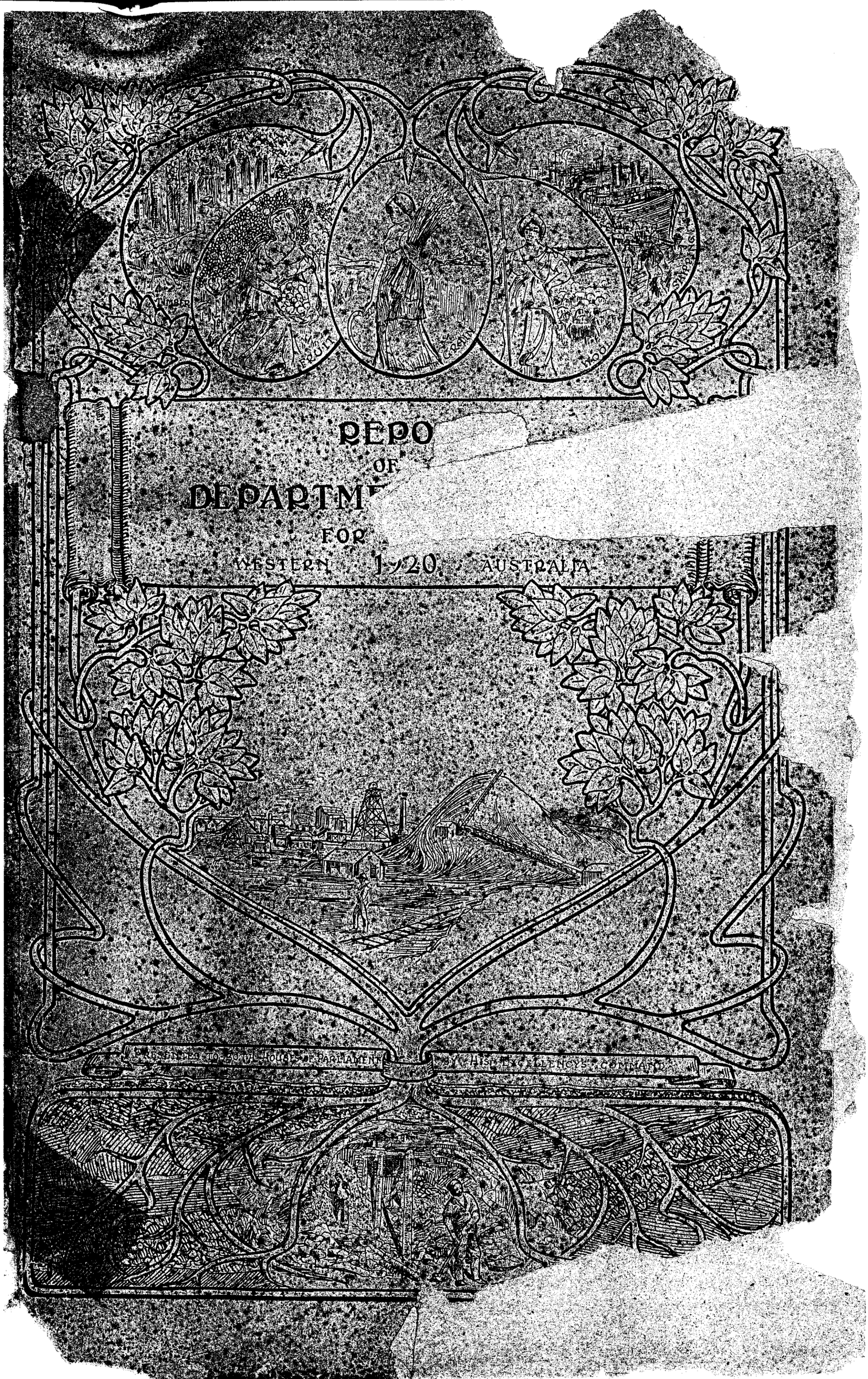


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OF
# DEPARTM
FOR
WESTERN 1920 AUSTRALIA

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

1921.

WESTERN AUSTRALIA.

# REPORT

OF THE

# DEPARTMENT OF MINES

FOR THE YEAR

1920.

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

[FIRST SESSION OF THE ELEVENTH PARLIAMENT.]

PERTH:
BY AUTHORITY : FRED. WM. SIMPSON, GOVERNMENT PRINTER.

1921.

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# ANNUAL REPORT OF THE DEPARTMENT OF MINES, WESTERN AUSTRALIA, 1920.

## TABLE OF CONTENTS.

### DIVISION I.

TABLE OF CONTENTS—*continued.*



(not published)

STATE OF WESTERN AUSTRALIA.

# Report of the Department of Mines for the State of Western Australia, for the Year 1920.

*To the Hon. the Minister for Mines.*

Sir,—

I have the honour to submit the Annual Report of the Department for the year 1920, with summaries of reports from the Wardens and other officers, together with various comparative tables furnishing statistics relating to the Mining Industry of the State.

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

I have, etc.,

M. J. CALANCHINI,

Under Secretary for Mines.

Department of Mines, Perth, 31st March, 1921.

## DIVISION I.

*Summary by the Under Secretary for Mines.*



### PART I.—GENERAL REMARKS.

The value of the mineral output of the State for the year 1920 was £3,259,411, being £301,793 less than that for the previous year.

Copper ore exported showed an increase of 1,056 tons, and copper ingot, matte, etc., an increase of 133 tons.

Coal showed a substantial increase, but silver and tin decreased.

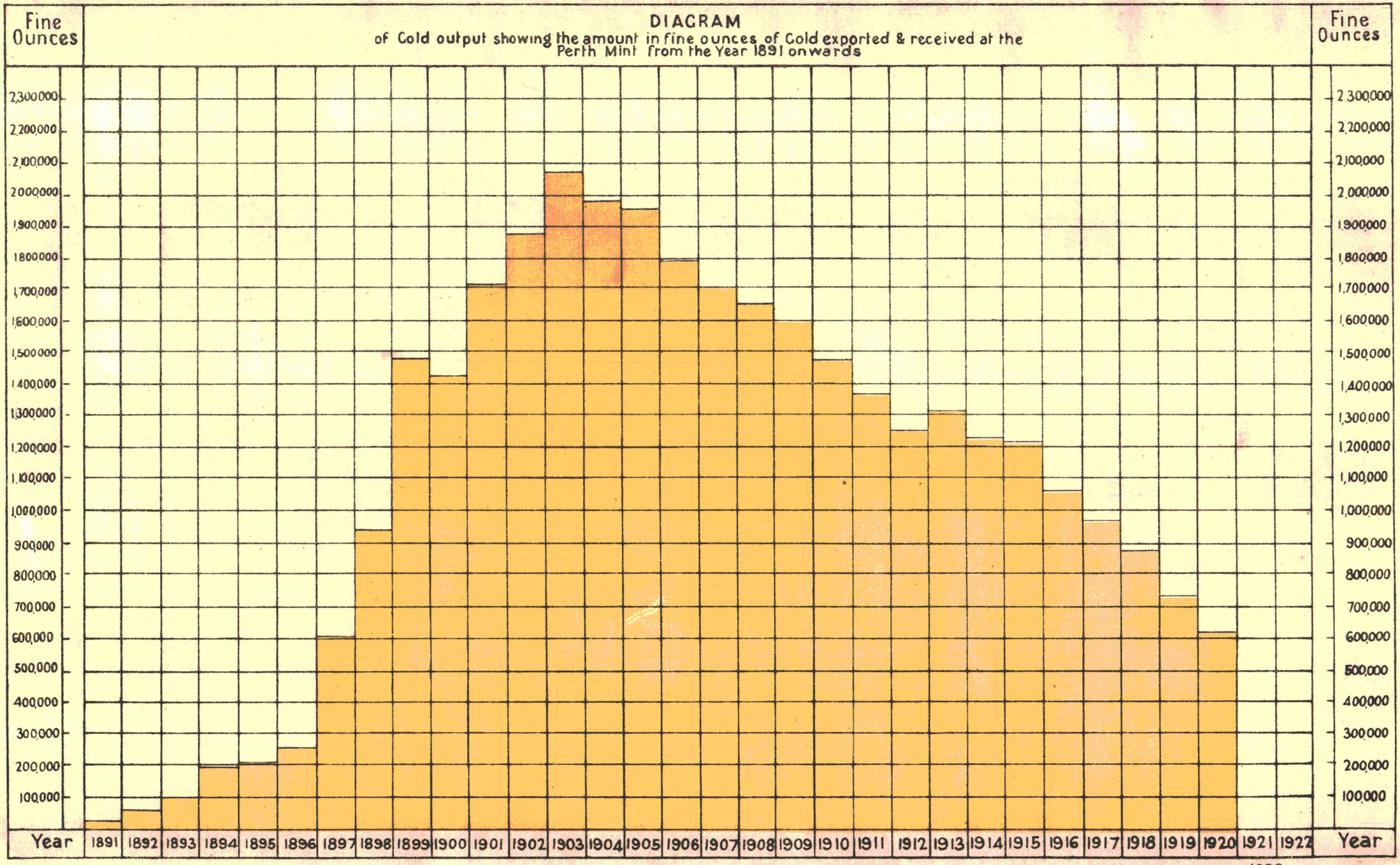
The value of the gold yield was £2,624,427, being 80.51 per cent. of the total output.

The value of the coal output was £350,346, copper £25,165, silver £36,605, and tin £49,449.

The dividends paid by mining companies amounted to £384,083, and in the preceding year £338,244, an increase of £45,839.

# DIAGRAM

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




1920.

The total dividends paid to the end of 1920 were £27,808,747. To the same date the total mineral production was £150,992,044, and the total gold production £143,354,054.

The number of men engaged in mining for minerals other than gold increased by 305, the principal increases being in coal and lead.

In gold mining there was a decrease of 155 men.

The average value of gold produced per man employed on gold mines has fallen from £412.28 in 1919 to £381.26 in 1920.

The average tonnage raised per man was 180.61 tons, and in the previous year 183.72 tons.

In the East Murchison field there was a falling-off, but prospects in the Lawlers centre showed an improvement.

In the Wiluna centre matters were very quiet, but an effort is being made to raise a considerable amount of capital for the development of the large bodies of low-grade ore known to exist, and until this eventuates not much improvement is likely.

The Black Range district showed no change, the principal producer being the large mine at Youanmi, which is reported to be looking better.

The Murchison field showed a decrease, owing to lessened outputs from the mines at Meekatharra.

In the Cue district there was a small improvement, the principal contributors being the Light of Asia and Big Bell mines.

There was little change in the Day Dawn district, although the output showed a small increase. In the Mt. Magnet district there was also an increase, the largest producer being the Mount Zion mine at Boogardie.

The Mt. Margaret field had a decreased output.

In the Mount Margaret district there was a falling-off, and the closing down of the Lancefield and Mary Mac mines towards the end of the year is a serious blow to the industry.

In the Mount Morgans district there was a small increase, the principal producers being the Westralia Mt. Morgans mine at Morgans; elsewhere matters were very quiet.

In the Mount Malcolm district, apart from the Sons of Gwalia mine, mining was very quiet and the output showed a falling-off.

## GOLD.

The gold yield shows a decline, being 116,224 fine ounces less than in 1919, which was 142,445 fine ounces less than for 1918.

The average value per ton of ore treated in the State as a whole has fallen from 44.88 shillings in 1919 to 42.22 shillings in 1920, and in the East Coolgardie goldfield, which produced over 64 per cent. of the State's reported yield, from 48.61 shillings to 47.02 shillings.

Comparing the tonnage of ore treated in 1919 and 1920, there is a decrease of 40,292 tons in the latter year, during which 1,249,607 tons were treated.

There were decreases in all the fields excepting Coolgardie, East Coolgardie, Peak Hill, and Pilbara, where there were increases of 7,410, 32,011, 6,610, and 477 tons respectively.

Working costs show an increase, the average cost per ton of 2,000 lbs. being, as published by the Chamber of Mines: in 1914, 20s. 6d.; in 1915, 19s. 9d.; in 1916, 22s. 3d.; in 1917, 23s. 7d.; in 1918, 24s. 8d.; in 1919, 26s. 2d. to 35s. 10d.; and in 1920, 29s. 6d. to 37s. 3d.

There were increases in the outputs of Coolgardie, East Coolgardie, Pilbara, and West Pilbara; the others all recorded decreases.

The acreage held under mining lease for all minerals is 66,383, being an increase of 12,695 acres when compared with 1919.

The area leased for gold mining is greater by 11,782 acres, and for minerals by 913 acres. The area held under prospecting areas is 64,420 acres, including 39,640 acres for coal and oil. This is an increase of 12,909 acres on the area held in 1919, and does not include the acreage of several large temporary reserves which have been created and rights of occupancy granted on special terms to persons desirous of searching for oil. At the close of the year the approximate area comprised in such reserves was 230,000 square miles.

The number of men engaged in all classes of mining was 8,496; an increase of 150 on the figures for 1919.

The Coolgardie field had a small increase.

Most of the centres were quiet, but at Gibraltar a couple of mines are very promising.

At St. Ives good progress is being made, and developments are encouraging.

The North Coolgardie field reported a decrease.

In the Menzies district there was a falling-off, attributable to the cessation of production at Comet Vale.

At Yunndaga the Menzies Consolidated mine continued operations, and was a consistent producer.

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

The Ularring, Niagara, and Yerilla districts were exceedingly quiet.

The North-East Coolgardie goldfield had a decrease.

At Kanowna boring for a deep lead is in progress, and reports indicate that very encouraging results are being got. If success is attained it will mean a revival at this centre. Mining for alunite has been retarded pending the results of field experiments by the Department of Agriculture, to determine its suitability as a fertiliser. Nothing of note was reported from the Kurnalpi district.

The Broad Arrow goldfield had a decrease. Mining in this field was exceedingly quiet, and the drought conditions which prevailed for most of the year militated greatly against prospecting.

In the East Coolgardie goldfield the number of men engaged in mining was 3,374, and in 1919, 3,093; an increase of 281. This goldfield gave employment to over 47 per cent. of the number of men engaged in gold mining, and the reported production during the year was 401,496 fine ounces, over 64 per cent. of the total reported yield.

The tonnage treated was 724,568 tons, being greater than in 1919 by 32,012 tons. The yield showed an increase of 4,441 fine ounces over the preceding year.

The average grade of the ore per ton depreciated from 48.61 shillings in 1919 to 47.02 shillings in 1920.

In the Yilgarn field there was a decrease, due, as in the previous year, to smaller outputs from the mines at Westonia.

At Forrestonia treatment of ore has been retarded owing to an insufficient water supply, but steps are being taken to overcome this.

At the other centres a good deal of prospecting was being carried out.

In the Dundas goldfield there was a lessened output, and mining was exceedingly quiet.

The Phillips River field showed a small decrease, and there was practically no change.

In the Northern goldfields—Kimberley, West Kimberley, West Pilbara, Ashburton, and Gascoyne—nothing of note transpired. In the Pilbara field there was a small increase, and a general improvement was apparent.

The number of workers in the field increased, and a considerable amount of prospecting was undertaken.

TIN.

The quantity of tin exported was 243 tons, valued at £49,449; a decrease in tonnage of 75 tons, and increase in value of £2,180.

The Greenbushes tinfield produced 190.09 tons, valued at £31,249; a decrease in tonnage of 54.52 tons, and in value of £3,710; the Pilbara field 41.50 tons, valued at £7,616; an increase in tonnage of 4.80 tons, and in value of £1,745. None was produced in any other field.

TANTALITE.

None of this mineral was exported or reported.

COPPER.

The value of the copper exported was £25,165, being £15,060 greater than in 1919. The ore raised in the West Pilbara field was 1,700.50 tons, valued at £32,059; an increase on the preceding year in tonnage of 669.72 tons, and in value of £16,252. The Whim Well mine was the chief producer.

In the Phillips River field the production was 217.27 tons, valued at £4,125; an increase in tonnage of 2.25 tons, but decrease in value of £868.

Mining on this field was very quiet, and several small mine owners are being financially assisted by the Government to develop their properties. The early raising of sufficient capital to properly open up some of the big mines is anticipated, which, if realised, will mean a considerable impetus to the industry.

The Peak Hill field produced 35.39 tons, valued at £1,401; an increase in tonnage of 21 tons, and in value of £1,048.

The mines in this field are in a very remote locality, consequently all costs are very high.

The only other field producing was Pilbara, with 9 tons, valued at £360.

The average number of men engaged in copper mining was 116, and in 1919, 72.

COAL.

The output of coal was 462,021 tons, being 60,308 tons more than in 1919.

There were five collieries producing. On another, the Scottish, only prospecting work was done, and eventually it closed down. Boring operations on known deposits at Wilga, about 16 miles south of Collie, and on the Irwin River, about 20 miles north-east of Mingenew, are in progress, and the results are awaited with considerable interest.

The number of men employed, 830, is greater by 104 than in 1919, and the output per man was, in 1919, 553 tons, and in 1920, 557 tons.

OIL.

In June the existence of oil was reported from a locality 120 miles north-east of Hall's Creek, in the Kimberley goldfield, and also from the West Kimberley goldfield. In each instance large areas with exclusive rights to prospect for oil have been allotted to the prospectors, and at the commencement of the cool season a geologist will proceed to both localities to investigate the discoveries.

ASBESTOS.

In the Pilbara field 156.50 tons, valued at £7,286, were produced. Large deposits exist in the Nullagine district, and are now being actively worked.

GRAPHITE.

Deposits of this mineral exist at Donnelly River, Kendenup in the Plantagenet district, and Munglinup between Ravensthorpe and Esperance. Not much work was done on any of the deposits, but 13 tons, valued at £130, were exported.

OTHER MINERALS.

The quantity of silver obtained as a by-product and exported was 130,692 ounces, valued at £36,605, and in the preceding year 223,332 ounces, valued at £55,342; a decrease of 92,640 ounces, and in value of £18,737.

Lead and silver-lead to the amount of 3,427 tons, valued at £84,743, were exported, and in the preceding year 248 tons, valued at £3,704; an increase of 3,179 tons, and in value of £81,039; also 1,930 tons of pig-lead, valued at £69,136, and in the preceding year 1,780 tons, valued at £48,462.

Pyritic Ore, amounting to 6,020 tons, valued at £7,276, was reported, and in the preceding year 4,136 tons, valued at £4,919.

Arsenical Ore to the extent of 1,765 tons, valued at £4,260, was exported, but none in the previous year.

Small quantities of Antimony, Mica, Molybdenite, and Scheelite were exported.

MINING GENERALLY.

With the exception of Victoria, which showed an increase of 33,552 fine ounces in the gold output, all the Australian States recorded decreases.

The New Zealand output was again greatly increased.

The Western Australian production was 44.29 per cent. of the total for Australasia, and in the previous year 56.73 per cent.

The diminished output, as in the previous year, was largely due to lessened outputs from certain of the large mines. The discoveries at Hampton Plains have not come up to expectations, but those at St. Ives and Mt. Monger are more promising, and may result in some producing mines being added to the State's list.

In mining for base metals, the serious collapse in the market has been a retarding factor. The assistance to prospectors by way of sustenance, loans of equipment, and transport facilities has been continued, and the expenditure for the year was close on £4,000. The number assisted was 117, including 62 returned soldiers. The whole of the Department's outfits are in constant use.

The area held under prospecting areas for gold and minerals other than coal and oil, viz., 24,780 acres, is over 10,000 acres more than in the preceding year, and indicates considerable interest and activity.

A large amount of assistance was also granted under the provisions of the Mining Development Act, details of which are given in the report of the State Mining Engineer, published as Division II. of this Report.

The policy of granting every application that has a reasonable hope of success has been continued.

# PART II.—MINERALS RAISED.

## TABLE 1.

*Quantity and Value of all the Minerals produced during 1919 and 1920.*

| | Description of Minerals. | 1919. | | 1920. | | Increase or Decrease for Year compared with 1919. | |
|---|---|---|---|---|---|---|---|
| | | Quantity. | Value. | Quantity. | Value. | Quantity. | Value |
| | | | £ | | £ | | £ |
| 1. | Antimony (exported), statute tons | ... | ... | 2½ | 45 | + 2½ | + 45 |
| 2. | Arsenical ore (exported), statute tons | ... | ... | 1,765 | 4,260 | + 1,765 | + 4,260 |
| 3. | Asbestos (reported), statute tons | 53 | 1,443 | 156 | 7,286 | + 103 | + 5,843 |
| 4. | Bismuth (exported), cwts. | 1 | 15 | ... | ... | — 1 | — 15 |
| 5. | Clay (exported), cwt. | ... | ... | 6 | 6 | + 6 | + 6 |
| 6. | Coal (raised), statute tons | 401,713 | 270,355 | 462,021 | 350,346 | + 60,308 | + 79,991 |
| 7. | Copper — Ore (exported), statute tons | 455 | 9,740 | 1,511 | 22,467 | + 1,056 | + 12,727 |
| | Copper — Ingot, Matte, etc. (exported), statute tons | 4 | 365 | 137 | 2,698 | + 133 | + 2,333 |
| 8. | Corundum (exported), statute tons | 1 | 1 | ... | ... | — 1 | — 1 |
| 9. | Gold (exported and minted), fine ounces | 734,066 | 3,118,113 | 617,842 | 2,624,427 | — 116,224 | —493,686 |
| 10. | Graphite (exported), statute tons | ... | ... | 13 | 130 | + 13 | + 130 |
| 11. | Iron Concentrates (exported) statute tons | ... | ... | 1 | 17 | + 1 | + 17 |
| 12. | Lead and silver lead (ore and concentrates exported), statute tons | 248 | 3,704 | 3,427 | 84,743 | + 3,179 | + 81,039 |
| 13. | Lead, Pig (exported), statute tons | 1,780 | 48,462 | 1,930 | 69,136 | + 150 | + 20,674 |
| 14. | Mica (exported), statute tons | 1 | 514 | * | 120 | ... | — 394 |
| 15. | Molybdenite (exported), statute tons | 7 | 100 | ½ | 5 | — 6½ | — 95 |
| 16. | Pyritic Ore (reported), statute tons | 4,136 | 4,919 | 6,020 | 7,276 | + 1,884 | + 2,357 |
| 17. | Silver (exported), fine ounces | 223,332 | 55,342 | 130,692 | 36,605 | — 92,640 | — 18,737 |
| 18. | Tantalite (exported), statute tons | ¼ | 75 | ... | ... | — ¼ | — 75 |
| 19. | Tin (exported), statute tons | 318 | 47,269 | 243 | 49,449 | — 75 | + 2,180 |
| 20. | Tungsten Ore — Scheelite (exported), statute tons | 6 | 772 | 2½ | 395 | — 3½ | — 377 |
| | Tungsten Ore — Wolfram (exported), statute tons | ½ | 15 | ... | ... | — ½ | — 15 |
| | **Total Values** | ... | **3,561,204** | ... | **3,259,411** | ... | **—301,793** |

* Weight not stated.

## TABLE 2.

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

| Year. | Total Exports. | Mineral Exports (exclusive of Coal). | Percentage. |
|---|---|---|---|
| | £ | £ | |
| 1901 | 8,515,623 | 6,920,118 | 81·27 |
| 1902 | 9,051,358 | 7,530,319 | 83·20 |
| 1903 | 10,324,732 | 8,727,060 | 84·53 |
| 1904 | 10,271,489 | 8,625,676 | 83·98 |
| 1905 | 9,871,019 | 7,731,954 | 78·33 |
| 1906 | 9,832,679 | 7,570,305 | 76·99 |
| 1907 | 9,904,860 | 7,544,992 | 76·17 |
| 1908 | 9,518,020 | 7,151,317 | 75·13 |
| 1909 | 8,860,494 | 5,906,673 | 66·66 |
| 1910 | 8,299,781 | 4,795,654 | 57·78 |
| 1911 | 10,606,863 | 7,171,638 | 67·61 |
| 1912 | 8,941,008 | 5,462,499 | 61·09 |
| 1913 | 9,128,607 | 4,608,188 | 50·48 |
| 1914 | 8,406,182 | 3,970,182 | 47·23 |
| 1915 | 6,291,934 | 2,969,502 | 47·19 |
| 1916 | 10,878,153 | 6,842,621 | 62·92 |
| 1917 | 9,323,229 | 5,022,694 | 53·87 |
| 1918 | 6,931,834 | 2,102,923 | 30·34 |
| 1919 | 14,279,240 | 6,236,585 | 43·67 |
| 1920 | 15,149,323 | 3,096,849 | 20·44 |
| **Total since 1900** | 194,386,428 | 119,987,749 | 61·73 |

TABLE 3.

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

| Goldfield. | Reported Yield. | | | | | |
|---|---|---|---|---|---|---|
| | 1919. | 1920. | Percentage for each Goldfield. | | Average Value of Gold per ton of Ore treated. | |
| | | | 1919. | 1920. | 1919. | 1920. |
| | fine ozs. | fine ozs. | | | shillings. | shillings. |
| 1. Kimberley ... ... ... ... | 151 | ... | ·02 | ... | ... | ... |
| 2. West Kimberley... ... ... ... | ... | ... | ... | ... | ... | ... |
| 3. Pilbara ... ... ... ... ... | 3,421 | 4,052 | ·50 | ·65 | 135·50 | 130·31 |
| 4. West Pilbara ... ... ... ... | 95 | 134 | ·01 | ·02 | 29·02 | 109·03 |
| 5. Ashburton ... ... ... ... | ... | ... | ... | ... | ... | ... |
| 6. Gascoyne ... ... ... ... | ... | ... | ... | ... | ... | ... |
| 7. Peak Hill ... ... ... ... | 2,255 | 1,656 | ·33 | ·26 | 42·40 | 12·30 |
| 8. East Murchison ... ... ... | 27,414 | 19,600 | 3·98 | 3·13 | 50·14 | 43·32 |
| 9. Murchison ... ... ... ... | 50,570 | 46,604 | 7·35 | 7·44 | 55·33 | 49·03 |
| 10. Yalgoo ... ... ... ... ... | 4,788 | 2,965 | ·70 | ·47 | 95·46 | 74·58 |
| 11. Mt. Margaret ... ... ... ... | 88,152 | 77,336 | 12·81 | 12·34 | 32·09 | 28·90 |
| 12. North Coolgardie ... ... ... | 23,020 | 12,024 | 3·34 | 1·92 | 48·70 | 48·86 |
| 13. Broad Arrow ... ... ... ... | 11,729 | 7,445 | 1·70 | 1·19 | 43·84 | 47·94 |
| 14. North-East Coolgardie ... ... ... | 5,472 | 1,739 | ·80 | ·28 | 147·03 | 40·10 |
| 15. East Coolgardie ... ... ... | 397,055 | 401,496 | 57·69 | 64·07 | 48·61 | 47·02 |
| 16. Coolgardie ... ... ... ... | 5,814 | 5,986 | ·84 | ·95 | 48·97 | 28·99 |
| 17. Yilgarn ... ... ... ... ... | 54,003 | 37,637 | 7·85 | 6·00 | 32·87 | 30·65 |
| 18. Dundas ... ... ... ... ... | 12,530 | 6,541 | 1·82 | 1·04 | 49·64 | 50·50 |
| 19. Phillips River ... ... ... ... | 1,700 | 1,423 | ·25 | ·23 | 105·29 | 183·69 |
| State generally ... ... | 46 | 21 | ·01 | ·01 | ... | ... |
| Totals and averages ... ... | 688,215 | 626,659 | 100·00 | 100·00 | 44·88 | 42·22 |

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

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

TABLE 4.

*Number of Gold-producing Mines in the several Goldfields and Districts during 1919 and 1920.*

| Goldfield. | District. | 1919. | | 1920. | | Increase or Decrease. |
|---|---|---|---|---|---|---|
| | | District. | Goldfield. | District. | Goldfield. | |
| Kimberley ... ... ... ... | ... ... ... ... | ... | ... | ... | ... | ... |
| West Kimberley ... ... ... | ... ... ... ... | ... | ... | ... | ... | ... |
| Pilbara ... ... ... ... | Marble Bar ... ... | 13 | 15 | 13 | 15 | ... |
| | Nullagine ... ... | 2 | | 2 | | |
| West Pilbara ... ... ... ... | ... ... ... ... | ... | 3 | ... | 1 | — 2 |
| Ashburton ... ... ... ... | ... ... ... ... | ... | ... | ... | ... | ... |
| Gascoyne ... ... ... ... | ... ... ... ... | ... | ... | ... | ... | ... |
| Peak Hill ... ... ... ... | ... ... ... ... | ... | 8 | ... | 3 | — 5 |
| East Murchison ... ... | Lawlers ... ... ... | 6 | 24 | 7 | 27 | + 3 |
| | Wiluna ... ... ... | 6 | | 11 | | |
| | Black Range ... ... | 12 | | 9 | | |
| Murchison ... ... ... | Cue ... ... ... | 16 | 50 | 11 | 43 | — 7 |
| | Meekatharra ... ... | 18 | | 15 | | |
| | Day Dawn ... ... | 3 | | 4 | | |
| | Mt. Magnet ... ... | 13 | | 13 | | |
| Yalgoo ... ... ... ... | ... ... ... ... | ... | 15 | ... | 10 | — 5 |
| Mt. Margaret ... ... ... | Mt. Morgans ... ... | 10 | 31 | 8 | 26 | — 5 |
| | Mt. Malcolm ... ... | 10 | | 9 | | |
| | Mt. Margaret ... ... | 11 | | 9 | | |
| North Coolgardie ... ... | Menzies ... ... ... | 11 | 23 | 8 | 14 | — 9 |
| | Ularring ... ... ... | 4 | | 1 | | |
| | Niagara ... ... ... | 4 | | 2 | | |
| | Yerilla ... ... ... | 4 | | 3 | | |
| Broad Arrow ... ... ... ... | ... ... ... ... | ... | 9 | ... | 5 | — 4 |
| North-East Coolgardie ... | Kanowna ... ... | 6 | 8 | 6 | 10 | + 2 |
| | Kurnalpi ... ... | 2 | | 4 | | |
| East Coolgardie ... ... | East Coolgardie ... | 42 | 42 | 59 | 60 | + 18 |
| | Bulong ... ... ... | ... | | 1 | | |
| Coolgardie ... ... ... | Coolgardie ... ... | 26 | 32 | 24 | 30 | — 2 |
| | Kunanalling ... ... | 6 | | 6 | | |
| Yilgarn ... ... ... ... | ... ... ... ... | ... | 34 | ... | 32 | — 2 |
| Dundas ... ... ... ... | ... ... ... ... | ... | 17 | ... | 14 | — 3 |
| Phillips River ... ... ... | ... ... ... ... | ... | 13 | ... | 11 | — 2 |
| State generally ... ... | ... ... ... ... | ... | 1 | ... | 1 | ... |
| | Totals ... ... | ... | 325 | ... | 302 | — 23 |

# 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 1920.

Fig 1. Output of Gold from various Goldfields as reported to Mines Dept.

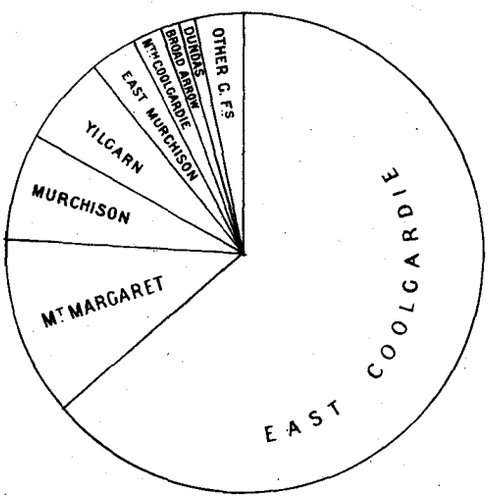



Fig 2. Gold produced from various Goldfields as given by the Export and Mint Returns.

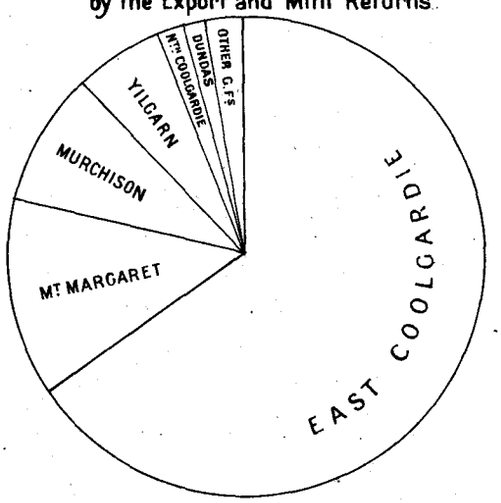



Fig 3. Value of Gold and other Minerals.

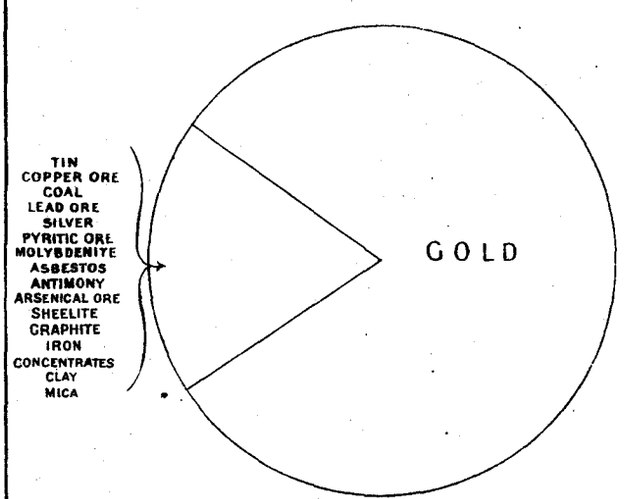



Fig 4. Value of Minerals other than Gold.

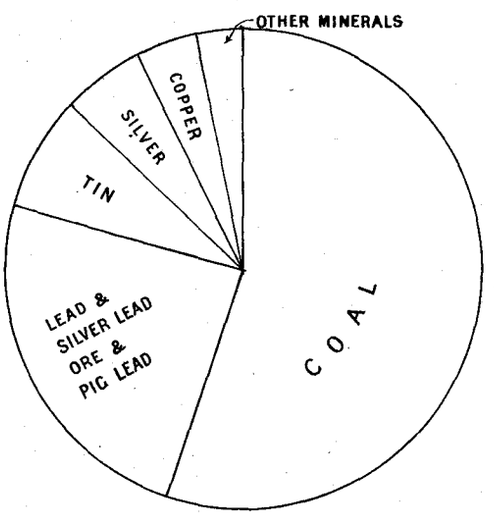



Fig 5. Areas of Land leased for Goldmining on various Goldfields.

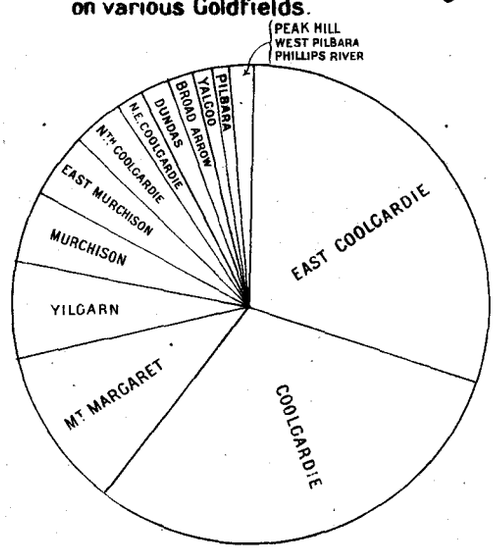
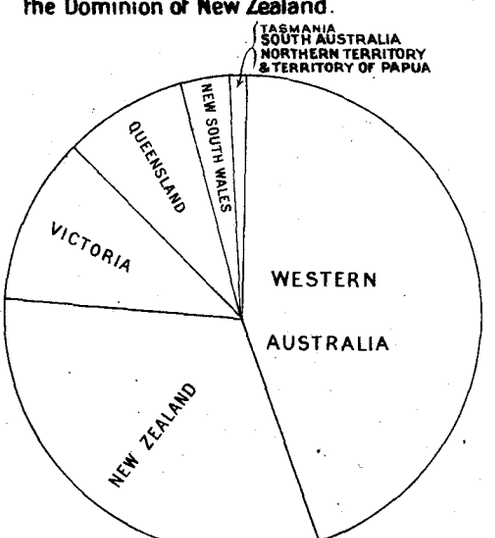
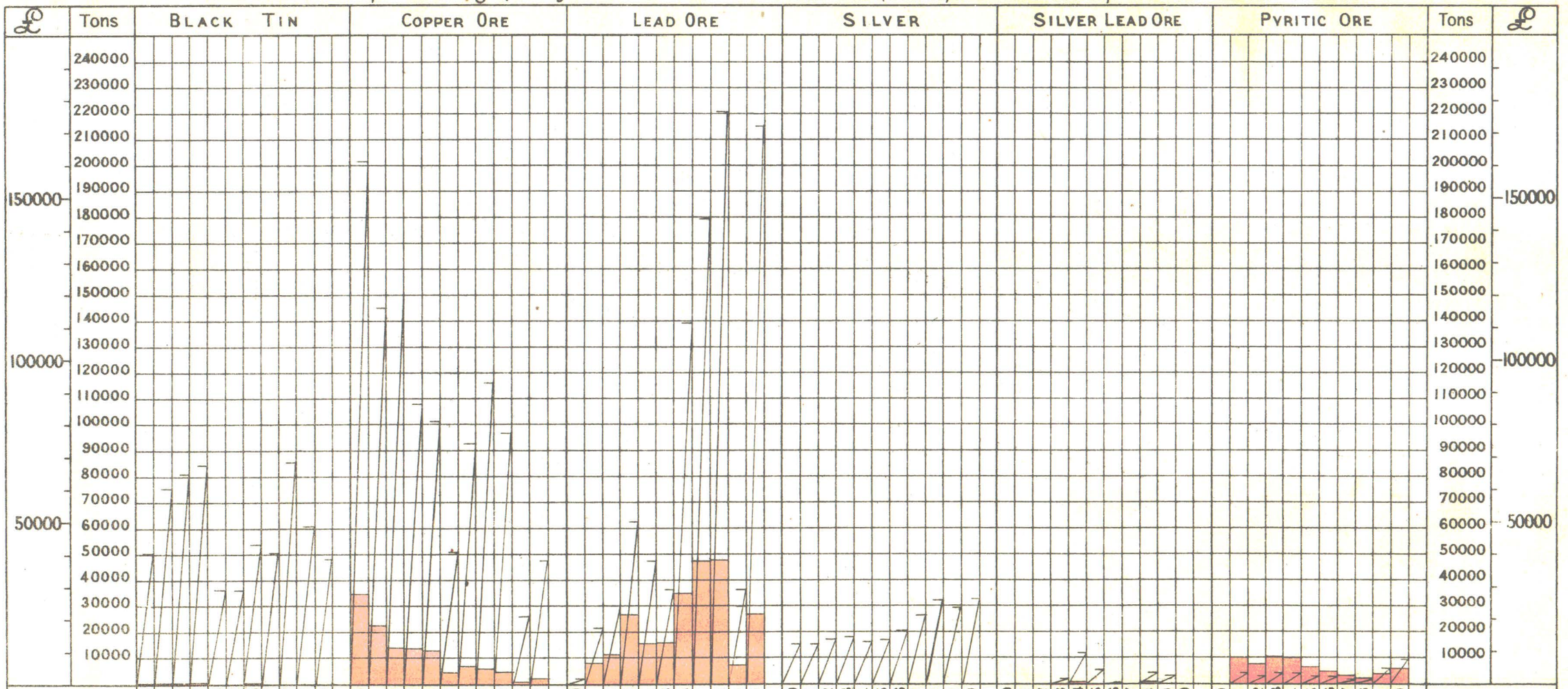



Fig 6. Output of Gold in the States of Australia and the Dominion of New Zealand.



# DIAGRAM

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




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

Other Minerals not shewn above viz { Asbestos 156 Tons Value £7286 ; Scheelite 178 „ „ £352 } also reported in the year 1920.

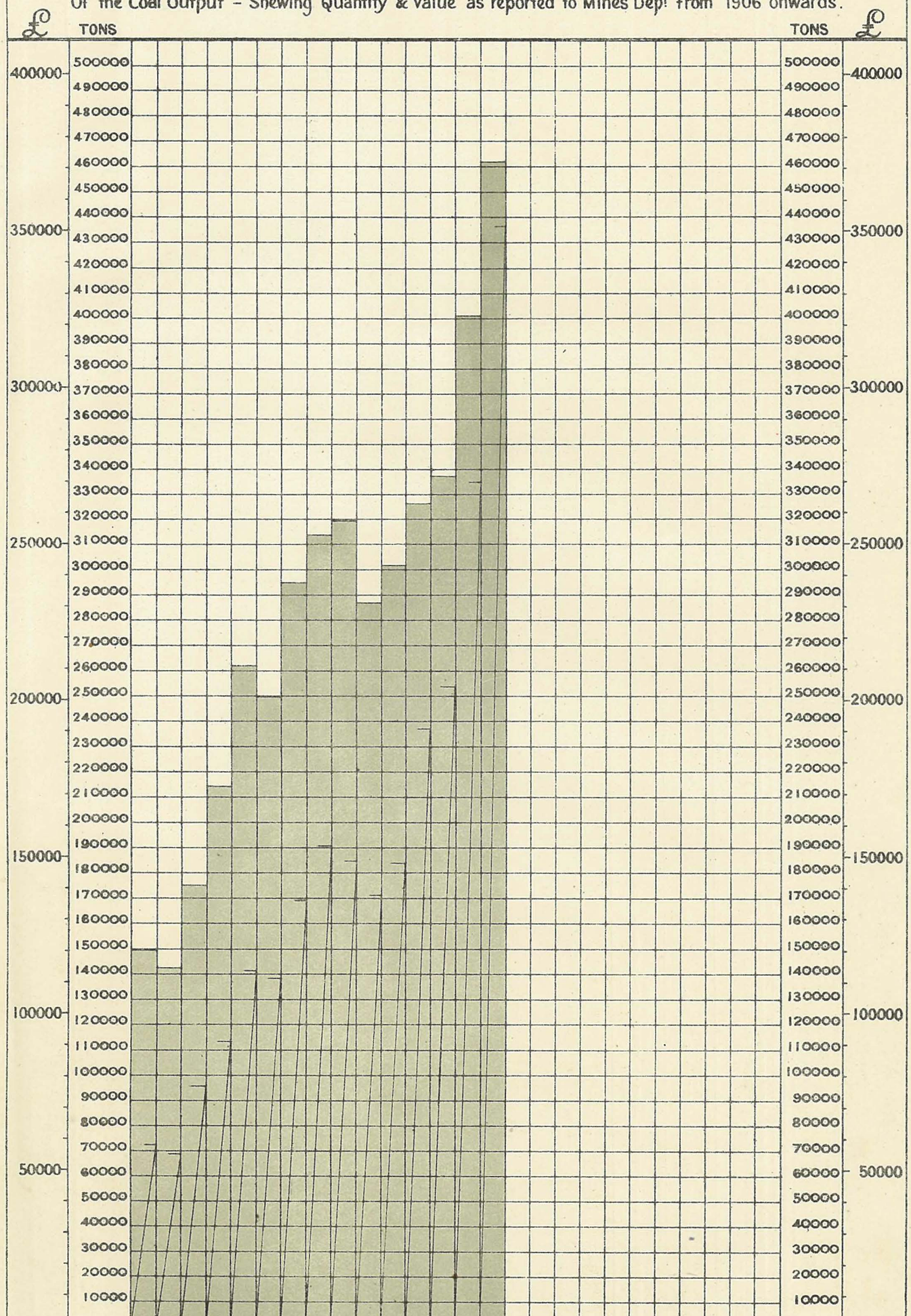
Previous to 1910 the Quantity & Value of various Minerals reported amounted to .....

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

1920.

# DIACRAM

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




| Year | | 1906 | 1907 | 1908 | 1909 | 1910 | 1911 | 1912 | 1913 | 1914 | 1915 | 1916 | 1917 | 1918 | 1919 | 1920 | Year |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Value | £ | 57998 | 55158 | 75694 | 90965 | 113699 | 111154 | 135857 | 153614 | 146684 | 137589 | 147823 | 191822 | 204319 | 270355 | 350346 | £ Value |
| Quantity | Tons | 149765 | 142373 | 175248 | 214302 | 262166 | 243890 | 295079 | 313818 | 319210 | 286666 | 301526 | 326550 | 337039 | 401713 | 462021 | Tons Quantity |

1920.

## TABLE 5.

*Gold Yield from Registered Gold Mining Companies and Gold Mining Leases for the Years* 1917, 1918, 1919, *and* 1920.

| Goldfield | Registered Companies producing over 12,000 ozs. | | | | | | | | Registered Companies producing under 12,000 ozs. | | | | | | | | Leases, exclusive of Sundry Claims and Treatment. | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1917. | | 1918. | | 1919. | | 1920. | | 1917. | | 1918. | | 1919. | | 1920. | | 1917. | | 1918. | | 1919. | | 1920. | |
| | No. | Fine ozs. | No. | Fine ozs. | No. | Fine ozs. | No. | Fine ozs. | No. | Fine ozs. | No. | Fine ozs. | No. | Fine ozs. | No. | Fine ozs. | No. | Fine ozs. | No. | Fine ozs. | No. | Fine ozs. | No. | Fine ozs. |
| Kimberley ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| West Kimberley ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Pilbara ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 19 | 2,811 | 9 | 2,264 | 15 | 2,449 | 15 | 3,478 |
| West Pilbara ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 3 | 249 | 2 | 81 | 3 | 57 | 1 | 90 |
| Gascoyne ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Peak Hill ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 9 | 1,328 | 9 | 921 | 8 | 683 | 3 | 523 |
| East Murchison ... ... | 1 | 14,591 | ... | ... | 1 | 13,468 | ... | ... | 5 | 8,302 | 6 | 19,967 | 3 | 7,346 | 6 | 14,229 | 35 | 6,703 | 25 | 6,676 | 20 | 5,154 | 21 | 3,289 |
| Murchison ... ... | 1 | 21,951 | ... | ... | 1 | 14,500 | ... | ... | 4 | 3,167 | 5 | 3,751 | 3 | 1,734 | 2 | 6,669 | 61 | 53,056 | 55 | 55,565 | 46 | 28,928 | 41 | 35,200 |
| Yalgoo ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1,788 | 1 | 311 | 1 | 715 | 1 | 889 | 19 | 3,696 | 15 | 3,718 | 14 | 3,737 | 9 | 1,846 |
| Mt. Margaret ... ... | 2 | 81,599 | 2 | 71,006 | 2 | 77,265 | 2 | 67,486 | 5 | 12,303 | 7 | 8,109 | 6 | 6,918 | 5 | 4,544 | 36 | 5,750 | 32 | 4,284 | 23 | 2,357 | 19 | 4,236 |
| N. Coolgardie ... ... | 1 | 12,531 | 1 | 12,845 | ... | ... | ... | ... | 5 | 11,053 | 7 | 13,502 | 7 | 14,612 | 3 | 9,499 | 31 | 7,019 | 22 | 7,449 | 16 | 5,789 | 11 | 900 |
| Broad Arrow ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 9,398 | 1 | 287 | 2 | 8,622 | 1 | 5,174 | 22 | 6,048 | 14 | 2,739 | 7 | 2,000 | 4 | 1,664 |
| N.E. Coolgardie ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 2,427 | 1 | 1,119 | 1 | 60 | ... | ... | 10 | 1,666 | 12 | 1,734 | 7 | 4,874 | 10 | 1,578 |
| E. Coolgardie ... ... | 9 | 508,073 | 10 | 482,906 | 10 | 361,151 | 9 | 363,254 | 14 | 14,880 | 11 | 4,019 | 8 | 3,808 | 14 | 15,422 | 29 | 26,290 | 27 | 28,532 | 24 | 24,685 | 37 | 14,732 |
| Coolgardie ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 4 | 1,180 | 4 | 655 | 2 | 679 | 1 | 43 | 37 | 6,712 | 33 | 4,925 | 30 | 3,507 | 29 | 4,889 |
| Yilgarn ... ... ... | 2 | 45,197 | 2 | 34,203 | 2 | 27,297 | 1 | 13,826 | 7 | 19,208 | 8 | 24,789 | 3 | 16,017 | 8 | 17,234 | 38 | 9,393 | 31 | 7,884 | 29 | 9,321 | 23 | 5,623 |
| Dundas ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | 11,650 | 2 | 8,569 | 1 | 5,466 | 1 | 2,647 | 13 | 5,931 | 16 | 6,389 | 16 | 6,034 | 13 | 3,196 |
| Phillips River ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 68 | 1 | 52 | 1 | 37 | 1 | 50 | 16 | 4,487 | 15 | 4,045 | 12 | 1,579 | 10 | 1,300 |
| State generally ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 46 | 1 | 7 |
| Total ... ... | 16 | 683,942 | 15 | 600,960 | 16 | 493,681 | 12 | 444,516 | 50 | 95,424 | 54 | 85,130 | 38 | 66,014 | 43 | 76,400 | 378 | 141,139 | 317 | 137,565 | 271 | 101,200 | 247 | 82,551 |

TABLE 6.

*Increase or Decrease in Output of certain producing Gold Mines in* 1920 *as compared with* 1919.

| Goldfield. | District. | Name of Mine. | Gold Production. | | Increase or Decrease for Year compared with 1919. |
|---|---|---|---|---|---|
| | | | 1919. | 1920. | |
| | | | Fine ozs. | Fine ozs. | Fine ozs. |
| Pilbara ... | Marble Bar ... | 1. Haig ... ... ... ... ... | 188·81 | 693·28 | + 504·47 |
| Do. ... | do. ... | 2. Kitchener ... ... ... ... ... | 244·35 | 921·16 | + 676·81 |
| Do. ... | do. ... | 3. Mt. Prophecy Leases ... ... ... | 1,024·11 | 431·06 | — 593·05 |
| East Murchison | Lawlers ... | 4. Waroonga G.M. Co., Ltd. ... ... | 2,480·38 | 1,146·95 | — 1,333·43 |
| Do. ... | Wiluna ... | 5. Moonlight Leases ... ... ... ... | 856·62 | 810·45 | — 46·17 |
| Do. ... | do. ... | 6. Western Machinery Co., Ltd. ... ... | 4,832·78 | 3,347·41 | — 1,485·37 |
| Do. ... | Black Range... | 7. Red, White, and Blue ... ... ... | ... | 512·71 | + 512·71 |
| Do. ... | do. ... | 8. Yuanmi G.Ms., Ltd. (Youanmi) ... | 13,468·00 | 9,303·09 | — 4,164·91 |
| Murchison ... | Cue ... ... | 9. Big Bell ... ... ... ... ... | 1,358·48 | 1,676·38 | + 317·90 |
| Do. ... | do. ... | 10. Mararoa G.M. Co., N.L. ... ... ... | ... | 4,823·20 | + 4,823·20 |
| Do. ... | do. ... | 11. Nigel ... ... ... ... ... | 559·93 | 37·15 | — 522·78 |
| Do. ... | do. ... | 12. Turn of the Tide ... ... ... ... | 456·77 | 840·66 | + 383·89 |
| Do. ... | Meekatharra ... | 13. Fenian Leases ... ... ... ... | 15,256·08 | 11,960·50 | — 3,295·58 |
| Do. ... | do. ... | 14. Gwalia ... ... ... ... ... | 596·64 | 435·25 | — 161·39 |
| Do. ... | do. ... | 15. Ingliston Consols Extended Leases ... | 14,500·17 | 11,889·29 | — 2,610·88 |
| Do. ... | do. ... | 16. Ingliston Leases ... ... ... ... | 2,605·65 | 1,722·91 | — 882·74 |
| Do. ... | do. ... | 17. Waterloo ... ... ... ... ... | 1,098·77 | 553·31 | — 545·46 |
| Do. ... | Day Dawn ... | 18. Eureka ... ... ... ... ... | ... | 764·68 | + 764·68 |
| Do. ... | do. ... | 19. Great Fingall Consolidated, Ltd. ... | 1,605·32 | 1,846·11 | + 240·79 |
| Do. ... | Mt. Magnet ... | 20. Mount Zion ... ... ... ... ... | 114·10 | 1,219·88 | + 1,105·78 |
| Do. ... | do. ... | 21. Moyagee ... ... ... ... ... | 429·66 | 593·15 | + 163·49 |
| Yalgoo ... | ... ... ... | 22. Carnation ... ... ... ... ... | 1,742·00 | 1,018·62 | — 723·38 |
| Do. ... | ... ... ... | 23. Lake View: Payne's Find Development Co., N.L. | 715·48 | 889·46 | + 173·98 |
| Mt. Margaret ... | Mt. Morgans ... | 24. Bindah ... ... ... ... ... | 293·59 | 1,807·91 | + 1,514·32 |
| Do. ... | do. ... | 25. Westralia Mt. Morgans Mines, N.L. ... | 3,050·97 | 2,766·55 | — 284·42 |
| Do. ... | Mt. Malcolm ... | 26. Sons of Gwalia, Ltd. ... ... ... | 48,615·73 | 41,870·00 | — 6,745·73 |
| Do. ... | Mt. Margaret ... | 27. Ida H. G.M. Co., Ltd. ... ... ... | 3,206·88 | 537·02 | — 2,669·86 |
| Do ... | do ... | 28 Lancefield G.Ms., Ltd. ... ... ... | 28,649·74 | 25,565·79 | — 3,083·95 |
| Do. ... | do. ... | 29. Nil Desperandum ... ... ... ... | 257·57 | 1,259·94 | + 1,002·37 |
| Do. ... | do. ... | 30. Mary Mac G.M. Co., N.L. ... ... | 496·43 | 1,089·91 | + 593·48 |
| North Coolgardie | Menzies ... | 31. Gladsome Leases ... ... ... ... | 3,360·44 | ... | — 3,360·44 |
| Do. ... | do. ... | 32. Sand Queen G.Ms., Ltd. ... ... ... | 2,406·24 | ... | — 2,406·24 |
| Do. ... | do. ... | 33. Menzies Consolidated G.Ms., Ltd. ... | 11,228·11 | 8,325·15 | — 2,902·96 |
| Do. ... | Ularring ... | 34. Riverina South G.M. Co., N.L. ... ... | 502·67 | ... | — 502·67 |
| Do. ... | Niagara ... | 35. Cosmopolitan No. 2: Western Machinery Co., Ltd. | 373·11 | 160·98 | — 212·13 |
| Broad Arrow ... | ... ... ... | 36. Associated Northern Blocks (W.A.), Ltd. | 8,618·55 | 5,174·11 | — 3,444·44 |
| Do. ... | ... ... ... | 37. Oversight ... ... ... ... ... | ... | 1,054·48 | + 1,054·48 |
| North-East Coolgardie | Kanowna ... | 38. Kanowna ... ... ... ... ... | 4,111·32 | 472·03 | — 3,639·29 |
| Do. ... | do. ... | 39. Pride of the Morning ... ... ... | 153·74 | 401·97 | + 248·23 |
| East Coolgardie | East Coolgardie | 40. Associated G.Ms. of W.A., Ltd. ... | 23,036·76 | 24,277·05 | + 1,240·29 |
| Do. ... | do. ... | 41. Associated Northern Blocks (W.A.), Ltd. | 24,766·65 | 11,023·06 | — 13,743·59 |
| Do. ... | do. ... | 42. Central and West Boulder G.Ms., Ltd. ... | 178·99 | 1,925·16 | + 1,746·17 |
| Do. ... | do. ... | 43. Creswick Leases ... ... ... ... | 1,094·49 | 607·00 | — 487·49 |
| Do. ... | do. ... | 44. Golden Horseshoe Estates Co., Ltd. ... | 47,651·10 | 54,697·44 | + 7,046·34 |
| Do. ... | do. ... | 45. Great Boulder Perseverance G.M. Co., Ltd. | 37,260·78 | 51,414·56 | + 14,153·78 |
| Do. ... | do. ... | 46. Great Boulder Proprietary G.Ms., Ltd. ... | 73,845·95 | 71,535·70 | — 2,310·25 |
| Do. ... | do. ... | 47. Great Hope, North ... ... ... | ... | 837·09 | + 837·09 |
| Do. ... | do. ... | 48. Hannan's Reward, Ltd. ... ... ... | 850·43 | 357·70 | — 492·73 |
| Do. ... | do. ... | 49. Idaho Leases ... ... ... ... | 6,870·34 | 6,484·54 | — 385·80 |
| Do. ... | do. ... | 50. Ironsides North Leases ... ... ... | 12,142·54 | 3,672·05 | — 8,470·49 |
| Do. ... | do. ... | 51. Ivanhoe Gold Corporation, Ltd. ... | 63,486·43 | 56,456·63 | — 7,029·80 |
| Do. ... | do. ... | 52. Kalgurli G.Ms., Ltd. ... ... ... | 15,575·93 | 17,198·01 | + 1,622·08 |
| Do. ... | do. ... | 53. Lake View and Star, Ltd. ... ... | 30,257·61 | 40,172·24 | + 9,914·63 |
| Do. ... | do. ... | 54. North Kalgurli (1912), Ltd. ... ... | 1,848·94 | 937·67 | — 911·27 |
| Do. ... | do. ... | 55. Oroya Links, Ltd. ... ... ... | 20,618·41 | 17,892·76 | — 2,725·65 |
| Do. ... | do. ... | 56. South Kalgurli Consolidated, Ltd. ... | 24,651·20 | 29,609·89 | + 4,958·69 |
| Do. ... | do. ... | 57. Waterfall Gold Mine Leases ... ... | 1,700·04 | ... | — 1,700·04 |
| Coolgardie ... | Coolgardie ... | 58. Burbanks Birthday G.Ms., Ltd. ... | 600·27 | | — 600·27 |
| Do. ... | do, ... | 59. Griffith's Gold Mine ... ... ... | 363·15 | 1,240·88 | + 877·73 |
| Do. ... | Kunanalling ... | 60. Carbine Leases ... ... ... ... | 379·98 | 1,593·22 | + 1,213·24 |
| Yilgarn ... | ... ... ... | 61. Bullfinch Proprietary (W.A.), Ltd. ... | 14,375·94 | 13,826·06 | — 549·88 |
| Do. ... | ... ... ... | 62. Great Victoria Leases ... ... ... | 3,477·67 | 2,444·61 | — 1,033·06 |
| Do. ... | ... ... ... | 63. Edna May Central G.M. Co., N.L. ... | 12,921·07 | 7,025·69 | — 5,895·38 |
| Do. ... | ... ... ... | 64. Edna May Deep Levels G.M. Co., N.L. ... | 5,804·32 | 8,975·07 | + 3,170·75 |
| Do. ... | ... ... ... | 65. Edna May G.M. Co., N.L. ... ... | 10,196·68 | 240·28 | — 9,956·40 |
| Do. ... | ... ... ... | 66. Transvaal Leases ... ... ... ... | 2,208·00 | ... | — 2,208·00 |
| Dundas ... | ... ... ... | 67. Mararoa G.M. Co., N.L. ... ... ... | 5,466·09 | 2,647·19 | — 2,818·90 |
| Do. ... | ... ... ... | 68. Viking No. 1 Leases ... ... ... | 2,850·52 | 1,582·41 | — 1,268·11 |
| Phillips River ... | ... ... ... | 69. Fair Play Leases ... ... ... ... | ... | 1,014·42 | + 1,014·42 |

TABLE 7.

*Averages of Gold Ore raised and treated, and Gold produced therefrom, per man employed on the several Goldfields of the State, during* 1919 *and* 1920.

| Goldfield. | 1919. | | | | 1920. | | | |
|---|---|---|---|---|---|---|---|---|
| | Tons of Gold Ore raised and treated. | | Fine ounces of Gold produced therefrom. | | Tons of Gold Ore raised and treated. | | Fine ounces of Gold produced therefrom. | |
| | Per man employed under ground. | Per man employed above and under ground. | Per man employed under ground. | Per man employed above and under ground. | Per man employed under ground. | Per man employed above and under ground. | Per man employed under ground. | Per man employed above and under ground. |
| | tons. | tons. | fine ozs. | fine ozs. | tons. | tons. | fine ozs. | fine ozs. |
| 1. Kimberley ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 2. West Kimberley ... ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 3. Pilbara ... ... | 67·24 | 32·54 | 107·23 | 51·88 | **67·41** | **36·14** | **106·26** | **56·98** |
| 4. West Pilbara ... ... | 101·00 | 50·50 | 34·69 | 17·35 | **17·50** | **10·00** | **22·46** | **12·83** |
| 5. Ashburton ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 6. Gascoyne ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 7. Peak Hill ... ... ... | 366·13 | 175·74 | 182·72 | 87·71 | **1,375·38** | **323·62** | **199·10** | **46·85** |
| 8. East Murchison ... ... | 320·81 | 152·46 | 189·35 | 89·99 | **253·55** | **104·90** | **129·29** | **53·49** |
| 9. Murchison ... ... ... | 214·38 | 116·60 | 139·61 | 75·94 | **254·45** | **140·99** | **146·84** | **81·37** |
| 10. Yalgoo ... ... ... | 73·64 | 39·97 | 82·74 | 44·91 | **70·39** | **36·33** | **61·78** | **31·89** |
| 11. Mt. Margaret ... ... | 447·59 | 268·25 | 169·09 | 101·34 | **471·56** | **263·94** | **160·43** | **89·79** |
| 12. North Coolgardie ... ... | 181·13 | 95·66 | 103·83 | 54·84 | **144·91** | **73·74** | **83·35** | **42·41** |
| 13. Broad Arrow ... ... | 201·38 | 116·41 | 103·93 | 60·07 | **167·02** | **100·74** | **94·26** | **56·85** |
| 14. North-East Coolgardie ... | 120·92 | 57·04 | 209·26 | 98·71 | **70·99** | **38·45** | **33·51** | **18·15** |
| 15. East Coolgardie ... ... | 398·25 | 225·81 | 227·88 | 129·21 | **379·55** | **215·71** | **210·07** | **119·39** |
| 16. Coolgardie ... ... ... | 62·38 | 30·30 | 35·95 | 17·47 | **71·50** | **36·83** | **24·40** | **12·57** |
| 17. Yilgarn ... ... ... | 284·84 | 173·60 | 110·21 | 67·17 | **404·26** | **195·32** | **145·85** | **70·47** |
| 18. Dundas ... ... ... | 247·18 | 139·49 | 144·45 | 81·51 | **194·96** | **104·24** | **115·90** | **61·97** |
| 19. Phillips River ... ... | 80·37 | 47·11 | 99·62 | 58·40 | **65·76** | **36·53** | **142·28** | **79·04** |
| Total Averages ... ... | 327·30 | 183·72 | 172·92 | 97·06 | **333·05** | **180·61** | **165·52** | **89·76** |

The average value of gold produced per man employed above and below ground was £412·28 in 1919 and £381·26 in 1920. The average tonnage of ore raised shows a decrease from 183·72 tons to 180·61 tons. The average tonnage raised per man is highest in the Peak Hill Goldfield, viz., 323·62 tons, average value £199·01, the next being Mt. Margaret Goldfield with 263·94 tons, average value £381·40.

