully running down the eastern fall: this has been worked at irregular intervals for a length of about 20 chains, and a good deal of work has been done. Most of the gold has been got in the wash right in the bed of the creek at a depth of from two to four feet from the surface, and usually at points where the gully is crossed by the granitic dykes which form natural riffles on the bed of the gully. No, or very little, gold has been got on the fall of the hills into the creek; and this fact, viz.:—that all the gold has been shed and carried into the bed of the creek, militates against the chance of any rich leaders being found. So far most of the gold found is pretty fine, the largest piece obtained being less than 10dwts. No specimens have been obtained, but one or two pieces of gold were found with small pieces of ironstone attached, which would show that the gold has been shed from a small ironstone leader, or leaders, in the greenstones, which has been completely denuded away. There are several other gullies in the hills, and these have all been tried for alluvial, and so far with negative results; the sides of the hills and the flats at the foot of them have also been tried in numerous places with similar results. At the time of my visit there were seven men at the 'find,' one of whom was employed in carting water from the soak 20 miles distant by road, the remaining six were engaged in alluvial working, and had obtained amongst the lot of them between 15 and 18dwts. of gold as the results of a week's work. These men professed themselves as very dissatisfied with the district, and gave it as their intention to leave the place within the next few days. On my way into Duketon I passed another party of five on their way out to the 'find'; this will make quite a sufficient number of men to thoroughly test the locality, if that has not been done already.

"While at the 'find' I saw several runs put through the shakers, and all of them with very disappointing results, mostly only a couple of small 'colours.' A party of four who were at the 'find' some weeks before the present party obtained 8ozs. 7dwts. of gold as the result of six weeks' work; while, in addition to this, one man got from 28 to 30dwts., but I was unable to ascertain how long it took him to get this amount.

"This district was originally prospected by H. Swincer, who is said to have obtained a little alluvial gold here about four years ago; a couple of years later, Kirkpatrick and party, as the result of several weeks' work, obtained a few ounces of alluvial gold; I was unable to ascertain the exact amount, but it was said to be somewhere about 10ozs.

"As regards the reefing possibilities of the district, I don't think anything of importance is likely to be found in this line. Quartz reefs are certainly fairly numerous, but they are small and very irregular, being for the most part merely short lenses or gashes running with the foliation of the greenstones, and are, I think, not likely to live to any great depth; they are also much broken and distorted, owing to the

intrusions of granitic dykes; the quartz is white and glassy, and, as far as tested, very low in its gold contents; a large number of samples were 'dollied' by myself, and the best result obtained was only slightly better than a trace, most of them being blanks. There is, however, one fairly well-defined line of reef—or, rather, line of lenses—traceable on the surface in a north and south direction for a distance of about 10 chains, the largest continuous length of quartz being about 60 feet, and having a maximum width of about three feet; it is, however, broken in several places by granitic intrusions, and the lenses of stone are likely to behave just as irregularly vertically as they do longitudinally.

"The stone in this line is the typical white glassy quartz, and near the north end has a considerable quantity of carbonate of copper associated with it, as well as occasional small pockets of galena. This line was carefully sampled by myself, and a large number of samples dollied, the best prospect obtained being equal to about 1 to 2dwts. per ton. A few of the samples gave traces of gold, but the majority of them were blanks.

"Almost every one of these reefs show signs of having been sampled several years back, and the area of possible auriferous country is so restricted that two or three men could thoroughly prospect it, from a reefing point of view, in a couple of weeks, and I am of opinion that this has already been done. The country rock is extremely hard right on the surface, and under existing conditions, *i.e.*, with the nearest battery 60 miles away, and over heavy sand at that, reefs would have to be exceptionally rich to be of any use to the prospectors, and I do not think there are any reefs of this description in the locality; and in my opinion, even if the reefs were of fair grade, there is nothing of sufficient size or regularity to warrant even the thought of erecting a battery on the spot.

"With regard to other possible finds in the vicinity, from personal observations, there is no auriferous country to the south until the Cosmo Newberry Ranges are reached: none south-easterly till Mt. Warren—and this is an exceedingly poor belt; and none westerly or south-easterly till the Duketon-Erlistoun belt. To the north and north-east, beyond Lake Wells, low granite ranges and sand plains extend as far as can be seen, and these are said to extend in this direction for practically an unlimited distance.

"As to the water supply of the locality, a well has been sunk on the eastern fall of the hills, about a mile and a-half from the lake, in which water was struck at about 30 feet. This water is, however, too salt to be of use even as stock water. If a well was put down on the other fall, I think the chances are that this would probably be salt too, as the lake runs round this side of the hills as well, though at a somewhat greater distance—about six miles. I do not think a permanent fresh water well is likely to be found in the locality. The present water supply is from a soak in a small creek eighteen direct miles from the 'find' along the Duketon road; water has to be carted from here to the 'find' over heavy sand, and the supply is only very limited and unless replenished by rain is not likely to last many more weeks. Between this and Duketon there is no water except at a rock hole six miles from the soak; this, however, is most probably dry by now as there were only a few gallons of water in it early in November.

"I don't think the 'find' is of sufficient promise to warrant the Government going to the expense of putting down wells along the road, but if these are put down, almost the only places where they could be put would be (1) on the cork tree flat, 16 miles from Duketon, and (2) on the creek, a little below the present soak, and I am not in great hopes of a supply being obtainable at either place, especially at (1)—that is in shallow wells.

"If these wells are put down—and this applies to all shallow wells in the out back country—I would very strongly advise that they should be put down in the summer season, for if a supply is met with then it can fairly safely be relied upon as permanent, whereas if they are put down in the winter—usually the wet season—a fairly heavy supply of soakage water is often met with which goes dry, or nearly so, before the dry season is over, and this is often a very serious matter in that part of the State. The Cosmo Newberry Government No. 2 Well is a case in point; this well is now only making a few gallons of water per day, and that only after it has been sunk another five or six feet by private parties."

Windanya Group of Leases, Broad Arrow Goldfield.—In the month of June Mr. Woodward prepared the following report upon the Windanya Leases, near Broad Arrow:—

SITUATION.—Windanya* is situated about four miles in a south-westerly direction from Bardoc, a town upon the eastern railway line 418 miles from Fremantle and 31 from Kalgoorlie.

GEOLOGY.—*Superficial Deposits.*—The area in which this group of leases is situated may be described as a valley running in a north-westerly and south-easterly direction of about four and a-half miles in length by half-a-mile in width, the surface of which is covered by a deposit of rich red loamy soil broken by two small patches of diorite boulders towards the southern extremity, the only indication of the presence of quartz reefs being lines of strewn fragments of quartz.

Laterite.—This valley is enclosed upon its eastern and western sides by lines of low ironstone-capped hills (laterite).

Schists.—The basic series are here represented by hornblende schists met with in sinking beneath the red loam of the flats, and are found to be much weathered above the water level (about 200 feet), and even below it in the immediate vicinity of the lodes.

Granite and Porphyry.—The acid series are represented by a granite intrusion, which outcrops in one of the patches of diorite towards the south end of the valley and by numerous small porphyritic dykes met with in the lodes.

Quartz Reefs.—The quartz reefs in the oxidised zone are much iron-stained and often contain vughs filled with gossan, which are generally rich in gold. Below the water level the quartz assumes a more banded appearance, and often contains pyrites in considerable quantities which in the vughs sometimes

* *Vide* Lithograph L 17, issued by the Department of Mines.

assumes a botryoidal form. The casing of these veins often consists of talcose rocks with veins of serpentine and fibrous talc. At the northern end of this area there are two main lines of lode fissure, the one upon which the Half Mile Reef mine is situated strikes north-west and south-east; whilst the other, upon which are the Struck Oil and Half Mile North, strikes north-north-west and south-south-east; both of these underlie to the eastward, and should junction if they continue a little south of the Half Mile workings. From this point to the southward, the country is considerably broken, the reefs being, although often rich, of short length, and have, for the most part, an easterly and westerly course, with a dip in a southerly direction.

The Mines.—There are at the present time only two mines at work in this district, one, the Half Mile Reef, which is in the hands of a party of tributers, who are raising the small patches of stone which were unprofitable for the Company to handle; the other, the Half Mile North, which is a prospecting show worked by the owners.

The Australasia Half Mile Reef, Ltd.—Mr. T. Blatchford, B.A., formerly Assistant Government Geologist, in his report on this district, accompanied by a geological map, published in the Annual Progress Report of the Geological Survey for the year 1899, page 27, says of this mine:—"The reefs which are being worked on this lease do not appear at the surface in a defined outcrop, though they have been followed for a considerable distance in the underground workings. In the southern end of the lease, however, loose masses of quartz may be still seen at the surface, and these, no doubt, led to the discovery of the reefs lying but a few feet beneath the surface." Upon this property a considerable amount of work has been done, a main working shaft has been sunk to a depth of 565 feet, from which are the following levels:—120 feet level, 343 feet in length; 170 feet level, 580 feet in length; 250 feet level, 540 feet in length; 285 feet level, 120 feet in length; the 365 feet level being 440 feet; the 465 feet level being 310 feet; the 565 feet level, 250 feet; whilst from this level a winze has been sunk on the ore body for a further depth of about 40 feet. The ore body varied very considerably in size, but averaged about two feet in thickness in the portion removed, which was carried in an ore chute that dipped to the southward of about 150 feet in width. North and south of this chute the country was tested for a considerable distance, as will be seen from the length of the levels, but as the veins become too small and poor to be worth following or pinched out, work was abandonded; whilst in the bottom level the stone has become so small and of such low value that the work of sinking has been discontinued. The little water this mine makes comes from the upper levels, the lower being comparatively dry. This mine has now been regularly worked for a number of years, during which time it has yielded 22,962·00 tons of stone, from which 14,432·52ozs. of gold have been obtained, the average value of the ore crushed being ·63oz. of gold to the ton. The question of the future of this mine is not one in which science can lend any assistance, since the ore body is still intact in the lower levels, but simply one of whether the stone from greater depths will pay to raise and crush or not.

The Struck Oil.—This property is situated a little to the north-east of the Half-Mile Reef, but belongs to the same Company, who use it as a water shaft for the supply of the battery. The shaft is about 300 feet deep, with a small crosscut from the bottom, in which a small vein of highly-mineralised stone heavily charged with water was cut. This latter was said to make at the rate of 45,000 gallons per diem, and thus stopped further prospecting at the time. There are several small shafts upon a small quartz reef, from which some years ago 139 tons of stone were raised and crushed, which yielded 105·05ozs. of gold, or an average per ton of ·75oz.

Windanya Half Mile North.—This lease is apparently upon the same line as the Struck Oil, and about 400 yards to the north of it; there was no outcrop of reef through the alluvium, but it was discovered by fragments of quartz upon the surface. It has now been opened up by three shafts, one at the northern extremity of the lease, one near the south, and the other a little north of the latter. No. 1 shaft is situated near the southern boundary, and has been sunk to a depth of 60 feet, at which point it struck the reef. There is also a crosscut at 40 feet from the surface to the reef from which a quantity of stone was raised. The reef is here from five feet to six feet in width, but considerably broken. No. 2 or middle shaft is about two chains north of the first mentioned, and has also been sunk to a depth of 60 feet, passing through the reef near the surface where it was small. At the bottom of this shaft a crosscut has been driven 30 feet east to the reef, from which point it has been followed for a distance of 85 feet north and 35 feet south, the ore body being eight feet to nine feet in width. No. 3 or the northern shaft was sunk close to the northern boundary to a depth of 103 feet, passing through the lode at 40 feet from the surface. At this level it was followed both north and south for a distance of about 20 feet. At the bottom of the shaft, a crosscut was driven east 30 feet to the reef, which is here about 12 feet in width. The reef was followed south from this point for a distance of 40 feet, and a winze sunk 30 feet upon it. All the stone raised from these workings has been crushed, yielding 779·79ozs. of gold from 927·25 tons of ore, averaging ·84oz. per ton. The country rock in the immediate vicinity of the lode is hornblende schist, the casing of the vein itself being often talcose. The lode consists of sections of quartz which are generally ferruginous, divided one from the other by intrusions of copper-stained porphyritic rock which lie between the lode walls intersecting the quartz, but in no instance so far penetrating the country.

Other Leases.—To the southward of the Half Mile Reef there are a series of abandoned claims upon which shallow shafts have been sunk to win rich stone from cross reefs; but to judge from the amount of work done, they must have been small and of limited extent.

The Surbiton.—At the south end of this valley is an abandoned mine called the Surbiton, upon which a considerable quantity of work has been done and plant erected, which latter has since been removed. This property was inspected by Mr. Blatchford, who in the Annual Progress Report for the year 1899, page 27, states that the reef strikes east and west dipping to the southward, and has been

opened by three shafts to a depth of 240 feet with a level at 80 feet from the surface, 206 feet in length, in which the lode is 132 feet in length and averages 10 inches wide, also a level at 160 feet driven east and west for a distance of 350 feet, the vein extending 255 feet, being about 15 inches wide upon the average. He further states that 10 tons of stone had been crushed, yielding 18ozs. of gold.

Wagin District.—Mr. Woodward visited the Wagin district for the purpose of reporting upon the possibilities of coal occurring and the reputed phosphatic deposits. From this report, which is given *in extenso* below, it appears that the occurrence of coal deposits is somewhat problematical, and that the reputed phosphatic deposits, which apparently cover a large area, do not contain sufficient quantities of phosphoric acid for fertiliser purposes:—

"Wagin* is situated upon the Great Southern Railway line, 193 miles from Perth and 147 miles from Albany, at an elevation of 840 feet above the sea level. It lies in one of the main valleys which drain the great tableland of the interior, the fall of which is so slight that in place of a well-defined water course a series of lakes have been formed which only during periods of great floods overflow one into another, by which means the water eventually finds it way into the Beaufort River.

"To the westward the ground rises rapidly for a distance of about four miles, attaining the greatest elevation in the district of Badgarnung Hill, which is a small ridge of granitic rocks about 300 feet above the level of the town.

"Should at any future time a water supply of greater magnitude than that at present in existence be required, there are several sites upon the eastern slope of this hill which would lend themselves admirably for reservoir construction from which 100 to 150 feet head of pressure could be obtained by a gravitation scheme, and a good water supply assured.

"A striking feature of this range is that it is clothed by a distinct vegetation from the surrounding country, the flora being identical with that met with in the coastal regions, whilst all around it nothing but the tableland vegetation is encountered.

"The main valley in which the town is situated runs in a north-east and south-west direction, from which the country rises gently to the north, whilst to the south and east it rises more abruptly on to sand plains, along the edge of which polished granite knobs outcrop here and there similar in every respect to those around the lake basins of the goldfields.

"Although this is one of the main drainage valleys from the salt interior, the holding capacity of the lakes is so great that without very exceptionally wet seasons occur inland little or no salt finds its way westward of the railway line, therefore the chain of lakes below it being filled locally are comparatively fresh, whilst those to the eastward, in some instances, contain salt in such large quantities as to render its removal after a long dry summer like the past a highly profitable undertaking.

"Upon the eastern side of this valley, running in a north-eastern direction from Lime Lake for a distance of about three miles, are some limestone deposits which in places consist largely of small shells, whilst the surface of the adjoining lake bed is covered by a deposit of earthy gypsum.

"Bonnar's Leases are situated upon the eastern side of Lime Lake, covering a portion of this lake bed, the low bank between it and the gypsum lake, part of which latter is also included.

"Lime Lake.—This lake covers an area of about 200 acres with limestone outcrops upon its eastern and southern sides, whilst to the westward and northward, if these deposits do exist, they are covered with accumulations of blown sand. The bed of this lake is covered upon the south-eastern side by a deposit of black earth full of small shells, beneath which are shelly limestones, which give place further into the basin to an earthy limestone perforated by root holes that have mostly been filled with earth. Beneath these superficial deposits cream-coloured chalky limestones are exposed in an old excavation which was opened some years ago in order to obtain limestone which was burned and used for building purposes in the town and which, to judge by the mortar, yielded a most excellent lime. This hole has now fallen in, and, as no reliable information can be obtained as to its depth and whether or no the total thickness of the beds was tested, it is impossible to state anything definite under this head until more work has been done. The lower portion of this lake bed upon which water lies after heavy rains, and the adjoining belt upon which salt-loving plants grow, is covered with earthy gypsum, which deposit is being used in conjunction with the burnt limestone in the manufacture of a fertiliser.

"Upon the low ridge between this lake and the Gypsum Lake, which lies to the eastward, are some old kilns which are at present being used by the lessee in which he burns the root-pierced limestone from the lake bed, and some creamy limestones which outcrop upon this ridge.

"In a small hole sunk in the Gypsum Lake a white chalk gypsum deposit is exposed, but this so far has not apparently been much worked.

"Wilson's Leases are situated about two miles north of the Lime Lake deposits, upon a low ridge between lake branches. Little work has been done here as yet, but to judge from the appearance of the surface stone, and that exposed in the excavation for the kilns, it is apparently of very good quality and admirably suited for the purpose to which it is proposed to put it, viz., the manufacture of a fertiliser by the addition of phosphatic and other substances to the calcined limestone.

"The whole of this deposit, so far as examined in this district, is decidedly of lacustrine origin apparently resulting directly from the weathering of shelly deposits similar to those met with at the surface, the occurrence of the latter proving conclusively that, in comparatively recent geological times, this area must have been covered by a huge lake which, to judge from the type of the shells, was in all probability salt.

* The localities mentioned throughout will be found on Lithographs 408 and 409, issued by the Lands Department.

"A number of samples were taken and tested for phosphates, but as will be seen from the attached analyses they contain too small a percentage of phosphoric acid to be classed as anything but limestones.

"This goes far to indicate the absence of fish in large quantities, for had they been present one would naturally expect to find a higher percentage of phosphoric acid, whilst to go one step further, this absence of fish might almost be expected in a salt lake, the water of which would be liable to vary so greatly in density owing to the intermittent character of the inflow of fresh water in a country destitute of flowing streams.

"Although containing too small a percentage of phosphoric acid to be of any appreciable value as a phosphatic manure, these deposits should be of considerable value since they are situated in the very heart of what is rapidly becoming a most extensive agricultural district, the soil of which, resulting for the most part from the disintegration of granitic rocks, is almost destitute of lime, a most essential substance in the production of first-class milling wheat. Gypsum is also a most valuable fertiliser, for in that form not only lime but also sulphur, a most important element in plant life, is conveyed to the soil.

"The supposed coal deposits of this district are entirely of a problematic character. A considerable tract of country which was once a large lake bed exists, but whether coal measures exist beneath the modern superficial deposits or not can only be proved by boring or sinking. Since no outcrops have so far been discovered, before any such work were undertaken it would be necessary to have a geological survey made in order to prove the extent of the area over which coal measures might extend.

"Gold is reported to have been discovered in some hills upon the northern side of the lake area, about 17 miles to the eastward of Wagin. The country in this locality changes decidedly in character, the red soil indicating the presence of hornblendic rocks, whilst the hill itself is composed of feldspathic rocks which at the surface is too much weathered to exhibit any structure. These rocks are intersected by numerous small quartz and ironstone veins, some of which have been opened up by pits and small shafts; but the parcels of stone tested did not prove of a sufficiently encouraging nature to warrant further expenditure upon them.

"The stone in places is of a very promising character, and is well worth prospecting in an inexpensive manner by simply dollying surface stones until gold is discovered, then by trenching in an east and west direction across the strike of the rocks to locate the lodes, which will probably be found to consist of a network of small leaders in a belt of dyke stone, the quartz being probably highly mineralised below the water level."

Appendix A.—The following are the results of analyses of specimens from Wagin, made by Mr. Simpson in the Survey Laboratory:—

Lab. No.	Description.	Phosphoric anhydride P_2O_5.	Calcium sulphate $CaSO_4$.	Calcium carbonate. $CaCO_3$.
871	Siliceous limestone, ridge lake side, surface	·008	...	...
872	Siliceous limestone, ridge lake side, under surface ...	·014	...	...
873	Siliceous limestone, under shell deposit, lake bed ...	·010	...	...
874	Siliceous limestone, old lime pit, lake bed	·026	...	...
875	Calcareous clay, gypsum lake	trace	·96	41·58
876	Calcareous earth, gypsum lake bed	trace	1·07	52·26
877	Siliceous limestone, Wilson's low ridge excavation ...	·008	...	...

Calcium carbonate is the only constituent present in sufficient quantities to be of value for fertilising purposes.

Appendix B.—Phosphatic Deposits in General—"As an introduction to this subject it may be as well to mention that the bones of all vertebrates are composed of phosphates of lime, and that all skin, feathers, hair, nails, hoofs, and scales are rich in phosphoric acid, whilst even the fleshy portions of the body, more especially the brains and nervous system of all birds, beasts (including man), and fishes, particularly the latter, contain phosphoric acid.

"It will be recognised from the above that it is absolutely necessary that man be supplied with phosphates of lime; and as he does not now eat the bones of his prey, he must look for his supply of this substance from some other source, the most convenient being found in bread, since all cereals contain phosphate of lime, particularly in the outer skin of the grain, which is now generally discarded as bran and pollard.

"Since cereals contain phosphate of lime, it naturally follows that the soil upon which they grow must be furnished with it; otherwise after a few crops have been taken off a piece of land its productivity will be exhausted. Other substances, such as nitrates and potash, are just as essential to plant life, but here only phosphates are being considered.

"Now, since phosphate of lime does not occur in large quantities in the average soil, if crops requiring it are grown year after year it naturally follows that this must be supplied, which of course can be done in the form of crushed bones or guano; but since the supply is limited and the demand great, other sources of supply must be considered.

"It has now been discovered that certain rocks rich in phosphoric acid, but which in their natural state are practically valueless as a fertiliser, become of greater value after treatment by a chemical process, which renders the insoluble phosphate of lime soluble and thus available as a plant food, when it is called a super-phosphate.

"When the term phosphatic deposits is used, it is generally understood to refer to a combination of phosphoric acid and lime sometimes called rock phosphates. But although the term is generally applied to the above, phosphoric acid also occurs in combination with other elements commonly such as lead and iron, in the latter of which forms it has played an important part as one of the best known phosphatic fertilisers of the world, viz., Thomas's Phosphate or basic slag, being a pulverised slag resulting from the conversion of phosphates of iron into steel by Thomas's process.

"Phosphatic deposits as they occur in Nature may be divided into two classes, those derived from mineral and those from organic sources. The former of these comprise deposits resulting for the most part from the disintegration of certain volcanic rocks rich in the mineral Apatite (phosphate of lime), the second which embraces by far the most numerous and most important may be classed under two heads, the first being fossil phosphatic deposits, and the second altered recent deposits.

"The fossil phosphates are mostly met with amongst the Mesozoic Rocks, where beds resulting from deposits formed by large fish-eating reptiles occur, called coprolites, whilst the more modern are limestones which have absorbed a considerable quantity of phosphoric acid from overlying guano beds, and as these latter are by far the most likely to be met with in this State it will be necessary to consider them more carefully.

"Deposits of phosphate of lime of this class are very similar in every respect to ordinary limestones, and since they contain the phosphoric material in an insoluble form they are of no particular value as a fertiliser until manufactured, and in consequence exhibit no evidence of their existence by increased vegetation. Therefore, if deposits of limestone are met with along the coast, or even at a considerable distance inland under the following conditions, they are well worth testing.

"Since these limestone deposits, which contain a large percentage of phosphoric acid, evidently in some bygone time have formed the camping and nesting ground of sea birds, they must at such periods have been near the sea, either on the top of cliffs, ridges of rock, or islands, whilst now as the coast line is rising rapidly, and has been for a considerable period, if they exist at all will be found inland upon the hill tops or sides at a considerable elevation above the sea level, or as isolated hills upon the coastal plains. If patches of limestone are found in the hollows or areas of depression, there is small chance of their proving to be rich in phosphoric acid, as they are in all probability lake deposits; and the same remark may apply to the coastal caralline limestone hills, which are recent wind-formed deposits.

"When the fact is borne in mind that similar phosphatic deposits are being formed at the present time from Geraldton northward along our west and north-west coasts, it is highly probable that similar deposits to those met with on Yorke's Peninsula in South Australia will be discovered in this State."

The Sunbeam Lease, No. 1121x, Kanowna.*—In the month of July Mr. Woodward prepared the following report in connection with a proposal to grant State aid towards the development of the mine:—

"This lease, which contains an area of 20 acres, is situated about half a mile to the northward of the north-west corner of the township boundary of Kanowna, and immediately adjoins the Ballarat lease upon the west, whilst the North Lead passes upon its western side.

"The property has been worked for a considerable number of years, during which period 4,870·25 tons of stone have been raised, yielding 7,744·56ozs. of gold, worth £28,800, the average value of the stone per ton being 1·59ozs.

"Upon this property there are two main lines of reef, called respectively the eastern and western reefs, whilst between them several rich flat leaders have been worked.

"The eastern reef has a north-easterly course and lies upon the eastern side of the property, having an underlay of about 30 degrees to the eastward or into the adjoining mine. That portion of this reef which lies within the boundaries of this property has been entirely worked out above the 130-feet level from the whip shaft upon the lease and below that from the Ballarat Company's shaft. At the 130-feet level the reef has been followed for a distance of 180 feet within the property, for which length it is well defined, but at the southern end it is broken and small. From the northern end of this level a crosscut has been driven 60 feet to the whip shaft, and then on for another 130 feet to the western reef, which has been followed from this point south for a distance of 265 feet. This reef averages about 10 inches in width, and dips generally at about 62 degrees east. Above this level most of the stone has been stoped to the surface, where the reef can be traced for a distance of about 450 feet.

"From this level three winzes have been sunk: the first near the crosscut to a depth of 46 feet; the second, 130 feet further south, to a depth of 41 feet; and the third, near the end of the level, to a depth of 56 feet; whilst the two latter are connected at the 170-feet level.

"This reef has a well defined hanging wall, which is sometimes striated. The foot wall is not well marked, the country upon that side being much broken, highly mineralised, containing stringers and leaders of quartz, but which as a rule are poor in gold. The north and south ends of the 130 feet level have been mullocked up; therefore the reef cannot be inspected, but it is said to be small.

"At the bottom of the southern winze, water has been struck; this would be at a vertical depth of about 160 feet and corresponds with the water level in the adjoining mine where water is said to make at the rate of from 50,000 to 60,000 gallons per diem.

"Above the water level the country is comparatively soft but stands well in the workings with but little timber. In the northern winze, however, the rock is extremely hard, consisting of a porphyritic rock impregnated with marcasite (white iron pyrites). This rock upon the footwall side of the lode is so heavily charged with mineral close to the reef that it presents the appearance of a pyritic vein.

* *Vide* Lithograph L 13, issued by the Department of Mines.

"The reef consists mostly of quartz of a laminated character, stained in places with oxide of iron and containing pyrites near the water level. Judging from the character of the western reef, it is a true fissure vein and therefore has every prospect of maintaining in depth. Its longitudinal extent has not yet been proved, but to judge from the surface indications it will probably split up and be lost to the southward. The lode is small but of good quality, as has been proved by the very constant returns of about $1\frac{1}{3}$ ounces of gold to the ton. It is by no means a company proposition, but there is every reason to believe that a party of working miners like the present owners should be able to make a fair return from it.

"The proposed work for which the loan is asked is to sink a main working shaft nine feet by four feet in the clear, divided into three compartments, and timbered throughout to a depth of 250 feet at a point which will cut the western lode at that depth. Besides this it is proposed to purchase a winding engine, boiler, headgear, cages, rope, and tanks for bailing water, also pumps and piping if required. If this work is undertaken it will be with every reasonable prospect of success provided the sum available is sufficient to carry through the undertaking."

Northam District.—In the month of September, Mr. H. P. Woodward visited Northam for the purpose of examining and reporting upon certain gold discoveries. It appears that discoveries of gold have been reported from the vicinity of Northam, from the period of its earliest settlement, and that prospecting work has been carried out at various periods, both by the Government and the residents, whilst the establishment of an ore crushing plant at Seabrook has given a considerable impetus to the search for gold in recent years.

Mr. Woodward's work in the district was exclusively confined to the examination and sampling of those localities where gold is reported to have been discovered. The high state of cultivation in the district resulted in most of the potholes and trenches in which lodes are reported to have been opened up being filled up, and any sampling possible consisted solely of collecting scattered fragments from the surface.

Mr. Woodward's report is as follows:—

"Northam * is situated upon the Avon River at its junction with the Mortlock; the surface is hilly and broken but the hills for the most part are soil-clad to the summits. Rocky ridges are rarely met with, the rock outcrops being mostly confined to the low-lying tracts and the stream beds.

"The rocks of the district are mostly granitic with belts of schistose country which strike roughly north and south with an easterly dip, and it is in these belts or along the junction of these with the granite that the mineral veins occur.

"Traversing one of these belts which lies immediately to the eastward of Northam are some large ferruginous banded quartz dykes very similar to those met with upon the Murchison goldfield. These form bold, rough, broken ridges of hills which can be traced for many miles. Associated with these dykes are numerous ferruginous quartz and hematite veins, also outcrops of limonite with opal veins and garnet rock.

"The tops of a few of the highest hills are capped by superficial ferruginous deposits (laterite), the under beds being ochre clays which are often weathered away, leaving caves beneath the harder upper beds.

"The first point examined was upon the Grass Valley road about $1\frac{1}{2}$ miles from Northam, upon Block P. 1 (Cunine); here the road passes through a break in a large banded ferruginous quartzite dyke mass striking north and south and dipping to the eastward. A sample of this was taken and numbered No. 1, but the sample yielded no gold.

"There was also a white quartz outcrop running at an angle to it, the strike of which was more to the north-west, but owing to the extremely barren and flinty character of the stone it was not sampled.

"At Mallabine, Block 1080, about two miles to the north-eastward of the last mentioned, a considerable amount of prospecting has been done by the owner, Mr. J. Beard, and his father before him. Good prospects are said to have been obtained from small ferruginous leaders which were opened upon by means of pits and trenches which are now pretty well filled in, but a considerable quantity of stone is lying about the surface from which a sample was taken, No. 2, which yielded no gold upon assay.

"In this locality a shaft has been sunk to a depth of 72 feet 6 inches in mica schist with the object of cutting the leader at a depth, but this shaft is not deep enough to attain its object.

"Copper is said to have also been discovered in this vicinity, but since all the old holes have now been filled in and the surface ploughed over there is no trace of it to be seen at the present time.

"About half a mile north, upon the northern half of Block 1080, Mr. Beard has also done some further prospecting upon what is said to have been a ferruginous leader rich with gold, but since all the stone has been removed and the shaft is not accessible a sample could not be taken. The rocks here are similar to that at the last mentioned, with the additions of bands of garnet rock.

"At the south-east corner of P. 3, near a conical hill with a laterite capping, gold is said to have been discovered in small potholes, now filled in, upon the west side of the hill. This land is now under crop, but some fragments of common opal are strewn about upon the surface.

"Upon the east side of the hill a shaft has been sunk to a vertical depth of over 100 feet in crystalline schists with veins of hypersthene, hematite, quartz, garnets and tourmaline, the joints of the rocks being often coated by thin facing of opal.

"About three miles north of this, upon the eastern edge of P. 4, there is a large and well-defined quartz outcrop of a very barren character, striking north-west and south-east, near which, in a creek bed, gold is said to have been discovered. In this stream bed a number of holes have been sunk but apparently without result, and these have now been filled in.

* *Vide* Lithograph 27, issued by the Department of Lands.

"Mt. Dick, which is about five miles north of Northam, is upon the line of ferruginous quartzites, but close to it are some outcrops of limonite with veins of semi-opal which have been opened up. The opal is much weathered, but is apparently of the fire variety and should be worth a further trial.

"There are also some veins of ligniform asbestos, but this mineral is too brittle in the fibre to be of any value.

"About six miles north of Northam, upon Mr. Morgan's property, T. 1, gold is said to have been discovered many years ago, and to test this the Government sunk a shaft over 100 feet deep upon the top of a hill at some little distance from the point where the discovery is said to have been made.

"A number of small holes have been sunk with the object of discovering the reef, but so far although a considerable quantity of quartz was met with, no definite body was encountered.

"The quartz from these holes varies considerably in character, but an average sample was taken of the whole, No. 3, the assay of which yielded a trace of gold. If a selection of the most promising stone had been treated alone there is no doubt but that a much better result would have been obtained.

"In the bend of the river immediately north of Northam, two pits have been sunk on two small parallel reefs by Mr. Cohen. This land is now under cultivation, but samples were taken from the stone raised, Nos. 4 and 5, neither of which yielded any gold.

"Taking the district as a whole it does not present any promising mineral character, but it is highly probable that gold may be discovered in small quantities, but it is extremely questionable whether these will prove to be payable. Small low-grade lodes are of absolutely no value, therefore without large auriferous formations are discovered there is no hope of a gold mine being worked at a profit in this district.

"The following is a return of assays made in the Survey Laboratory, under the supervision of Mr. E. S. Simpson:—

1293—No. 1	...	...	...	Gold—*nil.*
1294—No. 2	...	...	...	Gold—*nil.*
1295—No. 3	...	...	...	Gold—trace.
1296—No. 4	...	...	...	Gold—*nil.*
1297—No. 5	...	...	...	Gold—*nil.*"

Recent Mining Developments at Greenbushes.—A visit of the Assistant Geologist, Mr. Campbell, in the month of December to Mullalyup in connection with a question affecting the alienation of mining lands, afforded an opportunity for acquiring some information regarding the recent developments at Greenbushes. On his return, this officer submitted the following notes on the observations made:—

"I have the honour to report that, in accordance with instructions, I visited Greenbushes on the 13th December and obtained from Warden Geary some particulars of the localities where tantalite had been obtained.

"The principal one is M.L. 369, the Enterprise, held by Messrs. Jones, Grey, and Marsh, and is on the main road about three-quarters of a mile south of the post office. An open-cut about 12 feet deep has been made on the west side of the road; the upper seven feet shows a wash of tin and tantalite (*see* Mineral Specimens [**6507, 6508, 6509**]); below this is kaolinised gneiss containing a micaceous lode formation, 18 inches wide (*see* Mineral Specimen [**6506**]), slightly greenish in tint, but in places slightly ferruginous, carrying particles of tantalite and tourmaline from coarse dust to chunks, one inch in diameter. A drive has been put on the lode 30 feet. The lode is seen for 18 feet when it tapers out, but the micaceous formation continues and appears to be making again at the end of the drive. The strike of the lode is 323 degrees and the underlay 22 degrees to the south-west. A shaft, about seven feet deep, has been commenced a few yards further south to reach this lode further on the underlay. A pothole one and a-half chains north-west of the last spot shows a somewhat similar wash; *see* Mineral Specimen [**6508**]. Sample [**6509**] is the washed ore, ready for the market.

"A little tantalite is said to have been found in wash with tin on the next lease to the north, No. 370, The Wills, held by Alfred Seabrook, and a claim, No. 755, the Dill-McKay, held by Messrs. Hille and O'Farrell, adjoining the east side of M.L. 369, and also in M.L. 379, the Galtimore, held by Messrs. Marsh and Galt; this is one mile south-westerly from the Greenbushes Well Reserve 13811; it adjoins part of the south side of M.L. 313, The Battler's Hope; the workings of the latter were not accessible at the time of my visit. Several shafts have been put down in a line bearing 235 degrees at a depth of 40 feet in kaolinised granite; a micaceous lode containing tantalite is stated to have been found. (*See* Mineral Specimen [**6375**] given by Mr. Galt.)

"The remainder of the day I devoted to the examination of several leases where it appeared that tin-bearing lodes were being worked. Most work has been done in the Cornwall, M.L. 356, formerly No. 40, when it was held by the Greenbushes Tin Development Co., a Kalgoorlie syndicate I understood. The old workings comprised several shafts from 60 feet to 120 feet depth on the various lines of lode, of which there appear to be four in number (*see* Mineral Specimens **6510, 6511, 6512**), striking about 161 degrees with a westerly underlay of 84 degrees. The two western lodes at least are in decomposed granite, and either one or two of the eastern lodes are probably in the dark mica schist [**6514**] showing in the dump of the 120-feet shaft. Very little stoping appears to have been done by this company, their chief endeavour being to go deeper. The mine was reported on by Mr. Maitland, the Government Geologist, on the 26th of October, 1901, in connection with an application of several mines for Government subsidies, shortly before the mine was abandoned. The present owners, Messrs. Woodgate and Meagher, have been stoping and driving from the old workings at 60 feet to the surface of the decomposed rock, which is overlaid by about 7 feet of tin wash and gravel. They state that they found rich patches of ore. They have also sunk several minor shafts with drives and stopings, and have been very well satisfied with the mine.

"The Statist's returns for the year 1904 give the output as 2·33 tons value £163. This is the total value for that date. I inspected part of the workings down to 50 feet depth; the next level at 65 feet was partly flooded, so that I could not see that part. The lodes are somewhat sinuous, and vary from 18 inches to 5 feet in width, and are approximately parallel, though probably not all continuous through the lease. The formation in which the tin accompanied with tourmaline occurs is more or less decomposed granite slightly ferruginous in places and represent probably impregnations of the granite adjacent to a line of weakness caused by either fracture or pressure as is frequently the case in the Cornish mines in England.

"At M.L. 300, the South Cornwall, adjoining a portion of the west boundary of the previously described lease, another parallel lode is being worked. The main shaft is 80 feet deep, and the lode adjacent is stoped from 63 feet to the surface, for a width of eight feet from the western side where the schist is more decomposed there is a crosscut east for 78 feet which the owners state is tin-bearing all the way. This shaft is to be deepened 50 feet more, the country rock is mica schist.

"About 100 feet farther north the lode has been opened up by a 50-feet shaft and is stoped from 50 feet to surface for about 250 feet in length.

"The Statist's return for the year 1904 gives for South Cornwall leases, M.L. 300 (315), 4·50 tons value £330; total to date, 13·10 tons value £931.

"Another lease, No. 374, the Lost and Found, which comprises portion of the extinct M.L. 56, Amanda, is now held by Messrs. Andrew, Winter, and McGowan, and is situated 1½ miles south of the Post Office, at the Bunbury end; here a shaft 54 feet deep in kaolinised granite has been sunk on a lode composed of four veins or bands of about five inches each, in a total width of four feet, having an underlay of about 25 degrees to the east and a strike of 40 degrees. The formation is gneissic and slightly ferruginous in places; no lode mining has previously been done here. *See* Mineral Specimen [**6516**]. This formation carries crystals of tin and tourmaline, and resembles the lode in the Cornwall lease. I was informed by Mr. Andrew that, in the lead of tin-wash near here, a solitary specimen of gold was found, weighing 1½ grains, at 24 feet depth.

"In Dumpling Gully, three-quarters of a mile north of the post office, another lode said to be five feet wide has been opened up in M.L. 375, the Glasgow, to about 30 feet depth. I did not visit the locality but obtained samples from 30 feet depth and near the surface from Warden Geary. The name of White Lode has been given to it, as it is not ferruginous; *see* Mineral Specimens [**6517, 6518**].

"I also visited M.L. 313, the Battler's Hope, held by W. and J. Johnston, already referred to, where two shafts of 113 feet and 110 feet have been put down in a mica and tourmaline schist [**6515**]. The wash level at the 113-feet shaft, the easternmost shaft, is at 93 feet; here a drive, I was informed, goes 100 feet west. The wash contained numerous water-worn boulders of quartz up to six inches diameter. The 110-feet shaft is 91 feet to the wash; a drive goes 970 feet to the west. I understand that a Government subsidy of £115 7s. 6d. was paid for sinking and driving. Unfortunately no payable wash was found. Generally in regard to the floor on which the wash occurs in this district, I was informed that it is frequently on the smooth surface of the undecomposed rock. Great activity prevails on the various leases owing to the high price of tin, which was 27s. 6d. per unit at the time of my visit.

"Since my return, I find on inquiry that the monthly returns of tin won discriminate between lode and stream tin, but the Statist's published returns give only black tin. I would suggest that the two kinds of mining be distinguished in the same way that alluvial gold is shown distinct from reef gold, and enable the change in the character of mining in this district, that is coming about, to be appreciated."

Boring for Coal near Mullewa.—Reference was made in the Annual Progress Report of the Geological Survey for the year 1903 to the Carboniferous Rocks of the Irwin River Series, and it was suggested that as the discovery of commercial coals along any portion of the Murchison Railway would be of the utmost public importance, some experimental boring should be carried out in that district.

In the month of November, 1903, arrangements were made with the Goldfields Diamond Drilling Company to bore at the 47¼ mile peg on the Geraldton to Cue Railway Line; the position of the spot may be found by reference to Lithograph C 55 issued by the Department of Lands and Surveys.

Operations were duly commenced, and despite the many causes which stood in the way of boring, a total depth of 1,418 feet was reached.

The following is a description of the strata pierced, so far as can be ascertained from the data and cores in this office:—

Strata.	Thickness of Cores.
	Feet.
Sandstone and grit...	405
Light grey mudstones and bands of fine sandstone	195
Pebble grits, ferruginous sandstones, grey shales, fine sandstone, grits, shales, and pyrites, and fine sandstones	150
Light grey mudstone with carbon and dark shales with pyrites, light grey micaceous sandy shale	80
Grey mudstone with bands of pyrites and quartzites	120
Light grey mud stones, dark grey shales with pyrites and coaly particles ...	85
Yellow grit, carbonaceous shales, black grit, dark grey micaceous shale coal ...	285
Dark carbonaceous shale with pyrites and bands of hard, dark dolomitic limestone	40
(*No record*)	58
Total depth	1,418

The bore was carried down to a depth of 1,418 feet, when operations were suspended. The strata pierced belong to the Permo-Carboniferous series, hence the object for which the bore was put down cannot be said to have been accomplished until the base of the formation has been unequivocally reached. It is proposed to carry out further boring in the district after a more detailed geological examination has been made to determine whether the whole series could not be penetrated by a series of shallow bores in the valley of the Greenough River or some of its branches.

Miscellaneous Mineral Notes.—Mr. Simpson has prepared the following notes upon some of the more important minerals, which have passed through the laboratory during the whole period under report:—

"*Tantalum ores.*—One of the most interesting features of the year has been the sudden demand for the hitherto useless metal tantalum and its ores. As much as 18s. per lb. for 80% ore was paid early in the year in London. Prices rapidly fell, however, owing to the large production and limited demand to about one-sixth of that amount. In this connection the ultimate value of the research work carried out in the laboratory was well illustrated. Immediately news was received in Perth of the demand for tantalum ores, abundant information with regard to those ores and their occurrence in the State was available for the information of those interested in the matter.

"Tantalum was first detected in this State in Greenbushes stibiotantalite (tantalate of antimony) by Mr. Goyder, of Adelaide, in 1896. Subsequently in 1900 tantalite (tantalate of iron) was detected in this laboratory in alluvial material from Greenbushes; manganotantalite (tantalate of manganese) in 1904 in material from Wodgina (Pilbara G.F.); manganocolumbite (niobate and tantalate of manganese) and calciotantalite (tantalate of lime and iron) in 1905 from Wodgina and Green's Well (Pilbara G.F.).

"At Greenbushes tantalite has been found *in situ* as a constituent of a highly micaceous greisen, but is most frequent in water-worn pieces from the size of fine shot up to 13lbs. in weight, associated with stream tin ore. An analysis of a detrital specimen yielded the following results:—

G.S.M. 2025.

Ta_2O_5	80·61
Nb_2O_5	2·50
SnO_2	1·51
WO_3	·13
H_2O combined	·14
FeO	10·94
MnO	3·78
NiO	·02
MgO	·19
$(Ce.Y)_2O_3$	*Nil*
	99·82
Sp. Gr.	7·74

"This specimen, like all other obtained from Greenbushes, showed no crystal faces.

"Associated with the tantalite, but in much smaller and less frequent pieces, is the unique mineral stibiotantalite. It is found forming thin veins in tantalite, of which it is almost certainly an alteration product due to the passage of antimonial solutions through cracks in the parent mineral, and also occurs in water-worn fragments from the size of a pin's head up to about two inches in diameter. Most of these consist of pure yellow stibiotantalite, but some consist of an ill-defined black core of tantalite surrounded by yellow stibiotantalite. It is always more or less well crystallised and exhibits one very distinct cleavage. Assays of various samples of it have given the following results:—

Ta_2O_5	51·13	51·95	50·57	per cent.
Nb_2O_5	7·56	4·49	12·58	,,

"At Wodgina and Green's Well manganotantalite and manganocolumbite occur in detrital fragments from small grains up to 37 lbs. in weight associated with more or less tin ore, as well as *in situ* in veins of albite-granite. Specimens are frequently well crystallised, and the following faces were recognised on a parcel of crystalline ore from Green's Well:—a,100; b,010; c,001; u,133; k,103; m,110; e,021; g,130; y,210; z,530. These are arranged in their relative order of frequency.

"*Natural Nitrates.*—The naturally occurring nitrates of soda and potash have for many years been very profitably worked for use as fertilisers, etc., in the desert regions of Chili, India, and other countries. Owing to the somewhat similar conditions prevailing in the interior of this State, a keen lookout has been kept for some years for indications of their existence. The following are the most interesting results so far obtained:—

L.756B.,	Soil,	Kurrawang	Sodium nitrate	0·1614 %
889B.,	Water,	Cue	,,	0·0217 ,,
1125B.	,,	Pingin	,,	0·0063 ,,
1254B.	,,	Leonora	,,	0·0181 ,,
1271B.	,,	Mt. Ida	,,	0·0029 ,,
1274B.	,,	Meekatharra ...	,,	0·0231 ,,
1278B.	,,	Yundamindera ...	,,	0·0085 ,,
1279B.	,,	Niagara	,,	0·0156 ,,
1280B.	,,	Boogardie	,,	0·0079 ,,
1281B.	,,	Lennonville	,,	0·0055 ,,
1409B.	,,	Black Range ...	,,	0·0222 ,,
1513B.	,,	Pingin	,,	0·0157 ,,

"Waters from the Norseman and Phillips River Goldfields show only the faintest traces of nitrates. In view of the close association of nitrogen-fixing bacteria with leguminous plants, it is interesting to note

that all the nitrate-bearing waters come from the "mulga country," that is from that large area of the State in which mulga (a variety of the leguminous genus *Acacia*) forms by far the greatest part of the vegetation.

"*Bat Guano.*—A sample (L.929B) of this material said to represent 100 tons raised from a cave at Yanchep, 30 miles north of Perth, has been analysed with the following results:—

Moisture	13·89
Organic matter	21·99
Mineral matter, insoluble	22·91
„ „ soluble	41·21
	100·00
Total Phosphoric anhydride, P_2O_5	13·12
„ Lime, CaO	19·56
„ Nitrogen, N	3·36
Viz., Nitrogen as nitrates	1·61
Organic nitrogen	1·75

"In this connection it is interesting to quote an analysis recently made of a sample (L.948B) of pseudo-bitumen from the Wilgi Mia (War-paint Cave), Weld Ranges:—

Moisture over H_2SO_4 and at 80° C.		2·17	per cent.
Loss at 100° (Ammonia, etc.)		1·03	„
Organic lost at red heat		43·88	„
Ash SiO_2	6·17		
Fe_2O_3	23·62		
Al_2O_3	2·15		
MnO	·18		
CaO	2·27		
MgO	·90		
K_2O	9·88		
Na_2O	·66		
P_2O_5	·85		
SO_3	2·20		
Cl	5·69		
	54·57		
Less O=Cl	1·65	52·92	
		100·00	
Total Nitrogen		3·58	per cent.
Action of Solvents—			
Cold water	Extract	53·23	„
„ alcohol		6·39	„
Boiling ether		·96	„
„ chloroform		·43	„
„ carbon bisulphide		1·06	„

"The water extract included all the organic matter except a little short hair.

"The material analysed was typical of a number of samples that have been received from time to time from different parts of the State. They have been collected under the impression that they were true bitumens and possibly indicative of the existence of petroleum. It is evident from the composition and behaviour with solvents that though they resemble bitumen in outward appearance and smell they are really the result of the drying up of water which has passed through beds of bat or marsupial guano, and extracted therefrom organic matter and salts of potash, etc. The iron and silica in the sample are present in the form of dust derived from the walls of the cave, which is hollowed out of a lode of siliceous iron ore.

"*Crocidolite.*—The occurrence in the State of the yellow variety of this gem (tiger's eye) was recorded in the annual report for 1903.* During 1905 analyses were made of some of the gem itself from Yarra Yarra Creek and of the yellow opaline matrix enclosing it. The results are as follows:—

	Crocidolite.	Matrix.
SiO_2	91·24	84·42
H_2O above 100°C	3·60	4·08
K_2O	·05	·12
Na_2O	·32	·24
MgO	·13	·52
CaO	Trace	·08
Fe_2O_3	2·87	7·17
Al_2O_3	·77	1·43
H_2O at 100°C	1·20	1·96
	100·18	100·02
Sp. Gr.	2·13	2·36

"*Graphite.*—During the past year considerable interest has been taken locally in deposits of graphite, and those on the Donnelly River have been worked to a slight extent. The surface material at this locality consists of a very greasy clay impregnated with fine amorphous graphite, the mixture being incapable of concentration. Very few samples have been obtained from below the water line, and these appear to consist of a chlorite slate with fine scaly graphite both in bunches and also more or less evenly distributed through the mass.

* Annual Progress Report for 1903, p. 27.

The following are typical analyses :—

No.	L.840B	1188B	1189B
Graphite (Fixed Carbon)	32·48	38·74	41·86
Moisture	7·16	·94	·90
Volatile at red heat	5·77	4·18	4·42
Ash	54·59	56·14	52·82
	100·00	100·00	100·00

"Crystalline flakey graphite occurs in the Northampton district in a matrix of oxide of iron and clay, from which it is readily separated by washing. The following are typical analyses :—

No.	765	766	766A
Description.	Crude Ore.	Crude Ore.	Concentrates from 766.
Graphite (Fixed Carbon)	68·92	12·41	61·04
Moisture	·39	1·08	·21
Volatile at red heat	4·82	7·10	4·01
Ash	25·87	79·41	34·74
	100·00	100·00	100·00

"*Chromiferous Laterite.*—A sample of laterite iron ore was received from Comet Vale (North Coolgardie) for iron assay, and proved very interesting on account of the presence in it of a notable amount of chromium, mostly in the form of a hydrate readily soluble in hydrochloric acid, the balance being present in the form of chromite. The ore was of the usual cellular and concretionary type, black and brown in colour. The following results were obtained on analyses :—

Fe_2O_3	79·01	per cent.
Cr_2O_3	5·30	„
SiO_2	3·14	„
S	·124	„
P	·078	„
H_2O by difference	12·35	„
	100·002	„

I have, etc.,

A. GIBB MAITLAND,
Government Geologist.

INDEX TO NAMES OF PLACES, MINES, REEFS, ETC.

	Page
Adelaide Exhibition	125
Alienation of Mineral Lands	123
Analyses	124, 133, 138-40
Apatite	134
Arrino	123
Assayer and Mineralogist	124
Assays	124, 136, 138
Assays of Soils	124
Australasia Half-Mile Reef, Ltd.	131
Avon River	135
Badgarnung Hill	132
Ballarat Lease	134
Bardoc	130
Bat Guano	139
Battler's Hope Lease	136-7
Beard, J.	135
Beaufort River	132
Black Range	124
Blatchford, T.	131
Boiler Waters	124
Bonnar's Leases	132
Bore at Mullewa	123
Boring for Coal	123
Broad Arrow Goldfield	130
Burtville	128
Cadmium Assays	124
Calciotantalite	138
Campbell, W. D.	123, 136
Carboniferous Rocks	137
Cassiterite Lease	128
Chromiferous Laterite	140
Chromium	140
Coal	123, 132-3, 137
Coal, Boring for	123, 137
Cobalt Assays	124
Collection, Geological and Mineral	124
Collie Coalfield	123
Collie Coalfield, Royal Commission on	123
Colliery Managers' Examining Board	123
Comet Vale	140
Copper Assays	124
Copper Carbonate	130
Cornwall Lease	136
Cosmo-Newberry Ranges	128-130
Crocidolite	139
Croydon Station	126
Cumberland Gold Mine	126
Cunine	135
Detrital Tantalite	127
Dill-McKay Lease	136
Donnelly River	139
Duketon	128-9
Duketon-Erlistoun Belt	130
Dumpling Gully	137
Dundas	126
Eastern Goldfields	128
Eastern Railway	128
Economic Minerals	125
Enterprise Lease	136
Erlistoun	128
Examining Board, Colliery Managers'	123
Field Work	123
Fossils	124
Galena	130
Galtimore Lease	136
Geological Collection	124
Geraldton	134
Gibson, C. G.	123, 128
Glasgow Exhibition	125
Glasgow Lease	137
Glenroebourne	126
Gold Assays	124
Goldfields Diamond Drilling Co.	137
Goldfields Water Supply Pipe Track	124
Gossan	130
Granite	127, 130
Graphite	139-40
Grass Valley Road	135
Greenbushes	123, 136, 138
Greenough River	138
Greenstones	127-9
Green's Well, Pilbara	138
Guano	134
Guano, Bat	139
Gypsum	132-3
Gypsum Lake	132
Half-Mile North Mine	131
Half-Mile Reef Mine	131
Hamersley Range	126
Ida H.	128
Igneous Rocks	127
Immigration, Royal Commission on	123
Iron Assays	124
Irwin River District	123
Irwin River Series	137
Jackson, C. F. V.	123, 125, 128
Just-in-Time	126
Kalgoorlie	125
Kanowna	123, 134
Kirkpatrick and party	129
Laboratory Work	124
Lady Mary Gold Mine	126
Lake Cowan	126
Lake Wells	128-30
Lancefield	128
Laterite	128, 130, 135, 140
Laverton	128
Lead Assays	124
Leonora	124
Lime Assays	124
Lime Lake	132
Limestone	132
Limonite	135
Lost and Found Lease	137
McGuinness and Naysmith	127
Maitland, A. Gibb	123, 125, 136
Mallabine	135
Mangano-columbite	138
Mangano-tantalite	138
Melbourne Exhibition	125
Menzies Geological Survey	123
Mesozoic Rocks	134
Mica	127
Microscopic Slides	124
Mineral Collection	124

INDEX TO NAMES OF PLACES, MINES, REEFS, ETC.—*continued.*

	Page
Mineral Lands, Alienation	123
Mineral Lease 84	127
Mineral Lease 86	127
Mineralogist and Assayer	124
Mineral Resources	126
Minerals of Economic Value	125
Mining Development Act, Subsidies	123
Moolyella	128
Mortlock River	135
Mount Dick	136
Mount Margaret Goldfield	123, 125, 128
Mount Morgans	125, 128
Mount Shenton	128-9
Mount Venn	128-9
Mount Warren	128-30
Mullalyup	136
Mulgabbie	125
Mulga Queen	128
Mullewa Bore	123, 137
Murchison Goldfield	128, 135
Murchison Railway	123, 137
Natural Nitrates	138
Naysmith, McGuinness and	127
Nickel Assays	124
Niobium Assays	124
Nitrates	138
Norseman Geological and Topographical Map	126
Norseman Geological Survey	123, 126
Norseman Goldfield	123, 126, 138
Norseman Gold Mine	126
Northam District	123, 135
Northampton	123, 140
North Coolgardie Goldfield	125, 140
North Erlistoun	128
North Lead, Kanowna	134
North-West Division	123
Paris Exhibition	125
Pegmatite Veins	127
Permo-Carboniferous Series	138
Phillips River Goldfield	138
Phosphatic Deposits	123, 132-3
Pilbara Goldfield	123, 125-6
Pilbara, West, Goldfield	123, 126
Platinum Assays	124
Porphyry	129-30
Port Hedland	126
Princess Royal Gold Mine	126
Pseudo-bitumen	139
Publications	125
Pyrites	130
Royal Commission on Collie Coalfield	123
Royal Commission on Immigration	123
Schists	130
School of Mines Advisory Board	123
Seabrook	135
Silver Assays	124
Simpson, E. S.	124-5, 138
Soil Assays	124
South Cornwall Lease	137
Staff, The	123
State Batteries	124
Station Peak	126
Stibio-tantalite	138
Struck Oil Lease	131
Subsidies under Mining Development Act	123
Sunbeam Lease	134
Surbiton	131
Swincer, H.	129
Talbot, H. W. B.	123, 126
Tambourah	126
Tantalite	127, 136, 138
Tantalite Lease	127
Tantalum Assays	124
Tantalum Ores	138
Telluride Minerals	125
Tellurium Assays	124
The Wills Lease	136
Thomas' Phosphate	134
Tiger's Eye	139
Timber	128
Tin	124, 126-7, 136
Tin Assays	124
Tin Lodes	127
Tourmaline	127
Turner River	126
Ulrich Range	128-9
Valkyrie Gold Mine	126
Wagin	123, 132-3
Water	128-30, 134, 138
Weerianna	126
Weld Ranges	139
Western Shaw	126
Whim Creek	126
Wilgi Mia	139
Wilson's Leases	132
Windanya	123, 130
Windanya Half-Mile North	131
Wodgina	126-7, 138
Woodward, H. P.	123, 130, 132, 134-5
Yanchep	139
Yarra Yarra Creek	139
Yorke's Peninsula	134
Zinc Assays	124

DIVISION VI.

School of Mines of Western Australia.

DIRECTOR'S REPORT.

The Secretary for Mines.

SIR,

I beg to submit, for the information of the Hon. the Minister, my annual report for the year 1905:—

The second year of the School has been a successful one, and, judged by the attendance and the examination results, shows a marked improvement over the work of the previous year. The School equipment has been increased, and in every department facilities have been provided to enable students to obtain a thoroughly practical training in the subjects of the School courses.

As the students attending classes are nearly all engaged in work in connection with the mines and mills of the field their time for study is limited, but it is gratifying to find that the majority of those who join during the first term continue the class-work to the end of the year, and show by their regular attendance and attention to their studies that they are appreciating the benefits to be derived from a course of study at the School of Mines. This is further illustrated by the fact that the entries for examination and the certificates gained by the students during 1905 were double the number of those of 1904. Those now attending the School of Mines are, generally speaking, a good class of student, who, although they may be in some respects deficient in the elementary ground work of their subjects, are anxious and willing to learn. Many of these students display great perseverance, and, by attending regularly, often at considerable personal inconvenience, they are making good progress with their studies.

It is pleasing to record that the behaviour of the students throughout the year has been excellent, and I have also to thank the members of the staff for their cordial co-operation in the conduct of the School and the personal interest they have taken in the welfare of the students. At the end of February, 1905, the school sustained a severe loss in the death of its secretary, Mr. H. E. Hill, who, after a short illness, succumbed to an attack of typhoid fever. Mr. Hill was an able, conscientious, and trusted officer, who displayed untiring zeal in the discharge of his duties, and by his courteous manner he had endeared himself to the students and the members of the staff.

It is with feelings of deep regret that I have to record the death during the year of my late colleague, Mr. Alex. Purdie, M.A. Mr. Purdie was a capable and energetic officer, who, as Director of Technical Education, inaugurated the present system of Technical Schools in Western Australia, and always took a keen interest in School of Mines' work. His death is a distinct loss to the State, and will be deeply regretted by all who knew his sterling qualities.

In consequence of the illness and death of the late Director of Technical Education, and the various changes in the staff of the School of Mines, the intended alterations in the Associateship courses were not thoroughly discussed during 1905, but I hope to present early in 1906 a modified scheme, under which the Associateship courses will cover a period of four years, instead of three as at present, while the syllabus for several of the classes will be altered to more directly meet the requirements of the students, in accordance with the experience gained during the last two years.

On the retirement of Mr. A. S. Bowman at the end of April, Mr. W. Middleton, mechanical draughtsman at the Kalgurli G.M. Co., was engaged as Instructor in Mechanical Drawing, temporarily, for three months, pending the appointment of a Lecturer in Applied Mechanics and Mechanical Drawing, who could devote his whole time to the School. In the two and a-half months interval prior to the time when the newly appointed Lecturer, Mr. J. Corlette, B.E., commenced his duties, Mr. E. K. Beaumont kindly consented to take charge of the Drawing class. This class has been under the supervision of well-trained and experienced instructors during the year, but the several changes have, to some extent, hindered the progress of the class-work. A full-time lecturer in Applied Mechanics and Mechanical Drawing has now commenced duty, so that these classes will proceed, without interruption, along the lines detailed in the syllabus.

Mr. M. J. McNamara, temporarily employed as acting secretary from 27th February to 31st August, carried out the duties required of him satisfactorily; and at the end of August Mr. D. McDougall commenced work as acting secretary, and Lecturer in Physics.

At the end of April, Mr. C. Bircher was entrusted with the class in Engine-driving, in addition to his classes in Practical Electricity, and since then his work has been further extended in connection with the workshop.

At the end of February, 1905, I conducted an entrance examination in Preparatory Mathematics, and in November the annual examinations for class certificates were held, the results of which appear elsewhere. The scholarships offered by the Department have not yet attracted the amount of competition which they deserve, but the successful candidates, Messrs. Pike and Woolf, of Perth, and Hutchinson, of Kalgoorlie, handed in exceptionally good examination papers. D. M. Hutchinson, who has gained the senior scholarship, already holds an entrance scholarship, which he will now resign.

The School of Mines' students acquitted themselves creditably at the Government examination for engine-drivers' certificates held during last October. Out of seven candidates from the School of Mines, six gained Government certificates as engine-drivers; two of the students, viz., H. T. Taylor and C. T. Golding, headed the list for the whole State for first-class certificates; A. S. Morrison headed the list for second-class certificates, and E. W. Kissane headed the list for third-class certificates, while H. Beech was fourth on the list, and N. Miller, who attended the school for only a portion of the year, was thirteenth. The success of these School of Mines' students not only reflects credit on the instructors, but shows that the class-work of the School meets the requirements of candidates for engine-drivers' certificates. It is also noteworthy that the only Kalgoorlie candidates who were successful at these examinations were School of Mines' students. The class for Engine-driving, which was under the charge of Mr. T. Butement during the early part of the year, has been conducted since the beginning of May by Mr. C. Bircher, and it is proposed to divide the class during 1906 into two sections, one for Junior work and one for Senior work, so as to better meet the requirements of the new Government Regulations.

The Practical Electricity and Mechanical Engineering workshops, erected during 1905, have been partially fitted up with machine tools and apparatus to an extent sufficient to allow of class instruction being commenced, and Mr. Bircher has regularly conducted practical classes in the workshops during the last term of the year. These classes have been well attended by students, who have appreciated the opportunities afforded them of gaining practical experience in this class of work, and there have been hopes expressed that the scope of the workshops would be increased during the coming year. The class of work embraced by this workshop practise is greatly required by the workers on the goldfields, and extensions should be made when opportunity offers.

The School has proved of considerable benefit to prospectors, as shown by the fact that for the year ending 31st December, 1905, a total of 627 free assays and determinations of minerals have been made for prospectors in accordance with the regulations, as follows:—Assays for gold and silver, 571; assays for copper, 16; analyses, 5; mineral determinations, 35; total, 627. Messrs. W. H. Baker and H. J. Jessup deserve special credit for the assistance they have rendered in this department of the School work, the extra duties entailed by the assays and analyses being carefully and expeditiously performed, and Mr. L. K. Ward has carried out the blowpipe determinations in a careful and conscientous manner.

Many valuable donations have been made to the School, the extensive collection of tin ore and associated minerals, etc., donated by Mr. H. Ferd. Kayser, and the metallurgical products forwarded from Broken Hill by Messrs. Delprat and Hebbard, being especially welcome at this time for instruction purposes. Mr. A. E. Thomas has generously promised to the School a prize of books for the best junior student in Chemistry, commencing with the 1905 examinations, on the results of which the first prize has been awarded to G. Simms.

During the past year a considerable number of visitors have been shown through the School, the staff being at all times ready and willing to devote their attention to displaying the advantages offered by the institution and to make a tour through the class-rooms both entertaining and instructive. It is gratifying to know that the visitors carry away favourable impressions of the educational facilities offered by the School and its equipment.

I have, etc.,

F. B. ALLEN,

Director.

Kalgoorlie, 11th January, 1906.

Report of the Advisory Board of the School of Mines of Western Australia.

To the Secretary for Mines, Perth.

Mines Department, Office of the State Mining Engineer,

Perth, 1st March, 1906.

SIR,

I have the honour to report that two meetings of the Board were held during 1905, one on 22nd May, at Perth, and the other at Kalgoorlie on 30th October. At the first, matters relating to scholarships, status of students, the appointment of a secretary and lecturer in mathematics, and of a lecturer in physics, drawing, and applied mechanics, and the exemption of the staff of the school from the Public Service Act, were discussed, and recommendations made thereon for consideration of the Honourable the Minister for Mines. At the second meeting regulations to govern the staff of the school were drafted and recommended, and the question, brought forward by the Public Service Commissioner, that the offices of Director of the School of Mines and Director of Technical Education should be combined, was discussed, and a recommendation come to thereon that both Institutions should be under the same Director, provided that the control of the School of Mines remains ultimately with the Minister for Mines.

I have, etc.,

A. MONTGOMERY, M.A., F.G.S.,

State Mining Engineer, Chairman.

DIVISION VII.

Annual Report for the Year 1905 on the Operations of "The Inspection of Machinery Act, 1904."

The Secretary for Mines, Perth.

SIR,

I have the honour to submit, for the information of the Hon. Minister for Mines, the following Report, together with statistical tables, for the year ending 31st December, 1905, in accordance with Section 81 of "The Inspection of Machinery Act, 1904," on the operations of the Act in the districts proclaimed thereunder.

As mentioned in my last Annual Report, the Act was assented to by Parliament on the 24th December, 1904, to come into force by proclamation, as it was not deemed either practicable or advisable to apply its provisions until the 1st day of March, 1905.

This period of inoperation was occasioned and was required principally to admit of suitable registers, forms, etc., being designed and printed, and the systematic laying out of the new work contained in the improved measure, and which I am glad to be able to report was got into active and continuous operation on the date mentioned, marked by the absence of irritating delays which are commonly incidental to such an occasion, especially when the enactment is one that directly affects a large section of the public at frequent intervals. In addition to inspection of boilers previously carried out under the provisions of "The Steam Boilers Act, 1897" (now repealed), the new work, to which the Act applies, is dealt with in this report under specified headings, and comprises:—

(*a.*) Inspection of Factory and Mining Machinery.

(*b.*) Survey of Oil-engines on Passenger Launches, and Boilers and Machinery on River and Harbour Steamers.

(*c.*) Accident Inquiries.

(*d.*) The Supervision of Engine Drivers' Examinations, and all Inquiries relating thereto.

The report is subdivided into headings representing the chief branches comprising the work of this Department, viz.:—

(1.) Boiler Inspection.

(2.) Machinery Inspection.

(3.) Survey of Harbour and River Boats' Machinery.

(4.) Engine-drivers' Examinations, and Inquiries.

(5.) Accidents.

(6.) General Remarks.

INSPECTION OF BOILERS.

The work in this division has been carried on without cessation during the whole year; for the first two months under the provisions of the now repealed "Steam Boilers Act, 1897," and from the 1st March under the provisions of "The Inspection of Machinery Act, 1904," which, with a few important additions rendering it more workable, and several very necessary alterations, is practically a repetition of the repealed Act, as far as its application is concerned.

Inspections and new Registrations.—During the year there have been 176 new Registrations, which now total 3,060, as against 2,884 on the 31st December, 1904.

In order to show the types of boilers used, the following return (which is a record of interest) has been prepared.

Return No. I.

Return showing the Classification of the various Boilers registered in each District on 31st December, 1905.

Type of Boiler.	Districts.										
	South Western.	Coolgardie and Yilgarn.	Dundas.	East Coolgardie.	N.E. Coolgardie and Broad Arrow.	North Coolgardie.	Mount Margaret.	East Murchison.	Murchison, Peak Hill, and Yalgoo.	Pilbarra and West Pilbarra.	Total.
Lancashire	15	9	...	48	5	13	9	2	16	...	117
Cornish	87	98	20	180	52	79	91	48	115	...	770
Semi-Cornish	29	2	3	6	2	4	...	3	26	...	75
Vertical Stationary	321	70	15	91	42	68	61	34	74	...	776
Vertical Portable	68	6	...	2	...	1	...	...	8	...	85
Vertical Multi Stationary	30	3	...	4	1	9	8	1	5	...	61
Vertical Multi Portable	10	...	...	...	...	...	3	1	...	...	14
Vertical Patent Tubular	11	...	...	2	...	...	...	...	...	...	13
Loco Type Rectangular Fire-box Stationary	62	7	3	15	14	10	14	9	17	...	151
Loco Type Rectangular Fire-box Portable	266	15	4	13	9	8	8	7	11	...	341
Loco Type Circular Fire-box Portable	74	1	...	3	...	1	1	...	...	...	80
Locomotive	45	5	...	5	3	1	3	5	2	...	69
Water Tube	58	11	2	84	...	...	10	8	1	...	174
Return Multitubular Underfired Stationary	75	19	2	42	6	11	13	7	9	...	184
Return Multitubular Underfired Portable	4	6	...	4	2	...	...	...	3	...	19
Return Multitubular Internally Fired Stationary	52	3	...	4	...	...	1	...	7	...	67
Return Multitubular Internally Fired Portable	1	...	...	...	...	2	...	...	...	...	3
Egg End, and other Types not mentioned	14	7	...	5	3	...	2	...	1	19	51
Digesters	10	...	..	...	...	...	...	...	...	...	10
Total	1,232	263	49	507	139	207	224	125	295	19	3,060

Types of Boilers in Use.—A careful reference to the foregoing return will show that, if the Cornish type is disregarded, the boilers classed under "Vertical" represent a greater total than all the other types combined. Including all types, the number of vertical boilers registered is equivalent to 31 per cent. of the whole. Combining the Vertical and Cornish types, the sum is equal to 58 per cent. of total registrations.

Vertical Boilers.—It is worthy of note, however, that of the 949 classed as vertical boilers, no less than 440, or 46·3 per cent., are to be found in the metropolitan and coastal districts, where they are largely used in connection with small factories, woodyards, etc.

Cornish Boilers.—The next best type represented, and at one time the most favoured kind, is the "Cornish," which, if taken with the "Semi-Cornish" (commonly known as a "Jackass"), total 845, or 27·6 per cent. of total registrations.

Water-tube Boilers.—The type of boiler which is growing in the estimation of steam-users, owing to its economy and efficiency as a steam generator, is the "Water Tube." There has been an increase in the installations of this particular class, during the year, of 16·78 per cent., as against Cornish 2·80 per cent., and Vertical 6·39 per cent., and I anticipate a much greater increase in the future when the treating of indifferent feed-waters by chemical or other efficient means is more actively applied. Several different types of water tube boilers are now in use in this State, viz.:—"Babcock and Wilcox," "Heine," "Stirling," and "Hornsby," all of which, with the exception of the "Babcock and Wilcox" boiler, are of comparatively recent erection. The working and relative merits claimed by the manufacturers of this type of steam generator are being watched by engineers and others with considerable interest.

Boilers locally constructed.—It is gratifying to report that there has been no diminution in the number of boilers locally constructed, viz., 13 (10 Cornish, one multitubular underfired, one vertical, and one locomotive), as against 10 for the preceding 12 months. For the benefit of steam-users I would here point out that where specifications are submitted to this Department care is taken to see that all material used in boiler construction is of an approved and reliable brand; and, if desired, supervision during construction is arranged for in order to be assured that the workmanship is good. This action has not only the merit of adding to the public safety, but also secures to the steam-users a much more desirable and reliable boiler—that is to say, one which will not be continually giving trouble. Some of the local firms who make a speciality of this class of work have equipped themselves, at considerable cost, with appliances and modern machinery necessary for accuracy, speed, and economy; and I venture to say that the class of work turned out compares favourably in every respect with similiar types of boilers which in the past, for obvious reasons, have been imported from the Eastern States, Great Britain, America, and other parts. In view of the foregoing, and assuming that the initial cost compares favourably with the imported article landed in the State, it is surprising that these enterprising firms do not receive greater support, which would not only mean the employment of many more workmen, but a consequent benefit to the State in other directions.

Operations in each District.—As a means of easy and convenient reference, the work carried out in each of the several proclaimed districts has been suitably summarised in Return No. II. hereunder:—

RETURN No. II.

—	Districts.											
	South Western.	Coolgardie and Yilgarn.	Dundas.	East Coolgardie.	North-East Coolgardie.	Broad Arrow.	North Coolgardie.	Mount Margaret.	East Murchison.	Murchison, Peak Hill, and Yalgoo.	Pilbarra and West Pilbarra.	Totals.
Total number of Boilers...	1,232	263	49	507	86	53	206	225	125	295	* 19	3,060
Inspections for the Year { Thorough...	1,048	193	53	336	55	39	134	170	112	171	...	2,311
Inspections for the Year { Working ...	382	56	22	91	13	13	6	22	15	18	...	638
Boilers Condemned { Temporarily	50	1	...	5	...	2	7	9	5	5	...	84
Boilers Condemned { Permanently	6	...	...	...	...	...	1	...	2	1	...	10
Total number of Notices, issued for Repairs ...	479	44	11	110	28	16	60	68	18	14	...	848
Number of Inspectors ...	5 *a*	1 *b*		1			1		1		...	9
Number of Certificates issued...	896	245		425			294		267		...	2,127
Total amount of Fees brought to Revenue...	£ s. d. 2,452 4 0	£ s. d. 535 7 6		£ s. d. 1,029 12 6			£ s. d. 598 0 0		£ s. d. 567 15 0		...	£ s. d. 5,182 19 0

* District not yet proclaimed.

NOTE.—(*a*) One Inspector in the South-Western District did not commence duties until April 7th, 1905. (*b*) The inspection in the East Coolgardie, North-East Coolgardie, and Broad Arrow Districts was performed by one Inspector until arrangements were made whereby the assistance of the Inspector for the Coolgardie and Yilgarn District was obtained.

Working Inspections.—The total number of boilers inspected was 2,949, including 638 "Working Inspections," the majority of which have been carried out without previous notice having been given to the owners. These working inspections are considered highly important. They are made whilst the boilers are under steam, and are for the purpose of detecting possible tampering with safety-valves and subsequent increase over the pressure authorised. Two breaches of the Act in this particular were brought under notice during the year, and necessary action taken to punish and caution the offenders.

Thorough Inspections and Certificates granted—Of the 2,311 boilers thoroughly inspected, 2,127 were certificated, 10 were permanently condemned as being absolutely dangerous to life and property, and 84 temporarily condemned pending the carrying out of important repairs as detailed in Return III.

RETURN No. III.

Return of Boilers for which Certificates were refused pending Repairs.

No.	Type of Boiler.	Description of Repairs, etc.
4	Loco-Portable	All tubes to be drawn.
2	„ „	All tubes to be drawn and lagging removed.
1	„ „	Defective portion of fire-box back plate to be cut out and patched.
1	„ „	Mud-well to be removed; new rivets in smoke-box tube-plate and in bottom of barrel.
1	„ „	Smoke-box tube-plate to be straightened and new set of tubes to be put in.
1	„ „	Defective gusset stays to be renewed.
1	„ „	Bottom of barrel and fire-box casing to be patched; new crown stays and girders, tubes, and fire-box stays.
1	„ „	Defective fire-box space stays to be renewed.
1	Locomotive	New barrel; throat-plate, copper tube-plate, and crown stays renewed; new palm stays.
2	„	Tubes to be drawn and lagging removed.
1	„	Defective smoke-box tube-plate, barrel, and throat-plate to be renewed; several new stays required.
1	„	Defective smoke-box tube-plate to be renewed and defective rivets in fire-box to be replaced.
1	„	Defective plates in barrel to be renewed; new throat-plate and smoke-box tube-plate to be fitted.
1	„	Defective plate in barrel to be renewed; new copper tube-plate, new smoke-box tube-plate, new crown; palm and fire-box stays to be fitted.
1	„	New smoke-box tube-plate; new portion of throat-plate; sheathing plate in barrel to be fitted; defective rivets to renew.
1	„	New fire-box tube-plate to be fitted; fire-box shell to be patched.
1	„	Smoke-box tube-plate, fire-box tube-plate; portion of barrel to be renewed; new girder stays.
1	„	Bottom of barrel to be renewed; new copper tube-plate; foundation ring, space, crown, and longitudinal stays to be fitted.
1	„	Copper tube-plate to be straightened; two new palm-stays and new set of tubes to be fitted.

RETURN No. III.—*continued.*

Return of Boilers for which Certificates were refused pending Repairs—continued.

No.	Type of Boiler.	Description of Repairs, etc.
2	Locomotive	Bottom of barrel to be renewed; new copper-tube plate, and smoke-box tube-plate to be fitted.
1	,, ...	New smoke-box tube-plate, new palm stays, several now space stays, and fire-box to be fitted.
1	Return Multitubular ...	New furnace.
1	,, ,, ...	Bottom of shell to be renewed.
1	,, ,, ...	All tubes to be drawn.
4	,, ,, ...	Defective portion of bottom of shell to be cut out and patched.
1	,, ,, ...	Back and front end plates to be partially re-riveted, new set of tubes fitted, and new distance piece to mud-drum.
2	Marine	Defective portion of bottom of shell to be cut out and renewed.
1	,, ...	Defective tube-plate to be patched, and a new set of tubes fitted.
2	,, ...	Defective portion of combustion chamber to be cut out and patched.
1	Loco-Stationary ...	Defective plate around hand holes in front plate to be cut out and patched.
1	,, ,, ...	New fire-box tube-plate to be fitted.
1	,, ,, ...	New palm stays, new tubes, etc.
1	Lancashire	Galloway tubes to be renewed.
2	Vertical	Defective portion of shell to be cut out and patched; new uptake.
1	,, ...	Fire-box to be cut out and patched; new foundation ring, and shell to be patched.
5	,, ...	New uptake to be fitted.
2	,, ...	Fire-box to be repaired.
1	,, ...	Part of shell to be cut away and renewed.
4	Cornish	Defective plate in bottom of shell to be cut out, and boiler patched.
2	,, ...	New furnace and flue-tube required.
1	,, ...	Furnace and flue-tube to be restored to true form.
1	,, ...	Bottom of shell where bulged to be restored to true form, and seams riveted.
1	,, ...	Defective seams in shell to be re-riveted and caulked.
2	,, ...	Defective portion of front end plate to be cut out and patched.
2	,, ...	Defective portion of furnace to be cut out and patched.
1	,, ...	Galloway tubes to be re-riveted to flue-plate.
1	,, ...	Ring seams of flue to be re-riveted, and portion of flue patched.
1	,, ...	Front end plate and first section of furnace-tube to be renewed.
1	Water-tube	Two water-tube nipples to be renewed.