TABLE 8.

*Output of Gold from the several States of Australia, the Northern Territory, the Territory of Papua, and the Dominion of New Zealand during* 1920.

| State. | Output of Gold. | Value. | Percentage of total Output of Australasia. |
|---|---|---|---|
| | Fine ozs. | £ | |
| 1. Western Australia ... ... ... ... | 617,842 | 2,624,427 | 44·29 |
| 2. Victoria ... ... ... ... ... ... | 168,979 | 648,969 | 12·11 |
| 3. Queensland ... ... ... ... ... | 115,230 | 489,701 | 8·26 |
| 4. New South Wales ... ... ... ... | 48,907 | 207,746 | 3·50 |
| 5. Tasmania ... ... ... ... ... | 6,246 | 29,796 | ·45 |
| 6. South Australia ... ... ... ... | 1,697 | 7,209 | ·12 |
| 7. Northern Territory ... ... ... ... | 586 | 2,489 | ·04 |
| 8. Territory of Papua ... ... ... ... | 3,056 | 12,980 | ·22 |
| 9. New Zealand ... ... ... ... ... | 432,558 | 1,837,389 | 31·01 |
| Total ... ... ... | 1,395,101 | 5,860,706 | 100·00 |

TABLE 9.

*Dividends paid by Western Australian Gold Mining Companies during 1920 and Total to date.*

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

| Goldfield. | Name of Company. | Capital. | | | | Dividends. | | |
|---|---|---|---|---|---|---|---|---|
| | | Authorised | No. of Shares. | Par Value Shares. | Paid up to. | Paid in 1920. | | Grand Total paid to end of 1920. |
| | | | | | | No. | Total Amount. | |
| | | £ | | £ s. d. | £ s. d. | | £ | £ |
| Peak Hill ... | Various Companies ... | ... | ... | ... | ... | ... | ... | 160,666 |
| East Murchison... | Various Companies ... | ... | ... | ... | ... | ... | ... | 437,968 |
| Murchison ... | Various Companies ... | ... | ... | ... | ... | ... | ... | 1,835,170 |
| Mt. Margaret ... | Sons of Gwalia, Ltd. ... ... | 350,000 | 350,000 | 1 0 0 | 1 0 0 | 2 | 73,125 | 1,128,488 |
| | Other Companies ... | ... | ... | ... | ... | ... | ... | 376,213 |
| North Coolgardie | Various Companies ... | ... | ... | ... | ... | ... | ... | 575,032 |
| North-East Coolgardie | Various Companies ... | ... | ... | ... | ... | ... | ... | 82,971 |
| East Coolgardie | Associated Northern Blocks (W.A.), Ltd. | 350,000 | 350,000 | 1 0 0 | 1 0 0 | 1 | 17,500 | 743,750 |
| Do. ... | Golden Horseshoe Estates Co., Ltd. | 1,500,000 | 300,000 | 5 0 0 | 5 0 0 | 1 | 30,000 | 3,472,500 |
| Do. ... | Great Boulder Proprietary G.Ms., Ltd. | 175,000 | 1,750,000 | 0 2 0 | 0 2 0 | 2 | 131,250 | 5,794,300 |
| Do. ... | Ivanhoe Gold Corporation, Ltd. | 1,000,000 | 200,000 | 5 0 0 | 5 0 0 | 4 | 75,000 | 3,868,750 |
| Do. ... | Kalgurli G.Ms., Ltd. ... ... | 120,000 | 120,000 | 1 0 0 | 1 0 0 | 1 | 18,000 | 1,657,500 |
| Do. ... | Lake View and Star, Ltd. ... | 200,000 | 1,000,000 | 0 4 0 | 0 4 0 | 1 | 10,000 | 136,000 |
| Do. ... | Oroya Links, Ltd. ... ... | 312,500 | 1,250,000 | 0 5 0 | 0 5 0 | 1 | 14,375 | 161,875 |
| Do. ... | South Kalgurli Consolidated, Ltd. | 150,000 | 250,007 | 0 10 0 | 0 10 0 | 1 | 9,375 | 190,000 |
| Do. ... | Other Companies ... ... | ... | ... | ... | ... | ... | ... | 6,045,828 |
| Coolgardie ... | Various Companies ... | ... | ... | ... | ... | ... | ... | 339,495 |
| Yilgarn ... ... | Edna May Central Gold Mines, N.L. | 45,000 | 60,000 | 0 15 0 | 0 12 6 | 1 | 2,958 | 11,832 |
| Do. ... | Other Companies ... ... | ... | ... | ... | ... | ... | ... | 493,409 |
| Dundas ... ... | Mararoa G.M. Co., N.L. ... | 48,000 | 100,000 | 0 8 0 | 0 4 0 | 1 | 2,500 | 74,375 |
| | | | 10,000 | 0 8 0 | 0 8 0 | | | |
| Do. ... | Other Companies ... | ... | ... | ... | ... | ... | ... | 222,625 |
| | Total Dividends paid during 1920 ... ... | ... | ... | ... | ... | ... | 384,083 | ... |
| | Total Dividends paid to end of 1920 ... | ... | ... | ... | ... | ... | ... | 27,808,747 |

TABLE 10.

*Value of Gold Production and Percentage of Dividends paid.*

| Year. | Value of Gold Production. | Dividends paid by Gold Mining Companies. | Dividends % of Total Production. | Value of Gold Production by Gold Mining Companies only. | Dividends % upon Production by Gold Mining Companies. |
|---|---|---|---|---|---|
| | £ | £ | % | £ | % |
| Prior to 1911 ... | 98,027,412 | 21,351,283 | 21·78 | ... | ... |
| 1911 ... ... | 5,823,075 | 826,976 | 14·20 | 4,628,666 | 17·87 |
| 1912 ... ... | 5,448,385 | 814,092 | 14·94 | 4,304,161 | 18·91 |
| 1913 ... ... | 5,581,701 | 910,326 | 16·30 | 4,528,106 | 20·10 |
| 1914 ... ... | 5,237,353 | 799,392 | 15·26 | 4,094,336 | 19·52 |
| 1915 ... ... | 5,140,228 | 792,317 | 15·41 | 4,109,254 | 19·28 |
| 1916 ... ... | 4,508,532 | 632,883 | 14·04 | 3,518,531 | 17·90 |
| 1917 ... ... | 4,121,645 | 590,856 | 14·34 | 3,310,536 | 17·85 |
| 1918 ... ... | 3,723,183 | 368,295 | 9·81 | 2,914,325 | 12·64 |
| 1919 ... ... | 3,118,113 | 338,244 | 10·85 | 2,337,433 | 14·23 |
| 1920 ... ... | 2,624,427 | 384,083 | 14·63 | 2,212,711 | 17·36 |
| Total ... | 143,354,054 | 27,803,747 | 19·39 | *35,958,059 | *17·96 |

* Ten last years only.

TABLE 11.

*Quantity and Value of Minerals, other than Gold and Coal, reported to the Mines Department during 1920.*

| Goldfield, District, or Mineral Field. | 1920. | | Increase or Decrease for Year compared with 1919. | |
|---|---|---|---|---|
| | Quantity. | Value. | Quantity. | Value. |
| | tons. | £ | tons. | £ |
| **BLACK TIN.** | | | | |
| Pilbara Goldfield (Marble Bar District) | 41·50 | 7,616 | + 4·80 | + 1,745 |
| Greenbushes Mineral Field | 190·09 | 31,249 | — 54·52 | — 3,710 |
| Total | 231·59 | 38,865 | — 49·72 | — 1,965 |
| **PYRITIC ORE.** | | | | |
| Mt. Margaret Goldfield (Mt. Morgans District) | 6,019·98 | 7,276 | + 1,884·05 | + 2,357 |
| **COPPER ORE.** | | | | |
| Pilbara Goldfield (Nullagine District) | 9·00 | 360 | + 9·00 | + 360 |
| West Pilbara Goldfield | 1,700·50 | 32,059 | + 669·72 | + 16,252 |
| Peak Hill Goldfield | 35·39 | 1,401 | + 21·00 | + 1,048 |
| Phillips River Goldfield | 217·27 | 4,125 | + 2·25 | — 868 |
| Total | 1,962·16 | 37,945 | + 701·97 | + 16,792 |
| **LEAD ORE.** | | | | |
| Northampton Mineral Field | 27,716·40 | 172,483 | + 20,330·70 | + 142,642 |
| **TUNGSTEN ORES.** | | | | |
| SCHEELITE. | | | | |
| North Coolgardie Goldfield | 134·25 | 113 | — 138·81 | — 716 |
| Broad Arrow Goldfield | 3·35 | 175 | + 3·35 | + 175 |
| Coolgardie Goldfield | 40·00 | 54 | — 5·71 | — 47 |
| Dundas Goldfield | ·41 | 10 | + ·41 | + 10 |
| Total | 178·01 | 352 | — 140·76 | — 578 |
| **ASBESTOS.** | | | | |
| Pilbara Goldfield (Marble Bar District) | 32·00 | 1,900 | + 32·00 | + 1,900 |
| Do. (Nullagine District) | 124·50 | 5,386 | + 71·50 | + 3,943 |
| Total | 156·50 | 7,286 | + 103·50 | + 5,843 |

The output of Black Tin shows decreases in tonnage of 49.72 tons, and in value of £1,965. In Pyritic Ore there were increases in tonnage of 1,884.05 tons, and in value of £2,357. In copper ore there was an increase in tonnage of 701.97 tons, and in value of £16,792. Lead ore increased in tonnage by 20,330.70 tons, and in value £142,642. In tungsten ores the output of scheelite was 178.01 tons of a value of £352, there being 318.77 tons in the previous year; and the output of asbestos was 156.50 tons of a value of £7,286, whilst 53 tons were produced in the previous year.

The production of tin was again confined to Pilbara and Greenbushes Fields, while copper ore came from Pilbara, West Pilbara, Peak Hill, and Phillips River Goldfields. Pyritic ore came from Mount Margaret Goldfield. The production of Lead ore was confined to Northampton Mineral Field. Scheelite came from North Coolgardie, Broad Arrow, Coolgardie, and Dundas Goldfields, while asbestos came from Pilbara Goldfield.

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

TABLE 15.

*Number and Acreage of Mineral Leases in force 31st December each year, for the Five Years ending 31st December, 1920.*

| Mining District. | | Sub District. | | 1916. | | 1917. | | 1918. | | 1919. | | 1920. | | Increase or Decrease for 1920, compared with 1919. | | Mining District. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name. | Proclaimed. | Name. | Proclaimed. | Leases. | Acreage. | Leases. | Acreage. | Leases. | Acreage. | Leases. | Acreage. | Leases. | Acreage | Increase. | Decrease | |
| Ashburton ... ... | 11-12-90 | ... | ... | 6 | 79 | 6 | 79 | 5 | 69 | 4 | 45 | 3 | 44 | ... | 1 | Ashburton. |
| Murchison ... ... | 24-9-91 | Cue ... ... | 7-12-94 | 1 | 18 | ... | ... | 2 | 63 | 7 | 222 | 4 | 135 | ... | 39 | Murchison. |
| | | Meekatharra ... | 7-12-94 | 1 | 12 | 1 | 24 | ... | ... | ... | ... | ... | ... | | | |
| | | Day Dawn ... | 10-1-96 | 1 | 6 | 1 | 6 | 1 | 6 | 1 | 6 | 2 | 54 | | | |
| | | Mt. Magnet ... | 7-12-94 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | | | |
| Greenbushes ... | 7-4-92 | ... | ... | 35 | 522 | 33 | 492 | 51 | 644 | 27 | 409 | 29 | 421 | 12 | ... | Greenbushes. |
| Pilbara ... ... | 16-6-92 | Marble Bar ... | 16-6-92 | 8 | 145 | 8 | 145 | 11 | 259 | 8 | 145 | 11 | 247 | 126 | ... | Pilbara. |
| | | Nullagine ... | 6-11-96 | ... | ... | ... | ... | 2 | 54 | 6 | 120 | 10 | 144 | | | |
| Yalgoo ... ... | 23-1-95 | ... | ... | 6 | 144 | 11 | 318 | 11 | 282 | 13 | 284 | 14 | 320 | 36 | ... | Yalgoo. |
| Yilgarn ... ... | 22-3-95 | ... | ... | ... | ... | 1 | 48 | ... | ... | ... | ... | 1 | 48 | 48 | ... | Yilgarn. |
| Coolgardie ... ... | 22-3-95 | Coolgardie ... | 22-3-95 | 1 | 9 | 1 | 9 | 1 | 10 | 2 | 28 | 2 | 28 | ... | ... | Coolgardie. |
| | | Kunanalling ... | 1-9-97 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | | | |
| East Coolgardie ... | 22-3-95 | East Coolgardie | 22-3-95 | 3 | 13 | 3 | 13 | 3 | 13 | 8 | 120 | 2 | 3 | ... | 93 | East Coolgardie. |
| | | Bulong ... ... | 15-4-96 | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 24 | | | |
| East Murchison ... | 28-6-95 | Lawlers ... ... | 17-4-04 | 1 | 24 | 1 | 10 | 1 | 10 | ... | ... | ... | ... | ... | ... | East Murchison. |
| | | Black Range ... | 1-7-04 | ... | ... | ... | ... | 1 | 6 | 1 | 6 | 1 | 6 | | | |
| | | Wiluna ... ... | 1-3-10 | 1 | 10 | ... | ... | ... | ... | ... | ... | ... | ... | | | |
| North Coolgardie ... | 16-8-95 | Menzies ... ... | 15-4-96 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | North Coolgardie. |
| | | Ularring ... ... | 15-4-96 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | | | |
| | | Yerilla ... ... | 15-4-96 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | | | |
| | | Niagara ... ... | 1-3-97 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | | | |
| West Pilbara ... | 1-11-95 | ... | ... | 19 | 642 | 17 | 606 | 15 | 550 | 14 | 540 | 26 | 751 | 211 | ... | West Pilbara. |
| Dundas ... ... | 27-12-95 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | Dundas. |
| Collie ... ... | 21-2-96 | ... | ... | 100 | 30,602 | 113 | 34,647 | 114 | 34,661 | 115 | 34,981 | 115 | 34,979 | ... | 2 | Collie. |
| North East Coolgardie | 15-4-96 | Kanowna ... | 15-4-96 | ... | ... | ... | ... | 7 | 145 | 6 | 125 | 4 | 71 | ... | 54 | North-East Coolgardie. |
| | | Kurnalpi ... | 15-4-96 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | | | |
| Broad Arrow ... | 20-11-96 | ... | ... | 1 | 20 | 1 | 20 | ... | ... | ... | ... | ... | ... | ... | ... | Broad Arrow. |
| Northampton ... | 1-1-97 | ... | ... | 8 | 97 | 6 | 124 | 14 | 315 | 17 | 365 | 28 | 637 | 494 | ... | Northampton. |
| | | (Private Property) | ... | 1 | 48 | 2 | 72 | 3 | 84 | 3 | 75 | 8 | 297 | | | |
| Peak Hill ... ... | 1-4-97 | ... | ... | 11 | 300 | 15 | 351 | 9 | 225 | 8 | 183 | 12 | 375 | 192 | ... | Peak Hill. |
| Mt. Margaret ... | 1-4-97 | Mt. Margaret ... | 1-4-97 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | Mt. Margaret. |
| | | Mt. Malcolm ... | 1-4-97 | ... | ... | ... | ... | 1 | 48 | ... | ... | ... | ... | | | |
| | | Mt. Morgans ... | 2-4-02 | 4 | 74 | 4 | 74 | 4 | 74 | 3 | 69 | 3 | 69 | | | |
| Gascoyne ... ... | 15-4-97 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | Gascoyne. |
| Yandanooka ... | 1-12-97 | ... | ... | ... | ... | ... | ... | 1 | 10 | 1 | 10 | 1 | 10 | ... | ... | Yandanooka. |
| Phillips River ... | 1-7-99 | ... | ... | 15 | 409 | 18 | 443 | 18 | 447 | 15 | 397 | 16 | 437 | 40 | ... | Phillips River. |
| Other localities ... | ... | ... | ... | 13 | 544 | 16 | 572 | 12 | 391 | 29 | 2,728 | 18 | 2,187 | ... | 505 | Other Localities. |
| | | (Private Property) | ... | 1 | 48 | 1 | 48 | 1 | 48 | 2 | 72 | 5 | 108 | | | |
| West Kimberley | 19-3-20 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 10 | 448 | 448 | ... | West Kimberley. |
| Totals ... | ... | ... | ... | 237 | 33,766 | 259 | 38,101 | 288 | 38,414 | 290 | 40,930 | 326 | 41,843 | Increase of 36 leases and of 913 acres. | | |

In the Collie Mineral Field the largest area is held, viz., 34,979 acres worked entirely for coal; then follow Northampton, 934 acres for lead, copper, and coal; West Pilbara, 751 acres for copper and silver-lead; West Kimberley, 448 acres for iron; Phillips River, 437 acres for Copper; Greenbushes, 421 acres for tin; Pilbara, 391 acres for tin, copper, silver-lead, asbestos, and tantalite; Peak Hill, 375 acres for copper and manganese.

## TABLE 16.

*Number and Acreage of Mineral Leases in force on 31st December, 1920, showing Minerals for which they are worked.*

| Goldfield or Mineral Field. | District. | Mineral. | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coal. | | Tin. | | Copper. | | Iron. | | Clay. | | Limestone. | | Ochre. | | Silver and Lead. | | Asbestos. | | Manganese. | | Barytes. | |
| | | Leases. | Acres. | Leases. | Acres. | Leases. | Acres. | Leases. | Acres. | Leases. | Acres. | Leases. | Acres. | Leases. | Acres. | Leases. | Acres. | Leases. | Acres. | Leases. | Acres. | Leases. | Acres. |
| Pilbara ... ... ... | Marble Bar ... ... | ... | ... | 7 | 173 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 6 | 1 | 48 | ... | ... | ... | ... |
| | Nullagine ... ... | ... | ... | ... | ... | 1 | 48 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 9 | 96 | ... | ... | ... | ... |
| West Pilbara ... ... | ... ... ... ... | ... | ... | ... | ... | 24 | 717 | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 24 | ... | ... | 1 | 10 | ... | ... |
| Ashburton ... ... ... | ... ... ... ... | ... | ... | ... | ... | 1 | 24 | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 10 | ... | ... | ... | ... | ... | ... |
| Peak Hill ... ... ... | ... ... ... ... | ... | ... | ... | ... | 8 | 183 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 4 | 192 | ... | ... |
| | Yilgarn ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| East Murchison ... ... | Black Range ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 6 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Murchison ... ... ... | Day Dawn ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 6 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| | Cue ... ... | ... | ... | ... | ... | 2 | 63 | ... | ... | ... | ... | ... | ... | 2 | 72 | ... | ... | ... | ... | ... | ... | ... | ... |
| | Yandanooka ... ... | ... | ... | ... | ... | 1 | 10 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Yalgoo ... ... ... | ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Mt. Margaret ... ... | Mt. Morgans ... | ... | ... | ... | ... | 3 | 69 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| East Coolgardie ... ... | East Coolgardie ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 2 | ... | ... | 1 | 1 | ... | ... | ... | ... | ... | ... | ... | ... |
| East Coolgardie ... ... | Bulong ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 24 | ... | ... | ... | ... |
| Coolgardie ... ... ... | Coolgardie ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| North-East Coolgardie ... | Kanowna ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Phillips River ... ... | ... ... ... ... | ... | ... | ... | ... | 16 | 437 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Collie ... ... ... | ... ... ... ... | 115 | 34,979 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Greenbushes ... ... | ... ... ... ... | ... | ... | 29 | 421 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Northampton ... ... | ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| | (Private Property) ... | 1 | 100 | ... | ... | 1 | 24 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Outside Proclaimed Fields | ... ... ... ... | 6 | 1,920 | ... | ... | 5 | 72 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 48 |
| | (Private Property) ... | ... | ... | ... | ... | ... | ... | 1 | 48 | 1 | 24 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| West Kimberley ... ... | ... ... ... ... | ... | ... | ... | ... | ... | ... | 10 | 448 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| | Totals ... ... ... | 122 | 36,999 | 36 | 594 | 62 | 1,647 | 11 | 496 | 3 | 32 | 1 | 6 | 3 | 73 | 3 | 40 | 11 | 168 | 5 | 202 | 1 | 48 |

| Goldfield or Mineral Field. | District. | Mineral. | | | | | | | | | | | | | | | | | | Total. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Phosphatic Rock. | | Alunite. | | Tantalite. | | Lead. | | Gypsum. | | Graphite. | | Molybdenite. | | Mica. | | Potash. | | | |
| | | Leases. | Acres. | Leases. | Acres. | Leases. | Acres. | Leases. | Acres. | Leases. | Acres. | Leases. | Acres. | Leases. | Acres. | Leases. | Acres. | Leases. | Acres. | Leases. | Acres. |
| Pilbara ... ... ... | Marble Bar ... ... | ... | ... | ... | ... | 2 | 20 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 11 | 247 |
| | Nullagine ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 10 | 144 |
| West Pilbara ... ... | ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 26 | 751 |
| Ashburton ... ... ... | ... ... ... ... | ... | ... | ... | ... | ... | ... | 1 | 10 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 3 | 44 |
| Peak Hill ... ... ... | ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 12 | 375 |
| | Yilgarn ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 48 |
| East Murchison ... ... | Black Range ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 6 |
| Murchison ... ... ... | Day Dawn ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 48 | ... | ... | ... | ... | ... | ... | ... | ... | 2 | 54 |
| | Cue ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 4 | 135 |
| | Yandanooka ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 10 |
| Yalgoo ... ... ... | ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 14 | 320 | ... | ... | ... | ... | 14 | 320 |
| Mt. Margaret ... ... | Mt. Morgans ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 3 | 69 |
| East Coolgardie ... ... | East Coolgardie ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | 3 |
| East Coolgardie ... ... | Bulong ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 24 |
| Coolgardie ... ... ... | Coolgardie ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | 28 | ... | ... | 2 | 28 |
| North-East Coolgardie ... | Kanowna ... | ... | ... | 2 | 34 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | 37 | 4 | 71 |
| Phillips River ... ... | ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 16 | 437 |
| Collie ... ... ... | ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 115 | 34,979 |
| Greenbushes ... ... | ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 29 | 421 |
| Northampton ... ... | ... ... ... ... | ... | ... | ... | ... | ... | ... | 28 | 637 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 28 | 637 |
| | (Private Property) ... | ... | ... | ... | ... | ... | ... | 6 | 173 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 8 | 297 |
| Outside Proclaimed Fields | ... ... ... ... | 1 | 6 | ... | ... | ... | ... | ... | ... | 1 | 40 | 2 | 81 | ... | ... | 2 | 20 | ... | ... | 18 | 2,187 |
| | (Private Property) ... | 2 | 12 | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 24 | ... | ... | ... | ... | ... | ... | 5 | 108 |
| West Kimberley ... ... | ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 10 | 448 |
| | Totals ... ... | 3 | 18 | 2 | 34 | 2 | 20 | 35 | 820 | 2 | 88 | 3 | 105 | 14 | 320 | 5 | 96 | 2 | 37 | 326 | 41,843 |

TABLE 19.

*Miners' Rights issued during 1919 and 1920.*

| Place of Issue. | Miners' Rights. | | Place of Issue. | Miners' Rights. | |
|---|---|---|---|---|---|
| | 1919. | 1920. | | 1919. | 1920. |
| Albany ... ... ... ... ... | 20 | 18 | Mullewa ... ... ... ... | 11 | 10 |
| Boulder ... ... ... ... | 84 | 66 | Mulline ... ... ... ... | 1 | ... |
| Bridgetown ... ... ... ... | ... | 1 | Nannine ... ... ... ... | 23 | 17 |
| Broad Arrow ... ... ... ... | 62 | 20 | Narrogin ... ... ... ... | 7 | 6 |
| Broome ... ... ... ... | ... | 11 | Norseman ... ... ... ... | 95 | 99 |
| Bullfinch ... ... ... ... | 32 | 28 | Northampton ... ... ... | 32 | 43 |
| Bunbury ... ... ... ... | 3 | 24 | Northam ... ... ... ... | 3 | 1 |
| Busselton ... ... ... ... | 4 | 8 | Nullagine ... ... ... ... | 17 | 30 |
| Carnarvon ... ... ... ... | 35 | 28 | Onslow ... ... ... ... | 5 | 46 |
| Collie ... ... ... ... ... | 5 | 26 | Ora Banda ... ... ... ... | 32 | 14 |
| Coolgardie ... ... ... ... | 200 | 216 | Payne's Find ... ... ... | 24 | 15 |
| Cue ... ... ... ... ... | 163 | 133 | Peak Hill ... ... ... ... | 36 | 23 |
| Derby ... ... ... ... ... | 17 | 23 | Perth ... ... ... ... ... | 285 | 317 |
| Esperance ... ... ... ... | ... | 1 | Port Hedland ... ... ... | 9 | 14 |
| Geraldton ... ... ... ... | 10 | 12 | Ravensthorpe ... ... ... | 38 | 32 |
| Greenbushes ... ... ... ... | 127 | 124 | Roebourne ... ... ... ... | 38 | 49 |
| Hall's Creek ... ... ... ... | 15 | 50 | Sandstone ... ... ... ... | 57 | 40 |
| Kalgoorlie ... ... ... ... | 1,207 | 898 | Southern Cross ... ... ... | 94 | 110 |
| Kunanalling ... ... ... ... | ... | ... | St. Ives ... ... ... ... | ... | 5 |
| Lake Darlot ... ... ... ... | 12 | 2 | Wagin ... ... ... ... | ... | 1 |
| Laverton ... ... ... ... | 115 | 134 | Westonia ... ... ... ... | 218 | 103 |
| Lawlers ... ... ... ... | 40 | 41 | Wiluna ... ... ... ... | 34 | 60 |
| Leonora ... ... ... ... | 85 | 84 | Wyndham ... ... ... ... | 1 | 10 |
| Linden ... ... ... ... ... | 12 | 16 | Yalgoo ... ... ... ... | 47 | 52 |
| Marble Bar ... ... ... ... | 87 | 89 | Yarri ... ... ... ... ... | 6 | 2 |
| Marvel Loch ... ... ... ... | 29 | 27 | York ... ... ... ... ... | 4 | ... |
| Meekatharra ... ... ... ... | 124 | 81 | Youanmi ... ... ... ... | 29 | 43 |
| Menzies ... ... ... ... | 157 | 148 | | | |
| Mount Magnet ... ... ... | 110 | 102 | Total ... ... ... | 3,901 | 3,553 |

TABLE 20.

*Number and Acreage of Miners' Homestead Leases in force on 31st December, 1919 and 1920.*

| Goldfield. | District. | 1919. | | 1920. | | Increase. | | Decrease. | |
|---|---|---|---|---|---|---|---|---|---|
| | | Leases. | Acreage. | Leases. | Acreage. | Leases. | Acreage. | Leases. | Acreage. |
| West Pilbara ... ... | ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Greenbushes ... ... | ... ... ... | 9 | 854 | 7 | 631 | ... | ... | 2 | 223 |
| Pilbara ... ... | Marble Bar ... | 4 | 58 | ... | ... | ... | ... | 4 | 58 |
| | Nullagine ... | ... | ... | ... | ... | | | | |
| Dundas ... ... ... | ... ... ... | 27 | 1,425 | 27 | 1,345 | ... | ... | ... | 80 |
| Broad Arrow ... ... | ... ... ... | 2 | 40 | 2 | 40 | ... | ... | ... | ... |
| Yilgarn ... ... ... | ... ... ... | 19 | 688 | 19 | 1,144 | ... | 456 | ... | ... |
| Mt. Margaret ... | Mt. Malcolm ... | 4 | 1,039 | 5 | 1,239 | ... | 176 | ... | ... |
| | Mt. Margaret ... | 18 | 445 | 17 | 421 | | | | |
| Murchison ... | Cue ... ... ... | 8 | 1,297 | 6 | 1,264 | ... | ... | 6 | 81 |
| | Day Dawn ... | 7 | 98 | 5 | 75 | | | | |
| | Meekatharra ... | 16 | 1,890 | 15 | 1,870 | | | | |
| | Mt. Magnet ... | 3 | 261 | 2 | 256 | | | | |
| Yalgoo ... ... ... | ... ... ... | 2 | 680 | 2 | 680 | ... | ... | ... | ... |
| Coolgardie ... | Coolgardie ... ... | 21 | 922 | 25 | 992 | 4 | 70 | ... | ... |
| | Kunanalling ... | 3 | 540 | 3 | 540 | | | | |
| East Coolgardie ... | ... ... ... | 89 | 2,379 | 89 | 2,388 | ... | 9 | ... | ... |
| Phillips River ... ... | ... ... ... | 151 | 20,733 | 147 | 20,363 | ... | ... | 4 | 370 |
| Peak Hill ... ... | ... ... ... | 5 | 252 | 4 | 247 | ... | ... | 1 | 5 |
| North-East Coolgardie ... | Kanowna ... ... | 18 | 822 | 17 | 802 | ... | ... | 1 | 20 |
| North Coolgardie | Menzies ... ... | 9 | 729 | 9 | 729 | ... | ... | ... | ... |
| | Yerilla ... ... | 1 | 10 | 1 | 10 | | | | |
| | Niagara ... ... | 1 | 20 | 1 | 20 | | | | |
| | Ularring ... ... | 1 | 20 | 1 | 20 | | | | |
| East Murchison... | Lawlers ... ... | 5 | 1,110 | 6 | 1,115 | 5 | 76 | ... | ... |
| | Black Range ... | 4 | 100 | 8 | 171 | | | | |
| | Wiluna ... ... | 3 | 39 | 3 | 39 | | | | |
| | Total ... | 430 | 36,451 | 421 | 36,401 | ... | ... | 9 | 50 |

As compared with the year 1919, the number of leases held has decreased by 9 and the area by 50 acres.

## PART IV.—MEN EMPLOYED.

### TABLE 21.

*Average number of Men engaged in Mining during 1919 and 1920.*

| Goldfield. | District. | Reef or Lode. | | Alluvial. | | Total. | |
|---|---|---|---|---|---|---|---|
| | | 1919. | 1920. | 1919. | 1920. | 1919. | 1920. |
| 1. Kimberley ... ... ... ... | ... ... ... ... ... | ... | ... | 12 | 5 | 12 | 5 |
| 2. West Kimberley ... ... ... | ... ... ... ... ... | ... | ... | ... | ... | ... | ... |
| 3. Pilbara ... ... ... | Marble Bar ... ... ... | 43 | 50 | 12 | 17 | 55 | 67 |
| | Nullagine ... ... ... | 19 | 19 | 21 | 21 | 40 | 40 |
| 4. West Pilbara ... ... ... | ... ... ... ... ... | 4 | 7 | 9 | 10 | 13 | 17 |
| 5. Ashburton ... ... ... ... | ... ... ... ... ... | 3 | ... | 4 | ... | 7 | ... |
| 6. Gascoyne ... ... ... ... | ... ... ... ... ... | 2 | ... | 4 | ... | 6 | ... |
| 7. Peak Hill ... ... ... ... | ... ... ... ... ... | 25 | 34 | 2 | 3 | 27 | 37 |
| 8. East Murchison ... ... | Lawlers ... ... ... | 53 | 66 | ... | 1 | 53 | 67 |
| | Wiluna ... ... ... | 77 | 112 | ... | ... | 77 | 112 |
| | Black Range ... ... | 173 | 187 | ... | ... | 173 | 187 |
| 9. Murchison ... ... ... | Cue ... ... ... ... | 143 | 121 | 4 | 6 | 147 | 127 |
| | Meekatharra ... ... ... | 380 | 290 | 9 | 11 | 389 | 301 |
| | Day Dawn ... ... ... | 37 | 32 | 7 | 7 | 44 | 39 |
| | Mt. Magnet ... ... ... | 89 | 93 | 1 | 1 | 90 | 94 |
| 10. Yalgoo ... ... ... ... | ... ... ... ... ... | 105 | 93 | 1 | ... | 106 | 93 |
| 11. Mt. Margaret ... ... | Mt. Morgans ... ... ... | 108 | 124 | 7 | 5 | 115 | 129 |
| | Mt. Malcolm ... ... ... | 450 | 449 | 3 | 2 | 453 | 451 |
| | Mt. Margaret ... ... | 308 | 281 | 4 | 4 | 312 | 285 |
| 12. North Coolgardie ... ... | Menzies ... ... ... | 299 | 194 | 9 | 1 | 308 | 195 |
| | Ularring ... ... ... | 47 | 34 | 5 | 1 | 52 | 35 |
| | Niagara ... ... ... | 25 | 15 | 3 | ... | 28 | 15 |
| | Yerilla ... ... ... | 38 | 40 | 4 | 1 | 42 | 41 |
| 13. Broad Arrow ... ... ... | ... ... ... ... ... | 173 | 126 | 12 | 9 | 185 | 135 |
| 14. North-East Coolgardie ... | Kanowna ... ... ... | 41 | 62 | 6 | 6 | 47 | 68 |
| | Kurnalpi ... ... ... | 12 | 10 | 2 | 3 | 14 | 13 |
| 15. East Coolgardie ... ... | East Coolgardie ... ... | 3,049 | 3,335 | 19 | 9 | 3,068 | 3,344 |
| | Bulong ... ... ... | 18 | 24 | 7 | 6 | 25 | 30 |
| 16. Coolgardie ... ... ... | Coolgardie ... ... ... | 237 | 384 | 36 | 26 | 273 | 410 |
| | Kunanalling ... ... ... | 80 | 78 | 17 | 13 | 97 | 91 |
| 17. Yilgarn ... ... ... ... | ... ... ... ... ... | 804 | 534 | ... | ... | 804 | 534 |
| 18. Dundas ... ... ... ... | ... ... ... ... ... | 140 | 101 | ... | ... | 140 | 101 |
| 19. Phillips River ... ... ... | ... ... ... ... ... | 29 | 18 | 1 | ... | 30 | 18 |
| State generally ... ... | ... ... ... ... ... | 10 | 6 | ... | ... | 10 | 6 |
| Total—Gold Mining ... ... ... ... | | 7,021 | 6,919 | 221 | 168 | 7,242 | 7,087 |
| **MINERALS OTHER THAN GOLD.** | | | | | | | |
| Tin ... ... ... | Greenbushes ... ... ... | 154 | 136 | *5 | *8 | 159 | 144 |
| | Marble Bar ... ... ... | 2 | 2 | *48 | *41 | 50 | 43 |
| Copper ... ... | West Pilbara ... ... | 31 | 91 | ... | ... | 31 | 91 |
| | Phillips River ... ... | 25 | 21 | ... | ... | 25 | 21 |
| | Peak Hill ... ... ... | 16 | 4 | ... | ... | 16 | 4 |
| Pyritic Ore ... ... ... | Mt. Morgans ... ... ... | 18 | 17 | ... | ... | 18 | 17 |
| Lead Ore ... ... | Northampton ... ... | 73 | 238 | ... | ... | 73 | 238 |
| | Ashburton ... ... ... | 1 | ... | ... | ... | 1 | ... |
| Coal ... ... ... ... | Collie River ... ... ... | 726 | 830 | ... | ... | 726 | 830 |
| Asbestos ... ... ... | Nullagine ... ... ... | 5 | 19 | ... | ... | 5 | 19 |
| Manganese ... ... ... | Peak Hill ... ... ... | ... | 2 | ... | ... | ... | 2 |
| | Total—Other Minerals ... | 1,051 | 1,360 | 53 | 49 | 1,104 | 1,409 |
| | GRAND TOTAL ... | 8,072 | 8,279 | 274 | 217 | 8,346 | 8,496 |

*Classified elsewhere as employed at mines.

TABLE 22.

*Average Number of Men employed at Mines during 1920.*

| Mineral. | Above ground. | Under ground. | Total. | Percentage of total men employed. | Increase or decrease compared with 1919. |
|---|---|---|---|---|---|
| Coal ... ... ... ... ... ... | 218 | 612 | 830 | 9·97 | + 104 |
| Copper ... ... ... ... ... ... | 70 | 46 | 116 | 1·40 | + 44 |
| Gold ... ... ... ... ... ... | 3,167 | 3,752 | 6,919 | 83·08 | — 102 |
| Lead ... ... ... ... ... ... | 83 | 155 | 238 | 2·86 | + 164 |
| Pyritic Ore ... ... ... ... ... | 5 | 12 | 17 | ·20 | — 1 |
| Tin ... ... ... ... ... ... | *178 | 9 | 187 | 2·24 | — 22 |
| Asbestos ... ... ... ... ... ... | 16 | 3 | 19 | ·23 | + 14 |
| Manganese ... ... ... ... ... | 2 | ... | 2 | ·02 | + 2 |
| Total ... ... ... | 3,739 | 4,589 | 8,328 | 100·00 | + 203 |

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

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

TABLE 23.

*Average Number of Men employed at Gold Mines during 1920, 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 1919. | Percentage of total men employed. | |
|---|---|---|---|---|---|---|
| | | | | | 1919. | 1920. |
| 1. Kimberley ... ... ... ... | ... | ... | ... | ... | ... | ... |
| 2. West Kimberley ... ... ... | ... | ... | ... | ... | ... | ... |
| 3. Pilbara ... ... ... ... ... | 32 | 37 | 69 | + 7 | ·88 | 1·00 |
| 4. West Pilbara ... ... ... ... | 3 | 4 | 7 | + 3 | ·06 | ·10 |
| 5. Ashburton ... ... ... ... | ... | ... | ... | — 3 | ·04 | ... |
| 6. Gascoyne ... ... ... ... | ... | ... | ... | — 2 | ·03 | ... |
| 7. Peak Hill ... ... ... ... | 26 | 8 | 34 | + 9 | ·36 | ·49 |
| 8. East Murchison ... ... ... ... | 214 | 151 | 365 | + 62 | 4·32 | 5·27 |
| 9. Murchison... ... ... ... ... | 239 | 297 | 536 | — 113 | 9·24 | 7·75 |
| 10. Yalgoo ... ... ... ... | 45 | 48 | 93 | — 12 | 1·50 | 1·34 |
| 11. Mt. Margaret ... ... ... ... | 376 | 478 | 854 | — 12 | 12·33 | 12·34 |
| 12. North Coolgardie ... ... ... | 139 | 144 | 283 | — 126 | 5·83 | 4·09 |
| 13. Broad Arrow ... ... ... ... | 50 | 76 | 126 | — 47 | 2·46 | 1·82 |
| 14. North-East Coolgardie ... ... ... | 33 | 39 | 72 | + 19 | ·76 | 1·04 |
| 15. East Coolgardie ... ... ... ... | 1,450 | 1,909 | 3,359 | + 292 | 43·68 | 48·55 |
| 16. Coolgardie ... ... ... ... | 224 | 238 | 462 | + 145 | 4·52 | 6·68 |
| 17. Yilgarn ... ... ... ... ... | 276 | 258 | 534 | — 270 | 11·45 | 7·72 |
| 18. Dundas ... ... ... ... ... | 47 | 54 | 101 | — 39 | 1·99 | 1·46 |
| 19. Phillips River ... ... ... ... | 8 | 10 | 18 | — 11 | ·41 | ·26 |
| State generally ... ... ... ... | 5 | 1 | 6 | — 4 | ·14 | ·09 |
| Total ... ... ... | 3,167 | 3,752 | 6,919 | — 102 | 100·00 | 100·00 |

TABLE 24.

*Alluvial Gold Workers.*

| Goldfield. | 1919. | 1920. | Increase or Decrease compared with 1919. |
|---|---|---|---|
| 1. Kimberley ... ... ... ... ... ... ... | 12 | 5 | — 7 |
| 2. West Kimberley ... ... ... ... ... ... ... | ... | ... | ... |
| 3. Pilbara ... ... ... ... ... ... ... ... | 33 | 38 | + 5 |
| 4. West Pilbara ... ... ... ... ... ... ... | 9 | 10 | + 1 |
| 5. Ashburton ... ... ... ... ... ... ... | 4 | ... | — 4 |
| 6. Gascoyne ... ... ... ... ... ... ... | 4 | ... | — 4 |
| 7. Peak Hill ... ... ... ... ... ... ... | 2 | 3 | + 1 |
| 8. East Murchison ... ... ... ... ... ... ... | ... | 1 | + 1 |
| 9. Murchison ... ... ... ... ... ... ... | 21 | 25 | + 4 |
| 10. Yalgoo ... ... ... ... ... ... ... | 1 | ... | — 1 |
| 11. Mt. Margaret ... ... ... ... ... ... ... | 14 | 11 | — 3 |
| 12. North Coolgardie ... ... ... ... ... ... | 21 | 3 | — 18 |
| 13. Broad Arrow ... ... ... ... ... ... ... | 12 | 9 | — 3 |
| 14. North-East Coolgardie ... ... ... ... ... ... | 8 | 9 | + 1 |
| 15. East Coolgardie ... ... ... ... ... ... ... | 26 | 15 | — 11 |
| 16. Coolgardie ... ... ... ... ... ... ... | 53 | 39 | — 14 |
| 17. Yilgarn ... ... ... ... ... ... ... ... | ... | ... | ... |
| 18. Dundas ... ... ... ... ... ... ... ... | ... | ... | ... |
| 19. Phillips River ... ... ... ... ... ... ... | 1 | ... | — 1 |
| Total ... ... ... ... | 221 | 168 | — 53 |

TABLE 25.

RATE OF WAGES IN THE MINING INDUSTRY.

*Table showing Wages payable to Workers in Gold-mining and Copper-mining Industries under various Awards of the Court of Arbitration and Industrial Agreements up to the 31st December, 1920.*

| Locality in which Award or Agreement has effect. | Date of Award or Agreement. | Term. | Miner (hand labour) in shafts. | Miner (hand labour) in rises. | Miner (hand labour) in winzes. | Miner (hand labour) in all other places. | Millman in Charge. | Rosetterman in Charge. | Slimes Charger. | Slimes Platman (offsider). | Ropeman. | Men on Cracker. | Men on Dams. | Rock Drill Men and Chuckmen in Shafts. | Rock Drill Men and Chuckmen in rises. | Rock Drill Men and Chuckmen elsewhere. | Rock Drill Men in winzes. | Miners (Hammer and Drift men). | Miners (wet ground, extra allowance, per shift). | Brakesmen and Platmen. | Skiptenders. | Mullockers and Shovellers. | Shoveller. | Truckers. | Men working in Cyanide Vats and Precipitate Huts. | Man in Charge of Dam. | Timbermen. | Surface Labourers. | Boiler Cleaners. | Horse Drivers (including looking after horses). | Drill and Tool Sharpeners. | Mechanics' Labourers. | Oilers and greasers. | Riggers. | Firemen. | Pipe Fitters (underground). | Pitmen. | Fitters, Turners, and Blacksmiths. | Strikers. | Patternmakers. | Platers, Shapers, and Slotters. | Radial Drillers. | Electricians. | Motor Attendants. | Linemen. | Engine-driving. | | | Hours of Work per week. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Locomotive. | Surface Winding Engine. | All other classes of Engines. | Overtime. Week Day. Up to 4 hours. | Overtime. Week Day. After 4 hours. | Men on Surface (one shift). | Shiftmen and underground workers. |
| | | | s. d. | s. d. | s. d.

## PART V.—ACCIDENTS.

### TABLE No. 26.

### MEN EMPLOYED IN MINES KILLED AND INJURED IN MINING ACCIDENTS DURING 1919 AND 1920.

A.—*According to Locality of Accident.*

| Goldfield. | Killed. | | Injured. | | Total Killed and Injured. | |
|---|---|---|---|---|---|---|
| | 1919. | 1920. | 1919. | 1920. | 1919. | 1920. |
| 1. Kimberley ... ... ... ... ... ... | ... | ... | ... | ... | ... | ... |
| 2. West Kimberley ... ... ... ... ... ... | ... | ... | ... | ... | ... | ... |
| 3. Pilbara ... ... ... ... ... ... ... | ... | ... | ... | ... | ... | ... |
| 4. West Pilbara ... ... ... ... ... ... | ... | 1 | ... | ... | ... | 1 |
| 5. Ashburton ... ... ... ... ... ... | ... | ... | ... | ... | ... | ... |
| 6. Gascoyne ... ... ... ... ... ... | ... | ... | ... | ... | ... | ... |
| 7. Peak Hill ... ... ... ... ... | ... | ... | 1 | ... | 1 | ... |
| 8. East Murchison ... ... ... ... ... | 1 | 2 | 19 | 16 | 20 | 18 |
| 9. Murchison ... ... ... ... ... ... | 1 | 3 | 13 | 13 | 14 | 16 |
| 10. Yalgoo ... ... ... ... ... ... ... | ... | ... | ... | ... | ... | ... |
| 11. Mt. Margaret ... ... ... ... ... ... | 4 | 2 | 107 | 59 | 111 | 61 |
| 12. North Coolgardie ... ... ... ... ... | ... | 1 | 7 | 3 | 7 | 4 |
| 13. N.E. Coolgardie ... ... ... ... ... | ... | ... | ... | 1 | ... | 1 |
| 14. Broad Arrow ... ... ... ... ... ... | 1 | ... | 5 | ... | 6 | ... |
| 15. East Coolgardie ... ... ... ... ... | 11 | 9 | 319 | 337 | 330 | 346 |
| 16. Coolgardie ... ... ... ... ... ... | 1 | 1 | ... | 2 | 1 | 3 |
| 17. Yilgarn ... ... ... ... ... ... ... | 5 | 1 | 4 | 4 | 9 | 5 |
| 18. Dundas ... ... ... ... ... ... ... | 1 | ... | 1 | ... | 2 | ... |
| 19. Phillips River ... ... ... ... ... ... | ... | ... | ... | ... | ... | ... |
| MINING DISTRICTS— | | | | | | |
| Northampton ... ... ... ... ... | ... | 1 | 1 | 8 | 1 | 9 |
| Yandanooka ... ... ... ... ... | ... | ... | ... | ... | ... | ... |
| Collie ... ... ... ... ... ... | 1 | ... | 118 | 94 | 119 | 94 |
| Swan ... ... ... ... ... ... | ... | ... | 1 | 1 | 1 | 1 |
| Kendinup ... ... ... ... ... ... | ... | ... | ... | ... | ... | ... |
| Roelands ... ... ... ... ... ... | ... | ... | ... | ... | ... | ... |
| Total ... ... ... | 26 | 21 | 596 | 538 | 622 | 559 |

From the above Table it will be seen that the total number of fatal accidents for the year 1920 was five less than for 1919. The number of injured shows a decrease of 58 compared with the preceding year. Details of these accidents will be found in the Report of the State Mining Engineer, published as Division 11 to this Report.

B.—*According to Causes of Accidents.*

| | 1919. | | 1920. | | Comparison with 1919. | |
|---|---|---|---|---|---|---|
| | Fatal. | Serious. | Fatal. | Serious. | Fatal. | Serious. |
| 1. Explosives ... ... ... ... ... ... | 1 | 7 | 1 | 10 | ... | + 3 |
| 2. Falls of Ground ... ... ... ... ... | 12 | 58 | 7 | 54 | — 5 | — 4 |
| 3. In Shafts ... ... ... ... ... ... | 4 | 15 | 5 | 20 | + 1 | + 5 |
| 4. Miscellaneous—Underground ... ... ... ... | 5 | 370 | 3 | 311 | — 2 | — 59 |
| 5. Surface ... ... ... ... ... ... ... | 4 | 146 | 5 | 143 | + 1 | — 3 |
| Total ... ... ... ... | 26 | 596 | 21 | 538 | — 5 | — 58 |

Of the fatal accidents 20 occurred in gold mines and one in a lead mine. The death rate per 1,000 men employed on Gold Mines was 2·89 as against 3·56 in 1919.

## TABLE No. 27.

*Deaths of Persons employed at Mines from Accidents during* **1919** *and* **1920.**

| | 1919. | | | | | | 1920. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Persons killed. | | | Death Rate per 1,000 men employed. | | | Number of Persons killed. | | | Death Rate per 1,000 men employed. | | |
| | Above Ground. | Under Ground. | Total. | Above Ground. | Under Ground. | Total. | Above Ground. | Under Ground. | Total. | Above Ground. | Under Ground. | Total. |
| Coal Mines ... ... ... | 1 | ... | 1 | 5·46 | ... | 1·38 | ... | ... | ... | ... | ... | ... |
| Men employed ... ... | (183) | (543) | (726) | ... | ... | ... | (218) | (612) | (830) | ... | ... | ... |
| Gold Mines ... ... ... | 3 | 22 | 25 | ·91 | 5·58 | 3·45 | 12 | 8 | 20 | 3·60 | 2·13 | 2·82 |
| Men employed ... ... | (3,301) | (3,941) | (7,242) | ... | ... | ... | (3,335) | (3,752) | (7,087) | ... | ... | ... |
| Other Mines ... ... ... | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | 4·44 | 1·73 |
| Men employed ... ... | (272) | (106) | (378) | ... | ... | ... | (354) | (225) | (579) | ... | ... | ... |
| Total for all mines ... | 4 | 22 | 26 | 1·06 | 4·79 | 3·12 | 12 | 9 | 21 | 3·07 | 1·96 | 2·47 |
| Total number of men employed ... ... | (3,756) | (4,590) | (8,346) | ... | ... | ... | (3,907) | (4,589) | (8,496) | ... | ... | ... |

## TABLE No. 28.

*Deaths of Persons employed at Quarries from Accidents during* **1919** *and* **1920.**

| Mining District. | Number of Persons employed. | | | | | | Number of Persons killed. | | | | | | Death Rate per 1,000 men employed. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Above Ground. | | Under Ground. | | Total. | | Above Ground. | | Under Ground. | | Total. | | Above Ground. | | Under Ground. | | Total. | |
| | 1919. | 1920. | 1919. | 1920. | 1919. | 1920. | 1919. | 1920. | 1919. | 1920. | 1919. | 1920. | 1919. | 1920. | 1919. | 1920. | 1919. | 1920. |
| Swan ... | 239 | 195 | ... | ... | 239 | 195 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Roelands ... | 6 | ... | ... | ... | 6 | | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Total ... | 245 | 195 | ... | ... | 245 | 195 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |

## TABLE No. 29.

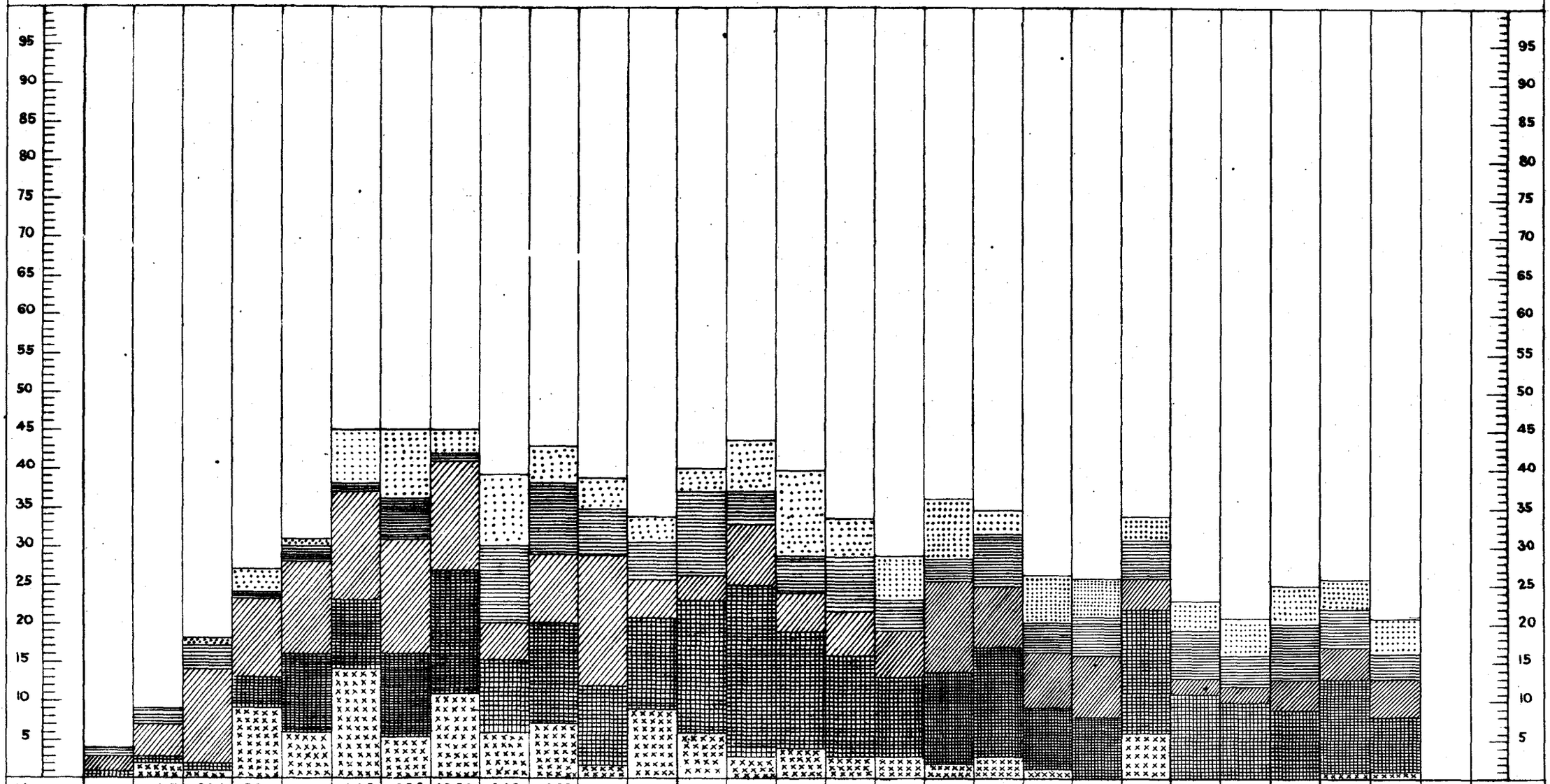
*Deaths from Accidents of Persons Employed in Gold Mines during 1920, and the Death Rate per 1,000 Men Employed and per 1,000 tons of Gold Ore raised during 1919 and 1920.* (*Number of men taken as in Table* No. 23, *not including Alluvial Gold Workers.*)

| Goldfield. | Number of Deaths. | | | Death Rate per 1,000 men employed. | | | | Number of Deaths per 1,000 tons of Gold Ore raised. | |
|---|---|---|---|---|---|---|---|---|---|
| | 1920. | | | 1920. | | | 1919. | | |
| | Above Ground. | Under Ground. | Total. | Above Ground. | Under Ground. | Total. | Total. | 1920. | 1919. |
| 1. Kimberley ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 2. West Kimberley ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 3. Pilbara ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 4. West Pilbara ... ... | ... | 1 | 1 | ... | 250·00 | 142·86 | ... | 14·286 | ... |
| 5. Ashburton ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 6. Gascoyne ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 7. Peak Hill ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 8. East Murchison ... ... | 1 | 1 | 2 | 4·67 | 6·62 | 5·48 | 3·30 | ·052 | ·022 |
| 9. Yalgoo ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 10. Mt. Margaret ... ... | 1 | 1 | 2 | 2·66 | 2·09 | 2·34 | 4·62 | ·009 | ·017 |
| 11. North Coolgardie ... ... | ... | 1 | 1 | ... | 6·94 | 3·53 | ... | ·048 | ... |
| 12. North-East Coolgardie ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 13. East Coolgardie ... ... | 1 | 8 | 9 | ·69 | 4·19 | 2·68 | 3·59 | ·012 | ·016 |
| 14. Broad Arrow ... ... | ... | ... | ... | ... | ... | ... | 5·78 | ... | ·050 |
| 15. Coolgardie ... ... ... | ... | 1 | 1 | ... | 4·20 | 2·16 | 3·15 | ·059 | ·104 |
| 16. Murchison ... ... ... | 2 | 1 | 3 | 8·37 | 3·37 | 5·60 | 1·54 | ·040 | ·013 |
| 17. Yilgarn ... ... ... | ... | 1 | 1 | ... | 3·88 | 1·87 | 6·22 | ·010 | ·035 |
| 18. Dundas ... ... ... | ... | ... | ... | ... | ... | ... | 7·14 | ... | ·051 |
| 19. Phillips River ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Total ... ... | 5 | 15 | 20 | 1·58 | 3·99 | 2·89 | 3·56 | ·016 | ·019 |

The number of deaths per 1,000 men employed shows a decrease from 3·56 in 1919 to 2·89 in 1920, and that per 1,000 tons of gold ore raised shows a slight decrease also, being ·016 as against ·019 for the preceding year.

The excessive figure for West Pilbara is due to the fact that only 4 men were there employed underground, and 7 altogether on *Gold* mines.

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




Part V, Table 26B.

## PART VI.—STATE AID TO MINING.

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

From inception to the end of 1920, gold and tin to the value of £5,379,861.39 have been recovered from the State plants. 1,283,521.44 tons of auriferous ore have been treated and have produced £4,421,881.09 worth of gold by amalgamation; £643,448.31 worth by cyanidation; £212,788.08 worth by slimes treatment; £9,353.37 worth from residues; and 80,013.75 tons of tin ore produced tin to the value of £92,390.54, and, in addition, a sum of £572.32 has been recovered from residues.

During the year the gold ore treated was 46,494.25 tons for 28,450.63ozs. bullion.

The working expenditure for all plants for the year totalled £42,313 18s. 3d. and the revenue £35,950 18s. 7d., which shows a loss of £6,362 19s. 8d. in the year's operations.

The capital expenditure since the inception of the scheme has been £384,577 7s. 3d., £292,596 5s. 7d. from General Loan Fund, and £91,981 1s. 8d. from Consolidated Revenue.

The cost of administration for the year was £3,825 13s. 3d., as against £3,577 18s. 8d. for 1919. The working expenditure from inception to the end of the year exceeds the revenue collected by £97,643 12s. 8d.

### GEOLOGICAL SURVEY.

The Government Geologist and the officers associated with him, though considerably reduced in numbers owing to resignations, have continued their investigations both in the field and the laboratory, tending towards the industrial development of the mineral and allied resources.

The work embraced a variety of subjects, such as the possibility of transforming potential wealth of the water powers of the Kimberley Division into actual wealth; artesian water supply for Geraldton; petroleum prospects of the Busselton neighbourhood and the Kimberley Division; the results of the different boring operations carried out in widely separated parts of the State; the areal and mining geology of Mount Monger and St. Ives; the lead lodes of the Northampton district; barytes veins of Cranbrook; and the reputed gold find near Bila in the South-West Division; chemical and physical investigations accompanied by experimental manufacture directly bearing on the establishment of industries likely to use local raw materials; petrological researches into materials collected by the field staff and for the public generally—full details of all of which will be found in the progress report of the Geological Survey which is appended. The report is accompanied by a useful map of the State showing the four miles to the inch series of geological sketch maps and others issued since 1896, which will be found of considerable utility.

### ASSISTANCE UNDER MINING DEVELOPMENT ACT, 1902.

The following statement shows the sums advanced during the year 1920 under "The Mining Development Act":—

| | £ | s. | d. |
|---|---|---|---|
| Advanced in aid of mining work and equipment of mines with machinery .. .. .. | 23,466 | 16 | 6 |
| Subsidies paid on stone crushed for public .. .. .. .. | 290 | 19 | 6 |
| Boring .. .. .. .. | 3,556 | 6 | 8 |
| Providing means of transport and equipment to prospectors .. | 3,485 | 12 | 1 |
| | £30,799 | 14 | 9 |

In addition to the above, amounts totalling £2,555 1s. 2d. were expended from Mining Development Vote on various matters for the assistance of mining, such as water supply, subsidies to assist carting of ore long distances, and subsidies for development work done below 100 feet level in small mines, and rebates to prospectors working low grade mines. The subsidies paid on stone crushed for the public, amounting to £290 19s. 6d., are subsidies paid to owners of plants crushing for the public, the conditions being that they crush at fixed rates; in most cases a further requirement being imposed as to purchasing or testing tailings. The ore crushed at such plants during the year amounted to 1,680.50 tons. The receipts under the Mining Development Act exclusive of interest payments amount to £2,653 9s. 3d., and include:—

| | £ | s. | d. |
|---|---|---|---|
| Refunds of advances .. .. | 1,887 | 2 | 9 |
| Sales of securities .. .. | 621 | 10 | 0 |
| Miscellaneous refunds .. .. | 144 | 16 | 6 |

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

### ASHBURTON GOLDFIELD.

No output was reported from this field, and mining is at a complete standstill.

### BROAD ARROW GOLDFIELD.

The output of gold was 7,445 fine ounces, and in the preceding year 11,729 fine ounces; a decrease of 4,284 fine ounces. 3.35 tons of scheelite, valued at £175, were also reported. Mining was exceedingly quiet on this field, and prospecting considerably retarded on account of the drought conditions which prevailed.

### COLLIE COAL FIELD.

The output of coal for the year was 462,021 tons, and for the preceding year 401,713 tons; an increase of 60,308 tons.

Five collieries were producing, viz., the Proprietary, Co-operative, Cardiff, Westralian, and Premier. At the Scottish some prospecting work was done, but eventually it closed down. The outlook for the field is good.

### COOLGARDIE GOLDFIELD.

The output of gold was 5,986 fine ounces, and in the preceding year 5,814 fine ounces; an increase of 172 fine ounces.

Scheelite to the extent of 40 tons, valued at £54, was also produced, and in the preceding year 45.71 tons, valued at £101; a decrease in tonnage of 5.71 tons and in value of £47. In the Kunanalling district there was little change, the output showing a small increase. At Gibraltar prospecting was active, also at Widgiemooltha, where several companies were doing active development work.

At St. Ives, where a promising discovery was made last year, a lot of work has been done and some of the leases give promising results.

DUNDAS GOLDFIELD.

The output of gold for the year was 6,541 fine ounces, and in the preceding year 12,530 fine ounces; a decrease of 5,989 fine ounces.