Boilers Temporarily and Permanently Condemned.—The relative percentages of temporarily and permanently condemned boilers, to the total inspections made, are slightly lower than last year, and is too small to warrant any special study of the probable cause being made. That these causes are a variable quantity is evidenced in the following Return, which is carefully compiled from year to year, on the same basis, in order that comparisons can be readily made:—

RETURN No. IV.

Year.	Temporarily Condemned.	Permanently Condemned.
1899	2·64 per cent.	1·42 per cent.
1900	5·21 ,,	·498 ,,
1901	4·35 ,,	·511 ,,
1902	5·00 ,,	·958 ,,
1903	2·43 ,,	·697 ,,
1904	3·08 ,,	·389 ,,
1905	2·84 ,,	·338 ,,

Repairs and Alterations.—A further reference to Return II. also shows that 848 repair "Notices" were served, *i.e.*, the requisite notice given to the owner, as required by the Act, that certain repairs (which must be specified) are needed before a certificate will be granted. Space alone debars a detailed list of these repairs, additions, and alterations being included in this Report. Such a list would certainly show to some extent the importance, the amount of time, and the variety of the labour involved in inspection work—a work that, by some, is perhaps undervalued on account of its not being understood.

Boilers used for Agricultural Purposes.—Cases of friction between owners of machinery and Inspectors are exceedingly rare. On the whole, the preparation for periodical examination and the carrying out of Inspectors' instructions have been very satisfactorily attended to. It is in the rural districts where the loco-portable type of boiler is almost exclusively used—numbering approximately 70 % of a total of 572 registered under that class—that complaint is occasionally heard. Through a combination of circumstances, this type of boiler is most difficult to deal with. Constant knocking about over rough country and bad roads, and in the majority of cases having unskilled attendants in charge, considerable damage, which seriously impairs the life of the plant, results. Moreover, with few exceptions, the boilers are unhoused, and in addition to being generally neglected are subjected to the influences of all kinds of weather. It can easily be imagined, under the circumstances mentioned, that internal and external deterioration is commonly met with, which is largely due to bad treatment.

But this is not the worst feature in connection with loco-portable boilers, as used for agricultural purposes. Although many and indifferent kinds of feed-waters heavily charged with scale-forming properties may have been used (and I am afraid sufficient attention is not given to this item by owners), the arrangement of the tubes renders it impossible to permit of more than a cursory examination of the interior of the boiler, without some of the tubes are withdrawn, to which the owners invariably demur unless some good reason is adduced for requiring this work to be done. To state that the course is necessary in order that the inside may be seen, so that probable defects may be brought to light, is to the owner occasionally an inconvincing reason, and it cannot be gainsaid that there is some logic on his side.

On the other hand, however, where the interior of a boiler cannot be thoroughly examined there must always remain an element of doubt in the mind of an Inspector when granting a certificate.

Withdrawal of Tubes from Multitubular Boilers.—The practice that has been adopted by the Department is to permit this class of boiler to run for a period of five to six years (which is the maximum allowed by the leading engine and boiler insurance companies of Great Britain) where invariably normal conditions obtain. But where bad feed-waters are used, and where care and maintenance are not satisfactory, or from other sufficient cause, permission will be given to Inspectors to require the opening up and stripping of these types of boilers for thorough internal and external inspection, when deemed necessary.

Maintenance and Care of Boilers.—From all other districts reports state that the maintenance of boilers and fittings is from fair to good, with the possible exception of safety-valves, which in a great many cases do not receive that attention required to keep them in free working order. In numerous instances this important agent of safety is not overhauled for 12 months, or from one annual inspection of boiler until the next, notwithstanding warnings and instructions given by the Inspectors, upon whom many steam-users appear to solely rely and wait for instructions. They do not appear to realise their own responsibility, if an accident due to the inaction of the safety valves were to take place.

Fees for Boiler Inspection.—The revenue brought to account representing fees for boiler inspections amounted to £4,325, as against £3,327 15s. for the preceding year, and shows an increase of £997 5s. for the twelve months. Owing to machinery inspections having been carried out in conjunction with boiler inspections, I have been unable to show expenditure separately for this division.

Explosions.—I am pleased at being able to again report that another year has passed without a boiler explosion, which, it is very fair to assume, in view of the reports from other places where there is not compulsory inspection, is in a great measure due to an enactment requiring periodical close inspection.

The recent reports of two terrible explosions in Victoria, whereby four persons were killed and several others seriously injured, besides damage to property, have formed the subject of much discussion and speculation as to why certain steam plants are exempted from inspection.

The Melbourne *Age* of January 16th last, in a leading article, tersely expresses the general sentiment:—

> "The farm hand and wood-cutter possess just as urgent rights to have their lives protected as the town artisan; and the legislature which repudiates its claims on the score of expense, or upon any grounds whatsoever, is short-sighted and unjust. The verdict of popular opinion will lay a large measure of blame for the two recent terrible accidents, which have widowed and orphaned so many luckless people, at the doors of the Parliament which in passing the Factories and Shops Act of 1896 exhibited so strangely partial an understanding of its responsibilities. It is open to extend the operation of that statute to the entire country and demonstrate that lives, irrespective of habitat, are equally dear to the State."

Queensland and South Australia both have fatalities and serious injury to report. In the South Australian explosion, pieces of the boiler and appurtenances were sent flying in all directions; one mass weighing 6cwt. was hurled 50 yards away, and another, 3cwt., was blown 150 yards away.

Mishaps.—Several minor misbaps, unattended with injury to any person, have been reported during the year in this State. In February an old return multitubular underfired boiler erected at Bellevue showed signs of fracture in one of the plates whilst under pressure, and which upon examination revealed a rent about 23in. long, circumferentially, in first plate from front end, and was caused through an accumulation of scale inside, permitting overheating.

Another boiler of the "Economic Multitubular" type, erected at Bunbury, was seriously damaged by having the crowns of the first two courses of furnace plates overheated, owing to the water being allowed to get too low, and consequently came down. Fortunately the rivetted seam of the two rings of furnace plates gave way, thereby making a vent and relieving the pressure. Had the material not been of first-class quality a serious explosion might have resulted.

Machinery Inspection.

Registration of Machinery.—The registration and inspection of machinery was entered upon on 1st March, and has been pushed on since as fast as possible with the staff at my disposal. The law requires that machinery shall be registered by the owners, but this work has usually to be done in a great number of cases on the initiative of the Inspectors of Machinery. The difficulty is not an unusual one as I note that identical remarks have been made in connection with similar measures in other parts of the Commonwealth.

Although it is expected to add considerably to the registrations, during the next year, I think very satisfactory work has been done in grouping and registering 1,549 plants, and inspecting 1,495 of this number, during the period of operations as shown in the following tabulated statement:—

RETURN No. V.

Return showing classification of Machinery, and operations, from 1st March to 31st December, 1905.

Districts.	South Western.	Coolgardie and Yilgarn.	Dundas.	East Coolgardie.	North-East Coolgardie.	Broad Arrow.	North Coolgardie.	Mount Margaret.	East Murchison.	Murchison, Peak Hill, and Yalgoo.	Total, all Districts.
Total number of Registrations ...	732	125	22	134	4	3	129	138	72	200	1,549
Total number Inspections made ...	816	125	22	49	5	5	129	138	38	98	1,495
Certificates issued bearing Fees ...	332	16	1	70	...	...	6	19	4	21	469
Certificates issued (Steam) without Fees	241	101	18	49	4	3	118	113	34	98	781
Fencing and Repair Notices issued ...	339	17	...	15	...	2	...	6	13	17	409
Electric Winding Engines (Mining shaft)	...	...	...	1	...	...	...	...	...	...	1
Electric Winches	10	...	...	...	...	...	...	...	...	...	10
Electric Lighting and Power Plants...	12	1	...	13	...	...	1	...	6	10	43
Electric Motor for all purposes ...	133	9	...	53	...	...	5	17	4	11	232
B.H.P. of Motor for all purposes ...	937·5	...	...	1,437	...	...	63	237	49·8	140·5	2,864·3
Electric Lifts for Passengers	20	...	...	...	...	...	...	...	...	...	30
Electric Lifts for Goods	13	...	...	..	...	...	...	...	...	...	13
Power Lift (*i.e.*, belt driven) for Passengers	...	...	...	...	...	...	...	...	...	...	...
Power Lift (*i.e.*, belt driven) for Goods	8	1	...	1	...	...	...	...	...	...	10
Refrigerating Plants	7	...	...	...	...	...	...	...	...	...	7
Oil Engines	127	6	1	...	...	...	2	4	...	15	155
Oil Engines, H.P. of	898·5	47	1·5	...	...	...	12·75	26	...	92·5	1,078·25
Gas Engines	23	...	...	...	...	...	...	...	...	...	23
Gas Engines, H.P. of	148·75	...	...	...	...	...	...	...	...	...	148·75
Hydraulic Lifts for Passengers ...	1	...	...	...	...	...	...	...	...	...	1
Hydraulic Lifts for Goods	19	...	...	...	...	...	...	...	...	...	19
Air Winches	1	1	...	6	...	...	...	...	...	...	8

This has been effected without boiler inspection having been neglected in any district excepting East Coolgardie, North-East Coolgardie and Broad Arrow, where it was found neccessary to hang up machinery inspection work in these districts since May last pending the appointment of an additional assistant. This difficulty has been got over during the early part of this year by transferring an Inspector from another district.

Dangerous Machinery.—As might be expected upon the initial application of a measure wherein certain obligations were thrown upon owners in regard to fencing and guarding of machinery, belts, etc., considered to be sources of danger to employees and others, numerous cases of defective and inefficient guarding were reported. In this connection a reference to Return V. indicates that it was found necessary to issue no less than 409 notices to owners, requiring moving and dangerous parts of machines to be provided with guards calculated to afford immunity from accident as far as practicable. Owners have generally conformed to Inspectors' suggestions, but the existence of a prejudice, not only on the part of some of the employers, but also of the employees, against any affixture that may interfere with rapidly manipulating the machine in the smallest degree, is sometimes difficult to overcome, and requires the exercise of much patience by the Inspectors.

Of course a certain amount of tacit opposition would be overcome by taking extreme steps where the Act is not complied with. I would recommend, however, that the experience of a full year's operations should be gained before any action is taken against owners for breaches in this respect.

The effect of legislation is manifested in the more modern types of machines, which are almost invariably constructed in compliance with the requirements of similar legislation in different parts of the World, and are consequently provided with necessary guards for the safety of attendants.

Machinery Certificates granted.—A total of 1,249 machinery certificates have been issued available for a period of 12 months providing no material alteration is effected during that period; but it is expected that the number will be almost doubled during the current year.

Fees for Machinery Inspection.—The revenue derived from the inspection of machinery amounted to £178, which is small compared to the cost of time involved in inspection. It is, however, expected that under ordinary circumstances machinery which has already been inspected and granted certificates will not again require the attention necessary at a first inspection, consequently costs will be less. It must, however, be remembered where material alteration, additions, and rearrangement of machinery takes place, the inspection work in connection therewith, whether previously registered or inspected prior to the change, is not materially reduced.

SURVEY OF HARBOUR AND RIVER VESSELS' MACHINERY.

With a view of consolidating legislation relating to machinery inspection, the survey of harbour and river steamers' boilers and machinery, oil launches, etc., previously carried out under "The Boat Licensing Act, 1878," was incorporated in "The Inspection of Machinery Act, 1904," and consequently was handed over to this department, which is now responsible for the work.

Harbour and River Boats' Machinery.—This important branch has been thoroughly attended to. Every steamer and oil launch (not exempted) plying on the rivers and in the harbours for the purpose of carrying goods or passengers for reward has had its boilers and machinery closely inspected. Many defects in connection with the boilers and working parts of the machinery were noted, and necessary action taken to have defects remedied. When vessels were put up on the slip at Fremantle every opportunity was taken to examine the tail shafts and other ordinarily submerged parts to see if they were in order before refloating.

Return No. VI.

Return of Surveys of Boilers and Machinery on Steamers, etc.

Name of Vessel.	Description of Machinery.	Means of Propulsion.	Motive Power.	Date of last Survey.	Nature of Defects, Instructions, etc.
				1905.	
"Florrie"	Single cylinders, condensing high-pressure ...	Screw ...	Steam ...	March 7th ...	Engine flywheel to be protected by rail; brake lever to be set to clear steam winch.
"Nerimba" ...	High-pressure non-condensing double cylinders ...	Paddle ...	Steam ...	March 20th	Additional water gauges to be fitted, working pressure reduced.
"Manx Fairy" ...	Two vertical compound surface condensing direct acting engines	Twin Screw	Steam ...	March 23rd	Boiler mountings and fittings to be overhauled. Boilers afterwards permanently condemned. The machinery, after very considerable repairs and overhauling, is now placed on the s.s. "Westralian."
"Helena"	Horizontal compound condensing	Paddle ...	Steam ...	March 24th	Additional spring loaded safety valve and water gauges fitted.
"Lady Ord" ...	Single cylinder non-condensing	Screw ...	Steam ...	March 14th	Doubling plate to be fitted to back tube plate, complete set of new tubes to be fitted.
"Vigilant" ...	Compound condensing	Screw ...	Steam ...	March 16th	Additional set of water gauges to be fitted; new plunger for main feed pump
"Kepler"	Double cylinder high-pressure condensing engines	Screw ...	Steam ...	March 15th	Defective portion of combustion chamber to be cut out and patched, two new stays required, and all furnace seams caulked.
"Duchess" ...	Compound surface condensing diagonal engines ...	Paddle ...	Steam ...	March 17th	Additional set of water gauges
"Torrens" ...	Compound surface condensing engines	Screw ...	Steam ...	December 9th	Blow-off pipe to be renewed, several rivets in furnace to be renewed, and seams of shell caulked, crown girder stay nuts to be tightened all boiler mountings to be overhauled. Protection ordered to portion of machinery.
"Countess" ...	Compound surface condensing diagonal engines ...	Paddle ...	Steam ...	March 21st	Additional sets of water guages. The position of air and circulating pumps to be altered.
"Sandow" ...	Double cylinder horizontal high-pressure non-condensing	Paddle ...	Steam ...	March 27th	Holding down bolts in frame to be tightened up.
"Brownie" ...	Tandem quadruple condensing engines	Screw ...	Steam ...	...	New condenser fitted, and the whole of the machinery thoroughly overhauled.
"Harley"	Compound condensing engines	Paddle ...	Steam ...	March 30th	Additional safety valve and water gauges to be fitted, several space stays in combustion chamber to be renewed.
"Avon"	Double cylinder high-pressure, non-condensing engines	Screw ...	Steam ...	May 11th ...	Sheet iron guards to be placed over pinion wheels.
"Taniwha" ...	Single cylinder non-condensing engines	Screw ...	Steam ...	May 11th ...	One longitudinal stay to be fitted; pipe fittings, feed check valves to be overhauled. Several seams to be caulked. Wash-out plug holes to be retapped.
"Kentish Lass" ...	Double cylinder non-condensing engine	Stern wheel	Steam ...	July 26th ...	Expansion joint in main steam pipe. Eccentric straps, main and crank bearings to be overhauled.
"Thistle"	Compound condensing engines	Screw ...	Steam ...	July 1st ...	Additional safety valve and set of water gauges to be fitted. Hole for safety valve in shell to be enlarged.
"Water Lily" ...	Machinery not inspected				
"Westralian" ...	Two vertical compound surface condensing direct acting engines	Twin screw...	Steam ...	November 29th	Machinery from s.s. "Manx Fairy" is placed in this vessel.
"Swan"	Internal combustion engine	Screw ...	Naphtha ...	April 3rd ...	
"Olga"	Internal combustion engine	Screw ...	Oil	March 31st ...	
"Valkyrie" ...	Internal combustion engine	Screw ...	Oil	March 24th...	
"Valhalla" ...	Internal combustion engine	Screw ...	Oil	July 25th ...	
"May Queen" ...	Internal combustion engine	Screw ...	Oil	April 4th ...	Reversing gear to be adjusted, and new pins fitted.
"Lilith"	Internal combustion engine	Screw ...	Oil	April 6th ...	
"Ophir"	Internal combustion engine	Screw ...	Naphtha ...	April 10th ...	
"Wilfred" ...	Internal combustion engine	Screw ...	Oil	May 29th ...	Portion of machinery to be fenced.
"Black Swan" ...	Single cylinder non-condensing engine 1 pr. diagonal engines, two hoisting engines	Screw ...	Steam ...	June 15th ...	Seven space stays at back end to be renewed, circular seams bottom of shell to be caulked. Tubes to be expanded. Guards and fencing necessary for machinery.

Repairs and Alterations.—For your information I am annexing hereto a Return showing steamers and launches dealt with, description of propelling machinery, and repairs and adjustments required (full particulars of which are given when writing to owners) before issuing Certificates. In every instance it is gratifying to report inspectors' instructions were carried out and every assistance was rendered by the steamship owners to expedite the duties involved by these surveys.

During the year an item of considerable interest to this State, inasmuch as it suggests unlimited possibilities in the ship-building line, was the construction of an entirely new steel hull for the river steamer "Manx Fairy" by a firm of local engineers, etc. The work was carried out in Perth expeditiously and well. Although the tonnage was not great in this instance, probably not exceeding 120 tons gross, it is sufficient evidence that there is local skill available should there be sufficient inducement offered to establish such an industry as ship building. The boat which has been re-named the "Westralian" since reconstruction, is now running and proving satisfactory in every respect.

Engine-drivers' Examination.

The first work taken in hand on the proclamation of the present Act was the collection from the various District offices, classification, and filing of records dating back to 1895, pertaining to the operations of nineteen district Boards of Examiners appointed under "The Mines Regulation Act, 1895," and "The Coal Mines Regulation Act, 1902." Approximately some 6,000 applications, together with other papers relating thereto, have been carefully indexed and filed for easy reference. These and all similar records will be entirely kept in the Perth office in future.

Board of Examiners.—As forecasted in my last Annual Report, a Central Board of Examiners, consisting of two Departmental engineers, a representative of the Engine-drivers' Associations, and a secretary, has now been appointed.

The Board sitting in Perth now arranges and directs all the engine-drivers' examinations for the different centres as required.

Engine-drivers' Regulations.—Immediately the Board was appointed (11th May), the task of revising the previously prepared draft regulations for the conduct of examinations and granting of certificates was entered upon, and, on the 7th of June, a comprehensive set, which has been much appreciated by engine-drivers and steam users, was available for issue.

Examinations.—Examination papers are also prepared by the Board in Perth, and despatched to supervisors, consisting of the Inspector of Machinery and the Inspector of Mines for the Coal and Goldfields Districts; and, for the South-Western District, the Inspectors of Machinery at the centres where the examinations are held.

At the conclusion of written examination, for which three hours are allowed, the supervisors conduct a *viva voce* examination of each candidate, according to the class of certificate applied for. A report of this *viva voce* examination, together with answers to questions set in paper, and which are sealed by the candidates and not sighted by the supervisors, is immediately sent to the Board of Examiners, Perth, for consideration. All applications for examination are received in Perth, and are scrutinised by the Board, whose approval of an applicant's qualifications for admission to examination must be given before a candidate can sit.

Examinations under this system were held in Perth, Bunbury, Coolgardie, Kalgoorlie, Menzies, Malcolm, and Cue on 3rd October last, when a total of 87 candidates were examined for Competency Certificates, and proved highly satisfactory; securing as it does a degree of uniformity, combined with efficiency and economy, that was not possible under the previously obtaining methods.

The extension, to factories and other works using steam power, of legislation which previously only applied to engine-drivers employed on mining plants, naturally resulted in the Board being deluged with applications for Service Certificates. From the date of first meeting (12th June) to 31st December, 627 applications were before the Board for consideration, and the issue of 379 Service Certificates of various classes was approved.

Interchange of Certificates.—The question that has engaged the serious attention of the Board is that of issuing certificates *ad eundum gradum* to engine-drivers presenting certificates from the other States and New Zealand. Having regard to the various methods and standards of examination adopted by the different States of the Commonwealth—which present many difficulties that must always exist until some system of uniformity has been arrived at—the Board has temporarily fixed the relative values of certificates issued in some of the Eastern States as compared with the certificates granted in this State.

A conference of representatives of the various States is highly essential, in order that some uniform method of dealing with Engine-drivers' Examinations, issuing of Certificates, Inquiries, Regulations, etc., on a uniform basis, applicable to the whole or the Commonwealth, might be arrived at. This has been briefly referred to in some of my previous Annual Reports. A good deal could be expected of such a conference, if it were decided upon, and at which only the questions of fixing an uniform standard of testing engine-drivers' knowledge, by a comparison of methods, interchange of certificates, and generally the controlling of engine-drivers' certificates on lines to be debated and mutually agreed upon, could be satisfactorily settled.

Inquiries.—Three inquiries have been held concerning the conduct of certain engine-drivers whilst on duty. The first on 17th August, was a case of overwinding at the main shaft at the Princess Royal Central G.M., Norseman, the driver being a first-class certificated man. This case is worthy of some comment, as it is connected with one of the most marvellous escapes from serious accident that has come under my notice. Five men had prepared for firing in the shaft at a depth of 940 feet and were waiting for the firing material. A bucket containing the materials, which included a drill and "guns," or cleaners, was temporarily halted at the surface in order to check the oscillation before the descent of the shaft was made. The engine-driver, during the temporary stoppage, must have reversed his engine, for at the signal "to lower" being given, away went the bucket to the poppet-heads, where it struck with sufficient force to part the bucket from the hook. The released bucket fell plumb for the shaft with ever increasing momentum, but by some miracle the drill and cleaners were jerked from their upright position and thrown across the top of the bucket under the handle. Being longer than the brace door-way, they held the bucket safely suspended. Had the bucket gone down, the firing material must have exploded

and would have in all probability blown the five men to atoms. The driver was under suspension for five months, and was, in addition, required to contribute an amount of £6 6s. towards the expenses incurred in conducting the inquiry.

Another mishap, which was fortunately unattended with fatal result, was that forming the subject of an inquiry into the conduct of a first-class certificated engine-driver, and occurred at the Paringa Consolidated G.M., Limited, on the 14th April. The driver was required to answer charges of misconduct and carelessness. In the evidence adduced it was shown that he was in charge of a winding-engine, whereby a lead-covered cable was being raised from the 1,300-feet level to the surface. The cable was attached to the North winding-rope by rope lashings at intervals of about 20 feet. The North winding-drum, which was out of gear so as to permit the South cage to be worked in connection with the securing of the cable, was held by the brake, assisted by two clamps on the rope—one at the surface and one at 20 feet from the surface on bearers. Whilst heaving the South cage, with a man on, from the 800-feet level to a higher one, the engine-driver noticed the North drum (which was still out of gear) revolving; he stopped his engine, applied the break to the South drum, put a little steam against the engine to assist the brake, and then left the engine-house "to get out of danger." A human life had rather a miraculous escape in this instance also; for immediately the engine-driver ceased to exercise control the South drum commenced to travel, and had the little steam which prevented the cage from gaining any momentum not been turned against the engine, the man must have been smashed to pieces instead of escaping with a slight shock, seeing that the cage ran no less a distance than 700 feet, merely throwing the occupant out on the plat. The Board found, after considering the evidence and the extraordinary conduct and demeanour of the engine-driver in leaving the engine-room, and whose only interests appeared to be for his own safety, that he was guilty of misconduct; and it was decided to suspend his First-class Certificate of Service for a period of two (2) years from date of accident, and to reduce him to the position of a Second-class driver during that period, in addition to paying costs of the inquiry.

On the 13th December a Second-class Certificated Engine-driver was summoned before a Board of Inquiry at Bunbury to answer a charge of negligence on the 21st October last, in that he allowed the water to get too low in an "Economic" Multitubular Boiler of which he was in charge, and narrowly avoided a serious accident. This man was found guilty and was reduced from a Second to a Third-class driver for a period of two (2) years from the date of the accident, and ordered to pay an amount of £4 4s. towards the cost of conducting inquiry.

The Board of Examiners held 44 meetings from the 24th May to end of year, and issued 459 certificates, as mentioned in hereunder Return No. VII.

RETURN No. VII.

Return showing Total Number of Certificates Granted (all classes.)

1st Class Competency	4
2nd Class Competency	5
3rd Class Competency	34
1st Class Service	5
2nd Class Service	127
3rd Class Service	163
Locomotive and Traction Competency	3
Locomotive and Traction Service	53
Traction Driver's Competency	*Nil*
Traction Driver's Service	11
Marine Driver's Competency	2
Marine (without examination)	20
Interim Certificates	19
Copies of lost and destroyed Certificates	13
Total Certificates granted	459

Fees from Examinations and Certificates.—The revenue derived from examination and certificate fees from 1st July last was £621, which leaves a substantial balance over expenditure incurred in conduct of examinations. Fees received from this source for the half year ending 30th June last are not included in the above total as they were brought to account as Mining Revenue. It should be understood that the revenue from this source is abnormal for this year.

ACCIDENTS IN CONNECTION WITH BOILERS AND MACHINERY.

This responsible section of the work, against the increase of which all efforts are being directed, has claimed a good portion of the inspector's attention during the ten months the Act has been in operation, and the duty of inquiring into boiler and machinery accidents has been cast on this Department. Return No. VIII. appended shows there have been four fatal, and 72 non-fatal and minor accidents. In the absence of any previous reliable record of accidents due to machinery to which the Act applies, I am unable to advise you whether the return furnished hereunder shows abnormal results or otherwise.

Judging from the cause and nature of the majority of the accidents, I am inclined to the belief that the list is an average one under conditions existing prior to compulsory inspection of machinery.

Fatal Accidents.—Two of the three fatal accidents recorded against the South-Western District occurred in connection with the saw-milling industry. The accident resulting in the death of J. E. Gates, at Millars' Karri & Jarrah Co.'s Mill, Perth, was caused by the timber jambing and getting carried back over saw. The man received a severe blow in the abdomen, causing peritonitis and death.

The second fatality occurred at the Royal Agricultural Show Grounds, and was the result of G. Emblen being caught in the fly-wheel of an oil engine which he was engaged in starting.

R. Roberts, a lad, and not an employee of the company, was injured at Messrs. Millars' Karri and Jarrah Co.'s saw mill, Yarloop, through having his clothing caught on a revolving shaft. He was badly crushed, and died from injuries received.

Non-fatal Accidents—Carelessness of Employees.—Of the 72 non-fatal accidents reported and inquired into, the causes are various. A close scrutiny of the causes as registered in this office (and which I would recommend for publication as an object-lesson to owners and operators of machinery) reveals the fact that, with several exceptions, which have received due attention, in a great number of instances the exercise of caution and care on behalf of the injured person might have obviated the mishap. But experience has proved a great many times over by as many calamitous circumstances that even as powerful a motive as self-preservation is unable to overcome the carelessness engendered by familiarity with occasions of peril and facile avoidance of fatality.

The exceptions which I have referred to are:—

(*a.*) Circular saw accidents;

(*b.*) Lift accidents, and

(*c.*) The manipulating of belts whilst machinery is in motion.

Circular Saws.—Concerning (*a.*), the effective guarding of saws used for cutting all sorts and sizes of timber opens a very debatable question. To authorise a guard being fitted over top of saw to prevent timber being overcarried would be both difficult and costly; and I must say that I shirk the responsibility of ordering protection where such would seriously interfere with the work in hand. I feel sure that in time a better system of protection will in some cases be possible, whilst in others, such as in the case of "twin" saws, would be utterly impossible; but to rigidly enforce, at short notice, owners of machinery accustomed to work unprotected so long, would be unnecessarily courting friction, which is not desirable. In the meantime I am collecting data and information concerning this matter from Great Britain and elsewhere.

Lifts.—(*b.*) Regarding goods and passenger lifts, I cannot do better than quote from an inspector's report:—

> "In many cases I found passenger lifts running with almost every door-catch broken or useless; with safety cams (in case of broken ropes) quite inoperative, and some of which never could have operated since the first; with ropes running absolutely dry and rusty; with defective electrical switches, and the stops on pull ropes hopelessly out of adjustment, and with these ropes simply 'fleeted' around the wheel to which they should be securely attached. With defective wiring, defective adjustment of slack rope devices, and with all sorts of other defects too numerous to mention. In one case a new lift was found so utterly defective in very many ways that I had to issue a notice forbidding its use until material alterations had been made.
>
> "I am convinced, if this Act had no other justification, it has been necessary, and has done good work in the protection of life, in the case of lifts alone."

Comment on these facts would be superfluous. As long as such owners will not recognise their liabilities and the risks involved, accidents will still happen. In many cases it is entirely due to ignorance. It is not sufficient to say that this or that particular device has been examined and passed by an inspector of machinery. Owners must be brought to acknowledge that active co-operation is imperative in order to insure machinery being kept in the same state of efficiency, protection, etc., as found on the occasion of inspection.

Belts.—(*c.*) Belting accidents will always happen, although by judicious manipulation many accidents can be avoided.

Quoting from the depositions taken at an inquiry held in Kalgoorlie recently, the injured man made the following statement:—

> "It would be absurd to stop the machinery (shafting running 175 revolutions per minute) to put a belt 6 inches x 30 feet long on, and I would put the same belt on again," *i.e.*, under the same conditions.

This statement is a correct reflex of the ideas that pervade the minds of men who have become accustomed to work amongst belt-driven machinery, and it is exactly this familiarity referred to earlier in this report that is directly responsible for mishaps.

From the foregoing and similar statements it will be observed how difficult it is to prevent accidents under such conditions. I desire also to supplement the remarks made herein as to the necessity of individual carefulness on behalf of the employees, by stating, at the same time that they apply to their full extent to employers as well. The evidence in the case quoted above revealed the fact that the risk was taken (and would be taken again) simply on account of a stoppage of the machinery being discountenanced by the persons in charge who desire that it shall run every moment of time possible.

Without any desire to reflect on their management generally, it is fitting to here remind managers, officers, and others into whose hands this report may fall, that it is sought, in dealing with these individual cases, to demonstrate the lessons which they should teach for future guidance, for it must be acknowledged that the collective experience of the whole State must afford information, which no single "works" or even district can offer; and the mistakes of one district may suggest useful hints as regards precautionary measures which do not exist, or are not practised in another. It is therefore to be hoped that those employers, in whose hands for the time being the care of lives and limbs happen to be, will exercise all their powers of prevision and provision to guard against accident. Intelligent care in the selection of men for dangerous or responsible positions, alertness at all points on the part of the owners and persons

in charge of any particular work; the encouragement of education; intelligence; and sobriety in the ordinary workmen, will go far to obliterate from the records of future years many kinds of accidents which are now far too common.

A number of quite minor occurrences have been reported and investigated, but which really do not merit more than passing notice. Section 50 of the Act specifies that "serious bodily injury" means an injury which is likely to incapacitate the sufferer from work for at least forty-eight hours. In this particular I am of opinion it is desirable in the near future to amend the Section to read "Fourteen days" in lieu of the forty-eight hours. My reasons for considering this alteration advisable, are that numerous accidents are reported to this Department not sufficiently serious to demand inquiry. These accidents are reported in order to escape certain liabilities imposed by the Act. For example, a workman receiving an ordinary flesh wound or other slight injury to his hands whilst at his bench, will invariably cease work for two or three days in order to avoid dirt or other foreign substance getting into the wound and causing more serious injury. To take up inspectors' time looking up these individuals, and the attendant work in connection therewith, is at times a serious matter, whilst its usefulness is problematical.

RETURN No. VIII.

District.	Nature of Accident.		Description of Machinery responsible for Accident.
	Fatal.	Non-fatal.	
South-Western ...	3	...	Saw-milling (2), Oil Engine (1)
Do. ...	...	10	Saw-milling (4), Lift (2), Planing and Joining (3), Brickmaking (1)
Coolgardie	1	...	Battery (1)
Do.	...	3	Mining (2), Battery (1)
East Coolgardie ...	...	49	Mining (9), Battery and Roasting (25), Belts (9), Circular Saw (3), Lathes (3)
Mount Margaret ...	...	4	Pumping (1), Battery (3)
Murchison	...	4	Battery (2), Belts (2)
East Murchison ...	...	2	Battery (2)
Total ...	4	72	

GENERAL REMARKS.

Before concluding this report I desire to express my satisfaction with the result of the year, which has been an extremely busy one, both for the inspectors and the office staff. To carry out the 4,440 inspections (machinery and boilers) an approximate distance of 41,967 miles (23,887 rail, 17,580 road, and 500 steamer) has been covered—an average of 9·45 miles per inspection.

The results should be considered satisfactory, when the conditions under which they have been obtained are carefully looked into, *e.g.*, the several long stages to be got over in the Murchison, East Murchison, and Mt. Margaret Goldfields by means of horse and trap; the inclusion of Esperance in the South-Western District, which now extends from Northampton on the West Coast to Esperance on the South Coast—a distance of over 900 miles, are facts that militate against a better return of work being shown.

The Head Office staff, too, which has been increased by one temporary clerk only to assist in dealing with the large amount of additional work already referred to, has worked well. Many hours outside of regulation office hours have been put in with exemplary devotion and self-denial, in order to obviate an accumulation of arrears. The issue of all engine-drivers' certificates and the centralising of clerical work pertaining to conduct of examinations has in a great measure been responsible for overtime being necessary. After the first eighteen months or two years the pressure should be somewhat relieved, and normal conditions obtain. The Head Office correspondence (including 374 telegrams) reached a total of 8,867 communications, or an average of 28·32 per day including holidays. This is exclusive of minutes on Departmental files.

Some changes have been made in the disposition of the Staff during the year. One additional inspector and one temporary clerk have been appointed, otherwise it is the same as formerly.

In March, during the year under review, Inspector Latimer, formerly of Mt. Margaret and North Coolgardie districts, was transferred to Kalgoorlie to take charge of the East Coolgardie, North-East Coolgardie, and Broad Arrow districts, and Inspector Lovegrove, of Coolgardie, was removed to Mt. Margaret and North Coolgardie. Mr. Gill was selected, after examination, in accordance with Section 6 of the Act, to fill the vacancy at Coolgardie, but was subsequently transferred to Perth to take up duties in the South-Western district, the Coolgardie district being temporarily placed in the charge of Assistant Inspector Lee of Kalgoorlie, pending the appointment of an additional inspector.

I desire to record my thanks to the Police Department for the assistance rendered in prosecutions for breaches under the Act, and in other directions; also to the Postal and Crown Law Departments for co-operation of officers in connection with the handing of engine drivers' certificates granted by the Board of Examiners to applicants in outside centres.

I have, etc.,
C. J. MATHEWS,
Chief Inspector of Machinery and
Chairman Board of Examiners.

13th March, 1906.

DIVISION VIII.

Tenth Annual Report of the Chief Inspector of Explosives and Government Analyst, for the Year 1905.

The Secretary for Mines, Perth.

SIR, 31st December, 1905.

I have the honour to submit, for the information of the Hon. Minister for Mines, my tenth Annual Report dealing with the work done in my Department during the year ending 31st December, 1905, in accordance with Section 45 of "The Explosives Act, 1895."

This year I propose dealing in this report almost entirely with my duties as Inspector of Explosives; the Analytical Branch of my work will be fully described in a special bulletin now in course of preparation, in which it can be more adequately dealt with.

The Explosives Act and Regulations have worked without any serious hitch during the year, and only one alteration has been found necessary in the By-laws under the Act. This was in April last, when a Regulation was issued dealing with the question of the storage of detonators in retail stores. It had become necessary to allow retail dealers, especially in mining centres, to stock these explosives in addition to the ordinary blasting compounds, and this Regulation was designed to give the storekeepers a little more latitude than they had hitherto possessed. On my recommendation also, a regulation has been made under the Mines Regulation Act, to come into force on the 1st March, 1906, prescribing limits for the burning rate of safety fuses to be employed in mining.

This Regulation was needed from the fact that considerable irregularity had begun to display itself in the burning rate of fuses imported into this State, and some particularly slow fuse was, apparently connected with a fatal accident which occurred at Kalgoorlie. I, therefore, consider that such a restriction as proposed, *i.e.*, that a fuse should take not less than 80 nor more than 100 seconds per yard to burn, was quite justified for the sake of the safety of miners.

On account of the increase of the private magazine lease system and the increased responsibility which this system brings to the Department, I think it will be desirable in the near future to entirely remodel the Explosives Act so as to include matters connected with administration as well as those matters of a more purely technical nature with which the Act now deals. This matter has been under my consideration for some time but could not receive attention owing to heavy pressure of other duties, but I hope to be able to compile such an Act for your consideration during the coming year.

I also hope during the year to be able to conduct a further series of experiments on the gases formed in explosions, in continuation of the work done in connection with the Royal Commission on the Ventilation and Sanitation of Mines, in 1904. That work has attracted considerable attention and been widely discussed, and there are several matters brought out during this discussion which require investigating. Special apparatus is now on its way from England to enable tests to be carried out with a greater degree of accuracy than was hitherto possible. I think investigations of this sort are becomingly undertaken by a Government department, as the facts disclosed may be of the highest importance to the health and safety of the working miners all over the world.

IMPORTATION.

The importation of explosives into this State is still great, but shows a falling off during 1905 as compared with 1904. I am glad to say that, through the courtesy of the Commonwealth Customs Department, I am this year able to present more reliable and detailed figures than was possible last year.

The following table gives the details of explosives imported:—

Kind of Explosive.	Quantity.	Value.
		£
Blasting Gelatine	522,500 lbs.	32,797
Dynamite	14,000 lbs.	616
Gelatine Dynamite	240,000 lbs.	14,046
Gelignite	2,384,600 lbs.	111,013
Explosives (N.E.I.)	...	2,501
Explosives for the Army, etc.	...	140
Fuse	633,876 coils	14,762
Powder, Blasting	240,400 lbs.	5,026
Powder, Sporting	1,025 lbs.	97
		£180,998

The values of Importations, as declared on the Customs Returns during the last five years, have been as follows:—

Total Values of Importations for Five Years.

Year.	1901.	1902.	1903.	1904.	1905.
Nitro-Glycerine Compounds	123,367	157,100	152,071	160,817	158,472
Blasting Powder	5,344	5,577	5,113	3,352	5,026
Sporting Powder	283	224	601	652	97
Fuse	11,687	13,439	10,433	15,653	14,762
Rackarock	...	115	...	...	...
Fireworks	150	341	...	245	...
Cartridges	5,973	8,593	...	14,781	...
Detonators	4,704	4,358	5,967	4,043	...
N.E.I.	779	...	4,651	22	2,641
	152,287	189,747	178,836	199,565	180,998

I am glad to be able to present this year particulars of the nitro-glycerine compounds. This table is of some importance to manufacturing firms as indicating the proportion of various explosives used in this market and the probable tendencies for the future.

KINDS AND QUANTITIES OF NITRO-GLYCERINE COMPOUNDS IMPORTED IN 1905.

Gelignite	2,384,600 lbs.
Blasting Gelatine	522,500 „
Gelatine Dynamite	240,000 „
Dynamite	14,000 „

It will be seen that gelignite still retains a pre-eminent position, but that blasting gelatine has made considerable strides, and is now second on the list. Owing to the difficulty of obtaining full returns immediately after the close of the year, I am unable this year to show a comparison of the importations into this State with those of the Eastern States of the Commonwealth.

In connection with these importations the following number of tests have been carried out in my laboratory, in addition to which large numbers of samples have been handled and examined as to physical condition during the course of inspections.

EXPLOSIVES TESTED DURING YEAR 1905.

	No. of Samples.
Gelignite	1,064
Gelatine Dynamite	154
Blasting Gelatine	241
Dynamite	22
Blasting Powder	1
Cheddite	2
Military Cartridges	13
Detonators	50
Fuse	198
Sundry Analyses and Tests of Materials	75
Total	1,820

There are six Importation Licenses in force at the close of the year.

STORAGE.

The big depôt at Fremantle has worked admirably during the year, and on all sides the highest appreciation has been expressed at the facilities there afforded, and the consequent rapidity of despatch and cheapness of handling in connection with shipments of explosives.

One new magazine (30 tons capacity) has been erected on the Reserve during the year, but in view of the slight shrinkage of importations and the general quietness existing in the mining industry, I do not think that any more expansion will take place just at present.

The lightning conductors on all buildings on this Reserve have been tested during the year by the Government Electrician, who has certified that they were in good order and afforded efficient protection for the buildings. This inspection should be made annually, and I will endeavour to have this done.

In the absence of the Government Electrician the Electrical Engineer for the Railway Department was asked to similarly examine and report on the lightning conductors at Kalgoorlie and Coolgardie, but I regret to say that this examination did not reveal as satisfactory a state of affairs as at Fremantle. The great difficulty experienced in obtaining an efficient "earth" appears to be almost insuperable, and the electrical experts are apparently in some perplexity as to what is the best course to pursue to protect

these magazines from lightning. The matter will be again submitted to the Government Electrician on his return from England, and is one which requires most earnest investigation. The provision of efficient lightning conductors is of course a duty, the onus of which rests entirely upon the proprietors of the magazines, but if there are grave technical difficulties in the way, it is only fair that the advice of the Government experts should be at the disposal of the merchants.

The Government Electrician has frequently expressed to me the opinion that it would be very difficult to get proper protection for these buildings. If this is impossible the urgent necessity at once arises for special precautions to be taken with regard to their distances from each other and from population, for if no adequate protection against lightning can be afforded, the explosion of a magazine by these means becomes at once a possibility far from remote, and this greatly increases the anxiety and responsibility of the care of these buildings.

The Kalgoorlie Reserve has during the year been rendered more fully equipped by the erection of Magazine Caretaker's quarters, and I think that the depôt at present is in many respects in excellent order, but difficulty has been experienced once or twice during the year through unauthorised trespass on the Reserve, on one occasion by a lad who broke through the fence for the purpose of shooting rabbits. Unfortunately the trespasser could not be caught, but additional measures are being taken to ensure prompt police assistance if future occasion arises.

The Coolgardie and Menzies Reserves have both been removed during the year to more satisfactory positions, and the former has been enclosed with a high galvanised iron fence. These depôts are now in much more satisfactory condition than hitherto, and when the Menzies Magazines have also been fenced, I think the four main depôts of the State will have been placed in as good order as present circumstances will allow.

The size of the stocks at Coolgardie does not at present warrant the appointment of a special caretaker, but keys of the gates of the enclosure are held by each merchant occupying a site on the Reserve, and the remoteness of the depôt and the general circumstances of the trade in this district lead me think no further precautions are at present necessary.

I am glad to be able to state that the year has been entirely free from any serious accidents in connection with the storage of explosives, such as I had to report last year.

There are at present 69 buildings erected on Explosives' Reserves, including Government buildings, but exclusive of detonator buildings; an increase of two during the year. These buildings represent a total capacity of 1,223 tons.

Outside of Reserves, 22 licenses have been granted for magazines (five of which are magazines on Government works) having a capacity of 42 tons. This is an increase of four on the previous year.

Three application have been received for Magazine Licenses, and are still awaiting settlement.

There are now 38 reserves for explosives in various parts of the State, with a total area of 2,797 acres.

The leases of all magazines on Government reserves have now been got in order and will be issued from my office early in the New Year.

This matter, which has given a great deal of trouble for some years past, will then be put on a proper basis.

The inspections which have been made of magazines throughout the State show that on the whole they are kept in very fair condition, the principal tendency being for licensees to store in excess of the quantities allowed by their licenses.

Two or three prosecutions have taken place for this offence, and in future will be instituted without further notice.

Licensed Premises (Sale).

The condition of these premises is revealed by the work of the Travelling Inspector, and leaves considerable room for improvement, but the laxity displayed by licensees is apparently largely due to not understanding the provisions of the regulations and the reasons for their enactment. By instruction and explanation the Travelling Inspector has done much to improve the condition of affairs.

As a result of this officer's work also, a large increase in the number of licenses has taken place, as I anticipated in my last report, and as shown by the following table of applications during the last five years:—

Store Licenses.

Year.	Applications received.	Licenses issued.	Licenses revoked.	Licenses Remaining in force.
1901	18	17	10	107
1902	31	32	14	125
1903	30	30	28	127
1904	7	7	31	103
1905	82	82	21	164

Carriage.

The question of carriage of explosives, especially in the neighbourhood of the goldfields centres, has been dealt with during the year, and, although it has not been settled in such a complete manner as I could wish, I think a distinct advance has been made. Owing to the scarcity of roads which are passable in winter, outside of the more or less populated centres of Kalgoorlie and Boulder, it is necessary that the traffic should pass closer to the towns than is altogether desirable, but definite routes have been laid down for this traffic, and it is entirely conducted under permits issued by me in accordance with the regulations. The traffic has thus been completely removed from the main thoroughfare and from principal sources of danger. One carrier was prosecuted and fined for disregarding the regulations in this respect, and this example has had a salutary effect.

The conditions of transport of explosives on the North-West Coast are still far from good. Freights for small quantities are difficult to procure and very costly, and I am afraid that the law is disregarded in some instances by the explosives being shipped as ordinary merchandise.

Inspection.

The greatest improvement in the work of my Department which has taken place this year has been under this heading, in consequence of the appointment of Mr. A. J. Guest, as Travelling Inspector, and I cannot speak too highly of the excellent work performed by this officer during the year. In addition to the actual work of inspection his duties have included the issue of licenses and permits, and the sampling and testing of shipments of explosives whenever his presence in Perth has rendered this possible. During his journeys of inspection he has carried with him a complete set of apparatus for testing explosives, and in this way has been able to keep a valuable check on the quality of the stocks in distant magazines. During the year Mr. Guest has made the following inspections :—

Magazines	152
Store Premises	206
Total	358

and has visited the following centres, in some cases more than once :—

Kalgoorlie, Coolgardie, Cue, Day Dawn, Mt. Magnet, Yalgoo, Black Range, Geraldton, Albany, Esperance, Norseman, Menzies, Kookynie, Malcolm, Leonora, Morgans, Laverton, and Lawlers. In addition to this a large number of inspections have been made of magazines at the Fremantle depôt, and of licensed premises in Perth, Fremantle, and surrounding districts.

Five prosecutions have been instituted as a result of Mr. Guest's inspections, of which particulars are given in an attached appendix. Several other cases might have been brought before the Court, but in the first round of his visits it was thought advisable to exhibit a certain amount of leniency which, however, will not be repeated if breaches of the Act are discovered during his subsequent visits.

I think that this record of work performed by the Travelling Inspector is an excellent one, especially when the long distances which have to be traversed are taken into account, and his work has also resulted in considerable increase of the revenue. It must moreover be remembered that Mr. Guest, being Senior Officer on my staff, takes charge of my office during my absence from office at any time, and has performed a considerable amount of office work during the year, so that the whole of his time has not by any means been fully occupied by purely inspection work. This appointment has therefore, I think, been amply justified by results.

The following is a list of explosives destroyed during the year in the course of inspections :—

Date.	Locality.	Kind and Quality.	Remarks.
3-5-1905 ...	Kalgoorlie	Gelignite, 234 cases ...	Condemned owing to low heat test.
6-9-1905 ...	Woodman's Point, Fremantle	Dynamite, 1 case (50lbs.)	Stored in Government Magazine, Unclaimed
6-9-1905 ...	Do.	1 case Sporting Powder	Do. do. do.
17-10-1905 ...	Do.	1 case Detonators, 10,000	Do. do. do.

Owing to a number of accidents having occurred in the Eastern States with ·303 cordite ammunition of Colonial manufacture, which has been traced to the faulty bulleting of the cartridges, the Commissioner of Police in November requested me to examine a supply of this ammunition which had been imported for the use of his officers. Accordingly, 28,000 rounds of this ammunition was carefully tested, according to directions issued by the Commonwealth Defence Department, and found to be in correct order.

ANALYTICAL.

As this part of my work has little or no connection with the general work of the Mines Department, its detailed description is out of place in this Report, and, as I have already stated, a special bulletin is in preparation describing the technical work carried out during 1905.

The following, however, is a numerical summary of the work performed:—

Explosives	1,820
Agricultural Department	124
Central Board of Health	12
Crown Law Department	66
Public Works and Railway Department	672
Stock Department	3
Customs (for Commonwealth)	1,346
Inspection of Liquors	173
Miscellaneous	130
Total	4,346

This represents an increase of 817 on the previous year.

Staff and Finances.

The staff in my laboratory at present consists of the following officers:—

Travelling Inspector	1
Clerks	3
Analysts	8
Magazines	2
Watchmen	3
Total	17

In addition to the above are six honorary Sub-Inspectors of Explosives in country districts, who exercise a general oversight over matters connected with this Department, in addition to their duties as officers of other departments.

The revenue and expenditure for this and the previous year have been as follows:—

—	1904.	1905.
	£	£
Revenue	4,866	4,004
Expenditure	3,178	4,617
Excess of Revenue over Expenditure	1,688	613

I have to again acknowledge the valuable assistance rendered to me from time to time by the Commissioner of Police and his officers, also by the Inspector of Mines.

I wish also to record the fidelity, energy, and interest displayed by the officers of my staff throughout the year.

I have, etc.,

E. A. MANN,

Chief Inspector of Explosives and Government Analyst.

APPENDIX.

Record of Prosecutions for Breaches of the Explosives Act and Regulations.

Date.	Licensee.	Offence.	Penalty.			
2-3-05	Elder, Shenton, & Co. ...	Overstocking Magazine at Woodman's Point	Fine ...	£5	0	0
			Costs ...	1	3	0
				£6	3	0
2-3-05	Strelitz Bros.	Overstocking Magazine at Woodman's Point	Fine ...	£5	0	0
			Costs ...	1	3	0
				£6	3	0
6-5-05	C. F. J. Hall	Carrying Explosives through Coolgardie Municipality without a permit	Fine ...	£0	10	0
			Costs ...	1	3	0
				£1	13	0
23-6-05	The Bairds Co., Boulder City	Overstocking Explosives on premises at Boulder City	Fine ...	£3	0	0
			Costs ...	2	4	0
				£5	4	0
13-7-05	Wm. Padbury	Storing Explosives on unlicensed premises	Fine ...	£2	5	10
			Costs ...	0	4	0
				£2	9	10

MINING STATISTICS

TO 31st DECEMBER, 1905.

TABLE OF CONTENTS.

PAGE

SUMMARY OF MINERAL PRODUCTS 165

AUSTRALASIAN MINERAL PRODUCTION 166

PART I.—GOLD.

TABLE I.—1905—Monthly Production of Gold, in Fine Ounces, showing the Quantity reported to the Mines Department and the Sterling Value thereof 167

TABLE II.—Total Production of Gold, in Fine Ounces, as reported to the Mines Department to the 31st December, 1905 168

TABLE III.—Return showing, for the respective Goldfields and Districts, the Area in square miles, Leases in force, particulars of Plant, Men employed, 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 1905 170

TABLE IV.—Production of Gold from all sources, showing the amount of Ore treated, with Gold and Silver Yield, in Fine Ounces, as reported to the Mines Department during 1904 and 1905, and the Total Production to date (*see* Note) 172

TABLE V.—Milling and Cyaniding Plants erected in the respective Goldfields and Districts on the 31st December, 1905 173

TABLE VI.—Return of Gold Bullion received at the Perth Branch of the Royal Mint from May, 1899, to the 31st December, 1905, showing, in Gross Ounces, the Quantity obtained from the respective Goldfields and other Countries, and the Actual Value thereof 182

TABLE VII.—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, 1905, showing, in Fine Ounces, the Quantity obtained each Year from the respective Goldfields, and the Total Annual Value 183

TABLE VIII.—Comparative Return of Gold Bullion entered for Export and received at the Perth Branch of the Royal Mint from 1st January, 1903, to the 31st December, 1905, showing, in Fine Ounces, the Quantity recorded each Month, and its Value 185

TABLE IX.—Monthly Returns of Gold Bullion and Gold Ores entered for Export during 1905 ... 186

PART II.—MINERALS OTHER THAN GOLD.

PAGE

TABLE X.—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 1905 and previous years 187

TABLE XI.—Quantity and Value of BLACK TIN reported to the Mines Department during 1905, and the Total Output to date 188

TABLE XII.—Quantity and Value of TANTALITE reported to the Mines Department during 1905, and the Total Output to date 188

TABLE XIII.—Quantity and Value of COPPER ORE reported to the Mines Department during 1905, and the Total Output to date 189

TABLE XIV.—Quantity and Value of IRONSTONE reported to the Mines Department during 1905, and the Total Output to date 190

TABLE XV.—Quantity and Value of LEAD ORE reported to the Mines Department during 1905, and the Total Output to date 190

TABLE XVI.—Quantity and Value of SILVER-LEAD ORE reported to the Mines Department during 1905, and the Total Output to date 190

TABLE XVII.—Quantity and Value of COAL reported to the Mines Department during 1905, and the Total Output to date 191

TABLE XVIII.—Quantity and Value of LIMESTONE reported to the Mines Department during 1905, and the Total Output to date 191

TABLE XIX.—Quantity and Value of DIAMONDS reported to the Mines Department during 1905, and the Total Output to date 191

TABLE XX.—Return of Ore and Minerals, other than Gold, entered for Export from 1850-1905, inclusive, showing the Quantity obtained from certain Goldfields and Mineral Fields, and the declared Value thereof 192

PART III.—ALL MINES.

TABLE XXI.—Quantity and estimated Value of Mining Machinery erected on the 31st December, 1905 196

APPENDIX.

Royal Mint (Perth Branch)—Notices 200

SUMMARY OF MINERAL PRODUCTS.

GOLD and OTHER MINERALS produced during 1905, and the estimated Value thereof, together with a comparison for previous years, and the Total Production to date.

Description of Mineral.	1905.		1904.		1903.		1902.		1901.		Previous to 1901.		Total to date.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
		£		£		£		£		£		£		£
Antimony ... ... (Exported) statute tons	...	...	...	...	22	230	...	...	...	...	...	...	22	230
Gold (Exported and [1]†Minted) fine ounces	**1,955,316**	**8,305,654**	1,983,230	8,424,226	2,064,801	8,770,719	1,871,037	7,947,662	1,703,417	7,235,653	5,293,886	22,486,997	14,871,687	63,170,911
Black Tin ... ... (Raised) statute tons	**1,079**	**86,840**	855	58,817	817	55,890	620	39,783	734	40,000	2,824	152,499	6,929	433,829
Tantalite ... ... (Raised) do	**73**	**10,515**	...	...	...	...	...	...	...	...	...	...	73	10,515
Copper Ore ... ... (Raised) do	**2,389**	**16,266**	3,969	25,180	20,527	56,541	2,262	8,090	9,960	69,900	16,165	134,881	55,272	310,858
Ironstone ... ... (Raised) do	**3,213**	**1,285**	1,441	577	220	88	4,800	2,040	20,569	13,246	25,203	18,497	55,446	35,733
Lead — Ore ... ... (Exported) do	...	...	...	...	...	...	...	...	...	...	33,644	364,756	33,644	364,756
Lead — Silver-Lead Ore (Raised) do	...	...	...	...	...	...	36	277	21	152	...	...	57	429
Lead — Pig ... ... (Exported) do	**2,730**	**34,471**	5,352	63,170	...	...	...	...	...	...	684	13,306	8,766	110,947
Silver ... ... (Exported) fine ounces	**359,744**	**44,278**	399,190	45,912	168,113	19,153	83,293	9,190	60,869	7,609	28,749	3,594	1,099,958	129,736
Asbestos ... ... (Exported) statute tons	...	...	...	...	[4]†	10	...	...	...	...	[2]†	1	...	11
Coal ... ... (Raised) do	**127,364**	**55,312**	138,550	67,174	133,427	69,128	140,884	86,188	117,836	68,561	176,254	82,547	834,315	428,910
Cobalt Ore ... (Exported) do	...	...	...	...	...	...	2	41	...	...	...	...	2	41
Limestone ... (Raised) do	**9,145**	**1,220**	13,397	1,699	1,280	178	5,080	1,340	18,210	4,348	33,520	6,432	80,632	15,217
Mica ... ... (Exported) do	....	...	...	...	...	...	...	...	...	...	[2]†	294	...	294
Plumbago Ore ... (Exported) do	...	...	[5]†	2	...	...	1	6	...	...	...	...	1	8
Precious Stones (Exported) carats	...	...	...	...	...	...	...	...	...	...	[3]†	24	...	24
Total Values	...	**£8,555,841**	...	£8,686,757	...	£8,971,937	...	£8,094,617	...	7,439,469	...	23,263,828	...	65,012,449

[1]† Since May, 1899. [2]† Weight not stated. [3]† 25 Small diamonds raised, weight not stated. [4]† 4cwts. [5]† 1cwt.

AUSTRALASIAN MINERAL PRODUCTION.

COMPARATIVE TABLE showing the Output of all Mineral Products from the several States of Australia and the Colony of New Zealand during 1904.

Description of Mineral.	Western Australia.		New South Wales.		Queensland.		Victoria.		Tasmania.		¶South Australia.		New Zealand.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
		£		£		£		£		£		£		£
Gold ... ... fine ounces	1,955,316	8,305,654	274,267	1,165,013	592,620	2,517,295	*747,166	*3,173,744	73,541	312,380	*20,393	*86,621	492,954	2,093,936
Copper ... ... statute tons	...	...	8,258	511,754	7,221	503,547	...	...	[5]†9,761	757,226	[6]†211,740	408,647	...	...
Copper Ore ... ... do	2,389	16,266	...	...	...	...	...	...	...	...	408	6,906	4	17
Lead (Pig, etc.) ... do	2,730	34,471	211	2,657	2,422	33,212	...	...	...	...	...	...	...	...
Manganese ... ... do	...	...	...	...	1,517	5,925	...	...	...	...	...	...	55	166
Platinum ... ... fine ounces	...	...	398	825	...	...	...	...	...	...	...	...	...	...
Silver ... ... do	359,744	44,278	417,520	52,196	601,712	69,176	32,600	4,100	...	...	14,455	1,626	1,179,903	120,549
Silver Ore, etc. ... statute tons	...	...	441,447	2,441,856	...	...	...	...	...	...	...	...	...	...
Silver-Lead, Ore, etc. do	...	...	...	...	...	...	...	...	75,271	246,888	149	1,484	...	...
Tin ... ... do	...	...	1,519	173,806	3,945	297,454	...	...	3,892	362,670	288	21,972	...	...
Black Tin ... ... do	1,079	86,840	...	...	...	...	...	...	...	...	...	...	...	...
Tin Ore ... ... do	...	...	...	...	...	...	124	11,159	...	...	...	...	...	...
Tantalite ... ... do	73	10,515	...	...	...	...	...	...	...	...	...	...	...	...
Wolfram ... ... do	...	...	87	7,361	1,409	99,873	...	...	32	2,371	63	3,379	...	...
Zinc Spelter ... ... do	...	...	103,533	221,155	...	...	...	...	...	...	...	...	...	...
Antimony ... ... do	...	...	[1]†388	5,221	24	174	[4]†25	352	...	...	...	...	...	...
Bismuth ... ... do	..	...	55	20,763	15	5,368	...	...	4	800	...	...	...	...
Alunite ... ... do	...	...	2,702	6,750	...	...	...	...	...	...	...	...	...	...
Coal ... ... do	127,364	55,312	6,632,138	2,003,461	529,326	155,477	155,185	79,060	51,993	44,194	...	...	1,585,756	792,878
Coke ... ... do	...	...	162,961	100,306	...	...	...	...	...	...	...	...	...	...
Shale (Oil) ... ... do	...	...	38,226	21,247	...	...	...	...	...	...	...	...	...	...
Cobalt Ore ... ... do	...	...	...	...	...	...	...	...	...	...	...	...	...	..
Gypsum ... ... do	...	...	...	...	...	...	974	330	...	...	4,401	994	...	...
Iron ... ... do	...	...	4,447	85,693	...	...	...	...	...	...	...	...	...	...
Iron Oxide ... ... do	...	...	542	417	...	...	...	...	...	...	...	...	...	...
Ironstone ... ... do	3,213	1,285	6,801	4,525	4,342	3,600	...	...	6,300	2,600	84,483	§	...	...
Lime ... ... do	...	...	18,018	15,019	...	...	...	...	...	...	...	...	...	...
Limestone ... ... do	9,145	1,220	14,941	9,519	25,057	15,863	§	§	...	...	44,498	4,791	...	...
Molybdenite ... ... do	...	...	19	2,507	63	8,496	...	...	...	...	...	...	...	...
Plumbago Ore ... ... do	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Precious Stones ... carats	...	...	6,354	3,745	...	[3]†8,255	...	...	...	...	...	...	...	...
			[2]†	59,000										
Unenumerated ... do	...	...	...	103·144	...	2,560	148	237	...	...	43	383	632	8,139
Total Values	...	8,555,841	...	7,017,940	...	3,726,275	...	3,268,982	...	1,729,129	...	536,803	...	3,015,685

* Revised. ¶ Including Northern Territory. [1]† Ore and Metal. [2]† Opal. [3]† Includes Opal, valued at £3,000. [4]† Antimony Ore. [5]† Includes Blister Copper, 8,610 tons, valued at £704,287. [6]† Includes 158 tons Matte, valued at £8,474. § Particulars not obtainable.

PART I.—GOLD

TABLE I.

1905.

Monthly Production of Gold, in Fine Ounces, showing the Quantity reported to the Mines Department, and the Sterling Value thereof.

Goldfield.	District.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
		ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.
Kimberley	...	8·71	8·71	10·45	13·07	...	19·16	..	401·20	...	...	...	34·84	**496·14**
Pilbarra	Marble Bar	79·35	827·13	308·93	284·47	223·69	688·19	373·42	335·29	549·32	156·31	202·35	505·80	**4,534·25**
Do.	Nullagine...	285·71	311·59	223·67	279·74	1,556·00	524·29	1,385·92	388·21	692·68	399·22	481·84	410·71	**6,939·58**
West Pilbarra	...	31·41	...	245·42	162·04	...	...	53·84	33·97	1·68	128·93	42·14	101·71	**801·14**
Ashburton	...	29·38	27·12	30·51	18·83	...	...	19·77	12·71	11·77	24·48	16·48	16·48	**207·53**
Gascoyne	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peak Hill	...	1,061·06	1,272·75	1,285·38	1,379·68	1,319·83	1,188·50	1,182·76	1,148·90	1,070·02	898·91	1,177·46	601·62	**13,586·87**
East Murchison ...	Lawlers ...	4,211·31	5,636·51	7,545·15	5,781·89	6,575·32	6,510·14	5,226·87	5,683·28	6,025·97	4,684·74	5,774·37	4,576·97	**68,232·52**
Do.	Black Range	925·57	678·88	857·29	939·72	1,818·48	1,054·07	1,564·25	1,422·78	2,109·23	1,851·29	1,888·71	1,583·49	**16,693·76**
Murchison	Cue ...	748·17	548·84	1,063·59	1,037·77	806·37	880·14	1,697·34	807·74	2,358·98	946·42	2,234·59	1,995·10	**15,125·05**
Do.	Nannine ...	1,502·76	1,234·97	1,128·49	757·02	1,872·22	1,799·12	734·65	2,067·62	1,599·23	858·82	2,530·95	2,463·32	**18,549·17**
Do.	Day Dawn	13,739·94	13,982·18	13,963·34	13,890·08	13,740·88	13,936·17	13,792·49	13,706·38	13,753·59	12,583·58	12,566·02	11,852·63	**161,507·28**
Do.	Mt. Magnet	1,161·01	499·10	1,657·62	968·05	797·64	657·06	644·68	998·20	975·30	1,180·76	625·06	1,388·90	**11,553·38**
Yalgoo	...	196·16	257·76	721·51	122·98	303·79	670·81	...	787·30	530·07	464·97	286·22	401·20	**4,742·77**
Mt. Margaret	Mt. Morgans	1,332·38	1,840·34	1,205·04	1,002·95	1,326·39	1,824·51	1,748·09	2,587·09	4,774·34	2,617·03	3,653·61	1,965·56	**25,877·33**
Do.	Mt. Malcolm	8,181·68	8,472·25	9,575·09	8,770·39	8,798·01	10,528·57	10,139·69	7,781·27	8,797·96	7,403·64	8,090·76	9,358·14	**105,897·45**
Do.	Mt. Margaret	4,019·61	3,455·52	3,763·05	4,706·48	4,773·73	5,201·91	5,355·13	4,472·42	5,399·24	3,488·22	3,623·24	8,678·88	**56,937·43**
North Coolgardie ...	Menzies ...	2,701·18	2,723·94	3,158·70	4,197·60	2,921·08	3,751·14	4,391·20	3,652·12	3,603·76	3,348·69	3,102·95	4,342·97	**41,895·33**
Do.	Ularring ...	2,259·57	4,351·26	3,527·24	3,800·97	4,061·27	3,928·84	4,479·83	2,715·16	2,760·06	4,548·02	3,694·10	3,260·75	**43,387·07**
Do.	Niagara ...	3,823·29	3,380·21	4,172·62	4,561·94	4,055·59	4,552·07	4,196·92	3,856·85	3,296·19	2,841·56	3,089·35	3,693·58	**45,520·17**
Do.	Yerilla ...	1,570·52	1,465·29	1,711·15	1,721·74	1,393·16	734·95	2,123·96	1,185·81	2,454·55	1,218·69	1,449·21	939·40	**17,968·43**
Broad Arrow	...	1,143·03	1,483·30	1,825·91	1,129·95	1,618·84	1,520·54	1,612·94	2,098·49	1,327·21	1,417·72	1,768·47	1,637·26	**18,583·66**
North-East Coolgardie	Kanowna ...	3,203·23	3,121·03	3,845·35	3,044·29	3,421·48	3,540·77	3,182·11	3,526·18	3,948·32	4,125·62	3,545·30	3,837·98	**42,341·66**
Do.	Bulong ...	686·30	869·24	727·40	359·48	504·01	1,301·38	641·81	514·12	622·75	795·99	1,498·57	1,251·83	**9,772·88**
Do.	Kurnalpi ...	70·51	27·80	30·58	17·13	23·95	111·38	19·42	13·37	122·16	298·24	19·68	78·50	**832·72**
East Coolgardie ...	...	79,908·64	78,956·95	82,726·80	80,957·21	79,524·50	81,282·43	84,724·36	84,841·42	85,047·25	86,426·25	84,761·59	88,035·62	**997,193·02**
Coolgardie	Coolgardie	5,016·32	4,955·15	5,308·01	4,700·97	3,957·15	3,520·80	4,825·52	4,285·86	4,681·73	4,662·39	4,708·18	3,876·96	**54,499·04**
Do.	Kunanalling	769·11	261·98	1,456·72	773·17	753·80	1,054·93	487·58	638·07	1,048·06	369·80	724·50	827·51	**9,165·23**
Yilgarn	...	279·83	2,070·47	1,245·09	1,283·61	2,093·78	2,203·20	1,712·91	1,451·26	1,760·39	1,623·19	1,343·85	2,223·84	**19,291·42**
Dundas	...	2,155·38	2,140·00	2,515·18	2,460·59	2,643·52	2,502·11	2,688·16	2,310·86	1,800·89	1,645·37	1,300·59	1,798·30	**25,960·95**
Phillips River	...	106·04	120·51	407·94	206·19	239·80	336·64	99·14	234·85	358·58	277·58	87·05	88·94	**2,563·26**
Donnybrook	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Goldfields generally	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	**141,207·16**	**144,980·78**	**156,243·22**	**149,330·00**	**151,124·28**	**155,823·82**	**159,104·76**	**153,958·78**	**161,481·28**	**151,286·43**	**154,287·19**	**161,828·79**	**1,840,656·49**

TABLE II.

YEARLY GOLD PRODUCTION.

Total Production of Gold, in Fine Ounces, as reported to the Mines Department, to 31st December, 1905.

Goldfield.	District.	1905.		1904.		1903.		1902.		1901.		1900.	
		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 ...	... ...	...	496·14	...	205·84	...	644·54	...	301·71	...	262·25	...	504·21
Pilbarra	Marble Bar ...	4,534·25	11,473·83	3,129·37	8,029·65	4,787·33	9,570·04	4,501·02	10,602·12	3,636·77	9,072·45	10,168·33	14,507·02
Do.	Nullagine ...	6,939·58		4,900·28		4,782·71		6,101·10		5,435·68		4,338·69	
West Pilbarra ...	... ...	...	801·14	...	3,427·71	...	5,100·48	...	1,910·42	...	198·73	...	779·48
Ashburton... ...	... ...	...	207·53	...	509·96	...	903·94	...	926·66	...	938·04	...	1,493·56
Gascoyne	... ...	...	...	...	...	...	...	...	...	...	85·10	...	64·86
Peak Hill	... ...	...	13,586·87	...	14,113·57	...	31,750·17	...	35,297·81	...	18,607·23	...	25,175·67
East Murchison ...	Lawlers ...	68,232·52	84,926·28	82,404·53	93,590·92	86,565·13	87,278·05	76,134·74	76,326·88	65,533·58	65,547·42	56,440·60	56,532·25
Do.	Black Range ...	16,693·76		11,186·39		712·92		192·14		13·84		91·65	
Murchison... ...	Cue	15,125·05	206,734·88	15,286·71	214,403·13	20,688·78	204,181·85	21,016·82	172,914·32	18,755·54	123,865·85	18,383·98	93,833·87
Do.	Nannine ...	18,549·17		18,668·31		19,947·48		19,329·49		17,690·99		25,913·18	
Do.	Day Dawn ...	161,507·28		161,163·51		136,768·68		102,030·80		57,867·95		12,413·87	
Do.	Mt. Magnet ...	11,553·38		19,284·60		26,776·91		30,537·21		29,551·37		37,122·84	
Yalgoo	... ...	...	4,742·77	...	2,353·41	...	3,138·35	...	5,198·89	...	8,351·30	...	8,794·00
Mt. Margaret ...	Mt. Morgans ...	25,877·33	188,712·21	45,230·33	183,523·25	59,517·40	182,763·92	51,092·42	186,818·98	41,607·09	165,243·01	31,819·52	126,855·11
Do.	Mt. Malcolm ...	105,897·45		94,300·27		83,529·04		78,171·96		84,278·40		77,235·19	
Do.	Mt. Margaret ...	56,937·43		43,992·65		39,717·48		57,554·60		39,357·52		17,800·40	
North Coolgardie...	Menzies ...	41,895·33	148,771.00	37,100·73	145,064·61	52,870·58	162,139·18	50,168·26	154,238·37	51,568·02	121,974·00	47,103·26	91,388·29
Do.	Ularring ...	43,387·07		21,769·41		19,142·55		25,766·96		17,821·18		11,641·47	
Do.	Niagara ...	45,520·17		67,230·33		77,013·02		69,877·50		42,146·08		25,013·63	
Do.	Yerilla	17,968·43		18,964·14		13,113·03		8,425·65		10,438·72		7,629·93	
Broad Arrow ...	... ...	...	18,583·66	...	22,180·19	...	26,021·17	...	17,092·95	...	29,885·18	...	43,438·91
N.E. Coolgardie ...	Kanowna ...	42,341·66	52,947·26	38,648·56	50,955·01	40,554·03	54,459·08	39,497·86	57,627·45	35,318·30	55,583·21	38,127·32	58,484·12
Do.	Bulong	9,772·88		11,155·38		13,180·06		16,849·50		17,445·04		17,129·11	
Do.	Kurnalpi ...	832·72		1,151·07		724·99		1,280·09		2,819·87		3,227·69	
East Coolgardie ...	... ...	...	997,193·02	...	1,050,922·89	...	1,062,898·06	...	941,436·40	...	856,748·86	...	657,863·87
Coolgardie ...	Coolgardie ...	54,499·04	63,664·27	53,505·01	63,199·76	58,692·50	71,285·59	65,002·37	74,502·96	59,973·11	73,083·48	70,702·09	90,009·59
Do.	Kunanalling ...	9,165·23		9,694·75		12,593·09		9,500·59		13,110·37		19,307·50	
Yilgarn	... ...	...	19,291·42	...	25,508·64	...	19,276·71	...	20,066·81	...	21,925·95	...	24,353·94
Dundas	... ...	...	25,960·95	...	31,830·27	...	33,845·76	...	28,579·34	...	29,843·03	...	34,036·83
Phillips River ...	... ...	...	2,563·26	...	4,016·63	...	7,050·73	...	7,441·30	...	665·83	...	36·72
Donnybrook ...	... ...	...	...	...	...	...	53·21	...	61·36	...	3·54	...	339·95
Goldfields generally		...	...	...	...	...	...	...	...	...	108·93	...	128·46
TOTAL Fine Ounces ...		...	1,840,656·49	...	1,913,835·44	...	1,962,330·83	...	1,791,344·73	...	1,581,993·39	...	1,328,620·71
TOTAL Sterling Value		**£7,818,612**		**£8,129,456**		**£8,335,579**		**£7,609,149**		**£6,719,881**		**£5,643,622**	

TOTAL PRODUCTION OF GOLD, ETC.—*continued.*

GOLDFIELD.	DISTRICT.	1899.		1898.		1897.		Previous to 1897.		Total to 31st December, 1905.	
		District.	Goldfield.	District.	Goldfield.	District.	Goldfield.	District.	Goldfield.	District.	Goldfield.
		ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.
Kimberley	...	...	804·06	...	402·44	...	209·32	...	11,686·66	...	15,517·17
Pilbarra	Marble Bar	11,856·46	17,357·03	9,339·65	12,746·05	4,804·81	5,615·46	21,207·61	22,478·47	77,965·60	121,452·12
Do.	Nullagine	5,500·57		3,406·40		810·65		1,270·86		43,486·52	
West Pilbarra	...	...	1,689·63	...	296·37	...	753·47	...	301·10	...	15,258·53
Ashburton	...	...	1,572·00	...	474·35	...	277·03	...	...	...	7,303·07
Gascoyne	...	...	330·63	...	12·29	...	12·39	...	...	...	505·27
Peak Hill	...	...	30,582·24	...	14,319·60	...	10,372·18	...	10,554·30	...	204,359·64
East Murchison	Lawlers	39,558·51	39,620·88	31,896·53	31,909·95	19,063·44	19,063·44	2,327·16	2,327·16	528,156·74	557,123·23
Do.	Black Range	62·37		13·42		...		...		28,966·49	
Murchison	Cue	21,869·47	71,209·25	22,037·29	70,306·71	20,527·54	55,692·73	20,827·00	125,186·63	194,518·18	1,338,329·22
Do.	Nannine	16,301·86		19,344·18		8,928·19		18,154·20		182,827·05	
Do.	Day Dawn	11,331·86		12,249·64		15,168·26		53,143·53		723,645·38	
Do.	Mt. Magnet	21,706·06		16,675·60		11,068·74		33,061·90		237,338·61	
Yalgoo	...	...	10,572·38	...	2,938·03	...	3,121·21	...	6,301·58	...	55,511·92
Mt. Margaret	Mt. Morgans	14,652·97	70,254·54	8,641·76	42,121·24	3,376·34	19,123·93	294·06	4,448·39	282,109·22	1,169,864·58
Do.	Mt. Malcolm	46,399·13		29,638·28		15,051·71		3,887·01		618,388·44	
Do.	Mt. Margaret	9,202·44		3,841·20		695·88		267·32		269,366·92	
North Coolgardie	Menzies	58,536·52	100,631·51	46,758·96	62,692·53	48,457·33	51,544·41	18,479·79	23,011·16	452,938·78	1,061,455·06
Do.	Ularring	10,199·16		3,709·08		608·25		57·21		154,102·34	
Do.	Niagara	22,703·15		8,112·48		504·03		189·13		358,309·52	
Do.	Yerilla	9,192·68		4,112·01		1,974·80		4,285·03		96,104·42	
Broad Arrow	...	...	40,615·81	...	25,005·93	...	12,541·93	...	8,333·96	...	243,699·69
N.E. Coolgardie	Kanowna	63,881·85	94,744·72	136,717·64	152,690·22	27,514·76	36,542·47	7,460·24	8,058·48	470,062·22	622,092·02
Do.	Bulong	27,367·87		14,191·28		8,692·91		509·13		136,293·16	
Do.	Kurnalpi	3,495·00		1,781·30		334·80		89·11		15,736·64	
East Coolgardie	...	...	799,464·46	...	400,457·41	...	284,297·70	...	137,975·92	...	7,189,258·59
Coolgardie	Coolgardie	89,081·78	110,359·36	68,722·90	89,613·88	40,420·91	57,196·18	60,781·58	67,138·88	621,381·29	760,053·95
Do.	Kunanalling	21,277·58		20,890·98		16,775·27		6,357·30		138,672·66	
Yilgarn	...	...	14,151·16	...	10,094·40	...	14,200·73	...	75,645·28	...	244,515·04
Dundas	...	...	37,839·28	...	32,469·59	...	17,115·64	...	3,663·25	...	275,183·94
Phillips River	...	...	...	...	...	...	...	...	...	...	21,774·47
Donnybrook	...	...	370·27	...	13·43	...	...	...	...	...	841·76
Goldfields generally	...	...	1,151·91	...	...	...	...	...	...	...	1,389·30
TOTAL — Fine Ounces	...	...	1,443,321·12	...	948,564·42	...	587,680·22	...	507,111·22	...	13,905,488·57
TOTAL — Sterling Value	...	£6,130,838		£4,029,246		£2,496,307		£2,154,071		£59,066,761	

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, 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 1905.