Scheelite to the extent of .41 of a ton, valued at £10, was also reported.

This field showed no progress, and mining was exceedingly quiet.

EAST COOLGARDIE GOLDFIELD.

The output of gold was 401,496 fine ounces, and in the preceding year 397,055 fine ounces; an increase of 4,441 fine ounces. There was a considerable amount of activity on this goldfield consequent on the discoveries at Hampton Plains and Mount Monger, but at the close of the year the developments at either centre had scarcely come up to expectations. At each several properties are still being opened up, and final success is hoped for. On the large mines there was little change.

EAST MURCHISON GOLDFIELD.

The output of gold was 19,600 fine ounces, and in the preceding year 27,414 fine ounces; a decrease of 7,814 fine ounces.

In the Lawlers district there was a fair amount of prospecting, and one or two shows in the vicinity of Lawlers gave promising indications.

At Kathleen Valley and Mt. Sir Samuel a few prospectors were at work.

In the Wiluna district there was no improvement, the principal output being by tributers on the Gwalia Consolidated. Efforts are being made to raise a considerable amount of capital for the purpose of opening up the large bodies of low grade ore known to exist, and at the close of the year the prospects of accomplishing this were hopeful. During the year some prospectors reported promising indications at a locality known as Coles Find, about 11 miles south from Wiluna, and many leases were pegged.

Unfortunately, results did not come up to expectations.

In the Black Range district there was little change, the principal producer being the Yuanmi G.M. Company's mine at Youanmi.

This mine is reported to be looking better than for some time past, otherwise the outlook is not indicative of any early improvement.

GASCOYNE GOLDFIELD.

Nothing was reported from this field, and the only mining going on is for mica deposits, of which some are known to exist.

GREENBUSHES MINERAL FIELD.

The output of black tin was 190.09 tons, valued at £31,249, and in the preceding year 244.61 tons, valued at £34,959; a decrease in tonnage of 54.52 tons, and in value of £3,710.

No new discoveries were reported, and increased costs of mining, combined with the decreased price ruling for the metal, have had a very paralysing effect on this field.

KIMBERLEY GOLDFIELD.

No gold was reported from this field, but in the preceding year the output was 151 fine ounces. A few fossickers still continue to endeavour to locate payable alluvial.

During the year oil shale in the vicinity of the junction of the Negri and Ord Rivers was discovered. This will be inspected at the earliest opportunity.

MOUNT MARGARET GOLDFIELD.

The output of gold was 77,336 fine ounces, and in the preceding year 88,152 fine ounces; a decrease of 10,816 fine ounces.

In addition, 6,019.98 tons of pyritic ore, valued at £7,276, were raised, and in the preceding year 4,135.93 tons, valued at £4,919; an increase in tonnage of 1884.05 tons, and in value of £2,357.

In the Mount Margaret district there was a decrease, although the tonnage of ore treated was greater than in the preceding year.

The closing down of the Lancefield and Mary Mac mines at the end of the year is a serious blow, and means a considerable falling off in output.

In the Mount Morgans district there was a small increase. The Westralia Mount Morgans Mine at Mount Morgans was the most consistent producer.

In other centres there was little change.

In the Mount Malcolm district there was a reduced output, the chief production being from the Sons of Gwalia Mine as hitherto.

Mining throughout the district has been very quiet, and no new finds have been reported.

MURCHISON GOLDFIELD.

The output of gold was 46,604 fine ounces, and in the preceding year 50,570 fine ounces; a decrease of 3,966 fine ounces.

In the Meekatharra district there was a decrease, due to smaller outputs from some of the mines, but generally speaking, there was little change.

In the Cue district there was a small increase, the principal producers being the Light of Asia and Big Bell Mines.

In the Day Dawn district there was also an increase, the principal production being by tributers on the Great Fingall Mine and from two shows at Lake Austin.

In the Mount Magnet district there was an increase, the largest producer being the Mount Zion Mine at Boogardie.

No new finds were reported.

NORTHAMPTON AND YANDANOOKA MINERAL FIELDS.

No minerals were reported from Yandanooka.

In the Northampton field the output of lead ore was 27,716.40 tons, valued at £172,483, and in the preceding year 7,385.70 tons, valued at £29,841; an increase in tonnage of 20,330.70 tons, and in value of £142,642.

At the commencement of the year mining was very active, but the large drop in the price obtaining for lead resulted in most of the mines closing down. Until a considerable improvement in this regard takes place matters are likely to continue quiet.

NORTH COOLGARDIE GOLDFIELD.

The output of gold was 12,024 fine ounces, and in the preceding year 23,020 fine ounces; a decrease of 10,996 fine ounces.

Scheelite ore to the extent of 134.25 tons, valued at £113, was also produced, and in the preceding year 273.06 tons, valued at £829; a decrease in tonnage of 138.81 tons, and in value of £716.

In the Menzies district there was a smaller output, attributable to an almost entire cessation of production at Comet Vale.

The other centres were also exceedingly quiet excepting Yunndaga, where the Menzies Consolidated Mine steadily continued operations.

In the Ularring, Niagara and Yerilla districts a little prospecting was in progress, but nothing of note transpired.

NORTH-EAST COOLGARDIE GOLDFIELD.

The output of gold was 1,739 fine ounces, and in the preceding year 5,472 fine ounces; a decrease of 3,733 fine ounces. Mining at both Kanowna and Kurnalpi has been quiet. At the former place a syndicate has been boring for deep alluvial, and indications are said to be promising. The production of alunite has been retarded pending the result of field experiments which are to be undertaken to prove its suitability or otherwise as a fertiliser in its unroasted state. Should the result prove its suitableness a great filip will be given to the mining of this mineral.

The other centres of the field were very quiet.

PEAK HILL GOLDFIELD.

The output of gold was 1,656 fine ounces, and in the preceding year 2,255 fine ounces; a decrease of 599 fine ounces.

Copper ore to the extent of 35.39 tons, valued at £1,401, was produced, and in the preceding year 14.39 tons, valued at £353; an increase in tonnage of 21 tons, and in value of £1,048.

Mining has been quiet, but Parliamentary sanction has been obtained for the construction of a private railway to extensive manganese deposits which exist at a locality 18 miles N.W. from Peak Hill.

When active operations commence this field should record an improvement.

PHILLIPS RIVER GOLDFIELD.

The output of gold was 1,423 fine ounces, and in the preceding year 1,700 fine ounces; a decrease of 277 fine ounces. The production of copper was 217.27 tons, valued at £4,125, and in the preceding year 215.02 tons, valued at £4,993; an increase in tonnage of 2.25 tons, and decrease in value of £868.

There was little change in this field, but efforts are being made to raise capital for the proper development of some of the large mines. Many small mine owners were financially assisted by the Government, and smelting was carried on at the State plant whenever sufficient ore was forthcoming. The expenditure of considerable capital is essential to properly develop this field.

PILBARA GOLDFIELD.

The output of gold was 4,052 fine ounces, and in the preceding year 3,421 fine ounces; an increase of 631 fine ounces.

Black tin to the amount of 41.50 tons, valued at £7,616, was raised, and in the preceding year 36.70 tons, valued at £5,871; an increase in tonnage of 4.80 tons, and in value of £1,745. Also nine tons of copper ore valued at £360, and 156.50 tons of asbestos, valued at £7,286; an increase in tonnage of 103.50 tons, and in value of £5,843 on the preceding year.

This field showed a general improvement, and the various centres are being actively prospected. The number of workers in the field has increased, and the outlook is distinctly promising.

WEST PILBARA GOLDFIELD.

The output of gold was 134 fine ounces, and in the preceding year 95 fine ounces; an increase of 39 fine ounces.

Copper ore amounting to 1,700.50 tons, valued at £32,059, was produced, and in the preceding year 1,030.78 tons, valued at £15,807; an increase in tonnage of 669.72 tons, and in value of £16,252.

The principal producer is the Whim Well Copper Mine. Outside this there are only a few prospectors at work.

WEST KIMBERLEY MAGISTERIAL DISTRICT.

A new goldfield, embracing this district together with the Broome Magisterial District, was proclaimed early in the year and called the West Kimberley Goldfield; the Warden's Court sits at Broome. This was done for the convenience of prospectors, to obviate the necessity of their having to come to Perth for most mining business.

In June the existence of oil in this field was reported, and the matter will be investigated by a Geologist at the earliest moment.

The iron leases taken up on Cockatoo Island at Yampi Sound were purchased by the Queensland Government, and will probably be thoroughly opened up shortly. Elsewhere only occasional prospecting has been going on.

YALGOO GOLDFIELD.

The output of gold was 2,965 fine ounces, and in the preceding year 4,788 fine ounces; a decrease of 1,823 fine ounces.

Mining throughout this field remained quiet, and the continued absence of a market for molybdenite prevented the leases at Warriedar held for that mineral being actively developed.

YILGARN GOLDFIELD.

The output of gold was 37,637 fine ounces, and in the preceding year 54,003 fine ounces; a decrease of 16,366 fine ounces. There has been a good deal of activity in the various centres, but no noteworthy find was reported.

At Westonia most of the mines continued operations and production. At Forrestonia the plant erected by the Government has been hung up in consequence of an insufficient water supply, but efforts are now being directed towards overcoming this.

The prospects for this field are good.

TABLE 30.

*Value of Mining Machinery and Number of Stamps and other Mills erected on the 31st December, 1920, compared with the previous Year.*

| Goldfield. | District. | Value of Mining Machinery. | | Batteries, Number of Stamps. | | Mills. | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 1919. | | | | | | | | 1920. | | | | | | | |
| | | 1919. | 1920. | 1919. | 1920. | Prospecting. | Ball. | Griffin. | Huntington. | Puddlers. | Other Crushers. | Flint. | Grinding Pans. | Prospecting. | Ball. | Griffin. | Huntington. | Puddlers. | Other Crushers. | Flint. | Grinding Pans. |
| | | £ | £ | | | | | | | | | | | | | | | | | | |
| 1. Kimberley ... ... ... | ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 2. West Kimberley ... ... | ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 3. Pilbara ... ... ... | Marble Bar ... ... | 11,918 | 11,134 | 38 | 38 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 |
| | Nullagine ... ... | 29,806 | 4,237 | 25 | 25 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 2 |
| 4. West Pilbara ... ... ... | ... ... ... ... | 2,350 | 2,100 | 40 | 20 | ... | ... | ... | ... | ... | ... | ... | 2 | 1 | ... | ... | ... | ... | ... | ... | ... |
| 5. Ashburton ... ... ... | ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 6. Gascoyne ... ... ... | ... ... ... ... | 1,100 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 7. Peak Hill ... ... ... | ... ... ... ... | 6,643 | 8,762 | 40 | 20 | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 3 |
| 8. East Murchison ... | Lawlers ... ... ... | 13,304 | 13,631 | 65 | 45 | ... | ... | ... | ... | ... | 2 | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 |
| | Wiluna ... ... ... | 50,872 | 36,830 | 90 | 80 | ... | ... | ... | ... | ... | 1 | 1 | 5 | ... | ... | ... | ... | ... | ... | 1 | 9 |
| | Black Range ... ... | 99,708 | 97,229 | 80 | 70 | ... | 1 | ... | ... | ... | ... | 2 | 4 | ... | 1 | ... | ... | ... | 1 | 1 | 5 |
| 9. Murchison ... ... | Cue ... ... ... | 33,239 | 36,361 | 75 | 68 | ... | ... | ... | ... | ... | 2 | ... | 4 | ... | ... | ... | ... | ... | 2 | ... | 4 |
| | Meekatharra ... ... | 118,916 | 76,730 | 97 | 97 | ... | ... | ... | ... | 1 | 4 | 2 | 15 | ... | ... | ... | ... | ... | 2 | ... | 13 |
| | Day Dawn ... ... | 21,200 | 6,200 | 60 | 50 | ... | ... | ... | ... | ... | 3 | ... | 10 | ... | ... | ... | ... | ... | 3 | ... | 6 |
| | Mt. Magnet ... ... | 16,248 | 18,243 | 35 | 30 | 1 | 1 | ... | ... | 1 | ... | ... | 1 | ... | 1 | ... | ... | ... | ... | ... | 1 |
| 10. Yalgoo ... ... ... ... | ... ... ... ... | 25,810 | 27,393 | 70 | 48 | ... | ... | ... | ... | ... | 1 | ... | 5 | ... | ... | ... | ... | ... | ... | ... | 6 |
| 11. Mt. Margaret ... ... | Mt. Morgans ... ... | 13,998 | 13,102 | 60 | 45 | ... | ... | ... | ... | ... | ... | ... | 3 | ... | ... | ... | ... | ... | ... | ... | 5 |
| | Mt. Malcolm ... ... | 246,552 | 234,704 | 127 | 127 | ... | ... | ... | ... | ... | 3 | 4 | 15 | ... | ... | ... | ... | ... | 2 | 4 | 9 |
| | Mt. Margaret ... ... | 47,678 | 47,220 | 60 | 50 | ... | 6 | ... | 1 | ... | 3 | ... | 14 | ... | 6 | ... | ... | ... | 2 | ... | 15 |
| 12. North Coolgardie ... | Menzies ... ... | 44,777 | 33,760 | 95 | 65 | ... | ... | ... | 1 | ... | 2 | ... | 20 | ... | ... | ... | ... | ... | ... | ... | 13 |
| | Ularring ... ... ... | 30,512 | 27,953 | 40 | 20 | ... | ... | ... | ... | ... | 1 | 1 | 2 | ... | ... | ... | ... | ... | 1 | 1 | 5 |
| | Niagara ... ... ... | 6,299 | 5,286 | 50 | 25 | ... | 1 | ... | ... | ... | 1 | ... | 3 | ... | 1 | ... | ... | ... | ... | ... | 3 |
| | Yerilla ... ... ... | 3,656 | 3,740 | 25 | 20 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | 1 |
| 13. Broad Arrow ... ... ... | ... ... ... ... | 4,841 | 64,260 | 45 | 45 | ... | 1 | ... | 3 | 3 | 2 | ... | 10 | ... | 1 | ... | 2 | 3 | 2 | ... | 10 |
| 14. North-East Coolgardie | Kanowna ... ... | 12,898 | 9,048 | 85 | 55 | ... | ... | ... | 1 | ... | 1 | ... | 2 | ... | ... | ... | 2 | ... | ... | ... | 1 |
| | Kurnalpi ... ... | 150 | 250 | 5 | 5 | 1 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... |
| 15. East Coolgardie ... | East Coolgardie ... | 1,323,236 | 1,297,043 | 540 | 500 | 1 | 41 | 15 | 5 | 5 | 46 | 33 | 170 | 1 | 41 | 13 | 3 | 6 | 44 | 33 | 167 |
| | Bulong ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 16. Coolgardie ... | Coolgardie ... ... | 32,568 | 13,796 | 143 | 63 | ... | ... | ... | 1 | ... | 1 | ... | 7 | ... | ... | ... | ... | ... | 2 | ... | 1 |
| | Kunanalling ... ... | 6,970 | 7,300 | 35 | 30 | ... | ... | ... | ... | ... | 1 | ... | 2 | ... | ... | ... | ... | ... | ... | ... | 2 |
| 17. Yilgarn ... ... ... ... | ... ... ... ... | 176,201 | 102,056 | 187 | 180 | ... | ... | ... | ... | ... | 4 | 2 | 25 | ... | ... | ... | ... | 1 | 2 | 2 | 20 |
| 18. Dundas ... ... ... ... | ... ... ... ... | 24,305 | 31,317 | 65 | 55 | ... | ... | ... | ... | ... | ... | ... | 14 | ... | ... | ... | ... | ... | ... | ... | 13 |
| 19. Phillips River ... ... ... | ... ... ... ... | 10,600 | 10,850 | 45 | 45 | 2 | ... | ... | ... | ... | 1 | ... | ... | 1 | ... | ... | ... | ... | 1 | ... | ... |
| State generally ... ... | ... ... ... ... | 30,000 | 30,000 | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... |
| Total, Gold-extracting Machinery ... ... ... | | 2,446,355 | 2,270,544 | 2,323 | 1,921 | 5 | 52 | 15 | 12 | 10 | 82 | 45 | 336 | 4 | 52 | 13 | 7 | 10 | 65 | 42 | 317 |
| Total, Machinery, other than Gold-extracting ... | | 381,823 | 363,654 | 5 | ... | ... | ... | 1 | 1 | 1 | 33 | ... | ... | ... | ... | ... | 5 | ... | 26 | 4 | 3 |
| TOTAL, MINING MACHINERY ... ... ... | | 2,828,178 | 2,634,198 | 2,328 | 1,921 | 5 | 52 | 16 | 13 | 11 | 115 | 45 | 336 | 4 | 52 | 13 | 12 | 10 | 91 | 46 | 320 |

## PART VIII.—EXISTING LEGISLATION.

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

1. "The Mining Act, 1904."
2. "Mining Act Amendment Act, 1920."
3. "Sluicing and Dredging for Gold Act, 1899."
4. "Mines Regulation Act, 1906."
5. "Mines Regulation Act Amendment Act, 1915."
6. "Coal Mines Regulation Act, 1902."
7. "Mining Development Act, 1902."
8. "Mines and Machinery Inspection Act, 1911."

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

Under "The Mining Act, 1904":—
- An amendment of Regulation 200.
- An amendment of Regulation 40a, Clause 8.
- An amendment of Regulation 40b, paragraph 1.
- An additional Regulation 86a.
- An additional Regulation 86b.
- A further amendment of Regulation 200.
- An amendment of Regulations 82 and 83.
- An amendment of Regulation 155.
- An amendment of Regulation 214.
- An additional Regulation 214a.

Under the "Mines Regulation Act, 1906":—
- An amendment of Regulation 10. Clauses 9, 10, and Sub-clause 3 of Clause 11.

Under the "Mining Development Act, 1902":—
- An amendment of Regulation 7.
- A further amendment of Regulation 7.

The "Mining Act Amendment Act, 1920," deals with tributing on mines, hitherto dealt with under the Regulations, and also provides for the granting of licenses to search for oil and the acquisition of leases for the same purpose.

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## PART IX.—INSPECTION OF MACHINERY.

The Chief Inspector of Machinery reports that the number of useful boilers at the end of the year totalled 2,894, as against 2,926 total for the preceding year, showing a decrease, after all adjustments, of 32 boilers.

Of the total 2,894 useful boilers, 1,411 were out of use at the end of the year; 1,397 thorough and 123 working inspections were made, and 1,435 certificates were issued.

Permanent condemnations totalled 33, and temporary condemnations 50. There were five conversions, and 30 boilers were exported.

The total number of machinery plants in use was 6,305, against 6,043 for previous year, showing an increase of 262.

Inspections made total 3,247, and 3,247 certificates were granted.

One hundred and sixty-nine applications for engine drivers' certificates were received and dealt with, and 115 certificates, all classes, were granted, as follows:—

| | |
|---|---|
| First Class Competency (including certificates issued under Regulation 27 and Section 63 of the Act) | 2 |
| Second class Competency (including certificates issued under Regulation 27 and Section 63 of the Act) | 29 |
| Third Class Competency (including Certificates issued under Regulation 27 and Section 63 of the Act) | 52 |
| Locomotive Competency | 7 |
| Traction Competency | 6 |
| Interim | 10 |
| Copies | 9 |
| Total | 115 |

Total mileage travelled was 41,893 miles, of which 16,081 were by rail, 25,758 by road, and 54 by water.

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## PART X.—SCHOOL OF MINES.

During this, the seventeenth year of the School's existence, the usual excellent progress has been well maintained.

The number of individual students in attendance was slightly in excess of that for the previous year. At the annual examinations more passes were obtained than in the previous year, although the number of credit passes was somewhat diminished.

Extra accommodation and additional assistance to the teaching staff are matters requiring early consideration.

The system of free assays for prospectors has been continued, and during the year a total of 494 assays and mineral determinations was made.

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## CONCLUSION.

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

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

M. J. CALANCHINI,
Under Secretary for Mines.

Department of Mines,
Perth, 31st March, 1921.

# DIVISION II.

## REPORT OF THE STATE MINING ENGINEER FOR THE YEAR 1920.

The Office of the State Mining Engineer,
Perth, 31st January, 1921.

*The Under Secretary for Mines, Perth.*

Sir,—

I have the honour to submit, for the information of the Hon. the Minister, the Annual Report of this Branch for the year 1920.

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

In May, 1920, various alterations were effected in the districts of the Inspectors of Mines, viz.:—

Menzies, Ularring, North-East Coolgardie, East Coolgardie, Coolgardie, Broad Arrow, and Dundas Goldfields to be inspected by the Inspectors of Mines at Kalgoorlie.

Yilgarn, Phillips River, and Yalgoo Goldfields; Greenbushes, Northampton, and Yandanooka Mineral Fields; Swan, Kendinup, and Roelands Mining Districts to be under Inspector Crabb's supervision with Southern Cross as his Head-quarters.

Black Range, Peak Hill, and Murchison Goldfields to be under Mr. Deeble's supervision, with Head-quarters at Cue.

Wiluna, Lawlers, Niagara, and Yerilla Mining Districts, together with the Mt. Margaret Goldfield, to be under Mr. Rockett, with Head-quarters at Leonora.

Mr. Inspector Winzar, of the East Murchison Goldfield, was transferred to the Kalgoorlie District.

Mr. R. C. Wilson resigned his position of Inspector of Mines in March to take up a more lucrative position as Superintendent of the Hampton Gold Mining Areas.

### WORKMEN'S INSPECTORS OF MINES.

Elections for the appointment of Workmen's Inspectors of Mines for the Kalgoorlie, Cue, and Leonora Districts were held on 30/10/20, and Messrs. Crocker and Darcey were re-elected for the Kalgoorlie District, Messrs. Goggin and Byfield being re-elected also for the Cue and Leonora Districts respectively.

### REPORTS OF INSPECTORS OF MINES.

Hereunder are Annual Reports of the various Inspectors of Mines:—

#### REPORT OF MR. W. M. DEEBLE, INSPECTOR OF MINES, CUE.

I beg to submit herewith my report for the year 1920.

During the past twelve months the general unrest throughout the world has been reflected in Australia, and in Western Australia the mining industry has been particularly adversely affected.

During the year a considerable number of men have been given assistance to go out prospecting, but, unfortunately, the results have not been satisfactory, which points to the fact that the rule of thumb methods of the past where it is possible for one prospector to be followed by a number of others should be altered when the work is being assisted by the Government, and an organised effort made so that whatever ground is tested with departmental assistance there should be a record on the maps and the results of any minerals found.

In the northern part of this district, copper, asbestos, mica, and manganese have been found in quantities that in most places would be highly payable, but, with the exception of the latter mineral, they are likely to remain where they are until the cost of transit is considerably reduced.

*Peak Hill.*—At Horseshoe, 16 miles north of Peak Hill, there is a range of hills with a capping of probably millions of tons of manganese, and the indications point to a very large lode underneath. The country on one side has been worked for gold, and rich dabs have been found from time to time on mostly contact leaders, and in a number of the drives put in to work the leaders containing the gold, veins of manganese can be seen. One of the prospectors informed me that it has always been noted at this place that gold could only be found on one side of the manganese. On the old Peak Hill mine work has been carried out intermittently owing to difficulties with water supply for mill. A number of miners are engaged in and around this district, and the average grade is high, but the stone has been broken from leaders, and in no case has anything been found worth recording.

*Holden's Find.*—The only mill in this district is on the Waterloo G.M., and owing to the shortage of water supply the owners were only able to work one shift. During Christmas exemption the owners started to sink the shaft deeper, and encountered an inflow of water which is expected to be sufficient to enable the mill to be run three shifts. This should not only be a boon to the owners, but also of great advantage to the district generally, as there are a number of promising shows worth trying in addition to the ones already being worked.

*Meekatharra.*—There have not been any new finds made during the year in the district, and the main producers are the following:—

Fenian G.M.—This mine has been employing an average of 113 men during the year, and the mine has produced 21,720 short tons for a return of 12,908.23

ozs. of bullion, valued at £51,001 10s. 8d. The total yield to December 31st, 1920, is 320,939 tons for 247,434.81 fine ozs, value £1,051,775 7s. 7d.

Ingliston Consols Extended G.M.—An average number of 95 men have been employed on this mine, and the tonnage treated was 25,262 tons for £50,068 11s. 11d. At the end of 1919 the lowest level, 900ft. depth, was stopped to enable the manage to convert it into a cistern to keep the water out of the shaft, which was to be sunk. Since that date another lift has been sunk and the 900ft. level driven 300 feet south and, the manager reports, in good values; going north 150 feet has been driven in fair grade values, thus showing ore over this level of 450 feet in length with an average width of 8 feet. The prospect for the next level at 1,000 feet depth is very promising, and it is very satisfactory to note that the development in the mine is being kept well ahead of the mill.

Ingliston G.M.—During 1920 the average number of men engaged was 31, and the tonnage treated 3,094 for 1,530 ozs. Towards the end of the year a new lift was started from the 387ft. level, and when the shaft had been sunk 46 feet below plat what appears to be a new lode was struck, which the manager reports shows gold freely. This seems to be a very promising development. From the smaller shows a total of 753 tons have been crushed at the State Mill for a return of 1,053.13 ozs.

*Culculli.*—At this place only three small shows are being worked at present on small leaders. The "Turn of the Tide" crushed 93 tons during the year for a yield of 916 ozs. from the plates. The "Culculli" 46¾ tons for 255 ozs. 5 dwts., and the "Wild Rabbit" 11 tons for 33 ozs. 6 dwts.

*Reedy's.*—Two leases have been working here during the year on a large lode formation, and practically all work done has been development.

*Tuckanarra.*—There are a number of prospectors in this district, and a number of small patches have been found, usually dollying stone. One parcel of five tons returned 168 ozs., and another of 5 tons 193 ozs.

*Pinnacles.*—Mining has been very quiet at this place. One party, in addition to dollying stone, crushed at the State Mill 42 tons for 171 ozs. 9 dwts. of gold.

*Cue and Day Dawn.*—In the district the main producer is the Light of Asia G.M. An average of 47 men have been engaged, and 5,232 tons treated for bullion, valued at £14,649.

Big Bell G.M.—The lode in this mine is very large, and low grade, and the owners were at first in difficulty on account of the shortage of water for milling; after securing a sufficient supply it has been found necessary to increase the milling capacity to deal with a larger tonnage, and this is being done at present.

Great Fingall G.M.—During the year work has been carried out by tributers, and a tonnage of 1,635 tons milled at the State Battery for a yield of 2,010 ozs. 13 dwts. from the plates.

*Mainland.*—The prospectors have not met with much success and the only ones worth noting are Ranuel and Gordon, who treated 18½ tons for a return of 557.17 ozs. fine.

*Lake Austin.*—A few men are engaged working small shows for themselves. A total of 66.5 tons have been treated during the past 12 months for a yield of 1,957.56 ozs. fine gold.

*Moyagee.*—The "Moyagee" lease, situated about six miles from the railway siding bearing the name, is a very promising show, and during the year 199.25 tons crushed returned 593.15 fine ozs., or nearly 3 ozs. per ton. There are two shafts on the lease. The No. 1 or South shaft was sunk, and a drive for about 100 feet driven at 100 feet depth, and the stone from this gave the above result. The Waverley Syndicate have an option over the property, and have driven from 140 feet depth along the line of reef for about 100 feet, and the ore from this is ready for the next mill run. The values are estimated at about previous returns. No. 2 shaft is now being sunk, and is down 160 feet, and it is intended to sink to 225 feet before opening out. All the stone taken out of this lease has been high grade.

*Mt. Magnet.*—During the last two years practically all the mining has been carried out in this district by small parties. During the year a five-head mill has been erected on the "Leap Year" by Mr. Thomas, and a tonnage of 330 tons milled for a yield of 205.64 fine ozs. In the "Fortune of War" there is a large reef from which 403.25 tons have been crushed for 142.21 fine ozs.

*Youanme.*—There are at present two mines working at the place. The "Yuanmi" G.M. is the mainstay of the district, and during the year treated 14,411 tons for a yield of 9,314.67 fine ozs.

*Sandstone.*—Throughout the year there have been 17 small parties working in and around this district, but nothing worth recording was found.

## Report of Mr. A. W. Winzar, Inspector of Mines on the Yalgoo, East Murchison, and Mount Margaret Goldfields for the Year 1920.

I beg to submit my report for the above as follows:—

About the middle of the year a change was made in the boundaries of the different inspectors' districts, with the result that I spent the first eight months in the East Murchison and part of the Yalgoo field, and the remaining four months in the Mount Margaret field, therefore my report covers only periods of the year, and is very incomplete.

In the Yalgoo field very little change occurred. The Gnow's Nest mine appears to have a bright future before it, and a plant will be erected in the near future.

At Payne's Find the leases maintain their average output.

Around Sandstone mining is at a low ebb. The Black Range West Company have sold their leases and are disposing of their plant. There are several parties working in different holdings with varying results.

The Yuanmi mine is treating high grade ore, and developments are satisfactory.

At Lawlers the Queen mine is being worked by a company under option, and is opening up very well.

At Wiluna a new find was made by Cole and McHugh, and was reported on fully to your office.

At the Diorites, Messrs. Pola and party got a good return, and are now sinking the main shaft to obtain a water supply for that centre. Other parties are prospecting in the vicinity, and some fair results are obtained. The State battery is kept going principally on ore from the Gwalia Consolidated tribute. A fair amount of prospecting is being done around about with varying results.

*Mt. Margaret Goldfield.*

The syndicate working the Great Western split up and sold the plant.

At Mt. Clifford a little mining is being carried out on the Victory.

The Bannockburn has been worked by two prospectors, who had a couple of payable crushings.

At Darlot prospects have improved, and the boiler at the State battery is being replaced. The holders of leases and prospectors are confident of doing well once the battery is got going.

REPORT OF MR. H. P. ROCKETT, INSPECTOR OF MINES, LEONORA.

I beg to present to you my annual report for the year 1920.

*Prospectors.*—There was a considerable number of prospectors at work in the district, but to date no important find had been made.

*General.*—Underground inspections were made in over 70 mines as often as practicable. On the whole mining showed a falling off as compared with 1919, due to many causes, including high working costs and depletion of ore supplies.

As from July last that part of the North Coolgardie goldfield formerly in the Menzies inspectorate, and lately in the Leonora inspectorate, was added to the Kalgoorlie inspectorate, while the Lawlers and Wiluna districts of the East Murchison goldfield were added to the Mt. Margaret goldfield inspector's district. Owing to other engagements I had no opportunity of visiting Lawlers and Wiluna.

The output for the Mt. Margaret district was 42.801 fine ounces, the Sons of Gwalia producing 41.870 fine ounces from 120.780 tons as against the rest of the district 931 fine ounces from 1,013 tons. A little gold was won from the Ping Pong, Rajah, Trump, and the King of the Hills mines.

The Murrin centre produced about 4,100 tons of copper-sulphur ore, valued at £6,100. The old Hills Proprietary mine has been taken up and worked again under the name of the Murrin Proprietary. So far as I can ascertain the average gold content of the ore located is about 70s. A small winding-engine, pump, and a 2-drill compressor have been erected and are now in operation, and it is proposed to erect a mill in the near future.

The only show working at Yundamindera is Mr. Leitch's "Big Stone" mine, formerly the Golden Treasure. At one time it was proposed by a Melbourne company to purchase this show and work it on a large scale, but negotiations failed.

At Linden the Bindah mine with its 5-head mill has reached a sound profit-earning stage. Crushing approximately 5,860 tons for 1,894 fine ounces, or approximately 113 tons of 6½dwt. ore per week. Other producers were the Torquay (formerly Devon), Democrat, Grand Junction, and Kangaroo.

Practically no gold was won from Yerilla or Yarri, and very little from Edjudina. A strong effort was made to work the Golden Lizard, but the results were unsatisfactory.

At Morgans the Westralia Mt. Morgans mine worked full time, employing about 25 men, the output being 2,766 ounces obtained from 8,865 tons.

A little work was done on the Millionare, but no pay-ore raised.

At Laverton the Mary Mac Company's Lady Harriet mine worked for about half the year, but in August work was almost completely stopped. 1,086 ounces were obtained from 9,424 tons.

Dr. Laver had some men on the Craggiemore during the whole year, but his efforts were not successful in proving the existence of a shoot of ore payable under present conditions.

There was a rumour of a find of gold-bearing telluride ore in the Augusta, but the report was not verified.

The Lancefield worked throughout the year, but ceased operations on the 31st December. As the pumps have been stopped and the water is being allowed to rise, there would seem very little prospect of the mine re-opening for some time to come. The yield was 25,555 ounces of gold from 78,200 tons.

Messrs. Finch and party at the Lancefield South have been sinking their shaft, and are now down 152 feet. Some stoping is being done at about 100 feet level.

At the Beria Main Reef several hundred tons were raised. The actual figures are not available.

At Duketon Patch Messrs. Cox and Brennan have continued to raise pay-ore from the Great Dolerite, as also did Messrs. McCallum and Oxley from their lease. The 251 ounces produced at Duketon was all won by dollying rich stone.

At the Baneygo South Mr. J. Dwyer commenced the erection of a 5-head mill, which should be finished about the end of April or the middle of May.

At Burtville the Nil Desperandum continued to produce rich ore, 806 ounces being obtained from 213 tons at one crushing, the total output for the year being 1,259 ounces from 323 tons.

Bond's Find, Lake Yilgarn Consols, and formerly the Karridale, is said to be paying its way satisfactorily.

The Ida H. is filled with water to the natural water level, but a few men still find employment in the upper levels.

Messrs. Lyons and party are still working the Cock of the North, about two miles North on the Ida H. White Horse line.

There are a few prospectors in the locality of the Australia United, and also one or two near Pig Well, and from the former 43¼ ounces were won.

*Lawlers District.*

The total gold yield from the district was 2,681 ounces, obtained from 9,000 tons. Of this the Waroonga produced 1,147 ounces after treating 6,800 tons. Work underground on this mine has now ceased temporarily.

Mr. H. Branson crushed from his Donegal mine 471 tons for 151 ounces, and from the Queen 189 tons for 515 ounces. From the Try It at Cue's Patch only 63 ounces were obtained from 320 tons.

The Yellow Aster leases at Kathleen Valley yielded 351 ounces from 600 tons. At Sir Samuel the Belle View South crushed nearly 100 tons for 34 ounces, and the Bluey Release 200 tons for 109 ounces. No other individual show in this district yielded 50 ounces.

The Alma May at Gum Creek treated 610 tons for 140 ounces.

The output from Mt. Keith centre was very low. The Aurora raised 224 tons of stone just over ounce grade, and the Missdeal recovered 145 ounces from 238 tons of ore.

With the exceptions of the Just-in-time and the Cromarte East at Cole's Find, no other mine in the Wiluna district yielded over 50 ounces during the year.

*Wiluna District.*

The tributers on the Western Machinery Company's lease 6J raised 9,200 tons, from which they recovered 3,394 ounces of gold, and the Moonlight leases with 798 ounces recovered from 1,250 tons are the principal producers in the district.

Some other producers near the centre were:—The Great Zig-zag, 213 tons for 110 ounces; Wiluna G.M., 270 tons for 232 ounces; Happy Jack, 89 tons for 58 ounces.

REPORT OF MR. J. CRABB, INSPECTOR OF MINES, SOUTHERN CROSS.

I beg to submit my Annual Report regarding the progress of mining and the administration of the Mines Regulations Act within the Yilgarn, Phillips River, and Yalgoo Goldfields; Greenbushes, Northampton, and Yandanooka Mineral Fields; Swan, Kendinup and Roelands Mining Districts, during the year 1920.

*Yilgarn Goldfield.*

Mining in the Yilgarn Goldfield was fairly brisk, and the yield of gold from the various mines compared pretty favourably with that of the previous year. The outlook of gold mining, however, is not very promising, and it seems evident that there will be a marked decrease in the total output of gold from this Goldfield for 1921.

A good deal of prospecting was done, but no important gold-bearing lodes were discovered. During the latter part of the year a little sensation was caused by the discovery of gold in lode formation situated a little north of Southern Cross. Exceptionally good prospects were obtained from the lode close to the surface, but a few prospect shafts disclosed that it was only a rich patch of very limited extent.

Mr. J. Davidson, who had the loan of a prospecting outfit from the Government, discovered a large deposit of Gypsum along the south-easterly shore of Lake Seabrook. This deposit I found to be about 300 yards wide, and that it runs continuously and in conformity with the foreshore of the lake for a distance of about three miles. It occurs in the bed of the lake near its edge in fairly large and coarsely crystalline lumps; along the foreshore it occurs as Seed Gypsum, and as Kopi on the eastern side of the Seed Gypsum.

The coarsely crystalline is of a light brown colour, owing to the presence of iron, and is impregnated with a considerable amount of salt. The Seed Gypsum occurs in a granular and crystalline form, and is almost pure white, resembling grains of rice. Analysis made by Dr. E. S. Simpson, Government Mineralogist and Chemist, go to show that it is a very high grade Gypsum, and is well suited for all kinds of modelling and building purposes. The results of two samples, which may be said to pretty well represent the main bulk of a few million tons, are as follows:—

| | per cent. |
|---|---|
| Sample No. 623c.—Insoluble in Acids ... | 1·88 |
| Water soluble Lime, CaO | 31·37 |
| Acid soluble Lime CaO ... | 1·50 |
| Equal to | |
| Gypsum, $CaSO_4$. $2H_2O$ ... ... | 96.31 |
| | per cent |
| Sample No. 6694E.—Insoluble in Acids ... ... | 0·44 |
| Water soluble Lime, CaO | 31·04 |
| Acid soluble Lime, CaO ... | 24·9 |
| Equal to— | |
| Gypsum $CaSO_4$, $2H_2O$ ... ... | 95·29 |
| Calcite, $CaCO_3$ ... ... ... | 4·44 |

No. 6,230 is of high grade, yielding a light bluish white plaster, which is quick setting to a strong body. It is well suited for all kinds of modelling and building purposes.

No. 6,694 is a high grade Gypsum, yielding a pure white plaster which is quick setting to a strong body. It is well suited for all purposes.

At Westonia the outlook of mining is by no means bright. The cost of handling the inflow of water at the principal mines was a considerable source of expense, and it may be said to have been the main cause of mining operations being unprofitable. It was thought by a few persons that concerted action on the part of the different mine owners in the erecting of a central pumping plant would enable the mines to be worked at a profit, but the Act that was provided to enable the Government to bring this about was not applied, as it was found it could not be done to advantage in this particular case.

Although the Edna May Deep Levels G.M. Coy. was successful in preventing the water flowing from the Edna May into their workings by the construction of a dam at the 480ft. level, it was found that in consequence of the increased cost of mining and a falling off in the grade and quantity of ore in the bottom workings it was impossible to make a profit.

At the Edna May Central a good deal of trouble was experienced in handling an additional flow of water in the bottom level, and towards the end of the year all work at this level was temporarily abandoned, until additional pumping machinery is erected to deal with the increased flow.

At the Bullfinch G.M., Bullfinch, the usual output of ore was maintained, but there was a slight decrease in the grade. As a considerable loss was made during the half year ending in December, it has been decided to apply for exemption. An average of 130 men were employed, and the average wage per man per fortnight during the last half of the year amounted to £10 0s. 2d. The percentage of gold extracted was 92 per cent., valued at 19s. 2d. per ton, and the cost amounted to 20s. 2d. per ton. The manager of the mine reports that there is little chance of getting a better grade of ore.

At Southern Cross mining was very dull. A few parcels of ore obtained from some of the old mines were treated at the local battery, but results, in most instances, were unsatisfactory.

At the Edna May Battler G.M. a 10-head mill has been erected, and crushing operations were commenced during the latter part of the year. A fairly large quantity of ore has been developed to a depth of 200 feet, which is thought can be made pay if a suitable treatment plant for tailings be provided.

Mining at Marvel Loch was also very dull; a few men were engaged prospecting some of the old shows and taking out a few parcels of ore from them, but, generally speaking, results were somewhat unsatisfactory. An option was taken on the Firelight G.M. by a company, and as prospects at different points of the mine are reported to be rather good, there appears to be a likelihood of the option being exercised.

Good developments occurred at the Golden Butterfly G.M., and it is expected that highly profitable results will be obtained from this property. A five-

head mill is being erected and will commence crushing during the early part of the present year.

At the Great Victoria G.M, Burbridge, the mill was constantly employed until the latter part of the year, when it had to close down owing to a shortage of water. Up to date the total amount of ore treated from this mine is just a little over 128,000 tons, from which an average value of 10s. per ton was recovered by amalgamation and 5s. per ton by cyanidation.

At Forrestania a 5-head mill has been erected, but owing to a shortage of water very little crushing was done.

*Phillips River Gold and Copper Field.*

Mining has been somewhat dull in consequence of the marked drop in the price of copper, and the outlook at present cannot be said to be promising so far as copper mining is concerned.

It has been reported that a fairly extensive deposit of potash-bearing material has been discovered in the Ravensthorpe Ranges, about five miles from Ravensthorpe, and that trial holes at close intervals ranging from 3 to 6 feet, have proved that the material extends over a very large area. It is said to be a basic sulphate of potash, iron and soda, known as Jarosite.

*Yalgoo Goldfield.*

Mining was fairly active at Payne's Find, and very satisfactory results were obtained from parcels of ore sent in from the different prospectors' shows. Recent returns show the average to be a little over 1 oz. per ton. Most of the veins that are being worked occur in biotite-gneiss, and as a rule they are small.

At Gnow's Nest G.M. a good deal of development has been done, and the mine is reported to be looking remarkably well. An offer of £12,000 was made for the property a short time ago, and there seem to be good prospects of it being accepted.

*Northampton Mineral Field.*

There was a slight revival in lead mining in this field during the early part of the year, which was due to a marked increase in the price of lead. A considerable amount of capital was spent in developing some properties that gave promise of becoming highly profitable if the price of lead remained as at the beginning of the year, but owing to the drop in price it was not considered advisable to continue operations on several of the mines.

At Ajana the developments in the bottom workings at the Surprise Mine are very satisfactory, and indicate a good future for the property.

The Fremantle Trading Company, which carries on business as mine-owner and smelter, showed a profit of £2,378 for the half-year ended July 31st. At the Baddera Mine 2,978 tons of ore treated produced 506.5 tons of concentrates of an assay value of 70 per cent. Pb. The Narra Tarra 8,406 tons of ore treated produced 975.3 tons of concentrates of an assay value of 70.91 per cent. Pb.

*Greenbushes Mineral Field.*

Tin mining on this field was fairly active, there being about 16 dredging and sluicing claims worked whilst water was available, and the outlook at present appears promising.

At the Southern Cross D.C. 580, a plant capable of treating about 300 yards of material a day is being erected. It will consist of two Huntington Mills, three cone classifiers, three concentrating tables, one tailing pump, electric outfit for lighting purposes, and one 80 H.P. compound engine. It is estimated that there are about 250,000 tons of materials that can be profitably treated at the present or even a lower price of tin.

The Perth-Greenbushes Dredging Claim, which is equipped with two loco. type boilers and engines, two centrifugal pumps, etc., has been carrying a face about 80 feet wide by about 20 feet deep. During the latter part of the year an average of 3.5 tons of tin a month have been obtained.

The King Tin D.C., which is situated a little north from the Perth-Greenbushes D.C., has been carrying a face 50 feet wide by 15 feet deep of profitable material.

At the Kapanga mine stoping operations were, during the latter part of the year, carried on at about 50 feet from the surface, where the lode is reckoned to average 30 feet wide. A parcel of 326 tons taken from the above-mentioned stopes gave a return of 27 cwt.

At the Cornwall mine a small party of men are driving on a lode which is situated about 200 feet east of the Cornwall main lode at a depth of 90 feet. It is intended to crosscut from this level to the old Cornwall main shaft for the purpose of testing the value of three other lodes which lie between the points mentioned. The lode that is being driven on averages 5 feet wide, and is considered to be of such a grade that it can be profitably handled.

A very efficient tin-dressing plant has been erected by the State Battery Branch near the Cornwall mine.

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

I have the honour to submit my Annual Report for the information of the Hon. the Minister for Mines on the working and administration of the Mines Regulation Act and amendments in the East Coolgardie, North-East Coolgardie, North Coolgardie, Coolgardie, Broad Arrow, and Dundas Districts.

A systematic routine inspection in the above goldfields has been maintained throughout the year. The work of inspection is allotted, two or three mines to each inspector, changing the Inspectors weekly so as to maintain a complete check of the work.

Special attention is given to the testing of safety hooks on cages, and the examnation of ropes and their lubrication. It has been found impossible to comply with the requirements of Section 32, paragraphs 30 and 31, in their entirety, as the shafts get deeper the tremendous surge in ropes compels the testing of cages on a specially constructed frame so they can be adjusted for greater safety.

The storage of dynamite and detonators, and the handling of same in the workings, has been constantly under supervision.

Special attention has been given to change rooms on all the big mines. The area required for each miner has been complied with, change rooms have been regularly cleaned, and sufficient wash basins and shower baths available.

The filling of stopes has been insisted on, and their height has, in some cases, been reduced. This was rendered necessary through the mines arriving at a stage when extra care was essential. In the Great Boulder, Golden Horseshoe, and Ivanhoe mines

there is a considerable amount of side pressure, which is causing all parties considerable anxiety, and everything possible is being done to resist this pressure in the shape of timber and filling.

During the year there have been several snaps of pillars in the Great Boulder which made considerable noise and caused the immediate vicinity to tremble. Of course this must be expected; wherever mining has been carried on in length and depth similar conditions have arisen.

Air receivers have been tested and examined in accordance with the requirements of the Mines Regulation Act and amendments.

Dust underground has been continually under control; back holes and shrinkage stopes are troublesome, but the continual pressure exercised by Inspectors has had a good effect and damping is general throughout.

Mr. Inspector Phoenix has continued to do good work in improving the ventilation of the various mines. A gradual control of air currents throughout the whole of the large mines has become general.

Mining development on the Boulder belt has been almost at a standstill. The Lake View have sunk their main shaft during the year from 2,100 to 2,300 feet, a distance of 200 feet. This should open up considerable tonnage of ore for crushing. The Lake View and Star and Chaffers Mines have been worked in part by tributers, who have done very well.

The Great Boulder Proprietary, Ivanhoe, and Golden Horseshoe Mines have continued to draw on their reserves.

The Great Boulder Perseverance is still in the hands of tributers, many of whom have made considerably more than wages. Since the tributers have been working this property half a million pounds value of gold has been won, averaging about twenty-thousands pounds per month.

The South Kalgurli Mine has developed some good ore in their lower levels. The mine has improved prospects.

At the North end and Williamstown, good prospecting work has been continuously carried on in the various leases.

At Broad Arrow, Ora Banda, Bardoc, Siberia, and Cane Grass, good prospecting development has been done over a considerable area.

At Comet Vale and Goongarrie work has almost ceased, still several parties are testing the auriferous formations, and any day a good find may be discovered.

At Menzies, Mulline, Mulwarrie, Davyhurst, and Mt. Ida, a good deal of development has been carried out.

The Menzies Consolidated are driving a crosscut at 1,900 feet, 600 feet in length which, when the lode is cut, should give the company from two to three years of pay ore.

At Kanowna a good deal of prospecting has been done. A crosscut is now in progress at the Main Reef Mine at 400 feet level. This should open up some good pay ore. A shaft to 100 feet has been sunk on the "Deep Alluvial" and 10 to 12 feet of wash is showing in the bottom carrying pay wash.

At Bulong and Mount Monger districts good prospecting has been done, and reports have been supplied during the year.

The Hampton Plains Blocks 50 and 48 have continued to develop their mining areas, a long line of auriferous country has been opened up, and I am informed it is proposed to erect a public battery, and if run on sound engineering and economic lines should help to develop these areas, and open up payable ore formations.

At Coolgardie and Gibraltar there is considerable energy in prospecting and development, and many of the mining propositions are of a promising character.

At Widgiemooltha prospecting has been vigorously carried on, and development is now progressing. With cheap ore treatment facilities development of a payable nature may be expected.

At Dundas the Mararoa Mine has finished tributing. The Mararoa South has been developed and is a promising mining prospect.

The O.K. Mine has been taken over by the Great Boulder No. 1, and the mine has been equipped with a large gas and air compressor plant. The ore is being treated at the Great Boulder Proprietary Mine.

General prospecting work is being carried on in several localities in the immediate vicinity of Norseman, and a development of promise may be located any day.

The Kunanalling district is being prospected by several parties who have obtained some good quantities of gold from a number of leases.

In the Dunnsville and Carbine districts a good deal of prospecting work has been done. At the Carbine Mine, owned by Messrs. Crawford and party, a rich shoot of ore has been located from which a good deal of gold has been won.

At St. Ives a number of large lode formations were located during the year, and a good deal of development done—the present development is delayed through the want of capital to thoroughly test the sulphide formations, which have been found in various shafts. If long shoots of pay ore exist in these formations an important goldfield has been opened up.

Mining is suffering from the high costs prevailing. It is evident that the auriferous areas are as rich as ever, that a fall in costs will mean increased energy in development, and renewed activity in the whole of the localities mentioned in this report.

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

I have the honour to submit to you my annual report for the year ending 31st December, 1920.

*Kanowna.*—I have visited this district on numerous occasions, and during the time of the Hampton Plains and Mt. Monger boom some attention was given to the mines there.

*The Edna May Consolidated* took over the Ballarat mine from Mr. Willmott under option, installed a 6in. Cornish lift and sunk the shaft a further depth of 100 feet to the 400 feet level; the crosscut to cut the reef was put out about 40 feet, but owing to the shareholders not responding to the calls work ceased, and up to date has not been resumed.

The old *Golden Valley* mine has also been taken under option by the Edna May Central company; the shaft has been unwatered and repaired, and small trial crushings have given highly payable returns.

permanently employed. The principal development work in progress is the crosscut at the 1,900ft. level, the face of this crosscut on my last visit was 200 feet from the reef. When this crosscut has intersected the reef it will provide an additional 340 feet of backs, and as the winzes are already down from the 1,700ft. level this block will soon be ready for stoping.

*Lady Shenton Mine.*—Messrs. Collier and party have been working this mine for the past three or four years, but during the last year they have not been very successful; they have now, however, located a block of stone on the 300ft. level showing good values, and the prospectors' hopes are brighter for the coming year.

*The Maranoa Mine,* situated about three miles east of Menzies, has been unwatered. This mine was formerly worked very successfully by Herley Bros. A Menzies Syndicate has secured it and intend to sink the shaft a further depth of 50 feet and opencut on the lode.

*Riverina South Mine.*—Development work has been in progress during the year driving on the lode at No. 3 level; the lode in the North drive is well defined, and good values have been reported for a considerable length of driving.

*Young Australia Mine.*—This mine is situated about one mile west of Mulline, and was formerly a good producer. A Melbourne syndicate has secured this property and erected a 10-stamp crushing plant with boiler and air compressor. The reef is very hard and small, and is intact below the 300ft. level. The proprietors are hopeful of making it a payable proposition by installing rock drills.

*Mt. Ida District.*

*Forrest Bell Mine.*—Mr. Moss has secured this mine and eight men are employed testing the lode above the water level. A trial crushing of 229 tons of ore taken from the 70ft. level yielded 14 dwts. per ton and 19 dwts. in sands.

*Mt. Ida Mine.*—This property has also been taken up by Mr. Moss. The main shaft has been unwatered and repaired. The lode which is well defined is exposed in the West crosscut, and driving South on its course has been resumed.

*Mt. Ida Consolidated.*—J. Bremner and party are the holders of this lease and have opened out at the 100ft. level on a lode 20 feet wide. A crushing of 500 tons from this level gave a return of 5 dwts. 19 grs. per ton over the plates, 2 dwts. 20 grs. in sands, and 5 dwts in slimes. About 120 tons are now at grass, from which a payable return is expected.

Regular visits of inspection have been made on these mines during the year, and mining operations have been carried out as near as practicable in accordance with the Mines Regulation Act.

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

I have the honour to submit my report for the year ended 31st December, 1920.

General details with regard to ventilation have been gone into and improvements made in various parts in these mines, with satisfactory results.

During the year the work of sampling the mine air has been done by the Assistant Government Analyst, Mr. Kirton. Samples of air were collected from the working faces, mostly from the return side of the mines. The figures obtained show that the ventilation of these mines is satisfactory.

The main object of ventilation has been to cool off the hot strata. This heat produced from the rock requires to be drawn off and needs a large volume of air. Temperatures and humidities are by far the most important element affecting these mines.

The management is keeping in closer touch with the underground ventilation conditions. This will render possible a proper supervision by the Inspector.

The unhealthy conditions cannot be due entirely to high temperatures. The chief causes come under the headings of dust and sanitation.

The currents of air are flowing continuously through the mine workings and allow mining work to be carried on at a reasonable temperature.

The ventilation of the mines is not conducted on any general scheme; there are variations of the scheme and several different systems are provided to suit the varied conditions. It is gratifying to observe that increased attention is being given to this subject.

*Sanitation.*—This subject has also been given close attention. The underground pan system with suitable disinfectants is in operation, and men are alive to the benefit of the system. Numerous cases arise which indicate that there are men who have still to be educated to a higher standard of cleanliness.

There also appears to be a want of appreciation of the methods that have been adopted for the improvement of underground conditions. In dealing with waste crib, for which receptacles are provided, frequent complaints have been made. These mines are provided with good drinking water and suitable cans to convey it.

Air receivers have been carefully examined.

Explosives are of fair quality, and provisions are made to safeguard the men.

The co-operation of the management and men is indispensable if improvements in these connections are to be made.

All complaints have been attended to immediately.

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

I beg to submit my Annual Report on the Collie Coalfield during the year 1920.

Five mines were producing coal during the year, viz., the Proprietary, Co-operative, Cardiff, Westralian, and Premier.

The Scottish colliery was also working, but the work done was simply prospecting, the conditions prevailing being against opening out and developing the mine owing to the soft nature of the roof. The mine was in operation about three years, and during that time very little coal was produced. All operations at the mine have now ceased, and the machinery and plant have been removed, the mine being allowed to fill with water.

During the year the Co-operative, Scottish, Cardiff, and Proprietary collieries were formed into one company, and are now known as the Amalgamated Collieries of W.A. The prospects for trade under the amalgamation appear to be better, the mines working better time and the outputs increasing. The total amount of coal produced for the year was 458,697·48 tons valued at £349,433·88, as against 401·711 tons valued at £270,355 in 1919.

The Government Railways took 260,741·45 tons of large coal, 5,897 tons of nut coal, and 542 tons of smalls.

The Government Tramways took 25,767·8 tons of smalls up till the end of October, after which date they dealt privately with the various companies. The balance of the output from the field went in bunkering and private trade, which is increasing rapidly, and appearances in this direction point to the fact that to deal with these orders the mines will have to be better equipped with machinery to cope with the orders. Development below ground is well ahead of present requirements.

The output from the Co-operative, Cardiff, and Proprietary was restricted during the month of March owing to breakdowns of machinery, and during the month of May owing to a strike of mechanical staff and carpenters. However, temporary repairs were effected by the engineering staff, which kept the mines going, and the strike was settled by granting an increase in wages to those affected.

| Colliery. | Production in tons. | Production in tons. | Employees. 1919. | | Employees. 1920. | |
|---|---|---|---|---|---|---|
| | 1919. | 1920. | Surface. | Underground. | Surface. | Underground. |
| Proprietary ... ... ... ... ... | 119,864·56 | 134,512·15 | 26 | 137 | 29 | 167 |
| Co-operative ... ... ... ... ... | 88,540·00 | 92,003·00 | 40 | 130 | 63 | 154 |
| Cardiff ... ... ... ... ... ... | 95,143·43 | 101,505·00 | 40 | 109 | 42 | 127 |
| Westralian ... ... ... ... ... | 67,207·14 | 91,468·75 | 38 | 97 | 48 | 132 |
| Premier ... ... ... ... ... | 30,279·70 | 38,828·58 | 18 | 43 | 21 | 48 |
| Scottish ... ... ... ... ... | 676·20 | 380·00 | 12 | 14 | 9 | 9 |
| Totals ... ... ... ... | 401,711·03 | 458,697·48 | 174 | 530 | 212 | 637 |

The average number of men employed during the year being 849 as against 704 during 1919, and the increase in output being 56,986·55 tons. The output per man employed being 540·28 tons.

## GENERAL PROGRESS.

*Proprietary.*—Development work has been carried on at this mine, and the bords standing are sufficient in number to double their present output if the necessary haulage arrangements were installed. The conditions prevailing at the mine have been fairly satisfactory during the year.

*Co-operative.*—The conditions prevailing at this mine are similar to above, want of haulage appliances restricting the output.

*Westralian.*—This mine is in very good order and a considerable amount of development work and prospecting has been done. The coal has been proved to extend beyond the fault in the main dip which the management intends to open out during the coming year.

*Cardiff.*—A considerable portion of the workings in this mine were under water, but this has been taken out and the places started working again, and with the installation of a new haulage engine the output has been considerably increased.

*Premier.*—Development work has been carried on here, and their output is now greater than it has ever been since the company started operations.

*Scottish.*—This mine has been abandoned owing to the unsatisfactory state of the roof, which prevented the successful opening out of the colliery, a calyx bore ahead of the workings showing the strata overlying the coal to be of too soft a nature to warrant the continuation of any work.

## MINING ACCIDENTS.

Tables 26, 27, 28, and 29 classify the mining accidents for the year 1920, the previous year's figures being given for comparison, and are forwarded herewith for inclusion in your Annual Report, together with diagram of the fatal accidents year by year, and their causes.

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

| | 1916. | 1917. | 1918. | 1919. | 1920. |
|---|---|---|---|---|---|
| Total fatal accidents on mines reported ... ... ... ... | 23 | 21 | 28 | 27 | 25 |
| Less accidents to persons not engaged in mining, deaths in mines due to natural causes, and accidents to persons which were not due to their occupation as miners ... ... ... ... | 2 | ... | 3 | 1 | 4 |
| Fatal accidents to men engaged in mining ... ... ... | 21 | 21 | 25 | 26 | 21 |
| Total men engaged in mining (average) ... ... ... ... | 10,903 | 10,041 | 9,265 | 8,346 | 8,496 |
| Accident death rate per 1,000 men engaged in mining ... | 1·93 | 2·09 | 2·70 | 3·12 | 2·47 |

Table 26 classifies the accidents according to causes, from which it will be noted that during 1920 21 persons were killed, and 538 seriously injured, as compared with 26 killed and 596 seriously injured during the previous year. The diagram shows graphically the totals of fatal accidents year by year since 1891.

Table 27 shows the death rate per 1,000 persons employed on surface and underground in gold, coal, and other mines, the general average rate for 1920

being 2.47 as against 3.12 for 1919. The rates per 1,000 are based upon the figures in Table No. 21 (Annual Report, Under Secretary for Mines, 1920), which shows a grand total for 1920 of 8,496 men employed at mines above and underground, inclusive of alluvial workers.

Table 28 gives the average number of men employed above and under ground at quarries, and the death rate per 1,000 persons employed therein. The total number of men employed during 1920 was 195 as against 245 for 1919; the death rate for both years was nil.

Table 29 summarises all the fatal accidents for 1920 above and below ground in gold mines only, with rates per 1,000 men employed and per 1,000 tons of ore raised, similar figures for 1919 being given for comparison. The number of men on which these rates are based is taken from Table 23 (Annual Report, Under Secretary for Mines, 1920), and does not include alluvial workers.

The following table has been compiled of all fatal and serious accidents reported to this office which occurred during 1920. The accidents are classified according to the gold or mineral field in which they happened, and also according to causes, the totals from each cause for 1919 being shown for comparison.

| —— | Explosives. | | Falls of Ground. | | In shafts. | | Miscellaneous Underground. | | Surface. | | Machinery. | | Total. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | F. | S. | F. | S. | F. | S. | F. | S. | F. | S. | F. | S. | F. | S. |
| 1. E. Coolgardie ... | ... | 3 | 3 | 25 | 3 | 14 | 2 | 203 | ... | 84 | 1 | 8 | 9 | 337 |
| 2. Mt. Margaret ... | ... | 1 | 1 | 8 | ... | 3 | ... | 28 | ... | 16 | 1 | 3 | 2 | 59 |
| 3. Murchison ... | ... | ... | ... | 1 | 1 | 2 | ... | 8 | 2 | 2 | ... | ... | 3 | 13 |
| 4. E. Murchison ... | ... | ... | ... | 3 | 1 | ... | 1 | 6 | ... | 6 | 1 | 1 | 3 | 16 |
| 5. Coolgardie ... | ... | ... | 1 | ... | ... | ... | ... | 1 | ... | 1 | ... | ... | 1 | 2 |
| 6. Yilgarn ... ... | 1 | 2 | ... | 1 | ... | ... | ... | 1 | 1 | ... | ... | ... | 2 | 4 |
| 7. N. Coolgardie ... | ... | ... | 1 | 2 | ... | ... | ... | 1 | ... | ... | ... | ... | 1 | 3 |
| 8. N.E. Coolgardie | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 |
| 9. Broad Arrow ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 10. Dundas ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 11. Pilbara ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 12. Peak Hill ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 13. Yalgoo ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 14. Phillips River ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 15. Collie ... ... | ... | 3 | ... | 13 | ... | ... | 2 | 61 | ... | 17 | ... | ... | 2 | 94 |
| 16. Greenbushes ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 17. Northampton ... | ... | ... | ... | 1 | ... | 1 | 1 | 2 | ... | 4 | ... | ... | 1 | 8 |
| 18. W. Pilbara ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... |
| 19. Swan ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 1 |
| 20. Ashburton ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 21. Roelands ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 22. Kendinup ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Total for 1920 ... | 1 | 10 | 7 | 54 | 5 | 20 | 6 | 311 | 3 | 131 | 3 | 12 | 25 | 538 |
| Total for 1919 ... | 1 | 7 | 12 | 58 | 4 | 13 | 5 | 370 | 4 | 125 | 1 | 21 | 27 | 596 |

## FATAL ACCIDENTS.

The following are brief particulars of each fatal accident which occurred during the year 1920:—

### *Explosives.*

At the Jean Nichol G.M., Yilgarn Goldfield, an explosion caused the death of one man. From the evidence adduced at the inquest it would appear that deceased struck with his pick an unexploded charge which had missed fire the previous day. The Coroner's jury gave a verdict of accidental death, with no blame attributable to anyone. (3091/20.)

### *In Shafts.*

A man was killed at the Fenian Gold Mine, Murchison Goldfield, through being struck by a stone falling down the main shaft. The accident occurred whilst a full truck was being sent to surface by deceased. The Coroner's jury found that deceased came to his death through being struck on the head by a piece of rock falling down the shaft, and that there was no blame attachable to anyone. (866/20.)

At the abandoned Golden Links shaft of the Lake View Gold Mine, East Coolgardie Goldfield, a prospector was killed while in the act of descending the shaft hand over hand on a rope, from which he fell to the 200ft. level. Owing to the shaft having been unused for many years the air in it was bad, and some difficulty was experienced in recovering the body. The shaft was well covered and protected. The Coroner's jury returned a verdict of accidental death, adding a rider to the effect that no person should be allowed to descend an abandoned shaft without the permission of an Inspector of Mines or other competent authority. While the intention of the rider is excellent, it must be obvious that prospectors will continue to act in such cases in accordance with their own will without delaying to get permission from anyone. (1014/20.)

An elderly man suffering from a weak heart collapsed and fell from the cage while he was descending the shaft of the Yuanmi Gold Mine, East Murchison Goldfield. At the time of the accident the gates were not in use on the cage, and the manager was proceeded against and prosecuted (see "Prosecutions"). The Coroner's jury returned a verdict of death from heart failure. (1488/20.)

At the Golden Horseshoe Gold Mine, East Coolgardie Goldfield, bailing operations were in progress when one of the tanks broke away from its fastening, carrying some shaft timbers with it. Two men working below were struck by the falling timber, one being only slightly injured, but the other was knocked into the water and drowned. The Coroner's jury returned a verdict of accidental death. (3089/20.)

A man was prospecting the shaft of the Taurus lease six miles from Bulong, East Coolgardie Goldfield. His neighbours missing him from his camp at 1.30 a.m. proceeded to the mine, and hearing groans one of the men descended the shaft and found deceased in an unconscious state. He was brought to the surface and taken to Bulong, where he died without regaining consciousness. The Coroner's jury gave a verdict of death from heart failure. This is doubtfully regardable as a mining accident. (1577/20.)

*Falls of Ground.*

At the London Gold Mine, Coolgardie Goldfield, a man was killed while working in an open cut through a piece of stone weighing about 1½ tons falling on him. The open cut was about nine feet deep. A verdict of accidental death was given by the Coroner's jury. (275/20.)

At the Golden Horseshoe Gold Mine, East Coolgardie Goldfield, a man was barring down ground previously fired when a piece came away from the west wall, and in trying to escape it deceased was pinned against a stage pole which had been rigged by the previous shift. The Coroner's jury returned a verdict of accidental death, and added the following rider: "That where possible no stage should be rigged until all ground is made safe." (2065/20.)

A man was killed at the Yannery Hill Copper Mine, West Pilbara Goldfield. At the time of the accident deceased rolled some stone back when the side of the open cut fell in and buried him. Rescue operations were commenced and half an hour after the body was recovered. From the evidence at the inquest deceased appears to have carried out the work with ordinary care and skill. The Coroner's jury gave a verdict of accidental death. (2140/20.)

At the Great Boulder Proprietary Gold Mine, East Coolgardie Goldfield, two men fired some holes, returned after a safe interval and barred down the loose ground, and were in the act of charging more holes when a portion of the back fell and killed one of the men. The place where the fall occurred was well secured, and the stope filled to within 6 or 7 feet of the back, and every precaution appears to have been taken to ensure safe mining. The Coroner's jury found that deceased met his death through a fall of stone. (2215/20.)

A fall of ground while barring down bad ground caused the death of a man at the Golden Horseshoe Gold Mine, East Coolgardie Goldfield. The fall was caused by a hidden mullocky head. A verdict of accidental death with no blame attachable to anyone was given by the Coroner's jury. (2748/20.)

One man was killed and one seriously injured through a heavy fall of ground at the Westralia Mt. Morgans Gold Mine, Mt. Margaret Goldfield. Logging sties were used for supporting the back and deceased was engaged squaring up the ground for building another sty close to the footwall when about 30 tons of rock fell. Every precaution seems to have been taken, and the place was considered safe to work in. The Coroner's jury returned a verdict of death through a fall of earth, no blame being attachable to anyone. (2802/20.)

At the Robinson Crusoe Gold Mine, North Coolgardie Goldfield, a man was swept into the bottom of a winze and killed through a fall of ground from the hanging wall. At the time of the accident an underlay winze was being run from the 100ft. level about 20ft. of the winze being filled with mullock which the men were endeavouring to run into the bottom. The Coroner's jury returned a verdict of accidental death, no blame being attributable to anyone. (3480/20.)

*Miscellaneous Underground.*

Two men were working at the 1,200ft. level of the Ivanhoe Gold Mine, East Coolgardie Goldfield, clearing a sand pass, when one of the men was caught by the sand and carried down the pass and suffocated. On recovery of the body life was extinct. The Coroner's jury returned a verdict of accidental death, adding the following rider:—"That a life line be supplied to men working in similar places." The Inspector of Mines was of the opinion that the jury's recommendation was impracticable, with which I concur. (3481/20.)

Two men were timbering a pass at the Ivanhoe Gold Mine, East Coolgardie Goldfield, when one of them lost his life through overbalancing and falling down the pass while standing on the logging. The Coroner's jury brought in a verdict of accidental death, and added the following rider:—"It is the opinion of the jury that such accidents could be avoided by having stage boards across the pass. (3397/20.)

One man was killed and one slightly injured while clearing a pass at the Surprise Lead Mine, Northampton Mineral Field. Deceased was trying to get the ore to run through the grizzly by probing it with a bar when the ore suddenly ran, and carried him with it into the pass, where he was buried and suffocated. The Coroner's jury returned a verdict of accidental death, with no blame attributable to anyone. (2534/20.)

*Surface (including Machinery).*

At the Youanmi Gold Mine, East Murchison Goldfield, a man was cleaning up the pit at the cracker when he was caught by the belt and drawn on to the shafting, sustaining fatal injuries. The Coroner's jury gave a verdict of accidental death. (528/20.)

A man was killed at the Ivanhoe Gold Mine, East Coolgardie Goldfield. At the time of the accident deceased was employed on the cracker, and his mate missing him at crib time went in search of him, and found the body inside the cracker. The Coroner's jury gave a verdict of death through being crushed in ore crusher, but no evidence to show how deceased came there; they consider there was negligence on the company's part in not seeing that surroundings of crusher were made more safe, also that lights around crusher on night of accident were insufficient. Further investigation of the matter did not give evidence to support prosecution of any person for the alleged negligence. (1612/20.)

A man was killed at the Lancefield Gold Mine, Mt. Margaret Goldfield, through the scarf he was wearing catching in the machinery while he was putting the belt on. When found the body was clear of the machinery, a portion of the scarf round his neck and the remainder entangled in the shafting.

The Coroner's jury brought in a verdict of accidental death, and added a rider: "That is should be made compulsory for employees on mines to wear such apparel as would not endanger accident whilst working about machinery." (2093/20.)

A man was killed through falling down an open cut at the Mt. Zion Gold Mine, Murchison Goldfield. The open cut was not protected by a railing. The Coroner's jury returned a verdict of accidental death, adding the following rider: "A light should be erected at the surface of the shaft, and a railing be put around the open cut near the shaft the deceased is supposed to have fallen down. (2838/20.)

A fatal accident occurred at the Great Fingall Gold Mine, Murchison Goldfield. Some men were inspecting the cyanide vats when one of them stepped on to an unsupported plank and fell to the ground, striking a girder in his fall. He died four days later. At the time of the accident the plant was being dismantled. (3215/20.)

## OTHER ACCIDENTS.

In addition to the above the following fatal accidents were reported, but not classified as mining accidents.

At the Cardiff Colliery, Collie Coalfield, a man while preparing to start work fell to the floor in an apopletic fit, he was taken to the hospital, where he died the following day. (389/20.)

At the Yuanmi Gold Mine, East Murchison Goldfield, a man immediately after starting work was seen to fall forward, and on examination life was extinct. The doctor gave a certificate of death from heart failure. (452/20.)

During the night time a man while under the influence of liquor fell into an open cut on P.A. 1117, Yilgarn Goldfield. The Coroner's jury returned a verdict of "death through faling down open cut. Jury are of the opinion that the proper authorities should take immediate steps to have this and other dangerous cuts and shafts fenced or made secure." The jury's recommendation was carried out, and the open cut securely fenced. (1555/20.)

A man suddenly collapsed and died while filling a skip at the Westralian Colliery, Collie Coalfield. The doctor gave a certificate of death from heart failure. (3131/20.)

## SERIOUS ACCIDENTS.

Under Section 26 of "The Mines Regulation Act all accidents which incapacitate the sufferer from attending to his work on the mine for 14 days or more are classified as "serious," although in a great number of cases the injuries are trivial and leave no lasting disabling effects.

337 of the 538 accidents during 1920 were recorded from the East Coolgardie Goldfield, but only 29 cases were breakages of the larger bones, permanent injury to limbs, or injuries likely to have lasting disabling effects. The balance were injuries of a less serious nature, such as bruises, cuts, broken and crushed fingers and toes, scalds, burns, poisoned cuts, shocks, smaller dislocations, sprains, wrenches, jars, etc., etc., but sufficiently serious to require the injured person to be absent from his work for fourteen days or more.

## EXPLOSIONS AND EXPLOSIVES.

Ten persons received serious injuries under the above classification during 1920. In one case a man was struck by a stone from an explosion; in two instances detonators exploded while being handled, and in another a man placed his hand on a detonator on a piece of timber left there by some person unknown. Two men were injured through failing to reach a place of safety before the charge exploded, and two through the charge exploding whilst they were priming the hole. A pit lamp fell and lighted half a plug of powder a man had in his hand. A tin of kerosene was being lowered into a shaft when the flame from a man's candle lit some naphtha he was carrying and caused the kerosene to explode.

## FALLS OF GROUND.

During 1920 falls of ground accounted for 54 serious accidents. In 13 cases the injuries were received while the men were engaged in pulling down loose ground after firing. In the remaining 41 cases the injuries were due to ground falling on men, or their being struck by falling stones or coal in various parts of the mines.

### *In Shafts.*

20 men met with serious injuries while working in shafts during 1920. In one instance the accident was due to the breaking of a winding rope, and in six through rocks and timber falling down shafts. Five men were injured through falling down shafts or from ladders in shafts, and one man while riding on the bridle was jolted off it. Three men received serious injuries while trucking, one man was struck by his mate's hammer, and one had his hand jammed between an angle iron and skid. While pulling a ladder up a man jarred his hand, and another sustained a poisoned cut while working in a shaft.

### *Miscellaneous Underground.*

311 miscellaneous underground accidents were reported as serious during 1920. In 87 cases the injuries were sustained while handling and loading trucks and skips, through fingers and bodies being jammed against chutes and other trucks, toes and feet run over, bodies struck by upsetting of trucks, men slipping and straining themselves while trucking, or lifting derailed trucks or material into trucks, and so on, the injuries being mostly wrenches, sprains, bruises, jars, fractures of fingers and toes, and cuts. In 62 cases the injuries were due to falling and rolling loose rocks and stone, such as runs of ore and mullock, while shovelling, or stones running down rills and ore chutes; and 14 men received severe cuts and bruises while handling sharp stones. 18 men were injured handling rock drills, coal cutting machines, and parts of same, and 3 by the stages on which machines were erected collapsing. Other falls in the workings from stages and ladders, in rills, passes, and so on, caused injury to 45 persons, and 23 were hurt by falling tools and pieces of machinery. Flying splinters of stone and steel were responsible for 22 men being injured, and 12 were hurt while handling timber, while 3 men were injured falling down ore passes. The remaining 22 cases were due to various accidental causes—jarring of hands and feet, blows from tools, strains, poisoned cuts and so on.

### *Surface (including Machinery).*

143 men received serious injury while working on the surface, 5 men were burnt and 1 scalded in various ways; 12 sustained injuries from falls in the course of their work; 13 were hurt by trucks and

skips, by being jammed or struck by them, by them capsizing or by the men sustaining strains while working them. Flying splinters injured 5 men; falls of timber and pieces of machinery while being handled accounted for 45 cases of injury; 24 cases were caused by machinery in motion, 5 of these being caused by handling belts in motion. 2 men were hurt by being struck by stones or coal; 4 received injuries through falling from stages and ladders; 15 men were struck by tools they were using falling or slipping; one man received injury through a water gauge glass bursting; while another jumped into a clay pit and twisted his knee, and one man sustained the loss of an eye through an explosion occurring whilst he was pouring molten zinc behind concave of rock breaker. Other causes of 14 accidents were strains from lifting heavy weights and broken fingers and ribs from heavy weights falling on them; jarred and jammed hands; poisoned cuts, and so on.

## WINDING MACHINERY ACCIDENTS.

(Without serious injury to persons.)

A number of accidents to winding machinery occurred during 1920, brief particulars of which are as follows:—

*Overwinding.*

An overwind occurred at the Great Fingall Gold Mine through the indicator registering wrongly. On examination it was found that the set screw on the indicator was loose, and the thread in pointer block very much worn. (2805/20.)

At the Gwalia Gold Mine an engine driver overwound his engine through missing the brake. The broken wheel was replaced by a new one. (453/20.)

While hauling ore at the Sons of Gwalia Gold Mine an engine-driver overwound the south skip and fouled the bearers supporting the sheaves; the bearers were splintered, and the pully wheel damaged; both were replaced with new ones. (3100/20.)

At the North White Feather Main Reef Gold Mine an engine-driver while bailing overwound the south tank through reversing lever flying out of his hand. The chains and part of the flange of pit head wheel were broken. The engine-driver failed to report accident to manager.

Three days after the above accident the manager of the mine put his son on the engine owing to the engine-driver failing to turn up for duty, and the son overwound the tank through the brake hanging up from coming in contact with the cross stays of the stool he was sitting on. Proceedings were taken by the Machinery Department against the manager and son. (1924/21.)

*Accidents to Skips and Cages in Shafts.*

The south skip became derailed at the No. 14 level of the Sons of Gwalia Gold Mine, very little damage was done as the skip stopped within about 10 feet of where it left the rails. A piece of lath was found near by, which evidently caused the accident. (328/20.)

An engine-driver while under the influence of drink allowed the south drum of the engine on the Great Boulder Proprietary Gold Mine to run away, and the cage and rope went to the bottom of the shaft. The rope was a new one, only having been in use two days. An inquiry was held by the Inspection of Machinery Department, and the engine-driver's first-class certificate suspended for 12 months. (3253/20.)

*Engine out of control.*

At the Edna May Deep Levels an engine was left by the driver who wished to do other work in the engine-room with the cage in east compartment at bottom of shaft and tank in west compartment at the top brace, when the engine moved and overwound the cage; the rope detached and went into engine-room. Only damage done was tank bent in bottom and indicator broken. (Machinery file 3/20.)

## PROSECUTIONS FOR BREACHES OF "THE MINES REGULATION ACT, 1906," AND REGULATIONS.

Proceedings were instituted against nine men for breaches of the Act and Regulations during 1920.

*Section* 31.

Paragraph 4.—A man was fined £5 and costs for driving a friction winch without holding an engine-driver's certificate. (3409/20.)

*Section* 32.

General Rule 3, paragraphs (g) and (h).—The management of a mine was proceeded against for neglecting to provide canisters for the carriage of explosives into the mine. The case was dismissed without costs. (2029/19.)

General Rule 3, paragraph (g).—Two miners were fined £1 and costs each for careless handling of explosives. (1025/20.)

*Section* 57.

Two men were proceeded against for neglecting to give proper warning that firing was in process whereby a man received slight injuries. Fines of £2 and 10s. with costs were inflicted. (3276/20.)

A tributer was proceeded against and pleaded guilty for allowing some sets of timber to collapse, and thus endangering the lives of another party of tributers. He was fined £1 and costs. (1949/20.)

Through the breaking of a defective winding rope a man working in the winze underneath was struck by a falling bucket and killed in 1919 (see fatal accidents 1919 Annual Report). An action for negligence in allowing the rope to be used was brought in 1920 against the manager of the mine. A fine of £10 with costs was inflicted. (1884/19.)

## GENERAL RULE 41.

A man fell from an ascending cage and was killed. Action was taken against the manager for neglecting to have gates attached to the cage, and a fine of £2 and costs imposed. (See Fatal Accident.) (1488/20.)

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

During 1920 twenty-three persons were granted exemption certificates for mines in the East Coolgardie Goldfield, one in the Mt. Margaret, one in the Coolgardie, one in the Dundas, one in the North Coolgardie, and one in the North-East Coolgardie Goldfields, making a total of 28 exemptions granted.

All applications for these certificates are examined by the District Inspector of Mines on the particular

machinery for which the exemption is required. The raising and lowering of men on these certificates is strictly prohibited.

### SUNDAY LABOUR IN MINES.

Six mines were granted permission to work on Sundays, some of them gaining permits on two and three separate occasions, 12 permits in all being issued during the year. Two of the permits were required for cleaning out and sinking shaft, one for unwatering winze, two for brushing main haulage road, one for cleaning tunnel, three for relaying main haulage road, one putting in big turn in main haulage road, and one for repairs to it, and one for installing a fan in main haulage road. All the work was of a nature which could not be done whilst the ordinary work of the mine was proceeding.

### AMENDMENTS AND ADDITIONS DURING 1920 TO THE REGULATIONS UNDER "THE MINES REGULATION ACT, 1906," "THE MINES REGULATION AMENDMENT ACT, 1915," "THE COAL MINES REGULATION ACT, 1902," "THE COAL MINES REGULATION ACT, 1915," AND "THE MINING DEVELOPMENT ACT, 1902."

*Mines Regulation Act.*—Amendment of Clauses 9, 10, and 11 (Subclause 3) of Regulation 10 relating to testing of winding ropes and appliances. (Gazetted 27/2/20.)

Approval for Mining and Engineering Branch of University to test ropes and appliances. (Gazetted 9/4/1920.)

Amendment of districts and headquarters of Inspectors of Mines. (Gazetted 21/5/20.)

Further six months exemption from Section 41, Subsection (1), to the Pilbara Copper Fields, Ltd., and Mons Cupri Copper Mines regarding hours of labour. (Gazetted 3/9/1920.)

### MINING DEVELOPMENT ACT, 1902.

Amendment of Regulation (7) of State Battery Regulations (fine gold to be paid for at the rate of 80s. per ounce). (Gazetted 6/8/1920.)

Extensions for further three years of Regulations (Gazetted 25/8/1911) relative to subsidies in connection with production of merchantable mica and manufactured mica goods. (Gazetted 17/12/1920.

### DEVELOPMENT OF MINING.

Cancellation of public notice in *Government Gazette* of 18/7/1919 relating to advances on alunite and substitution of amended terms and conditions. (Gazetted 9/1/1920.)

Extension of bonus for 12 months for production of graphite mined and prepared for market within the State. (Gazetted 17/12/1920.)

### PHILLIPS RIVER SMELTING WORKS.

REPORT OF THE MANAGER, MR. RICHARD SHEPHERD, DATED 29TH MARCH, 1921.

In the following report I have the honour to submit an epitome of the work done on the Phillips River Goldfield for the year 1920 in mine development and in connection with the State Smelter at Ravensthorpe.

The continuation of high costs and uncertain metal prices, which retarded progress during 1919, were still a bar to progress, and the ore sent to the smelter for treatment accumulated very slowly. But by September there was sufficient tonnage in the yard to justify the resumption of treatment, and the furnace was blown in on 4th September. By the 1st December, when taken off, some 2,174 tons of ore had been smelted and blister copper, matte, and other saleable products had been produced, containing 2,654 ozs. gold, 1,698 ozs. silver, and 98.165 tons pure copper. The scarcity of sulphides and the preponderance of fine oxidised high grade gold ores made smelting difficult and necessitated the making of blister carrying over 27 ozs. gold per ton, and therefore too rich for good commercial work.

As this, the tenth campaign, concludes the seven years for which the smelter was originally leased by the Department, the summary of results attached may be of service as a record of the output of the Phillips River Field during the period of operation by the Mines Department.

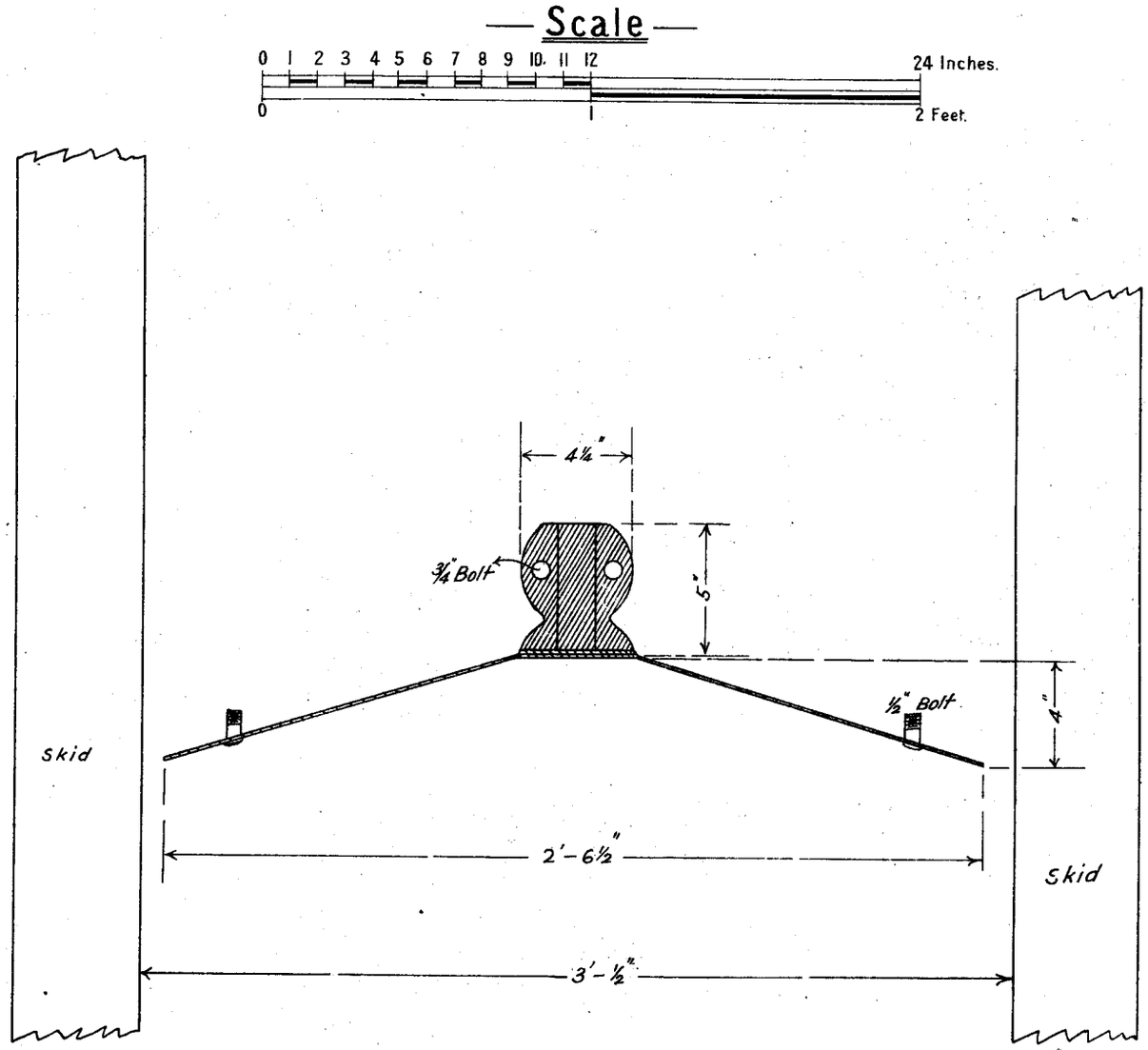
During the first four years (1914 to 1917) the richer surface ores from all over the field, being easily accessible, were sent in for treatment as fast as the growing scarcity of miners permitted; the demand for copper at high prices owing to the war being not yet counterbalanced by the rise in cost of production and treatment. The smelter was entirely self-supporting and the proceeds highly profitable to the ore producers.

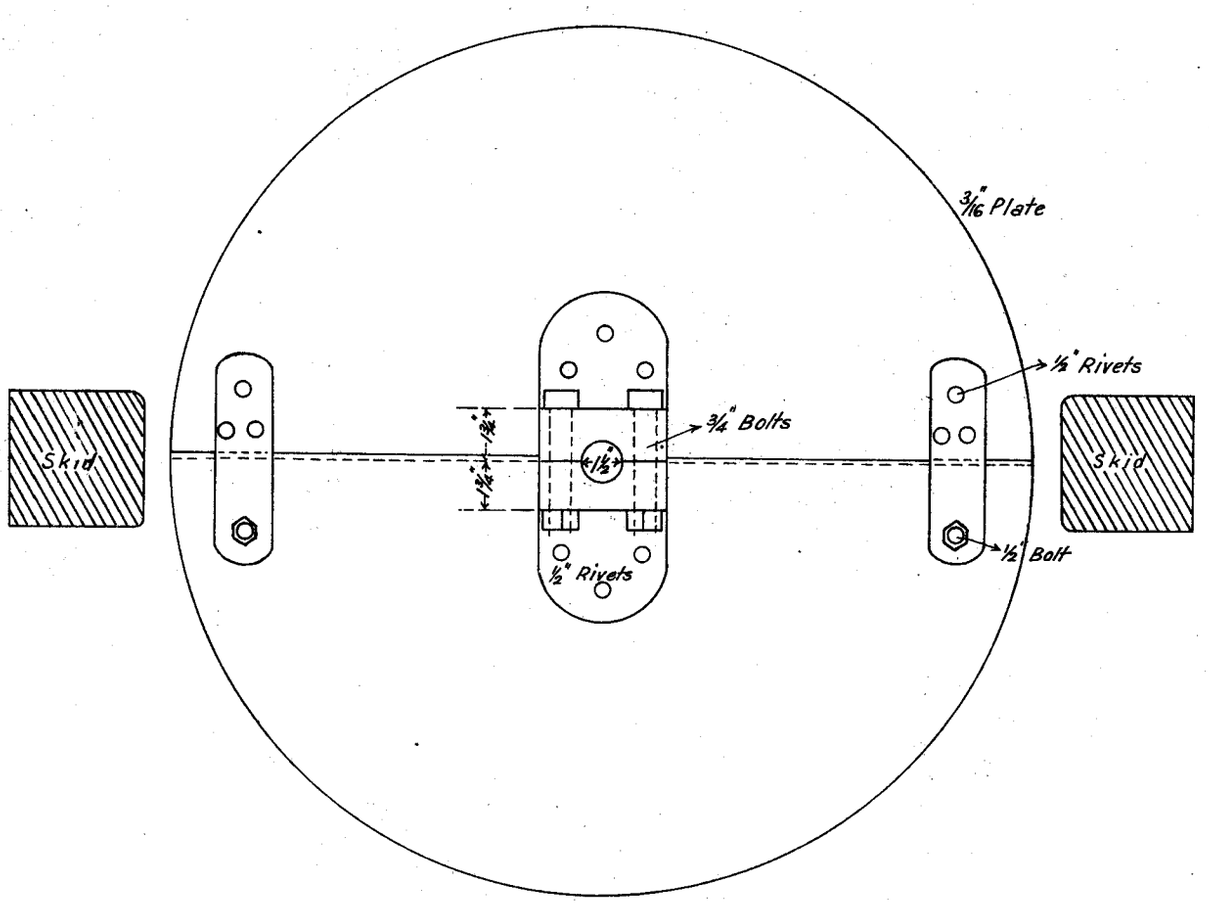
During 1918 costs, due to the war, mounted rapidly, but the price of copper had already passed its zenith. In the absence of systematic development in the mines the ore output was seriously diminished. For these reasons the works were no longer self-supporting, and the profits to the ore producers were reduced, on an average, to the wage level.

During 1919 and 1920 ore production came almost to a standstill on the field; only ores whose main values were in gold being still profitable. The work of developing the mines of the field with the assistance of loans from the vote for that purpose was continued during 1920 on the lines of the previous year. Seventeen different claims received assistance, and £5,002 3s. 7d. were expended in that way. A total of 556 feet of sinking in the different shafts and 850 feet of driving and crosscutting were completed during the year. Exclusive of three claims, where the main cost was due to water and money was advanced for plant, the loans advanced for sinking and driving averaged 33s. 4d. and 28s. 11d. per foot respectively. Although no new or important ore bodies were found as the result of the year's development work, in four cases at the Kundip end of the field, where shafts were deepened below the water level, the ore veins were proved to live down and to carry undiminished metal values which, though scarcely payable under the present high treatment costs, will be well worth mining under normal conditions.

# IVANHOE GOLD CORPORATION LTD

# SHIELD USED FOR WORKING IN SHAFT



| Lease. | Name. | Work Done. | | | | Loans. | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Sinking. | | Driving and Crosscutting. | | Total Amount approved. | Expended prior to 1-1-20. | Expended during 1920. | Unexpended Balance. |
| | | Feet. | Av. Cost per foot. | Feet. | Av. Cost per foot. | | | | |
| | | | s. d. | | s. d. | £ s. d. | £ s. d. | £ s. d. | £ s. d. |
| "Ardpatrick" G.M.L. 197 | Bryan and Party ... | 51 | ... | 75 | ... | 1,250 0 0 | 200 0 0 | 642 4 5 | ... |
| "Bickerton" M.L. 378 ... | Bickerton, G. ... | 23 | 45 0 | ... | ... | 150 0 0 | 20 0 0 | 51 15 0 | 78 5 0 |
| P.A. 184 ... ... ... | Bird and Taylor ... | 32 | 21 3 | 46 | 34 6 | 300 0 0 | 187 0 0 | 113 0 0 | ... |
| P.A. 169 ... ... ... | Clarkson & Son ... | 6 | 30 0 | 36½ | 30 0 | 150 0 0 | 55 12 6 | 63 15 0 | 30 12 6 |
| "Gem" G.M.L. 184 ... | Reynolds and Scott ... | 47 | 71 0 | 112 | 31 6 | 500 0 0 | 84 0 0 | 416 0 0 | ... |
| "Gem" Consolidated G.M.L. 151 | Dunn and Parkinson | ... | ... | ... | ... | 600 0 0 | 500 0 0 | 100 0 0 | ... |
| "Flag" ⩚94H ... ... | Grant and Edwards ... | ... | ... | 203 | 22 2 | 225 0 0 | ... | 225 0 0 | ... |
| | Hamilton and another | 25 | 25 0 | 7 | 21 0 | 150 0 0 | 110 5 0 | 39 15 0 | ... |
| "Harbour View" M.L. 52 | H. V. G. & C. Co. ... | 74 | ... | 118 | ... | ... | ... | 2,287 1 4 | ... |
| "Ironclad" ⩚ ... ... | Kuhlmann and another | 23½ | 38 0 | 52 | 34 3 | 300 0 0 | 121 10 0 | 133 10 0 | 45 0 0 |
| P.A. 172 ... ... ... | Johnston and another | ... | ... | 52½ | 30 0 | 150 0 0 | 71 10 0 | 78 10 0 | ... |
| "Mt. Kooyoura" G.M.L. 196 | Smith, W. F. ... | 81½ | 22 6 | 35½ | 28 0 | 300 0 0 | 158 5 0 | 141 15 0 | ... |
| "Mt. Iron" G.M.L. 198 | Mt. Iron Syndicate ... | 28 | 25 0 | ... | ... | 200 0 0 | 90 0 0 | 35 0 0 | 75 0 0 |
| "Surprise" M.L. 342 ... | Roberts and Others ... | 49 | ... | 26 | ... | 600 0 0 | 44 5 0 | 277 12 10 | 278 2 2 |
| "North Harbour View" M.L. 370 | A. Reeve ... ... | 68 | 20 0 | 32 | 20 0 | 100 0 0 | ... | 100 0 0 | ... |
| Jarosite ⩚ ... ... | ... ... ... ... | ... | ... | ... | ... | ... | ... | 73 17 10 | ... |
| Mt. McMahon ⩚ ... | ... ... ... ... | 48 | ... | 55 | ... | ... | ... | 223 7 2 | ... |
| | | 556 | Av. 33 4 | 850½ | Av. 28 11 | ... | £1,642 7 6 | 5,002 3 7 | ... |

| Campaign. | Period. | Ore Treated. | Metals Recovered. | | | Total Gross Value. |
|---|---|---|---|---|---|---|
| | | | Copper. | Gold. | Silver. | |
| | | tons. | tons. | ozs. | ozs. | £ s. d. |
| I. | 1914 to April, 1915 ... | 7,950 | 641·559 | 4,891·900 | 5,290·471 | 78,734 3 4 |
| II. | 1915, Second Half ... ... | 4,931 | 309·031 | 3,227·227 | 2,676·730 | 56,833 6 5 |
| III. | 1916, First Half ... ... | 3,358 | 231·222 | 2,272·707 | 2,042·891 | 39,693 17 6 |
| IV. | Second Half ... ... | 3,421 | 244·424 | 3,104·108 | 2,501·085 | 42,020 9 10 |
| V. | 1917, First Half ... ... | 3,469 | 242·744 | 2,232·155 | 2,447·097 | 38,216 2 5 |
| VI. | Second Half ... ... | 4,019 | 243·596 | 2,417·074 | 2,446·968 | 37,788 10 6 |
| VII. and VIII. | 1918, First Half ... ... | 2,553 | 175·571 | 1,996·475 | 1,761·929 | 27,008 13 1 |
| IX. | Second Half ... ... | 2,901 | 161·815 | 2,156·081 | 1,845·675 | 28,208 19 4 |
| X. | 1919–1920 ... ... ... | 2,174 | *98.165 | *2,653·999 | *1,698·812 | *21,335 10 10 |
| | | 34,776 | 2,348·127 | 24,951·726 | 22,711·658 | £369,839 13 3 |

* Estimate.

## SHIPMENT OF ORES TO ENGLAND.

Permission was obtained from the Metal Exchange, Melbourne, to ship the following parcels of ore to England for various persons.

One parcel of tin concentrates, six of lead ore, two of silver lead ore, two of copper ore, one of antimony, one of gadolinite, two of asbestos, and one of platinum ware.

Permission was also obtained to ship 1,000lbs. of tin concentrates to Singapore.

## MINE VENTILATION.

During August, 1920, a special analytical examination was made of the air in the large mines at Kalgoorlie by Mr. Kirton of the Government Analyst's Department in conjunction with the Ventilation Inspector of Mines, Mr. Phoenix. Measurements were made of quantity of air passing through the workings at various points, and determinations of humidity, temperatures both wet and dry bulb, carbonic acid gas, oxygen, and carbon monoxide, also of weight of dust in the air per cubic metre.

Mr. Kirton's report is appended hereto (Appendix No. 1), but it has not been thought necessary to print the tabulated details of individual observations, the results of which are summarised in the report.

## SHIELD FOR MINE KIBBLES WHEN SINKING.

The Ivanhoe Gold Corporation have recently adopted a circular steel shield for the protection of shaft repairers. The shield is a shallow cone made in halves, as shown on sketch herewith, to facilitate its ready removal. A device of this kind, varied to suit different shaft conditions, is very desirable in shafts where by reason of their depth the velocities of the smallest falling bodies become dangerous.

## BORING FOR COAL.

During 1920, in addition to assisted boring at Collie for private owners, two important calyx drill bores have been put down departmentally on the Wilga and Irwin River Fields. No. 1 Bore at Wilga reached a depth of 598ft. 6in., and passed through several seams of coal, but apparently did not find the seams seen in O'Grady's shaft. The boring is being continued in 1921 and the results will best be compared when all the bore sections can be brought together and dealt with collectively.

The No. 1 bore at Irwin River reached a depth of 674 feet, in which six small seams of coal, all too

small for working, were cut, and in this case also boring is being continued in 1921, and report is best deferred till it has been completed.

## ADVANCES ON ORES.

The following table shows the various ores on which advances were made by the Department:—

### ADVANCES ON ORES.

*Statement of Transactions for Year* 1920.

MISCELLANEOUS MINERALS.

| Mineral. | Filo. | Tonnage. | Amount advanced. | Expenses in shipping. | Balance of proceeds remitted to owners. | Total amount realised. |
|---|---|---|---|---|---|---|
| | | | £ s. d. | £ s. d. | £ s. d. | £ s. d. |
| Asbestos ... ... ... | 1771/19 | 1·1 | 150 0 0 | 17 8 4 | 83 2 7 | 250 10 11 |
| Felspar ... ... ... ... | 1110/18 | 19·2 | 38 4 0 | Not yet | shipped. | |
| Lead Ore ... ... ... | 1565/20 | 29·5625 | 275 0 0 | 165 16 11 | Proceeds | not to hand. |
| Copper Ore ... ... ... | 770/20 | 10·4058 | 195 0 0 | 24 18 2 | ... | *a*180 5 10 |
| Do. ... ... ... | 2333/20 | 6·1232 | 130 0 0 | 9 12 1 | Proceeds | not to hand. |
| Do. ... ... ... | 2637/20 | 4·5169 | 75 0 0 | 9 6 1 | Proceeds | not to hand. |
| Do. ... ... ... | 3333/20 | 10·7933 | 167 0 0 | 10 11 5 | Proceeds | not to hand. |
| Do. ... ... ... | 1774/20 | 52·7106 | 672 0 0 | 65 14 8 | ... | *a*726 15 2 |
| Do. ... ... ... | 2141/20 | 158·4595 | 1,044 0 0 | 101 9 10 | ... | *a*1,033 1 3 |
| Do. ... ... ... | 2333/20 | | | | | |
| Do. ... ... ... | 2406/20 | 57·9975 | 290 0 0 | 93 13 7 | ... | *a*285 11 5 |
| Do. ... ... ... | 2484/20 | | | | | |
| Do. ... ... ... | 2490/20 | 38·8700 | 195 0 0 | 87 3 5 | ... | *a*779 13 1 |
| Do. Precipitates ... | 2490/20 | 15·8719 | 800 0 0 | | | |
| Do. Ore ... ... | 2543/20 | 63·5983 | 325 0 0 | 38 15 4 | 41 19 6 | *a*405 14 10 |
| Do. Precipitates ... | 2859/20 | 8·4111 | 430 0 0 | 7 1 4 | ... | *a*271 14 1 |
| Do. do. ... ... | 3578/20 | 12·8629 | ... | 9 14 2 | 289 12 6 | *b*299 6 8 |
| | | 440·6210 | 4,323 0 0 | 458 0 1 | 331 12 0 | 3,982 2 4 |

*a* Advance of £75 per ton by Smelting Company. *b* Advance of £57 4s. 3d. per ton by Smelting Company. (Balance available when copper sold.)

## LOANS AND SUBSIDIES UNDER "THE MINING DEVELOPMENT ACT, 1902," AND FROM THE MINING DEVELOPMENT VOTE.

The transactions under the above heading are shown in tabulated form in Appendix No. 2 hereunder.

## FIELD WORK.

The Assistant State Mining Engineer, Mr. Blatchford, has been much in the field during the year, in connection with the Hampton Plains and Mt. Monger gold discoveries, the borings for coal at Wilga, and examination of numerous mines for which assistance has been sought under the Mining Development Act. Owing to the very large number of applications for loan under the Mining Development Act, this sort of examination of mines is becoming increasingly more necessary, and a good deal of sampling is being done, though not yet nearly so much as is desirable and advisable.

My own time has been very greatly taken up by office work, which has greatly increased with the general decline in mining production owing to the great number of applications for Government assistance, and the efforts being made to bring about an improvement in mining. Short visits have, however, been made to Ravensthorpe, Collie, Kalgoorlie, Hampton Plains, Mt. Monger, and the Horseshoe Range. The large manganese deposit at the latter place has been described in a published bulletin.

I have, etc.,

A. MONTGOMERY,

State Mining Engineer.

## APPENDIX 1.

### Investigations of the Air Underground in the Deep Mines at Boulder, 1920.

By Mr. T. N. Kirton, Inspector of Explosives.

On the 21st May a request was made to the Secretary for Mines by the Secretary of the A.W.U. (through Mr. Collier, M.L.A.) that an officer of this Department should investigate the condition of the air in the deep mines at Boulder.

The Matter was dealt with on Mines File No. 1947/20, and in accordance with the instructions contained in that file I saw Mr. Bradley and Mr. Turnbull, representatives of the union, on the 25th May, 1920, and informed them that the Hon. Minister had approved of the work being undertaken and made the conditions set out by the Hon. Minister in the file referred to, clear to them and also ascertained the nature and scope of the work they desired undertaken.

On the 4th June I saw the Secretary of the Chamber of Mines and explained to him the position and requested that he ascertain if the managers desired to appoint a representative to accompany us throughout the sampling. The reply I received later in the day was to the effect that the managers did not desire to appoint a special representative, but they would give every facility and help to us in any way possible. I had another conversation with Mr. Bradley, and he expressed himself as perfectly satisfied with the arrangements.

An actual start with the work of sampling was made on the 17th June, Mr. Turnbull accompanying me throughout, and the choice of positions where samples were to be taken was left entirely with him. All the principal mines were visited, and the following table will show the position where samples of air were taken, analyses and temperatures recorded, etc. All temperatures and anemometer readings were taken by Mr. Phoenix, Inspector of Mines, who accompanied us throughout the underground work, and facilities were given to the union representative and the underground managers who accompanied us to check the readings. We confined our attention first to the general condition of the mine air at the faces and other parts of the mine where men were at work, and the results will be found in the following table.

*Table of Analyses of Mine Air.*

A number of analyses were made of samples of air collected on the surface at different points on the leases, in the grounds of the School of Mines, and in the bush beyond the boundaries of the towns.

Altogether 16 samples of surface air were analysed and the average composition was found to be as follows:—

| | | |
|---|---|---|
| Carbon Dioxide, $CO_2$ | .. | ·054 per cent. |
| Oxygen, $O_2$ | .. | 20·122 per cent. |
| Nitrogen, $N_2$ | .. | 79·824 per cent. |

These analyses were obtained for the purpose of comparison and ascertaining to what extent the air underground was vitiated by the production of $CO_2$ and the reduction of oxygen through the breathing of the miners, the burning of candles, and the combustion of explosives. A comparison of the above figures given in the tables will show that the air in the underground workings at the time of taking the samples was only very lightly affected.

*Temperatures and Humidity of the Mine Air.*

From a study of the figures given in the table it will be noticed that the average temperatures is 73·5 D.B., while the highest obtained was 82 D.B., with a humidity of 87%. According to Dr. Haldane, so long as the temperature of a mine is moderate the percentage saturation of the air with moisture is practically without any direct influence on the comfort or health of miners, but should the temperatures go above 80° to 85° in still and saturated air it is difficult for men to do continuous work. In the general report of the Miners' Phthisis Prevention Committee of the 15th March, 1916, the opinion is expressed that the matter of the effect of temperature and moisture on the health of miners requires further investigation, and extended observations and experiments are necessary before definite conclusions can be arrived at.

In no position in any of the mines we visited was the air stagnant, but on the other hand there was a good volume of air passing through the working places. Some of the miners express the opinion that the air is recirculating through the mines, but a study of the attached plan will show the principle on which the air currents are controlled, and prove there is no recirculation of the air through the working places in the mines.

A study of the following table will make this easily understood:—

| Mine. | No. of Men underground (Day Shift). | Average Consumption Explosives per Shift. | Volume of air per minute passing through mine |
|---|---|---|---|
| | | lbs. | |
| Ivanhoe ... ... | 173 | 135 | 65,000 |
| Horseshoe ... | 162 | 300 | 72,000 |
| Great Boulder ... | 100 | 85 | 41,000 |
| South Kalgurli ... | 52 | 175 | 21,000 |
| Associated ... | 48 | 50 | 59,000 |
| Star ... ... | 50 | 70 | 22,000 |
| Lake View ... | 43 | 72 | 22,000 |
| Kalgurli ... | 40 | 50 | 22,000 |
| Perseverance ... | ... | ... | 49,000 |

As will be seen, there are enormous volumes of air directed through the mines while the number of men employed is very low, and the consumption of explosives is also low, therefore the vitiation caused by combustion of the explosives and the exhalation of the men cannot affect the air to any appreciable extent, as a man at work will in the act of breathing take into his lungs about 20,000 cubic centimetres or 2/3 of a cubic foot of air with the probable production of 70 cubic centimetres of $CO_2$ per minute. The average quantity of air being supplied to the underground workings over the whole belt being about 400 cubic feet per minute per man.

On completion of this portion of the work I set about investigating other points raised by the union representative.

The opinion was expressed that the products of combustion from explosives were more injurious now than was the case prior to the war owing to the inferior nature of the explosives.

The theoretical products of combustion of gelignite being used in 1910 and that in use at the present time will be found in the following table:—

THEORETICAL PRODUCTS OF COMBUSTION CALCULATED FROM ANALYSES OF EXPLOSIVES.

| | Elements—Per cent. | | | | | Products of Combustion. | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Moisture. | Oxygen. | Carbon. | Hydrogen. | Nitrogen. | Oxygen required to burn C to $CO_2$. | Oxygen required for conversion of $H_2$ to $H_2O$. | Oxygen required for conversion of Na to $Na_2O$. | Excess of Oxygen. |
| 1. Gelignite - as used in the Mines during 1910 | ·36 | 57·34 | 13·47 | 1·81 | 15·64 | 35·91 | 14·48 | 2·28 $K_2O$ | 4·66 |
| 2. Gelignite in use at the present time | ·96 | 57·27 | 13·24 | 1·82 | 15·45 | 34·42 | 14·56 | 2·97 | 5·32 |

Since the theoretical results obtained by calculation from analysis are often very materially modified in practice by the effect of the physical condition both of the individual ingredients and the complete explosives, such theoretical calculations always require checking by practical trials. Practical tests accordingly were made on the South Kalgurli on the 6th August, 1920, by firing out a complete end in a drive. The following are the particulars of firing samples taken and the results of analyses:—

| No. | Particulars of Sample. | CO. | $CO_2$. | O. | Ratio. CO–$CO_2$. |
|---|---|---|---|---|---|
| | | Per cent. | Per cent. | Per cent. | |
| 1 | Dead end 60 feet in from plat, taken while charging cut ... ... | *Nil* | ·125 | 19·95 | ... |
| 2 | Taken immediately after firing cut holes, 40 plugs Gelatine Dynamite used ... ... ... ... ... ... ... ... | ·076 | ·75 | 19·75 | 1–10 |
| 3 | Taken while charging Easors 30 minutes after refire of cut in which 34 plugs of Gelatine Dynamite were used ... ... ... | ·0069 | ·25 | 19·95 | 1–37 |
| 4 | Taken immediately after firing Easors, seven plugs Gelatine Dynamite used ... ... ... ... ... ... ... | ·120 | 1·05 | 19·75 | 1–8·7 |
| 5 | Taken while men charging round of ten holes, 45 minutes after firing Easors ... ... ... ... ... ... ... ... | *Nil* | ·125 | 20·02 | ... |
| 6 | Taken immediately after firing round of 10 holes in which 60 plugs of Gelatine Dynamite were used ... ... ... ... | 1·29 | 10·8 | 15·64 | 1–8·4 |

In June, 1910, a place fired out on the same mine with Gelatine Dynamite gave results as follows:—

| | CO per cent. | $CO_2$ per cent. | Ration CO to $CO_2$. |
|---|---|---|---|
| After firing cut ... ... | ·106 | 1·59 | 1 — 15 |
| After firing Easors ... | ·084 | 1·16 | 1 — 13·8 |
| After firing round ... | ·534 | 5·94 | 1 — 11 |

From the figures it will be seen that the practical results are less favourable than those obtained in 1910 —the departmental inquiry in 1910 on this subject gave an average ratio, after firing cuts, of 1 CO to 13 $CO_2$, for Easors the ration was 1 CO to 12 $CO_2$.

*Sand Blasting.*—This is really an abuse in the use of explosives, especially in underground workings, and, in my opinion, should be prohibited wherever possible, but when it has to be resorted to, Blasting Gelatine should be used as it is much quicker in its rate of detonation, and in consequence the products of combustion will not be so harmful to the men as would be the case in the use of Gelignite.

With the assistance of the management of the South Kalgurli Mine two trial shots were fired on stones placed in a drive where the gases could be collected immediately after firing, the actual firing being left entirely in the hands of a man used to sand blasting.

The explosive used was three plugs of standard Gelignite in each test and the composition of the gases was found to be as follows:—

| | CO. | $CO_2$. | Ratio Co — $CO_2$. |
|---|---|---|---|
| 1 ... ... | ·149 | ·725 | 1 — 4·8 |
| 2 ... ... | ·172 | ·385 | 1 — 2·2 |

There was also a trace of the oxides of nitrogen in both these samples, but in insufficient quantities to estimate.

The ratios when compared with those obtained when firing with burdens on the charge show the disadvantage of sand blasting.

Other tests made at the request of Mr. Turnbull, the representative of the Union, and having bearing on the purity of the air were as follows:—

*Sulphurated Hydrogen.*—Three samples of air immediately above stagnant water lying on the levels of the Horseshoe Mine were collected and all gave negative results.

*Cyanide or Hydrocyanic Acid.*—From sand used for filling stopes, four samples of air were taken during the tipping of trucks of sand down the sand passes, the position selected for collecting the samples being at openings where the displaced air was escaping. Three of the tests gave negative results, while Sample No. 2, taken on the 10th August, 1920, gave a very slight trace of HCN.

A sample of air was also taken from the precipitating room of the treatment plant on the Perseverance Mine; this gave a reaction for HCN, but the quantity present was too small to estimate.

Some of the miners working on machines were under the impression that the exhaust from the machines which are driven by compressed air was harmful, and a request was made that it should be tested.

The only source of contamination would be the carbonisation of the oils used in the compressor, and to ascertain if this was taking place the following tests were made and it will be noted that the air as it leaves the exhaust of the machine is unaltered and, provided high class oils are used, there is no danger of any ill effect on the health of the miners from the free use of compressed air, nor the exhaust from the machine.

| No. | Particulars of Sample. | CO. | $CO_2$. | $O_2$. | $CH_4$. |
|---|---|---|---|---|---|
| 1 | Sample of air in compressor room at intake of compressor ... ... | ... | ·025 | 20·15 | ... |
| 2 | Sample of surface air taken 40 feet north of compressor room ... | ... | ·050 | 20·10 | ... |
| 3 | Taken from an air pipe on the 1,500 feet level ... ... ... | *Nil* | ·050 | 20·10 | *Nil* |
| 4 | Sample of air in drive on 1,500 feet level in which Liner drill was being worked by compressed air ... ... ... ... ... | *Nil* | ·125 | 19·57 | ... |
| 5 | Exhaust from machine boring on the 1,400 feet level ... ... | *Nil* | ·050 | 20·10 | *Nil* |
| 6 | Do. do. do. do. ... ... | *Nil* | ·025 | 20·00 | *Nil* |

*Dust.*

In view of the danger arising from dusty working places I was requested to determine the amount of dust in the air about the mill rooms and other parts of the surface plants where dry crushing was in progress.

These determinations were made by simply passing a known quantity of air through a weighed cotton wool filter and determining the amount of dust collected therein.

Dr. J. McCrae's research into the size of silica particles found in silicotic lungs showed that these do not exceed 12 microms (a microm being 1/25,000 part of an inch), and concluded that particles in the sample larger than 12 microms are relatively unimportant as a factor in the causation of disease. Therefore it may be assumed that the harmful dust in the samples collected is not as high as the figures indicate, as the apparatus I used for drawing the air through the filter was a powerful suction pump and would therefore draw in any of the larger particles in process of settlement.

I had intended for the purpose of comparison to take samples of air from the streets of Boulder and Kalgoorlie, but owing to wet weather was unable to obtain any figures which could serve any useful purpose. The method of determining the harmfulness of dust has been much discussed. The Committee for the Prevention of Miners' Phthisis in South Africa decided to adopt a tentative standard of five milligrammes per cubic metre, this figure at the time being supposed to represent the average amount of dust in the streets of Johannesburg. They afterwards concluded that the character and size of the dust had an important bearing upon its harmfulness, and that therefore the direct comparison of weights only may be misleading. Such comparison, however, was all which was possible in the time at my disposal—any further investigation as to the nature of the dust would have involved a long inquiry.

RESULTS OBTAINED FROM THE SAMPLES TAKEN FROM TREATMENT PLANTS.

(Figures represent millograms per cubic metre of air.)

| No. | Date. | Mine. | Position at which sample as taken. | Weight or Dust Mgs per cubic metre. |
|---|---|---|---|---|
| 1 | 17–6–20 | Great Boulder ... | Ball room floor around the crushing mills ... ... ... | 82·3 |
| 2 | ,, | do. ... ... | Near push conveyor in ball room mill ... ... ... ... | 449·5 |
| 3 | ,, | do. ... ... | On main shaft platform in furnace shed ... ... ... ... | 34·3 |
| 4 | ,, | do. ... ... | Near dust receivers which were open and dust being removed ... | 27·4 |
| 5 | 2–8–20 | do. ... ... | On ball room floor around crusihing mills and conveyors ... | 6·86 |
| 6 | ,, | do. ... ... | On ball room floor around crushing mills ... ... ... | 6·86 |
| 7 | ,, | do. ... ... | On ball room floor near conveyor belts and elevator ... ... | 5·1 |
| 8 | ,, | do. ... ... | On main shaft platform in furnace sheds ... ... ... | 8·57 |
| 9 | ,, | do. ... ... | On furnace room floor between furnaces ... ... ... ... | 24·75 |
| 10 | ,, | do. ... ... | A general sample taken through all the dry crushing and roasting compartments | 6·86 |
| 11 | 4–8–20 | South Kalgurli ... | On ball room floor round crushing mills ... ... ... ... | 27·2 |
| 12 | ,, | do. ... ... | On bottom floor of mill ... ... ... ... ... ... | 20·58 |
| 13 | ,, | do. ... ... | A general sample from all dry crushing compartments ... ... | 17·15 |
| 14 | ,, | Kalgurli ... ... | On conveyor floor ... ... ... ... ... ... ... | 6·86 |
| 15 | ,, | do. ... ... | On ball room floor round crushing mills ... ... ... ... | 5·14 |
| 16 | ,, | do. ... ... | A general sample taken from all compartments of dry crushing plant | 3·42 |

During the sampling on the Great Boulder on the 17th June, 1920, the dust flues were being cleaned out, and in consequence the exhaust fans were not working, with the result that the dust was escaping into the air instead of being conveyed to the main dust flues.

The samples taken on the 2nd August, 1920, are from the same positions (but with exhaust fans working) as those taken on the 17th June, 1920, and the effect of mechanical devices is very apparent from the figures obtained.

I was given to understand that the fans have to be stopped once every six weeks for the purpose of cleaning out the flues.

It will be noticed that there is a marked difference in the amount of dust in the air at the mill on the South Kalgurli Mine and the other two plants visited, when working under normal conditions. This is also very apparent on entering the mill.

The following samples were collected from the underground working for the estimation of dust:—

| No. | Date. | Mine. | Particulars of Sample. | Weight of Dust Mgs per cubic metre. |
|---|---|---|---|---|
| 1 | 3-8-20 | Great Boulder ... | Taken on 2,350 level, Sec. 11, and in dead end, truckers drawing off ore from chute | 17·0 |
| 2 | ,, | do. ... ... | 2,200 level, cut 16, taken at chute while trucks being filled, trucker standing such a position that the air current was taking the dust past him | 82·0 |
| 3 | ,, | do. ... ... | Same position as No. 2 only on the other side of chute ... | 13·7 |
| 4 | 5-8-20 | South Kalgurli ... | 1,500 level at No. 4 on chute while men employed filling trucks ... | 12·0 |
| 5 | ,, | do. ... ... | 1,500 level, a general sample taken over this level ... ... ... | 6·86 |
| 6 | 10-8-20 | do. ... ... | Taken on level on which ore was being trucked from chutes ... | 10·29 |
| 7 | ,, | do. ... ... | Taken in slope in which six men were working ... ... ... | 8·58 |

I must make special mention of samples Nos. 2 and 3. Here we found a man filling trucks from a chute which is on a level where there is a good current of air passing, and the dust was being carried away from the mouth of the chute in the direction the air was travelling, as will be seen from the figures obtained. If this man had stood and worked from the other side of the chute he would have been breathing air containing only one-sixth the amount of dust, and it is difficult to understand how any man can have so little regard for his own health.

*Conclusions.*

From the figures obtained it will be seen that the miner has nothing to fear in regard to his health from the atmospheric conditions of the mines at the present time, but of course it must not be lost sight of that there is practically no development work carried on in any of the mines just now, and in consequence the amount of explosives used is comparatively small (this being by far the largest factor in the production of gases which are injurious to the health of the miners), and in development work, also currents of air cannot be directed along drives as efficiently as is being done in the slopes of the mines.

In regard to dust the underground workings are remarkably free, and if the facilities provided for the suppression of dust are at all times made free and intelligent use of, there need be very little trouble from this.

I should like to express my appreciation and thanks to the managers and staff and miners on the South Kalgurli Mine for arranging and carrying out blasting which facilitated the collection of gases immediately after firing, and the sand blast tests, also to Mr. Phoenix, Inspector of Mines, who accompanied me throughout and made the work as light as possible with his valuable advice and help.