Goldfield.	District.	Warden's Office.	Date of Proclamation of Goldfield.				Area in Square Miles.		Leases in Force.		Particulars of Plant.				Average Number of Men employed.	
			Proclamation gazetted.	To take effect from	Latest Amendment of Boundaries gazetted.	To take effect from	Goldfield.	District.	No.	Area in Acres.	Milling.		Cyaniding.		Above Ground.	Under Ground.
											Stamps.	Other Mills.	Leaching and Agitating Vats.	Filter Presses.		
Kimberley	...	Hall's Creek	20-5-86	20-5-86	31-10-02	1-11-02	33,000	...	2	13	50	1	...	...	1	2
Pilbarra	Marble Bar / Nullagine	Marble Bar	1-10-88	1-10-88	20-9-95	1-11-95	34,880	25,205 / 9,675	22 / 30	267 / 322	55 / 40	2 / ...	24 / 11	... / ...	59 / 29	30 / 74
West Pilbarra	...	Roebourne	20-9-95	1-11-95	...	...	9,480	...	6	102	20	1	...	...	5	7
Ashburton	...	Onslow	11-12-90	11-12-90	18-10-01	14-10-01	14,252	...	1	12	...	...	...	...	...	...
Gascoyne	...	Carnarvon	25-6-97	15-4-97	...	...	5,061	...	4	54	...	...	...	...	...	...
Peak Hill	...	Peak Hill	19-3-97	1-4-97	...	...	12,194	...	47	492	50	5	12	9	103	74
East Murchison	Lawlers / Black Range	Lawlers	28-6-95	28-6-95	28-3-02	2-4-02	25,420	20,000 / 5,420	155 / 118	2,144 / 1,486	250 / 26	10 / 2	82 / 18	4 / ...	407 / 184	443 / 124
Murchison	Cue / Nannine / Day Dawn / Mt. Magnet	Cue	24-9-91	24-9-91	8-2-95	23-1-95	20,513	7,981 / 7,716 / 728 / 4,088	110 / 119 / 98 / 66	1,152 / 1,291 / 1,035 / 532	110 / 159 / 160 / 115	1 / 1 / ... / 2	38 / 44 / 43 / 35	... / ... / 6 / ...	158 / 90 / 365 / 101	151 / 99 / 379 / 82
Yalgoo	...	Yalgoo	8-2-95	23-1-95	...	..	18,921	...	32	344	75	1	15	...	53	62
Mt. Margaret	Mt. Morgans / Mt. Malcolm / Mt. Margaret	Mt. Morgans	12-3-97	1-4-97	28-3-02	2-4-02	44,976	1,637 / 3,544 / 39,795	74 / 144 / 172	1,152 / 2,467 / 2,676	146 / 255 / 182	2 / 2 / 5	76 / 93 / 71	3 / 2 / 2	168 / 465 / 404	187 / 564 / 417
North Coolgardie	Menzies / Ularring / Niagara / Yerilla	Menzies	28-6-95	28-6-95	12-3-97	1-4-97	30,609	10,342 / 5,182 / 779 / 14,306	106 / 83 / 88 / 86	1,335 / 1,016 / 1,090 / 1,366	155 / 80 / 130 / 60	2 / 1 / 1 / 2	60 / 45 / 58 / 52	4 / 2 / 3 / ...	283 / 145 / 245 / 162	319 / 282 / 309 / 208
Broad Arrow	...	Broad Arrow	17-11-96	20-11-96	...	...	590	..	76	943	175	3	58	...	99	161
North-East Coolgardie	Kanowna / Bulong / Kurnalpi	Kanowna	20-3-96	15-4-96	13-11-96	20-11-96	21,542	1,099 / 991 / 19,452	89 / 64 / 11	1,151 / 944 / 198	196 / 40 / 5	10 / 3 / 1	69 / 6 / ...	2 / ... / ...	240 / 52 / 16	405 / 91 / 10
East Coolgardie	...	Kalgoorlie	21-9-94	1-10-94	20-3-96	15-4-96	632	...	258	3,708	655	121	378	122	2,902	3,354
Coolgardie	Coolgardie / Kunanalling	Coolgardie	6-4-94	6-4-94	20-3-96	15-4-96	11,974	9,221 / 2,753	173 / 55	2,273 / 679	319 / 135	... / 3	143 / 41	2 / 1	414 / 104	643 / 144
Yilgarn	...	Southern Cross	1-10-88	1-10-88	20-3-96	15-4-96	15,593	...	61	924	185	3	97	...	158	159
Dundas	...	Norseman	31-8-93	31-8-93	22-8-02	1-9-02	11,500	...	84	956	120	4	59	3	176	259
Phillips River	...	Ravensthorpe	21-9-00	14-9-00	22-8-02	1-9-02	3,850	...	13	149	40	2	5	...	27	35
Donnybrook	Crown Land / Private Property	Greenbushes	17-11-99	27-11-99	...	...	102	...	...	...	...	...	...	...	...	...
State generally (Newcastle)	...	...	...	...	...	...	...	...	...	...	...	4	...	...	143	...
		Total	...	...	...	...	315,089	...	2,447	32,273	3,988	195	1,633	165	7,758	9,074

TABLE III.—*Return showing, for the respective Goldfields and Districts, etc.*—continued.

Goldfield.	District.	Production.					
		Alluvial.	Dollied and Specimens.	Ore Treated.	Gold therefrom.	Total Gold.	Fine Silver.
		fine ozs.	fine ozs.	tons (2,240lbs.)	fine ozs.	fine ozs.	fine ozs.
Kimberley	...	114·10	...	214·00	382·04	496·14	...
Pilbarra	Marble Bar	561·35	155·67	2,226·51	3,817·23	4,534·25	320·44
	Nullagine	354·42	187·18	3,101·85	6,397·98	6,939·58	...
West Pilbarra	...	466·42	...	260·00	334·72	801·14	...
Ashburton	...	207·53	...	...	...	207·53	...
Gascoyne	...	...	...	...	...	...	...
Peak Hill	...	...	62·48	52,974·00	13,524·39	13,586·87	526·19
East Murchison	Lawlers	28·55	56·09	175,446·00	68,147·88	68,232·52	4,550·75
	Black Range	238·80	689·65	10,975·90	15,765·31	16,693·76	3·55
Murchison	Cue	6·68	85·26	19,074·89	15,033·11	15,125·05	...
	Nannine	1,764·88	151·78	14,180·87	16,632·51	18,549·17	40·36
	Day Dawn	49·04	130·74	184,627·25	161,327·50	161,507·28	26,627·52
	Mt. Magnet	119·50	136·16	18,592·36	11,297·72	11,553·38	155·81
Yalgoo	...	...	5·47	6,344·00	4,737·30	4,742·77	...
Mt. Margaret	Mt. Morgans	207·92	300·65	59,469·25	25,368·76	25,877·33	1,055·55
	Mt. Malcolm	28·53	242·04	174,921·10	105,626·88	105,897·45	5,314·10
	Mt. Margaret	...	8·51	97,918·75	56,928·92	56,937·43	1,317·57
North Coolgardie	Menzies	100·37	104·65	46,972·00	41,690·31	41,895·33	2,707·35
	Ularring	...	35·74	42,733·05	43,351·33	43,387·07	2,151·83
	Niagara	185·94	151·83	116,814·50	45,182·40	45,520·17	2,012·57
	Yerilla	...	99·96	25,913·90	17,868·47	17,968·43	37·40
Broad Arrow	...	3,000·34	57·87	21,539·49	15,525·45	18,583·66	...
North-East Coolgardie	Kanowna	1,080·58	238·30	67,199·92	41,022·78	42,341·66	1,082·76
	Bulong	1,188·87	1,706·29	8,921·28	6,877·72	9,772·88	...
	Kurnalpi	273·52	35·26	261·00	523·94	832·72	5·00
East Coolgardie	...	2,365·05	1,037·39	1,288,953·59	993,790·58	997,193·02	165,453·04
Coolgardie	Coolgardie	192·18	1,034·27	111,207·60	53,272·59	54,499·04	...
	Kunanalling	...	375·90	10,091·13	8,789·33	9,165·23	...
Yilgarn	...	7·06	...	47,965·00	19,284·36	19,291·42	1,037·67
Dundas	...	41·01	416·29	31,754·50	25,503·65	25,960·95	3,568·55
Phillips River	...	18·00	18·75	2,769·50	2,526·51	2,563·26	554·42
Donnybrook	...	...	...	...	...	...	...
Goldfields generally	...	...	...	...	...	...	...
	Total	**12,600·64**	**7,524·18**	**2,643,423·19**	**1,820,531·67**	**1,840,656·49**	**218,522·43**

TABLE IV.

The work of recasting the figures for this Table, giving the details of the production of each mine from 1897 to the close of 1903, and substituting "fine gold" content for "gross weight," is not yet completely finished. It is anticipated, however, that this will shortly be ready, when it might be published, either as an appendix to the annual departmental Report for 1905, or held over for embodiment in that of the following year.

JAMES WALLACE,
Statist.

TABLE V.

MILLING and CYANIDING PLANTS erected in the respective Goldfields and Districts on the 31st December, 1905.

Lease or Area on which erected.	Name of Company or Works.	Milling.											Cyaniding.		
		Batteries.		Other Mills.											
		Number of Heads of Stampers.	Prospecting.	Ball.	Krupp.	Griffin.	Huntington.	Salford.	Tremain.	Flint.	Other Crushers.	Puddlers.	Leaching Vats.	Agitating Vats.	Filter Presses.
	Kimberley Goldfield.														
M.A. 8 ...	Mt. Bradley Tunnelling claim	25	...	...	...	...	1	..	...	...	...	...	...	...	...
M.A. 15 ...	Mary River Works	5	...	...	...	...	...	...	...	...	...	...	...	...	...
M.A. 9 ...	Ruby Queen	20	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	**50**	...	...	...	...	**1**	...	...	...	...	...	...	...	...
	Pilbarra Goldfield.														
	Marble Bar District.														
161	Bulletin	10	...	...	...	...	...	...	...	...	...	...	3	...	...
R.C. 112 ...	Lallarookh: British Exploration of Australasia, Ltd.	...	...	...	...	...	...	...	...	...	...	...	10	...	...
615	British Exploration of Australasia, Ltd.... ...	5	...	...	...	...	...	...	1	...	...	...	...	...	...
M.A. 30 ...	Ironclad Cyanide Works	...	...	...	...	...	...	...	...	...	...	...	5	...	...
505, 483 ...	British Exploration of Australasia, Ltd.... ...	10	...	...	...	...	...	...	...	...	...	...	...	...	...
M.A. 18 ...	Klondyke Battery	5	...	...	...	...	...	...	...	...	...	...	...	...	...
M.A. 27 ...	Salgash Public Crushing Co.	15	...	...	...	...	...	...	...	...	...	...	...	...	...
625	Elsie Abandoned...	...	1	...	...	...	...	...	...	...	...	...	2	...	...
M.A. 19 ...	Lady Adelaide Battery	10	...	...	...	...	...	...	...	...	...	...	4	...	...
	Total ...	**55**	**1**	...	...	...	...	...	**1**	...	...	...	**24**	...	...
	Nullagine District.														
95L	Bell's Exploration Co., Ltd.	10	...	...	...	...	...	...	...	...	...	...	4	...	...
M.A. 6L ...	Royer's Public Crushing Syndicate	10	...	...	...	...	...	...	...	...	...	...	...	...	...
106L	Barton	10	...	...	...	...	...	...	...	...	...	...	4	...	...
⩚9718 ...	20-Mile Sandy: State Battery	10	...	...	...	...	...	...	...	...	...	...	3	...	...
	Total ...	**40**	...	...	...	...	...	...	...	...	...	...	**11**	...	...
	West Pilbarra Goldfield.														
106, etc. ...	Ninety-nine leases	...	1	...	...	...	...	...	...	...	...	...	...	...	...
117/8	Pilgrim's Rest leases	20	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	**20**	**1**	...	...	...	...	...	...	...	...	...	...	...	...
	Peak Hill Goldfield.														
1P, etc. ...	Peak Hill Goldfield, Ltd.	40	3	...	...	...	...	...	...	...	...	2	8	...	9
	Ravelstone State Battery	10	...	...	...	...	..	...	...	...	...	...	4	...	...
	Total ...	**50**	**3**	...	...	...	...	...	...	...	...	**2**	**12**	...	**9**
	East Murchison Goldfield.														
	Lawlers District.														
(557)	(Enterprise)	5	...	...	...	...	...	...	...	...	...	...	...	...	...
113	Nil Desperandum...	10	...	...	...	...	...	...	...	...	...	...	...	...	...
382, etc. ...	Yellow Aster	10	...	...	...	...	...	...	...	...	...	...	4	...	...
⩚7864 ...	Darlôt State Battery	10	...	...	...	...	...	...	...	...	...	...	4	...	...
797	Auckland	...	1	...	...	...	...	...	...	...	...	...	...	...	...
170	Black Swan: Gwalia Consolidated, Ltd.	20	...	...	...	...	...	...	...	...	...	...	4	...	...
	Carried forward ...	55	1	...	...	...	...	...	...	...	...	...	12	...	...

TABLE V.—*Milling and Cyaniding Plants erected in the respective Goldfields and Districts, etc.*—continued.

Lease or Area on which erected.	Name of Company or Works.	Milling.										Cyaniding.		
		Batteries.		Other Mills.										
		Number of Heads of Stampers.	Prospecting.	Ball.	Krupp.	Griffin.	Huntington.	Salford.	Tremain.	Flint.	Other Crushers.	Puddlers.	Leaching Vats.	Agitating Vats.	Filter Presses.
	East Murchison Goldfield—*continued.*														
	***Lawlers District*—continued.**														
	Brought forward ...	55	1	...	...	...	...	...	...	...	...	...	12	...	...
542, etc. ...	Gwalia Consolidated, Ltd.	10	...	...	...	...	...	...	...	...	1	...	10	...	3
674	Highland Mary	5	...	...	...	...	...	...	...	...	...	...	...	...	...
837	Lady Wiluna	...	...	...	...	...	...	...	...	...	...	...	2	1	...
149, etc. ...	Lake Way Goldfield, 1899, Ltd.	30	...	...	...	...	...	...	...	...	...	...	3	...	...
137, etc. ...	Monarch of the East G.M. Co., N.L.	10	1	...	...	...	...	...	...	...	...	...	3	...	...
⅄9909 ...	Wiluna State Battery	10	...	...	...	...	...	...	...	...	...	...	...	...	...
	Urquhart and Hayes' Cyanide Plant	...	...	...	...	...	...	..	...	...	...	...	4	...	...
532, etc. ...	Brilliant leases	5	...	...	...	...	...	...	...	...	...	...	6	...	...
(714)	(British American Alliance)	5	...	...	...	...	...	...	...	...	...	...	...	...	...
645	Cinderella	5	...	...	...	...	...	...	...	...	...	...	7	...	...
M.A. 11 ...	Lawlers Public Battery	10	...	...	...	...	...	...	...	...	...	...	4	...	...
15, etc. ...	Leinster leases	10	...	...	...	...	...	...	...	...	...	...	8	...	...
37, etc. ...	London and Western Australian Exploration Co., Ltd.	40	...	1	...	...	...	...	...	...	4	...	5	...	...
521, etc. ...	Vivien G.M. Co., Ltd.	10	...	...	...	...	...	...	...	...	2	...	4	...	1
24, etc. ...	Bellevue Proprietary, Ltd.	40	...	...	...	...	...	...	...	...	...	...	...	...	...
M.A. 17 ...	Condor Cyanide Works (Dunstan and Cummings)	...	...	...	...	...	...	...	...	...	...	...	8	...	...
339	Vanguard	5	...	...	...	...	...	...	...	...	...	...	5	...	...
	Total ...	**250**	**2**	**1**	...	...	...	...	...	...	**7**	...	**81**	**1**	**4**
													82		
	Black Range District.														
171B	El'Dorado	...	...	...	...	...	...	...	1	...	...	...	4	...	...
133B	Reply	5	...	...	...	...	...	...	...	...	...	...	...	...	...
5B	Black Range	10	...	...	...	...	...	...	...	...	...	...	6	...	...
M.A. 1B ...	Earlsville Mill	...	1	...	...	...	...	...	...	...	...	...	...	...	...
⅄9768 ...	Black Range State Battery...	11	...	...	...	...	...	...	...	...	...	...	8	...	...
	Total ...	**26**	**1**	...	...	...	...	...	**1**	...	...	...	**18**	...	...
	Murchison Goldfield.														
	Cue District.														
1440/1 ...	Scotia leases	5	...	...	...	...	...	...	...	...	...	...	...	...	...
595, etc. ...	Victory United G.M. Co., N.L.	10	...	...	...	...	...	...	...	...	...	...	4	...	...
203	Cue No. 1	20	...	...	...	...	...	...	...	...	...	...	8	...	...
1174	Cue Victory	10	...	...	...	...	...	...	...	...	...	...	4	...	...
1020	Gem of Cue Extended	10	...	...	...	...	...	...	...	...	...	...	5	...	...
1374	Salisbury	10	...	...	...	...	...	...	...	...	...	...	8	...	...
1512	Ruby	5	...	...	...	...	...	...	...	...	...	...	...	...	...
1182, etc. ...	(Anchor Consolidated G.Ms. (W.A.), Ltd.) ...	10	...	...	...	...	...	...	...	...	...	...	3	...	...
1335	Open Cut	...	1	...	...	...	...	...	...	...	...	...	2	...	...
	Tuckanarra State Battery	10	...	...	...	...	...	...	...	...	...	...	4	...	...
M.A. 17 ...	Weld Hercules G.M., Ltd.	20	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	**110**	**1**	...	...	...	...	...	...	...	...	...	**38**	...	...
	Nannine District.														
171N	Mt. Vranizan	10	...	...	...	...	...	...	...	...	...	...	3	...	...
172N, etc. ...	New Murchison King G.Ms.	10	...	...	...	...	...	...	...	...	...	...	5	...	...
238N	Alliance	5	...	...	...	...	...	...	...	...	...	...	4	...	...
408N	New Alliance	5	...	...	...	...	...	...	...	...	...	...	5	...	...
361N	Margueritta	10	...	...	...	...	...	...	...	...	...	...	4	...	...
379N	Mountain View	5	...	...	...	...	...	...	...	...	...	...	...	...	...
32N	Nannine Goldfields, Ltd.	10	...	...	...	...	...	...	...	...	...	...	...	...	...
455N	Jillawarra	5	...	...	...	...	...	..	...	...	...	...	5	...	...
⅄9142 ...	Meekatharra State Battery...	10	...	...	...	...	...	...	...	...	...	...	4	...	...
7N	Champion Extended	20	...	...	...	...	...	...	...	...	...	...	...	...	...
10N, 11N, etc.	Champion Reef (Nannine, W.A.) G.M. Co., Ltd.	30	...	...	...	...	...	...	...	...	...	...	8	...	...
	Carried forward ...	120	...	...	...	...	...	...	...	...	...	...	38	...	...

TABLE V.—*Milling and Cyaniding Plants erected in the respective Goldfields and Districts, etc.*—continued.

Lease or Area on which erected.	NAME OF COMPANY OR WORKS.	MILLING.											CYANIDING.		
		Batteries.		Other Mills.											
		Number of Heads of Stampers.	Prospecting.	Ball.	Krupp.	Griffin.	Huntington.	Salford.	Tremain.	Flint.	Other Crushers.	Puddlers.	Leaching Vats.	Agitating Vats.	Filter Presses.
	MURCHISON GOLDFIELD—*continued.*														
	Nannine District—continued.														
	Brought forward ...	120	...	...	...	...	...	...	...	...	...	...	38	...	...
16N, 25N, etc.	Mt. Hall, Royalist Consolidated and Nannine leases	10	1	...	...	...	...	...	...	...	...	...	...	..	...
478M	Princess Dagmar	5	...	...	...	...	...	...	...	...	...	...	...	...	...
613N	Scotchman	4	...	...	...	...	...	...	...	...	...	...	...	...	...
174N	Star of the East, Ltd.	20	...	...	...	...	...	...	...	...	...	...	6	...	...
	Total ...	**159**	**1**	...	...	...	...	...	...	...	...	...	**44**	...	...
	Day Dawn District.														
389D	Crême D'Or	5	...	...	...	...	...	...	...	...	...	...	...	...	...
M.A. 6D ...	Day Dawn Public Battery	...	...	...	...	...	...	...	...	...	...	...	3	...	...
26D, etc. ...	East Fingall G.Ms., Ltd.	5	...	...	...	...	...	...	...	...	...	...	...	...	...
1D, etc. ...	Great Fingall Consolidated, Ltd.	100	...	...	...	...	...	...	...	...	...	...	24	...	6
179D	Kinsella	20	...	...	...	...	...	...	...	...	...	...	...	...	...
320D	Mt. Fingall	5	...	...	...	...	...	...	...	...	...	...	4	...	...
138D, etc. ...	Murchison Associated G.Ms., Ltd.	10	...	...	...	...	...	...	...	...	...	...	4	...	...
393D	Trenton	10	...	...	...	...	...	...	...	...	...	...	3	...	...
5D, etc. ...	Island Eureka G.M. Co., N.L.	5	...	...	...	...	...	...	...	...	...	...	...	...	...
355D, etc. ...	Mainland Consols leases	...	...	..	...	...	...	...	...	...	...	...	5	...	...
	Total ...	**160**	...	...	...	...	...	...	...	...	...	...	**43**	...	**6**
	Mt. Magnet District.														
∧9769 ...	Boogardie State Battery	10	...	...	...	...	...	...	...	...	...	...	5	...	...
465M, etc. ...	Empress leases	10	...	...	...	...	...	...	...	...	...	...	4	...	...
30M	Long Reef...	20	...	...	...	...	...	...	...	...	...	...	10	...	...
693M	Piedmont	20	...	...	...	...	...	...	...	...	...	...	...	...	...
∧7499 ...	Lennonville State Battery	10	...	...	...	...	...	...	...	...	...	...	...	...	...
57M	Welcome	...	...	...	...	...	...	...	1	...	...	...	...	...	...
784M (313M)...	New Chum	10	...	...	...	...	...	..	...	...	...	...	...	...	...
314M, etc. ...	Morning Star Quartz Co., N.L.	10	...	...	...	...	...	...	...	...	...	...	7	...	...
M.A. 2M ...	New Chum Cyanide Works...	...	...	...	...	...	...	...	...	...	...	...	9	...	...
776M	Paris	...	...	...	...	...	1	...	...	...	...	...	...	...	...
(340M) ...	(Windsor Consolidated (W.A.) G.Ms., Ltd.) ...	20	...	...	...	...	...	...	...	...	...	...	...	...	...
766M	Ophir	5	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	**115**	...	...	...	...	**1**	...	**1**	...	...	...	**35**	...	...
	YALGOO GOLDFIELD.														
441, etc. ...	Field's Reward G.Ms., Ltd.	20	...	...	...	...	...	...	...	...	...	...	...	...	...
170/1, 174 ...	Monarch leases	10	...	...	...	...	...	...	...	...	...	...	3	...	...
34, etc. ...	Phœnix G.Ms, Ltd.	10	...	...	...	...	...	...	...	...	...	...	4	...	...
392	Golden Eagle	5	...	...	...	...	...	..	...	...	...	...	...	...	...
P.A. 119 ...	(Gloster, A.B.)	...	1	...	...	...	...	...	...	...	...	...	...	...	...
192, etc. ...	(Woodley's G.Ms., Ltd.)	20	...	...	...	...	...	...	...	...	...	...	4	...	...
(508)... ...	(Emerald)	5	...	...	...	...	...	...	...	...	...	...	...	...	...
409, etc., M.A. 8	Royal Standard leases	5	...	...	...	...	...	...	...	...	...	...	4	...	...
	Total ...	**75**	**1**	...	...	...	...	...	...	...	...	...	**15**	...	...
	MT. MARGARET GOLDFIELD.														
	Mt. Morgans District.														
M.A. 3F ...	Hamblin's Battery	5	...	...	...	...	...	...	...	...	...	...	6	...	...
8F	Millionaire, Ltd.	5	...	...	...	...	...	...	...	...	...	...	6	...	...
97F	Ramornie	5	...	...	...	...	...	...	...	...	...	...	3	...	...
6F	Westralia Mt. Morgans G.Ms. Co., Ltd. ...	60	...	...	...	...	...	...	...	...	2	...	36	...	3
	Carried forward ...	75	...	...	...	...	...	...	...	...	2	...	51	...	3

TABLE V.—*Milling and Cyaniding Plants erected in the respective Goldfields and Districts, etc.*—continued.

Lease or Area on which erected.	NAME OF COMPANY OR WORKS.	MILLING.											CYANIDING.		
		Batteries.		Other Mills.											
		Number of Heads of Stampers.	Prospecting.	Ball.	Krupp.	Griffin.	Huntington.	Salford.	Tremain.	Flint.	Other Crushers.	Puddlers.	Leaching Vats.	Agitating Vats.	Filter Presses.
	MT. MARGARET GOLDFIELD—*continued.*														
	Mt. Morgans District—continued.														
	Brought forward ...	75	...	...	...	...	...	...	...	...	2	...	51	...	3
7F	Westralia Mt. Morgans G.Ms., Ltd. (Guest's Battery)	20	...	...	...	...	...	...	...	...	...	...	3	...	...
189F	Malcolm Mines, Ltd.	30	...	...	..	...	...	...	...	...	...	...	8	...	...
193F, etc. ...	Proprietary Extended leases	16	...	...	...	...	...	...	...	...	...	...	7	...	...
200F	Princess Alix G.M. Co., Ltd.	5	...	...	...	...	...	...	...	...	...	...	7	...	...
	Total ...	**146**	..	...	...	...	...	...	...	...	**2**	...	**76**	...	**3**
	Mt. Malcolm District.														
M.A. 7c ...	(Williams and party)	5	..	...	...	...	..	...	...	...	...	...	...	...	...
1104c... ...	Great Gwalia North	5	...	...	...	...	...	...	...	...	...	...	...	...	...
218/9c ...	Great Tower Hill G.Ms., Ltd.	40	...	...	...	...	...	...	...	...	...	...	12	...	...
1083c... ...	Katie	...	...	...	...	...	...	...	...	...	...	...	3	...	...
195/6c ...	Leonora Gold Blocks	10	...	...	...	...	...	...	...	...	...	...	5	...	...
210c, etc. ...	Leonora Main Reef, Ltd.	10	...	...	...	...	...	...	...	...	...	...	5	...	...
190c, etc. ..	Sons of Gwalia, Ltd.	50	...	...	...	...	1	...	...	...	...	...	16	...	1
⋀7121 ...	Leonora State Battery	10	...	...	...	...	...	...	...	...	...	...	5	...	...
263c	Trump	10	...	...	...	...	...	...	...	...	...	...	4	...	...
991c	Richmond Gem	10	...	...	...	...	...	...	...	...	...	...	4	...	...
W.R. 84c ...	(Hill and party)	...	...	...	...	...	...	...	1	...	...	...	...	...	...
638c, etc. ...	Merton's Reward G.M. Co., Ltd.	30	...	...	...	...	...	...	...	...	...	...	14	2	1
1040c... ...	Workman	10	...	...	...	...	...	...	...	...	...	...	...	...	...
M.A. 8c ...	Mt. Clifford Battery	10	...	...	...	...	...	...	...	...	...	...	2	...	...
⋀9681 ...	Pigwell State Battery	10	...	..	...	...	...	...	...	...	...	...	4	...	...
(987c) ...	(Anglo-Saxon)	5	...	...	...	...	...	...	...	...	...	...	...	...	...
978c	Randwick	10	...	...	...	...	...	...	...	...	...	...	4	...	...
65c, etc. ...	Perseverance G.Ms., Ltd.	15	...	...	...	...	...	...	...	...	...	...	7	...	...
1120c ...	Great Western	10	...	...	...	...	...	...	...	...	...	...	6	...	...
1116/7c ...	Lorna's Luck, Ltd.	5	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	**255**	...	...	...	...	**1**	...	**1**	...	...	...	**91**	**2**	**2**
													93		
	Mt. Margaret District.														
1041T ...	Away from Home	1	...	...	...	...	...	...	...	...	...	...	...	...	...
1398T ...	Golden Orbit	1	...	...	...	...	...	...	...	...	...	...	...	...	...
781T	Sailor Prince	5	...	...	...	...	...	...	...	...	...	...	4	...	...
934T	Sons of Westralia	10	...	...	..	...	...	...	...	...	...	...	5	...	...
⋀8914 ...	Burtville State Battery	10	...	...	...	...	...	...	...	...	...	...	3	...	...
⋀— ...	Duketown State Battery	10	...	...	...	...	...	...	...	...	...	...	3	...	...
725T	Baneygo North	5	...	...	...	...	...	...	...	...	...	...	2	..	...
1300T, etc. ...	Caledonia leases	...	1	...	...	...	...	...	...	...	...	...	4	...	...
1509T, etc. ...	Famous Blue leases	...	...	...	...	1	1	...	...	...	...	...	...	...	...
1046T ...	Golden Spinnifex...	5	...	...	...	...	...	...	...	...	...	...	4	...	...
771T	Little Doris	5	...	...	...	...	...	...	...	...	...	...	4	...	...
1414T ...	Mistake	10	...	...	...	...	...	...	...	...	...	...	4	...	...
1517T, etc. ...	Mulga Queen leases	10	...	...	...	...	...	...	...	...	...	...	4	...	...
1546T, etc. ...	Euro leases	10	...	...	...	...	...	...	...	...	...	...	...	...	...
371T	Augusta	10	...	...	...	...	...	...	...	...	..	...	4	..	...
592T, etc. ...	Craiggiemore Proprietary, Ltd.	20	...	...	...	...	...	...	...	...	1	...	6	...	...
1602T ...	Great Bedford	...	...	...	...	...	1	...	...	...	...	...	...	...	...
829T, etc. ...	Ida H. G.M. Co., Ltd.	10	...	...	...	...	...	...	...	...	...	...	5	...	...
806T, etc. ...	Lancefield G.M. Co., Ltd.	50	...	...	...	...	...	...	...	...	...	...	16	...	2
⋀8336 ...	Laverton State Battery	10	...	...	...	...	...	...	...	...	...	...	3	..	...
	Total ...	**182**	**1**	...	...	**1**	**2**	...	...	...	**1**	...	**71**	...	**2**
	NORTH COOLGARDIE GOLDFIELD.														
	Menzies District.														
5148Z ...	Coonega G.M. Co., Ltd.	10	...	...	...	...	...	...	...	...	...	...	6	...	...
2728Z, 3480Z...	Boddington leases	10	...	...	...	...	...	...	...	...	...	...	3	...	...
5218Z ...	Midas: Goongarrie Midas G.M. Co., N.L. ...	5	...	...	...	...	...	...	...	...	...	...	...	...	...
2823Z, etc. ...	Crusoe Gold Claims, Ltd.	10	...	...	...	...	...	...	...	...	...	...	3	...	...
	Carried forward ...	35	...	...	...	...	...	...	...	...	...	...	12	...	...

TABLE V.—*Milling and Cyaniding Plants erected in the respective Goldfields and Districts, etc.*—continued.

Lease or Area on which erected.	Name of Company or Works.	Milling.											Cyaniding.		
		Batteries.		Other Mills.											
		Number of Heads of Stampers.	Prospecting.	Ball.	Krupp.	Griffin.	Huntington.	Salford.	Tremain.	Flint.	Other Crushers.	Puddlers.	Leaching Vats.	Agitating Vats.	Filter Presses.
	North Coolgardie Goldfield—continued.														
	Menzies District—continued.														
	Brought forward ...	35	...	...	...	...	...	...	...	...	...	...	12	...	...
5017z, etc. ...	Crusoe Gold Claims, Ltd.	20	...	...	...	...	...	...	...	...	...	...	3	...	2
2821z, etc. ...	Florence leases	10	...	...	...	..	...	...	...	...	..	..	3	...	...
4855z, etc. ...	Goodenough leases	...	1	...	...	...	...	...	...	...	1	...	2	...	...
2820z, 3006z,etc	Lady Shenton G.M., Ltd.	10	...	...	...	...	...	...	...	...	...	...	...	...	...
4895, etc. ...	Maranora leases	5	...	...	...	...	...	...	...	...	...	...	1	...	...
4931z, etc. ...	Menzies Consolidated G.Ms., Ltd.	20	...	...	...	...	...	...	...	...	...	...	16	...	...
2832z, etc. ...	Menzies Mining and Exploration Corporation, Ltd.	10	...	...	...	...	...	...	...	...	...	...	8	...	1
2836z, etc. ...	Queensland-Menzies G.M. Co., N.L.	15	...	...	...	...	...	...	...	...	...	...	3	...	1
	Menzies Gold Recovery Syndicate	...	...	...	...	...	...	...	...	...	...	...	2	...	...
⩚	Menzies State Battery	10	...	...	...	...	...	...	...	...	...	...	3	...	...
4525z, etc. ...	Mt. Ida Consols, Ltd.	10	...	...	...	...	...	...	...	...	...	...	4	...	...
	Mt. Ida Cyanide Plant	...	...	...	...	...	...	...	...	...	...	...	3	...	...
⩚	Mt. Ida State Battery	10	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	**155**	**1**	...	...	...	...	...	...	...	**1**	...	**60**	...	**4**
	Ularring District.														
458u, etc. ...	Eileen leases	10	...	...	...	...	...	...	...	...	...	...	...	...	...
459u, etc. ...	Golden Pole G.Ms., Ltd.	20	...	...	...	...	...	...	...	...	...	..	10	...	1
613u, etc. ...	Great Ophir Gold Corporation, Ltd.	...	...	...	...	...	...	...	...	...	1	...	14	...	...
438u	Westralia Waihi G.Ms., N.L.	10	...	...	...	...	...	...	...	...	...	...	6	...	...
123u, etc. ...	Riverina G.M. Co., N.L.	10	...	...	...	...	...	...	...	...	...	...	4	...	...
⩚7250 ...	Mulline State Battery	20	...	...	...	...	...	...	...	...	...	...	5	...	1
⩚8045 ...	Mulwarrie State Battery	10	...	...	...	...	...	...	...	...	...	...	6	...	...
	Total ...	**80**	...	...	...	...	...	...	...	...	**1**	...	**45**	...	**2**
	Niagara District.														
W.R. 72g ...	Brittannia...	...	...	...	...	...	...	...	...	...	...	...	7	...	...
320g, etc. ...	Champion	10	...	...	...	...	...	...	...	...	...	...	10	...	...
20g, etc. ...	Cumberland Niagara G.Ms., Ltd.	20	...	...	...	...	...	...	...	...	...	...	13	...	...
26g, etc. ...	Englishman: Cosmopolitan Proprietary, Ltd. ...	50	...	...	...	...	...	...	...	...	...	...	16	...	3
(628g) ...	(Puzzle) Victoria Works	...	...	...	...	...	...	...	1	...	...	...	..	...	...
518g, etc. ...	Eaglehawk Heather Co., N.L.	10	...	...	...	...	...	...	...	...	...	...	...	...	...
419g, etc. ...	Opal: Hannan's Main Reef G.M. Co., Ltd. ...	10	...	...	...	...	...	...	...	...	...	...	...	...	...
⩚7494 ...	Niagara State Battery	10	...	...	...	...	...	...	...	...	...	...	3	...	...
505g	W.E.G.	10	...	...	...	...	...	...	...	...	...	...	4	...	...
M.A. 44g ...	Mignonette Battery	10	...	...	...	...	...	...	...	...	...	...	...	...	...
M.A. 44g ...	Tampa Cyanide Works	...	...	...	...	...	...	...	...	...	...	...	5	...	...
	Total ...	**130**	...	...	...	...	...	...	**1**	...	...	...	**58**	...	**3**
	Yerilla District.														
401r, etc. ...	Neta leases	5	...	...	...	...	...	...	...	...	...	...	5	...	...
401r	Weekley's Works...	...	...	...	...	...	...	...	...	...	...	...	9	...	...
M.A. 3r ...	Pauley & McCoy's Battery	10	...	...	...	...	...	...	...	...	...	...	4	...	...
539r	Senate	5	...	...	...	...	...	...	...	...	...	...	...	...	...
(406r) ...	(Great Carbine: Greenhills G.M. Co., Ltd.) ...	...	1	...	...	...	...	...	...	...	...	...	...	...	...
⩚	Pingin State Battery	5	...	...	...	..	...	...	...	...	...	...	2	...	...
⩚	Yarri State Battery	10	...	...	...	...	...	...	...	...	...	...	3	...	...
682r	Melba Consols	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	Lady Ailsa Cyanide Plant	...	...	...	...	...	...	...	...	...	...	...	5	...	...
W.R. 28r ...	Yerilla State Battery	5	...	...	...	...	...	...	...	...	...	...	3	...	...
803r	Nine of Hearts	...	...	...	...	...	...	...	...	...	...	...	3	...	...
450r, etc. ...	Potosi Consolidated, Ltd.	20	...	...	...	...	...	...	...	...	...	...	12	...	...
⩚	Yundamindera State Battery	...	...	...	...	...	1	...	...	...	...	...	6	...	...
	Total ...	**60**	**1**	...	...	...	**1**	...	...	...	...	...	**52**	...	...

TABLE V.—*Milling and Cyaniding Plants erected in the respective Goldfields and Districts, etc.*—continued.