## APPENDIX 2.

### Summary of Expenditure from Mining Development Vote from 1st January to 31st December, 1920.

| *Advances in aid of Mining Work and and Equipment—* | £ s. d. | £ s. d. |
|---|---|---|
| Knox and Barnes | 37 3 6 | |
| Norseman Prospecting Syndicate, Norseman | 415 3 8 | |
| C. B. Rooke, Coolgardie | 36 10 2 | |
| Edna May Battler G.M., Westonia | 2,083 8 9 | |
| Golden Lizard Syndicate, Edjudina | 225 0 0 | |
| Western Graphite Co., Ltd., Plantagenet | 100 0 0 | |
| Dunn and Parkinson, "Gem Consolidated," Phillips River | 350 0 0 | |
| A. Oliver, Carbarup, Kendenup | 21 5 0 | |
| Lugg and Party, Kalgoorlie | 54 6 4 | |
| Matthews and Mott, Roebourne | 389 10 8 | |
| Harbour View G.M., Phillips River | 2,772 7 0 | |
| Faulkner and Lavery, Yilgarn | 16 5 0 | |
| Erection Plant Forrestonia, Forrestonia | 2,822 9 9 | |
| Purchase of Battlesville Mine, Yundamindera | 9 15 0 | |
| Thring, Waun, and Dwyer, Northampton | 37 1 5 | |
| Dower and McOmish | 34 13 9 | |
| Hamilton and Congdon, Ravensthorpe | 123 15 0 | |
| Bird and Taylor, Phillips River | 183 15 0 | |
| Purchase of Pump, "Ardpatrick," Phillips River | 268 8 8 | |
| A. H. Williams, Coolgardie | 137 10 0 | |
| T. R. Byass, Marble Bar | 20 0 0 | |
| Lalla Rookh G.M., Marble Bar | 1,411 9 3 | |
| Bonnie Venture G.M., Yalgoo | 36 18 3 | |
| C. A. Barratt, Mulgarrie | 75 0 0 | |
| Keeley, Henderson, and Kuhlmann, Ravensthorpe | 297 17 2 | |
| Nicholas and Mackay, Marvel Loch | 313 12 8 | |
| W. F. Smith, Phillips River | 175 10 0 | |
| Grant, Mt. Iron G.M., Kundip | 78 15 0 | |
| Colreavy and Party, Forrestonia | 165 11 6 | |
| Hyne and Pittaway | 4 18 0 | |
| Bryan and Party, "Ardpatrick," Phillips River | 804 6 4 | |
| Johnston and Stennett, Ravensthorpe | 122 0 0 | |
| Clarkson and Sons, Ravensthorpe | 104 7 6 | |
| G. Bickerton, Phillips River | 71 15 0 | |
| Osborne and Fallows, Ravensthorpe | 47 0 0 | |
| Reynolds and Scott, "Gem," Phillips River | 500 0 0 | |
| J. H. Green, "Victory" G.M., Yilgarn | 88 18 3 | |
| A. Reeve, "North Harbour View," Ravensthorpe | 100 0 0 | |
| Grant and Edwards, Flag G.M., Ravensthorpe | 220 5 0 | |
| Daniels and Party, "Surprise," Phillips River | 327 4 1 | |
| Riverina South G.M. Co., Mulline | 1,534 5 0 | |
| A. Main, Ochre Deposits, Carbarup | 28 8 0 | |
| East Collie Coal Mining Co., Ltd., Collie | 449 4 11 | |
| St. George G.M., Marvel Loch | 11 5 0 | |
| | 17,106 19 7 | |
| Less Repayments credited to Vote— | £ s. d. | |
| Credo. G.M. Syndicate, N.L. | 142 2 3 | |
| St. George G.M. | 11 5 0 | |
| Nicholas and McKay | 16 2 6 | |
| | 169 9 9 | |
| | | 16,937 9 10 |

| | £ s. d. | £ s. d. |
|---|---|---|
| *Boring—* | | |
| Boring for Coal, Irwin River | 1,416 13 4 | |
| Boring for Coal, Wilga | 2,139 13 4 | |
| | | 3,556 6 8 |
| *Providing Transport and Equipment for Prospectors—* | | |
| Prospecting, etc. | 3,498 6 5 | |
| Less Credits to Vote | 12 14 4 | |
| | | 3,485 12 1 |
| *Miscellaneous Expenditure—* | | |
| Maintenance of Securities | 17 1 6 | |
| Rebates *re* Water Supply | 13 4 0 | |
| Pre-Investigations, Sampling Mines | 398 12 2 | |
| Subsidy towards Cost of marketing Asbestos | 27 13 1 | |
| St. Ives Water Supply— | | |
| Surveys including boring | 780 5 1 | |
| Enlargement of Condenser | 389 3 9 | |
| Carriage of Water | 445 15 2 | |
| Construction of Tank | 202 3 6 | |
| Tank, 1,000 gals., equipment | 6 6 9 | |
| Road, Ives to Widgiemooltha | 200 7 5 | |
| Upkeep of Condenser | 230 19 11 | |
| Supervision and Sundries | 2 4 0 | |
| Supplying Water Free to Prospectors | 377 3 2 | |
| Track Victory G. Mine to, Parker's Hill | 33 0 0 | |
| Mt. Monger Water Supply— | | |
| Investigations, Surveys, Water for Mine | 67 8 2 | |
| Improvements to Creedon's Tank | 328 6 5 | |
| Renovating State Battery, Darlôt | 46 15 6 | |
| Sinking Well No. 1, Mt. Gould | 5 11 0 | |
| Investigating Mineral Industry | 551 18 0 | |
| Investigating Collie Coal | 0 16 4 | |
| Edna May Central, etc., Unwatering Mine' | 2,343 11 9 | |
| Prospecting Jarosite Deposits, Ravensthorpe | 74 4 0 | |
| | | 6,542 10 8 |
| Rebates to Prospectors crushing at War Rates | | 2,516 2 6 |
| *Subsidies Development Work—* | | |
| Ivanhoe Gold Mining Syndicate, Kalgoorlie | 9 3 0 | |
| Thomas and Eustace, Sandstone | 6 16 6 | |
| | | 15 19 6 |
| *Subsidies to Batteries crushing for Public—* | | |
| Watson, R., 105 tons, Darlôt | 7 17 6 | |
| Patterson, W. A., 148¼ tons, Parker's Range | 14 16 6 | |
| Lang, S. C., 783½ tons, Bullfinch | 97 18 9 | |
| Brown, A., 420 tons, Tuckabianna | 63 0 0 | |
| Bellchambers, F., 20 tons, Curran's Find | 2 0 0 | |
| Hastedt, R., 156 tons, Leonora | 15 12 0 | |
| Mandelstam, A. S., 19 tons, Edjudina | 1 8 6 | |
| Battaglia, S., 1,177½ tons, Yundamindera | 88 6 3 | |
| | | 290 19 6 |
| *Subsidies Carting long distances to Batteries—* | | |
| Lewis, D., Bulla Bulling | | 9 15 2 |
| Total (according to net Treasury figures for Year) | | £33,354 15 11 |

## APPENDIX 2—*continued.*

| | £ | s. | d. | £ | s. | d. |
|---|---|---|---|---|---|---|
| *Advances Refunded—* | | | | | | |
| Havilah ... ... ... ... | 46 | 9 | 2 | | | |
| Aurora ... ... ... ... | 94 | 17 | 10 | | | |
| Donovan's Find ... ... | 78 | 0 | 0 | | | |
| Yellow Aster ... ... ... | 42 | 3 | 7 | | | |
| Lady Evelyn ... ... ... | 1 | 7 | 7 | | | |
| Nicholas and McKay ... ... | 14 | 11 | 6 | | | |
| Elverdton ... ... ... | 45 | 14 | 3 | | | |
| Harbour View ... ... ... | 74 | 16 | 7 | | | |
| Great Leviathan ... ... | 102 | 11 | 0 | | | |
| Grant and Edwards ... ... | 0 | 13 | 1 | | | |
| André, C. H. ... ... ... | 11 | 5 | 0 | | | |
| Credo ... ... ... ... | 142 | 2 | 3 | | | |
| St. Patrick ... ... ... | 365 | 3 | 6 | | | |
| Kirtons ... ... ... ... | 66 | 5 | 0 | | | |
| Rainbow ... ... ... | 1 | 8 | 4 | | | |
| Great Western ... ... ... | 600 | 0 | 0 | | | |
| Main, A. M. ... ... ... | 3 | 19 | 6 | | | |
| Shamrock ... ... ... | 61 | 7 | 10 | | | |
| Surprise ... ... ... ... | 11 | 9 | 0 | | | |
| Lorna ... ... ... ... | 1 | 7 | 9 | | | |
| Victory ... ... ... | 1 | 10 | 0 | | | |
| Bulletin ... ... ... ... | 20 | 0 | 0 | | | |
| Barratt, C. A. ... ... ... | 100 | 0 | 0 | | | |
| | | | | 1,887 | 2 | 9 |

| | £ | s. | d. | £ | s. | d. |
|---|---|---|---|---|---|---|
| *Recovered from Sale of Securities—* | | | | | | |
| Pyx ... ... ... ... | 21 | 10 | 0 | | | |
| McCahon and Party ... ... | 7 | 0 | 0 | | | |
| Kingdom Come ... ... | 20 | 0 | 0 | | | |
| Nooka ... ... ... ... | 500 | 0 | 0 | | | |
| Mt. Rankin No. 2 Account ... | 10 | 0 | 0 | | | |
| Mt. Rankin No. 1 Account ... | 38 | 0 | 0 | | | |
| Wheal May ... ... ... | 10 | 0 | 0 | | | |
| Malcolm Prospecting Company | 15 | 0 | 0 | | | |
| | | | | 621 | 10 | 0 |
| *Miscellaneous Refunds—* | | | | | | |
| Fraser's G.M. ... ... ... ... | | | | 144 | 16 | 6 |
| | | | | 2,653 | 9 | 3 |

THE MINING DEVELOPMENT ACT, 1902.—ADVANCES WRITTEN OFF TO 31ST DECEMBER, 1920.

| | £ | s. | d. | £ | s. | d. |
|---|---|---|---|---|---|---|
| Previously Reported ... ... | 30,026 | 15 | 6 | | | |
| Year 1920 ... ... ... | 759 | 0 | 6 | | | |
| | | | | 30,785 | 16 | 0 |

# MINING DEVELOPMENT EXPENDITURE.

*Advances Outstanding, 31st December, 1920.*

| | Name of Lease, Mine, or Borrower. | No. of Lease. | District. | Amount authorised. | Principal Moneys advanced | | Principal Moneys | | Interest | | Total Principal and Interest outstanding at 31st December, 1920. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Previous to 1920. | During 1920. | Repaid, including Sale of Securities, etc. | Balance outstanding. | Paid. | Outstanding. | |
| | A.—PIONEER MINING AND PROSPECTING. | | | £ s. d. | £ s. d. | £ s. d. | £ s. d. | £ s. d. | £ s. d. | £ s. d. | £ s. d. |
| 90/12 | Alicia | 254E | Mt. Morgans | 245 0 0 | 195 0 0 | ... | ... | 195 0 0 | 4 2 6 | 54 14 8 | 249 14 8 |
| 1359/19 | Ard Patrick | 197 | Phillips River | 1,000 0 0 | 338 0 8 | 569 10 10 | ... | 907 11 6 | ... | 31 8 0 | 938 19 6 |
| | | | | 2.0 0 0 | ... | 268 8 8 | ... | 268 8 8 | ... | 7 0 1 | 275 8 9 |
| 2315/16 | Augusta | 2058T | Laverton | 150 0 0 | 150 0 0 | ... | ... | 150 0 0 | ... | 13 0 0 | 163 0 0 |
| 807/19 | Barrat, C. A. | 1426X | Mulgarrie | 300 0 0 | 150 0 0 | 75 0 0 | 100 0 0 | 125 0 0 | 10 7 3 | 6 18 10 | 131 18 10 |
| 141/19 | Bird & Taylor | ... | Phillips River | 300 0 0 | 116 5 0 | 183 15 0 | ... | 300 0 0 | ... | 18 0 7 | 318 0 7 |
| 367/18 | Bulletin | 795 | Marble Bar | 600 0 0 | 402 10 7 | 20 0 0 | 20 0 0 | 402 10 7 | 29 15 2 | 36 7 5 | 438 18 0 |
| 909/12 | Brittania | 953M | Mt. Magnet | 150 0 0 | 114 12 6 | ... | 43 10 0 | 71 2 6 | ... | 9 4 6 | 80 7 0 |
| 2380/18 | Bickerton | 3,8 | Phillips River | 150 0 0 | ... | 71 15 0 | ... | 71 15 0 | ... | 3 14 0 | 75 9 0 |
| 1326/19 | Bonnie Venture G.M. Co., Ltd. | ... | Yalgoo | 360 0 0 | 196 18 3 | ... | ... | 196 18 3 | ... | 20 6 2 | 217 4 5 |
| 2329/15 | Colreavy & party | 2909 | Forrestonia | 630 0 0 | 559 0 0 | 50 1 6 | ... | 609 1 6 | 3 10 7 | 55 4 11 | 664 6 5 |
| 2257/12 | Champion South | 817N, 1039N | Nannine | 400 0 0 | 400 0 0 | ... | 353 0 0 | 47 0 0 | 29 11 8 | 19 19 8 | 66 19 8 |
| 353/19 | Clarkson & Son | ... | Ravensthorpe | 150 0 0 | 34 10 0 | 84 17 6 | ... | 119 7 6 | ... | 5 16 5 | 125 3 11 |
| 3166/09 | Emily | 1510 | Day Dawn | 400 0 0 | 372 1 9 | ... | ... | 372 1 9 | ... | 44 7 10 | 416 9 7 |
| 2208/08 | Elverdton | ... | Ravensthorpe | 3,500 0 0 | 3,498 17 10 | ... | 3,307 13 2 | 191 4 8 | 456 14 3 | 6 1 0 | 197 5 8 |
| 1846/17 | Edna May Consolidated Extended, N.L. | 3081 | Westonia | 750 0 0 | 353 0 0 | ... | ... | 353 0 0 | ... | 19 12 11 | 372 12 11 |
| 1444/12 | Eclipse | 1047X | Gindalbie | 498 19 1 | 498 19 1 | ... | 262 5 0 | 236 14 1 | 62 8 11 | ... | 236 14 1 |
| 1884/18 | East Collie Coal Mining Co., N.L. | ... | Collie | 1,000 0 0 | 341 0 3 | 449 4 11 | ... | 790 5 2 | ... | 47 2 2 | 837 7 4 |
| 1558/20 | Edna May Battler G.M. Co., N.L. | 911, 3170, 3171 | Westonia | 3,000 0 0 | ... | 2,083 8 9 | ... | 2,083 8 9 | ... | 47 13 1 | 2,131 1 10 |
| 801/18 | Foley, Wm. | M.L. 44 | Arrino | 100 0 0 | 69 5 0 | ... | ... | 69 5 0 | 5 6 7 | 4 6 10 | 73 11 10 |
| 1753/20 | Falkiner & Lavery | ... | Yilgarn | 150 0 0 | ... | 16 5 0 | ... | 16 5 0 | ... | 0 1 5 | 16 6 5 |
| 3594/09 | Globe | 912N | Nannine | 500 0 0 | 444 12 9 | ... | 145 18 2 | 298 14 7 | 77 17 10 | 15 8 1 | 314 2 8 |
| 3056/15 | Golden Spinifex Mining Syndicate, Ltd. | 2035T, 2044T | Laverton | 750 0 0 | 162 15 0 | ... | ... | 162 15 0 | ... | 14 14 3 | 177 9 3 |
| 642/11 | Glideaway | 2272 | Yilgarn | 200 0 0 | 140 0 0 | ... | ... | 140 0 0 | 31 2 2 | 3 10 7 | 143 10 7 |
| 2656/17 | Gallagher, H. J. | M.L. 145 | Northampton | 50 0 0 | 25 0 0 | ... | ... | 25 0 0 | ... | 2 16 6 | 27 16 6 |
| 2118/16 | Gem Consolidated | ... | Phillips River | 600 0 0 | 250 0 0 | 350 0 0 | ... | 600 0 0 | ... | 36 7 0 | 636 7 0 |
| 2454/20 | Grant & Edwards (Flag) | ... | Ravensthorpe | 225 0 0 | ... | 220 5 0 | 0 13 1 | 219 11 11 | ... | 7 16 2 | 227 8 1 |
| 2831/19 | Golden Lizard | ... | Edjudina | 400 0 0 | ... | 225 0 0 | ... | 225 0 0 | ... | 6 10 5 | 231 10 5 |
| 4689/06 | Havilah | 345B | Black Range | 600 0 0 | 553 2 1 | ... | 417 18 1 | 135 4 0 | 150 9 7 | 3 12 2 | 138 16 2 |
| 1963/16 | Hassell & others (Flag) | 136–7–8 | Ravensthorpe | 3,500 0 0 | 3,080 3 9 | ... | ... | 3,080 3 9 | ... | 177 9 6 | 3,257 13 3 |
| 4738/09 | Hawk | 725G | Desdemona | 120 0 0 | 116 12 2 | ... | 22 5 11 | 94 6 3 | 3 7 10 | ... | 94 6 3 |
| 310/19 | Harbour View Gold and Copper Co., Ltd. | M.L. 52, 94 | Phillips River | 2,886 11 0 | 222 17 4 | 2,663 13 8 | 74 16 7 | 2,811 14 5 | 1 12 1 | 101 1 1 | 2,912 15 6 |
| 2826/19 | Hamilton & Congdon (Flag) | ... | Ravensthorpe | 150 0 0 | 26 5 0 | 123 15 0 | ... | 150 0 0 | ... | 8 10 8 | 158 10 8 |
| 3681/16 | Ironclad (Kuhlman & Buckie) | M.L. 367 | Ravensthorpe | 400 0 0 | 294 12 6 | 103 9 2½ | ... | 398 1 8 | ... | ... | 398 1 8 |
| | Do. do. do. | do. | do. | 300 0 0 | 100 10 0 | 162 18 0 | ... | 263 8 0 | 0 15 11 | 12 6 1 | 275 14 1 |
| 319/12 | Jupiter | 771 | Mt. Magnet | 401 0 0 | 401 0 0 | ... | 109 14 1 | 291 5 11 | 5 0 0 | 45 11 3 | 336 17 2 |
| 350/19 | Johnston & Stennett | ... | Ravensthorpe | 150 0 0 | 50 10 0 | 99 10 0 | ... | 150 0 0 | ... | 8 6 8 | 158 6 8 |
| 2825/07 | Kingdom Come | M.L. 112 | Northampton | 204 14 0 | 204 14 0 | ... | 80 0 0 | 124 14 0 | 5 8 6 | 15 11 0 | 140 5 0 |
| 4548/11 | Klondyke Boulder | 604 | Warrawoona | 1,000 0 0 | 999 10 7 | ... | 163 5 6 | 836 5 1 | 34 5 4 | 150 12 7 | 986 17 8 |
| 2186/14 | Kirkland, A. G. | M.A. 12N | Nannine | 500 0 0 | 500 0 0 | ... | 336 9 11 | 163 10 1 | 20 17 4 | 12 12 5 | 176 2 6 |
| 2489/18 | Lady Evelyn | 1289W | Ora Banda | 300 0 0 | 216 14 2 | ... | 1 7 7 | 215 6 7 | 9 2 9 | 6 15 8 | 222 2 3 |
| 3507/13 | Loader & Nevill | 711 | Yalgoo | 200 0 0 | 135 0 0 | ... | 43 16 8 | 91 3 4 | 33 9 1 | 4 11 5 | 95 14 9 |
| 2167/14 | Lake View Extended | 4536E | Kalgoorlie | 1,050 0 0 | 892 15 5 | ... | 650 0 0 | 242 15 5 | ... | 54 11 1 | 297 6 6 |
| 1079/16 | Lorna | 4554 | Coolgardie | 100 0 0 | ... | 36 10 2 | 1 7 9 | 35 2 5 | 0 2 3 | 1 2 9 | 36 5 2 |
| 387/20 | Lugg, R. B. | 4868E | Kalgoorlie | 75 0 0 | ... | 54 6 4 | ... | 54 6 4 | ... | 0 17 1 | 55 3 5 |
| 4000/05 | Mindeloo | 1518 | Mindoolah | 300 0 0 | 198 17 0 | ... | 10 0 0 | 188 17 0 | ... | 8 1 1 | 196 18 1 |
| 2126/11 | Mt Rankin Gold Mines, N.L. | 2416 | Yilgarn | 535 6 3 | 535 6 3 | ... | 43 0 0 | 492 6 3 | 60 10 0 | 13 9 10 | 505 16 1 |
| 491/18 | Mt. Rankin Gold Mines, N.L. | 3135/6 | Yilgarn | 1,000 0 0 | 911 19 9 | ... | 10 0 0 | 901 19 9 | 0 8 3 | 47 8 4 | 949 8 1 |
| 2937/17 | Mitchell & Judd | ... | Coolgardie | 500 0 0 | 500 0 0 | ... | ... | 500 0 0 | ... | ... | 500 0 0 |
| 1825/19 | Mt. Iron | 198 | Kundip | 200 0 0 | 70 0 0 | 55 0 0 | ... | 125 0 0 | ... | 8 3 7 | 133 3 7 |
| 2341/18 | Melba (Munn & Hodgson) | 1053R | Yerilla | 575 0 0 | 496 18 10 | ... | ... | 496 18 10 | ... | 43 2 9 | 540 1 7 |
| 2565/18 | Mac's Lucky Ridge | 2103T | Mt. Lucky | 75 0 0 | 44 0 0 | ... | ... | 44 0 0 | 2 8 6 | 1 7 9 | 45 7 9 |
| | Main, A. M. | P.A. | Carbarup | 30 13 0 | ... | 28 8 0 | 3 19 6 | 24 8 6 | 0 0 6 | 0 13 6 | 25 2 0 |
| 2476/20 | Mott & Matthews | P.A. | Roebourne | 750 0 0 | ... | 389 10 8 | ... | 389 10 8 | ... | 4 8 0 | 393 18 8 |
| 1042/19 | Nicholas & McKay | 3190 | Marvel Loch | 340 0 0 | 6 0 0 | 302 10 2 | 14 11 6 | 293 18 8 | 0 2 6 | 6 10 9 | 300 9 5 |
| 1314/17 | North Harbour View | 370 | Ravensthorpe | 100 0 0 | ... | 100 0 0 | ... | 100 0 0 | ... | 2 14 1 | 102 14 1 |
| 627/19 | Norseman Prospecting Syndicate | 1261 | Norseman | 515 3 8 | ... | 415 3 8 | ... | 415 3 8 | ... | 23 9 8 | 438 13 4 |

## MINING DEVELOPMENT EXPENDITURE—*Advances Outstanding 31st December, 1920*—continued.

| | Name of Lease, Mine, or Borrower. | No. of Lease. | District. | Amount authorised. | Principal Moneys advanced | | Principal Moneys | | Interest | | Total Principal and Interest outstanding at 31st December, 1920. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Previous to 1920. | During 1920. | Repaid, including Sale of Securities, etc. | Balance outstanding. | Paid. | Outstanding. | |
| | A.—PIONEER MINING, ETC.—*continued.* | | | £ s. d. | £ s. d. | £ s. d. | £ s. d. | £ s. d. | £ s. d. | £ s. d. | £ s. d. |
| 567/19 | Oliver, Arthur | P.A. | Kendenup | 50 0 0 | ... | 21 5 0 | ... | 21 5 0 | ... | 0 5 8 | 21 10 8 |
| 3292/13 | Pearl | 1095M | Mt. Magnet | 76 0 0 | 76 0 0 | ... | ... | 76 0 0 | ... | 23 13 2 | 99 13 2 |
| 289/13 | Pyx | 789B | Sandstone | 600 0 0 | 571 4 8 | ... | 37 10 7 | 533 14 1 | 12 14 5 | 24 15 0 | 558 9 1 |
| 3612/15 | Premier Coal Mining Co., N.L. | 260/2, 363/6, 271 | Collie | 500 0 0 | 500 0 0 | ... | 1 1 10 | 498 18 2 | 112 6 4 | 16 0 3 | 514 18 5 |
| 2397/18 | Quistini & Kinnane | P.A. | Broad Arrow | 75 0 0 | 70 2 6 | ... | ... | 70 2 6 | ... | 3 16 4 | 73 18 10 |
| 3409/12 | Rupe & Young (Hornsby) | M. Area | Nannine | 848 17 5 | 848 17 5 | ... | 500 0 0 | 348 17 5 | ... | 24 13 5 | 373 10 10 |
| 977/12 | South Cornwall | 567 | Greenbushes | 1,170 2 0 | 1,170 2 0 | ... | 26 0 0 | 1,144 2 0 | ... | ... | 1,144 2 0 |
| 2376/10 | Stanley | 1271X | Kanowna | 150 0 0 | 112 0 0 | ... | ... | 112 0 0 | ... | 39 14 8 | 151 14 8 |
| 97/15 | Scots Greys | 2801 | Yilgarn | 400 0 0 | 400 0 0 | ... | ... | 400 0 0 | ... | 62 3 2 | 462 3 2 |
| 1462/19 | Smith, W. F. | P.A. | Phillips River | 300 0 0 | 158 5 0 | 141 15 0 | ... | 300 0 0 | ... | 15 19 1 | 315 19 1 |
| 2963/11 | Surprise | M.L. 342 | Phillips River | 600 0 0 | ... | 327 4 1 | 11 9 0 | 315 15 1 | ... | 8 10 4 | 324 5 5 |
| 936/18 | Rainbow G.M. Co., N.L. | 5091 | Coolgardie | 230 0 0 | 45 0 0 | 137 10 0 | 1 8 4 | 181 1 8 | 6 3 7 | 4 14 0 | 185 15 8 |
| 2491/14 | Reynolds & Scott (Gem) | 184 | Phillips River | 500 0 0 | 500 0 0 | ... | ... | 500 0 0 | 4 7 8 | 17 4 10 | 517 4 10 |
| 9780/97 | Riverina South G.M. Co., N.L. | 324U, etc. | Mulline | 2,000 0 0 | ... | 1,534 5 0 | ... | 1,534 5 0 | ... | 30 14 9 | 1,564 19 9 |
| 49/20 | Tobin, P. (Fields Find Extended) | 902 | Yalgoo | 361 2 3 | 361 2 3 | ... | ... | 361 2 3 | ... | 13 18 0 | 375 0 3 |
| 413/17 | Unexpected Gold Mines | 5454Z, 5290Z | Mt. Ida | 750 0 0 | 600 0 0 | ... | ... | 600 0 0 | 4 9 5 | 39 18 6 | 639 18 6 |
| 2426/11 | V's United | 271F | Mt. Morgans | 672 2 0 | 578 16 1 | ... | 170 0 0 | 408 16 1 | 3 19 5 | 34 14 1 | 443 10 2 |
| 1164/16 | Victory | | Marvel Loch | 175 0 0 | ... | 88 18 3 | 1 10 0 | 87 8 3 | 1 7 3 | 2 12 0 | 90 0 3 |
| 2427/11 | Westralia Tasmania | 1665T, 1745T | Erlistoun | 300 0 0 | 300 4 9 | ... | 51 0 0 | 249 4 9 | 90 2 8 | 74 15 7 | 324 0 4 |
| 1266/18 | Western Graphite Co., Ltd. | M.L. 2PP. | Plantagenet | 300 0 0 | ... | 100 0 0 | ... | 100 0 0 | ... | 2 9 8 | 102 9 8 |
| 1807/09 | Wheal May | Loc. 6 | Northampton | 302 4 6 | 302 4 6 | ... | 50 0 0 | 252 4 6 | 5 15 9 | 14 9 8 | 266 14 2 |
| 1055/19 | Westgarth & Party | M.L. 113E, 117/8E, M.A. 68E | Kalgoorlie | 150 0 0 | 150 0 0 | ... | ... | 150 0 0 | 5 5 10 | 4 14 6 | 154 14 6 |
| 2239/12 | Williamson & Pender | ... | Kanowna | 180 0 0 | 180 0 0 | ... | ... | 180 0 0 | ... | 12 18 1 | 192 18 1 |
| | Totals | ... | ... | ... | 26,293 16 8 | 11553 4 4 | 7,065 12 3 | 30,781 8 9 | 1,285 9 8 | 1,773 19 0 | 32,555 7 9 |
| | B.—ASSISTANCE IN ERECTING BATTERIES AND TREATMENT PLANTS TO BE USED FOR CRUSHING FOR THE PUBLIC. | | | | | | | | | | |
| 2120/09 | Battlesville | 931R | Yundamindera | 1,775 0 0 | 1,063 16 2 | 9 15 0 | ... | 1,073 11 2 | 187 9 0 | 336 18 1 | 1,410 9 3 |
| 5651/10 | Butcher Bird | 1933 | Yilgarn | 1,863 14 2 | 1,863 14 2 | ... | 17 16 2 | 1,845 18 0 | 137 3 10 | 124 6 5 | 1,970 4 5 |
| 5947/10 | Chunderloo | 1048N | Nannine | 2,032 12 8 | 1,730 10 2 | ... | 424 9 2 | 1,306 1 0 | ... | 218 16 2 | 1,524 17 2 |
| 3145/12 | Donovan's Find | 768 | Jacoletti | 1,150 0 0 | 1,150 10 0 | ... | 78 10 0 | 1,072 0 0 | 235 13 0 | 219 14 6 | 1,291 14 6 |
| 3155/11 | Great Victoria | 719, 944/5, 1229 | Southern Cross | 2,000 0 0 | 1,643 3 3 | ... | 1 7 9 | 1,641 15 3 | 689 8 11 | 41 7 7 | 1,683 2 10 |
| 913/19 | Great Southern | 2909 | Forrestonia | 3,000 0 0 | ... | 2,882 9 9 | ... | 2,882 9 9 | ... | 29 14 4 | 2,912 4 1 |
| 1343/07 | Hodder, E. | M.A.64Y | Randalls | 253 3 2 | 253 3 2 | ... | 148 13 6 | 104 10 2 | 6 8 4 | 35 11 3 | 140 1 5 |
| 1116/18 | Knox & Barnes | ... | ... | 40 0 0 | ... | 35 11 0 | ... | 35 11 0 | ... | 1 12 6 | 37 3 6 |
| 562/15 | Lalla Rookh | 112, 786, T.A. 10 | Marble Bar | 3,000 0 0 | 1,169 14 4 | 1,411 9 3 | ... | 2,581 3 7 | 92 0 7 | 79 9 9 | 2,660 13 4 |
| 2985/13 | Mandelstam, A. S. | 1011R | Edjudina | 200 0 0 | 200 0 0 | ... | 17 11 7 | 182 8 5 | 44 19 2 | 12 16 9 | 195 5 2 |
| 4416/11 | Malcolm Prospecting Co. | 1175C | Malcolm | 1,550 0 0 | 1,550 0 0 | ... | 15 0 0 | 1,535 0 0 | 40 6 10 | 723 4 9 | 2,258 4 9 |
| 363/12 | McCahon & Party | ... | Mt. Ida | 400 0 0 | 400 0 0 | ... | 7 0 0 | 393 0 0 | ... | 27 14 5 | 420 14 5 |
| 2911/10 | Phoenix | 622N | Quinn's | 250 0 0 | 250 0 0 | ... | 39 12 0 | 210 8 0 | 17 12 1 | 17 5 11 | 227 13 11 |
| 1353/10 | Red, White and Blue | 641B | Curran's Find | 2,676 9 0 | 2,676 9 0 | ... | 224 12 2 | 2,451 16 10 | 856 18 10 | 121 10 1 | 2,573 6 11 |
| 919/14 | Rocklee | ... | Yaloginda | 350 0 0 | 350 0 0 | ... | 43 0 0 | 307 0 0 | 12 2 0 | 21 14 1 | 328 14 1 |
| 2253/11 | Ravensthorpe Battery Co. | ... | Ravensthorpe | 1,300 0 0 | 1,038 8 2 | ... | 25 0 0 | 1,013 8 2 | ... | 326 1 2 | 1,339 9 4 |
| 4726/11 | Southern Cross and Southern Cross South | 1067Y, 1076Y | Bulong | 1,000 0 0 | 1,650 0 0 | ... | 1,342 12 3 | 307 7 9 | 31 12 6 | 202 8 10 | 509 16 7 |
| 3551/10 | Randwick | 978C | Malcolm | 584 14 0 | 577 3 5 | ... | 54 4 6 | 522 18 11 | ... | 45 3 5 | 568 2 4 |
| 4222/07 | Star of Fremantle | 6458 | Kunanalling | 325 0 0 | 320 10 0 | ... | 0 10 0 | 320 0 0 | 132 14 11 | 8 1 4 | 328 1 4 |
| 3362/11 | Spring Hill | 721 | Parker's Range | 655 16 5 | 655 16 5 | ... | 19 2 0 | 636 14 5 | 365 0 10 | 109 9 7 | 746 4 0 |
| 3971/15 | Triplicate | 1914 | Tuckabianna | 500 0 0 | 608 17 7 | ... | 66 13 10 | 542 3 9 | 51 0 8 | 39 14 7 | 581 18 4 |
| 1525/13 | Thring Bros. & Dwyer (Kirton's) | 127 | Northampton | 2,050 0 0<br>200 0 0<br>500 0 0 | 2,028 12 9<br>200 0 0<br>462 18 7 | ...<br>...<br>37 1 5 | 98 2 4<br>...<br>... | 1,930 10 5<br>200 0 0<br>500 0 0 | 537 3 10<br>15 13 7<br>8 14 1 | 98 5 8<br>10 0 7<br>31 6 9 | 2,028 16 1<br>210 0 7<br>531 6 9 |
| | Totals | ... | ... | ... | 21,843 6 11 | 4,376 6 5 | 2,623 16 9 | 23,595 16 7 | 3,832 3 0 | 2,882 8 6 | 26,478 5 1 |
| | C.—BORING. | | | | | | | | | | |
| ... | Mt. McMahon | ... | ... | ... | 474 7 8 | ... | ... | 474 7 8 | ... | ... | 474 7 8 |
| ... | Irwin River | ... | ... | ... | 170 9 0 | 1,416 13 4 | ... | 1,587 2 4 | ... | ... | 1,587 2 4 |
| ... | Wilga | ... | ... | ... | ... | 2,139 13 4 | ... | 2,139 13 4 | ... | ... | 2,139 13 4 |
| | Totals | ... | ... | ... | 644 16 8 | 3,556 6 8 | ... | 4,201 3 4 | ... | ... | 4,201 3 4 |
| ... | A.—PIONEER MINING AND PROSPECTING | ... | ... | ... | 26,293 16 8 | 11,553 4 4 | 7,065 12 3 | 30,781 8 9 | 1,285 9 8 | 1,773 19 0 | 32,555 7 9 |
| ... | B.—ASSISTANCE ERECTING BATTERIES, ETC. | ... | ... | ... | 21,843 6 11 | 4,376 6 5 | 2,623 16 9 | 23,595 16 7 | 3,832 3 0 | 2,882 8 6 | 26,478 5 1 |
| ... | C.—BORING | ... | ... | ... | 644 16 8 | 3,556 6 8 | ... | 4,201 3 4 | ... | ... | 4,201 3 4 |
| | Totals | ... | ... | ... | 48,782 0 3 | 19,485 17 5 | 9,689 9 0 | 58,578 8 8 | 5,117 12 8 | 4,656 7 6 | 63,234 16 2 |

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

Office of the State Mining Engineer,
Mines Department, Perth, 27th April, 1921.

*The Under Secretary for Mines, Perth, W.A.*

Sir,

We have the honour to forward, for the information of the Hon. the Minister for Mines, the Annual Report for the year 1920, of the Board of Examiners.

Two ordinary meetings were held during the year in the office of the State Mining Engineer, that called for 28th April, being adjourned to 5th May owing to the illness of one of the members; the second meeting was held on 27th October, 1920.

*Examinations for Certificates of Competency.*

An examination was held at the Inspector of Mines' Office, Collie, on the 7th, 8th, and 9th April, there being only one applicant, Mr. O. R. Howie, who sat for a First Class Certificate of Competency, and his papers and oral examination being very satisfactory the Board granted him a First Class Certificate of Competency.

At the examination held at the Inspector of Mines' Office, Collie, on the 6th, 7th, and 8th October there were four applicants, viz., Messrs. Z. Rogers, H. M. Sweeney, S. Annesley, and C. T. Blackford, who all sat for Second Class Certificates. The examinees' papers and oral examinations were exceptionally good and each gained a Second Class Certificate of Competency. The Board placed on record the high standard and excellence of the examinees' papers.

Mr. J. McVee, Inspector of Mines, Collie, and a member of the Board, acted as Supervisor at both examinations; he also conducted the oral examinations.

*Reciprocity with New South Wales in regard to Certificates.*

The Board communicated with the Under Secretary for Mines, Sydney, pointing out that a complaint had been made by the holder of a W.A. First Class Certificate of Competency that the New South Wales Board refused to recognise W.A. certificates, and asked on what conditions, if any, certificates from other States were acceptable by the New South Wales Board, at the same time pointing out that the W.A. Board accepted certificates from other Examining Boards and granted Western Australian equivalent certificates without further examination, provided the other Boards' examinations were about the same standard as Western Australian.

In reply the Under Secretary for Mines, Sydney, stated that under the New South Wales Act the only certificates which must be registered outside their own are those issued under Imperial Acts where experience has been gained in Great Britain. The Board decides as to the registration of certificates from other places, being guided in their decision by the nature of the experience gained by applicant. Further correspondence on this matter is in progress.

Copies of papers set for the written examinations held in April and October, 1920, are appended to this report.

We have, etc.,

A. MONTGOMERY,
State Mining Engineer, Chairman.

A. GIBB MAITLAND,
Government Geologist, Member.

JAS. McVEE,
Inspector of Mines, Member.

F. A. LANE,
Secretary.

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THE COAL MINES REGULATION ACT, 1902.

*Examination for First Class Certificate of Competency.*

SUBJECT: ARITHMETIC.

Wednesday, 7th April, 1920, 10 a.m. to 11 a.m.

| Possible marks | |
|---|---|
| 25 | 1.—Find the quantity of coal in a seam 6ft. 6in. high, area 7 acres 1 rood 20 perches, Specific gravity 1.28.<br>Also, find the quantity raised by working pillars 20 yards by 6 yards, bords 8 yards wide, cut-throughs 3 yards wide, with a loss of 2 per cent. in the whole and 7 per cent. in the broken. |
| 15 | 2.—Taking miners' average earnings at 17s. 6d. per day, what would the average wage be after an advance of 15 per cent. is given, and a second advance of 10 per cent.? Should a reduction of 25 per cent. come afterwards, what then will their average earnings be? |
| 10 | 3.—An advance of 9¼ per cent. is given on the machine cutting rate of 4¾d. per ton; by how much would this increase the cost, the fortnightly output being 11,580 tons? |
| 15 | 4.—Express as a vulgar fraction .1050.<br>Extract the square root of 5345344. |
| 10 | 5.—If 3/5ths of an estate be worth £7,520, what is the value of ⅝ of the estate? |
| 25 | 6.—In a bord and pillar working the pillars are 44 yards by 14 yards and the bords are 8 yards wide, cut-throughs 3 yards; what percentage of coal is left in the pillars? |
| 100 | |

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SUBJECT: SURVEYING.

Wednesday, April 7th, 1920, 11 a.m. to 1 p.m.

| Possible marks | |
|---|---|
| 40 | 1.—What are the principal instruments used in coal mine surveys? |
| 30 | 2.—Describe the methods that are available in surveying for measuring distances on the surface and underground. |
| 30 | 3.—In what respects do colliery surveys differ from those required in metalliferous mining? |

SUBJECT: SURVEYING—*continued.*

Possible marks.

30 4.—What is the difference between the true level of two stations, A and B, having given the distances AM, MB, 1,040 and 1,820 feet, and the heights AE, BF of apparent level with L (the instrument station) 5 feet and 6 feet respectively.

30 5.—Plot the following survey on the scale of 50 feet per inch:—

From A N. 17° W. 150 feet level.
N. 65° E. 230 „
E 115 „
S. 45° E. 200 feet rising 1 in 4 to B.

Find the length and bearing of the closing line AB.

30 6.—Describe the methods of making and preserving mine plans.

190

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SUBJECT: GEOLOGY.

Wednesday, April 7th, 1920, 2 p.m. to 4 p.m.

Possible marks

20 1.—Under what geological conditions is coal invariably found? How may coals be classified?

15 2.—Enumerate the effects which faults produce in coal measures. What is the difference between a normal and a reverse fault?

15 3.—In what respect is fossil evidence of value in determining whether a formation is likely to contain coal?

15 4.—Give a classification of the different kinds of coal and state where they are found.

15 5.—Explain how you would set about testing an area in which coal-bearing strata are thought to exist beneath a cover of newer formations.

15 6.—Give a succinct account of the Rocks of the Collie Coalfield, their sequence and structural relations. Illustrate your answer by a geological section.

95

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SUBJECT: THE COAL MINES REGULATION ACT, 1902.

Wednesday, April 7th, 1920, 4 p.m. to 5 p.m.

Possible marks

15 1.—What are the stipulations in the Coal Mines Regulation Act concerning the support of roof and sides in working places and roadways?

10 2.—To what scales may colliery plans be made? State the information to be shown on such plans.

20 3.—Describe what is meant by the term "ventilating district" as used and defined in the Coal Mines Regulation Act.

20 4.—State fully the various duties and responsibilities of an Under Manager.

15 5.—What steps are to be taken on the abandonment of a mine?

20 6.—Give a complete list of the several examinations and reports necessary, under the Coal Mines Regulation Act, below ground.

100

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SUBJECT: MACHINERY.

Thursday, April 8th, 1920, 10 a.m. to 1 p.m.

Possible marks

35 1.—Describe a portable pump for draining an advancing dip heading, the quantity of water being 70 gallons per minute.

35 2.—What are the dangers arising out of the use of electrical power underground in connection with cables and motors, and how are they to be avoided?

35 3.—How is electrical power taken from the dynamo or generator at surface to the motor underground, and how is the electricity prevented from leaking away?

40 4.—What is the strain on rope that hauls 16 skips, each 18cwt. full, up a grade of 1 in 8, 400 yards long, co-efficient 1/28? If journey is done in two minutes calculate brake horse power, and indicate horse power when modulus is 70 per cent. Rope 16lbs. per fathom direct haulage.

40 5.—Water is running into the sump at the bottom of the shaft at the rate of 3,000 gallons per hour during the whole 24 hours; what class of pump, giving dimensions, would you instal to deal with this quantity in seven hours, the depth of shaft being 800 feet?

35 6.—What do you understand by
(a) priming in boilers?
(b) pitting and grooving of plates in boilers?

What causes these phenomena, and what can be done to prevent or overcome them?

40 7.—Describe fully the necessary equipment and plant to deal with 800 tons in seven hours per shift from a seam containing about 10 per cent. of refuse.

40 8.—Show by sketch how wire conductors for shaft winding are tightened and secured, above and below.

300

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SUBJECT: MINING OF COAL.

Thursday, April 8th, 1920, 2 p.m. to 5 p.m.

Possible marks

40 1.—An improved haulage road, 1,000 yards long in a flat seam, is to be made 12ft. wide and 7ft. high in bad roof and sides; illus- how you would support it.

40 2.—Ventilate the workings on the accompanying plan with due regard to haulage.

35 3.—What are the chief points to be aimed at in the extraction of pillars?

Make a sketch of a small panel containing 16 pillars each 30 yards long by 8 yards wide, showing six of the pillars out, numbering them in the order of their withdrawal, and indicating the various stages in the extraction of the remaining pillars.

35 4.—Assuming that systematic timbering is required, what orders would you give as to the timbering of places
(a) in longwall,
(b) in bord and pillar workings,

and what provisions would you make for the economical and safe drawing of timber in any of these places?

35 5.—The hours of underground workers having been reduced from eight to seven, to what points would you chiefly direct your attention in order to maintain as far as possible the former output of coal?

SUBJECT: MINING OF COAL—*continued.*

Possible marks.

35 6.—What should be taken into consideration when determining the size of pillars in laying out a colliery? Describe fully.

40 7.—There is a top brushing in long wall gateways of a gassy and dusty mine; this work so far has been done without explosives, but now a hard belt of sandstone appears to within two feet of the coal; there is also two feet of moderately hard shale on the floor, the remainder being hard sandstone. Give a few practical remarks as to what you would do, shot firing being very undesirable because of the danger.

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

300

SUBJECT: VENTILATION AND DANGEROUS CASES.

Friday, April 9th, 1920, 10 a.m. to 1 p.m.

Possible marks

35 1.—In an airway 12ft. x 6ft. the air current is charged with gas up to 3 per cent.
(a) What quantity of gas must be added to raise it to most explosive point?
(b) By how much must the air be reduced to bring it to most explosive point?
The velocity is 200ft. per minute in first case.

30 2.—If 100,000 cub. ft. of air per minute pass when a fan is running at 100 revolutions, what quantity will pass at 120 revolutions, and if W.G. is 2in. at former speed? What will W.G. be at latter speed?

35 3.—Describe the gases C.O. and $C.O_2$. Under what conditions are they produced? What are the effects of these gases on human being, and what methods are employed for their detection?

35 4.—It has become necessary to fire occasional shots on a main haulage road which is dry and dusty; give full particulars as to the explosive you would use, the precautions you would take, and in what part of the shift, or what part of the day you would fire your shots.

35 5.—What arrangements would you adopt for the ventilation of a stone drift 11 feet wide and 8 feet high which is being driven 300 yards on a rising gradient of 1 in 8 when heavy blasting is required at the face. Illustrate your answer by sketches.

30 6.—Give the composition of air and fire damp; say what proportions of each form the most explosive gases and say what gases result from a mine explosion.

35 7.—Winning places in a gassy seam with very soft roof heavily timbered are driven 66 yards between cut-throughs; how would you carry the ventilation to the face? Illustrate by sketches and give dimensions of material used.

35 8.—A sinking has to go 1,200 ft.; sketch the ventilation arrangements you would make for the sinking and until a holeing is made with the second shaft 100 yards away.

30 9.—If one airway is 6ft. by 10ft. and another is 7ft. by 12ft., how much greater must the W.G. be in the first case than the second if the length of airways and quantity passing be the same in each?

300

THE COAL MINES REGULATION ACT, 1902.

*Examinations for Second-class Certificate of Competency as Under Manager or Overman.*

SUBJECT: VENTILATION AND DANGEROUS CASES.

Wednesday, October 6th, 1920, 10 a.m. to 11.30 a.m.

Possible marks

50 1.—A volume of 150,000 cubic feet of air and $C.H_4$. being at its most explosive point, how many cubic feet of gas does the mixture contain, and how much air will be required to be added to reduce the $C.H_4$. to 1.5 per cent. of the mixture?

50 2.—Ventilate the workings on the accompanying plan with due regard to haulage.*

50 3.—The velocity of air current is 630ft. per minute, the place of measurement is semi-circular, side walls 4ft. high and 12ft. wide; what are the perimeter, area, and quantity of air passing per minute?

50 4.—Name and describe the various gases found in coal mines, stating where they are found, and their effect on men and lights.

50 5.—Is it safe to pass a current of intake air through the abandoned workings of a mine and then conduct it to the face of the workings? State your reasons.

50 6.—Show by a sketch how you would ventilate a pair of headings going to the full rise in a seam, rising 1—4. The thickness of the seam is 6ft. and the places give off fire damp freely.

300

*Plan not printed herewith.

SUBJECT: MINING OF COAL.

Wednesday, October 6th, 1920, 11.30 a.m. to 1 p.m.

Possible marks

50 1.—Describe some system of working a coal seam with which you are acquainted, giving sketches if necessary.

50 2.—Sketch in detail how you would set a wooden chock in a seam, say, 5 feet thick, dipping 1 in 3—
(a) Where the chock has to be repeatedly withdrawn and reset.
(b) Where it is put in permanently and filled with dirt.

50 3.—A fall occurs on the main road practically blocking the airway while the mine is working; what would you do, and how would you proceed to clear the fall, the roof having fallen for a distance of six yards and six feet above the original timber?

50 4.—Hours having been reduced from eight to seven per shift, to what principal points would you direct your attention in order to increase the output of coal from the faces?

50 5.—Describe with sketches how you would construct an overcast over a main haulage road, state materials you would use in construction.

50 6.—In an incline rising about 1 in 4 coal has to be lowered from a number of different levels on to the main haulage road. Describe various methods of doing this.

300

## SUBJECT: ARITHMETIC.

Wednesday, October 6th, 1920, 2 p.m. to 3 p.m.

| Possible marks | |
|---|---|
| 17 | 1.—What quantity of coal is contained in 320 acres of a coal field in a seam 6 feet thick if the specific gravity be 1.28, and the strata be level? What will be the quantity if the strata dips 1 in 3? |
| 17 | 2.—A seam of coal 4ft. 6in. thick is worked longwall, the gateways are 12ft. wide and 30 yards apart centre to centre, the gateway packs are 18ft. wide and cost 2s. 9d. per cubic yard; how much do packs cost per ton of coal got? A cubic foot weighs 80lbs. |
| 16 | 3.—Find the cost by practice of 17 acres 3 roods 27 poles at £12 17s. 6d. per acre. |
| 17 | 4.—Give weight of water in a lodgment 35 yards long 8 yards wide and 6 feet deep. How long will it take a pump discharging 150 gallons per minute to empty sump, there being a feeder of water of 40 gallons per minute running in, and the pump working 16 hours per day? |
| 17 | 5.—How many bricks are required to build a semi-circular archway in pit bottom? Side walls 5ft. high, roadway 12 feet wide, arch continues for a distance of 20 yards, thickness of brick work 14in. (333 bricks = 1 cubic yard). |
| 16 | 6.—The distance from an airway to an upcast shaft is 85 yards measured along the level; what would be the length of a dumb drift from airway to come into the shaft at a height of 42 yards above it? |
| 100 | |

## SUBJECT: ROADWAYS.

Wednesday, October 6th, 1920, 3 p.m. to 4 p.m.

| Possible marks | |
|---|---|
| 50 | 1.—Describe with sketches the main and tail rope system of haulage, showing two branch roads. |
| 50 | 2.—What points have to be kept in view in making your permanent main roads for haulage and ventilation underground and afterwards in maintaining them? |
| 50 | 3.—In endless rope haulage, describe arrangements for keeping the rope tight. |
| 50 | 4.—Make a sketch of a district showing wheeling and machine roads, and explain how you would lay your roads so that machine could travel without interfering with the wheeling. |
| 50 | 5.—It is desired to widen a tunnel and main haulage road from 9ft. to 12ft. for the purpose of installing an endless rope. Describe fully how you would have this work carried out expeditiously, the tunnel being heavily timbered. Haulage operations on two shifts. |
| 50 | 6.—In driving a pair of headings slightly above water level trouble is experienced with water in passing through a swallow. How would you deal with the water? |
| 300 | |

## SUBJECT: THE COAL MINES REGULATION ACT, 1902.

Wednesday, October 6th, 1920, 4 p.m. to 5 p.m.

| Possible marks | |
|---|---|
| 16 | 1.—What are the Regulations as to shot firing and the treatment of explosives underground? |
| 18 | 2.—What are the requirements of the Act respecting the ventilation of a mine? What instruments are required to comply with this section of the Act? |
| 17 | 3.—Give a complete list of the several examinations and reports necessary under the Coal Mines Regulation Act. |
| 16 | 4.—What does the Act require as to—<br>(a) Person in charge of machinery?<br>(b) Fencing of machinery? |
| 16 | 5.—What are the provisions of the Act relating to timbering, and the general support of the roof? |
| 17 | 6.—Under what circumstances does it become necessary to withdraw the workmen from a mine or any part thereof? If this has to be done what further steps are to be taken? |
| 100 | |

# DIVISION III.

## REPORT OF SUPERINTENDENT OF STATE BATTERIES.

Office of the Superintendent of State Batteries,
Perth, 17th May, 1921.

*The Under Secretary for Mines.*

Sir,

Herewith my report upon the operations of State Batteries during the year 1920, which I have the honour to submit for the information of the Hon. the Minister for Mines.

### MILLING.

At the close of the year 26 batteries (175 stamps) were operating under departmental control, and two batteries (Darlot and Tuckanarra, each 10 stamps) were operated by lessees under State Battery regulations. During the year it was found necessary to close four batteries, *i.e.,* Burtville (10 stamps), Mulwarrie (10 stamps), Quinns (5 stamps), and Yerilla (5 stamps).

*Tonnage.*—46,494¼ tons were milled at 23 batteries, and altogether 517 parcels of ore were handled, the mean weight of each parcel being nearly 90 tons. The tonnage milled showed an increase of 6,203½ tons in comparison with the figures for 1919. In addition to the four batteries closed, the mills at Mt. Egerton, Sandy Creek, and Siberia were inoperative. The principal tonnages were crushed at Coolgardie (13,532½ tons), Wiluna (10,485¾ tons lode and 792¼ tons quartz), Cue (3,424½ tons), Boogardie (2,575¾ tons), Norseman (2,278 tons), Ora Banda (2,216¾ tons), and Paynes Find (2,183½ tons).

The total tonnage offered for treatment was sufficient to keep the batteries engaged only 20.3 per cent. of full time (Sundays excluded). (Schedules 1, 5, and 8.)

*Stamp Duty.*—The duty per stamp at 5-head batteries (15) was 4.18 tons, and at 10-head batteries (8) 5.07 tons per 24 hours. The mean duty at all batteries was 4.66 tons per 24 hours.

*Amalgamation.*—36,662½ tons were treated in the first instance by amalgamation, and 24,929¾ ozs. of bullion, estimated to contain 21,131¾ fine ounces were recovered, equal to 74.6 per cent. of the gross value of the ore. During 1919 the recovery was 77 per cent., but the grade of ore fell from 76s. per ton to 65s. 6d. per ton, whilst the gross value of 14,261½ tons treated at Coolgardie was only 22s. 8d. per ton. (Schedule 5.)

*Charges.*—Charges for the treatment of quartz remained unaltered. The charge for the treatment of lode material at Wiluna was altered from the sliding scale printed in last year's report to 15s. per ton for ore worth under 10 dwts. per ton and 17s. per ton for ore worth 10 dwts. per ton and over. 20,338½ tons of low-grade ore were crushed at reduced rates provided for in the scale of charges, rebates amounting to £2,391 13s. being allowed to owners from the Development of Mining Vote.

*Expenditure.*—Milling operations accounted for an expenditure of £29,163 5s. 6d., including £2,993 5s. 1d. spent on repairs and renewals. The cost per ton was 12s. 6.48d. compared with 12s. 4.08d. during 1919.

*Revenue.*—Revenue collected amounted to £20,208 19s. 4d., equal to 8s. 8.26d. per ton compared with 8s. 2.02d. during 1919. The loss on milling was £8,954 6s. 2d. compared with a loss of £8,425 14s. 10d. during 1919. (Schedules 1, 5, and 8.)

### TAILING TREATMENT.

Despite the high cost of galvanised iron we were compelled to install two new plants (Cue and Warriedar), to renew the vats at Coolgardie, and to repair vats at Boogardie and elsewhere. Since the department has undertaken to pay gold premiums as declared by the Gold Producers' Association upon the gold purchased in tailings, it is necessary to produce sufficient gold to obtain premiums at least equal to liabilities. This has been done. 15,437 tons of tailing were treated, having a mean head value of 6.197 dwts. per ton. The mean residue value was 1.347 dwts. per ton, the theoretical recovery being 78.15 per cent. The actual recovery was 77 per cent., but slag values were not realised, and will more than account for the difference.

*Expenditure.*—£6,978 7s. 10d., equal to 9s. 0.49d. per ton, compared with 9s. 2.47d. during 1919, when 15,764 tons were treated. The cost includes £408 2s. 4d. spent on repairs.

*Revenue.*—At the beginning of the year the basis upon which revenue is derived was altered. The first charge against revenue is now the recoup of purchase money. When that has been satisfied, any balance is taken to revenue. The purchase account is therefore kept balanced, and profits or losses are now shown in the working account.

The revenue amounted to £10,303 15s. 9d., equal to 13s. 4.19d. per ton, the profit being £3,325 7s. 11d. During 1919 the profit was £91 3s. 2d. (Schedules 3 and 9.)

### SLIME TREATMENT.

The only plant treating tailing which is slimed is at Wiluna. 11,525 tons were handled in the vacuum filter plant having a mean head value of 8.849 dwts. per ton. The mean residue value was 1.794 dwts. per ton, and the recovery was 79.7 per cent.

*Expenditure* amounted to £5,728 2s., equal to 9s. 11.28d. per ton compared with 9s. 1.08d. per ton

during 1919. The vats were renewed, and total repairs and renewals amounted to £747 15s. 6d., or 1s. 3½d. per ton.

*Revenue.*—Altogether £5,015 10s. 6d. was collected, equal to 8s. 8.4d. per ton, compared with 7s. 5.37d. per ton during 1919. The loss amounted to £712 11s. 6d., or slightly less than the cost of renewals and repairs, compared with a loss of £1,088 18s. 6d. during 1919.

## TIN ORE TREATMENT.

The old plants at Bunbury End and Salt Water Gully were dismantled and a plant more centrally situated and better designed was constructed at Floyd's Gully. It is to be regretted that just after the plant commenced operations the tin market collapsed, and claim-holders ceased production. Only 737 cubic yards were treated in the plant, which consists of a 6ft. Huntingdon mill, which reduces the ore to any desired grade. The pulp is passed through a small cone, the underflow passing over two Phoenix Weir tables, which give a close concentration of the coarse material. The overflow from the first cone passes into two larger cones. The underflow from them passes to a No. 5 Wilfley concentrating table, and the overflow is gravitated to the residue dams. Its value was only 0.09 per cent. Sn, and the mean value of the total tailing was 0.1 per cent. Sn.

*Expenditure.*—The small tonnage treated did not permit of low costs. The expenditure amounted to £330 1s. 1d., equal to 8s. 11.47d. per yard, compared with 10s. 1.51d. per yard during 1919, when 1,204 yards were treated.

*Revenue* amounted to 9s. 3.31d. per yard compared with 3s. 11.88d. per yard during 1919. The total revenue was £341 17s. 7d., and included £130 from the sale of tailing, thus showing a profit of £11 16s. 6d. on all operations. (Schedules 1 and 8.)

## ORE DRESSING.

Only one parcel (of 109¼ tons) of scheelite ore was treated at the ore-dressing plant, Coolgardie. The market for heavy minerals and base metals fell so low that we cannot expect tonnage for treatment until a decided improvement takes place. (Schedule 8.)

## REPAIRS AND RENEWALS.

The expenditure incurred in repairs and renewals amounted to £4,149 2s. 11d. Renovations to some of the batteries and new vats at Wiluna cost a good deal of money. Details of expenditure are:—

| | £ | s. | d. |
|---|---|---|---|
| Batteries .. .. | 2,993 | 5 | 1 |
| Leaching plants .. | 408 | 2 | 4 |
| Slime plant .. .. | 747 | 15 | 6 |
| Tin ore plant .. .. | nil. | | |
| Ore-dressing plant .. | nil. | | |
| | £4,149 | 2 | 11 |

## TOTAL OPERATIONS.

74,302½ tons were handled. The gross expenditure was £42,313 18s. 3d., equal to 11s. 4.67d. per ton, compared with 70,604½ tons at a cost of 11s. 0.55d. per ton during 1919. The gross revenue was £35,950 18s. 7d., equal to 9s. 8.12d. per ton, compared with £29,071 4s. 11d., or 8s. 2.81d. per ton during 1919.

The gross loss on all operations was £6,362 19s. 8d., compared with a gross loss of £9,924 10s. 6d. during 1919.

*Comparative synopsis of results at State Batteries for* 12 *months ending* 31*st December,* 1920 *and* 1919.

| | 1920. | | | 1919. | | |
|---|---|---|---|---|---|---|
| | Tonnage. | Expenditure. | Revenue. | Tonnage. | Expenditure. | Revenue. |
| | | s. d. | s. d. | | s. d. | s. d. |
| Milling ... ... ... ... | 46,494¼ | 12- 6·48 | 8-8·26 | 40,290¾ | 12- 4·08 | 8- 2·02 |
| Tailing Treatment ... ... | 15,437 | 9- 0·49 | 13-4·19 | 15,764 | 9- 2·47 | 9- 5·73 |
| Slime Treatment ... ... ... | 11,525 | 9-11·28 | 8-8·40 | 12,780 | 9- 1·08 | 7- 5·37 |
| Tin Treatment ... ... ... | 737 | 8-11·47 | 9-3·31 | 1,204 | 10- 1·51 | 3-11·88 |
| Tin Residue ... ... ... | ... | ... | ... | 200 | 7- 3·77 | 3-11·32 |
| Ore Dressing ... ... ... | 109¼ | 20-10·63 | 14-9·43 | 365¾ | 19-11·88 | 11- 7·29 |

*Receipts and Expenditure,* 1920.

| | Tonnage. | Expenditure. | Revenue. | Profit. | Loss. |
|---|---|---|---|---|---|
| | | £ s. d. | £ s. d. | £ s. d. | £ s. d. |
| Milling ... ... ... ... | 46,494¼ | 29,163 5 6 | 20,208 19 4 | ... | 8,954 6 2 |
| Tailing Treatment ... ... | 15,437 | 6,978 7 10 | 10,303 15 9 | 3,325 7 11 | ... |
| Slime Treatment ... ... ... | 11,525 | 5,728 2 0 | 5,015 10 6 | ... | 712 11 6 |
| Tin Treatment ... ... ... | 737 | 330 1 1 | 341 17 7 | 11 16 6 | ... |
| Ore Dressing ... ... ... | 109¼ | 114 1 10 | 80 15 5 | ... | 33 6 5 |
| | 74,302½ | 42,313 18 3 | 35,950 18 7 | 3,337 4 5 | 9,700 4 1 |
| | | | | Less Profit ... | 3,337 4 5 |
| | | | | Gross Loss ... | £6,362 19 8 |

## PURCHASE OF TAILING.

22,436½ tons of tailing were purchased for £20,877 14s. net to owners.

## OUTPUT SINCE INCEPTION.

Tons of auriferous ore treated, 1,283,521.

Production—

| | £ |
|---|---|
| By Amalgamation .. .. | 4,421,881 |
| „ Tailing treatment .. .. | 643,448 |
| „ Slime treatment .. .. | 212,788 |
| „ Residue treatment .. .. | 9,353 |
| | £5,287,470 |

Tons of staniferous ore treated, 80,013.75.

| | |
|---|---|
| Production .. .. .. | 92,863 |
| | £5,380,433 |

## STAFF.

On the 17th October Mr. David Missingham died at the Cue Hospital as a result of injuries sustained in an accident at the Great Fingall Mine, Day Dawn. He had occupied the position of engineer in charge of construction work for nearly 17 years and had proved himself to be a most efficient officer. His demise has been a great loss to the department. Mr. D. A. Wilson, his assistant, was appointed to fill the vacancy. There were no other changes in the staff.

## GENERAL REMARKS.

The increase in the total tonnage handled was entirely due to the increased tonnage milled. Tailing, slime, and tin ore treatment showed a decrease compared with the previous year. The mean gross value of the ore milled dropped from 65s. 11d. per ton in 1919 to 58s. 7d. per ton. At Coolgardie, 13,398½ tons of a total of 13,532½ tons milled were low grade. One mine produced about 10,000 tons for treatment at our battery, but the value was so low that supplies might cease at any time. Present indications point to a serious decline in the amount of ore likely to be offered for treatment during 1921. Our principal tonnage was obtained at Wiluna and Coolgardie, where over 50 per cent. of the total was handled. The recent award for wages is so high that it is doubtful if leaseholders can continue operations profitably.

The rates of wages for engine-drivers, battery feeders, and general labourers employed at State Batteries were advanced from 3s. to 5s. per shift on the 1st July, 1921, in accordance with Mr. Justice Burnside's award. The effect will be to increase our cost of treatment considerably.

Appended will be found the report of the Inspector.

I have, etc.,

A. M. HOWE,

Superintendent of State Batteries.

# Report of Mr. D. F. Browne, Inspector of State Batteries.

Herewith my report on the work at State Batteries for the year ending 31st December, 1920.

The general treatment has been more satisfactory, both as regards tonnages and cost, than I anticipated. The total tonnage treated has increased from 70,217.75 tons in 1919 to 74,302.5 tons in 1920, whilst the loss was reduced from £9,931 12s. 8d. in 1919 to £6,362 19s. 8d.

The large increase of tons milled at Coolgardie—13,535½ against 7,260.25 in 1919—and the advent of Cue to active operations are responsible for the increased tonnage, and the basis on which the tailing system has been placed, with its consequent increased revenue, is responsible mainly for the decreased loss in operations generally.

## MILLING.

Nine 10-stamp mills and seventeen 5-head mills were employed in public crushing, and, eliminating Sunday work, were engaged for 267,615 stamp hours out of a full-time total of 1,314,600, equal to 20.3 per cent.

Seven mills crushed over 2,000 tons, viz., Coolgardie (13,532½), Wiluna (11,258), Cue (3,424.5), Boogardie (2,575.75), Norseman (2,278), Ora Banda (2,216.75), Payne's Find (2,183.5).

46,494.25 tons were milled at a cost of 12s. 6.48d., and a revenue of 8s. 8.26d., as against 40,290.75 tons and cost and revenue respectively of 12s. 4.08d. and 8s. 2.02d. for 1919. The loss per ton has been reduced from 4s. 2.06d. to 3s. 10.22d.

The total loss on milling was £8,954 6s. 2d., whilst that for 1919 was £8,479 9s. 1d.

*Cost per ton.*—Coolgardie shows the best result for 10-head mills, viz., 6s. 7.45d., and Ora Banda (9s. 11.13d.) heads the 5-heads. At both these centres the ore is soft and easily crushed.

*Cost per hour.*—At Wiluna, which heads the 10-head mills with a cost of 14.50 shillings per hour, it is difficult, on account of broken time, to arrive at an exact figure.

Coolgardie did well, considering the big water bill, to crush for 18.67 shillings per hour, and Norseman (10.36), Payne's Find (11.58), Bamboo Creek (12.32), Mt. Ida (12.73), and Warriedar (12.83) show excellent work for 5-head mills.

*Stamp Duty.*—10-head mills averaged 5.07 tons per stamp per day, Coolgardie showing 6.46. Five-head mills averaged 4.18 tons per stamp per day, Ora Banda (9.06) and Meekatharra (5.27) showing the highest results.

*Fuel Consumption and Cost.*—The consumption at all classes of plant, viz., steam, charcoal producer, and wood producer, varies considerably, due chiefly to the difference in time employed, with the consequent number of stoppages. Plants which through want of carting facilities or labour only run two shifts are greatly handicapped, as fuel is consumed in quantities during the hang-ups and the re-starting.

The steam plants show a fairly uniform consumption, and Yarri with .66 pence per H.P.H. has the best cost.

*Charcoal Producer Plants.*—Fuel consumption is headed by Linden with 1.13 lbs. per B.H.P., followed by Cue and Marble Bar with 1.19 lbs.—all excellent results.

Boogardie and Warriedar show high consumption, which has improved lately at the former plant, but should be a matter of investigation at the latter.

The best cost per H.P.H. is that of Linden (0.45 pence) and Mt. Ida (0.46 pence).

*Wood Producer Plants.*—Ora Banda is easily first, and shows remarkably good figures with a consumption of 2.60 lbs. per B.H.P. and a cost of 0.178 pence.

The Wiluna figures would be good, but on account of the difficulty of estimating the continuous horse-power developed I have not tried to arrive at them.

*Low-grade Rebates.*—A marked increase in the tonnage crushed under the above charges is shown over the preceding years. In 1919, 9,473 tons of low-grade ore were treated for rebate amounting to £1,171 15s. In 1920, 20,338½ tons were crushed and rebate of £2,391 13s. allowed, made up as follows:—

| | Tons. | Rebates. £ s. d. |
|---|---|---|
| Bamboo Creek .. | 104 | 10 13 6 |
| Black Range .. | 136 | 13 4 0 |
| Boogardie .. | 1,531½ | 256 9 7 |
| Coolgardie .. | 13,398½ | 1,480 5 0 |
| Cue .. .. | 597 | 96 4 4 |
| Meekatharra .. | 248 | 23 13 6 |
| Mt. Ida .. .. | 32 | 1 13 6 |
| Norseman .. | 1,077½ | 144 9 7 |
| Ora Banda .. | 2,177¼ | 191 14 6 |
| Wiluna .. .. | 19¾ | 4 2 11 |
| Payne's Find .. | 39½ | 2 1 6 |
| Warriedar .. | 476½ | 72 10 2 |
| Youanme .. | 501 | 94 10 11 |
| | 20,338½ | £2,391 13 0 |

## TIN TREATMENT.

Owing to the closing down of Salt Water Gully and Bunbury End plants whilst the new one at Floyd's Gully was being erected, a very small tonnage was handled. Floyd's Gully plant treated 737 yards at a cost of 4s. 6.70d. per yard and a loss of £33 17s. 8d., which is a good figure for the initial run of the plant.

Unfortunately the price of tin fell to an unprofitable figure, and there is little hope of any tonnage until the price rises.

Expenditure and receipts on the old plants brought the cost per yard treated to 8s. 11.47d. and a revenue of 9s. 3.31d., resulting in a net profit of £11 16s. 6d.

The figures for 1919 were 1,204 yards for a cost of 10s. 1.51d. and a revenue of 3s. 11.88d. and a net loss of £369 6s. 4d.

## ORE DRESSING.

The plant at Coolgardie had a small round in a parcel of scheelite ore with satisfactory results.

Minor adjustments to the rolls feed had a beneficial effect.

Tons treated, 109.25. Cost, 20s. 10.63d., and revenue 14s. 9.43d.

Net loss, £33 6s. 5d.

## TAILINGS TREATMENT.

The tonnage handled, exclusive of Wiluna, was 15,437, or 327 tons less than 1919. The cost of 9s. 0.49d. was 1.99 pence lower than in the preceding year, and the revenue 13s. 4.19d., an increase of 3s. 10.76d.

The cost is high, but is a satisfactory one considering the times. The revenue is the direct result of the new basis upon which the estimation of revenue has been put.

Each battery now stands on its own as regards the purchase of tailings and the recoup to Tailings Purchase Accounts and profits derived from the treatment of tonnage over and above that paid for, and increased extraction goes directly to revenue, whilst any loss due to short tonnage, short head values, or poor extraction is charged against working.

This has been a direct incentive to managers to do good work and exercise due precautions in purchasing tailings.

*Cost.*—Cue, a new plant, treated 1,140 tons for a cost of 6s. 3.32d., Norseman 2,895 tons for 7s. 3.40d., and Boogardie 3,815 tons for 8s. 1.44d., all good figures, whilst Youanme treated 240 tons of sand only for 6s. 9.36d. per ton.

*Extraction.*—The average head value was 6.197 dwts., and the tail value 1.347 dwts., giving an extraction of 78.26 per cent., which is slightly lower than usual. The difference between the actual and theoretic extract is 1.26 per cent., which should easily be made up when the slags are treated, and shows excellent results.

Bamboo Creek and Black Range head the list with 85.13 per cent. and 84.91 per cent. respectively.

## REPAIRS AND RENEWALS.

| | Total expend. £ s. d. | Expend. per ton. s. d. |
|---|---|---|
| Milling .. | 2,993 5 1 | 1 3.44 |
| Tailings .. | 408 2 4 | 6.34 |
| Slime .. | 747 15 6 | 1 3.50 |
| Tin .. | nil. | |
| Total .. | £4,149 2 11 | |

## INSPECTION.

During the year I was absent from Perth on whole or part of 183 days, full time amounting to 142¼ days.

The total mileage travelled was 18,356. The following are particulars of cost of inspection, etc.:—

| | £ s. d. | |
|---|---|---|
| Salary ... ... | 455 9 8 | |
| Travelling Expenditure ... ... | 133 15 6 | |
| Motor Hire ... | 84 6 3 | 7·09 pence per mile. |
| Porterage and Wires | 13 5 7 | 1-5·4 per day travelling |
| Railway Tickets, etc. | 163 8 2 | |
| | £850 5 2 | |

| | |
|---|---|
| Mileage by Rail ... | 15,504 |
| Mileage by Car ... | 2,852 |

## STAFF.

Thirteen Managers and one Assistant, C. McMaster, ran our batteries during 1920, the erection work being in the hands of Dave Missingham, who unfortunately died on the 17th October.

I wish to place on record this officer's service during the years I have been Inspector.

No transfers or additions to our staff were made, and the highly satisfactory co-operation of the Head Office staff was exemplified by the want of complaints from our Managers during my visits.

The Managers deserve credit for their work as reflected in the state of their plants and the costs for the year.

## Schedule 1.

*Return showing the number of tons crushed, gold yield, average per ton in shillings, and total value for year ending 31st December, 1920.*

| Battery. | Tons Crushed. | Gold Yield, Bullion. | Average per ton in shillings. | Total Value. |
|---|---|---|---|---|
| | | | | £ |
| Bamboo Creek ... | 868·25 | 1,808·40 | 149·80 | 6,510·24 |
| Black Range ... | 1,255·00 | 765·50 | 413·90 | 2,755·80 |
| Boogardie ... ... | 2,575·75 | 1,206·30 | 33·72 | 4,342·68 |
| Coolgardie ... ... | 13,532·50 | 2,715·45 | 14·44 | 9,775·80 |
| Cue ... ... ... | 3,424·5 | 7,011·91 | 147·42 | 25,242·87 |
| Laverton ... ... | 269·25 | 236·50 | 63·24 | 851·40 |
| Leonora ... ... | 369·00 | 513·15 | 100·12 | 1,847·34 |
| Linden ... ... | 366·50 | 434·47 | 85·34 | 1,564·09 |
| Marble Bar ... ... | 407·00 | 488·35 | 86·38 | 1,758·06 |
| Meekatharra ... ... | 753·00 | 1,053·65 | 100·74 | 3,793·14 |
| Mt. Ida ... ... | 617·00 | 425·85 | 49·70 | 1,533·06 |
| Mt. Keith ... | 492·25 | 441·65 | 64·60 | 1,589·94 |
| Mt. Sir Samuel ... | 388·00 | 215·32 | 39·94 | 775·15 |
| Niagara ... ... | 196·5 | 234·50 | 85·92 | 844·20 |
| Norseman ... ... | 2,278·00 | 2,239·82 | 70·78 | 8,063·35 |
| Ora Banda ... ... | 2,216·75 | 332·06 | 10·78 | 1,195·41 |
| Payne's Find ... ... | 2,183·50 | 2,818·10 | 92·92 | 10,145·16 |
| Peak Hill ... ... | 925·00 | 742·10 | 57·76 | 2,671·56 |
| Quinn's ... ... | 54·00 | 13·25 | 17·66 | 47·70 |
| Warriedar ... ... | 1,164·00 | 342·20 | 21·16 | 1,231·92 |
| Wiluna ... ... | 792·25 | 599·47 | 54·48 | 2,158·09 |
| Yarri ... ... ... | 379·5 | 298·25 | 56·58 | 1,073·70 |
| Youanme ... ... | 501·00 | 133·85 | 19·23 | 481·86 |
| | 36,008·5 | 25,070·10 | 50·12 | 90,252·52 |
| Wiluna Lode ... | 10,485·75 | No amalgamation. | | |

### *Tin Plants.*

| Plant. | Yards Treated, | Yield. |
|---|---|---|
| | | Tons. |
| Greenbushes ... ... ... ... ... | 737 | 3·256 |

---

## Schedule 2.

*Return showing the number of tons crushed, gold yield, average per ton, and value since inception to 31st December, 1920.*

| Battery. | Tons Crushed. | Gold Yield. | Average per ton. | Value. |
|---|---|---|---|---|
| | | ozs. | ozs. | £ |
| Bamboo Creek ... | 8,890·75 | 14,922·66 | 1·674 | 53,721·58 |
| Black Range ... | 69,151·40 | 72,247·00 | 1·044 | 260,284·53 |
| Boogardie ... ... | 65,192·90 | 42,163·14 | ·646 | 153,181·49 |
| Coolgardie ... ... | 107,634·75 | 72,287·12 | ·671 | 260,287·29 |
| Cue ... ... ... | 4,712·00 | 7,775·33 | 1·650 | 27,991·18 |
| Darlot ... ... | 33,210·00 | 37,637·74 | 1·133 | 138,928·25 |
| Laverton ... ... | 16,213·75 | 17,080·91 | 1·053 | 62,663·00 |
| Leonora ... ... | 53,475·95 | 59,394·99 | 1·110 | 217,302·29 |
| Linden ... ... | 18,948·00 | 21,137·75 | 1·115 | 76,095·99 |
| Marble Bar ... ... | 10,526·25 | 13,253·05 | 1·259 | 47,710·93 |
| Meekatharra ... ... | 74,462·50 | 89,298·19 | 1·199 | 324,152·87 |
| Mt. Egerton ... ... | 7,582·25 | 4,017·86 | ·529 | 13,731·12 |
| Mt. Ida ... ... | 41,272·40 | 53,629·06 | 1·299 | 196,366·79 |
| Mt. Keith ... ... | 9,482·50 | 8,422·65 | ·888 | 30,321·54 |
| Mt. Sir Samuel ... | 9,516·75 | 7,399·92 | ·777 | 26,639·70 |
| Mulline ... ... | 76,613·45 | 98,216·09 | 1·281 | 352,748·07 |
| Niagara ... ... | 4,172·50 | 57,305·99 | ·893 | 208,489·76 |
| Norseman ... ... | 64,172·50 | 66,029·14 | 1·097 | 240,887·37 |
| Ora Banda ... ... | 16,575·50 | 7,464·03 | ·450 | 26,870·47 |
| Payne's Find ... ... | 21,828·25 | 26,869·76 | 1·230 | 96,731·13 |
| Peak Hill ... ... | 19,108·30 | 20,297·02 | 1·062 | 74,240·51 |
| Siberia... ... ... | 15,337·00 | 16,445·44 | 1·072 | 59,128·91 |
| 20-M. Sandy ... ... | 12,184·15 | 19,055·77 | 1·563 | 68,930·34 |
| Tuckanarra ... ... | 15,476·85 | 21,276·06 | 1·374 | 78,217·53 |
| Warriedar ... ... | 4,376·75 | 1,896·65 | ·433 | 6,827·94 |
| Wiluna ... ... | 55,633·25 | 30,131·59 | ·541 | 108,618·90 |
| Yarri ... ... ... | 46,070·50 | 30,453·51 | ·661 | 109,632·46 |
| Youanme ... ... | 27,401·50 | 9,360·38 | ·341 | 33,697·36 |
| Batteries closed ... | 259,629·34 | 270,313·31 | 1·041 | 981,998·47 |
| | 1,224,875·19 | 1,195,782·11 | ·976 | 4,336,397·77 |
| Wiluna (Lode) ... | 58,646·25 | 23,655·69 | ·403 | 85,483·32 |
| | 1,283,521·44 | 1,219,437·80 | ·950 | 4,421,881·09 |

### *Tin Plants.*

| Plant. | Tons. | Yield, Black Tin. |
|---|---|---|
| | | Tons. |
| Greenbushes ... ... ... ... ... | 737·00 | 3·256 |
| Plants closed ... ... ... ... ... | 79,276·75 | 969·276 |
| | 80,013·75 | 972·532 |

| *Milling.* | Tons. | ozs. |
|---|---|---|
| Up to 1901 (3 years) | 68,791 | 75,553 |
| 1902 ... ... | 39,517 | 57,255 |
| 1903 ... ... | 49,233 | 58,305 |
| 1904 ... ... | 71,616 | 78,309 |
| 1905 ... ... | 85,018 | 92,327 |
| 1906 ... ... | 95,831 | 94,187 |
| 1907 ... ... | 95,280 | 97,962 |
| 1908 ... ... | 95,624 | 89,875 |
| 1909 ... ... | 94,218 | 83,127 |
| 1910 ... ... | 89,278 | 80,074 |
| 1911 ... ... | 59,373 | 56,265 |
| 1912 ... ... | 56,636 | 53,868 |
| 1913 ... ... | 60,573 | 52,515 |
| 1914 ... ... | 56,570 | 45,641 |
| 1915 ... ... | 49,595 | 39,095 |
| 1916 ... ... | 47,330 | 31,734 |
| 1917 ... ... | 42,947 | 38,015 |
| 1918 ... ... | 39,329 | 33,523 |
| 1919 ... ... | 40,291 | 27,027 |
| 1920 ... ... | 46,494 | 28,450 |

| *Sand Treatment.* | Tons. |
|---|---|
| Up to 1902 ... ... ... | 29,255 |
| 1903 ... ... ... ... | 33,369 |
| 1904 ... ... ... ... | 42,559 |
| 1905 ... ... ... ... | 54,420 |
| 1906 ... ... ... ... | 60,422 |
| 1907 ... ... ... ... | 63,778 |
| 1908 ... ... ... ... | 62,081 |
| 1909 ... ... ... ... | 61,265 |
| 1910 ... ... ... ... | 43,915 |
| 1911 ... ... ... ... | 27,444 |

| *Sand Treatment*—continued. | Tons. |
|---|---|
| 1912 ... ... ... ... | 18,599 |
| 1913 ... ... ... ... | 18,300 |
| 1914 ... ... ... ... | 6,219 |

| *Tailing Treatment.* | |
|---|---|
| 1913 ... ... ... ... | 13,078 |
| 1914 ... ... ... ... | 32,723 |
| 1915 ... ... ... ... | 31,887 |
| 1916 ... ... ... ... | 34,725 |
| 1917 ... ... ... ... | 24,890 |
| 1918 ... ... ... ... | 24,364 |
| 1919 ... ... ... ... | 15,764 |
| 1920 ... ... ... ... | 15,437 |

| *Slime Treatment.* | |
|---|---|
| Up to 1904 ... ... ... | 691 |
| 1905 ... ... ... ... | 7,028 |
| 1906 ... ... ... ... | ... |
| 1907 ... ... ... ... | 8,220 |
| 1908 ... ... ... ... | 5,818 |
| 1909 ... ... ... ... | 16,848 |
| 1910 ... ... ... ... | 28,819 |
| 1911 ... ... ... ... | 20,821 |
| 1912 ... ... ... ... | 8,085 |
| 1913 ... ... ... ... | 6,089 |
| 1914 ... ... ... ... | 6,246 |
| 1915 ... ... ... ... | 3,454 |
| 1916 ... ... ... ... | 15,536 |
| 1917 ... ... ... ... | 13,086 |
| 1918 ... ... ... ... | 11,892 |
| 1919 ... ... ... ... | 12,780 |
| 1920 ... ... ... ... | 11,525 |

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## Schedule 3.

### *Sand and Tailing Treatment, 1920.*

| Battery. | Tons. | Yield. | Value. |
|---|---|---|---|
| | | Fine ozs. | £ |
| Bamboo Creek ... ... | 560 | 304·76 | 1,294·35 |
| Black Range ... ... | 1,420 | 668·14 | 2,837·60 |
| Boogardie ... ... ... | 3,815 | 805·93 | 3,426·13 |
| Coolgardie ... ... ... | 1,937 | 148·17 | 629·27 |
| Cue ... ... ... ... | 1,140 | 369·82 | 1,570·67 |
| Linden ... ... ... | 720 | 215·65 | 915·89 |
| Niagara ... ... ... | 774 | 114·24 | 485·31 |
| Norseman ... ... ... | 2,895 | 852·89 | 3,622·30 |
| Ora Banda ... ... ... | 1,236 | 184·51 | 783·69 |
| Payne's Find ... ... ... | 700 | 70·10 | 297·79 |
| 20-M. Sandy ... ... ... | ... | 21·53 | 91·45 |
| Youanme ... ... ... | 240 | 50 91 | 216·25 |
| | 15,437 | 3,806·65 | 16,170·70 |

### *Slime Treatment, 1920.*

| Battery. | Tons. | Yield. | Value. |
|---|---|---|---|
| | | Fine ozs. | £ |
| Wiluna ... ... ... | 11,525 | 3,951·76 | 16,782·76 |

## Schedule 4.

### *Sand and Tailing Treatment since Inception to 31st December, 1920.*

| Battery | Tons. | Yield. | Value. |
|---|---|---|---|
| | | Fine ozs. | £ |
| Bamboo Creek ... ... | 6,734·00 | 2,408·99 | 10,245·58 |
| Black Range ... ... | 45,278·00 | 12,917·47 | 54,586·06 |
| Boogardie ... ... ... | 48,787·00 | 12,865·18 | 54,059·11 |
| Burtville ... ... ... | 16,788·75 | 5,464·13 | 22,793·76 |
| Coolgardie ... ... ... | 54,869·00 | 8,574·93 | 36,101·40 |
| Cue ... ... ... ... | 1,140·00 | 369·82 | 1,570·67 |
| Laverton ... ... ... | 14,996·00 | 2,566·98 | 10,708·48 |
| Leonora ... ... ... | 37,139·50 | 9,056·71 | 37,699·89 |
| Linden ... ... ... | 16,157·00 | 5,437·08 | 23,113·73 |
| Meekatharra ... ... ... | 49,700·00 | 9,855·41 | 41,245·78 |
| Mt. Keith ... ... ... | 7,053·00 | 816·70 | 3,468·72 |
| Mt. Sir Samuel ... ... | 5,988·00 | 1,367·56 | 5,809·39 |
| Mulline ... ... ... | 44,794·50 | 12,261·27 | 49,863·24 |
| Mulwarrie ... ... ... | 23,809·25 | 4,675·53 | 19,220·11 |
| Niagara ... ... ... | 43,764·00 | 6,696·34 | 27,865·74 |
| Norseman ... ... ... | 43,234·50 | 96,47·49 | 40,222·67 |
| Ora Banda ... ... ... | 8,132·00 | 1,716·18 | 7,290·73 |
| Payne's Find ... ... | 13,627·00 | 1,608·24 | 6,831·71 |
| Quinn's ... ... ... | 7,486·00 | 686·56 | 2,916·43 |
| Sandy Creek ... ... ... | 11,496·25 | 3,512·53 | 14,639·07 |
| Siberia ... ... ... | 5,550·00 | 1,201·56 | 5,105·20 |
| Wiluna ... ... ... | 71,852·00 | 7,930·79 | 33,590·87 |
| Yarri ... ... ... ... | 44,180·00 | 4,197·75 | 17,567·84 |
| Youanme ... ... ... | 11,665·00 | 3,070·08 | 13,037·75 |
| Yerilla ... ... ... | 13,620·00 | 1,622·66 | 6,892·92 |
| Batteries closed ... ... | 121,351·50 | 23,451·89 | 97,001·46 |
| | 715,192·25 | 153,979·83 | 643,448·31 |

### *Residue Treatment from Inception to 31st December, 1920.*

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

### *Slime Treatment since Inception to 31st December, 1920.*

| Battery. | Tons. | Yield. | Value. |
|---|---|---|---|
| | | Fine ozs. | £ |
| Mulwarrie ... ... ... | 4,733·50 | 751·79 | 3,194·22 |
| Wilnua ... ... ... | 68,459·00 | 25,309·36 | 107,483·24 |
| Slime Plants closed ... | 111,196·25 | 25,088·87 | 102,110·62 |
| | 184,388·75 | 51,150·02 | 212,788·08 |

### *Tin Residue Treatment from Inception to 31st December, 1920.*

| | Tons. |
|---|---|
| Greenbushes, Bunbury End ... ... | 315 |
| Greenbushes, Salt Water Gully ... ... | 1,444 |
| | 1,759 |

## Schedule 5.

### *Return showing Number of Parcels treated and Tons crushed at State Batteries for Year 1920.*

| Number of Parcels crushed. | Battery. | Tons. | Yield by Amalgamation. Bullion. | Yield by Amalgamation. Fine Gold. | Gross Contents of Tailings. Fine Gold. | Total Contents of Ore. Fine Gold. | Average per ton. Fine Gold. | Gross Value of Ore per ton. |
|---|---|---|---|---|---|---|---|---|
| | | | ozs. | ozs. | ozs. | ozs. | dwt. grs. | £ s. d. |
| 13 | Bamboo Creek ... ... ... | 883·25 | 1,808·20 | 1,532·73 | 381·74 | 1,914·47 | 43 8 | 9 4 2 |
| 20 | Black Range ... ... ... | 1,255·00 | 765·50 | 648·88 | 485·79 | 1,134·67 | 18 2 | 3 16 10 |
| 69 | Boogardie ... ... ... ... | 2,575·75 | 1,206·30 | 1,022·52 | 649·60 | 1,672·12 | 12 23 | 2 15 1 |
| 77 | Coolgardie ... ... ... ... | 14,261·50 | 2,715·45 | 2,301·77 | 1,287·71 | 3,589·48 | 5 8 | 1 2 8 |
| 66 | Cue ... ... ... ... ... | 3,424·50 | 7,011·90 | 5,943·68 | 955·48 | 6,899·18 | 40 7 | 8 11 3 |
| 7 | Laverton ... ... ... ... | 269·25 | 236·50 | 200·47 | 71·54 | 272·01 | 20 5 | 4 5 11 |
| 17 | Leonora ... ... ... ... | 369·00 | 512·65 | 434·55 | 151·29 | 585·84 | 31 18 | 6 14 11 |
| 14 | Linden ... ... ... ... | 366·50 | 434·47 | 368·28 | 100·52 | 468·80 | 25 14 | 5 8 9 |
| 8 | Marble Bar ... ... ... ... | 407·00 | 348·75 | 295·62 | 110·01 | 405·63 | 19 22 | 4 4 8 |
| 18 | Meekatharra ... ... ... ... | 753·00 | 1,053·65 | 893·13 | 274·72 | 1,167·85 | 31 0 | 6 11 9 |
| 6 | Mt. Ida ... ... ... ... | 617·00 | 425·85 | 360·97 | 339·73 | 700·70 | 22 17 | 4 16 6 |
| 5 | Mt. Keith ... ... ... ... | 462·25 | 441·65 | 374·36 | 54·28 | 428·64 | 18 13 | 3 18 10 |
| 6 | Mt. Sir Samuel ... ... ... | 388·00 | 215·32 | 182·51 | 69·64 | 252·15 | 12 23 | 2 15 1 |
| 5 | Niagara ... ... ... ... | 196·50 | 234·50 | 198·77 | 56·72 | 255·49 | 26 0 | 5 10 6 |
| 43 | Norseman ... ... ... ... | 2,218·00 | 2,239·82 | 1,898·59 | 682·72 | 2,581·31 | 23 6 | 4 18 10 |
| 15 | Ora Banda ... ... ... ... | 2,216·75 | 332·06 | 281·47 | 107·32 | 388·79 | 3 12 | 0 14 11 |
| 32 | Payne's Find ... ... ... | 2,183·50 | 2,818·10 | 2,388·78 | 232·64 | 2,621·42 | 24 2 | 5 2 4 |
| 15 | Peak Hill ... ... ... ... | 925·00 | 742·10 | 629·04 | 248·36 | 877·40 | 18 23 | 4 0 7 |
| 1 | Quinn's ... ... ... ... | 54·00 | 13·25 | 11·23 | 6·03 | 17·26 | 6 9 | 1 7 1 |
| 14 | Warriedar ... ... ... ... | 1,164·00 | 342·20 | 290·00 | 398·02 | 688·02 | 11 19 | 2 10 1 |
| 15 | Wiluna ... ... ... ... ... | 792·25 | 599·47 | 508·14 | 341·75 | 849·89 | 21 10 | 4 11 0 |
| 10 | Yarri ... ... ... ... ... | 379·50 | 298·25 | 252·81 | 100·04 | 352·85 | 18 14 | 3 19 0 |
| 2 | Youanme ... ... ... ... | 501·00 | 133·85 | 113·45 | 70·13 | 183·58 | 7 8 | 1 11 2 |
| 478 | | 36,662·50 | 24,929·79 | 21,131·75 | 7,175·78 | 28,307·53 | 15 10 | 3 5 6 |
| 39 | Wiluna Lode ... ... | 10,731·75 | No amalgamation. | | 4,440·37 | 4,440·37 | 8 6 | 1 15 1 |
| 517 | | 47,394·25 | | | | | | |
| | Add tonnage not completed, 31st December, 1920 ... ... ... | 90·00 | | | | | | |
| | | 47,484·25 | | | | | | |
| | Less tonnage not completed, 31st December, 1919 ... ... | 990·00 | | | | | | |
| | | 46,494·25 | | | | | | |

### *Ore Dressing Plant—Coolgardie.*

| | |
|---|---|
| Tons Scheelite Ore Treated ... ... ... | 109¼ |
| Yield (Value at 22s. 6d. per unit) ... ... | £50 |
| Yield per ton ... ... ... ... ... | 9/2 |

### *Tin Ore Treatment.*

| No. of Parcels. | Battery. | Yards of Tin Ore treated. | Yield, Black Tin. | Average per yard. |
|---|---|---|---|---|
| | | | tons. | lbs. |
| 10 | Greenbushes ... ... ... ... | 737 | 3·25 | 9·8 |

## Schedule 6.

*Expenditure from Consolidated Revenue Vote and Loan Expenditure Funds on Erection of State Batteries for Year ending 31st December, 1920, and Totals since Inception.*

| Battery. | From Revenue. | From Loan. | Total. |
|---|---|---|---|
| | £ s. d. | £ s. d. | £ s. d. |
| Erection of Coolgardie Scheelite Plant ... ... | ... | 24 7 1 | 24 7 1 |
| Erection of State Battery, Cue | ... | 32 11 7 | 32 11 7 |
| Erection of Cue Railway Siding ... ... ... | ... | 120 16 2 | 120 16 2 |
| Erection of Tin-dressing Plant, Floyd's Gully ... ... | ... | 3,760 9 8 | 3,760 9 8 |
| Erection of Leaching Plant, Warriedar ... ... | ... | 853 10 2 | 853 10 2 |
| Erection of Leaching Plant, Cue ... ... ... | ... | 1,140 6 6 | 1,140 6 6 |
| St. Ives, Supply and Installation of 5-head Battery and Water Supply ... | ... | 431 13 6 | 431 13 6 |
| | ... | 6,363 14 8 | 6,363 14 8 |
| Erection of State Batteries—Expenditure to 31st December, 1907 ... ... | 91,981 1 8 | ... | ... |
| Loan Expenditure to 31st December, 1918 ... ... | ... | 286,232 10 11 | 378,213 12 7 |
| Totals ... ... | 91,981 1 8 | 292,596 5 7 | 384,577 7 3 |

## Schedule 7.

*Direct Purchase of Tailings, 1920.*

| Battery. | Tons. | Amount |
|---|---|---|
| | | £ s. d. |
| Bamboo Creek ... ... ... ... | 415 | 533 5 3 |
| Black Range ... ... ... ... | 1,219½ | 1,746 14 10 |
| Boogardie ... ... ... ... | 1,494 | 1,271 17 11 |
| Coolgardie ... ... ... ... | 510½ | 298 13 10 |
| Cue ... ... ... ... | 2,134½ | 2,092 1 5 |
| Laverton ... ... ... ... | 129½ | 142 3 6 |
| Leonora ... ... ... ... | 210½ | 250 8 4 |
| Linden ... ... ... ... | 320 | 240 2 6 |
| Meekatharra... ... ... ... | 408 | 419 19 4 |
| Mt. Keith ... ... ... ... | 195½ | 13 15 8 |
| Mt. Sir Samuel ... ... ... | 207¾ | 60 14 3 |
| Mulline ... ... ... ... | ... | 4 18 6 |
| Mulwarrie ... ... ... ... | ... | 6 6 11 |
| Mt. Egerton... ... ... ... | ... | 7 12 3 |
| Niagara ... ... ... ... | ... | 22 9 6 |
| Norseman ... ... ... ... | 1,668½ | 1,465 8 8 |
| Ora Banda ... ... ... ... | 32½ | 51 4 8 |
| Payne's Find ... ... ... | 553½ | 98 5 10 |
| Pig Well ... ... ... ... | ... | 1 16 10 |
| Siberia ... ... ... ... | 33¾ | 6 11 1 |
| Warriedar ... ... ... ... | 937 | 934 19 5 |
| Wiluna ... ... ... ... | 411½ | 848 13 8 |
| Wiluna (Lode) ... ... ... | 10,837¾ | 10,011 8 11 |
| Yarri ... ... ... ... | 317 | 246 15 11 |
| Youanme ... ... ... ... | 400¾ | 43 5 0 |
| | 22,436½ | 20,877 14 0 |

## Schedule 7a.

*Return showing Tailing payable and unpayable and Gross Contents, 1920.*

| Battery. | Tailing payable. | | Tailing Unpayable. | | Totals. | |
|---|---|---|---|---|---|---|
| | Tons. | Gross Contents. | Tons. | Gross Contents. | Tons. | Gross Contents. |
| | | ozs. dwts. grs. | | ozs. dwts. grs. | | ozs. dwts. grs. |
| Bamboo Creek ... ... ... ... ... ... | 611½ | 367 18 10 | 94 | 13 16 1 | 705½ | 381 14 11 |
| Black Range ... ... ... ... ... ... | 821½ | 484 13 19 | 12 | 1 2 0 | 833½ | 485 15 19 |
| Boogardie ... ... ... ... ... ... | 1,542½ | 577 7 15 | 598 | 72 4 12 | 2,140½ | 649 12 3 |
| Coolgardie ... ... ... ... ... ... | 578¼ | 179 0 7 | 11,386¾ | 1,108 13 22 | 11,965 | 1,287 14 5 |
| Cue ... ... ... ... ... ... ... | 2,095 | 911 19 9 | 569¼ | 43 10 6 | 2,664¼ | 955 9 15 |
| Laverton... ... ... ... ... ... | 143½ | 57 18 16 | 81 | 13 12 4 | 224½ | 71 10 20 |
| Leonora ... ... ... ... ... ... | 265¼ | 147 10 9 | 45¼ | 3 15 14 | 310¼ | 151 5 23 |
| Linden ... ... ... ... ... ... | 305 | 100 10 10 | ... | ... | 305 | 100 10 10 |
| Marble Bar ... ... ... ... ... ... | 341½ | 109 5 4 | 7½ | 0 15 0 | 348½ | 110 0 4 |
| Meekatharra ... ... ... ... ... ... | 509½ | 272 10 9 | 96 | 2 4 0 | 605½ | 274 14 9 |
| Mt. Ida ... ... ... ... ... ... | 392 | 327 10 10 | 101½ | 12 4 6 | 493½ | 339 14 16 |
| Mt. Keith ... ... ... ... ... ... | 8½ | 2 4 15 | 380 | 52 1 3 | 388½ | 54 5 18 |
| Mt. Sir Samuel ... ... ... ... ... | 255 | 59 13 12 | 72½ | 9 19 9 | 327½ | 69 12 21 |
| Niagara ... ... ... ... ... ... | 167 | 56 14 11 | ... | ... | 167 | 56 14 11 |
| Norseman ... ... ... ... ... ... | 1,617½ | 651 9 8 | 287½ | 31 5 4 | 1,905 | 682 14 12 |
| Ora Banda ... ... ... ... ... ... | 32½ | 12 2 2 | 1,741¼ | 95 4 9 | 1,773½ | 107 6 11 |
| Paynes Find ... ... ... ... ... ... | 548½ | 101 13 3 | 1,199 | 130 19 17 | 1,747½ | 232 12 20 |
| Peak Hill ... ... ... ... ... ... | 424½ | 228 0 11 | 314½ | 20 6 19 | 739 | 248 7 6 |
| Quinn's ... ... ... ... ... ... | ... | ... | 42 | 6 0 18 | 42 | 6 0 18 |
| Warriedar ... ... ... ... ... ... | 937½ | 395 10 5 | 16¾ | 2 10 6 | 954¼ | 398 0 11 |
| Wiluna ... ... ... ... ... ... | 644½ | 339 14 0 | 20½ | 2 1 0 | 665 | 341 15 0 |
| Yarri ... ... ... ... ... ... | 311 | 98 16 20 | 8½ | 1 4 2 | 319½ | 100 0 22 |
| Youanme ... ... ... ... ... ... | 400¾ | 70 2 15 | ... | ... | 400¾ | 70 2 15 |
| | 12,951½ | 5,552 6 4 | 17,073¾ | 1,623 10 8 | 30,025¼ | 7,175 16 12 |
| Wiluna (Lode) ... ... ... ... ... | 10,731¾ | 4,440 7 13 | No amalgamation. | | 10,731¾ | 4,440 7 13 |
| | 23,683¼ | 9,992 13 17 | 17,073¾ | 1,623 10 8 | 40,757 | 11,616 4 1 |

## Schedule 8.

*Statement of Receipts and Expenditure for Year ending 31st December, 1920.*

MILLING AND TIN.

| Plant. | Tonnage. | Management. | Wages. | Stores. | Total Working Expenditure. | Cost per ton | Repairs and Renewals. | Sundries. | Gross Expenditure. | Cost per ton. | Receipts. | Per ton. | Profit. | Loss. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | £ s. d. | £ s. d. | £ s. d. | £ s. d. | s. d. | £ s. d. | £ s. d. | £ s. d. | s. d. | £ s. d. | s. d. | £ s. d. | £ s. d. |
| Bamboo Creek ... ... ... | 868½ | 138 17 10 | 372 7 9 | 281 14 8 | 793 0 3 | 18 3·12 | 64 1 2 | 101 11 2 | 958 12 7 | 22 0·96 | 544 19 8 | 12 6·48 | ... | 413 12 11 |
| Black Range ... ... ... | 1,255 | 212 0 0 | 326 10 8 | 392 8 6 | 930 19 2 | 14 10·03 | 361 13 5 | 178 14 6 | 1,471 7 1 | 23 5·37 | 599 14 6 | 9 6·69 | ... | 871 12 7 |
| Boogardie ... ... ... ... | 2,575½ | 202 10 0 | 793 9 0 | 650 19 10 | 1,646 18 10 | 12 9·45 | 286 17 5 | 187 2 1 | 2,120 18 4 | 16 5·61 | 1,204 9 6 | 9 4·22 | ... | 916 8 10 |
| Burtville ... ... ... ... | ... | ... | ... | 10 7 1 | 10 7 1 | ... | ... | 47 4 9 | 57 11 10 | ... | 27 0 0 | ... | ... | 30 11 10 |
| Coolgardie ... ... ... ... | 13,532½ | 396 4 10 | 1,070 11 9 | 2,286 12 10 | 3,753 9 5 | 5 6·55 | 169 16 11 | 764 4 1 | 4,687 10 5 | 6 11·11 | 4,098 14 7 | 6 0·67 | ... | 588 15 10 |
| Cue ... ... ... ... | 3,424½ | 318 0 0 | 992 9 9 | 877 2 7 | 2,187 12 4 | 12 9·31 | 87 7 8 | 386 13 7 | 2,661 13 7 | 15 6·52 | 1,732 11 6 | 10 1·41 | ... | 929 2 1 |
| Darlot ... ... ... ... | ... 16 11 5 | 68 11 5 | 38 13 11 | 123 16 9 | ... | ... | 43 8 0 | 167 4 9 | ... | 6 6 0 | ... | ... | 160 18 9 |
| Laverton ... ... ... ... | 269½ | 122 7 4 | 107 7 3 | 97 3 11 | 326 18 6 | 24 3·40 | 17 7 1 | 30 11 6 | 374 17 1 | 27 10·12 | 144 9 9 | 10 8·78 | ... | 230 7 4 |
| Leonora ... ... ... ... | 369 | 60 0 0 | 120 16 11 | 163 10 5 | 344 7 4 | 18 7·96 | 30 16 3 | 55 16 3 | 430 19 10 | 23 4·32 | 186 0 0 | 10 0·96 | ... | 244 19 10 |
| Linden ... ... ... ... | 366½ | 60 10 0 | 72 2 8 | 118 18 4 | 251 11 0 | 13 8·71 | 83 3 2 | 78 17 1 | 413 11 3 | 22 6·81 | 188 9 5 | 10 3·40 | ... | 225 1 10 |
| Marble Bar ... ... ... | 407 | 194 8 10 | 142 4 7 | 213 9 11 | 550 3 4 | 27 0·40 | 24 8 10 | 94 1 8 | 668 13 10 | 32 10·32 | 258 4 0 | 12 8·25 | ... | 410 9 10 |
| Meekatharra ... ... ... | 753 | 73 3 10 | 121 16 0 | 166 3 4 | 361 3 2 | 9 7·10 | 53 5 2 | 95 17 3 | 510 5 7 | 13 6·62 | 296 17 0 | 7 10·60 | ... | 213 8 7 |
| Mt. Egerton ... ... ... | ... 6 0 0 | ... | 34 1 7 | 40 1 7 | ... | ... | 0 16 8 | 8 2 11 | 49 1 2 | ... | ... | ... | ... | 49 1 2 |
| Mt. Ida ... ... ... ... | 617 | 140 5 4 | 188 18 0 | 65 18 11 | 395 2 3 | 12 9·67 | 3 4 0 | 48 17 2 | 447 3 5 | 14 5·92 | 300 14 6 | 9 8·97 | ... | 146 8 11 |
| Mt. Keith ... ... ... ... | 492½ | 60 0 0 | 230 2 8 | 215 5 9 | 505 8 5 | 20 6·40 | 152 12 10 | 134 9 0 | 792 10 3 | 32 2·37 | 277 9 3 | 11 3·26 | ... | 515 1 0 |
| Mt. Sir Samuel ... ... ... | 388 | 131 0 0 | 189 1 7 | 122 9 10 | 442 11 5 | 22 9·74 | 74 11 4 | 117 12 6 | 634 15 3 | 32 8·64 | 204 0 0 | 10 6·19 | ... | 430 15 3 |
| Mulline ... ... ... ... | ... 25 14 3 | 89 11 6 | 3 14 2 | 118 19 11 | ... | ... | 10 9 9 | 129 9 8 | ... | 13 16 7 | ... | ... | 115 13 1 |
| Mulwarrie ... ... ... ... | ... ... | 41 13 4 | 3 14 11 | 45 8 3 | ... | ... | 5 3 2 | 50 11 5 | ... | ... | ... | ... | 50 11 5 |
| Niagara ... ... ... ... | 196½ | 156 4 4 | 78 13 9 | 0 17 6 | 235 15 7 | 24 0·00 | 24 9 4 | 38 18 7 | 299 3 6 | 30 5·40 | 100 15 0 | 10 3·04 | ... | 198 8 6 |
| Norseman ... ... ... | 2,278 | 180 8 4 | 614 11 9 | 477 13 11 | 1,272 14 0 | 11 2·06 | 57 1 5 | 171 6 2 | 1,501 1 7 | 13 2·13 | 1,056 10 3 | 9 3·31 | ... | 444 11 4 |
| Ora Banda ... ... ... | 2,216½ | 224 7 1 | 290 4 10 | 324 11 7 | 839 3 6 | 7 6·84 | 74 12 9 | 187 13 5 | 1,101 9 8 | 9 11·23 | 505 10 1 | 4 6·72 | ... | 595 19 7 |
| Paynes Find ... ... ... | 2,183½ | 215 0 0 | 669 11 3 | 443 9 2 | 1,328 0 5 | 12 1·96 | 97 5 8 | 229 19 5 | 1,655 5 6 | 15 1·92 | 1,146 7 0 | 10 6·00 | ... | 508 18 6 |
| Pinjin ... ... ... ... | ... ... | ... | 12 11 10 | 12 11 10 | ... | ... | ... | 12 11 10 | ... | ... | ... | ... | 12 11 10 |
| Peak Hill ... ... ... ... | 925 | 354 0 0 | 278 2 10 | 418 19 6 | 1,051 2 4 | 22 8·71 | 74 13 5 | 111 1 4 | 1,236 17 1 | 26 8·90 | 479 10 9 | 10 4·41 | ... | 757 6 4 |
| Quinn's ... ... ... ... | 54 | ... | 28 5 4 | 14 17 10 | 43 3 2 | 7 11·99 | 15 16 0 | 6 2 8 | 65 1 10 | 24 1·29 | 45 9 8 | 16 10·12 | ... | 19 12 2 |
| 20-Mile Sandy ... ... ... | ... 77 0 0 | 34 0 0 | 64 10 9 | 175 10 9 | ... | ... | 3 13 6 | 179 4 3 | ... | ... | ... | ... | 179 4 3 |
| Siberia ... ... ... ... | ... ... | ... | 0 3 11 | 0 3 11 | ... | ... | 2 13 8 | 2 17 7 | ... | ... | ... | ... | 2 17 7 |
| Tuckablanna ... ... ... | ... ... | ... | 0 5 0 | 0 5 0 | ... | ... | ... | 0 5 0 | ... | 12 10 0 | ... | 12 5 0 | ... |
| Tuckanarra ... ... ... | ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 9 1 3 | ... | 9 1 3 | ... |
| Warriedar ... ... ... ... | 1,164 | 95 0 0 | 292 12 6 | 248 16 2 | 636 8 8 | 10 11·20 | 3 17 0 | 125 8 0 | 765 13 8 | 13 1·87 | 525 13 1 | 9 0·38 | ... | 240 0 7 |
| Wiluna ... ... ... ... | 792½ | 21 0 0 | 119 16 7 | 91 8 4 | 232 4 11 | 5 10·34 | 43 0 0 | 47 15 0 | 322 19 11 | 8 1·82 | 345 4 4 | 8 8·56 | 22 4 5 | ... |
| Yarri ... ... ... ... | 379½ | 40 0 0 | 125 5 8 | 110 0 3 | 275 5 11 | 14 6·09 | 283 16 5 | 94 12 8 | 653 15 0 | 34 5·42 | 199 4 9 | 10 6·00 | ... | 454 10 3 |
| Yerilla ... ... ... ... | ... ... | ... | ... | ... | ... | ... | ... | 0 17 4 | 0 17 4 | ... | ... | ... | 0 17 4 |
| Youanme ... ... ... ... | 501 | 35 0 0 | 161 5 7 | 88 12 7 | 284 18 2 | 11 4·48 | 90 12 4 | 77 7 11 | 452 18 5 | 18 0·96 | 236 7 3 | 9 5·23 | ... | 216 11 2 |
| Menzies ... ... ... ... | ... ... | ... | 65 13 2 | 65 13 2 | ... | ... | 13 13 2 | 79 6 4 | ... | ... | ... | ... | 79 6 4 |
| Mt. Jackson ... ... ... | ... ... | ... | 19 3 6 | 19 3 6 | ... | ... | ... | 19 3 6 | ... | ... | ... | ... | 19 3 6 |
| Wodgina ... ... ... ... | ... ... | ... | 46 8 7 | 46 8 7 | ... | ... | ... | 46 8 7 | ... | ... | ... | ... | 46 8 7 |
| Marble Bar Sales ... ... | ... ... | ... | 4 5 0 | 4 5 0 | ... | ... | ... | 4 5 0 | ... | 65 19 8 | ... | 61 14 8 | ... |
| Tuckabianna Sales ... ... | ... ... | ... | 217 0 6 | 217 0 6 | ... | ... | ... | 217 0 6 | ... | 212 3 5 | ... | ... | 4 17 1 |
| | 36,008½ | 3,555 13 5 | 7,620 4 11 | 8,391 19 7 | 19,567 17 11 | 10 10·34 | 2,175 6 3 | 3,499 19 3 | 25,243 3 5 | 14 0·14 | 15,024 2 9 | 8 4·08 | 105 5 4 | 10,324 6 0 |
| Wiluna Lode ... ... ... | 10,485½ | 201 10 0 | 1,388 1 7 | 696 5 5 | 2,285 17 0 | 4 4·29 | 900 10 9 | 733 14 4 | 3,920 2 1 | 7 4·80 | 3,484 16 7 | 6 7·75 | ... | 435 5 6 |
| Coolgardie Ore Dressing ... | 109½ | 2 10 0 | 50 19 11 | 50 7 3 | 103 17 2 | 19 0·14 | 7 1 8 | 3 3 0 | 114 1 10 | 20 10·63 | 80 15 5 | 14 9·43 | ... | 33 6 5 |
| TIN PLANTS. | | | | | | | | | | | | | | |
| Greenbushes ... ... ... | 737 | 84 19 8 | 47 13 0 | 29 10 0 | 162 2 8 | 4 4·79 | ... | 10 18 3 | 173 0 11 | 4 8·35 | 138 3 10 | 3 9·00 | ... | 34 17 1 |
| do. Bunbury End ... | ... | 33 12 7 | ... | 48 5 4 | 81 17 11 | ... | ... | ... | 81 17 11 | ... | 146 7 7 | ... | 64 9 8 | ... |
| do. Salt Water Gully ... | ... | 33 12 7 | ... | 41 9 8 | 75 2 3 | ... | ... | ... | 75 2 3 | ... | 57 6 2 | ... | ... | 17 16 1 |
| Wiluna Working Account, 1919 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1,700 0 0 | ... | 1,700 0 0 | ... |
| | 47,340½ | 3,911 18 3 | 9,106 18 10 | 9,257 17 3 | 22,276 14 11 | 9 4·87 | 3,082 18 8 | 4,247 14 10 | 29,607 8 5 | 12 6·02 | 20,631 12 4 | 8 8·54 | 1,869 15 0 | 10,845 11 1 |

## Schedule 9.

*Statement of Receipts and Expenditure for Year ending 31st December, 1920.*

TAILING AND SLIME TREATMENT.

| Plant. | Tonnage. | Management. | Wages. | Assays. | Stores. | Total Working Expenditure. | Cost per ton. | Repairs and Renewals. | Sundries. | Gross Expenditure. | Cost per ton. | Receipts. | Per ton. | Profit. | Loss. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | £ s. d. | £ s. d. | £ s. d. | £ s. d. | £ s. d. | s. d. | £ s. d. | £ s. d. | £ s. d. | s. d. | £ s. d. | s. d. | £ s. d. | £ s. d. |
| Bamboo Creek ... | 560 | 66 13 4 | 95 19 6 | 15 14 6 | 112 2 0 | 290 9 4 | 10 4·46 | 14 14 1 | 58 16 6 | 363 19 11 | 13 0·00 | 1,714 2 10 | 6 1·46 | 1,350 2 11 | ... |
| Black Range ... | 1,420 | 103 0 0 | 268 4 8 | 38 7 0 | 261 13 4 | 671 5 0 | 9 5·44 | 11 12 3 | 82 7 5 | 765 4 8 | 10 9·33 | 1,302 11 1 | 18 4·15 | 537 6 5 | ... |
| Boogardie ... ... | 3,815 | 157 10 0 | 636 10 3 | 57 1 11 | 413 6 9 | 1,264 8 11 | 6 7·53 | 63 1 4 | 221 15 6 | 1,549 5 9 | 8 1·46 | 1,968 18 1 | 10 3·86 | 419 12 4 | ... |
| Coolgardie ... ... | 1,937 | 29 0 0 | 403 7 1 | 33 15 9 | 227 0 8 | 693 3 6 | 7 1·87 | 94 10 3 | 89 7 6 | 877 1 3 | 9 0·64 | 737 5 7 | 7 7·34 | ... | 139 15 8 |
| Cue ... ... ... | 1,140 | 15 0 0 | 171 12 6 | 4 15 7 | 117 8 4 | 308 16 5 | 5 5·01 | ... | 48 18 1 | 357 14 6 | 6 3·28 | 1,006 1 2 | 17 7·80 | 648 6 8 | ... |
| Leonora ... ... | ... | ... | ... | ... | 1 19 4 | 1 19 4 | ... | ... | 4 5 0 | 6 4 4 | ... | 80 10 5 | ... | 74 6 1 | ... |
| Linden ... ... | 720 | 35 0 0 | 132 14 2 | 48 15 8 | 132 3 7 | 348 13 5 | 9 8·20 | 54 16 4 | 48 7 0 | 451 16 9 | 12 6·60 | 547 18 9 | 15 2·64 | 96 2 0 | ... |
| Mt. Keith ... ... | ... | ... | 10 0 0 | ... | 0 14 8 | 10 14 8 | ... | ... | ... | 10 14 8 | ... | Dr. B. 10 10 11 | ... | ... | 21 5 7 |
| Mulline ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 16 11 | 1 16 11 | ... | ... | ... | ... | 1 16 11 |
| Niagara ... ... | 774 | 35 0 0 | 111 11 8 | 9 19 11 | 105 9 7 | 262 1 2 | 6 9·24 | 34 13 11 | 39 17 4 | 336 12 5 | 8 8·37 | 218 3 6 | 5 7·63 | ... | 118 8 11 |
| Norseman ... ... | 2,895 | 87 10 3 | 328 10 6 | 42 15 6 | 409 11 1 | 868 7 4 | 5 11·97 | 42 14 11 | 158 9 8 | 1,039 13 10 | 7 2·18 | 1,620 12 2 | 11 2·32 | 580 18 4 | ... |
| Ora Banda ... ... | 1,236 | 167 0 0 | 213 19 0 | 21 15 10 | 76 14 4 | 679 9 2 | 10 9·98 | 27 8 4 | 70 7 2 | 777 4 8 | 12 4·96 | 572 3 7 | 9 3·09 | ... | 205 1 1 |
| Paynes Find ... | 700 | 45 0 0 | 91 5 0 | 15 3 2 | 136 3 7 | 287 11 9 | 8 2·59 | 35 9 10 | 29 3 7 | 352 5 2 | 10 0·76 | 239 5 5 | 6 10·03 | ... | 112 19 9 |
| 20-M. Sandy ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 91 9 0 | ... | 91 9 0 | ... |
| Warriedar ... ... | ... | 5 0 0 | ... | 2 5 0 | ... | 7 5 0 | ... | ... | ... | 7 5 0 | ... | ... | ... | ... | 7 5 0 |
| Youanme ... ... | 240 | 10 0 0 | 23 1 4 | 11 6 3 | 21 14 11 | 66 2 6 | 5 6·12 | ... | 15 5 6 | 81 8 0 | 6 9·38 | 191 18 7 | 15 11·92 | 110 10 7 | ... |
| Laverton ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 11 15 7 | ... | 11 15 7 | ... |
| Mulwarrie ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 7 2 11 | ... | 7 2 11 | ... |
| Yarri ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 4 8 0 | ... | 4 8 0 | ... |
| | 15,437 | 755 13 7 | 2,486 15 8 | 301 16 1 | 2,216 2 2 | 5,760 7 6 | 7 5·54 | 379 1 3 | 868 17 2 | 6,978 7 10 | 9 0·49 | 10,303 15 9 | 13 4·17 | 3,932 0 10 | 606 12 11 |
| Wiluna Slimes ... | 11,525 | 222 10 0 | 2,013 15 10 | 268 18 2 | 1,671 15 5 | 4,176 19 5 | 7 2·97 | 747 15 6 | 803 7 1 | 5,728 2 0 | 9 11·28 | 5,015 10 6 | 8 8 40 | ... | 712 11 6 |
| | 26,962 | 978 3 7 | 4,500 11 6 | 570 14 3 | 3,887 17 7 | 9,937 6 11 | 7 4·44 | 1,126 16 9 | 1,672 4 3 | 12,706 9 10 | 9 5·08 | 15,319 6 3 | 11 4·32 | 3,932 0 10 | 1,319 4 5 |

# STATE BATTERIES.

## SCHEDULE 10.

*Balance-Sheet.*

| | £ s. d. | £ s. d. | | £ s. d. | £ s. d. |
|---|---|---|---|---|---|
| To Capital Expenditure:— | | | By Batteries, Tailing, and Slimes Plants ... | 384,577 7 3 | |
| From General Loan Fund ... ... ... | 292,596 5 7 | | Less Depreciation ... | 305,285 17 10 | |
| From Consolidated Revenue ... ... | 91,981 1 8 | | | | 79,291 9 5 |
| | | 384,577 7 3 | By Stores ... ... ... ... | | 16,455 11 1 |
| To Treasury ... ... ... | | 115,075 15 1 | By Sundry Debtors ... ... | | 9,789 11 4 |
| To Interest and Sinking Fund ... | | 270,797 0 10 | By Profit and Loss Account ... | | 667,873 5 1 |
| To Sundry Creditors ... ... | | 2,959 13 9 | | | |
| | | £773,409 16 11 | | | £773,409 16 11 |

*Profit and Loss Account.*

| | £ s. d. | £ s. d. | | £ s. d. | £ s. d. |
|---|---|---|---|---|---|
| To Expenditure— | | | By Revenue ... ... | 1,160,164 5 3 | |
| Head Office and all Batteries ... ... | 1,251,954 11 8 | | By Loss on Working carried down ... ... | 91,790 6 5 | |
| To Loss on Working brought down ... | 91,790 6 5 | | | | 1,251,954 11 8 |
| To Interest at 3½ per cent. and Sinking Fund at 1¼ per cent. on Capital Expenditure | 270,797 0 10 | | | | |
| To Depreciation ... ... ... ... | 305,285 17 10 | | | | |
| | £667,873 5 1 | | By Gross Loss ... ... | | £667,873 5 1 |

## SCHEDULE 11.

*Working Profit and Loss for year ending 31st December, 1920.*

| | £ s. d. | | £ s. d. |
|---|---|---|---|
| To Working Expenditure— | | By Revenue— | |
| Batteries and Tin Plants ... ... | 29,607 8 5 | Batteries and Tin Plants ... ... | 20,631 12 4 |
| Tailing and Slime Plants ... ... | 12,706 9 10 | Tailing and Slime Treatment ... | 15,319 6 3 |
| | | By Loss on Year's operations ... ... | 6,362 19 8 |
| | £42,313 18 3 | | £42,313 18 3 |

## SCHEDULE 12.

*State Battery Statistics from Inception to 31st December, 1920.*

| Year. | Milling. | | | | Sand and Tailing Treatment. | | | | Slime Treatment. | | | | Tin Treatment. | | | | Gross Loss. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Tons. | Expenditure per ton. | Revenue per ton. | Loss. | Tons. | Expenditure per ton. | Revenue per ton. | Profit. | Tons. | Expenditure per ton. | Revenue per ton. | Loss. | Tons. | Expenditure per ton. | Revenue per ton. | Loss. | ‡ |
| | | s. d. | s. d. | £ | | s. d. | s. d. | £ | | s. d. | s. d. | £ | | s. d. | s. d. | £ | £ |
| 1899 ... | 18,806 | ... | ... | 2,827 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2,827 |
| 1900 ... | 22,675 | 22 10·1 | 17 4·5 | 7,611 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 7,611 |
| 1901 ... | 26,775 | 18 0·0 | 16 6·0 | 1,983 | 9,534 | 16 9 | ... | 1,337 | ... | ... | ... | ... | ... | ... | ... | ... | 646 |
| 1902 ... | 39,516 | 14 8·6 | 14 8·2 | 169 | 9,721 | 22 3 | ... | 724 | ... | ... | ... | ... | 1,170 | 12 2 | ... | 286 | †269 |
| 1903 ... | 49,233 | 13 6·8 | 12 10·6 | 1,250 | 33,369 | 7 7 | ... | 1,442 | ... | ... | ... | ... | 2,009 | 8 2 | ... | 153 | †2,539 |
| 1904 ... | 71,616 | 14 4·4 | 12 6·5 | 6,423 | 43,251 | 7 10 | ... | 1,448 | ... | ... | ... | ... | 2,337 | 8 2 | ... | 165 | 5,141 |
| 1905 ... | 85,018 | 12 4·0 | 12 2·5 | 957 | 54,420 | 7 3 | 9 8·5 | 6,689 | 7,028 | 12 1 | ... | 410 | 3,697 | 5 8 | 5 0·3 | 324 | †3,342 |
| 1906 ... | 95,831 | 12 2·0 | 11 3·8 | 4,076 | 65,159 | 7 4 | 9 2·1 | 5,549 | 4,737 | 11 8 | 12 1·1 | †2,254 | 11,428 | 4 2 | 4 3·3 | †156 | †2,880 |
| 1907 ... | 95,280 | 12 6·0 | 11 4·8 | 8,724 | 64,514 | 6 8·7 | 9 2·8 | 6,474 | 8,220 | 8 7·6 | 13 5·5 | †1,983 | 10,496 | 4 4·4 | 4 8·8 | †191 | 1,688 |
| 1908 ... | 95,628 | 12 1·9 | 9 3·6 | 13,669 | 62,272 | 6 4·7 | 8 11·0 | 8,017 | 5,818 | 12 0·9 | 11 8·0 | 120 | 5,573 | 4 5·2 | 3 6·3 | 254 | 7,278 |
| 1909 ... | 94,218 | 11 1·7 | 9 6·6 | 7,568 | 61,032 | 6 5·8 | 8 9·7 | 7,096 | 16,848 | 10 0·7 | 9 6·7 | 423 | 5,043 | 4 8·2 | 3 7·5 | 267 | 1,965 |
| 1910 ... | 89,278 | 11 3·3 | 9 6·6 | 7,709 | 43,391 | 6 2·9 | 8 6·1 | 4,903 | 28,600 | 8 9·1 | 9 11·5 | †1,723 | 3,769 | 5 5·5 | 3 4·1 | 401 | 2,365 |
| 1911 ... | 59,373 | 12 6·9 | 9 10·3 | 8,058 | 27,362 | 6 5·9 | 8 9·7 | 3,173 | 28,183 | 10 10·5 | 9 5·3 | 1,666 | 6,061 | 4 0·3 | 3 4·9 | 188 | 7,490 |
| 1912 ... | 56,636 | 12 9·2 | 9 8·7 | 8,616 | 18,600 | 8 3·5 | 8 8·6 | 397 | 8,085 | 11 8·6 | 10 5·2 | 519 | 5,330 | 4 5·1 | 3 7·6 | 210 | 9,786 |
| 1913 ... | 60,573 | 12 5·6 | 9 5·4 | 9,155 | 31,378* | 7 5·0 | 9 5·2 | 3,160 | 6,089 | 12 4·1 | 9 6·1 | 862 | 8,032 | 5 5·1 | 4 1·7 | 513 | 7,711 |
| 1914 ... | 56,570 | 12 6·8 | 9 2·9 | 9,413 | 38,942 | 6 6·5 | 8 2·2 | 3,202 | 6,246 | 10 10·2 | 9 0·0 | 578 | 3,340 | 7 10·6 | 4 6·6 | 557 | 7,418 |
| 1915 ... | 49,595 | 11 10·7 | 9 2·6 | 6,642 | 31,887 | 6 9·3 | 8 0·6 | 2,041 | 3,454 | 12 6·2 | 9 10·1 | 462 | 1,767 | 8 1·2 | 3 11·7 | 364 | 5,415 |
| 1916 ... | 47,304 | 12 6·7 | 9 1·9 | 8,018 | 35,665 | 7 1·7 | 8 7·3 | 2,510 | 15,536 | 8 8·2 | 8 7·3 | 56 | 943 | 11 11·6 | 4 0·3 | 374 | 5,982 |
| 1917 ... | 42,947 | 12 1·5 | 9 0·0 | 6,714 | 24,674 | 8 3·3 | 8 10·3 | 727 | 15,408 | 9 8·5 | 8 3·1 | 1,104 | 1,118 | 11 2·9 | 3 8·2 | 422 | 7,554 |
| 1918 ... | 39,330 | 13 2·9 | 8 11·4 | 8,442 | 24,364 | 8 3·7 | 9 5·7 | 1,420 | 11,892 | 9 4·8 | 7 9·0 | 982 | 5,985 | 4 10·2 | 3 0·2 | 558 | 8,650 |
| 1919 ... | 40,290¾ | 12 4·1 | 8 2·0 | 8,426 | 15,764 | 9 2·4 | 9 3·8 | 91 | 12,780 | 9 1·1 | 7 4·6 | 1,089 | 1,204 | 10 0·9 | 3 11·2 | 369 | ‡9,925 |
| 1920 ... | 46,494¼ | 12 6·4 | 7 11·5 | 8,954 | 15,437 | 9 0·4 | 13 4·1 | 3,325 | 11,525 | 9 11·2 | 8 8·4 | 713 | 737 | 8 11·2 | 9 3·5 | †12 | ‡6,363 |

* Tailing Treatment commenced 1913. † Profit. ‡ Details of Ore dressing and Residue Treatment not shown, but financial result included in the figure of this column.

DIVISION IV.

# ANNUAL PROGRESS REPORT

OF THE

# GEOLOGICAL SURVEY

FOR THE

# YEAR 1920,

WITH

A Map of Western Australia showing the 4 Miles to the Inch Series of Geological Sketch Maps and other Geological Maps issued since 1896.

## TABLE OF CONTENTS.



Map of Western Australia, showing the four miles to the inch series of Geological Sketch Maps and other Geological Maps issued since 1896.

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

# MAP OF WESTERN AUSTRALIA.

Showing 4 Miles to 1 Inch Series of Geological Sketch Maps
& other Geological Maps issued since 1916

BASED ON THE WORK OF THE GEOLOGICAL SURVEY.

A. GIBB MAITLAND,
GOVERNMENT GEOLOGIST.

1920.

Scale of English statute miles.
50 40 30 20 10 0 50 100 150 200

LEGEND.

Standard 4 Miles to 1 Inch, Published.....
,, ,, ,, Surveys completed, printing authorised, small scale map published.....
,, ,, ,, Surveys completed.....
,, ,, ,, ,, ,, small scale map published.....
Surveys in hand but incomplete.....
District maps published on various scales.....
Maps of individual Centres on various scales... (See list on margin)..... 30

Longitude 121° East of Greenwich.

By Authority: FRED. WM. SIMPSON, Government Printer, Perth.