Lease or Area on which erected.	Name of Company or Works.	Milling.											Cyaniding.		
		Batteries.		Other Mills.											
		Number of Heads of Stampers.	Prospecting.	Ball.	Krupp.	Griffin.	Huntington.	Salford.	Tremain.	Flint.	Other Crushers.	Puddlers.	Leaching Vats.	Agitating Vats.	Filter Presses.
	Broad Arrow Goldfield.														
1186/7w ...	Excelsior leases	5	...	...	...	...	...	...	...	...	1	...	4	...	...
1266w ...	Howden	5	...	...	...	...	...	...	...	...	...	...	...	...	...
959w, etc. ...	New Slug Hill G.M. Co., Ltd.	20	...	...	...	...	...	...	...	...	...	...	6	...	...
17w, etc. ...	Zoroastrian	10	...	...	...	...	...	...	...	...	...	...	2	...	...
43w, etc. ...	Black Flag Proprietary Co., Ltd.	50	...	...	...	...	...	...	...	...	...	...	6	...	...
47w, etc. ...	Lady Bountiful G.M. Co., N.L.	10	...	...	...	...	...	...	...	...	...	...	6	...	...
M.A. 19w ...	Milne's Battery	5	...	...	...	...	...	...	...	...	...	...	...	...	...
56w, 75w ...	Broad Arrow Consols G.M. Co., N.L.	10	...	...	...	...	...	...	...	...	...	...	4	...	...
3w, etc. ...	Golden Arrow Mine, Ltd.	20	...	...	...	...	...	...	...	...	...	...	4	...	...
2w, etc. ...	New Austral Co., Ltd.	...	...	...	1	...	...	...	...	...	...	...	...	...	...
...	(Hill End Cyanide Works)	...	...	...	...	...	...	...	...	...	...	...	13	...	...
W.R. 63w ...	Carter's Venture Mill	10	...	...	...	...	1	...	...	...	...	...	...	...	...
45w	Mt. Corlic	10	...	...	...	...	...	...	...	...	...	...	...	...	...
M.A. 14w ...	New Arrow Proprietary Battery	10	...	...	...	...	...	...	...	...	...	...	...	...	...
53w, etc. ...	New Standard Exploration Co., Ltd.	10	...	...	...	...	...	...	...	...	...	...	6	...	...
T.A. 13w ...	Paddington Cyanide Works	...	...	...	...	...	...	...	...	...	...	...	7	...	...
	Total ...	**175**	...	...	**1**	...	**1**	...	...	...	**1**	...	**58**	...	...
	North-East Coolgardie Goldfields.														
	Kanowna District.														
434x, etc. ...	Camelia	10	...	...	...	...	...	...	...	...	...	...	6	...	...
1123x ...	Gindalbie	10	...	...	...	...	...	...	...	...	...	...	...	...	...
1127x ...	Monkland	5	...	...	...	...	...	...	...	...	...	...	...	...	...
392x, etc. ...	Queen Margaret G.M. Co., Ltd.	15	...	...	...	...	...	...	...	...	...	...	10	...	...
M.A. 42x ...	Koh-i-Noor Works	5	...	...	...	...	...	...	...	...	...	...	6	...	...
891x	Sirdar	10	...	...	...	...	...	...	...	...	...	...	...	...	...
367x, etc. ...	Commonwealth G.Ms., Ltd.	10	...	...	...	...	1	...	...	...	...	...	...	...	...
(918x) ...	Government Well	...	...	...	...	...	...	...	...	...	...	1	...	...	...
52x, etc. ...	Lake View South G.M. (W.A.), Ltd.	20	...	1	...	...	...	...	...	...	...	...	...	...	...
...	Venture Cyanide Syndicate	...	...	...	...	...	...	...	...	...	...	2	5	...	2
187x, etc. ...	London and Coolgardie Explorers, Ltd.	20	...	...	...	...	...	...	...	...	...	...	..	...	...
3x, etc. ...	North White Feather G.Ms., Ltd.	20	...	...	...	...	...	...	...	...	...	...	10	...	...
1083x ...	Scotia	...	...	...	...	...	...	...	...	...	...	...	...	1	...
12x, etc. ...	White Feather Main Reefs, Ltd.	20	...	...	...	...	...	...	...	...	...	...	7	...	...
9x, etc. ...	White Feather Reward, Ltd.	20	...	...	...	...	...	...	...	...	...	...	11	...	...
Q.C. 61x ...	Campbell's Works	...	...	...	...	...	...	...	...	...	...	1	...	...	...
M.A. 45x ...	Donnan's Works	...	1	...	...	...	...	...	...	...	...	...	...	...	...
E.A.C. 342x ...	Irving's Works	...	...	...	...	...	...	...	...	...	...	1	...	...	...
M.A. 47x ...	Mallon's Works	5	...	...	...	...	...	...	...	...	...	...	...	...	...
M.A. 43x ...	Monmouth Works	...	...	...	...	...	...	...	...	...	...	...	4	...	...
M.A. 39x ...	Mudlark Works	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Q.C. 57x ...	Norton's Works	16	...	...	...	...	...	...	...	...	...	...	...	...	...
...	Middleton Cyanide Works	...	...	...	...	...	...	...	...	...	...	...	6	...	...
M.A. 19x ...	Old Cement Works (Martin's)	10	...	...	...	...	...	...	...	...	...	...	...	...	...
...	Middleton's Cyanide Works	...	...	...	...	...	...	...	...	...	...	...	3	...	...
M.A. 15x ...	Sims and Son's Works	...	1	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	**196**	**2**	**1**	...	...	**1**	...	...	...	...	**6**	**68**	**1**	**2**
													69		
	Bulong District.														
835y, etc. ...	Green Harp leases	...	...	...	..	...	1	...	...	...	...	...	...	...	...
9y, etc. ...	Queen Margaret G.M. Co., Ltd.	20	...	...	...	...	...	...	...	...	2	...	2	...	...
W.R. 24 ...	Berry's Public Battery	10	...	...	...	...	...	...	...	...	...	...	..	...	...
⩚9535 ...	Randall's State Battery...	10	...	...	...	...	...	...	...	...	...	...	4	...	...
	Total ...	**40**	...	...	...	...	**1**	...	...	...	**2**	...	**6**	...	...
	Kurnalpi District.														
280k, M.A. 2k	Billy Billy...	5	...	...	...	...	...	...	...	...	...	...	...	...	...
M.A. 3k ...	Glover's Works	...	1	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	**5**	**1**	...	...	...	...	...	...	...	...	...	...	...	...

TABLE V.—*Milling and Cyaniding Plants erected in the respective Goldfields and Districts, etc.*—continued.

Lease or Area on which erected.	Name of Company or Works.	Milling.											Cyaniding.		
		Batteries.		Other Mills.											
		Number of Heads of Stampers.	Prospecting.	Ball.	Krupp.	Griffin.	Huntington.	Salford.	Tremain.	Flint.	Other Crushers.	Puddlers.	Leaching Vats.	Agitating Vats.	Filter Presses.
	East Coolgardie Goldfield.														
4041E ...	Crown Jewel	...	...	...	...	...	1	...	...	...	...	...	...	...	...
2310E, etc. ...	Golden Ridge Proprietary leases	20	...	...	...	...	...	...	...	...	...	...	6	...	...
38E, etc. ...	Associated G.Ms. of W.A., Ltd.	10	...	...	10	...	1	...	...	...	...	...	...	12	7
49E	Associated Northern Blocks (W.A.), Ltd. ...	...	...	...	3	...	...	...	...	...	...	...	...	6	3
4205E ...	Deep Levels South	...	...	...	...	...	...	...	...	...	...	...	2	...	...
351E, etc. ...	Golden Horseshoe Estates Co., Ltd.	150	...	...	...	...	...	...	...	10	1	...	24	22	20
873E	Great Boulder Main Reef, Ltd.	...	...	...	2	...	..	...	...	...	2	1	4	...	4
	(Federation Company's Works)	...	...	...	...	...	1	...	...	...	...	...	..	...	2
50E	Great Boulder No. 1, Ltd.	10	...	...	...	...	...	...	...	...	...	...	6	...	...
66E	Great Boulder Perseverance G.M. Co., Ltd. ...	...	...	...	...	16	...	...	...	...	2	...	...	24	13
16E, etc. ...	Great Boulder Proprietary G.Ms., Ltd.	...	1	...	2	12	...	...	...	...	...	1	...	15	12
3643E ...	Hainault G Ms., Ltd.	30	...	...	...	...	...	...	...	...	...	...	18	...	2
M.A. 11E, etc.	Hannan's Public Crushing, Condensing, and Saw-mills Co. (W.A.), Ltd.	20	...	...	...	...	...	...	...	...	1	1	12	6	11
15E, etc. ...	Hannan's Star, Ltd.	...	...	...	2	...	...	...	...	1	2	1	...	4	2
31E, etc. ...	Ivanhoe Gold Corporation, Ltd.	100	...	...	...	...	...	...	...	...	...	...	32	...	8
22E, etc. ...	Kalgurli G.Ms., Ltd.	...	...	...	9	...	...	...	...	...	...	...	...	16	6
25E, etc. ...	Lake View Consols, Ltd.	75	...	...	...	...	...	...	...	6	2	...	10	14	13
75E etc. ...	Lake View South G.M. (W.A.), Ltd.	...	...	...	...	...	...	...	...	...	1	...	3	...	...
33E, etc. ...	North Boulder G.Ms., Ltd.	...	...	...	...	...	...	...	...	...	2	...	8	...	...
281E, etc. ...	North Kalgurli Co., Ltd.	10	...	...	...	...	...	...	...	...	...	...	8	3	1
410E, etc. ...	Oroya-Brown Hill Co., Ltd.	50	...	...	2	...	3	...	...	6	...	...	...	13	6
M.A. 25E ...	South Boulder Metallurgical Works (Deeble's)	...	...	...	...	...	...	...	...	...	...	...	2	...	...
1208E, etc. ...	South Kalgurli G.Ms., Ltd.	...	...	...	3	...	...	...	...	...	...	...	...	5	7
4187E ...	Trurant	10	...	...	...	...	...	...	...	...	...	...	...	...	...
Block 48 ...	Hampton Plains Estate, Ltd.	20	...	...	1	...	...	...	...	...	...	...	6	...	1
Block 50 ...	Hampton Properties, Ltd.	5	...	...	...	...	...	...	...	...	...	...	...	...	...
1101E, etc. ...	A.W.A. United leases	10	...	...	...	...	...	...	...	...	...	...	7	...	...
796E, etc. ...	Bonnie Lass leases	5	...	...	...	...	...	...	...	...	...	...	...	...	...
552E, etc. ...	Brown Hill Consols leases	20	...	...	...	...	...	...	...	...	1	...	14	...	...
21E, etc. ...	Butcher's Hill, etc.	10	...	...	...	...	...	...	...	...	...	...	...	...	...
13E, etc. ...	Crœsus South G.Ms., Ltd.	20	...	...	...	...	...	...	...	...	2	...	8	...	...
3880E, etc. ...	Devon Consols leases	25	...	...	...	...	...	...	...	...	...	...	12	...	...
750E, etc. ...	Golden Links, Ltd.	20	...	...	1	...	...	...	...	...	...	...	6	...	...
12E, etc. ...	Hannan's North G.Ms, Ltd.	10	...	...	...	...	...	...	...	...	...	...	...	...	...
	(Weston's Cyanide Works)	...	...	...	...	...	...	...	...	...	...	...	7	...	...
941E, etc. ...	Hannan's Proprietary, Ltd.	...	...	...	...	...	3	...	...	...	...	...	12	...	...
97E, etc. ...	Hannan's Reward and Mt. Charlotte, Ltd. ...	10	...	...	...	...	...	...	...	...	...	...	11	...	...
	(Venture Syndicate's Works)	...	...	...	...	...	...	...	...	...	...	...	...	3	2
Mach. L. 2 ...	Kalgoorlie Gold Recovery Co., Ltd.	...	...	...	...	...	...	...	...	...	...	...	17	...	2
1037E ...	North End G.Ms., Ltd.	15	...	...	...	...	...	...	...	...	...	...	...	...	...
M.A. 38E ...	(Warrell's Works)	...	...	...	...	...	...	...	...	...	...	1	...	..	...
S.L. 545/152	(Davidson's Works)	...	...	...	...	...	...	...	...	...	...	1	...	...	...
E.A.C. 204E ...	(Bowden and party)	...	...	...	...	...	...	...	...	...	...	1	...	...	...
E.A.C. 239E ...	(Queenslander)	...	...	...	...	...	...	...	...	...	...	1	...	...	...
L.C. 264E ...	Little Wonder Amalgamated	...	1	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	**655**	**2**	...	**35**	**28**	**9**	...	...	**23**	**16**	**8**	**235**	**143**	**122**
													378		
	Coolgardie Goldfield.														
	Coolgardie District.														
3847, etc. ...	Bendigo and Coolgardie Proprietary Co., N.L. ...	15	...	...	...	...	...	...	...	...	...	...	6	...	...
M.A. 62 ...	Vale of Coolgardie Slimes Plant (Finey and Howell)	...	...	...	...	...	...	...	...	...	...	...	10	...	...
595, etc. ...	Gem leases	20	...	...	...	...	...	...	...	...	...	...	6	...	...
1552, etc. ...	Vale of Coolgardie G.Ms., Ltd.	10	...	...	...	...	...	...	...	...	...	...	5	...	...
144, etc. ...	Westralia and East Extension Mines, Ltd. ...	40	...	...	...	...	...	...	...	...	...	...	21	4	2
134, etc. ...	Burbanks Birthday Gift G.M., Ltd.	60	...	...	...	...	...	...	...	...	...	...	7	...	...
2985, etc. ...	Burbanks Main Lode (1904), Ltd.	10	...	...	...	...	...	...	...	...	...	...	6	...	...
2160	Lady Robinson G.M. Co., N.L.	10	...	...	...	...	...	...	...	...	...	...	9	...	...
133, etc. ...	Bayley's Mines, Limited	20	...	...	...	...	...	...	...	...	...	...	6	...	...
4091	Big Blow: Greenmount Mines, N.L.	5	...	...	...	...	...	...	...	...	...	...	...	...	...
3918	Coolgardie Redemption	10	...	...	...	...	...	...	...	...	...	...	6	...	...
1604/5 ...	Flagstaff: Greenmount Mines, N.L.	10	...	...	...	...	...	...	...	...	...	...	...	...	...
1902, etc. ...	Griffiths' leases	10	...	...	...	...	...	...	...	...	...	...	5	...	...
18, etc. ...	King Solomon's leases	20	...	...	...	...	...	...	...	...	...	...	3	...	...
	Carried forward ...	240	...	...	...	...	...	...	...	...	...	...	90	4	2

TABLE V.—*Milling and Cyaniding Plants erected in the respective Goldfields and Districts, etc.*—continued.

Lease or Area on which erected.	NAME OF COMPANY OR WORKS.	MILLING.											CYANIDING.		
		Batteries.		Other Mills.											
		Number of Heads of Stampers.	Prospecting.	Ball.	Krupp.	Griffin.	Huntington.	Salford.	Tremain.	Flint.	Other Crushers.	Puddlers.	Leaching Vats.	Agitating Vats.	Filter Presses.
	COOLGARDIE GOLDFIELD—*continued.*														
	Coolgardie District—continued														
	Brought forward ...	240	...	...	...	...	...	...	...	...	...	...	90	4	2
3415/6 ...	Perseverance G.Ms., Ltd.	...	...	...	...	...	...	...	...	...	...	...	10	...	...
4152/3 ...	Queen's Cross leases	11	...	...	...	...	...	...	...	...	...	...	6	...	...
73	Star of the South	...	...	...	...	...	...	...	...	...	...	...	5	...	...
⩚9435 ...	Coolgardie State Battery	10	...	...	...	...	...	...	...	...	...	...	4	...	...
33, etc. ...	Tindal's Coolgardie G.M. Co., N.L.	10	...	...	...	...	...	...	...	...	...	...	8	...	...
M.A. 61 ...	Western Australian Bank (Ada)	5	...	...	...	...	...	...	...	...	...	...	4	...	...
3838	Prince of Wales G.M. Co., Ltd.	10	...	...	...	...	...	...	...	...	...	...	3	...	...
(4049) ...	(Londonderry G.M. Co., Ltd.)	10	...	...	...	...	...	...	...	...	...	...	3	...	...
3404, etc. ...	Red Hill Westralia G.Ms., Ltd.	10	...	...	...	...	...	...	...	...	...	...	3	...	...
M.A. 22 ...	(Highgate Works)	3	...	...	...	...	...	...	...	...	...	...	3	...	...
⩚7497 ...	Widgiemooltha State Battery	10	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	**319**	...	...	...	...	...	...	...	...	...	...	**139**	**4**	**2**
													143		
	Kunanalling District.														
M.A. 13s ...	Stanley Battery	5	...	...	...	...	...	...	...	...	...	...	...	...	...
33s, etc. ...	Carbine	10	...	...	...	...	...	...	...	...	...	...	...	...	...
M.A. 15s ...	(Regan and party)	10	...	...	...	...	...	...	...	...	...	...	...	...	...
369s ...	Jourdie Hills G.M. Co., Ltd.	10	...	...	...	...	...	...	...	...	...	...	6	...	...
514s	Pride of Jaudie North	5	...	...	...	...	...	...	...	...	...	...	...	...	...
17s	Wealth of Nations: North Coolgardie G.Ms., Ltd.	10	...	...	...	...	...	...	...	...	...	...	4	...	...
M.A. 14s ...	(Berliner and Besta)	5	...	...	...	...	...	...	...	...	...	...	...	...	...
734/5s ...	Great Cement Proprietary, Ltd.	20	...	...	...	...	...	...	...	...	...	...	8	...	...
674s	Golden	...	1	...	...	...	...	...	...	...	...	...	...	...	...
746s	Pole	5	...	...	...	...	...	...	...	..	...	...	5	...	..
Near W.R. ⩚4250	Siberia State Battery	5	...	...	...	...	...	...	...	...	...	...	3	...	...
696s, 727s ...	Blue Bell leases	5	...	...	...	...	...	...	...	...	...	...	...	...	...
646s, etc. ...	Bow's leases	10	...	...	...	...	...	...	...	...	...	...	...	...	...
(70s), 79s ...	Premier G.M. Co., N.L	25	...	2	...	...	...	...	...	...	...	...	11	...	1
645s	Star of Fremantle	10	...	...	...	...	...	...	...	...	...	...	4	...	...
	Total ...	**135**	**1**	**2**	...	...	...	...	...	...	...	...	**41**	...	**1**
	YILGARN GOLDFIELD.														
503, etc. ...	Greenmount Mines, N.L.	10	...	...	...	...	...	...	...	...	...	...	6	...	...
550	Sunbeam	5	...	...	...	...	...	...	...	...	...	...	...	...	...
536	Transvaal	20	...	...	...	...	...	...	...	...	...	...	8	...	...
(19)	Hope's Hill G.M. Co., Ltd.	30	...	...	...	3	...	...	...	...	...	...	12	...	...
490, etc. ...	(Jacoletti) Lady Loch Mines, Ltd.	10	...	...	...	...	...	...	...	...	...	...	4	...	...
212, etc. ...	Mt. Jackson G.Ms., Ltd.	10	...	...	...	...	...	...	...	...	...	...	7	...	...
T.A. 13 ...	André's Cyanide Works	...	...	...	...	...	...	...	...	...	...	...	6	...	...
508	Australia	5	...	...	...	...	...	...	...	...	...	...	6	...	...
520	Blue Hill	5	...	...	...	...	...	...	...	...	...	...	4	...	...
T.A. 9 ...	Brimage's Battery	10	...	...	...	...	...	...	...	...	...	...	8	...	...
13, etc. ...	British and Foreign Development Syndicate, Ltd.	30	...	...	...	...	...	...	...	...	...	...	6	...	...
256, etc. ...	Fraser South Extended G.M. Co., Ltd.	20	...	...	...	...	...	...	...	...	...	...	5	...	...
552, etc. ...	Haddon leases	10	...	...	...	...	...	...	...	...	...	...	10	...	...
529, etc. ...	Hatt's leases	10	...	...	...	...	...	...	...	...	...	...	12	...	...
⩚8901 ..	Southern Cross State Battery	10	...	...	...	...	...	...	...	...	...	...	3	...	...
	Total ...	**185**	...	...	...	**3**	...	...	...	...	...	...	**97**	...	...
	DUNDAS GOLDFIELD.														
M.A. 28 ...	Pathway Battery	...	...	...	...	...	...	1	...	...	...	..	...	...	...
M.A. 30 ...	Break-o'-Day Battery	10	...	...	...	...	...	...	...	...	...	...	4	...	...
42, etc. ...	Cumberland G.M. Co., N.L....	10	...	...	...	...	...	...	...	...	...	...	8	...	...
49, etc. ...	Lady Mary G.M. Co., N.L.	20	...	...	...	...	...	...	...	...	...	...	5	...	...
M.A. 18 ...	Mararoa Crushing and Cyaniding Works ...	10	...	...	...	...	...	...	...	...	...	...	4	...	...
	Carried forward ...	50	...	...	...	...	...	1	...	...	...	...	21	...	...

TABLE V.—*Milling and Cyaniding Plants erected in the respective Goldfields and Districts, etc.*—continued.

Lease or Area on which erected.	Name of Company or Works.	Milling.											Cyaniding.		
		Batteries.		Other Mills.											
		Number of Heads of Stampers.	Prospecting.	Ball.	Krupp.	Griffin.	Huntington.	Salford.	Tremain.	Flint.	Other Crushers.	Puddlers.	Leaching Vats.	Agitating Vats.	Filter Presses.
	Dundas Goldfield—*continued.*														
	Brought forward ...	50	...	...	...	...	...	1	...	...	...	...	21	...	...
18, etc. ...	Norseman G.Ms., Ltd.	20	...	2	...	...	...	...	...	...	...	...	5	...	...
106, etc. ...	Princess Royal G.M. Co., N.L.	30	...	...	...	...	...	...	...	...	...	...	10	3	2
106	(Royal Tailings Syndicate)	...	...	...	...	...	...	...	...	...	...	...	10	...	...
634, etc. ...	Princess Royal North G.M. Co., N.L.	10	...	...	...	...	...	...	...	...	...	...	...	...	...
/\—	Norseman State Battery	10	...	...	...	...	...	...	...	...	...	...	5	...	1
(88)	(Three Colonies)	...	...	...	...	...	...	...	...	...	1	...	...	...	...
(129)	(Central Wealth Consolidated Goldfields, Ltd.)...	...	...	...	...	...	...	...	...	...	...	...	5	...	...
	Total ...	**120**	...	**2**	...	...	...	**1**	...	...	**1**	...	**56**	**3**	**3**
													59		
	Phillips River Goldfield.														
M.L. 52, 94 ...	Ravensthorpe G.M. Syndicate, N.L.	10	...	...	...	...	...	...	...	...	...	...	...	...	...
M.L. 60 ...	Red, White, and Blue	5	...	...	...	...	...	...	...	...	...	...	...	...	...
89	Mt. Agnes Reward	...	1	...	...	...	...	...	...	...	...	...	...	...	...
43	Gilbert Gold Mine, Ltd.	10	...	...	...	...	...	...	...	...	...	...	...	...	...
M.L. 202 ...	Grafter	...	1	...	...	...	...	...	...	...	...	...	...	...	...
(27)	(Lucy)	5	...	...	...	...	...	...	...	...	...	...	...	...	...
1	Phillips River G.M. Co., N.L.	10	...	...	...	...	...	...	...	...	...	...	5	...	...
	Total ...	**40**	**2**	...	...	...	...	...	...	...	...	...	**5**	...	...
	State Generally.														
...	Fremantle Smelter, Ltd.	...	...	...	1	...	...	...	...	...	3	...	...	...	...
	Total ...	...	...	...	**1**	...	...	...	...	...	**3**	...	...	...	...
	Tinfield.														
	Greenbushes.														
/\G.R. 7993 ...	State Tin-dressing Plant	5	...	...	...	...	...	...	...	...	...	...	...	...	...
M.A. 21, Location No. 290	The Greenbushes Tin-Mining and Water Supply Company, Ltd.	5	...	...	...	...	...	...	...	...	...	2	...	...	...
Leases.															
W.R. 213, 73	Nelson	...	...	...	...	...	...	...	...	...	...	1	...	...	...
361	Baronia Gully	...	...	...	...	...	...	...	...	...	...	1	...	...	...
367	Greenbushes Sluicing Company, Ltd.	...	...	...	...	...	...	...	...	...	...	2	...	...	...
374	Lost and Found	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Claims.															
219A	Elliott and Hille	...	...	...	...	...	...	...	...	...	...	1	...	...	...
318	Spring claims	...	...	...	...	...	...	...	...	...	...	1	...	...	...
608	Bonanza Tin Syndicate	...	...	...	...	...	...	...	...	...	1	1	...	...	...
700	Rattray's Crusher	...	...	...	...	...	...	...	...	...	1	1	...	...	...
730	Kreitmayer's claim	...	...	...	...	...	...	...	...	...	...	1	...	...	...
743	Blakeney's claim	...	...	...	...	...	...	...	...	...	...	1	...	...	...
	Total ...	**10**	...	...	...	...	...	...	...	...	**2**	**13**	...	...	...

COALFIELD.

Collie River Coalfield.

Lease or Area on which erected.	Name of Company.	Screens (fixed).	Ventilating Fans and Furnaces.	Coal-cutting Machines.	Tumblers and Kick-ups.
		No.	No.	No.	No.
Leases.					
197, etc. ...	Cardiff Coal Mining Company, Ltd.	2	1	1	1
151, etc. ...	The Scottish Collieries of W.A., Ltd. (late Collie-Boulder Coal Company)	2	1	4	2
244, etc. ...	Collie Co-operative Collieries, Ltd.	1	...	...	1
88, etc. ...	Collie Proprietary Coalfields of W.A., Ltd.	2	2	2	3
	Total ...	**7**	**4**	**7**	**7**

TABLE VI.

Return of Gold Bullion received at the Perth Branch of the ROYAL MINT from May, 1889, to the 31st December, 1905, showing in gross ounces the Quantity obtained from the respective Goldfields and other Countries, and the Actual Value thereof.

Year.	Month.	Kimberley.	Pilbarra.	West Pilbarra.	Ashburton.	Gascoyne.	Peak Hill.	East Murchison.	Murchison.	Yalgoo.	Mt. Margaret.	North Coolgardie.	Broad Arrow.	North-East Coolgardie.
		ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.	ozs.
1899	... ...	308·45	529·80	...	281·80	85·65	16,274·00	3,758·07	24,675·64	5,190·05	16,911·54	44,779·38	8,503·50	16,700·90
1900	... ...	644·02	7,493·88	137·33	474·26	86·10	18,019·08	32,049·74	48,540·12	8,851·52	67,748·45	88,688·14	14,376·10	40,503·12
1901	... ...	663·37	11,279·93	394·38	55·42	18·56	21,351·67	44,746·88	43,024·65	9,191·01	126,703·91	135,493·31	18,829·13	43,055·63
1902	... ...	439·93	10,706·03	3,284·37	...	124·86	32,637·17	62,357·98	47,628·18	5,116·94	144,663·12	182,543·06	15,903·42	53,901·58
1903	... ...	511·75	14,217·53	6,481·58	135·30	36·29	34,684·27	77,089·29	64,127·18	1,687·99	148,006·49	197,229·08	21,528·20	42,649·25
1904	... ...	37·69	8,293·58	5,170·06	150·73	13·10	20,909·99	77,237·31	63,037·71	3,345·82	143,453·51	166,939·82	24,721·53	39,799·55
	Total	2,605·21	52,520·75	15,467·72	1,097·51	364·56	143,876·18	297,239·27	291,033·48	33,383·33	647,487·02	815,672·79	103,861·88	236,610·03
1905	January	152·21	...	4·80	...	...	...	8,345·43	3,894·35	257·69	12,254·07	15,846·95	1,689·09	4,446·03
	February	...	3,626·06	372·00	18·53	...	...	6,910·14	8,750·28	572·85	10,824·76	12,950·41	1,341·14	3,329·66
	March	...	...	...	...	8·15	3,873·49	8,173·88	18,082·90	630·75	13,737·92	13,792·05	1,505·43	4,093·67
	April	67·23	...	...	...	...	1,499·34	8,718·46	9,677·28	353·04	14,833·65	11,947·02	1,857·94	3,844·35
	May	22·51	9·68	10·58	2·63	...	...	9,997·41	8,230·60	622·67	15,780·51	17,727·55	1,149·37	3,755·71
	June	...	4,431·18	641·48	21·73	...	3,002·55	8,149·75	7,577·31	463·35	14,380·37	14,245·77	1,496·69	3,813·27
	July	67·14	32·61	...	...	...	1,302·25	11,170·73	7,818·76	255·07	18,330·46	16,058·07	1,535·79	4,164·93
	August	327·20	4,319·87	11·33	...	17·50	1,395·96	8,933·22	9,744·03	709·17	15,551·51	17,400·54	1,684·73	4,320·88
	September	20·05	...	...	...	...	1,243·44	6,562·76	9,413·07	467·36	16,774·84	12,432·21	1,537·88	3,707·23
	October	...	...	334·77	...	...	1,245·01	13,070·66	8,642·59	429·15	16,720·23	15,081·04	1,001·63	4,906·12
	November	...	187·03	5·81	5·26	...	1,045·97	8,476·66	9,777·09	498·40	18,372·39	13,457·09	1,754·89	3,821·34
	December	...	3,446·99	19·69	2·39	...	1,467·35	8,786·07	9,885·08	209·56	16,618·16	14,118·44	1,839·59	4,149·03
	Total for 1905 ...	656·34	16,053·42	1,400·46	50·54	25·65	16,075·36	107,295·17	111,493·34	5,469·06	184,178·87	175,057·14	18,394·17	48,352·22
	Total	3,261·55	68,574·17	16,868·18	1,148·05	390·21	159,951·54	404,534·44	402,526·82	38,852·39	831,665·89	990,729·93	122,256·05	284,962·25

Year.	Month.	East Coolgardie.	Coolgardie.	Yilgarn.	Dundas.	* Phillips River.	Donnybrook.	Goldfields 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.	ozs.	ozs.	ozs.	ozs.	ozs.	£ s. d.	ozs.	£ s. d.	ozs.	£ s. d.
1889	...	33,051·33	27,611·24	9,070·70	473·63	...	196·17	904·39	**209,306·24**	**762,546 11 6**	103·46	336 18 3	209,409·70	762,883 9 9
1900	...	139,845·60	51,607·26	28,648·51	31,583·20	...	265·55	1,620·93	**581,182·91**	**2,096,212 14 2**	17·49	44 15 7	581,200·40	2,096,257 9 9
1901	...	263,514·75	78,026·07	29,433·84	32,825·75	...	4·64	1,667·79	**860,280·69**	**3,033,311 0 4**	92·25	297 5 8	860,372·94	3,033,608 6 0
1902	...	636,536·52	94,134·17	25,873·68	31,088·91	5,146·80	67·08	2,461·98	**1,354,615·78**	**4,791,303 18 1**	16·27	38 10 2	1,354,632·05	4,791,342 8 3
1903	...	685,289·82	82,218·79	26,856·28	40,006·39	6,420·79	97·52	3,350·32	**1,452,624·11**	**5,139,852 11 9**	294·78	703 14 10	1,452,918·89	5,140,556 6 7
1904	...	699,475·35	73,076·66	35,854·87	37,508·11	2,450·03	...	1,608·47	**1,403,083·89**	**4,955,870 9 0**	263·05	614 11 9	1,403,346·94	4,956,485 0 9
	Total ...	2,457,713·37	406,674·19	155,737·88	173,485·99	14,017·62	630·96	11,613·88	**5,861,093·62**	**20,779,097 4 10**	787·30	2,035 16 3	5,861,880·92	20,781,133 1 1
1905	January ...	56,571·00	7,261·13	2,114·40	3,502·74	600·60	...	281·11	**117,221·60**	**410,282 18 8**	63·93	130 11 2	117,285·53	410,413 9 10
	February ...	56,205·66	6,701·11	2,133·52	2,603·99	...	...	56·01	**116,396·12**	**410,304 15 10**	4·45	17 4 2	116,400·57	410,322 0 0
	March ...	55,508·48	6,470·34	1,790·70	2,716·66	...	...	223·42	**130,607·84**	**458,020 17 3**	172·86	529 7 2	130,780·70	458,550 4 5
	April ...	65.188·88	6,287·91	1,961·18	3,069·59	...	...	29·10	**129,334·97**	**448,457 5 6**	31·75	82 15 7	129,366·72	448,540 1 1
	May	62,355·00	6,922·60	2,275·45	3,226·89	364·29	...	114·08	**132,567·53**	**459,922 7 4**	...	...	132,567·53	459,922 7 4
	June	58,494·48	5,876·52	2,540·11	2,444·14	...	...	213·00	**127,791·70**	**447,339 12 3**	54·74	141 4 6	127,846·44	447,480 16 9
	July	58,660·83	5,201·02	2,630·74	3,202·92	...	...	108·36	**130,539·68**	**457,337 12 10**	29·04	90 2 10	130,568·72	457,427 15 8
	August ...	66,003·40	6,617·75	2,911·72	3,106·24	263·80	...	114·95	**143,433·80**	**501,909 2 7**	108·35	318 4 0	143,542·15	502,227 6 7
	September ...	66,431·29	5,145·12	6,173·36	3,044·93	...	...	138·09	**133,091·63**	**463,711 5 5**	3·88	11 15 2	133,095·51	463,723 0 7
	October ...	64,004·88	6,356·10	1,859·42	2,445·57	...	...	121·95	**136,219·12**	**481,419 15 11**	23·30	69 10 0	136,242·42	481,489 5 11
	November ...	59,145·54	6,448·34	1,800·05	1,993·57	...	...	45·94	**126,835·37**	**447,567 0 7**	13·84	31 17 0	126,849·21	447,598 17 7
	December ...	68,495·70	5,327·42	2,214·00	1,596·32	524·63	...	375·98	**139,076·40**	**489,568 8 8**	19·66	68 9 0	139,096·06	489,636 17 8
	Total for 1905	737,065·14	74,615·36	30,404·65	32,953·56	1,753·32	...	1,821·99	**1,563,115·76**	**5,475,841 2 10**	525·80	1,491 0 7	1,563,641·56	5,477,332 3 5
	Total ...	3,194,778·51	481,289·55	186,142·53	206,439·55	15,770·94	630·96	13,435·87	**7,424,209·38**	**26,254,938 7 8**	1,313·10	3,526 16 10	7,425,522·48	26,258,465 4 6

* Prior to 1902 included in Goldfields generally.

TABLE VII.

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, 1905, showing, in Fine Ounces, the Quantity obtained each Year from the respective Goldfields, and the Total Annual Value.

Year.	Kimberley.			Pilbarra.			a West Pilbarra.			Ashburton.			b Gascoyne.			c Peak Hill.		
	Export.	Mint.	Total.	Export.	Mint.	Total.	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.	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	...	...	...	4,571·38	...	4,571·38
1898 ...	257·54	...	257·54	10,433·27	...	10,433·27	1,814·48	...	1,814·48	402·46	...	402·46	...	...	...	12,288·93	...	12,288·93
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	297·96	76·63	374·59	14,064·24	14,558·64	28,622·88
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	...	77·02	77·02	9,528·14	16,119·79	25,647·93
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	6·59	16·82	23·41	231·85	19,352·44	19,584·29
1902 ...	1·48	378·02	379·50	...	9,199·50	9,199·50	...	2,822·20	2,822·20	...	...	...	...	107·29	107·29	85·93	28,044·55	28,130·48
1903 ...	...	433·71	433·71	2·26	12,049·52	12,051·78	...	5,493·23	5,493·23	...	114·67	114·67	...	30·76	30·76	203·60	29,395·32	29,598·92
1904 ...	...	31·51	31·51	...	6,931·27	6,931·27	...	4,320·82	4,320·82	...	125·96	125·96	...	10·95	10·95	...	17,475·33	17,475·33
Total ...	22,422·06	2,296·58	24,718·64	147,235·75	45,581·99	192,817·74	4,165·01	13,116·56	17,281·57	4,104·96	967·24	5,072·20	304·55	319·47	624·02	40,974·07	124,946·07	165,920·14
1905 ...	...	545·95	545·95	48·33	13,353·49	13,401·82	...	1,164·92	1,164·92	...	42·05	42·05	...	21·34	21·34	125·01	13,371·75	13,496·76
Total ...	**22,422·06**	**2,842·53**	**25,264·59**	**147,284·08**	**58,935·48**	**206,219·56**	**4,165·01**	**14,281·48**	**18,446·49**	**4,104·96**	**1,009·29**	**5,114·25**	**304·55**	**340·81**	**645·36**	**41,099·08**	**138,317·82**	**179,416·90**

Year.	c East Murchison.			Murchison.			d Yalgoo.			c Mt. Margaret.			e North Coolgardie.			f Broad Arrow.		
	Export.	Mint.	Total.	Export.	Mint.	Total.	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.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.
1886 ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1887 ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1888 ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1889 ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1890 ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1891 ...	...	...	...	1,846·83	...	1,846·83	...	...	...	...	...	...	...	...	...	...	...	...
1892 ...	...	...	...	21,789·19	...	21,789·19	...	...	...	...	...	...	...	...	...	...	...	...
1893 ...	...	...	...	18,974·77	...	18,974·77	...	...	...	...	...	...	...	...	...	...	...	...
1894 ...	...	...	...	47,365·54	...	47,365·54	...	...	...	...	...	...	...	...	...	...	...	...
1895 ...	...	...	...	58,575·66	...	58,575·66	...	...	...	...	...	...	...	...	...	...	...	...
1896 ...	...	...	...	63,769·17	...	63,769·17	...	...	...	...	...	...	15,351·71	...	15,351·71	...	...	...
1897 ...	8,457·34	...	8,457·34	74,154·67	...	74,154·67	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 ...	35,393·19	...	35,393·19	83,794·22	...	83,794·22	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 ...	33,826·08	3,361·95	37,188·03	61,586·09	22,074·71	83,660·80	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 ...	23,545·54	28,671·55	52,217·09	53,815·70	43,423·77	97,239·47	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 ...	29,780·63	40,557·07	70,337·70	92,149·56	38,996·10	131,145·66	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 ...	25,450·63	53,583·10	79,033·73	141,731·91	40,926·08	182,657·99	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 ...	21,878·06	65,334·05	87,212·11	154,012·88	54,348·53	208,361·41	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 ...	21,296·85	64,550·36	85,847·21	165,232·67	52,683·16	217,915·83	...	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
Total ...	199,628·32	256,058·08	455,686·40	1,038,798·86	252,452·35	1,291,251·21	11,269·83	29,515·68	40,785·51	426,334·43	560,210·21	986,544·64	229,028·12	705,734·35	934,762·47	104,897·09	90,105·78	195,002·87
1905 ...	1,361·68	89,249·93	90,611·61	131,656·36	92,742·05	224,398·41	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
Total ...	**200,990·00**	**345,308·01**	**546,298·01**	**1,170,455·22**	**345,194·40**	**1,515,649·62**	**11,346·58**	**34,064·93**	**45,411·51**	**461,284·18**	**713,413·26**	**1,174,697·44**	**230,221·83**	**851,349·82**	**1,081,571·65**	**105,500·75**	**105,406·36**	**210,907·11**

a. Prior to 1st May, 1898, included with Pilbarra.
b. Prior to March, 1899, included with Ashburton.
c. From 1st August, 1897.
d. Prior to 1st April, 1897, included with Murchison.
e. Prior to 1st May, 1896, included with Coolgardie.
f. From 1st September, 1897.

TABLE VII.—*Total Output of Gold Bullion entered for EXPORT and received at the Perth Branch of the Royal Mint, etc.*—continued.