## Geological Maps of Individual Centres.

| Map. | ANNUAL REPORT. Year. | Plate. | Scale. | BULLETIN. No. | Plate. | Scale. |
|---|---|---|---|---|---|---|
| 3. Coolgardie | 1897 | VII. | 20 chains per inch | 3 | II. | 40 chains per inch |
| 4. Northampton | ,, | I. | 40 ,, ,, | 9 | .... | 40 ,, ,, |
| 5. Peak Hill | ,, | II. | 4 ,, ,, | | | |
| 6. Horseshoe | ,, | III. | 10 ,, ,, | | | |
| 7. Bunbury | ,, | IV. | 8 ,, ,, | | | |
| 8. Kanowna | ,, | VI. | 20 ,, ,, | | | |
| 9. Collie Coal Field | 1898 | I. | 80 ,, ,, | 64 | I. | 95 ,, ,, |
| 11. Wongan Hills | ,, | IV. | 10 ,, ,, | | | |
| 13. Lake Way (Wiluna) | ,, | VI. | 20 ,, ,, | | | |
| 14. Greenbushes | 1899 | I. | 43 ,, ,, | 32 | .... | 20 ,, ,, |
| 15. Mulgarrie | ,, | II. | 25 ,, ,, | | | |
| 16. Lindsay's and Hayes' New Find | ,, | III. | 25 ,, ,, | | | |
| 17. Bardoc | ,, | IV. | 37 ,, ,, | | | |
| 18. Donnybrook Goldfield | ,, | V. | 37 ,, ,, | | | |
| 19. Kanowna | ,, | VI. | 6 ,, ,, | | | |
| 20. Menzies | ,, | VII. | 37 ,, ,, | 21 | III. | 40 ,, ,, |
| 21. Arrino (2 sheets) | 1903 | | 40 ,, ,, | | | |
| 22. Wanneroo | ,, | .... | 1½ miles per inch | | | |
| 23. Canning River Valley | ,, | .... | 20 chains per inch | | | |
| 24. Helena River Valley | ,, | .... | 20 ,, ,, | | | |
| 26. Kalgoorlie (separately) (6 sheets) | ,, | .... | 10 ,, ,, | | | |
| Do. | 1910 | I. | 30 ,, ,, | 42 | II. | 30 ,, ,, |
| Do. | .... | .... | .... | 42 | I. | 26·6 ,, ,, |
| Do. (North-End), (Sheets 1, 2, 5, 6, 7, 10–11) | .... | .... | .... | 51 | XII. | 2 ,, ,, |
| Do. ,, | .... | .... | .... | 69 | XII. | 10 ,, ,, |
| Do. ,, (Sheets 10–21) | .... | .... | .... | 69 | XIV. | 2 ,, ,, |
| 27. Boulder Belt (2 sheets) | .... | .... | 4 chains per inch | | | |
| 28. Auriferous Reefs, Cue and Day Dawn | .... | .... | .... | 7 | I. | 20 ,, ,, |
| 29. Lennonville | .... | .... | .... | 8 | .... | 15 ,, ,, |
| 30. Boogardie and Mt. Magnet | .... | .... | .... | 8 | .... | 15 ,, ,, |
| 31. Edjudina and Yarri | .... | .... | .... | 11 | I. | 40 ,, ,, |
| 32. Mulline | .... | .... | .... | 12 | I. | 40 ,, ,, |
| | | | | 64 | XVI. | 40 ,, ,, |
| 32A. Mulwarrie and Davyhurst | .... | .... | .... | 12 | II. | 40 ,, ,, |
| 33. Leonora | .... | .... | .... | 13 | .... | 30 ,, ,, |
| 34. The Island, Lake Austin | .... | .... | .... | 14 | II. | 20 ,, ,, |
| 35. The Mainland, Lake Austin | .... | .... | .... | 14 | III. | 20 ,, ,, |
| 36. Tuckanara | .... | .... | .... | 14 | IV. | 20 ,, ,, |
| 37. Quinns | .... | .... | .... | 14 | V. | 20 ,, ,, |
| 37A. Gabanintha | .... | .... | .... | 14 | VI. | 20 ,, ,, |
| 38. Nannine | .... | .... | .... | 14 | VII. | 20 ,, ,, |
| 39. Meekatharra | .... | .... | .... | 14 | VIII. | 20 ,, ,, |
| Do. (Sheets A and B) | .... | .... | .... | 68 | IV. | 40 ,, ,, |
| Do. (Sheets 1–9) | .... | .... | .... | 68 | XIII. | 132 feet per inch |
| | | | | 68 | XXI. | 80 chains per inch |
| 40. Abbotts | .... | .... | .... | 14 | XI. | 20 ,, ,, |
| 41. Lalla Rookh | .... | .... | .... | 15 | .... | 20 ,, ,, |
| | | | | 40 | II. | 20 ,, ,, |
| 42. Bamboo | .... | .... | .... | 15 | .... | 40 ,, ,, |
| | | | | 40 | IV. | 40 ,, ,, |
| 43. Yandicoogina | .... | .... | .... | 15 | .... | 40 ,, ,, |
| | | | | 40 | V. | 40 ,, ,, |
| 44. Mosquito Creek | .... | .... | .... | 15 | .... | 40 ,, ,, |
| | | | | 40 | VI. | 40 ,, ,, |
| 45. Moolyella Tinfield | .... | .... | .... | 15 | .... | 20 ,, ,, |
| | | | | 40 | VII. | 20 ,, ,, |
| 46. Auriferous Reefs, Talga Talga | .... | .... | .... | 15 | .... | 40 ,, ,, |
| | | | | 40 | III. | 40 ,, ,, |
| 47. Southern Cross | .... | .... | .... | 17 | .... | 20 ,, ,, |
| | | | | 32 | .... | 20 ,, ,, |
| 48. Mt. Morgans | .... | .... | .... | 48 | I. | 47 ,, ,, |
| 49. Mulgabbie | .... | .... | .... | 49 | IX | 40 ,, ,, |
| | | | | 18 | .... | 20 ,, ,, |
| 50. Nullagine | .... | .... | .... | 18 | .... | 20 ,, ,, |
| | | | | 20 | I. | 20 ,, ,, |
| 51. Warrawoona | .... | .... | .... | 40 | VIII. | 20 ,, ,, |
| | | | | 20 | III. | 20 ,, ,, |
| | | | | 40 | X. | 20 ,, ,, |
| 52. Marble Bar | .... | .... | .... | 20 | VII. | 20 ,, ,, |
| | | | | 40 | XIV. | 20 ,, ,, |
| 53. Norseman (2 sheets) | .... | .... | .... | 21 | .... | 20 ,, ,, |
| 55. Tambourah | .... | .... | .... | 23 | I. | 10 ,, ,, |
| | | | | 40 | XV. | 10 ,, ,, |
| 56. Western Shaw | .... | .... | .... | 23 | II. | 10 ,, ,, |
| | | | | 40 | XVI. | 10 ,, ,, |
| 57. Tambourah and Western Shaw | .... | .... | .... | 23 | III. | 80 ,, ,, |
| | | | | 40 | XVII. | 80 ,, ,, |
| 58. Just in Time | .... | .... | .... | 23 | IV. | 5 ,, ,, |
| | | | | 40 | XVIII. | 5 ,, ,, |
| 59. Wodgina Tinfield | .... | .... | .... | 23 | V. | 10 ,, ,, |
| | | | | 40 | XIX. | 10 ,, ,, |
| 60. Stannum | .... | .... | .... | 23 | VI. | 10 ,, ,, |
| | | | | 40 | XX. | 10 ,, ,, |
| 61. Laverton | .... | .... | .... | 24 | I. | 20 ,, ,, |
| 62. Lancefield | .... | .... | .... | 24 | II. | 20 ,, ,, |
| 63. Heaphy's Find (Ida H) | .... | .... | .... | 24 | III. | 20 ,, ,, |
| 64. Burtville | .... | .... | .... | 24 | IV. | 20 ,, ,, |
| 65. Auriferous Reefs, Duketon | .... | .... | .... | 24 | V. | 40 ,, ,, |
| 69. Dandaraga | .... | .... | .... | 26 | III. | 1 mile per inch |
| 70. Princess Royal Harbour | .... | .... | .... | 26 | IV. | 1 ,, ,, |
| 72. Lawlers | .... | .... | .... | 28 | .... | 20 chains per inch |
| 73. Sir Samuel | .... | .... | .... | 28 | .... | 20 ,, ,, |
| 74. Cue | .... | .... | .... | 29 | .... | 20 ,, ,, |
| 75. Cuddingwarra | .... | .... | .... | 29 | .... | 20 ,, ,, |
| 76. Day Dawn | .... | .... | .... | 29 | .... | 20 ,, ,, |
| 77. Bonnievale | .... | .... | .... | 31 | .... | 20 ,, ,, |
| 78. Sandstone and Nungarra | .... | .... | .... | 31 | .... | 30 ,, ,, |
| | | | | 62 | V. | 40 ,, ,, |
| 79. Birrigrin | .... | .... | .... | 31 | .... | 20 ,, ,, |
| 80. Christmas Island | 1908 | .... | 9½ chains per inch | | | |
| 81. Koolan Island, Yampi Sound | 1908 | .... | 67 ,, ,, | | | |
| 83. Bangemall | .... | .... | .... | 33 | II. | 10 ,, ,, |
| 84. Uaroo | .... | .... | .... | 33 | III. | 10 ,, ,, |
| 85. Red Hill | .... | .... | .... | 33 | IX. | 5 ,, ,, |
| 87. Roebourne | .... | .... | .... | 33 | XI. | 2 miles per inch |
| 88. Station Peak | .... | .... | .... | 33 | XII. | 10 chains per inch |
| 89. Barrambie | .... | .... | .... | 34 | .... | 20 ,, ,, |
| 90. Auriferous Reefs, Wiluna | .... | .... | .... | 34 | .... | 20 ,, ,, |
| 91. Ravensthorpe | .... | .... | .... | 35 | .... | 20 ,, ,, |
| 92. Desmond and Kundip | .... | .... | .... | 35 | .... | 20 ,, ,, |
| | | | | 36 | .... | 1 mile per inch |
| 94. Gingin | .... | .... | .... | 55 | .... | 1 ,, ,, |
| | | | | 72 | .... | 1 ,, ,, |
| 96. Geraldine | .... | .... | .... | 38 | II. | 108 chains per inch |
| 101. Whim Creek | .... | .... | .... | 41 | I. | 10 ,, ,, |
| 102. Glencoe Bourne | .... | .... | .... | 41 | IV. | 20 ,, ,, |
| 103. Weerianna | .... | .... | .... | 41 | V. | 20 ,, ,, |
| 107. Kanowna | .... | .... | .... | 41 | VI. | 20 ,, ,, |
| 109. Moora | .... | .... | .... | 48 | III. | 300 ,, ,, |
| 110. Kelmscott Clay Deposit | .... | .... | .... | 48 | IV. | 8 ,, ,, |
| | | | | 48 | V. | 80 ,, ,, |
| 111. Pinjarra Limestone Deposit | .... | .... | .... | 48 | VI. | 300 feet per inch |
| 112. Payne's Find | .... | .... | .... | 48 | VII. | 40 chains per inch |
| 113. Soanesville Asbestos Deposit | .... | .... | .... | 52 | IV. | 10 ,, ,, |
| 115. Tindall's and Londonderry | .... | .... | .... | 53 | II. | 40 ,, ,, |
| 116. Ora Banda | .... | .... | .... | 54 | I. | 15 ,, ,, |
| 119. Goodardy | .... | .... | .... | 57 | III. | 20 ,, ,, |
| 120. Poona | .... | .... | .... | 57 | V. | 20 ,, ,, |
| 121. Kurnalpi | .... | .... | .... | 59 | II. | 40 ,, ,, |
| 122. Ruby Well | .... | .... | .... | 59 | IV. | 20 ,, ,, |
| 123. Mikhaburra (Holden's Find) | .... | .... | .... | 59 | VII. | 10 ,, ,, |
| 124. Mt. Keith | .... | .... | .... | 59 | VIII. | 20 ,, ,, |
| 125. Lennonville, Mt. Magnet, and Boogardie | .... | .... | .... | 59 | IX. | 60 ,, ,, |
| 126. Woodline Rush | .... | .... | .... | 59 | XIII. | 6 ,, ,, |
| 127. Golden Ridge | .... | .... | .... | 59 | XV. | 10 ,, ,, |
| | | | | 66 | III. | 10 ,, ,, |
| 128. Illgarere | .... | .... | .... | 59 | XVIII. | 6 ,, ,, |
| 130. Narra Tarra | .... | .... | .... | 59 | XXIII. | 10 ,, ,, |
| 132. Marvel Loch | .... | .... | .... | 63 | II. | 40 ,, ,, |
| 133. Great Victoria and Parker's Range | .... | .... | .... | 63 | III. | 40 ,, ,, |
| 134. Olga, Dulcie, and Cheriton's | .... | .... | .... | 63 | IV. | 40 ,, ,, |
| 135. Yerilla | .... | .... | .... | 64 | II. | 20 ,, ,, |
| | | | | 64 | V. | 40 ,, ,, |
| 139. Speakmans | .... | .... | .... | 66 | IX. | 10 ,, ,, |
| 141. Yalogindа (Sheets 1–4) | .... | .... | .... | 68 | XXII. | 132 feet per inch |
| 142. Karangahaki (Sheets 1–3) | .... | .... | .... | 68 | XXIV. | 132 ,, ,, |
| 148. Eenuin | .... | .... | .... | 71 | VI. | 40 chains per inch |
| 149. Bullfinch | .... | .... | .... | 71 | VII. | 40 ,, ,, |
| 150. Corinthian | .... | .... | .... | 71 | VIII. | 40 ,, ,, |
| 151. Westonia | .... | .... | .... | 71 | IX. | 20 ,, ,, |
| 152. Jackson | .... | .... | .... | 71 | XVII. | 40 ,, ,, |
| 153. Marda | .... | .... | .... | 71 | XVIII. | 40 ,, ,, |
| 156. Linden | .... | .... | .... | 73 | II. | 40 ,, ,, |
| 157. Yundamindera, Pennyweight Point, Pike's Hollow, and Eucalyptus | .... | .... | .... | 73 | III. | 40 ,, ,, |
| 158. Yilgangi | .... | .... | .... | 73 | VII. | 30 ,, ,, |
| 159. Field's Find (Duketon) | .... | .... | .... | 74 | III. | 10 ,, ,, |
| 161. Mungilup | .... | .... | .... | 76 | I. | 2 ,, ,, |
| 162. Bulong and Lake Yindarlgooda, the Country between | .... | .... | .... | 82 | I. | 30 ,, ,, |
| 163. Bulong Magnesite Area | .... | .... | .... | 82 | II. | 15 ,, ,, |

### DISTRICT GEOLOGICAL MAPS.

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. Kimberley District | .... | .... | .... | 2 | IV. | 80 miles per inch |
| 2. Pilbara Goldfield (Part of) | .... | .... | .... | 2 | V. | 20 ,, ,, |
| 10. South-Western Districts | 1898 | III. | 20 miles per inch | | | |
| 12. Murchison and Sandford Rivers | ,, | V. | 10 ,, ,, | | | |
| 25. Irwin River Coalfield | 1903 | .... | 20 ,, ,, | | | |
| | | | | 23 | .... | 10 ,, ,, |
| 54. Pilbara Goldfield | .... | .... | .... | 40 | .... | 10 ,, ,, |
| | | | | 52 | X. | 20 ,, ,, |
| 66. Kimberley District | .... | .... | .... | 25 | .... | 12 ,, ,, |
| 67. Artesian Area North of Northampton | .... | .... | .... | 26 | I. | 25 ,, ,, |
| 68. Artesian Area between the Minilya and Ashburton Rivers | .... | .... | .... | 26 | II. | 25 ,, ,, |
| 71. Greenough River District | .... | .... | .... | 26 | V. | 1 ,, ,, |
| 82. Ashburton and Gascoyne Goldfields | .... | .... | .... | 59 | I. | 5 ,, ,, |
| | | | | 33 | I. | 10 ,, ,, |
| 86. West Pilbara Goldfield | .... | .... | .... | 33 | X. | 10 ,, ,, |
| | | | | 41 | I. | 6 ,, ,, |
| 93. Country along Transcontinental Railway | .... | .... | .... | 37 | .... | 20 ,, ,, |
| 95. Country between Arrino and Northampton (2 sheets) | .... | .... | .... | 38 | I. | 240 chains per inch |
| 97. Country between Carnamah and Moora to the Coast | .... | .... | .... | 38 | III. | 240 ,, ,, |
| 98. Wiluna to Hall's Creek (2 sheets) | .... | .... | .... | 39 | I. | 15 miles per inch |
| 99. Hall's Creek to Tanami | .... | .... | .... | 39 | II. | 10 ,, ,, |
| 100. Country North of Southern Cross | 1910 | II. | 10 miles per inch | | | |
| 104. South-West Division (Portion of) | .... | .... | .... | 44 | I. | 160 chains per inch |
| 105. Lake Barlee, Country in the neighbourhood of | .... | .... | .... | 45 | I. | 4 miles per inch |
| 106. Yilgarn Goldfield (Part of) | .... | .... | .... | 46 | I. | 4 ,, ,, |
| 108. Peak Hill Goldfield and Parts of Ashburton and Gascoyne Goldfields | .... | .... | .... | 48 | II. | 15 ,, ,, |
| 114. Coolgardie and Londonderry, the Country between | .... | .... | .... | 53 | I. | 80 chains per inch |
| 117. Coolgardie and Boulder, the Country between | .... | .... | .... | 56 | I. | 80 ,, ,, |
| 118. Murchison Goldfield (Part of) | .... | .... | .... | 57 | I. | 4 miles per inch |
| 129. Bremer Range | .... | .... | .... | 59 | XIX. | 4 ,, ,, |
| 131. Yilgarn Goldfield (South Part) | .... | .... | .... | 63 | .... | 10 ,, ,, |
| | | | | 63 | I. | 4 ,, ,, |
| 136. Kalgoorlie and Mulline, the Country between | .... | .... | .... | 64 | XV. | 4 ,, ,, |
| 137. Extreme South-Western Portion of Western Australia | .... | .... | .... | 65 | I.–II. | 4 ,, ,, |
| 138. Coolgardie and East, Coolgardie Goldfields, Part of | .... | .... | .... | 66 | I. | 120 chains per inch |
| 140. Meekatharra District | .... | .... | .... | 68 | II. | 4 miles per inch |
| 143. Yilgarn Goldfield | .... | .... | .... | 71 | .... | 10 ,, ,, |
| 144. Lake Barlee and Jackson, the Country between | .... | .... | .... | 71 | II. | 4 ,, ,, |
| 145. Lake Currajong and Southern Cross, the Country between | .... | .... | .... | 71 | III. | 4 ,, ,, |
| 146. Marvel Loch and North Iron Cap, the Country between | .... | .... | .... | 71 | IV. | 4 ,, ,, |
| 147. Middle Mt. Ironcap and Ravensthorpe Range, the Country between | .... | .... | .... | 71 | V. | 4 ,, ,, |
| 154. North Coolgardie Goldfield (Part of) | .... | .... | .... | 73 | .... | 10 ,, ,, |
| 155. Yerilla District | .... | .... | .... | 73 | I. | 4 ,, ,, |
| 160. Laverton through Warburton range to South Australian Border | .... | .... | .... | 75 | II. and III. | 4 ,, ,, |
| 164. North-West, Central, and Eastern Divisions between Long. 119° and 122° 45′ E. and Lat. 21° 30′ and 27° S. | .... | .... | .... | 83 | .... | 12 ,, ,, |

NOTE:— The numbers in green correspond with those of the 300 chains per inch series issued by the Department of Lands & Surveys.

## DIVISION IV.

# ANNUAL PROGRESS REPORT OF THE GEOLOGICAL SURVEY FOR THE YEAR 1920.

DESPITE the fact that during the year 1920 the personnel of the field staff of the geological survey suffered such further reductions as to practically bring it to vanishing point, a good record of work, not as the result of a change of policy but rather as an adaptation to circumstances, has been shown. If, however, governmental efforts tending towards the industrial development of the State's mineral and allied resources are to be carried out upon scientific lines, which alone will prove ultimately effective, it is absolutely imperative that immediate steps be taken to bring the field staff up to its normal strength by the appointment of adequately trained and experienced geologists.

### THE STAFF.

There were 13 classified officers engaged upon the work of the geological survey during the year 1920. There have again been some reductions in the field staff, the department losing the services of Messrs. Talbot and Clarke.

Mr. Talbot, who originally joined the Survey in the year 1902, found himself, owing to a self sacrificing devotion to duty, no longer able to carry out the arduous field work upon which he had been engaged during his term of service, and was in consequence retired under Section 56 of the Public Service Act, such retirement dating from the end of December. Few men have contributed more to our knowledge of the inaccessible and arid regions of the State; the value of Mr. Talbot's personal contributions to our knowledge of the topography and structural geology of large tracts of country is shown by the records of his published work, and forms the foundation upon which future investigations must be based. As the result of Mr. Talbot's retirement, the Geological Survey loses the services of an officer possessing an accumulation of specialised local knowledge, whom it will be difficult to replace.

Mr. E. de C. Clarke, who was selected from a large number of candidates for the position of field geologist, joined the staff in 1913, a position which he resigned to accept the more lucrative appointment of Lecturer in Geology at the University of Western Australia. During his term of service Mr. Clarke has carried out a good deal of that multifarious work called for in a Government department, viz., reconnaissance geological surveys, detailed work in mining fields in active operation, investigations into the geological aspects involved in dealing with applications for State aid, and towards the development of mining, etc.

Mr. Clarke's work on the mining field at Meekatharra represents a type of the most detailed work carried out by the Survey, whilst that on the Warburton Range country, near the South Australian frontier, carried out in conjunction with his colleague, Mr. Talbot, is typical of that important class of exploration work covering in a general way large tracts of country.

The retirement of the two previously mentioned field geologists has brought about a condition of affairs which, in the public interest, demands serious and immediate attention. It is to be hoped that when the positions are filled better financial inducements will be offered than has been the case in the past, so as to enable the services of experienced officers capable of undertaking more or less independent work to be secured and retained.

### FIELD WORK.

The table hereunder shows the distribution of the field work, and gives the names of the officers engaged in the different portions of the State during the calendar year 1920.

*Table showing the Distribution of Field Work for the Year 1920.*

| Goldfield or Land Division. | H. W. B. Talbot. | | E. de C. Clarke. | | F. R. Feldtmann. | |
|---|---|---|---|---|---|---|
| | No. of days in the field. | Percentage of working days. | No. of days in the field. | Percentage of working days. | No of days in the field. | Percentage of working days. |
| Coolgardie Goldfield ... ... ... | ... | ... | 93 | 25·47 | ... | ... |
| North-East Coolgardie Goldfield ... | ... | ... | 87 | 23·83 | ... | ... |
| Mt. Margaret Goldfield ... ... | 77 | 21·09 | ... | ... | ... | ... |
| South-West Division ... ... ... | 2 | 54 | ... | ... | 47 | 12·87 |
| Total | 79 | 21·63 | 180 | 49·30 | 47 | 12·87 |

The areas of those portions of Western Australia covered by geological maps on the different scales published by the Geological Survey are shown on the plan by which this report is accompanied.

**H. W. B. Talbot**, Field Geologist.

Mr. Talbot, after returning from his annual leave, was actively engaged at headquarters until the middle of April, with the exception of a brief visit to Collie, preparing the plans and reports in connection with the work of the previous field season. This officer left Perth on the 13th April for Laverton, and the period between that date and the 30th June was devoted to extending the geological reconnaissance survey northward from the point at which the work ceased during the previous year to the south-eastern portion of the area, which has been fully described in Bulletin 83, *i.e.*, northward from the latitude of Duketon to the Lee Steere Range. The remainder of the year was spent at headquarters in the preparation of plans, the writing of reports, the revision of Bulletin 83, and other work necessitated by Mr. Talbot's retirement at the end of the year. The total number of days spent in the field by Mr. Talbot amounted to 79.

**E. de Courcey Clarke**, Field Geologist.

Mr. Clarke, after returning from annual leave in the middle of January, was at headquarters until the end of May, engaged in writing up the results of the previous season's field work on the Yalgoo Goldfield and in collecting data for the survey of the mining centres of Mt. Monger and St. Ives. The officer was engaged at the Mt. Monger centre, from the beginning of June (with the exception of 10 days' sick leave) until the 6th of August, in making a geological survey of that centre on a scale of five chains per inch, and of about 150 square miles of the surrounding country on the scale of 80 chains to the inch. St. Ives was reached on August the 10th, from which date until the 23rd of November (except for 17 days occupied by a visit to Perth to deal with the question of boring for coal in the south branch of the Irwin River) Mr. Clarke was engaged in mapping the St. Ives, Love's Find, and Paris centres on a scale of 10 chains to the inch, and about 200 square miles of surrounding country on the scale of 80 chains per inch. The last week in November was spent in examining developments which had taken place at Mt. Monger since August. On December the 2nd Mr. Clarke, having been appointed to the position of Lecturer in Geology at the Western Australian University, left Monger for Perth in order to complete the necessary office work, relinquishing his position in the Survey. Six interim reports on the geological features of the new finds were written in the field, and at least four of them were published more or less *verbatim* in the Goldfields press.

An informal lecture on the geology of St. Ives and neighbourhood was delivered at the conclusion of Mr. Clarke's field work; it was contemplated delivering a similar address when revisiting Mt. Monger, but the decrease in population at that centre, the expenditure of time required to prepare the suitable maps, etc., seemed unwarranted, and the project was abandoned.

Mr. Clarke spent 180 days in the field, which were distributed throughout the fields enumerated in the table.

**F. R. Feldtmann**, Field Geologist.

Owing to the exigencies of the department, it was found impossible for Mr. Feldtmann to spend but a very short time in the field. The period between the 7th and 15th of July was spent in examining the barytes deposit at Cranbrook; that between 30th of August and the 2nd of September was devoted to an examination of the reported gold find at Bila, near Brunswick, and from the 21st of October to the 25th of November Mr. Feldtmann spent in more or less detailed examination of the lodes of that district, including the Surprise lode at Galena. The total number of days spent by Mr. Feldtmann in the field amounted in all to 47.

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## PRINCIPAL RESULTS OF THE YEAR'S FIELD OPERATIONS.

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### 1.—DEVELOPMENT OF WATER POWER FOR THE GENERATION OF ELECTRICITY, KIMBERLEY DIVISION.

(A. Gibb Maitland).

The Kimberley or Northern Division forms part of what may be conveniently described as the Great Plateau of Western Australia. The portion of the plateau lying within the Kimberley Division consists of an elevated tableland, the King Leopold Plateau, the highest point of which is believed to be about 2,800 feet above sea level.

This dissected plateau is built up of horizontal or gently inclined strata, and in general possesses all the scenic features of such formations, viz., flat-topped hills with more or less precipitous sides.

This plateau, which lies within the 30 to 40 inches rainfall belt, is drained by the principal rivers, viz., The Prince Regent, Roe, Lawley, King Edward, Drysdale, Chamberlain, Hann, Isdell and Charnley. These rivers, all of which extend for considerable distances inland, flow seaward through gorges (cañons), sometimes of great extent and of exceptional beauty, without the water being of any special service to the country.

Such waters, if properly controlled, have some potential value as a possible source of power. The advantages to the State from the development of water power, if such is found to be feasible, are, as can be readily understood, almost beyond measure.

The distance, however, to which power from such sources can be economically transmitted is naturally limited.

The possibility of utilising the energy of the waters of the Glenelg, Isdell, and Charnley Rivers for the generation of power for a hydro-electrical installation required in connection with the development of the iron deposits of Yampi Sound, has led to applications for water rights by private persons.

During the course of an exploration carried out in the King Leopold Plateau in the year 1901 I travelled down the valley of the Isdell River, and on July 8th saw several of the rapids and gorges.

The most important of these ("Deep Gorge" of the map xix./800) is that which lies immediately above one of the water rights applied for. The waters of the Isdell enter the gorge below our camp,

C. 4. The gorge at this point forms a narrow, picturesque cañon, cut out of gently inclined beds of quartzite, seamed with thin veins of quartz. After flowing some miles down this cañon the Isdell River enters the open tidal water, Walcott Inlet, through a narrow gorge. As I saw it on the 11th of July, 1901, the mouth of the Isdell River was about 150 yards wide, with steep, muddy banks, and a sandy bar across it; so far as could be judged, the rise and fall of the tide at this spot appeared to be about 20 feet.

The Charnley River, the subject of another application, enters the head of Walcott Inlet, and at some distance above its mouth flows through a steep-sided cañon excavated out of quartz of the type prevailing on the plateau. This cañon I found to be about 150 yards wide, with walls of from 200 to 300 feet in height.

The Calder River, which also flows into Walcott Inlet, likewise traverses some cañons on the way to the sea.

Of the portion of the Glenelg River which forms the subject of another application, I have no personal knowledge; its position, however, as shown by reference to the plan, indicates that it is a tidal arm of the sea, into which the waters of the river flow after falling about 1,150 feet from its source in the Elizabeth-Catherine Range.

As pointed out previously such waters as have been referred to possess a certain potential value, and the question for investigation is how this potential wealth can be turned into actual wealth.

The somewhat abnormal high rise and fall of the tide has led to expectations in regard to the utilisation of this source of power, which, theoretically, is great; while this is undoubtedly the case, experience elsewhere has shown that the difficulties in making use of a tidal flow, though not insuperable, are great, whilst the power produced is expensive in proportion to the energy furnished.

Experience has shown that satisfactory and effective water power requires the maintenance of a uniform flow in the rivers developed, and, in order to increase the dependable flow, it is necessary to impound a sufficient quantity of water above the power station; this would involve the erection of a storage dam or dams of sufficient capacity for the purpose.

Whether or not it is possible to utilise the waters of the Isdell, Charnley, Calder, Sale and Glenelg Rivers as a source of power, can, of course, only be satisfactorily ascertained after careful surveys have been made by hydraulic engineers—work which, of necessity, would take some considerable time to carry out.

It seems that, at the present stage, the most important aspect arising out of the applications for water rights is for the Government to consider as to whether—

(a) water powers—whatever may be their ultimate value—which are the property of the people as a whole, should be controlled by the State, or whether

(b) they should be leased to others for development on a scale sufficient to adequately meet public requirements, in such a way that the community may reap the fullest advantage from one of the Nation's resources.

## 2.—ARTESIAN WATER, GERALDTON.

(A. Gibb Maitland.)

The matter of obtaining water from artesian sources, suitable for domestic or most industrial purposes to meet the requirements of Geraldton, has been dealt with by this Department at different times since the year 1897, as may be seen by reference to the reports which have already been supplied, viz.:—

(a) One by the Government Geologist dated the 5th of March, 1897.

(b) One by the Acting Government Geologist dated the 3rd of December, 1908.

(c) Report upon the Prospects of obtaining a Water Supply for Geraldton, either Artesian, Sub-Artesian or Catchment Areas, by the Assistant Government Geologist, dated the 16th of February, 1910, and communicated to the Public Works Department on the 10th of March, 1910, and

(d) A memo to the Chief Engineer for Water Supply dated the 11th of June, 1920.

The results of such boring operations as have been carried out demonstrated that an artesian water basin exists in the vicinity of Geraldton—the term "artesian" being defined in this connection as waters under a natural pressure which rise above the level at which they are encountered, though not necessarily reaching to or flowing over the surface of the ground.

The geological features of the Coastal Plain in the vicinity of Geraldton have already been dealt with in previous reports and hardly need much further elaboration.

The salient features which have a bearing upon the probability of striking fresh water in the vicinity of the Geraldton Racecourse are briefly recapitulated in the following paragraphs.

The rocks which make up the Coastal Plain in the vicinity of Champion Bay are sands, sandstones, clays and, subordinately, limestones, which have been comparatively little altered from their original condition and are mainly of marine origin.

The land area of the Coastal Plain stretches from Dongara to the mouth of the Murchison River, whilst the underwater extension reaches to the 100 fathom line, about 70 or 80 miles to the west of Geraldton.

The strata, so far as is ascertainable in the vicinity of Champion Bay, have a gentle dip to the east, the inclination being measurable in feet per mile rather than in degrees.

The lower members of the strata underlying the Coastal Plain in the vicinity of Champion Bay do not outcrop but merely abut against the older crystalline rocks ("bedrock"), a stratigraphical arrangement which is of high importance in its bearing on the question of the possibility of the occurrence of potable artesian water.

Many of the sandy beds of the Coastal Plain are of such a lithological character as conduce to the absorption and transmission of water.

The geological conditions are suitable for the storage of considerable quantities of deep-seated water, provided the strata are disposed in such a way as to admit of the absorption of the rainfall, which is the source of the artesian water in this portion of Western Australia.

The strata lie on an uneven surface, which may have been modified by faulting. Only one borehole has unequivocally reached the floor of ancient crystalline rocks, viz., that at the Railway Yard at Geraldton, which is reported to have struck granite at a depth of 420 feet, without a supply of water having been obtained.

The Geraldton Race-course bore was carried down to a depth of 1,531 feet, and is stated to have yielded a supply of salt water which rose to a height of 45 feet from the surface. The water on analysis was found to contain a quantity of salt, about equal to that in sea water.

From such evidence as is available it is not by any means quite clear as to whether the salt water reported came from the upper levels or not. A manuscript geological map in the Geological Survey Office contains the following note relating to the Geraldton Race-course bore: "Fresh flow 11,688 gallons at 73 feet." The original source from which this information was derived is unknown, though it is contained on a geological map used by the late Mr. H. P. Woodward in the field investigations carried out by him in the neighbourhood of Geraldton.

It has been demonstrated by boring operations at Dongara and the Geraldton Race-course, in the Champion Bay neighbourhood, that the salt-water areas are relatively near the sea, and in fairly low-lying land near the coast. The water drawn from the Yardarino bore, 9 miles from the coast and 130 feet above sea-level, proved to be much more potable, containing 67.76 grains per gallon of sodium chloride as against 1,154.86 and 907.20 in the Dongara and Geraldton Race-course bores respectively.

Shallow saline waters which may owe their origin to the direct entrance of sea water to the strata have no necessary relation to any deeper waters which may be present in the rock series.

Some, at any rate, of the saline waters occur in beds of marine origin, in which the imprisoned sea water has never been completely replaced by fresh water, owing to the structural arrangement of the strata preventing the escape of the contained water.

Salt water is not peculiar to any one particular horizon and does not bear any necessary relation to the geological age of the deposits.

The presence of salt water may be due either to the leaching of marine deposits, the penetration of sea water, or a leaching of the marine beds into underlying deposits.

The occurrence, however, of artesian water in the vicinity of Geraldton is now no longer a matter of theory, as has already been demonstrated by boring operations carried out; the main point for consideration now being whether by boring in the vicinity of the Racecourse (it being considered impracticable to deepen the existing borehole) a supply of potable water can be reasonably anticipated from the strata lying at a deeper level than that already encountered at a depth of 1,531 feet.

Salt water beds tend to freshen as circulation down the dip is established. It may be that the high salinity of the water at Dongara and the Geraldton Race-course results in a large measure from an effective penetration of sea water through the superficial beds overlying the deeper sediments. The actual measure of freshening from a salt water area in a series of beds has already been determined in the case of the Dongara and Yardarino bores, where a very notable variation in salinity within a few miles has been observed.

Whether the water obtained from relatively deep-seated sources is likely to be chemically purer than that drawn from the two bores in question is one of those questions to which a definite answer can hardly be given.

The feasibility, therefore, of obtaining water suitable for domestic or industrial purposes from the deep-seated sediments in the vicinity of the Geraldton Race-course is doubtful until established by actual boring operations, which have been, as pointed out in my report of the 5th of March, 1897, carried down through the whole thickness of beds, and operations only cease when the floor of the old crystalline rocks has been reached.

In considering the advisability of continuing operations down to bedrock, it ought not to be lost sight of that water which percolates beneath the surface dissolves the soluble constituents of the strata to an extent which appears to be in some measure dependent on the composition of the rock it traverses, the depth and the time it remains confined.

As a rule it has been found that artesian waters are less chemically pure than surface waters, for the reason that, the farther they penetrate, the longer they remain embedded in the strata, the greater are the opportunities for solution. Where water is absorbed by quartzose sandstones and allied rocks of the nature met within the bore at the Geraldton Racecourse, without coming in contact with calcareous beds, such would naturally be expected to be relatively free from mineral impurities.

Geological conditions are suitable for the storage of artesian water in the sedimentary rocks of the Coastal Plain of the Champion Bay neighbourhood, and it is very much to be regretted that nearly all the bores put down by the State in the area of the Coastal Plain have not been carried down deep enough to reach bedrock.

In the case of the Geraldton water supply, had this been done as recommended in 1897, the problem as to whether the town could depend upon artesian water for its use would have been settled for all time. Should operations be decided upon, over 1,500 feet of needless boring will probably have to be undertaken, as in all probability it may be found impracticable to either ream out or deepen the Racecourse bore hole.

The relative merits of artesian sources as against surface catchments for town supplies are, of course, a matter outside the province of a geologist, though it may be pointed out that in the Coastal Plain of the eastern portion of the United States of America, where the geological conditions have proved to be favourable, hundreds of artesian wells constitute the chief public water supplies in many town and cities, and are also numerous in villages and rural districts.

## 3.—PETROLEUM PROSPECTS OF THE BUSSELTON NEIGHBOURHOOD, SOUTH-WEST DIVISION.

(A. Gibb Maitland).

The work of the Geological Survey is, as is well known, carried out for what it is worth, and when

properly interpreted serves a variety of purposes, not the least important of which is the aid it supplies in dealing with questions relating to the possibilities of the occurrence of petroleum-bearing rocks, etc.

It has already been pointed out in previous reports dealing with the subject of the occurrence of oil in different portions of Western Australia, how it is generally recognised that the foundation of successful petroleum enterprise must be laid by the geologist rather than by the engineer. Hence the necessity for careful and detailed geological surveys forms an essential preliminary to (a) the search for areas of suitable petroleum-bearing rocks, and (b) any intelligent scheme of boring operations designed to locate favourable geological structures and the occurrence of oil pools.

In this connection, attention may be drawn to the debate in Parliament on the subject of prospecting for petroleum, as reported in *Hansard* No. 15, Session 1919, p. 1326:

> . . . . prospecting for oil is not merely a matter of putting down a bore. We have to do the preliminary prospecting first in order to decide which is the most likely site to start operations upon. I am not satisfied that geologists are the best judges. I shall, however, have to depend upon the advice that is given by our geologists. We may be doing something in the direction of finding oil, but others who have different grounds to work upon may find a likely spot more speedily than geologists would do.

The general geology of the Busselton neighbourhood, using the latter term in its widest sense, has been fully set out in Bulletin 44—A Geological Reconnaissance of a Portion of the South-West Division of Western Australia. The results of this survey, which are graphically summed up in the geological sketch maps and the sheet of sections which have been appended to the report, are of high importance in their bearing upon the possibility of the occurrence of crude petroleum in the area which it covers. A good deal of boring has been carried out in the Busselton district, particulars regarding which are given in Bulletin 44, pages 29-34, and the records show that the Government Bore (No. 5), at the Vasse River, struck bedrock (gneiss and granite) at 655 feet 6 inches below the surface, and that at Newtown (No. 6) reached the floor of ancient crystalline rocks (gneiss), at 330 feet. Neither of these bores gave any indication leading to the belief that the occurrence of petroleum was likely. Official reports (Bulletin 74, Report 66) have also been made on the area in the vicinity of Block 687, about 6 miles from Busselton, on the Abba River, which discharges into the Vasse Estuary. This area is underlaid by sands, clays, and gravel, estimated to be about from one to two hundred feet thick, beneath which lie the beds of the Donnybrook Series, the thickness of which is unknown; though from such evidence as is available, it does not appear at all likely that the floor of ancient crystalline rocks upon which the beds rest is more than (even if as much as) 200 feet below the coal-bearing horizons, as shown in the bores at Newtown and Busselton. No undoubted indications of the occurrence of petroleum or rock oil have been found in the neighbourhood.

The possible existence of a commercial petroleum field is, as well known, dependent upon three essential factors resulting from the conditions of deposition, viz., (a) the original oil-forming material, (b) a porous reservoir rock, and (c) an impervious rock cover. As has been pointed out in previous reports, the most important evidence in regard to the petroleum carrying character of formations consists of traces of residues of oil, viz., such as (a) a seepage of petroleum, or (b) exudations of asphaltum, *i.e.*, black veinlets of solid hydro-carbons at points on the surface. Petroleum seepages stain the rocks for some distance around them, and are accompanied by a characteristic odour. It was the occurrence of seepages which ultimately led to the development of pretty nearly all the leading oil fields of the world. Oil seepages, while of the utmost importance as "indicators," are, of course, not the only thing required, for the structural features of the strata must be of such a nature as to favour the accumulation of petroleum in commercial quantities. Geological research has definitely established the intimate connection which exists between pools of rock oil and foldings in the earth's crust, and in this way the foundations have been laid of intelligent and successful modern boring operations.

It is known that if petroleum occurs distributed in a porous and more or less horizontal stratum, such as underlies the Coastal Plain, in the vicinity of the Vasse, it cannot accumulate in sufficient quantity to make its exploitation a remunerative commercial undertaking.

One of the many wide-spread popular fallacies relating to the occurrence of petroleum is that such can be obtained by boring in unsuitable rocks if you only go deep enough.

Such a view is, apparently, not without its adherents in Western Australia, in so far as may be inferred from the following statement appearing in *Hansard* No. 15, Session 1919, p. 1326:

> Lord Fisher declares that although he is not a geologist, there is no part of the world where oil cannot be found if boring is conducted deeply enough. Others who are not geologists have declared that Lord Fisher is a lunatic . . . . I hope he will prove to be a lunatic in regard to oil discoveries in Western Australia, and that by following his advice we shall find that much needed commodity in this State.

In this connection it is only necessary to direct attention to the following statement of one of the world's leading authorities on petroleum geology:

> *Drill Deep.*—Very frequently the statement is made that all that is necessary to secure oil is to drill deep enough, and the failure to obtain oil in a well is explained as lack of depth. This is possibly true in the case of an individual well correctly located on a structure, but as generally applied the statement is fallacious. To drill without the knowledge that the well is actually on a favourable structure and that in depth we may hope to strike a favourable reservoir is a waste of money and time. Whenever this argument is presented it is well to call to mind the fact that if depth were the only requisite to a producing well, the investor would probably prefer to sink wells in his own back yard where markets and transportation facilities are at hand.

In regard to the matter of boring for rock oil in the neighbourhood of Busselton, such would be absolutely unwarranted until some definite "indications" of petroleum have been discovered in localities which are, from the point of view of geological structure, suitable. To initiate any scheme of boring operations until some such indications of the occurrence of rock oil have been met with savours of putting the cart before the horse.

To sum up the available evidence relating to the possibility of the occurrence of oil in the vicinity of Busselton, it appears that (a) there is a fairly large

area of strata of sedimentary origin which contain amongst their members rocks of varying degrees of porosity, and some coal seams; (b) the beds have not been proved to be very thick nor in any way thrown into folds; (c) no oil seepages or other exudations of petroleum residuals have been noticed anywhere in the vicinity; (d) granite and allied crystalline rocks have been met with at relatively shallow depths in two of the bore holes, the positions of which are shown in the plan attached to Bulletin 44.

The Hon. the Premier, in reply to the deputation which waited upon him on the 6th of March at Busselton regarding boring for petroleum, intimated that:

The public must carry out their own boring operations, and that when there was a reasonable chance of success, the Government would assist.

This being the declared policy of the Government, State aid should only be granted in those cases where undoubted indications of oil exist, and the bore sites selected in accordance with the information afforded by a study of the structural geology of the area. Anything short of this would tend to leave the public interest in jeopardy, in as much as without it the Government might be placed in that undesirable position of enabling company promoters, *et hoc genus omne,* to utilise the fact of the State's contributing towards the cost of boring operations as a means of deluding the public into the belief that its official scientific advisers are of the opinion that there might be more in the venture than "very considerable gambling chances."

## 4. NOTE ON A SPECIMEN OF SUPPOSED BITUMEN FROM TURKEY CREEK—KIMBERLEY DIVISION.

(A. Gibb Maitland.)

A sample of supposed bitumen was received at the Geological Survey Office on the 30th of June through the Hon. the Colonial Secretary, to whom it had been handed by Mr. Walter Okes of Ningbing Station, near Wyndham, with the statement that he believed it to be "oil shale or coal."

An identical sample was received on the same date from Mr. Hobler, the engineer for Commonwealth Railways, who stated that it had been handed to him while accompanying the Ministerial party in Kimberley.

Mr. Okes, it appears, had been prospecting for coal in the Kimberley Division prior to serving in the war, and has now apparently resumed his operations about 50 miles from Turkey Creek. He informed the Minister that he was confident a valuable oil deposit had been discovered.

The sample received from Mr. Hobler, which is in every respect identical with that submitted by the Hon. H. P. Colebatch, has been examined in the Geological Survey Laboratory and reported on by Dr. Simpson (G.S.L. 6104E) as follows:—

The sample consisting of a brilliant black organic substance associated with rock fragments, chiefly limestone, claystone, and cherty rock. The black substance is firmly adherent to some of the rock and penetrates deeply into it along fissures and other cavities, but does not impregnate it. It is brittle, not sticky, is slightly heavier than water, has no perceptible odour, and does not melt at temperatures up to a red heat.

By washing, some of the black material was obtained as free as possible from the associated rock. This had the following composition:—

| | | |
|---|---|---|
| Moisture | 0.84 | per cent. |
| Volatile matter | 38.20 | „ |
| Fixed carbon | 41.00 | „ |
| Ash | 19.96 | „ |
| | 100.00 | |

A distillation experiment showed the volatile matter to consist of:—

| | | |
|---|---|---|
| Water | 1.9 | per cent. |
| Oil | 16.0 | „ |
| Gas | 20.3 | „ |
| | 38.2 | |

The gas burnt freely with a slightly luminous flame. The oil was dark brown in colour, translucent, fluorescent, and of small viscosity.

Treatment of the black substance with carbon bisulphide extracted 10.3 per cent. of a brilliant black bitumen.

Though different in some respects from any asphalt with which I am acquainted, I am inclined to consider this black material to be a true asphalt akin to glance pitch, and therefore a surface indication of petroleum.

So far there is no definite information as to the precise whereabouts of the locality from which Mr. Okes obtained the sample handed to the Hon. the Colonial Secretary, and to Mr. Hobler. An inspection of the geological map of Kimberley indicates that Turkey Creek is made up of metamorphic rocks such as slates, schists, gneisses, etc., which are certainly not coal-bearing.

On the other hand, there are large areas of limestone to the south of Turkey Creek, on the outcrops of which there might be bituminous exudations.

Bituminous limestones are not uncommon in many geological formations in different parts of the world, though not always in such quantities as to render distillation of the oil commercially practicable. In some cases, however, it has been found possible to utilise bituminous limestones, sandstones, etc., for paving and allied purposes.

Glance pitch, to which the samples submitted bear some resemblance, is not uncommon in Egypt, East Syria, and the Dead Sea region, none of which, however, are productive oil-fields, though crude petroleum has been found locally.

Mr. Okes, it appears, has applied for a prospecting area (P.A.) for oil, the position of which does not appear to have been fixed by survey, but it is stated to be about 10 miles from the junction of the Ord and the Negri Rivers. Its assumed position lies just to the south of Mount Close, on the extensive basaltic plateau which covers such a large area of country in this portion of Western Australia.

It is necessary to have some definite and authentic data as to the precise locality, mode of occurrence, etc., relating to the specimens submitted by Mr. Okes. At present, for reasons which are self evident, it is advisable to withhold judgment and to act with caution.

## 5.—GLAUCONITIC SANDSTONE IN ROBERTS STREET BORE, METROPOLITAN AREA.

(A. Gibb Maitland.)

A bore in search of artesian water was put down to a depth of 665 feet at Roberts Street, Osborne

Park, towards the latter end of 1920, the section as supplied by the Engineer for Metropolitan Water Supply being as follows:—

| Strata. | Depth. | | Thickness. | |
|---|---|---|---|---|
| | ft. | in. | ft. | in. |
| Fine white sand ... ... | 0 | 0 | 31 | 0 |
| Yellow sand ... ... ... | 31 | 0 | 58 | 0 |
| Brown conglomerate and sandstone | 89 | 0 | 0 | 6 |
| Coarse sand ... ... ... | 89 | 6 | 7 | 6 |
| Clay ... ... ... ... | 97 | 0 | 4 | 0 |
| Clay and Gravel ... ... | 101 | 0 | 7 | 0 |
| Dark shales and sandy shales ... | 108 | 0 | 92 | 0 |
| Dark shales ... ... ... | 200 | 0 | 90 | 0 |
| Dark sandy shales ... ... | 290 | 0 | 70 | 0 |
| Soft sandstone (*water bearing*) ... | 360 | 0 | 15 | 0 |
| Sandy shale (*with increase of water*) | 375 | 0 | 75 | 0 |
| Green sandstone (GLAUCONITIC) | 450 | 0 | 20 | 0 |
| Dark puggy shales with pyrites | 470 | 0 | 20 | 0 |
| Grey sandstone (*with increase of water*) | 490 | 0 | 48 | 0 |
| Dark grey shale ... ... | 538 | 0 | 12 | 0 |
| Sandstone (*containing water*) ... | 550 | 0 | 50 | 0 |
| Dark grey shale ... ... | 600 | 0 | 25 | 0 |
| Sandstone (*containing more water*) | 625 | 0 | 20 | 0 |
| Dark shales and pyrites ... | 645 | 0 | 7 | 0 |
| Black micaceous sandy shale ... | 652 | 0 | 13 | 0 |

At a depth of 370 feet the yield from the bore was 12,000 gallons of water per day; at 538 feet it was 50,000 gallons; from between 652 and 676 feet the yield of overflowing water was 1,200,000 gallons of good cool potable water.

A band of glauconitic sandstone 20 feet in thickness was encountered at a depth of 450 feet.

A complete analysis of it was made in the Geological Survey Laboratory, and its composition shown to be as follows:—

*Complete Analysis of a Greensand* (*G.S.L.* 6658E) *from* 450*ft. to* 470*ft. Roberts Street Bore, Osborne Park.*

| | Per cent. |
|---|---|
| $SiO_2$ ... ... ... ... | 86·82 |
| $Al_2O_3$ ... ... ... ... | 3·63 |
| $Fe_2O_3$ ... ... ... ... | 2·98 |
| FeO ... ... ... ... | ·78 |
| MnO ... ... ... ... | Trace |
| MgO ... ... ... ... | ·54 |
| CaO ... ... ... ... | Trace |
| $Na_2O$ ... ... ... ... | ·45 |
| $K_2O$ ... ... ... ... | 2·54 |
| $H_2O-$ ... ... ... ... | ·70 |
| $H_2O+$ ... ... ... ... | 1·21 |
| $TiO_2$ ... ... ... ... | ·27 |
| $ZrO_2$ ... ... ... ... | Trace |
| $CO_2$ ... ... ... ... | ·05 |
| $P_2O_5$ ... ... ... ... | Trace |
| $B_2O_3$ ... ... ... ... | Trace |
| $FeS_2$ ... ... ... ... | ·20 |
| Cl ... ... ... ... | Trace |
| | 100·17 |
| Acid Soluble $Na_2O$ ... ... | ·12 |
| „ „ $K_2O$ ... ... | 1·04 |

Analyst—D. G. Murray.

The approximate mineral composition is—

| | |
|---|---|
| Quartz ... ... ... ... | 71 |
| Glauconite ... ... ... | 16 |
| Felspar and Mica ... ... | 12 |
| Pyrite, Rutile, Dolomite, Zircon, Tourmaline, Kyanite, Epidote, and Staurolite ... ... ... | 1 |
| | 100 |

The greensand forms part of that series which outcrops in the neighbourhood of Gingin and which is of Cretaceous Age. The Gingin greensand is over 30 feet in thickness.

## 6.—BORING AT COLLIE.

(A. GIBB MAITLAND.)

During the year a deep bore was put down in the Municipal Water Reserve 4919 in the township of Collie. The operations were carried out by a Calyx plant and the total depth attained was 1,135 feet 10 inches, most of which was represented by cores, type samples of which have been preserved [1/2800] in the Geological Survey Office.

The boring presents two features of particular interest: (1) it is one of the deepest yet made on the Collie field, and (2) it met with two bands of sandy limestone at depths of 1,083 and 1,133 feet 6 inches respectively, indicating a change from fresh water or estuarine to marine conditions.

The bore, which was primarily sunk for the purpose of finding water, passed through several seams of coal at depths set out in the log as supplied by the driller.

No. 1 BORE TRENCH WELL, COLLIE.

| Strata. | Depth. | | Thickness. | |
|---|---|---|---|---|
| | ft. | in. | ft. | in. |
| Sandy clay ... ... ... | 0 | 0 | 20 | 0 |
| Ironstone conglomerate ... | 20 | 0 | 1 | 0 |
| Coarse sand with clay seams ... | 21 | 0 | 17 | 0 |
| Sandy clay ... ... ... | 38 | 0 | 10 | 0 |
| Fine sand ... ... ... | 48 | 0 | 8 | 0 |
| Yellow clay ... ... ... | 56 | 0 | 3 | 0 |
| Coarse sand ... ... ... | 59 | 0 | 11 | 0 |
| Sandy clay ... ... ... | 70 | 0 | 13 | 0 |
| Coarse sandstone conglomerate | 83 | 0 | 5 | 0 |
| Coarse sand ... ... ... | 88 | 0 | 14 | 0 |
| Sandstone conglomerate ... | 102 | 0 | 1 | 0 |
| Fine sandy clay ... ... | 103 | 0 | 3 | 0 |
| Coarse sandstone "Soft" ... | 106 | 0 | 16 | 0 |
| Fine sandstone ... ... ... | 122 | 0 | 14 | 0 |
| Hard puggy clay ... ... | 136 | 0 | 3 | 0 |
| Hard sandstone ... ... | 139 | 0 | 9 | 0 |
| Pipe clay ... ... ... | 148 | 0 | 1 | 0 |
| Hard sandstone with clay bands | 149 | 0 | 11 | 0 |
| Coarse sandstone ... ... | 160 | 0 | 6 | 0 |
| Fine sandstone with clay bands | 166 | 0 | 7 | 0 |
| Coarse sandstone ... ... | 173 | 0 | 17 | 0 |
| Sandstone with clay bands ... | 190 | 0 | 2 | 0 |
| Coarse sandstone ... ... | 192 | 0 | 48 | 0 |
| Grey shale ... ... ... | 240 | 0 | 2 | 0 |
| Coarse sandstone ... ... | 242 | 0 | 17 | 0 |
| Fine sandstone ... ... ... | 259 | 0 | 8 | 0 |
| Coarse sandstone ... ... | 267 | 0 | 6 | 5 |
| *Coal* ... ... ... ... | 273 | 5 | 0 | 3 |
| Coarse sandstone ... ... | 273 | 8 | 7 | 4 |
| Black shale with carbonaceous bands | 281 | 0 | 7 | 0 |
| Sandy shale ... ... ... | 288 | 0 | 5 | 0 |
| Coarse sandstone ... ... | 293 | 0 | 11 | 0 |
| Black shale ... ... ... | 304 | 0 | 0 | 3 |
| Fine sandstone with shale bands | 304 | 3 | 14 | 3 |
| *Coal* ... ... ... ... | 318 | 6 | 1 | 0 |
| Carbonaceous shale ... ... | 319 | 6 | 1 | 0 |
| Hard fine sandstone with shale bands | 320 | 6 | 5 | 0 |
| Carbonaceous shale ... ... | 325 | 6 | 3 | 6 |
| *Coal* | 329 | 0 | 3 | 0 |
| Hard fine sandstone with shale bands | 332 | 0 | 6 | 0 |
| Coarse sandstone ... ... | 338 | 0 | 8 | 0 |
| *Coal* ... ... ... ... | 346 | 0 | 0 | 3 |
| Black shale ... ... ... | 346 | 3 | 2 | 9 |
| Carbonaceous shale ... ... | 349 | 0 | 1 | 0 |
| Hard fine sandstone with shale bands | 350 | 0 | 10 | 0 |
| Carbonaceous shale ... ... | 360 | 0 | 0 | 6 |
| *Coal* ... ... ... ... | 360 | 6 | 0 | 6 |
| Carbonaceous shale ... ... | 361 | 0 | 0 | 6 |
| Coarse sandstone ... ... | 361 | 6 | 19 | 6 |

No. 1 BORE, TRENCH WELL, COLLIE—*continued.*

| Strata. | Depth. | | Thickness. | |
|---|---|---|---|---|
| | ft. | in. | ft. | in. |
| *Coal* ... ... ... ... | 381 | 0 | 0 | 6 |
| Sandy shale ... ... ... | 381 | 6 | 2 | 6 |
| Coarse sandstone ... ... | 384 | 0 | 43 | 0 |
| *Coal* ... ... ... ... | 427 | 0 | 4 | 0 |
| Hard fine sandstone with shale bands | 431 | 0 | 7 | 6 |
| Sandstone ... ... ... | 438 | 6 | 4 | 6 |
| *Coal* ... ... ... ... | 443 | 0 | 0 | 6 |
| Hard fine sandstone with shale bands | 443 | 6 | 9 | 6 |
| Coarse sandstone ... ... | 453 | 0 | 52 | 0 |
| *Coal* ... ... ... ... | 505 | 0 | 3 | 0 |
| Hard fine sandstone with shale bands | 508 | 0 | 5 | 0 |
| Carbonaceous shale ... ... | 513 | 0 | 1 | 0 |
| Coarse sandstone with pyrites boulders | 514 | 0 | 15 | 0 |
| Carbonaceous shale ... ... | 529 | 0 | 1 | 0 |
| *Coal* ... ... ... ... | 530 | 0 | 2 | 0 |
| Hard fine sandstone with shale bands | 532 | 0 | 2 | 0 |
| Coarse sandstone with pyrites boulders | 534 | 0 | 14 | 0 |
| *Coal* ... ... ... ... | 548 | 0 | 9 | 6 |
| Shale ... ... ... ... | 557 | 6 | 4 | 6 |
| Coarse sandstone with quartz and pyrites boulders | 562 | 0 | 25 | 0 |
| Carbonaceous shale ... ... | 587 | 0 | 1 | 0 |
| *Coal* ... ... ... ... | 588 | 0 | 1 | 0 |
| Hard fine sandstone with shale bands | 589 | 0 | 4 | 3 |
| Carbonaceous shale with *coal* bands | 593 | 3 | 11 | 3 |
| Sandy shale ... ... ... | 604 | 6 | 3 | 6 |
| Fine sandstone ... ... ... | 608 | 0 | 9 | 0 |
| Coarse sandstone ... ... | 617 | 0 | 25 | 2 |
| *Coal* ... ... ... ... | 642 | 2 | 0 | 3 |
| Fine sandstone with shale bands | 642 | 5 | 0 | 7 |
| *Coal* ... ... ... ... | 643 | 0 | 16 | 6 |
| Hard sandstone with shale bands | 659 | 6 | 2 | 6 |
| *Coal* ... ... ... ... | 662 | 0 | 4 | 0 |
| Hard fine sandstone with shale bands | 666 | 0 | 15 | 6 |
| Coarse sandstone ... ... | 681 | 6 | 17 | 6 |
| Coarse sandstone cemented with clay | 699 | 0 | 19 | 0 |
| Carbonaceous shale ... ... | 718 | 0 | 8 | 0 |
| Coarse sandstone ... ... | 726 | 0 | 4 | 0 |
| Carbonaceous shale with *coal* bands | 730 | 0 | 2 | 6 |
| *Coal* ... ... ... ... | 732 | 6 | 2 | 0 |
| Carbonaceous shale with *coal* bands | 734 | 6 | 2 | 6 |
| Coarse sandstone ... ... | 737 | 0 | 9 | 0 |
| *Coal* ... ... ... ... | 746 | 0 | 4 | 0 |
| Fine sandstone with shale bands | 750 | 0 | 3 | 0 |
| Coarse sandstone ... ... | 753 | 0 | 14 | 0 |
| Shale ... ... ... ... | 767 | 0 | 1 | 0 |
| *Coal* ... ... ... ... | 768 | 0 | 3 | 0 |
| Fine sandstone with shale bands | 771 | 0 | 20 | 0 |
| Coarse sandstone ... ... | 791 | 0 | 4 | 0 |
| Fine sandstone with shale bands | 795 | 0 | 4 | 6 |
| Pyrites boulder ... ... | 799 | 6 | 0 | 6 |
| Coarse sandstone with pyrites boulders | 800 | 0 | 8 | 0 |
| *Coal* ... ... ... ... | 808 | 0 | 0 | 6 |
| Sandy shale ... ... ... | 808 | 6 | 1 | 0 |
| Coarse sandstone with pyrites and quartz boulders making a little water | 809 | 6 | 75 | 6 |
| Sandstone with shale bands ... | 885 | 0 | 2 | 0 |
| Coarse sandstone with pyrites boulders | 887 | 0 | 13 | 0 |
| Fine sandstone with shale bands | 900 | 0 | 3 | 0 |
| Coarse sandstone ... ... | 903 | 0 | 16 | 0 |
| Fine sandstone with shale bands | 919 | 0 | 10 | 0 |
| Fine sandstone, hard ... ... | 929 | 0 | 45 | 0 |
| Black puggy shale ... ... | 974 | 0 | 7 | 0 |
| Hard mudstone band ... ... | 981 | 0 | 2 | 0 |
| Black puggy shale ... ... | 983 | 0 | 12 | 0 |
| Fine sandstone ... ... ... | 995 | 0 | 5 | 0 |
| Black shale ... ... ... | 1,000 | 0 | 2 | 0 |
| Hard fine sandstone ... ... | 1,002 | 0 | 5 | 0 |
| Sandy limestone at ... ... | 1,083 | 0 | 0 | 9 |
| Do. ... ... ... | 1,133 | 6 | Bored into for 2 feet 4 inches. | |

The bore yields 45,000 gallons of water per day.

The following proximate analyses of certain of the coals have been made in the Geological Survey Laboratory:—

A.

No. 1 Bore, Trench Well, Municipal Water Reserve Pumping Station, Collie. 9ft. 6in. seam at 548ft.

| G.S.L. No. ... ... | 6387E | 6388E |
|---|---|---|
| Mark. | No. 1, Top half. | No. 2, Bottom half. |
| *Analysis:* | per cent. | per cent. |
| Moisture ... ... | 11·04 | 11·65 |
| Volatile Hydrocarbons | 27·69 | 28·41 |
| Fixed Carbon ... | 49·25 | 52·71 |
| Ash ... ... ... | 12·02 | 7·23 |
| | 100·00 | 100·00 |
| Calorific value, B.T.U. ... | 9,870 | 10,455 |

Two small (2in.) shale bands rejected from upper half. All this seam is dull black, rather tender, with well defined bedding and joint planes. The coal core had been exposed to the air for some weeks before it was analysed.