Year.	*a* North-East Coolgardie.			*a* East Coolgardie.			*b* Coolgardie.			Yilgarn.			*c* Dundas.		
	Export.	Mint.	Total.	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.	fine ozs.	fine ozs.	fine ozs.
1886	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1887	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...
1888	...	...	..	...	...	...	...	...	...	...	...	...	...	...	...
1889	...	...	...	...	...	...	...	...	...	1,662·61	...	1,662 61	...	...	...
1890	...	...	...	...	...	...	...	...	...	2,036·99	...	2,036·99	...	...	...
1891	...	...	...	...	...	...	...	...	...	11,480·61	...	11,480·61	...	...	...
1892	...	...	...	...	...	...	...	...	...	18,973·91	...	18,973·91	...	...	...
1893	...	...	...	...	...	...	...	...	...	67,760·73	...	67,760·73	132·37	...	132·37
1894	...	...	...	...	...	...	94,227·58	...	94,227·58	28,178·31	...	28,178·31	204·31	...	204·31
1895	...	...	...	...	...	...	111,919·21	...	111,919·21	17,666·25	...	17,666·25	216·40	...	216·40
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	3,891·77	...	3,891·77
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	17,275·36	...	17,275·36
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	28,655·52	...	28,655·52
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	39,980·65	423·71	40,404·36
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	8,144·72	28,254·19	36,398·91
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	5,411·46	29,752·16	35,163·62
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	4,401·31	26,714·16	31,115·47
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	1,311·53	33,905·88	35,217·41
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	1,834·13	31,347·06	33,181·09
Total	224,943·71	205,923·15	430,866·86	4,428,550·17	2,105,849·28	6,534,399·45	658,576·78	353,231·06	1,011,807·84	196,828·65	135,380·45	332,209·10	111,459·43	150,397·16	261,856·59
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	1,324·48	27,411·31	28,735·79
Total	**227,130·82**	**246,143·34**	**473,274·16**	**4,907,804·54**	**2,718,952·48**	**7,626,757·02**	**658,754·58**	**415,297·40**	**1,074,051·98**	**196,828·65**	**160,671·56**	**357,500·21**	**112,783·91**	**177,808·47**	**290,592·38**

Year.	*d* Phillips River.			*e* Donnybrook.			Goldfields generally.			**GRAND TOTAL.**			
	Export.	Mint.	Total.	Export.	Mint.	Total.	Export.	Mint.	Total.	**Export.**	**Mint.**	**Total.**	**Value.**
	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	fine ozs.	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 ·17 8 6½
1888	...	...	...	...	...	...	...	...	...	3,124·82	..	3,124·82	13,273 7 0
1889	...	...	...	...	...	...	...	...	...	13,859·52	...	13,859 52	58,871 9 11½
1890	...	...	...	...	...	...	...	...	...	20,402·42	...	20,402·42	86,663 19 5½
1891	...	...	...	...	...	...	...	...	...	27,116·14	...	27,116·14	115,182 0 10
1892	...	...	...	...	...	...	...	...	...	53,271·65	...	53,271·65	226,283 11 8½
1893	...	...	...	...	...	...	...	...	...	99,202·50	...	99,2 2 50	421,3 5 8 8½
1894	...	...	...	...	...	...	...	...	...	185,298·73	...	185,298·73	787,698 19 6
1895	...	...	...	...	...	...	...	...	...	207,110·20	...	207,110·20	879,748 4 2½
1896	...	...	...	...	...	...	...	...	...	251,618·69	...	251,618·69	1,06·,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	...	...	...	277·27	175·49	452·76	...	809·07	809·07	1,283,960·25	187,244·41	1,470,604·66	6,24 ,731 10 7¾
1900	...	...	...	...	237·56	237·56	5,644·83	1,450·08	7,094·91	894,367· 7	519,923·59	1,·14 310·36	6,0 7,610 13 4½
1901	...	...	...	...	4·20	4·20	215·91	1,511·63	1,727·54	923,686·96	779,729·56	,703,416··2	7,235,653 9 1
1902	2,946·53	4,422·56	7,369·09	4·94	57·64	62·58	7·77	2,115·52	2,123 29	707,039·75	1,163,997·60	1,871,037·35	7,947,661 9 7¾
1903	2,136·09	5,441·68	7,577·77	...	82·64	82·64	53·44	2,839·44	2,892·88	823,685·78	·,2·1,115·62	2,064,8 1·40	8,770,718 1· 6¼
1904	936·76	2,047·59	2,984·35	...	...	...	·86	1,344·25	1,345·11	810,616·04	1,172,614·03	1,983,230·07	8,424,225 17 3¾
Total	6,019·38	11,911·83	17,931·21	282·21	557·53	839·74	5,922·81	10,069·99	15,992·80	7,861,746·19	5,054,624·81	12,916,371·00	54,865,256 11 9
1905	2,060·46	1,458·44	3,518·90	...	...	...	70·41	1,515·58	1,585·99	655,089·88	1,300,226·60	1,955,315·88	8,305,653 18 5½
TOTAL	**8,079·84**	**13,370·27**	**21,450·11**	**282·21**	**557·53**	**839·74**	**5,993·22**	**11,585·57**	**17,578·79**	**8,516,836·07**	**6,354,850·81**	**14,871,686·88**	**63,170,910 10 2½**

a. Prior to 1st May, 1896, including with Coolgardie. *b*. Declared 5th April, 1894, to which date included with Yilgarn. *c*. Prior to 1893 included with Yilgarn. *d*. Prior to 1902 included in Goldfields generally.
e. From 1st March, 1899.

TABLE VIII.

Comparative Return of Gold Bullion entered for EXPORT and received at the Perth Branch of the ROYAL MINT, from 1st January, 1903, to 31st December, 1905, showing in Fine Ounces the Quantity recorded each Month and its Value.

Months and Quarters.	1903.						1904.						1905.					
	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	86,102·30	92,257·19	178,359·49	757,622	19	1½	77,217·72	99,435·55	176,653·27	750,375	7	10½	67,945·50	97,506·90	165,452·40	702,797	2	5½
February	68,012·57	95,046·42	163,058·99	692,630	11	3½	69,738·89	92,662·78	162,401·67	689,838	8	11	57,212·61	96,820·25	154,032·86	654,290	0	0
March	66,874·77	98,155·54	165,030·31	701,004	3	11¾	44,191·93	92,642·68	136,834·61	581,236	9	6¾	52,275·84	108,641·80	160,917·64	683,534	13	8¾
1st January to 31st March ...	220,989·64	285,459·15	506,448·79	2,151,257	14	4½	191,148·54	284,741·01	475,889·55	2,021,450	6	4½	177,433·95	302,968·95	480,402·90	2,040,621	16	2¼
April	73,722·53	103,091·20	176,813·73	751,056	19	8½	88,396·06	92,603·28	180,999·34	768,836	6	6½	64,553·14	107,583·01	172,136·15	731,187	17	9¼
May	78,631·49	97,227·78	175,859·27	747,002	13	11¼	58,680·69	101,599·36	160,280·05	680,826	7	6½	47,413·38	110,271·90	157,685·28	669,804	9	10¾
June	61,256·95	115,075·82	176,332·77	749,013	19	11¼	70,173·95	97,272·36	167,446·31	711,266	14	3½	48,850·54	106,299·29	155,149·83	659,034	11	9
1st January to 30th June ...	434,600·61	600,853·95	1,035,454·56	4,398,331	7	11½	408,399·24	576,216·01	984,615·25	4,182,379	14	8¾	338,251·01	627,123·15	965,374·16	4,100,648	15	7¼
July	76,425·73	103,671·70	180,097·43	765,005	5	1½	69,317·58	91,400·76	160,718·34	682,688	2	3½	57,415·76	108,585·09	166,000·85	705,126	15	9¾
August	69,720·74	105,389·77	175,110·51	743,822	3	4	71,063·11	97,369·28	168,432·39	715,455	6	3¾	55,370·49	119,310·65	174,681·14	741,998	6	4½
September	60,665·79	110,027·08	170,692·87	725,057	4	6	67,058·42	98,793·28	165,851·70	704,493	4	10	52,589·55	110,707·86	163,297·41	693,643	6	1¾
1st January to 30th September	641,412·87	919,942·50	1,561,355·37	6,632,216	0	11	615,838·35	863,779·33	1,479,617·68	6,285,016	8	2	503,626·81	965,726·75	1,469,353·56	6,241,417	3	11¼
October	61,439·17	100,252·98	161,692·15	686,824	11	11¼	76,517·54	98,090·10	174,607·64	741,686	2	2½	47,313·32	113,309·36	160,622·68	682,281	15	6½
November	64,220·13	106,276·76	170,496·89	724,224	15	1	60,005·52	103,927·46	163,932·98	696,343	0	9	57,745·00	105,503·80	163,248·80	693,436	16	6
December	66,613·61	104,643·38	171,256·99	727,453	9	1	58,254·63	106,817·14	165,071·77	701,180	6	2¼	46,404·75	115,686·09	162,090·84	688,518	2	5¾
Total	**833,685·78**	**1,231,115·62**	**2,064,801·40**	**8,770,718**	**17**	**0¼**	**810,616·04**	**1,172,614·03**	**1,983,230·07**	**8,424,225**	**17**	**3¾**	**655,089·88**	**1,300,226·00**	**1,955,315·88**	**8,305,653**	**18**	**5½**

TABLE IX.

Monthly Returns of GOLD BULLION and GOLD ORES entered for EXPORT during 1905.

Month.	New South Wales.		Victoria.		South Australia.		United Kingdom.		Other Countries.		**TOTALS OF BULLION AND ORE.**			Minted Gold Exported.*
	Bullion.	Ore.	Bullion.	Ore.	Bullion.	Ore.	Bullion.	Ore.	Bullion.	Ore.	**Bullion.**	**Ore.**	**Total.**	
1905.	Fine ozs.	Estimated fine ozs.	Fine ozs.	Estimated fine ozs.	Fine ozs.	Estimated fine ozs.	Fine ozs.	Estimated fine ozs.	Fine ozs.	Estimated fine ozs.	Fine ozs.	Estimated fine ozs.	Fine ozs.	Fine ozs.
January ...	...	232·59	1,967·17		...	...	65,745·74	...	...	...	**67,712·91**	**232·59**	**67,945·50**	11,869·79
February ...	...	284·87	1,395·33	...	...	...	54,955·63	576·78	...	...	**56,350·96**	**861·65**	**57,212·61**	14,217·95
March ...	...	...	2,186·11	...	...	...	50,089·14	·59	...	...	**52,275·25**	**·59**	**52,275·84**	11,853·48
April	...	94·17	1,693·14	...	...	...	62,763·48	2·35	...	...	**64,456·62**	**96·52**	**64,553·14**	9,481·68
May	...	105·94	958·16	...	...	...	46,304·16	23·78	[1]† 21·34	...	**47,283·66**	**129·72**	**47,413·38**	11,876·23
June	...	51·79	1,159·28	...	...	...	47,322·54	316·93	...	...	**48,481·82**	**368·72**	**48,850·54**	7,106·43
July	...	134·19	1,294·12	...	...	...	55,985·10	2·35	...	...	**57,279·22**	**136·54**	**57,415·76**	9,481·59
August ...	...	70·62	1,535·29	...	...	11·01	53,733·85	19·72	...	...	**55,269·14**	**101·35**	**55,370·49**	9,499·67
September ...	...	153·02	650·46	...	...	...	50,929·82	856·25	...	...	**51,580·28**	**1,009·27**	**52,589·55**	4,736·26 ‡ 56·00
October ...	...	23·54	1,836·04	...	...	...	44,414·98	998·15	...	[2]† 20·96 [3]† 19·65	**46,251·02**	**1,062·30**	**47,313·32**	11,858·55
November ...	...	47·08	1,540·36	...	...	...	56,157·56	...	...	...	**57,697·92**	**47·08**	**57,745·00**	11,853·72
December ...	...	94·17	1,279·41	...	...	...	44,911·84	88·62	[1]† 9·99	[4]† 20·72	**46,201·24**	**203·51**	**46,404·75**	9,478·86
Totals ...	...	1,291·98	17,494·87	...	...	11·01	633,313·84	2,885·52	31·33	61·33	**650,840·04**	**4,249·84**	**655,089·88**	123,370·21

* When considering the total production for the State, these amounts must be disregarded, having already been recorded in the total receipts of gold at the Mint. [1]† To India; [2]† To United States of America; [3]† To France; [4]† To Germany. ‡ To United Kingdom. All the other amounts were fine bars of minted gold exported to India.

PART II.—MINERALS OTHER THAN GOLD.

TABLE X.

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 1905 and previous years.

Year.	Month.	BLACK TIN.						TANTALITE.						COPPER ORE.									
		Greenbushes Mf.		Marble Bar D.		Total.		Greenbushes Mf.		Marble Bar D.		Total.		Day Dawn D.		Mt. Malcolm D.		Northampton Mf.		Phillips River Gf.		West Pilbarra Gf.	
		Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Previous to 1899	...	tons 1,590·33	£ 66,108	tons. 75·45	£ 4,419	tons. 1,665·78	£ 70,527	tons. ...	£ ...	tons. ...	£ ...	tons. ...	£ ...	tons. ...	£ ...	tons. ...	£ ...	tons. ...	£ ...	tons. ...	£ ...	tons. 7,018·00	£ 55,270
1899	...	277·32	21,658	57·50	3,612	334·82	25,270	...	...	...	...	...	...	...	...	273·00	4,338	136·00	2,122	..	...	2,555·00	29,478
1900	...	435·62	29,528	387·87	27,174	823·49	56,702	...	...	...	...	...	...	5·15	91	4,539·00	30,718	...	...	34·00	725	1,605·00	12,139
1901	...	321·34	18,852	412·98	21,148	734·32	40,000	...	...	...	...	...	...	10·50	76	7,660·00	40,738	38·50	277	1,089·14	12,918	1,162·00	15,891
1902	...	403·21	24,680	216·35	15,103	619·56	39,783	...	...	...	...	...	...	...	...	1,954·00	6,852	...	...	308·25	1,238	...	...
1903	...	524·94	34,362	292·11	21,528	817·05	55,890	...	...	...	...	...	...	...	...	18,965·00	45,557	...	...	1,561·33	10,984	...	..
1904	...	533·64	34,462	320·86	24,355	854·50	58,817	...	...	...	...	...	...	...	...	500·00	900	...	...	3,468·89	24,280	...	...
1905	...	643·52	52,960	435·74	33,880	1,079·26	86,840	2·34	1,590	70·95	8,925	73·29	10,515	...	...	60·00	674	...	...	2,329·04	15,592	...	...
	Total	**4,729·92**	**282,610**	**2,198·86**	**151·219**	**6,928·78**	**433,829**	**2·34**	**1,590**	**70·95**	**8,925**	**73·29**	**10,515**	**15·65**	**167**	**33,951·00**	**129,777**	**174·50**	**2,399**	**8,790·65**	**65,737**	**12,340·00**	**112,778**

Year.	Month.	COPPER ORE.		IRONSTONE.						LEAD ORE.		SILVER-LEAD ORE.		COAL.		LIMESTONE.						DIAMONDS.	
		Total.		West Pilbarra Gf.		State generally.		Total.		Northampton Mf.		Ashburton Gf.		Collie River Coal Mf.		Yilgarn Gf.		State generally.		Total.		Nullagine D.	
		Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Previous to 1899	...	tons. 7,018·00	£ 55,270	tons. 100·00	£ 300	tons. ...	£ ...	tons. 100·00	£ 300	tons. ...	£ ...	tons. ...	£ ...	tens. 3,508·00	£ 1,761	tons. ...	£ ...	tons. ...	£ ...	tons. ...	£ ...	carats. ...	£ ...
1899	...	2,964·00	35,938	...	...	12,852·00	8,939	12,852·00	8,939	82·75	912	...	...	54,336·00	25,951	...	...	17,593·00	2,838	17,593·00	2,838	*	24
1900	...	6,183·15	43,673	...	...	12,251·00	9,258	12,251·00	9,258	268·00	533	...	...	118,410·10	54,835	269·85	273	15,657·00	3,321	15,926·85	3,594	...	...
1901	...	9,960·14	69,900	...	...	20,569·00	13,246	20,569·00	13,246	...	...	21·05	152	117,835·80	68,561	1,642·00	919	16,568·00	3,429	18,210·00	4,348	...	...
1902	...	2,262·25	8,090	...	...	4,800·00	2,040	4,800·00	2,040	...	...	35·85	277	140,883·90	86,188	535·00	340	4,545·35	1,000	5,080·35	1,340	...	...
1903	...	20,526·33	56,541	...	...	220·00	88	220·00	88	...	...	...	...	133,426·62	69,128	102·00	75	1,177·50	103	1,279·50	178	...	...
1904	...	3,968·89	25,180	...	...	1,441·50	577	1,441·50	577	...	...	...	...	138,550·04	67,174	...	...	13,397.20	1,699	13,397·20	1,699	...	...
1905	...	2,389·04	16,266	...	...	3,212·60	1,285	3,212·60	1,285	...	...	...	...	127,364·06	55,312	...	...	9,144·60	1,220	9,144·60	1,220	...	...
	Total ...	**55,271·80**	**310,858**	**100·00**	**300**	**55,346·10**	**35,433**	**55,446·10**	**35,733**	**350·75**	**1,445**	**56·90**	**429**	**834,314·52**	**428,910**	**2,548·85**	**1,607**	**78,082·65**	**13,610**	**80,631·50**	**15,217**	...	**24**

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 XX., pages 192-195 of the Annual Mining Statistics of the Department of Mines for the year 1905. * Weight unknown.

TABLE XI.

Quantity and Value of BLACK TIN reported to the Mines Department during 1905, and the Total Output to date.

Goldfield, District, or Mineral Field.	Locality.	Number of Lease.	Registered Name of Company or Mine.	1905.		Total to Date.		Remarks.
				Quantity.	Value.	Quantity.	Value.	
				tons.	£	tons.	£	
Greenbushes, Mf.	Greenbushes	35	(Horans)	...	...	188·35	11,605	
Do. ...	do.	35, 169 218(228) 272, 287	Westralian Stannaries, Ltd.	1·50	125	78·70	5,206	
Do. ...	do. ...	73	(Nelson)	...	...	22·40	1,675	
Do. ...	do. ...	73, 233	Nelson leases	20·36	1,469	54·84	3,630	
Do. ...	do. ...	147	Haphazard	...	...	7·78	468	
Do. ...	do. ...	169	(Horans No. 1 North) ...	...	...	9·50	684	
Do. ...	do. ...	218	(W.A. Mount Bischoff) ...	...	...	5·38	342	
Do. ...	do. ...	244	Mount Pleasant	22·55	2,052	36·45	2,995	
Do. ...	do. ...	271	Pioneer	...	...	1·84	117	
Do. ...	do. ...	296	Central	25·09	2,267	43·15	3,573	
Do. ...	do. ...	300, (315)	South Cornwall leases ...	1·74	140	14·84	1,071	
Do. ...	do. ...	(317)	(Queen May Consols) ...	1·23	94	22·01	1,454	
Do. ...	do. ...	331	Lady Esther	3·00	212	10·00	744	
Do. ...	do. ...	337, 706c	Gladstone	17·71	1,478	24·13	1,912	
Do. ...	do. ...	356	Cornwall	11·30	874	13·63	1,037	
Do. ...	do. ...	357	Greenbushes Sluicing Co., Ltd.	21·33	1,826	21·33	1,826	
Do. ...	do. ...	361	Baronia	5·05	406	5·05	406	
Do. ...	do. ...	374	Lost and Found	·75	70	·75	70	
Do. ...	do. ...	375	Glasgow	·15	14	·15	14	
Do. ...	do. ...	382	Dreamland	1·32	139	1·32	139	
Do. ...	do. ...	388	Dixie	·52	42	·52	42	
Do. ...	do. ...	Locs. 289, 290	Freehold ground (Clarth and others)	84·07	7,124	111·86	9,155	
Do. ...	do. ...	...	Voided leases	...	...	129·63	8,169	
Do. ...	do. ...	...	Sundry claims	425·85	34,628	3,926·31	226,276	
			Total	643·52	52,960	4,729·92	282,610	
Marble Bar D. ...	Cooglegong ...	...	Sundry claims	141·13	12,034	760·35	52,179	
Do. ...	Moolyella ...	...	Voided leases	...	...	330·53	21,340	
Do. ...	do. ...	...	Sundry claims	256·21	18,727	931·19	64,708	
Do. ...	Old Shaw ...	...	Voided leases	...	...	6·75	424	
Do. ...	do. ...	...	Sundry claims	17·65	1,394	138·59	10,106	
Do. ...	Wodgina ...	77	Stanum	·75	60	4·35	255	
Do. ...	do. ...	84	Mount Cassiterite	7·50	635	13·85	1,132	
Do. ...	do. ...	...	Sundry Claims	12·50	1,030	13·25	1,075	
			Total	435·74	33,880	2,198·86	151,219	
			Grand Total ...	**1,079·26**	**86,840**	**6,928·78**	**433,829**	

TABLE XII.

Quantity and Value of TANTALITE reported to the Mines Department during 1905, and the Total Output to date.

Goldfield, District, or Mineral Field.	Locality.	Number of Lease.	Registered Name of Company or Mine.	1905.		Total to Date.		Remarks.
				Quantity.	Value.	Quantity.	Value.	
				tons.	£	tons.	£	
Greenbushes Mf.	Greenbushes	369	Enterprise	2·34	1,590	2·34	1,590	
Marble Bar D. ...	Wodgina ...	86, 87	H.M. and Anchorite ...	26·00	3,425	26·00	3,425	
Do. ...	Do. ...	...	Sundry claims	44·95	5,500	44·95	5,500	
			Total	**73·29**	**10,515**	**73·29**	**10,515**	

TABLE XIII.

Quantity and Value of COPPER ORE reported to the Mines Department during 1905, and the Total Output to date.

Goldfield, District, or Mineral Field.	Locality.	Number of Lease.	Registered Name of Company or Mine.	1905. Quantity. Ore.	1905. Quantity. Metallic Copper.	1905. Value.	Total to Date. Quantity (Ore).	Total to Date. Value.	Remarks.
				tons.	tons.	£	tons.	£	
Day Dawn D. ...	Day Dawn ...	...	Voided leases ...	...	...	...	15·65	167	
Mt. Morgans D. ...	Murrin Murrin	(6c) 4f (10c) 5f (11c)	Murrin Copper Mines, Ltd.	...	...	...	33,891·00	129,103	
Do. ...	do. ...	6f (48c)	Murrin Murrin Nangaroo	60·00	14·70	674	60·00	674	
Northampton Mf.	Geraldine ...	...	Voided leases ...	...	...	...	136·50	1,992	
Yandanooka Mf. ...	Yandanooka	...	Voided leases ...	...	...	...	38·00	407	
Phillips River Gf.	Kundip ...	(197)	(Afric)	6·02	·78	39	6·02	39	
Do. ...	do. ...	184	Christmas Gift ...	15·81	1·90	95	27·97	210	
Do. ...	do. ...	52, 94	(Harbour View leases)	48·73	6·94	347	604·36	4,524	
Do. ...	do. ...	(179)	(Mosaic)	19·76	1·57	78	53·48	310	
Do. ...	do. ...	52, 94	Ravensthorpe G.M. Syndicate, N.L.	94·89	15·11	755	94·89	755	
Do. ...	do. ...	60	Red, White, and Blue	171·96	19·65	1,047	233·02	1,660	
Do. ...	do. ...	...	Voided leases ...	...	...	...	20·40	198	
Do. ...	Mt. Desmond	186	C.D.C.	18·07	3·13	156	36·50	282	
Do. ...	do. ...	168	(Elverton South) ...	...	...	...	18·48	119	
Do. ...	do. ...	109	Mt. Desmond ...	76·05	10·78	541	198·87	1,640	
Do. ...	do. ...	108	Mt. Stennett ...	...	...	...	197·66	1,633	
Do. ...	do. ...	(188)	(O.K.)	6·67	1·00	50	6·67	50	
Do. ...	do. ...	95	Phillips River Options Syndicate, N.L.	443·42	61·45	3,072	2,752·03	20,933	
Do. ...	do. ...	199	P.L.P.	45·23	8·15	409	52·66	461	
Do. ...	do. ...	...	Voided leases ...	...	...	...	138·63	1,567	
Do. ...	do. ...	...	Sundry claims ...	10·62	1·76	87	21·30	177	
Do. ...	Ravensthorpe	215	Birthday	5·47	·72	36	5·47	36	
Do. ...	do. ...	196	Contest	5·12	·58	29	5·12	29	
Do. ...	do. ...	(187)	(Copper Horseshoe)	1·25	·27	13	13·55	100	
Do. ...	do. ...	124	Emily Hale	29·56	5·22	262	95·49	799	
Do. ...	do. ...	(119)	(Kilmore)	11·09	1·35	67	72·78	532	
Do. ...	do. ...	116	Last Chance	75·58	12·20	611	614·22	5,048	
Do. ...	do. ...	200	Last Chance Proprietary	17·32	2·28	113	17·32	113	
Do. ...	do. ...	16	Marion Martin ...	329·25	44·32	2,216	865·69	6,650	
Do. ...	do. ...	7	Mary	168·75	22·72	1,135	768·42	5,492	
Do. ...	do. ...	175	Mt. Benson	364·68	44·28	2,212	591·82	3,642	
Do. ...	do. ...	195	Mt. Benson Extended	2·55	·42	21	2·55	21	
Do. ...	do. ...	15	Mt. Cattlin	182·14	18·14	1,053	281·56	1,716	
Do. ...	do. ...	219	Puzzler	9·86	1·39	69	9·86	69	
Do. ...	do. ...	115	Sunset	87·00	9·65	484	438·66	2,866	
Do. ...	do. ...	114	Surprise	61·42	9·19	460	220·88	1,711	
Do. ...	do. ...	...	Voided leases ...	...	...	...	266·58	1,896	
Do. ...	do. ...	...	Sundry claims ...	20·77	2·71	135	43·24	270	
West River ...	... ...	...	Sundry claims ...	...	...	...	14·50	189	
			Total ...	2,329·04	307·66	15,592	8,790·65	65,737	
West Pilbarra Gf.	Croydon ...	31	British Exploration of Australasia, Ltd.	...	...	...	453·00	5,593	
Do. ...	do. ...	...	Voided leases ...	...	...	...	40·00	595	
Do. ...	Egina ...	...	Voided leases ...	...	...	...	530·00	6,571	
Do. ...	Roebourne ...	...	Voided leases ...	...	...	...	181·00	2,746	
Do. ...	Whim Creek	34	Balla Balla Copper Mines, Ltd.	...	...	...	2,009·00	12,036	
Do. ...	do. ...	...	Freehold of 100 acres	...	...	...	9,097·00	84,987	
Do. ...	do. ...	...	Voided leases ...	...	...	...	30·00	250	
			Total ...	...	...	...	12,340·00	112,778	
			Grand Total ...	**2,389·04**	**322·36**	**16,266**	**55,271·80**	**310,858**	

TABLE XIV.

Quantity and Value of IRONSTONE reported to the Mines Department during 1905, and the Total Output to date.

Goldfield, District, or Mineral Field.	Locality.	Number of Lease.	Registered Name of Company or Mine.	1905. Quantity.	1905. Value.	Total to Date. Quantity.	Total to Date. Value.	Remarks.
				tons.	£	tons.	£	
West Pilbarra Gf.	Whim Creek	...	Voided leases	...	...	100·00	300	
East Coolgardie Gf.	Boulder ...	...	Voided leases	...	...	450·00	247	
	** From State generally—*							
	Avon			...	...	22,223·00	16,241	
	Clackline			3,212·60	1,285	15,880·10	7,839	
	Coates' Paddock			...	...	4,712·00	3,277	
	Greenbushes			...	...	7,481·00	4,629	
	Werribee			...	...	4,600·00	3,200	
			Total	**3,212·60**	**1,285**	**55,446·10**	**35,733**	

* Ore flux received by the Fremantle Smelter, Ltd.

TABLE XV.

Quantity and Value of LEAD ORE reported to the Mines Department during 1905, and the Total Output to date.

Goldfield, District, or Mineral Field.	Locality.	Number of Lease.	Registered Name of Company or Mine.	1905. Quantity.	1905. Value.	Total to Date. Quantity.	Total to Date. Value.	Remarks.
				tons.	£	tons.	£	
Northampton Mf.	Narra Tarra	...	*From locality generally* ...	...	...	225·00	185	
Do. ...	Northampton	...	Voided leases	...	...	106·75	1,048	
Do. ...	Victoria ...	...	Voided leases	...	...	19·00	212	
			Total	...	...	**350·75**	**1,445**	

TABLE XVI.

Quantity and Value of SILVER-LEAD ORE reported to the Mines Department during 1905, and the Total Output to date.

Goldfield, District, or Mineral Field.	Locality.	Number of Lease.	Registered Name of Company or Mine.	1905. Quantity.	1905. Value.	Total to Date. Quantity.	Total to Date. Value.	Remarks.
				tons.	£	tons.	£	
Ashburton Gf. ...	Ashburton ...	...	Voided leases	...	...	56·90	429	
			Total	...	...	**56·90**	**429**	

TABLE XVII.

Quantity and Value of COAL reported to the Mines Department during 1905, and the Total Output to date.

Goldfield, District, or Mineral Field.	Locality.	Number of Lease.	Registered Name of Company or Mine.	1905.		Total to Date.		Remarks.
				Quantity.	Value.	Quantity.	Value.	
				tons.	£	tons.	£	
Collie River Mf. ...	Collie ...	197, etc.	Cardiff Coal Mining Co., Ltd.	30,392·89	14,059	100,821·15	46,619	
Do. ...	do. ...	151, etc.	Collie-Boulder Coal Co., Ltd.	29,122·86	10,302	35,423·36	13,430	
Do. ...	do. ...	244, etc.	Collie Co-operative Collieries	18,556·31	8,664	19,191·21	8,998	
Do. ...	do. ...	85-100	Collie Proprietary Coalfields of W.A., Ltd. (No. 2 Pit)	35,865·00	16,482	276,121·40	151,705	
Do. ...	do. ...	88	Collie Proprietary Coalfields of W.A., Ltd. (No. 1 Pit) *late* Westralian Wallsend Colliery	13,427·00	5,805	377,187·55	195,228	
Do. ...	do. ...	...	Voided leases	...	...	25,569·85	12,930	
			Total	**127,364·06**	**55,312**	**834,314·52**	**428,910**	

TABLE XVIII.

Quantity and Value of LIMESTONE reported to the Mines Department during 1905, and the Total Output to date.

Goldfield, District, or Mineral Field.	Locality.	Number of Lease.	Registered Name of Company or Mine.	1905.		Total to Date.		Remarks.
				Quantity.	Value.	Quantity.	Value.	
				tons.	£	tons.	£	
Yilgarn Gf. ...	Southern Cross	...	Voided leases	...	...	2,548·85	1,607	
	* *From State generally*—							
	Fremantle			9,144·60	1,220	78,082·65	13,610	
			Total	**9,144·60**	**1,220**	**80,631·50**	**15,217**	

* Ore flux received by the Fremantle Smelter, Ltd.

TABLE XIX.

Quantity and Value of DIAMONDS reported to the Mines Department during 1905, and the Total Output to date.

Goldfield, District, or Mineral Field.	Locality.	Number of Lease.	Registered Name of Company or Mine.	1905.		Total to Date.		Remarks.
				Quantity.	Value.	Quantity.	Value.	
				carats.	£	carats.	£	
Nullagine D. ...	Nullagine ...	M.R.C. 6L	(Morgans, A. E.)	...	...	§	24	§230 tons conglomerate returned 25 small diamonds (weight unknown) and 77·70ozs. gold.
			Total	...	...	...	**24**	

TABLE

Return of Ore and Minerals other than Gold entered for EXPORT from 1850-1905, inclusive, showing

Year.	METALLIC									
	COPPER ORE.									
	West Pilbarra Gf.		Northampton Mf.		Phillips River Gf.		State generally.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons.	£	tons.	£	tons.	£	tons.	£	tons.	£
1850	...	...	...	...	...	...	...	...	...	...
1	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...
3	...	...	[2]†	7·50	...	...	...	...	...	7·50
4	...	...	...	...	...	...	...	...	...	...
5	...	...	2·05	26·45	...	...	...	...	2·05	26·45
6	...	...	57·00	1,017 90	...	...	...	...	57·00	1,017·90
7	...	...	80·00	1,920·00	...	...	...	...	80·00	1,920·00
8	...	...	433·25	9,531·50	...	...	...	...	433·25	9,531·50
9	...	...	941·50	14,122·50	...	...	...	...	941·50	14,122·50
1860	...	...	517·50	8,021·25	...	...	...	...	517·50	8,021·25
1	...	...	409·00	6,339·50	...	...	...	...	409·00	6,339·50
2	...	...	783·50	12,536·00	...	...	...	...	783·50	12,536·00
3	...	...	763·00	12,208 00	...	...	...	...	763·00	12,208·00
4	...	...	1,076·00	17,216·00	...	...	...	...	1,076·00	17,216·00
5	...	...	886·00	13,290·00	...	...	...	...	886·00	13,290·00
6	...	...	557·50	8,362·50	...	...	...	...	557·50	8,362·50
7	...	...	337·00	5,055·00	...	...	...	...	337·00	5,055·00
8	...	...	83·00	1,245·00	...	...	...	...	83·00	1,245·00
9	...	...	155·00	2,325·00	...	...	...	...	155·00	2,325·00
1870	...	...	6·00	90·00	...	...	...	...	6·00	90·00
1	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	...	...	...	...	...	...
3	...	...	56·50	847·50	...	...	...	...	56·50	847·50
4	...	...	66·50	997·50	...	...	...	...	66·50	997·50
5	...	...	204·75	3,071·25	...	...	...	...	204·75	3,071·25
6	...	...	279·00	4,185·00	...	...	...	...	279·00	4,185·00
7	...	...	53·50	802·50	...	...	...	...	53·50	802·50
8	...	...	9·00	135·00	...	...	...	...	9·00	135 00
9	...	...	...	...	...	...	...	...	...	...
1880	...	...	8·00	120·00	...	...	...	...	8·00	120·00
1	...	...	...	...	...	...	...	...	...	...
2	...	...	1·50	22·50	...	...	...	...	1·50	22·50
3	...	...	5·00	75·00	...	...	...	...	5·00	75·00
4	...	...	118·00	1,770·00	...	...	...	...	118·00	1,770·00
5	...	...	119·50	1,792·50	...	...	...	...	119·50	1,792·50
6	...	...	249·00	3,735·00	...	...	...	...	249·00	3,735·00
7	...	...	23·00	345·00	...	...	...	...	23·00	345·00
8	...	...	87·50	1,487·50	...	...	...	...	87·50	1,487·50
9	...	...	112·00	1,904·00	...	...	...	...	112·00	1,904·00
1890	...	...	8·00	136·00	...	...	...	...	8·00	136·00
1	262·50	4,462·50	...	...	...	...	...	...	262·50	4,462·50
2	[1]† 412·00	6,318·80	155·00	2,377·20	...	...	...	...	567·00	8,696·00
3	50·00	606·00	...	...	...	...	...	...	50·00	606·00
4	...	...	...	...	...	...	...	...	...	...
5	802·00	12.832·00	24·00	120·00	...	...	...	...	826·00	12,952·00
6	6·30	100·00	...	...	...	...	...	...	6·30	100·00
7	64·85	731·25	21·15	302·00	...	...	...	...	86·00	1,033·25
8	*a* 280·87	3,334·00	*b* 74·53	931·50	...	...	...	...	355·40	4,265·50
9	1,404·50	31,978·50	586·55	9,473 25	...	...	..	...	1,991·05	41,451·75
1900	543·55	10,696·00	...	...	105·15	2,411·00	*c* 197·41	3,355·00	*d* 846·11	16,462·00
1	1,058·00	26,464 00	·50	10·00	1,205·00	22,107·00	396·75	6,322·00	2,660·25	54,903·00
2	68·50	1,698·00	20·00	330·00	162·00	2,469·00	33·00	489·00	283·50	4,986·00
3	3·60	180·00	25·05	460·00	301 70	3,538·00	15·45	349·00	345·80	4,527·00
†4	50·00	500·00	...	...	11·00	154·00	72·00	1,589·00	133·00	2,243·00
†5	...	...	...	...	80·00	2,808·00	4·00	206·00	84·00	3,014·00
Total	**5,006·67**	**99,901·05**	**9,394·83**	**148,744·30**	**1,864·85**	**33,487 00**	**718 61**	**12,310·00**	**16,984·96**	**294,442·35**

† These figures are liable to revision, as they refer to Countries *beyond the Commonwealth only*. The interstate export figures of Western not stated. [3]† Probably the produce of the Greenbushes Tinfield. *a* 280 tons 17cwts. 2qrs. *b* 74 tons 10cwts. 2qrs. *h* 278 tons 8cwts. 1qr. *i* 101 tons 18cwts. 3½qr.

XX.

the quantity obtained from certain Goldfields and Mineral Fields, and the declared value thereof.

MINERALS.								
LEAD ORE.		BLACK TIN (Dressed Tin).						YEAR.
Northampton Mf.		Pilbarra Gf.		Greenbushes Mf.		Total.		
Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	
tons.	£	tons.	£	tons.	£	tons.	£	
5·00	55·00	...	...	...	...	...	...	1850
...	...	...	...	...	...	...	...	1
...	...	...	...	...	...	...	...	2
[2]†	4·00	...	...	...	...	...	...	3
...	...	...	...	...	...	...	...	4
25·00	250·00	...	...	...	...	...	...	5
...	...	...	...	...	...	...	...	6
...	...	...	...	...	...	...	...	7
...	...	...	...	...	...	...	...	8
13·50	135·00	...	...	...	...	...	...	9
98·50	985·00	...	...	...	...	...	...	1860
79·00	790·00	...	...	...	...	...	...	1
9·00	90·00	...	...	...	...	...	...	2
230·00	2,300·00	...	...	...	...	...	...	3
80·00	800·00	...	...	...	...	...	...	4
703·00	8,436·00	...	...	...	...	...	...	5
273·50	3,282·00	...	...	...	...	...	...	6
902·00	10,824·00	...	...	...	...	...	...	7
1,100·50	13,206·00	...	...	...	...	...	...	8
699·50	8,394·00	...	...	...	...	...	...	9
1,209·50	14,514·00	...	...	...	...	...	...	1870
420·00	5,040·00	...	...	...	...	...	...	1
364·00	4,368·00	...	...	...	...	...	...	2
965·50	11,586·00	...	...	...	...	...	...	3
2,143·75	25,725·00	...	...	...	...	...	...	4
2,289·00	27,468·00	...	...	...	...	...	...	5
2,191·50	26,298·00	...	...	...	...	...	...	6
3,955·50	47,466·00	...	...	...	...	...	...	7
3,617·50	43,410·00	...	...	...	...	...	...	8
2,775·00	33,300·00	...	...	...	...	...	...	9
1,921·00	15,368·00	...	...	...	...	...	...	1880
1,400·50	11,204·00	...	...	...	...	...	...	1
1,793·50	14,348·00	...	...	...	...	...	...	2
1,038·00	7,266·00	...	...	...	...	...	...	3
696·00	4,872·00	...	...	...	...	...	...	4
465·00	3,255·00	...	...	...	...	...	...	5
611·00	4,277·00	...	...	...	...	...	...	6
471·00	4,710·00	...	...	...	...	...	...	7
532·00	5,320·00	...	...	...	...	...	...	8
250,00	2,500·00	...	...	...	...	[3]†5·00	300·00	9
213·50	2,135·00	...	...	...	...	[3]†67·50	5,400·00	1890
25·00	250·00	...	...	204·00	10,200·00	204·00	10,200·00	1
29·75	150·00	...	...	*f* 265·49	13,843·00	*f* 265·49	13,843·00	2
...	...	56·45	3,470·00	171·50	7,664·00	227·95	11,134·00	3
...	...	19·00	949·00	371·25	14,325·00	390·25	15,274·00	4
...	...	...	...	277·15	9,703·00	277·15	9·703·00	5
...	...	...	...	137·25	4,338·00	137·25	4,338·00	6
[2]†	4·00	...	...	95·55	3,275·00	95·55	3,275·00	7
5·00	33·00	...	...	*g* 68·14	2,760·00	*g* 68·14	2,760·00	8
16·00	96·00	29·55	2,025·00	*h* 278·41	21,138·00	*j* 307·96	23,163·00	9
26·85	242·00	*e* 368·34	30,146·00	*i* 101·94	8,032·00	*k* 470·28	38,178·00	1900
...	...	439·00	34,600·00	67·50	4,895·00	506·50	39,495·00	1
...	...	248·00	19,698·00	31·00	2,870·00	279·00	22,568·00	2
...	...	267·00	20,988·00	24·70	1,868·00	291·70	22,856·00	3
...	...	64·00	4,932·00	24·00	1,389·00	88·00	6,321·00	†4
...	...	188·00	16,853·00	119·00	8,177·00	307·00	25,030·00	†5
33,643·85	**364,756·00**	**1,679·34**	**133,661·00**	**2,236·88**	**114,477·00**	**3,988·72**	**253,833·00**	

Australia for 1904 are not yet available. [1] †*See* Woodward's Mining Handbook, Perth: By Authority, 1895; p. 123. [2]† Declared; weight
c 197 tons 8cwts. 1qr. *d* 846 tons 2cwts. 1qr. *e* 368 tons 6cwts. 3qrs. *f* 265 tons 9cwts. 3 qrs. *g* 68 tons 2cwts. 3qrs.
j 307 tons 19 cwts. 1qr. *k* 470 tons 5cwts. 2¼qrs.

TABLE XX.—*Return of Ore and Minerals, other than Gold,*

YEAR.	NON-METALLIC MINERALS.						ORES NOT OTHERWISE ENUMERATED.		COPPER INGOT.	
	ASBESTOS.		COAL.		MICA.					
	State generally.		Collie River Coal Mf.		State generally.				State generally.	
	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	...	...	...	...	...	...	...	...	...	...
9	...	...	...	...	...	...	...	...	...	...
1890	...	...	...	...	...	...	...	...	...	...
1	...	...	...	...	...	...	...	...	...	...
2	...	...	...	...	[2]†	25·00	...	...	...	...
3	...	...	...	...	[2]†	4·00	...	...	...	...
4	...	...	...	...	...	...	...	...	...	...
5	...	...	...	...	[2]†	3·00	...	...	...	...
6	...	...	...	...	...	...	...	...	...	...
7	...	...	...	...	[2]†	209·00	...	...	...	...
8	..	...	1·00	1·00	...	...	...	...	...	...
9	†	1·00	798·00	772·00	[4]†	50·00	...	...	...	...
1900	...	...	355·00	350·00	[2]†	3·00	5·00	85·00	248·90	17,475·00
1	...	...	970·75	969·00	...	...	[2]†	4·00	{ 439·40	31,062·00
									{ § 441·10	24,804·00
2	...	...	12·00	12·00	...	...	[7]† 3·00	47·00	§ 175·00	7,918·00
3	·20	10·00	...	...	...	...	[8]† 22·00	230·00	{ 51·45	3,371·00
									{ §1,023·80	29,917·00
†4	...	...	11·00	7·00	...	...	[9]† ·05	2·00	99 00	3,676·00
†5	...	...	108·00	87·00	...	...	{ [10]† 18·00	5,729·00	} § 791·00	53,806·00
							{ [11]† 7·00	178·00	}	
Total	**·20**	**11·00**	**2,255·75**	**2,198·00**	...	**294·00**	**55·05**	**6,275·00**	**3,269·65**	**172,029·00**

[2]† Declared; weight not stated. [4]† 13 packages; weight not stated. [5]† Estimated; no tonnage given. [6]† No tonnage given,
[9]† 1 cwt. plumbago ore. [10]† Unenumerated; principally tantalite. [11]† Spelter, concentrates, dross, and ashes. [12]† Lead
table to show in detail the quantity of Commercial

entered for EXPORT from 1850–1905, inclusive—continued.

COMMERCIAL PRODUCTS. ¶						PRECIOUS STONES.		Year.
SILVER.		TIN INGOT. (White Tin.)		PIG LEAD.				
State generally.		Greenbushes Mf.		State generally.		State generally.		
Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	
ozs.	£	tons.	£	tons.	£	carats.	£	
...	...	...	...	...	...	...	...	1850
...	...	...	...	...	...	...	...	1
...	...	...	...	...	...	...	...	2
...	...	...	...	55·00	1,200·00	...	...	3
...	...	...	...	122·00	2,440·00	...	...	4
...	...	...	...	133·75	2,675·00	...	...	5
...	...	...	...	60·00	1,200·00	...	...	6
...	...	...	...	120·50	2,410·00	...	...	7
...	...	...	...	61·00	1,220·00	...	...	8
...	...	...	...	24·75	495·00	...	...	9
...	...	...	...	...	...	...	...	1860
...	...	...	...	...	...	...	...	1
...	...	...	...	...	...	...	...	2
...	...	...	...	...	...	...	...	3
...	..	...	...	...	...	...	...	4
...	...	...	...	...	...	...	...	5
...	...	...	...	...	...	...	...	6
...	...	...	...	[5]†3·00	50·00	...	...	7
...	...	...	...	...	...	...	...	8
...	...	...	...	...	...	...	...	9
...	...	...	...	...	...	...	...	1870
...	...	...	...	...	...	...	...	1
...	...	...	...	...	...	...	...	2
...	...	...	...	...	...	...	...	3
...	...	...	...	...	...	...	...	4
...	...	...	...	4·25	89·25	...	...	5
...	...	...	...	[5]†7·00	155·00	...	...	6
...	...	...	...	[5]†1·00	15·00	...	...	7
...	...	...	...	...	...	...	...	8
...	...	...	...	...	...	...	...	9
...	...	...	...	[5]†5·00	89·00	...	...	1880
...	...	...	...	[5]†1·00	20·00	...	...	1
...	...	...	...	...	...	...	...	2
...	...	...	...	...	...	...	...	3
...	...	...	...	...	...	...	...	4
...	...	...	...	...	...	...	...	5
...	...	...	...	...	...	...	...	6
...	...	...	...	[5]†6·00	120·00	...	...	7
...	...	...	...	[5]†2·00	40·00	...	...	8
...	..	...	...	...	...	...	...	9
...	...	...	...	...	...	...	...	1890
...	...	...	...	...	...	...	...	1
...	...	...	...	...	...	...	...	2
...	...	...	...	...	...	...	...	3
...	...	...	...	...	...	...	...	4
...	...	...	...	...	...	...	...	5
...	...	...	...	...	...	...	...	6
...	...	...	...	[6]†·50	11·00	...	...	7
...	...	...	...	...	...	...	...	8
...	...	...	...	77·00	1,077·00	...	...	9
28,749·00	3,594·00	142·35	18,872·00	...	...	...	...	1900
60,869·00	7,609·00	96·50	12.607·00	...	...	...	...	1
83,293·00	9,190·00	141·00	16,380·00	...	...	...	...	2
168,113·00	19,153·00	235·35	29,277·00	...	...	...	...	3
399,190·00	45,912·00	129·00	16,155·00	5,352·00	63,170·00	...	...	†4
359,744·00	44,278·00	...	...	[12]†2,730·00	34,471·00	...	...	†5
1,099,958·00	**129,736·00**	**744·20**	**93,291·00**	**8,765·75**	**110,947·25**	...	...	...

6 packages estimated at 10 cwts. [7]† 2 tons cobalt ore, value £41 : 1 ton plumbago ore, value £6 [8]† 22 tons antimony ore, value £230, contained in bullion from the Fremantle Swelters, Ltd. ¶ Advantage has been taken of the series of years covered by this Products exported. § Copper Matte.

PART III.—

TABLE

Quantity and Estimated Value of MINING

Goldfield.	District.	State Batteries.	Motive Plant.									
			Employed in Mining.		Employed in Reduction.							
			Steam Boilers.	Steam Engines.	Steam Boilers.	Steam Engines.	Portable Boiler and Engines.	Oil Engines.	Gas Engines.	Electric Motors.	Air Compressors.	Air Receivers.
			1	2	3	4	5	6	7	8	9	10
1. Kimberley	... ...	... ...	6	3	2	...	2	..	...	...	...	...
2. Pilbarra	Marble Bar ...	... ...	4	4	4	4	2	...	...	...	...	...
	Mullagine ...	... ...	2	1	...	...	3	...	...	...	...	...
	do.	20-Mile Sandy ...	...	...	1	1	...	...	...	...	...	...
3. West Pilbarra	... ...	... ...	1	...	3	3	1	...	...	...	...	...
4. Ashburton	... ...	... ...	...	...	...	...	...	...	...	...	...	...
5. Gascoyne	... ...	... ...	...	...	...	...	...	...	...	...	...	...
6. Peak Hill	... ...	... ...	3	2	7	14	...	...	...	...	2	4
Do.	... ...	Ravelstone	...	...	1	1	...	...	...	...	1	...
7. East Murchison ...	Lawlers	... ...	41	19	23	26	6	...	1	6	7	7
	do.	Darlôt	...	...	1	1	...	...	...	...	...	...
	do.	Wiluna	...	...	1	...	1	...	...	...	...	...
	Black Range ...	... ...	2	2	4	3	...	...	...	...	...	...
	do.	Black Range	...	...	2	1	...	...	...	..	...	...
8. Murchison	Cue	... ...	17	9	9	8	...	...	...	...	2	2
	do.	Tuckanarra	...	...	1	1	...	...	...	...	...	...
	Nannine	... ...	22	21	16	14	2	1	...	...	5	5
	do.	Meekatharra ...	...	...	2	1	1	...	...	...	...	...
	Day Dawn	... ...	18	12	11	9	3	2	...	8	6	6
	Mt. Magnet ...	... ...	12	6	11	7	...	2	1	...	1	1
	do.	Boogardie	...	...	2	1	...	...	...	...	1	...
	do.	Lennonville	...	...	1	1	...	...	...	...	...	...
9. Yalgoo	... ...	... ...	10	10	9	7	2	...	...	...	2	1
10. Mt. Margaret ...	Mt. Morgans ...	... ...	15	7	11	7	2	1	...	12	8	5
	Mt. Malcolm ...	... ...	21	14	22	16	4	...	...	4	7	8
	do.	Leonora	...	...	1	1	...	...	...	...	...	...
	do.	Pig Well	...	...	1	1	...	...	...	...	...	...
	Mt. Margaret ...	... ...	25	14	18	19	1	...	...	...	6	5
	do.	Burtville	...	...	3	1	...	...	...	...	...	...
	do.	Duketon	...	...	2	1	...	...	...	...	...	...
	do.	Laverton	...	..	2	1	...	...	...	...	1	...
	Menzies	... ...	22	21	15	14	4	2	...	...	11	9
	do.	Menzies	...	...	2	1	...	...	...	...	...	...
	do.	Mt. Ida	...	...	1	1	...	...	...	...	1	1
	Ularring	... ...	9	4	4	8	1	...	...	...	4	4
	do.	Mulline	...	...	2	1	1	...	...	...	..	...
	do.	Mulwarrie	...	...	1	1	...	...	...	...	1	...
11. North Coolgardie ...	Niagara	... ...	21	9	11	10	3	...	...	5	5	4
	do.	Niagara	...	...	2	1	1	...	...	...	...	...
	Yerilla	... ...	9	2	6	5	1	...	...	...	3	3
	do.	Pingin	...	...	1	1	...	...	...	...	...	...
	do.	Yarri	...	...	4	1	...	...	...	...	...	...
	do.	Yerilla	...	...	1	1	...	1	...	...	...	...
	do.	Yundamindera ...	...	...	...	...	1	...	...	...	...	...
12. Broad Arrow	... ...	... ...	14	12	14	15	7	...	...	...	1	3
13. N.E. Coolgardie ...	Kanowna	... ...	29	13	14	14	8	4	...	...	8	8
	Bulong	... ...	3	3	3	2	...	1	...	...	1	1
	do.	Randalls	...	...	2	1	...	...	...	...	...	...
	Kurnalpi	... ...	...	...	2	2	...	...	...	...	...	...
14. East Coolgardie	... ...	... ...	142	73	128	59	10	...	...	90	54	64
15. Coolgardie	Coolgardie	... ...	34	30	33	25	11	...	...	6	11	15
	do.	Coolgardie	...	...	2	1	...	...	...	...	...	...
	do.	Widgiemooltha ...	...	...	1	1	...	...	...	...	1	...
	Kunanalling ...	... ...	13	7	11	7	9	...	...	...	1	1
	do.	Siberia	...	...	1	1	...	...	...	...	...	...
16. Yilgarn	... ...	... ...	15	13	16	11	8	5	...	9	6	6
Do.	... ...	Southern Cross ...	...	...	1	...	1	...	...	...	...	...
17. Dundas	... ...	... ...	13	11	14	9	6	1	1	1	9	8
Do.	... ...	Norseman	...	...	2	2	...	...	...	...	...	...
18. Phillips River	... ...	... ...	3	3	6	5	1	2	...	...	2	2
19. Donnybrook	... ...	... ...	...	...	...	...	...	...	...	...	...	...
State generally	... ...	... ...	...	...	4	6	...	...	...	...	...	...
Total Gold-extracting Machinery			**526**	**325**	**375**	**356**	**103**	**22**	**3**	**141**	**168**	**173**
Tinfield ... Greenbushes Mineral Field			3	1	9	10	5	3	...	6	1	...
Tinfield ... State Tin-dressing Plant			...	...	1	1	...	...	...	...	...	...
Copperfield West Pilbarra Goldfield			...	...	2	1	...	...	...	...	...	...
Copperfield Phillips River State Smelter			...	...	1	1	...	...	...	...	...	...
Coalfield ... Collie River Coal Mineral Field			11	11	1	2	...	...	...	...	4	2
Total Machinery other than Gold-extracting			**14**	**12**	**14**	**15**	**5**	**3**	...	**6**	**5**	**2**
TOTAL MINING MACHINERY			**540**	**337**	**389**	**371**	**108**	**25**	**3**	**147**	**173**	**175**

ALL MINES.

XXI.

MACHINERY erected on the 31st December, 1905.

Pumping Plant.					Hauling Plant.								Reduction Plant.											
															Batteries:		Mills.							
Pumps (Cornish Lift or Plunger).	Steam Pumps.	Centrifugal Pumps.	Electric Pumps.	Baling Tanks.	Single Winding Gear.	Double Winding Gear.	Air Winches.	Electric Winding Engines.	Whims.	Whips.	Endless Rope Trams.	Lifts.	Stone Breakers.	Ore Feeders.	No. of Heads of Battery Stampers.	Prospecting Batteries.	Ball Mills.	Krupp Mills.	Griffin Mills.	Huntington Mills.	Salford Mills.	Tremain Mills.	Flint Mills.	Other Crushers.
11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
...	5	...	...	...	...	...	...	...	...	...	...	...	1	...	50	...	...	...	...	1	...	...	...	...
3	7	...	...	...	1	2	...	...	1	...	...	...	...	1	55	1	...	...	...	...	...	1	...	...
2	8	...	...	...	...	1	...	...	..	3	...	...	...	...	30	...	...	...	...	...	...	...	...	...
...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...	...
1	5	...	...	...	...	...	...	...	...	...	...	...	...	...	20	1	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	8	...	...	...	...	...	...	...	...	...	...	...	2	8	40	3	...	...	...	...	...	...	...	...
...	5	...	...	...	...	...	...	...	...	1	...	...	...	...	10	...	...	...	...	...	...	...	...	...
4	83	...	3	7	9	18	...	...	1	10	...	2	8	26	230	2	1	...	...	...	...	...	...	7
...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...	...
...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...	...
...	10	...	...	...	...	2	...	...	...	...	...	...	2	2	15	1	...	...	...	...	...	1	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	11	...	...	...	...	...	...	...	...	...
8	21	1	...	10	1	8	1	...	1	7	...	1	1	2	100	1	...	..	...	...	...	...	...	...
1	3	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...	...
12	44	4	...	11	10	11	1	...	1	3	...	...	4	12	149	1	...	...	...	...	...	...	...	...
...	6	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	...	..	...	...	...	...	...	...
5	25	...	2	3	4	8	1	...	...	...	1	...	4	26	160	...	...	...	...	...	...	...	...	...
9	26	...	...	8	1	7	...	...	4	4	...	...	3	5	95	...	...	...	...	1	...	1	...	...
...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...	...
...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...	...
7	18	...	...	4	2	6	...	...	...	2	1	...	1	8	75	1	...	...	...	...	...	...	...	...
2	22	3	...	7	5	9	1	...	...	1	1	1	4	26	146	...	...	...	...	...	...	...	...	2
4	37	2	1	5	7	14	3	...	...	10	...	2	7	27	235	...	...	...	...	1	...	1	...	...
...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...	...
6	42	6	...	3	1	14	1	...	...	8	...	...	4	17	152	1	...	...	1	2	...	...	...	1
...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	1	2	10	...	...	...	...	...	...	...	...	...
...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...	...
7	38	3	...	7	5	10	2	...	3	11	2	2	4	15	135	1	...	...	...	...	...	...	...	1
...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...	...
...	2	...	...	...	1	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...	...
2	11	...	...	4	2	4	1	...	...	8	...	...	3	6	50	...	...	...	...	...	...	...	...	1
1	7	...	...	...	...	...	...	...	...	...	...	...	...	...	20	...	...	...	...	...	...	...	...	...
...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...	...
3	30	...	2	4	...	5	2	...	...	3	...	4	7	20	120	...	...	...	...	...	...	1	...	...
...	6	...	...	...	...	...	...	...	...	3	...	...	...	...	10	...	...	...	...	...	...	...	...	...
2	13	1	...	1	3	4	...	...	2	11	...	...	2	4	40	1	...	...	...	...	...	...	...	...
...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	...
...	6	...	...	...	...	...	...	...	...	...	...	...	1	...	10	...	...	...	...	...	...	...	...	...
1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	1	...	...	...	...
7	36	1	...	14	5	8	...	...	2	10	1	...	3	15	175	...	...	1	...	1	...	...	...	1
14	33	2	...	11	5	14	1	...	...	6	1	1	6	25	196	2	1	...	...	1	...	...	...	...
1	5	1	...	4	...	2	2	...	...	4	...	...	2	5	30	...	...	...	...	1	...	...	...	2
...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	10	...	...	...	...	...	...	...	...	...
...	1	...	...	...	...	...	...	...	...	...	...	...	...	1	5	1	...	...	...	...	...	...	...	...
31	141	22	8	35	12	60	16	1	1	30	6	4	53	210	655	2	...	35	28	9	...	...	23	16
7	68	4	3	17	5	26	4	1	1	10	2	1	13	43	299	...	...	...	...	...	...	...	...	...
...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...	...
3	44	...	...	3	3	8	...	...	3	14	...	...	4	12	130	1	2	...	...	...	...	...	...	...
1	3	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	...
8	34	8	3	2	6	8	...	1	...	2	...	...	10	31	175	...	...	...	3	...	...	...	...	...
...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...	...
8	35	1	1	2	2	9	4	...	1	18	...	...	6	16	110	...	2	...	...	...	1	...	...	1
...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...	...
1	10	...	...	1	1	1	1	...	...	3	2	...	1	4	40	2	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1	9	...	...	...	...	...	...	...	...	...	...	10	3	5	...	...	...	1	...	...	...	...	...	3
171	953	59	23	163	91	259	41	3	21	182	17	28	162	576	3,988	22	6	37	32	18	1	5	23	35
1	20	7	...	2	2	...	...	...	...	3	1	...	1	...	5	...	...	...	...	...	...	...	...	2
...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	...
...	2	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...
...	2	...	...	...	...	...	...	...	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...
...	20	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...
1	47	7	...	2	2	...	...	...	...	3	2	1	3	...	10	...	...	...	...	...	...	...	...	2
172	1,000	66	23	165	93	259	41	3	21	185	19	29	165	576	3,998	22	6	37	32	18	1	5	23	37

TABLE XXI.--*Quantity and Estimated Value of MINING*

GOLDFIELD.	DISTRICT.	STATE BATTERIES.	REDUCTION PLANT (*continued*).											
			Puddlers.	Roasting Furnaces.	Tailings Elevators.	Amalgamating Barrels, Pans, and Settlers.	Concentrators.	Classifiers.	Trommels and Revolving Screens.	Cyaniding.		Chlorination Vats.	Melting and Refining Furnaces.	Assay Furnaces.
										Leaching Vats.	Filter Presses.			
			36	37	38	39	40	41	42	43	44	45	46	47
1. Kimberley	...	...	...	...	...	1	...	...	...	...	...	...	...	...
2. Pilbarra	Marble Bar	...	...	...	...	...	1	...	...	24	...	...	...	2
	Nullagine	...	...	...	...	2	...	...	...	8	...	...	1	3
	do.	20-Mile Sandy	...	...	...	...	...	...	...	3	...	...	1	1
3. West Pilbarra	...	...	...	...	...	1	...	...	...	...	...	...	1	1
4. Ashburton	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5. Gascoyne	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6. Peak Hill	...	...	2	...	...	2	...	...	...	8	9	1	1	1
Do.	...	Ravelstone	...	...	...	...	...	...	...	4	...	...	...	...
7. East Murchison	Lawlers	...	...	1	10	11	10	4	...	74	4	...	13	11
	do.	Darlôt	...	...	...	...	...	...	...	4	...	...	...	1
	do.	Wiluna	...	...	...	...	...	...	...	4	...	...	..	...
	Black Range	...	...	...	...	...	...	...	...	10	...	...	...	1
	do.	Black Range	...	1	1	...	...	...	...	8	...	...	2	1
8. Murchison	Cue	...	...	...	2	...	6	...	...	34	...	...	7	4
	do.	Tuckanarra	...	...	...	...	...	...	...	4	...	...	1	...
	Nannine	...	...	...	7	24	4	...	...	40	...	...	8	7
	do.	Meekatharra	...	...	...	6	...	...	...	4	...	...	2	...
	Day Dawn	...	...	3	3	17	33	2	...	43	6	...	3	7
	Mt. Magnet	...	...	...	2	4	...	...	...	30	...	2	8	4
	do.	Boogardie	...	...	...	...	...	...	...	5	...	...	1	1
	do.	Lennonville	...	...	...	...	...	...	...	...	...	...	...	...
9. Yalgoo	...	...	...	...	1	...	...	...	...	15	...	...	3	7
10. Mt. Margaret	Mt. Morgans	...	...	...	2	10	...	...	...	76	3	...	14	9
	Mt. Malcolm	...	...	1	4	17	12	1	...	84	2	1	12	14
	do.	Leonora	...	...	1	2	...	...	...	5	...	...	...	...
	do.	Pig Well	...	...	1	...	...	...	...	4	...	...	1	1
	Mt. Margaret	...	...	1	6	5	11	...	...	62	2	...	8	6
	do.	Burtville	..	...	...	...	...	...	...	3	...	...	...	1
	do.	Duketon	...	...	...	...	...	...	...	3	...	1	2	...
	do.	Laverton	...	1	...	1	...	...	...	3	...	...	2	2
	Menzies	...	...	1	3	16	6	2	...	57	4	...	12	9
	do.	Menzies	...	...	...	...	1	...	...	3	...	...	1	1
	do.	Mt. Ida	...	...	...	3	1	...	...	...	...	...	2	1
	Ularring	...	...	...	...	3	...	...	1	34	1	...	4	4
	do.	Mulline	...	...	...	...	...	...	...	5	1	...	3	1
	do.	Mulwarrie	...	...	...	2	2	...	...	6	...	...	2	2
11. North Coolgardie	Niagara	...	...	1	4	4	12	...	...	55	3	...	6	6
	do.	Niagara	...	...	1	...	...	...	...	3	...	...	3	1
	Yerilla	...	...	...	3	8	...	...	...	38	...	...	1	1
	do.	Pingin	...	...	...	...	...	...	...	2	...	...	1	2
	do.	Yarri	...	...	1	4	...	...	...	3	...	...	2	1
	do.	Yerilla	...	...	...	...	...	...	...	3	...	...	...	...
	do.	Yundamindera	...	...	...	...	...	...	...	6	...	...	...	2
12. Broad Arrow	...	...	...	...	...	...	9	1	...	58	...	...	12	9
13. N.E. Coolgardie	Kanowna	...	6	2	6	28	4	...	...	69	2	...	8	6
	Bulong	...	...	...	2	2	...	...	...	2	...	...	2	1
	do.	Randalls	...	...	...	...	1	...	...	4	...	...	1	1
	Kurnalpi	...	...	...	1	...	...	...	...	...	...	...	...	...
14. East Coolgardie	...	...	8	85	23	85	168	374	7	378	122	...	50	56
15. Coolgardie	Coolgardie	...	...	1	4	23	5	...	...	139	2	5	13	14
	do.	Coolgardie	...	...	...	...	2	...	...	4	...	...	...	...
	do.	Widgiemooltha	...	...	...	2	...	...	...	...	...	...	...	...
	Kunanalling	...	...	...	2	2	...	...	...	38	1	...	8	4
	do.	Siberia	...	...	1	...	...	...	...	3	...	...	1	...
16. Yilgarn	...	...	...	2	6	19	2	...	...	94	...	...	15	11
Do.	...	Southern Cross	...	...	...	4	...	...	...	3	...	...	2	1
17. Dundas	...	...	...	1	3	16	4	...	...	54	2	...	9	8
Do.	...	Norseman	...	...	...	...	...	...	...	5	1	...	...	...
18. Phillips River	...	...	...	...	1	1	5	...	...	5	...	...	1	1
19. Donnybrook	...	...	...	...	...	...	...	...	...	...	...	...	...	...
State generally	...	...	...	4	1	...	...	...	1	...	...	...	...	9
Total Gold-extracting Machinery	...	...	**16**	**105**	**102**	**334**	**291**	**383**	**9**	**1,633**	**165**	**10**	**250**	**237**
TINFIELD	Greenbushes Mining Field	...	13	...	...	...	3	...	1	...	...	...	...	2
	State Tin-dressing Plant	...	...	...	...	...	1	...	...	...	...	...	...	...
COPPERFIELD	West Pilbarra Goldfield	...	...	...	...	...	...	...	...	...	...	...	...	...
	Phillips River State Smelter	...	...	...	...	...	...	...	...	...	...	...	...	1
COALFIELD	Collie River Coal Mineral Field	...	...	...	...	...	...	...	...	...	...	...	...	...
Total Machinery other than Gold-extracting		...	**13**	...	...	...	**4**	...	**1**	...	...	...	...	**3**
TOTAL MINING MACHINERY		...	**29**	**105**	**102**	**334**	**295**	**383**	**10**	**1,633**	**165**	**10**	**250**	**240**

MACHINERY erected on 31st December, 1905—continued.

Water Supply Plant.						Miscellaneous.										Estimated Value of Plant.		
												Coal Mining Machinery.						
Engines.	Pumps.	Dams and Reservoirs.	Tanks.	Condensers.	Windmills.	Rock Drills.	Fan Blasts.	Blowers.	Electric Light Plants.	Blast Furnaces.	Reverberating Smelting Furnaces.	Screens (Fixed).	Ventilating Fans and Furnaces.	Coal Cutting Machines.	Tumblers and Kick-ups.	State Batteries.	District.	Goldfield.
48	49	50	51	52	53	54	55	56	57	58	59					£	£	£
...	...	1	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7,500
...	1	5	3	5	2	...	...	...	...	...	...	...	...	...	...	...	21,018	
...	...	4	23	...	...	...	...	...	...	...	...	...	...	...	...	...	...	37,189
...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	4,771	16,171	
...	...	...	6	...	1	...	...	...	...	...	...	...	...	...	...	...	...	3,200
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	2	1	6	2	...	...	...	...	3	...	...	...	...	...	...	...	...	103,690
...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	2,448	...	
1	21	8	52	9	...	25	...	1	5	3	...	...	...	...	...	...		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3,668	245,898	
...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	2,767		262,520
...	2	...	15	...	...	...	...	...	...	...	...	...	...	...	...	...		
...	3	...	2	...	...	...	...	...	...	...	...	...	...	...	...	4,816	16,622	
4	1	3	13	...	...	4	...	...	...	...	...	...	...	...	...	...		
...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	2,349	45,699	
2	7	1	36	36	...	13	1	1	1	...	...	...	...	...	...	...		
...	...	...	9	...	...	...	...	...	...	...	...	...	...	...	...	3,724	94,150	
2	6	2	30	5	3	51	...	2	1	1	...	...	...	...	...	...	267,873	449,385
...	...	1	12	...	...	4	...	...	1	...	...	...	...	...	...	...		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3,553	41,663	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3,610		
1	2	1	11	2	2	7	...	...	1	...	...	...	...	...	...	...	...	27,870
...	12	4	19	55	6	43	6	...	4	1	...	...	...	...	...	...	201,662	
...	13	6	48	7	1	51	1	1	2	1	...	...	...	...	...	...		
..	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	2,898	134,893	
..	2	...	1	...	...	...	...	...	...	...	...	...	...	...	...	2,000		473,280
2	8	1	35	5	1	25	...	2	1	...	...	...	...	...	...	...		
...	1	...	2	...	...	...	...	...	...	...	...	...	...	...	...	3,682	136,725	
...	2	...	3	...	...	...	...	...	...	...	...	...	...	...	...	6,592		
...	1	...	2	...	...	...	...	...	...	...	...	...	...	...	...	2,653		
5	5	10	45	12	...	45	...	...	7	...	1	...	...	...	...	...		
...	...	1	3	...	...	...	...	...	...	...	...	...	...	...	...	3,651	78,571	
1	2	...	...	...	...	...	..	...	...	...	...	...	...	...	...	4,372		
...	6	7	33	5	...	15	...	...	1	...	...	...	...	...	...	...		
...	...	...	5	1	...	...	...	...	...	...	...	...	...	...	...	6,860	43,999	
...	3	...	3	1	...	...	...	...	...	...	...	...	...	...	...	3,839		
...	3	6	15	2	2	26	3	...	1	...	...	...	...	...	...	...		259,165
...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3,729	101,479	
...	1	1	11	...	...	11	...	...	1	...	...	...	...	...	...	...		
...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	3,306		
...	...	...	2	1	...	...	...	...	...	...	...	...	...	...	...	5,841	35,116	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1,065		
1	5	...	2	...	...	...	...	...	...	...	...	...	...	...	...	2,029		
...	8	7	70	4	2	7	...	1	...	...	3	...	...	...	...	...	...	73,231
...	3	10	59	10	1	39	1	...	5	...	...	...	...	...	...	...	90,275	
...	1	1	38	3	...	2	...	...	...	...	...	...	...	...	...	...		
...	2	...	2	1	1	...	...	...	...	...	...	...	...	...	...	4,851	19,051	109,596
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	270	
3	25	16	235	63	1	378	9	8	18	3	1	...	..	...	...	...	...	1,760,121
1	18	18	182	7	2	42	...	...	3	...	2	...	...	...	...	...		
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3,972	154,718	
...	3	...	3	...	...	...	..	...	...	...	...	...	...	...	...	1,521		189,308
...	4	7	75	15	...	5	...	...	1	...	...	...	...	...	...	...		
...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	2,670	34,590	
1	6	9	41	8	2	21	...	2	2	...	...	...	...	...	...	...	...	
...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	2,550	...	116,831
...	2	8	79	40	4	45	1	...	2	...	...	...	...	...	...	...	...	
1	6	1	...	...	...	...	...	...	...	...	...	...	...	...	...	6,189	...	89,173
...	2	6	9	2	...	2	...	...	1	..	...	...	...	...	...	...	...	25,150
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	6	1	1	...	...	5	1	3	1	...	...	...	...	...	...	55,945
27	190	146	1,273	302	33	861	22	23	62	12	8	...	...	...	...	105,976	...	4,043,154
2	5	7	17	...	...	...	...	...	1	...	4	...	...	...	...	...		
...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	1,719	39,214	...
...	...	1	...	...	...	...	...	1	...	...	..	...	...	...	...	...		
...	1	1	1	...	...	...	...	1	...	1	...	...	...	...	...	1,350	4,350	...
...	...	1	...	...	...	1	...	...	...	...	...	7	4	7	7	...	38,120	...
2	6	11	18	...	...	1	...	2	1	1	4	7	4	7	7	3,069	...	81,684
29	196	157	1,291	302	33	862	22	25	63	13	12	7	4	7	7	109,045	...	4,124,838

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 or under Police escort.

A circular can be obtained from the Deputy Master of the Mint giving all necessary information for intending depositors, conditions of the Escort Service, Coining Regulations, etc., etc.

An Escort Service is provided by the Police Department for parcels of all sizes. The consignor pays for the carriage by coach or train, but the escort charges are collected by the Mint.

Forms for use in connection with gold sent to the Mint by post or under Police escort can be obtained at the Mint.

Charges for Assaying, Refining, and Coinage.

Gross Weight of Deposit in ounces.	Mint charge.	Gross Weight of Deposit in ounces.	Mint charge.	Gross Weight of Deposit in ounces.	Mint charge.
Up to and including—	£ s. d.	Up to and including—	£ s. d.	Up to and including—	£ s. d.
24	0 5 0	400	4 3 4	1,300	10 4 2
30	0 6 3	410	4 5 5	1,400	10 16 8
40	0 8 4	420	4 7 6	1,500	11 9 2
50	0 10 5	430	4 9 7	1,600	12 1 8
60	0 12 6	440	4 11 8	1,700	12 14 2
70	0 14 7	450	4 13 9	1,800	13 6 8
80	0 16 8	460	4 15 10	1,900	13 19 2
90	0 18 9	470	4 17 11	2,000	14 11 8
100	1 0 10	480	5 0 0	2,100	15 4 2
110	1 2 11	490	5 2 1	2,200	15 16 8
120	1 5 0	500	5 4 2	2,300	16 9 2
130	1 7 1	520	5 6 8	2,400	17 1 8
140	1 9 2	540	5 9 2	2,500	17 14 2
150	1 11 3	560	5 11 8	2,600	18 6 8
160	1 13 4	580	5 14 2	2,700	18 19 2
170	1 15 5	600	5 16 8	2,800	19 11 8
180	1 17 6	620	5 19 2	2,900	20 4 2
190	1 19 7	640	6 1 8	3,000	20 16 8
200	2 1 8	660	6 4 2	3,100	21 9 2
210	2 3 9	680	6 6 8	3,200	22 1 8
220	2 5 10	700	6 9 2	3,300	22 14 2
230	2 7 11	720	6 11 8	3,400	23 6 8
240	2 10 0	740	6 14 2	3,500	23 19 2
250	2 12 1	760	6 16 8	3,600	24 11 8
260	2 14 2	780	6 19 2	3,700	25 4 2
270	2 16 3	800	7 1 8	3,800	25 16 8
280	2 18 4	820	7 4 2	3,900	26 9 2
290	3 0 5	840	7 6 8	4,000	27 1 8
300	3 2 6	860	7 9 2	4,100	27 14 2
310	3 4 7	880	7 11 8	4,200	28 6 8
320	3 6 8	900	7 14 2	4,300	28 19 2
330	3 8 9	920	7 16 8	4,400	29 11 8
340	3 10 10	940	7 19 2	4,500	30 4 2
350	3 12 11	960	8 1 8	4,600	30 16 8
360	3 15 0	980	8 4 2	4,700	31 9 2
370	3 17 1	1,000	8 6 8	4,800	32 1 8
380	3 19 2	1,100	8 19 2	4,900	32 14 2
390	4 1 3	1,200	9 11 8	5,000	33 6 8

For every additional 100ozs. the charge is increased by 12s. 6d.

NOTE.—Additional charges (*see* Regulation No. 6) are collected when base metals in a deposit exceed 2 per cent. of its weight.

The following table illustrates the operation of these charges in case of gold of the value of £3 17s. 10½d. an ounce:—

Weight of Deposit.	Rate of Charge per ounce.	Amount of Charge.	Net Value of Deposit.
Ozs.	d.	£ s. d.	£ s. d.
50	2·5	0 10 5	194 3 4
100	2·5	1 0 10	388 6 8
600	2·3	5 16 8	2,330 8 4
1,000	2·0	8 6 8	3,885 8 4
5,000	1·6	33 6 8	19,435 8 4
10,000	1·55	64 11 8	38,872 18 4

NOTE.—From 1st July, 1905, 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 „ „ „ „
„ „ 10,000ozs. upwards „ „ 4 „ „ „ „
The rate at which payment for silver is made is liable to fluctuation. The present price is 2s. 6d. an oz. fine.

GOLD ESCORT SERVICE.

Table of Rates fixed by the Commissioner of Police.

From	To	Period.	Rate per Ounce.	Remarks.
			d.	
Abbotts	Nannine	Monthly ...	1	
Australia United Mine	Malcolm	Do. ...	1½	
Burbanks	Coolgardie	Fortnightly	0½	
Burtville	Malcolm	Monthly ...	0⅞	Not less than 1,000ozs.
Do.	Laverton	Every two months	...	Actual cost: 19s. 3d.
Coolgardie	Perth	Fortnightly	0¼	On all gold for the Mint.
Cork Tree	Lawlers	Monthly ...	1	Or if escort is specially provided, cost £4 6s. 6d.
Cosmopolitan Proprietary, Ltd. ...	Kalgoorlie	Do. ...	1	
Cue	Geraldton	Do. ...	1	
Field's Find	Yalgoo	Do. ...	2	
Geraldton	Perth	Do. ...	2	
Kalgoorlie	Do.	Fortnightly	0¼	Special for Mint only.
Kanowna	Kalgoorlie	Do. ...	0¼	
Kathleen Valley	Lawlers	Monthly ...	0½	
King of the Hills	Kalgoorlie	Do. ...	2	
Laverton	Malcolm	Do. ...	0¾	Not less than 2,900ozs.
Lawlers	Leonora or Malcolm	Do. ...	1⅝	4,000ozs. to 4,500ozs.
Do.	Do. do.	Do. ...	1½	Exceeding 4,500ozs.
Leinster G.M. Co.	Lawlers	...	...	Actual cost: £2 10s. 4d.
Mt. Sir Samuel	Do.	Do. ...	0½	Not less than 1,600ozs.
Malcolm	Kalgoorlie	Do. ...	0⅛	Not less than 7,800czs.
Morgans	Malcolm	Do. ...	0½	Not less than 4,300ozs.
Munara Gully	Nannine	Do. ...	0½	
Nannine	Cue	Do. ...	1	Under 2,000ozs.
Do.	Do.	Do. ...	1½	2,000ozs. to 3,000ozs.
Norseman	Coolgardie	Do. ...	2	
Peak Hill	Nannine	Do. ...	2½	2,000ozs. and not exceeding 2,500ozs.
Do.	Do.	Do. ...	2	2,500ozs. and not exceeding 3,000ozs.
Do.	Do.	Do. ...	1¾	Over 3,000ozs.
Ravensthorpe	Hopetoun	Do. ...	...	Under 500ozs.: Actual cost.
Do.	Do.	Do. ...	1¼	Not less than 500ozs.
Do.	Do.	Do. ...	0⅝	Not less than 1,000ozs.
Wiluna	Malcolm	Do. ...	3⅜	Not less than 2,000ozs.
Yalgoo	Geraldton	Do. ...	0½	
Yerilla	Kalgoorlie	Do. ...	1½	

Rates for carriage of gold on Government Railways:—

	Distance not over—													
	25 miles.		50 miles.		100 miles.		150 miles.		200 miles.		250 miles.		300 miles.		350 miles.	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
Gold dust and bullion per 100ozs. ...	1	0	2	0	3	0	3	9	4	6	5	0	5	6	6	0

6d. per 100ozs. for every additional 50 miles, or part thereof.

NOTE.—A special reduction of 25 per cent. is made for all gold dust or bullion consigned to the Perth Mint.

To find the value per ounce of gold sent from a mine to the Mint.—Divide the standard gold by the weight before melting, and multiply the result by £3 17s. 10½d. For instance, supposing the Mint return to show:—

	Ozs.
Weight before melting	47·41
Standard gold	38·19

The calculation would be as follows:—

4741)3819·0(·805
3792·8
——
26200
23705
——
2495
——

·805 × £3 17s. 10½d. =
·805 × £3·894
·805
——
19470
311520
——
£3·134(670)
20
——
s. 2·680
12
——
d. 8·160 = £3 2s. 8d., value per ounce of gold as produced from the mine.

J. F. CAMPBELL,
Deputy Master.

20th April, 1906.

By Authority: A. CURTIS, Acting Government Printer, Perth.