B.

*No. 1 Bore, Trench Well, Municipal Water Reserve Pumping Station, Collie. Three sections of 16 feet 6 inches seam at 643 feet.*

| G. S. L. No. | 6504E. Top 5ft. 6in. | 6505E Middle 5ft. 6in. | 6506E Bottom 5ft. 6in. |
|---|---|---|---|
| Moisture ... ... ... | 10·26 | 11·85 | 11·37 |
| Volatile ... ... ... | 20·12 | 26·37 | 31·28 |
| Fixed Carbon ... ... | 46·66 | 52·24 | 48·86 |
| Ash ... ... ... ... | 16·96 | 9·54 | 8·49 |
| | 100·00 | 100·00 | 100·00 |
| Calorific value B.T.U .... | 9,058 | 10,000 | 10,041 |

This is a strong, rather dull, coal of the Proprietary type. It does not form a coherent coke. The coal had been air-dried for several weeks before it was analysed.

The sandy limestone, the first encountered in the Collie Basin, met with at a depth of 1,133 feet 6 inches, on being analysed in the Geological Survey Laboratory, showed its composition to be in parts per hundred:—

*Limestone* [1/2800], *No.* 1 (*Municipal*) *Trench Bore Well, Collie, Depth* 1,133 *feet* 6 *inches.*

| | per cent. |
|---|---|
| $SiO_2$ ... ... ... ... | 45·43 |
| $Al_2O_3$ ... ... ... ... | 8·19 |
| $Fe_2O_3$ ... ... ... ... | ·69* |
| FeO ... ... ... ... | 1·48 |
| MnO ... ... ... ... | ·93 |
| MgO ... ... ... ... | 1·07 |
| CaO ... ... ... ... | 20·18 |
| $Na_2O$ ... ... ... ... | 1·22 |
| $K_2O$ ... ... ... ... | 2·51 |
| $H_2O$— ... ... ... ... | 1·22 |
| $H_2O$+ ... ... ... ... | 1·10 |
| $TiO_2$ ... ... ... ... | ·33 |
| $CO_2$ ... ... ... ... | 15·83 |
| $P_2O_5$ ... ... ... ... | ·17 |
| $SO_3$ ... ... ... ... | ·20 |
| Organic ... ... ... ... | ·33† |
| Cl ... ... ... ... | ·01 |
| | 100·89 |

G. 2·615

* Approximate owing to the presence of organic matter.

† Contains ·18 per cent. carbon.

Minerals recognised: Calcite, Quartz, Felspar, Kaolin, Ilmenite, Rutile and Organic Matter.

Analyst—J. N. A. Grace.

## 7.—BORING FOR COAL AT WILGA.

(A. GIBB MAITLAND.)

In the Annual Progress Report of the Geological Survey for the year 1918, reference was made to what appears to be an extension of the Collie Coal-

field situated on the upper reaches of the Collie River about five and a-half miles to the northeast of Wilga Siding in the Donnybrook-Preston Valley Railway.

From such little evidence as is available it does not appear that the extent of the coal measures in the vicinity of Wilga is very great, and the area is, in consequence, somewhat circumscribed.

It was decided during the year 1919 to carry out some boring operations on the field at the State expense, with the view of, if possible, penetrating the whole thickness of the coal measures and thus ascertaining something of the sequence of the strata and their capabilities as a coal-bearing series.

A detailed geological survey of the area is an essential condition precedent to undertaking boring operations designed to systematically test the field. This, however, being at the time impossible, a site for an experimental bore was selected to the east of the western boundary of Location 2009/93, and boring carried out to a depth of 598 feet, when it appeared that bed-rock was unequivocally reached.

The following is a record of the strata pierced in the bore hole:—

RECORD OF STRATA IN No. 1 BORE AT WILGA.

| Strata. | Depth. | | Thickness. | |
|---|---|---|---|---|
| | ft. | in. | ft. | in. |
| Ironstone gravel ... ... | ... | | 7 | 0 |
| Ironstone conglomerate ... | 7 | 0 | 13 | 0 |
| Grey clay ... ... ... | 20 | 0 | 7 | 0 |
| Ironstone conglomerate ... | 27 | 0 | 2 | 0 |
| Grey clay ... ... ... | 29 | 0 | 5 | 0 |
| Coarse sand ... ... ... | 34 | 0 | 5 | 0 |
| Shale ... ... ... ... | 39 | 0 | 3 | 0 |
| Sandy shale ... ... ... | 42 | 0 | 5 | 0 |
| *Coal* ... ... ... ... | 47 | 0 | 1 | 6 |
| Sandy shale with quartz boulders | 48 | 6 | 11 | 6 |
| Greasy shale ... ... ... | 60 | 0 | 6 | 0 |
| *Coal* with carbonaceous shale bands | 66 | 0 | 3 | 0 |
| Hard sandy shale ... ... | 69 | 0 | 4 | 0 |
| Coarse sandstone ... ... | 73 | 0 | 6 | 0 |
| Sandstone ... ... ... | 79 | 0 | 8 | 0 |
| *Coal* ... ... ... ... | 87 | 0 | 5 | 0 |
| Carbonaceous shale ... ... | 92 | 0 | 1 | 0 |
| Sandy shale ... ... ... | 93 | 0 | 6 | 0 |
| Sandstone ... ... ... | 99 | 0 | 10 | 0 |
| Carbonaceous shale ... ... | 109 | 0 | 1 | 0 |
| Puggy shale ... ... ... | 110 | 0 | 2 | 0 |
| Sandstone ... ... ... | 112 | 0 | 7 | 6 |
| Carbonaceous shale with *coal* bands | 119 | 6 | 7 | 6 |
| Sandy shale ... ... ... | 127 | 0 | 3 | 0 |
| Sandstone ... ... ... | 130 | 0 | 3 | 6 |
| *Coal* with stone band in middle | 133 | 6 | 2 | 6 |
| Sandy shale ... ... ... | 136 | 0 | 2 | 0 |
| Sandstone ... ... ... | 138 | 0 | 11 | 0 |
| *Coal* ... ... ... ... | 149 | 0 | 1 | 0 |
| Sandy shale ... ... ... | 150 | 0 | 2 | 0 |
| Sandstone ... ... ... | 152 | 0 | 29 | 0 |
| Carbonaceous shale with *coal* seams | 181 | 0 | 4 | 0 |
| Sandy shale ... ... ... | 185 | 0 | 1 | 0 |
| *Coal* ... ... ... ... | 186 | 0 | 1 | 0 |
| Black shale ... ... ... | 187 | 0 | 4 | 0 |
| Sandstone ... ... ... | 191 | 0 | 85 | 0 |
| Sandy shale ... ... ... | 276 | 0 | 3 | 0 |
| Sandstone ... ... ... | 279 | 0 | 39 | 6 |
| Shale ... ... ... ... | 318 | 6 | 1 | 6 |
| Carbonaceous shale ... ... | 320 | 0 | 0 | 6 |
| Shale ... ... ... ... | 320 | 6 | 2 | 6 |
| Sandstone ... ... ... | 323 | 0 | 39 | 6 |
| Greasy shale ... ... ... | 362 | 6 | 16 | 9 |
| Hard band, mudstone and sandstone conglomerate | 379 | 3 | 0 | 9 |
| Hard dark sandstone ... ... | 380 | 0 | 1 | 6 |
| Granite boulder ... ... | 381 | 6 | 0 | 6 |
| Hard dark sandstone ... ... | 382 | 0 | 8 | 0 |
| Hard grey shale with fine sandstone seams | 390 | 0 | 15 | 0 |
| Grey shale ... ... ... | 405 | 0 | 1 | 0 |
| Hard mudstone band ... ... | 406 | 0 | 0 | 6 |
| Dark shale ... ... ... | 406 | 6 | 2 | 0 |
| Hard mudstone band ... ... | 408 | 6 | 0 | 6 |
| Dark shale ... ... ... | 409 | 0 | 4 | 0 |
| Brown shale with hard seams ... | 413 | 0 | 56 | 8 |
| Lime and mudstone band ... | 469 | 8 | 0 | 7 |
| Brown shale ... ... ... | 470 | 3 | 9 | 3 |
| Lime and mudstone band ... | 479 | 6 | 0 | 6 |
| Brown shale ... ... ... | 480 | 0 | 4 | 8 |
| Lime and mudstone band ... | 484 | 8 | 0 | 7 |
| Brown shale ... ... ... | 485 | 3 | 13 | 6 |
| Lime and mudstone band ... | 498 | 9 | 0 | 9 |
| Hard grey shale ... ... | 499 | 6 | 5 | 0 |
| Lime and mudstone band ... | 504 | 6 | 0 | 3 |
| Hard grey shale ... ... | 504 | 9 | 10 | 3 |
| Lime and mudstone band ... | 515 | 0 | 1 | 0 |
| Hard grey shale ... ... | 516 | 0 | 3 | 9 |
| Lime and mudstone band ... | 519 | 9 | 1 | 0 |
| Hard grey shale ... ... | 520 | 9 | 8 | 6 |
| Lime and mudstone band ... | 529 | 3 | 0 | 9 |
| Hard grey shale ... ... | 530 | 0 | 10 | 0 |
| Granite boulder ... ... | 540 | 0 | 0 | 6 |
| Hard grey shale ... ... | 540 | 6 | 4 | 6 |
| Hard grey shale with granite boulders | 545 | 0 | 3 | 6 |
| Conglomerate, sandstone, and granite boulders | 548 | 6 | 7 | 0 |
| Fine sandstone ... ... ... | 555 | 6 | 6 | 0 |
| Conglomerate, sandstone, and granite boulders | 561 | 6 | 2 | 0 |
| ? Amphibolite ... ... ... | 598 | 0 | ... | |

## 8.—IRWIN RIVER COALFIELD, SOUTH-WEST DIVISION—BORING OPERATIONS.

(E. de C. CLARKE.)

In October, 1920, boring to a depth of 700 feet at bore-site No. 1, selected by me last year (Annual Report, 1919), being nearly completed, I was required to report on the advisability of further boring on the Upper Irwin River. On plotting the data obtained from this bore (which will be named P.W.D. bore No. 1) on to a section showing also the information obtained from previous shallower bores, it is apparent that between 400 and 700 feet P.W.D. bore No. 1 is at the horizon of the coal-bearing beds cut in the old bores. The results obtained show that it is improbable that payable coal seams will be found near the new bore.

As, however, it might be deemed more economical to test the Upper Irwin for coal in a conclusive manner, additional bore-sites have now been selected. Of these bores P.W.D. No. 2 would determine whether or not the coal seams thicken southwards along the general strike of the Permo-Carboniferous beds; P.W.D. No. 3 would determine whether there is a payable development of coal in the country between the north and south branches of the Upper Irwin; P.W.D. No. 4 would explore beds lying below the horizon of the known coal-bearing beds; P.W.D. No. 5 would ascertain whether there is any northward extension of the seams exposed in the north branch of the Irwin River. These bores are numbered in the order in which it is advisable they be undertaken. In my opinion, if P.W.D. bore No. 1 is a failure the chances of a coalfield in the Upper

Irwin are so small that a private company could not be advised to spend more money there; but it is another question whether, having regard for the great benefits that would accrue to the whole community by the opening up of such an important industry in this part of the country, the State would not be justified in spending money on a rather forlorn hope.

In my first report (Annual Report, 1918) on the Irwin River I recommend that "boring should not . . . be undertaken until the country has been carefully mapped in considerable detail." However, boring was undertaken without any such preliminary work, and I understand that Prof. Woolnough, who has since spent some months in the district, is of opinion, as a result of his work, that the best locality for boring would have been some miles farther south.

[NOTE BY A. GIBB MAITLAND.—In a paper on The Sequence, Glaciation and Correlation of the Carboniferous Rocks of the Hunter River District, New South Wales, by Messrs. Sussmilch, David and Walkom, published by the Royal Society of New South Wales, Vol. LIII., 1919, pp. 305-321, there appears an account (Section 5, the Irwin River and Gascoyne River Areas, Western Australia) of a section near Nangetty Station, to which the following footnote is appended:—

Dr. W. G. Woolnough informs me that a coal seam eight feet thick has just been discovered there.

Prof. Woolnough in a letter to myself dated the 25th of January, 1921, advises that the statement of the thickness of the coal seam as mentioned is certainly a mistake, and that so far as he could judge from the meagre evidence available it is between five and six feet.

The boring which has been carried out on the south branch of the Irwin River by the Department of Works has proved the existence of six thin seams of coal at the following depths:—

| Depth from Surface. | Thickness. | |
|---|---|---|
| feet. | ft. | in. |
| 342 | 1 | 0 |
| 354 | 1 | 0 |
| 357 | 1 | 6 |
| 410 | 1 | 0 |
| 457 | 1 | 0 |
| 460 | 1 | 0 |

None of the seams are of workable thickness, and therefore of no value whatever.

The geological structure and constitution of the Irwin River Valley are of such a nature that the boring already carried out determines for all time the question of the likelihood of the occurrence of coal seams of commercial value in the vicinity.

The failure of the Government bore to prove the seam referred to by Prof. Woolnough clearly indicates the patchy nature of the seams and confirms the results obtained by the previous borings, which were designed to test the capabilities and extent of the Irwin River field.]

## 9.—THE GEOLOGY OF MT. BURGES AND NEIGHBOURHOOD, COOLGARDIE GOLDFIELD.

(E. de C. CLARKE.)

A day was spent in examining Mt. Burges and the country along the old "90 mile road" between Mt. Burges and Coolgardie, in order to obtain information for the last edition of the State Geological Map. It was found that the chief constituent of Mt. Burges is serpentine similar in character to the ultra-basic rocks of the Monger Serpentine belt, which are briefly described in another part of this report.

## 10.—GENERAL GEOLOGY OF THE MONGER-ST. IVES DISTRICT, COOLGARDIE AND NORTH-EAST COOLGARDIE GOLDFIELDS.

(E. de C. CLARKE.)

My field work in 1920 was distributed over an area of about 800 square miles, between the latitude of Wombola (the old Mt. Monger centre) in the north, and that of the north shore of Lake Cowan, near the Paris group in the south; and between the longitude of Binyarinyinna on the east and that of Love's Find on the west. This area will be called the Monger-St. Ives District. Of this district it has been possible to map little more than 400 square miles with any approach to certainty, the geology of the balance being completely obscured by superficial deposits or by salt "lakes."

About three-quarters of the season's field work was spent in examining the new finds at Monger, St. Ives, the Paris, and Love's Find in as much detail as was warranted by their undeveloped condition.

The following general account of the geology of the whole district and of the various mining centres may require revision when microscopic examination of rock-specimens has been completed. Moreover, about two more months of broad field-work are necessary to link up the various belts of rock in this area with those shown by Feldtmann at Bulong to the north (Bull. 82, Pl. II) and by Honman to the north and west (Bull. 66, Pl. II).

The chief places of interest in the district are the new mining centres of Monger and St. Ives. The Monger workings are nearly 40 miles S.E. of Kalgoorlie by the track through Boorara and Golden Ridge. St. Ives is nearly 50 miles in a straight line SSE. of Kalgoorlie. The nearest railway station (Widgiemooltha, on the Coolgardie-Norseman Railway) is 25 miles from St. Ives by track.

The whole region is one of very low relief, none of the most prominent hills—Carnilya, Mt. Monger, Parker Hill and Yalca—rising much more than 300 feet above the surrounding plain-or lake-country. In the northern (Monger) portion of the district, the higher country consists not of defined lines of hills but of groups of irregularly arranged knolls. In the southern (St. Ives) section two or three fairly marked lines of hilly ground occur, the most prominent being that which extends from Parker Hill southwards nearly to the Paris—a distance of about 25 miles. However, in the southernmost part of the district—on the north shore of Lake Cowan—is a jumble of low hills. These differences of topography are due to structural differences which need not be detailed here.

The most striking topographic features of the Monger-St. Ives district are the three large salt "lakes": at the south end Cowan, with longer axis running about NE.; on the west side Lefroy, with greatest extension north and south; on the east side Randall's, extending mainly eastwards. The mutual relations of these three lakes are puzzling: thus, was

Randalls originally connected with Lefroy, or are the two lakes now approaching union, and, if so, which is the more active in the move; does Lefroy connect with Cowan, and what is the relation between Lakes Cowan and Randalls?

However, a question of a more practical nature has also to be answered with regard to these and others of the Western Australian "lakes," namely, whether or not they contain deposits of alluvial gold which would pay for recovery by dredging or some other means. This question is discussed a little more fully in my unpublished report on the Leonora-Duketon district, and the arguments there advanced for the testing of Lake Carey apply equally to the lakes of the Monger-St. Ives district.

During the latter part of this year boring for deep alluvial has been begun about two miles S.W. of Mt. Monger Trig. on the shore of an arm of Randalls Lake, and has proved the existence of about 50 feet of "wash" half a mile from the lake. Without extraordinarily good luck no actual discovery of gold-bearing wash can be expected until a considerable amount of further boring on some carefully thought-out method has been done.

The chief difficulty in unravelling the geological structure of the Monger-St. Ives district lies in the masking of the fundamental geology over so large a proportion of the area by superficial deposits of sand, loam, etc.: a second obstacle is the difficulty of obtaining specimens not hopelessly obscured by weathering: a third is the intermediate character of many of the rocks: thus, at St. Ives a suite of specimens collected only a few feet apart shows gradation from quartz-porphyry or porphyrite to greenstone, no boundary between the two types being definable.

Broadly, the district consists of a central belt of greenstones—in part sheared, in part massive—with a general N.W. trend. Several intrusive bodies of acid rock occur in this greenstone area, the two largest—disposed with their main axes generally parallel to the shear-planes of the greenstones—being in the southern part of the district.

The greenstone is bounded on the west side by a belt of porphyrite breccias and flows. Another similar belt occurs in the N.E. corner of the district, and a third, possibly the tail-end of a belt of sediments mapped by Honman just east of Kalgoorlie, occurs in the N.W. corner, forming the prominent Carnilya Hill. Later dykes and intrusive masses of basaltic and gabbroid rocks are found at Monger, at St. Ives, and, particularly, along the north shore of Lake Cowan south of the Paris group. Certain light friable rocks collected from the shore of Lake Cowan are possibly representatives of the tertiary or post-tertiary sponge-spicule beds of Norseman.

At present the microscopic data available are not sufficient to attempt more than a generalised account of the character of and the relation between the various rock types included in the above groups.

The greenstones are probably divisible into three main groups: fine-grained, slaty rocks; coarser more massive epidiorites; and serpentines. Possibly the fine-grained greenstones and the porphyrite-breccia series mentioned above are contemporaneous and are older than the coarser epidiorites; also, the balance of the evidence as to the relation between the epidiorites and the serpentines appears to favour the view that these two groups are contemporaneous, being differentiations from the same magna, and that the serpentines are not, except in a very restricted sense, intrusive into the epidiorites.

The acid intrusives appear to be mainly biotite-microcline granites and quartz-porphyries, but many varieties of porphyry and porphyrite could probably be distinguished, particularly at St. Ives, where, as already mentioned, some remarkable gradations from porphyry to greenstone (probably a result of digestion of the greenstone by the porphyry) have been noted. Moreover, care has to be exercised in the field if one is to discriminate between country composed of decomposed intrusive acid rocks and that formed from the weathered products of the older porphyrite breccia flow series.

The later basaltic and gabbroid intrusions probably belong to the same period of igneous activity as the norites and similar rocks that occur near Norseman and in many other parts of the State. They are probably the youngest of the deep-seated rocks in the district, being subsequent to the period of gold injection, and therefore have no effect on ore-bodies beyond cutting through and interrupting them.

A short generalised account of the geology of the whole district, and of the mining centres which have lately been attracting some attention, is all that can be usefully added to the foregoing description in a report unaccompanied by maps, etc.

MONGER.—The lately discovered "lode formations" are on a line of low hills which extends for about four miles in an E.S.E. direction from near Creedon's homestead towards the Mt. Monger Trig. station. These hills are composed of ultra-basic rocks forming an apparently unbroken belt, which averages about a quarter of a mile in width. As usual in ultra-basic areas, the rock alters very much in appearance from place to place. This variableness increases the difficulty of those prospecting such a belt for the first time and accustomed to the uniform character of lodes in the doleritic greenstones which in most parts of this State are the gold-bearing rocks. The tendency is, naturally, to pay too much attention to fancied resemblances and differences between the various ultra-basic types and, on the strength of these, to plan ambitious and futile schemes of development.

Flanking the ultra-basic belt in most places, and probably in close genetic relationship with it, are rather coarse-grained epidiorites similar to the "Warden's House" type of Kalgoorlie. Farther out from the ultra-basics, both to the east and to the west, are sheared porphyries, porphyrites, sediments, and fine-grained rather slaty greenstones, in which occur rich leaders at "Creedon's Welcome" and adjoining leases on the west side, and again at the "Daisy" and other leases on the east.

Later dykes of porphyry and porphyrite occur in a few places, intruding all the rocks described above, and a (probably still later) dyke of gabbro, with an east and west strike, has been noted at the north end.

A few particulars regarding the Lass o' Gowrie-Monger Proprietary line of gold occurrences in the ultra-basic (serpentine) belt may be of interest:

Much disappointment has been felt in various quarters owing to the allegedly erratic behaviour of gold-bearing "lodes" in the Monger serpentine belt. A well known case is that of the Lass o' Gowrie lease, where the first discovery was in chlorite rock showing gold freely. Other occurrences of similar rock, said to yield fair prospects, were found on the property, and it was thought by many that three large ore-

bodies could be traced on the "Lass o' Gowrie." A rather ambitious policy of sinking and driving was adopted, but very contradictory results were obtained by the various parties who sampled the various workings. It is not proposed to discuss these results here, but certainly no large body of stone yielding results comparable to those of the original discovery has been found.

On the other hand, farther north, on the "Monger Proprietary" and adjoining "McCahon's Great Hope," a shoot at least 150 feet long has been opened up, and from this shoot the "Monger Proprietary" had by November, 1920, crushed 71 tons of picked ore for a yield of about 1,030 ozs. of gold.

The discovery and development of this shoot were mainly due to the policy of "sticking to the gold" instead of "standing off, sinking to 50 feet (or 100 feet) and cross-cutting" to get a lode of new type of which such all-important features as direction of strike and dip, amount of dip, and direction of pitch of shoots were quite unknown.

Judging from what has been disclosed in those workings where makes of ore have actually been followed as, particularly, on the Monger Proprietary and McCahon's Great Hope, it appears that gold is found in the Monger ultra-basic belt mainly in a black or dark-green talc-chlorite rock, which occurs in fairly narrow seams along planes of strong shearing. These shear planes strike more or less parallel to the main axis of the ultra-basic belt, *i.e.*, W.N.W., and dip in some places N.N.E., in others S.S.W. The bulk of the evidence indicates that the gold is localised into south-pitching shoots.

It appears probable that the seams of black massive rock are small ultra-basic intrusions slightly later than the main ultra-basic belt, and were responsible for the introduction of the gold. In some places it is true the highest values are found in strongly sheared talc-chlorite-magnetite rock bordering on the black, massive, supposedly later rock, but such an occurrence is probably due to the gold having left the later intrusions in solution and having been precipitated in the schist. If this view of the origin of the gold in the serpentine belt at Monger be correct, then values should "live down."

In the country near Monger there are four main directions of strike: W.N.W. for the fine-grained slaty greenstones and belts of serpentine and coarser epidiorite between Mt. Monger Trig. and Wombola: E.N.E. for the quartz veins and slaty rocks of Wombola; N.N.W. for the "Sudden Jerk" country; N.N.E. for the country towards Randalls. Of particular interest is the strike of the Wombola country, which is practically at right angles to the general trend of the Monger belt. Probably it is this feature to which MacLaren refers as the "Monger Thrust Plane." If, when the geological survey of the district has been completed, further detail regarding these different trend-lines is obtained, it should throw light on the nature and origin of the various ore deposits.

St. Ives.—At the St. Ives centre there are 214 newly surveyed leases, which may be divided into two groups: the main St. Ives group and the smaller Victory group, lying north of the main group and separated from it by a gap of about three-quarters of a mile.

The majority of the leases are on a belt of gently rising ground between Lake Lefroy and Parker Hill. On this rising country a line of small hills begins near the Reward lease and trends northward for about a mile. Another inconspicuous line begins at the "Mentone" and thence runs N.W. for more than a mile. A slightly higher and rougher size-system runs N.W. from the "Jubilation" for about a mile.

The country occupied by the St. Ives leases is mainly greenstone in contact, along its eastern side, with a belt of acid rock (porphyry grading into granite) which separates it from the more or less parallel greenstone belt of Parker Hill. The belt of granitic rock swings westward at the Victory end, and there, caught up in it, are small patches of greenstone. Farther south a few porphyry dykes, right in the heart of the greenstones, are probably off-shoots from the main belt of granite.

The St. Ives greenstone belt contains the usual varieties of greenstone—grading from coarse massive to fine-grained slaty. It also has a considerable development of ultra-basic rock (serpentine) and also many jasper bars, the trend of which last features may be roughly summarised by stating that along the eastern and central parts of the belt the bars strike consistently a little west of north, while on the western side they swing westward, so that their course becomes northwest in the neighbourhood of the "Cooee" lease. In the "Cooee" part of the field the makes of ore appear to be associated with the jasper bars, being probably deposited along faults in them. Again, on the "Clifton" lease, south of "Ives Reward," the jasper bars and accompanying porphyry have an almost east and west trend, although on the next lease to the north their strike is almost due north. Apparently a line running northwest from the "Clifton" separates country with a predominantly northerly strike from country in which the strike varies but is mostly northwest.

Two irregularly-shaped areas of serpentinous rock closely associated with doleritic greenstones occur at St. Ives, but up to the present little if any gold has been discovered in them.

At the Victory end the boundary between acid rocks (porphyry and granite) and greenstones is very intricate. Gold occurs along, or very close to, the contact between the two classes of rock.

The original, and apparently the most important finds at St. Ives, lie on the "Ives Reward" and "Lake View Reward East" leases, through which run two parallel porphyry dykes, about 10 chains apart, striking a little west of north. The eastern one is associated with a jasper bar and forms the Ives Reward East Lode. On, or close to, the western dyke (on "Ives Reward" lease) a make of sulphide ore in sheared basic greenstone is now being explored by sinking and cross-cutting in Shafts Nos. 3 and 4. Farther south gold is being obtained in this dyke itself, probably in the majority of cases in minute quartz leaders.

Love's Find.—Eight leases have been surveyed at this centre, which is about 10 miles S.S.W. of St. Ives, and lies in the western belt of porphyrite breccias, etc., mentioned in the introductory part of this report. The original find was made in a porphyry dyke with many quartz stringers carrying large patches of pyrite. With one exception, however, the other leases seem to be in porphyrite country and to be working either cross-leaders, which are probably off-shoots fom porphyry dykes, or else so-called

lodes in the porphyrite. So little work has been done at this centre that no opinion regarding its future is justified.

PARIS GROUP.—This group of 34 leases is about 17 miles S.S.E. of St. Ives, near the western edge of the main greenstone belt. The predominant country is a coarse epidiorite which is cut by a large porphyry dyke. Gold-bearing quartz veins with a W.N.W. trend have been located on the "Observation," "H. H. H.," and "Saltbush" ("Paris") leases. The "H. H. H." workings could not be examined. On the "Observation," which is now abandoned, the ore-body does not appear to live below the zone of weathering. The ore-body on the "Saltbush" is now being prospected and appears to have the same general characteristics as the "Observation" body, but to differ in being closer to this porphyry dyke and in having a north-and-south striking formation which might, so far as development work had disclosed by the end of November, 1920, be either a distinct ore-body crossing the W.N.W. body, or merely a locally disturbed portion of it.

## 11.—PRELIMINARY REPORT ON THE LEAD LODES OF THE NORTHAMPTON MINING DISTRICT, SOUTH-WEST DIVISION.

(F. R. FELDTMANN.)

### INTRODUCTION.

The present investigation of the Northampton lead lodes arose from a request by the manager of the Fremantle Trading Co., Ltd., the owners of the Baddera Lead Mine, for an examination of that mine, owing to the ore being nearly exhausted. None of the mines of this district being accessible during previous examinations and surveys by officers of the Geological Survey Department, it was considered advisable to take the opportunity to obtain such information as was possible as to the structure and composition of the ore-bodies, and their relationship to the rocks of the district.

*Location.*—Northampton township, the centre of the mining district, is situated 27 miles north of Geraldton (34 miles by rail). The new township of Galena is situated immediately south of Murchison River, about 31 miles (45 miles by road) north of Northampton and about 8½ miles (12 miles by road) N.N.E. of Ajana, the terminus of the railway from Geraldton.

### GEOLOGY OF THE DISTRICT.

*General statement.*—The metalliferous district consists of an elevated tract of country, the present surface of which is strongly undulating, where the removal of the overlying Jurassic strata has exposed the crystalline rocks. The southern portion of this area of crystalline rocks, which consist largely of garnetiferous gneiss or gneissic granite, has been surveyed by Mr. W. D. Campbell, whose map * shows the southern end of the main belt to be about seven miles due east of Geraldton. The northern extension of this belt has not yet been determined, and in view of the economic importance of these rocks a broad survey of this portion of the gneissic belt is highly desirable. From hasty observations made on the road from Northampton to Galena, it appears probable that the gneissic rocks extend without a break to and beyond the Murchison River, with the possible exception of the high Binnu Sand Plain. How far they extend eastward along Murchison River has not been determined, but I was informed that they occur at the 10 Mile Pool.

The length of the metalliferous belt, if continuous, is therefore at least 70 miles, the maximum width being probably about 15 miles. The belt, however, is very irregular and the average width is probably considerably less.

The gneiss is cut by a number of basic (greenstone) dykes, striking nearly northnortheast, and by a greater number of pegmatite dykes or veins, with, so far as could be determined, similar strike, as have also the lodes. The lodes are closely associated with these dykes, but their relationship to the basic dykes is purely structural, the lines of fracture along many of which these dykes made their way forming lines of weakness during subsequent periods of shearing. On the other hand, the formation of the ore-bodies appears to be closely connected with the introduction of the pegmatites, which probably extended over a considerable period, the earlier stages of which were marked by high temperatures—as shown by the wide development of garnet in the gneiss and also, though but sparsely, in some of the pegmatites and the formation of tourmaline in a few of the pegmatites and their ultra-acid varieties, such as certain of the quartz reefs. The formation of the ore-bodies took place during the final stages of igneous activity, under lower temperature conditions. The occurrence of lead, zinc, and copper deposits as the final products of granitic magmas is by no means uncommon in other countries. In Australia the Broken Hill deposits form a notable example, being genetically connected with a series of pegmatite dykes † which from Mawson's ‡ description closely resemble those of the Northampton district.

In prospecting for new lodes it is advisable to examine closely the immediate neighbourhood of the greenstone and pegmatite dykes.

*The gneissic rocks.*—These are pale to fairly dark greyish rocks, usually fine in grain, which proved to be garnetiferous wherever examined. The ferromagnesian appears to be chiefly biotite, possibly chloritised in places. Pegmatitic facies of these rocks, with large felspars and garnets, occur. In some places the gneissic structure of the rocks is well marked, in others the rocks are compact and massive, the only traces of a gneissic structure being a slight parallelism of the composing minerals. Occasional zones of sheeted or laminated rock occur in the gneiss, marking lines of intense shearing and probably corresponding to the laminated jaspers so commonly associated with the goldfields greenstones and, in places, with the Pre-Cambrian sediments. The general strike of these sheeted zones is nearly northwest; they were apparently formed prior to the introduction of the basic dykes and the pegmatites.

*The basic dykes.*—These rocks are for the most part coarse to fine-grained massive epidiorites, from dolerites, but they probably range from intermediate-basic to ultra-basic in composition. Their most remarkable feature is the general uniformity of their strike, which round Northampton averages about N. 32° E.; they appear to be nearly vertical. They are of great length, and, on the average, of considerable width, several of those examined being 60 or

* W.A. Geol. Survey Bull. 38. Pl. I., 1910.
† *Vide* Mawson, Douglas, Geological investigations in the Broken Hill area: Roy. Soc. S. Aus. Mem., Vol. II., pt. 4., pp. 236, 286 *et seq.*
‡ *Op. cit.* pp. 292–295.

70 feet wide in places, and Gregory mentions some as attaining a width of 180 feet. Being harder than the surrounding gneiss they usually form prominent outcrops, a rounded outline being characteristic of the weathered outcrops and boulders.

The structural relationship of these rocks to many of the lodes has been noticed by previous writers, and specimens showing fragments of one of these dykes in the lode breccia were obtained by me from a dump on the Wheal Ellen North M.L. 143.

Among those lodes which for a part of their length at least occur along the margins of basic dykes are the Wheal Ellen, Gwalla (south lode), Unaring, Derby Syndicate (Loc. 325), Wheal Beta, and Yandanooka at Northampton, and the Surprise at Galena.

*The pegmatites.*—These are of great variety. The occurrence of pegmatitic veins apparently as a facies of the gneissic rocks has already been mentioned, but most of the pegmatites undoubtedly belong to the stages of igneous activity immediately preceding ore deposition, and are intrusive into the gneiss. No direct evidence was obtained as to the relative age of these rocks and the basic dykes, but from their composition and close relationship to the lodes they appear to be younger than the basic rocks. The pegmatite dykes are much more numerous and much smaller, as a rule, than the epidiorites, their width usually ranging from a few inches to a few feet, but it is probable that much larger dykes, particularly of the more acid varieties, occur. Their dip appears to be very similar to that of the lodes.

One of the commonest types of pegmatite is a coarse-grained rock, consisting chiefly of felspar and quartz, mainly in graphic intergrowths, with some large and small flakes of a silvery greenish-grey mineral, probably vermiculite; flakes of graphite are common in some specimens and are probably contemporaneous with the other minerals composing the rock. In some localities the felspars are white, in others, such as the Baddera and Victoria mines, they are of a dark red colour. Aplitic facies of these rocks are common. Specimens of pegmatite of this type, from the Wheal Alpha Mine, contain malachite and azurite, deposited in thin films throughout the rock as well as, in one specimen, in a vughy veinlet, probably on the wall of the dyke. A variety from an outcrop on the Gwalia Mine (Loc. 315) contains large felspar crystals in a ground-mass consisting largely of a graphic intergrowth of tourmaline and quartz.

A different and much more acid aplitic type of pegmatite occurs in the Baddera and Wheal May mines. It is composed of greyish glassy quartz, containing numerous small pale salmon-pink felspars. Another highly acid type from the Baddera is a rock composed of glassy quartz with fairly numerous small garnets; a few minute specks of mica are also present.

Extreme ultra-acid types are represented by some large quartz reefs, carrying very sparsely distributed groups of large tourmaline crystals.

## The Lodes.

*General features.*—The lodes occupy zones of intense shearing and brecciation in the gneissic granite. Where a shear zone is along the margin of a greenstone or pegmatite dyke, these rocks may also be sheared and brecciated.

The strike of the lodes is roughly parallel to that of the greenstone dykes, but is, however, less regular. A few of the lodes, including the Uga, the Baddera branch lode, and parts of the Chiverton, Nooka, and Wheal Alpha lodes strike approximately north. The Surprise lode, at Galena, strikes nearly northnorthwest.

The dip is usually northwest, at a steep angle, but in places the lodes are vertical, or even have a slight southeasterly dip. The Surprise lode dips westsouthwest.

In length the lodes range from about three chains (Derby Syndicate lode) to about one mile (Waneranooka lode), averaging, perhaps, between 30 and 40 chains.

The width is very variable, and a distinction must be drawn between the width of the "lode" channel, or zone of shearing and brecciation, and that of the ore veins or shoots. The "lode" may contain no ore, even where the shear zone is of moderate width, and shearing and brecciation are fairly well marked, or payable ore may occupy the full width of the channel. The ore-bodies may range in width from a fraction of an inch to 30 feet, or even more. In the Surprise mine sheared rock, carrying veins of galena, occupies a width of more than 100 feet at the 110 feet level.

In most of the lode channels the shearing stresses have found relief along one or more planes in a main zone of intense shearing, with the formation of a narrow band of crush clay (flucan) along the planes; the remainder of the rock in the main zone being brecciated. Shear planes, roughly parallel to the main planes, as well as irregular joint planes, were also formed in the rock for some distance outside the main shear zone.

That the ore-bearing solutions were introduced during a period of relief from pressure is indicated by the numerous vughs, the sugary, or crystalline and glassy character of the quartz, and the coarsely crystalline structure of the galena in the larger veins. In the main body of the lodes, where most affected by the ore-bearing solutions, the rock breccia has been recemented by silica, the cement now consisting of very finely crystalline quartz, coloured greyish by inclusions of partly digested rock, and in places containing minute specks of pyrite. As is usual in lode formations the boundaries of the ore-bodies are ill-defined, and the ore is not necessarily confined to the rock enclosed between two particular planes or "walls"; a shear plane, which forms a convenient hanging-wall at one point in a mine, may be used as a footwall at another point.

It is probable that shearing also took place along the lode channels subsequently to ore-deposition. In addition to the varied directions of the striæ on the shear planes, which in the Wheal Ellen mine are in places vertical, in places horizontal, thus suggesting local movement, the main shear planes are in many places marked by a few inches of crush clay, and by a band of crushed rock and clayey material, which carry no ore even where the lode is rich; moreover, bands of barren schist and occasional joint or shear planes occur in the body of the lode. It is difficult to explain why these should contain no ore, except on the assumption that they are subsequent to ore deposition.

*Classification.*—So far as could be judged all the lodes of this district are similar in structure and, with the exception of the Surprise lode, where barite veins are a conspicuous feature in the ore-shoot, in their gangue, though differing in their degree of silicification. Any classification is therefore neces-

sarily arbitrary. It is, however, convenient to group them according to the proportions of economic minerals present into:—

(a) Galena lodes carrying only negligible quantities of sphalerite (zinc blende or black jack), copper ores and pyrites—the Baddera, Surprise, and Wheal May lodes being of this type.

(b) Galena-sphalerite lodes, carrying galena and blende in nearly equal proportions with minor quantities of copper ores (chiefly chalcopyrite), pyrite, and marcasite—the Wheal Ellen belonging to this group.

(c) Copper lodes, in which galena and blende, if present, occur only in small quantities; in this group, however, pyrite and marcasite are probably present in fair quantities; the Wheal Margaret and Victoria may be taken as representative of this group.

As stated, this classification is purely arbitrary, the three groups grading into each other through intermediate types.

Detailed observations had, unfortunately, to be confined to lodes of the first two groups, as none of the workings on the Northampton copper lodes were accessible and practically all the ore had been removed from the dumps.

In the lodes of the first group the galena occurs usually as veins of coarsely crystalline material along the main shear planes; as coarse octahedral or cubo-octahedral crystals lining vughs and in places associated with glassy or sugary quartz; as veinlets of more finely crystalline material in the body of the lode; or, more rarely, in a fine-grained massive, in places schistose, form, probably a replacement of the rock along narrow zones of intense shearing. In the rich shoot in the Surprise mine groups of coarse galena crystals separated by tiny irregular veinlets of quartz occur over a width of 20 feet in places. The blende and pyrite usually occur as narrow veins or veinlets filling shear or joint planes outside the main body or in the poorer portions of the lode.

In those of the second group the galena occurs as before but blende is also found in fairly large masses in the body of the lode as well as occurring as in the first group. Pyrite occurs as in the first group, but marcasite is, in places, associated with galena in the body of the lode. In addition, finely disseminated chalcopyrite (altering to malachite in the oxidised zone) is fairly common in the more quartzose portions of the lode.

*Secondary enrichment.*—The secondary deposition of galena or blende on a large scale appears to be very doubtful, no deposits definitely formed in this way being known. As is suggested by their mode of occurrence, rich shoots such as those of the Surprise, Geraldine, and Baddera mines are most likely due to the primary deposition of galena from ascending solutions under favourable conditions.

On the other hand, the secondary deposition of copper sulphides on a large scale near water-level is of common occurrence. Whether this has taken place to any great extent in the Northampton lodes, it is, in the absence of accessible workings, impossible to say. That a certain amount of secondary deposition has taken place is, however, suggested by the presence of such minerals as covellite and chalcocite, though even these may be of primary origin.

### Other Minerals of Economic Value.

*Graphite.*—Graphite is found as sparsely distributed small flakes or groups of flakes in many of the pegmatites, also in a more concentrated form in a few lodes. A small graphite lode occurs on the Wheal May mine, two or three chains east of the southern end of the lead lode. In the deposits so far discovered the graphite has proved to be either too sparsely distributed or too intimately mixed with iron ore to be payable.

*Jarosite and alunite.*—These potash-bearing minerals have been found near Wibi Well on Udandarra Creek, on Lot 12. A shaft has been sunk to a depth of about 30 feet on the deposit at a point about 15 chains SW. of the well. The rock near the shaft is largely obscured, and the shaft was inaccessible, so that little information could be obtained as to the mode of occurrence of the minerals. Judging by the material on the dump, they are, however, associated with graphite and decomposed pegmatite; fragments of greenish-grey and light-brown opal were also found on the dump. The formation of the potash-bearing minerals is probably due to the action of sulphuric acid, from decomposing pyrite, on potash-bearing felspars of the granitic rocks.

*Mica.*—Muscovite flakes of moderate size occur in a few of the pegmatites, but no dykes carrying mica in sufficient quantity or sufficiently large to warrant working were seen.

*Tin and Wolfram.*—The occurrence of wolfram in the gneissic area near Galena has been reported, but whether in any quantity is not known. Wolfram is commonly associated with cassiterite in pegmatite veins and its occurrence, if of any extent, indicates the possible occurrence of tin-bearing veins, although these are usually associated with soda-bearing pegmatites rather than with potash-bearing types such as those of this district.

### Summary and Conclusions.

The metalliferous area consists of a belt of garnetiferous gneiss and gneissic granite, exposed by the denudation of the Jurassic rocks.

This belt has a probable length of at least 70 miles and a maximum width of about 15 miles.

The gneiss is intersected by a series of basic dykes with an average strike of about N. 32°E., and also by a series of pegmatite dykes of varied composition.

The lodes are genetically connected with the pegmatites and were formed during a period of relief from pressure under conditions of falling temperature. They represent the final stages of the period of igneous activity, of which the garnetisation of the older granitic rocks and the introduction of the pegmatites marked the earlier stages.

Many of the lodes occur at the junctions of basic and pegmatite dykes and the gneiss. Such junctions should therefore be carefully examined in the search for new lodes.

The rich shoots of galena are probably wholly or almost wholly of primary origin, but some secondary deposition of sulphides may have taken place in the copper lodes.

There is every probability of the lodes extending to very considerable depths below the limits of the present workings, and there is no evidence to show that rich shoots may not occur below those hitherto discovered.

At greater depths, however, the lead ore may change in character, becoming more compact and finer-grained and containing larger proportions of pyrite and chalcopyrite, and probably, also, of blende in lodes like the Surprise and Baddera.

In spite of the number of years since mining first started, the district has not been thoroughly prospected, and the recent discovery of the Surprise lode shows that by careful prospecting other rich lodes may yet be found.

## 12.—THE BARITE VEINS OF CRANBROOK, SOUTH-WEST DIVISION.

(F. R. Feldtmann.)

### Introduction.

Barite is the natural sulphate of barium, with the composition $BaSO_4$, and containing 65.7 per cent of barium oxide. It is usually white, creamy, or pale-grey in colour, and is distinguishable from other non-metallic minerals by its weight—its specific gravity ranging from 4·3 to 4·6.

Barite has been found at several localities in this State, notably at Breen's Camp* in the Pilbara Goldfield. Barite veins of fair size also occur in the Surprise lead mine at Galena, on the Murchison River.

The Cranbrook barite deposits were discovered about 1897 by J. H. Cox, a farmer in the district, whose attention was drawn by the weight of fragments of the mineral. Cox had a specimen of the mineral determined, but being informed that there was, at that time, little market for the mineral, made no attempt to work the deposits. In 1912 a specimen of the Cranbrook barite was sent to the Departmental Laboratory by C. J. R. LeMesurier. Analysis showed the specimen to consist of good commercial barite, but to contain sufficient iron oxide to give a creamy colour to the powdered mineral.

On May 10, 1920, a mineral lease (277$^H$) of 48 acres was pegged out by J. H. Cox, and on the 22nd of the same month a prospecting area (341$^H$) of 12 acres was pegged out by J. H. Cox, F. Leslie, and Maurice Brown as agents for L. M. Healy. A mineral claim (9$^H$) of 240 acres was pegged out on June 15, round the area previously taken up, by W. E. O'Neill, as agent for C. G. Stevenson and W. E. O'Neill; I was informed that earlier on the same day the ground covered by P.A. 341$^H$ and an area to the east was repegged by F. Leslie, as agent for L. M. Healy, as a lease of 48 acres. Instructions to examine the deposits were received on June 23, the examination being carried out between the 8th and 14th of July.

### Geography.

Cranbrook is situated on the Great Southern Railway, 274 miles from Perth. The barite deposits are from 3½ to 3¾ miles E. of the railway station and from 1¼ to nearly 1¾ miles ENE. of Sukey Hill—the westernmost extension of the hilly area of the Stirling Range.

The country round the town and for a considerable distance to the north and northeast is flat and swampy, and round Pootenup, seven miles NE. of Cranbrook, there is an extensive area of salt-lake country. The hilly area gradually widens as it extends eastward from Sukey Hill. In the immediate vicinity of the barite deposits, the country is undulating.

The timber is chiefly white gum and yate.

* Blatchford, Torrington, Mineral Resources of the North-West Division: W.A. Geol. Survey Bull. 52, pp. 28-29, 1913.

### Geology.

The country rock of the higher ground is a fine-grained pale-reddish or cream-coloured quartzite—presumably of the Stirling Range Series. On the tops of some of the hills, the rock resembles a dark-reddish sandstone with threadlike veinlets of quartz. This alteration is probably due to lateritic action. Owing to the quantity of debris covering the surface and the fact that the outcrops are seldom more than a few inches above the general surface of the ground, the strike and dip of the quartzites are difficult to determine. At a point about six chains E. of the north-east corner of M$^1$ C$^m$ 9$^H$, the strike appeared to be about N. 39° W. and the dip nearly vertical, but probably slightly to the east.

The flats are covered by superficial deposits which completely obscure the underlying rock in the area examined. It is possible, however, that they are in part underlain by an extension of the Miocene beds which outcrop about four miles E. of Kendinup and about 16 miles SE. of Cranbrook.

Other than those of the quartzites, the only rock outcrops seen were those of what are either two aplite dykes, or aplitic marginal portions of a granite mass, about 30 chains WNW. and 50 chains NNW., respectively, of Sukey Hill, their strike being approximately ENE.; and a small outcrop of epidiorite, probably a dyke of the Darling Range Series, on the track from the townsite to the surveyed pipe-track north of Location 1529.

### The Barite Veins.

*Occurrence.*—Up to the present, three barite veins have been found, two being in M.L. 277$^H$ and one—the smallest—in P.A. 341$^H$. None have so far been discovered in M$^1$ C$^m$ 9$^H$. The enclosing rock is quartzite, here stained slightly reddish by iron oxide, but on one wall of the small vein in P.A. 341$^H$ there is an irregular band of white material of clayey appearance, but probably consisting largely of minute quartz grains.

The largest vein is from about 1 to 4 chains NW. of the southwesterly portion of the southeast boundary of M.L. 277$^H$, and has been traced for a distance of about 380 feet. It strikes N. 83° E. and is practically vertical so far as exposed. The vein has been worked in a shaft about 10 feet deep, about 10 chains N.E. of the south corner of the lease; here it is approximately 4 feet wide near the surface but narrows slightly going down. The vein consists for the most part of finely-crystalline opaque white barite with irregular lenses of more coarsely crystalline translucent (occasionally transparent) barite consisting of more or less divergent groups of crystals ("crested barite"), and occasional irregular or broadly lenticular areas of the more coarsely crystalline mineral stained reddish by iron oxide; no other impurities were visible in the specimens examined. The vein has been cut in three costeans west, and two east, of the shaft. In one costean, about 150 feet west of the shaft, the vein is only a foot wide; it has been traced for about 155 feet further west. It also narrows east of the shaft. The vein appears to fork near the easternmost costean, the branch vein running a few feet south of the shaft.

The second vein has been traced from a point about 410 feet E. of the west corner of the lease to a point about 175 feet further E. It strikes about N. 85° E., and appears to be vertical. It has been worked in a shaft or pot-hole about 4½ feet deep, about 560 feet east of the west corner of the lease. Here the vein

is about 4 feet wide and consists of material closely resembling that of the first vein, but with, perhaps, a larger proportion of the more coarsely crystalline translucent barite; there appeared, also, to be less iron present. There are three costeans west, and one east, of the shaft; that immediately west of the shaft failed to cut the vein, which appears to bend northwards at this point.

The small vein in P.A. 341H has been worked in a shaft about 40 feet deep near the centre of the P.A. This vein has only been traced about 50 feet E. of the shaft. It strikes approximately N. 70° W. and dips about 80° N. It was about 18 inches wide in the shaft at the surface but gradually narrowed and apparently pinched at the bottom. This vein differs from the others in that it consists practically entirely of dense fine-grained barite, either very slightly translucent and of a creamy colour, or opaque and white, the opaque white mineral occurring on the walls or along cracks in the vein. Analysis of the opaque white material might show it to be of a different composition to the rest of the vein, but the vein appears on the whole to consist of purer material than the others.

*Origin.*—As to the origin of the veins, the evidence is very slight. Of the various theories which have been put forward as to the origin of different barite deposits, three are considered here, namely:—(1) Deposition on the sea-bottom of barite from organic remains, with later concentration in fissures by percolating solutions; (2) the action of oxidising pyrites on barium-bearing felspars or micas; (3) deposition from solutions of deep-seated origin.

(1) Samoilov*, after a careful examination of the barite deposits of northeast European Russia, which are associated with clay beds of Upper Jurassic age, came to the conclusion that the barite, which occurs as nodules in certain horizons, owed its origin to the accumulation on the sea-bottom of the remains of a group of Rhizopods—the Xenophyophora—the bodies of which contain small granules of barium sulphate. The occurrence of barite as a cement in sandstones has also been described by various writers.

No analysis has yet been made of the Cranbrook quartzite to prove the presence or absence of barite therein, but in any case it appears too compact and fine-grained to permit of the free circulation of ground-water through the body of the rock, as would be required to allow the concentration of sufficient barite to form veins of any size, even assuming that the compact nature of the rock near the surface is in part due to laterisation. Moreover, barium sulphate is highly insoluble. The formation of these veins through the concentration and deposition of barite derived from the surrounding quartzite is therefore unlikely.

(2) Barium sulphate is said to be formed when barium bicarbonate solution, formed by weathering processes from barium-containing felspars (two barium felspars, celsian and hyalophane, are known) and micas in crystalline rocks, comes into contact with oxidising pyrites.

Against the application of this theory to the Cranbrook veins are the facts that no igneous rocks occur near the deposits, nor was pyrites found anywhere in the vicinity.

(3) That barium may be derived from deep-seated magmas is shown by its occurrence in certain felspars and micas; averages of a number of analyses of igneous rocks show that, as a whole, they contain about twice as much barium as sedimentary rocks. Barite is also known to occur as a hot-spring deposit. In view, therefore, of the mode of occurrence of the Cranbrook barite, of the fact that overlying rocks may be affected by solutions from an igneous magma even when that magma is not otherwise manifested at the surface, and of the evidence against the first two theories it seems most reasonable to regard the barite as derived from a deep-seated magma. After a careful investigation, Tarr* concluded that the Missouri barite deposits, many of which occur as veins in dolomitic limestone, were deposited from solutions of deep-seated origin, and a similar origin has been assigned to the English barite veins.

## Uses of Barite.

Barite, after cleaning and grinding to a fine white powder, is used in the manufacture of white lead and zinc white, and as a base in other pigments—for paints of fine quality particularly fine-grinding is said to be essential. The mineral is also used for weighting wall-papers, linoleum, rubber goods, and fertilisers; for bleaching shoddy cloth; in the preparation of artificial ivory and in the manufacture of pottery and porcelain.

Barium hydrate is used in the refining of sugar, beet sugar in particular, and the carbonate, nitrate, or sulphate in the manufacture of certain glasses.

## Summary and Conclusions.

The Cranbrook barite occurs as veins in quartzite of the Stirling Range Series.

Three veins have so far been found, of which the largest has been traced for a distance of about 380 feet, its greatest width being about 4 feet.

Careful prospecting may reveal the presence of other veins of the mineral.

The barite is of good quality, but is, in places, discoloured by iron oxide; hand-picking would therefore be necessary.

The veins appear to be of deep-seated origin.

Regarding the depth to which the deposits may extend, the deposition of barite, notwithstanding the fact that it may be of deep-seated origin, is said by authorities to be confined to comparatively shallow depths. Some of the English veins, however, have been followed to a depth of 400 feet or even more. The only local evidence on this question is the pinching of the small vein in P.A. 341H at a depth of about 40 feet. It is, however, reasonable to expect that the larger veins extend to a considerably greater depth.

Analyses of Cranbrook Barite:—

| | A. Per cent. | B. Per cent. |
|---|---|---|
| Barium Sulphate ($BaSO_4$) ... | 96·38 | 98·69 |
| Calcium Sulphate ($CaSO_4$) ... | 0·34 | *Nil* |
| Iron Oxide ($Fe_2O_3$) ... ... | 0·39 | ·02 |
| Silica ($SiO_2$), etc. ... ... | 2·89 | 1·55 |
| | 100·00 | 100·26 |

* Samoilov, J. V., Palæophysiology: the organic origin of some minerals occurring in sedimentary rocks. Min. Mag. Vol. XVIII., No. 84, pp. 87–98, 1917.

* Tarr, W. A., The Barite Deposits of Missouri: University of Missouri Studies, Vol. III., No. 1, pp. 99–100, 1918.

## 13.—REPORTED GOLD FIND NEAR BILA, SOUTH-WEST DIVISION.

(F. R. FELDTMANN).

*Location.*—The spot shown me as the site of this find is in Lot 11 of Mr. W. J. George's Maroondah Downs Estate—forming part of Location 1—at a point, roughly, 2¼ miles SE. of Bila Siding*, on the Brunswick-Collie Railway, and approximately 15 chains S. of peg No. L73 on the Lunenburgh Road and 18 chains W. of the west boundary of Location 51. It is near the foot of the northern slope of a small, steep hill; a small watercourse runs in a northeasterly direction a few chains north of the alleged site.

The district is exceedingly hilly, the hills and ridges, which are well timbered with jarrah and, in places, red gum, being scored by a number of small creeks and watercourses, which run into Brunswick and Lunenburgh Rivers.

*History.*—A specimen of pyritous quartz, about 8lbs. in weight was, it was stated, picked up prior to the war by G. R. Smith, of Clifton Area, Brunswick, when kangaroo-hunting, in company with Herbert Piggott, of the same locality. On his return from the war, Smith, I was informed, gave portions of the stone to J. Ewing, Esq., M.L.C., who had two assays made, one giving an average of 1oz. 2dwts., the other of 10dwts. of gold to the ton. A Prospecting Area of six acres was pegged out under Mr. Ewing's direction. A small specimen, said to resemble the first, was, it was stated, picked up about 20 feet east of the first find by Mr. Cammilleri, of Busselton, and I was informed that two small pieces were picked up by two of Smith's brothers, in Mr. Ewing's presence, on the slope of the hill, about a chain south of the supposed site of the first find. When the news of the find leaked out, a small rush set in, and several areas were pegged round Smith's P.A., but it is said that those men who had had previous experience in prospecting or gold-mining returned without pegging out any ground.

*Geology.*—The country rock of this locality is a coarse-grained biotite granite, containing large porphyritic felspar crystals. The granite has been intensely sheared in places. A few small masses of basic rock, apparently epidiorite, some of which have also been sheared, occur in the granite; the boundaries of those seen were obscured, rendering it difficult to determine whether they were dykes or basic segregations in the granite. Some pegmatite veins, striking about eastnortheast, also occur; most of these consist almost entirely of granular glassy quartz with a few small crystals of felspar and occasional flakes of dark-greenish biotite; small flakes of pale yellowish-brown mica are also present in some of the veins.

*Examination of the site.*—I visited the site on August 30 in company with Mr. Frank George. No work was then being carried on. A small pothole, about four feet deep, had been put down on a small pegmatite vein, a few feet from where the first and also Mr. Cammilleri's specimens were said to have been found. The ground where the other two small specimens were picked up had also been examined, and a pegmatite vein, about a foot to 18 inches wide, near the top of the hill, had been knapped in places. Examination of the ground failed to reveal any vein or fragments of pyritous quartz.

The ground was revisited the following day in company with Mr. F. George and Mr. G. R. Smith. Mr. Smith showed me what he had left of the first specimen. This consisted of two small fragments of greyish quartz, one of which contained a large proportion of fine pyrites; a small quantity of pyrites was also present in the second piece. The ground was again examined, but without success, the only veins seen being the previously-mentioned pegmatites and another some distance to the southeast, and a little east of the west boundary of Loc. 51. Specimens of this vein and of that near the top of the first hill were dollied and panned off, but no trace of gold was seen in either.

The ground covered by the Prospecting Area, and the small watercourse to the north, were again unsuccessfully examined on September 1.

*Conclusions.*—The evidence as to the exact locality of the original find is somewhat unsatisfactory. As stated, no specimens in any way resembling that first picked up were found by me, and were it not for the fact that those picked up in Mr. Ewing's presence resemble the small fragments seen of the first, considerable doubt would exist as to whether that was actually found at the spot indicated by Reuben Smith, especially as I was informed that Mr. Piggott was of the opinion that the scene of the discovery was on or near Lot 1, near Bila Siding and some two miles northwest of the spot indicated by Smith. Moreover, the granite in the immediate vicinity of the site on Lot 11 shows comparatively little sign of shearing and vein-alteration. In view, however, of the other specimens picked up, it is probable that a systematic search on the north slope of the hill, above where the last specimens were found, would locate the vein from which they were derived, but from the small number of fragments found, the erratic distribution of the pyrites therein, and the fact that previous search has been without result, I am of the opinion that it would prove too small, and its gold content too erratic, to work profitably, especially as, owing to the difficulty of thoroughly prospecting the ground, some time might elapse before the vein was located.

That this district is auriferous has already been shown by the discovery, in 1898, of sheared pyritous quartz rock, containing traces of gold, on Rural Lot 45 of the Ditchingham Estate,* north of Olive Hill Siding, also by the discovery, about 1900, of gold near the head waters of Ferguson River, and of alluvial gold in the bed of a branch of Preston River.† None of these finds, however, proved payable, and there does not appear to be much hope of the occurrence of payable deposits in the district.

* *Vide* Lands Department Map 411A/40

## CHEMICAL AND MINERALOGICAL WORK.

(E. S. SIMPSON).

During the year 1920, the work of the laboratory has continued upon the lines followed during recent years, viz., in assisting by chemical and physical investigations as well as by experimental manufacture, in the development of the State's mineral resources and in the establishment of industries likely to use local raw materials. The large amount of data regarding the latter, which is now preserved in the laboratory is each year proving of greater value to established and prospective manufacturers.

*Maitland, A. Gibb, W. A. Geol. Survey, Ann. Rept. for 1898, p. 12, 1899.

† Maitland, A. Gibb, W. A. Geol. Survey, Ann. Rept. for 1900, p. 11, 1901.

With additional temporary professional assistance during part of the year, the staff was just sufficient to keep the routine work up to date and to devote a small amount of time to additional research regarding some unutilised minerals. Much more could have been done, were suitable accommodation and apparatus available, the present accommodation having long outgrown its utility and being a severe tax upon the health of the staff during the summer months, when the temperature in the coolest part of the building is frequently over 95°, and for several days in each year is over 100°. This state of affairs has been referred to on previous occasions and calls for immediate rectification by the housing of the staff in a brick or stone laboratory of modern design, with separate rooms for different investigations and abundant head room and ventilation.

The accompanying table gives an indication of the routine work carried out during the year. It shows a slight increase over that for the previous year.

TABLE SHOWING THE ROUTINE WORK CARRIED OUT BY THE GEOLOGICAL SURVEY LABORATORY DURING 1920.

| —— | Public Pay. | Public Free. | Geological Survey. | Other Departments. | Total. |
|---|---|---|---|---|---|
| Samples ... ... | 58 | 482 | 81 | 985 | 1,606 |
| Analysis— | | | | | |
| Complete ... ... | 2 | 7 | 21 | 9 | 39 |
| Mechanical ... ... | ... | 2 | ... | ... | 2 |
| Partial ... ... | 3 | 11 | 1 | 14 | 29 |
| Proximate ... ... | 4 | 8 | 6 | 9 | 27 |
| Qualitative ... ... | ... | ... | ... | 2 | 2 |
| Assays for— | | | | | |
| Antimony ... ... | ... | ... | ... | 1 | 1 |
| Arsenic ... ... | ... | ... | ... | 1 | 1 |
| Barium ... ... | ... | 1 | ... | ... | 1 |
| Cerium ... ... | ... | 1 | ... | ... | 1 |
| Chromium ... ... | 1 | 1 | 1 | ... | 3 |
| Copper ... ... | 12 | 66 | 3 | 18 | 99 |
| Gold ... ... ... | 30 | 198 | 14 | 809 | 1,051 |
| Iron ... ... ... | ... | 12 | 2 | 31 | 45 |
| Lead ... ... ... | 4 | 22 | ... | 4 | 30 |
| Lime ... ... ... | 1 | 8 | ... | 2 | 11 |
| Manganese ... ... | ... | ... | ... | 56 | 56 |
| Mercury ... ... | ... | 4 | ... | 1 | 5 |
| Molybdenum ... ... | ... | 1 | ... | ... | 1 |
| Nickel ... ... ... | ... | ... | ... | 1 | 1 |
| Nitrogen ... ... | ... | 5 | ... | ... | 5 |
| Petroleum ... ... | ... | 4 | ... | 7 | 11 |
| Phosphorus ... ... | ... | 14 | 2 | 4 | 20 |
| Platinum ... ... | ... | 4 | ... | ... | 4 |
| Potash ... ... | 1 | 4 | 1 | 95 | 101 |
| Silica ... ... ... | ... | 9 | 3 | 27 | 39 |
| Silver ... ... ... | 20 | 85 | 12 | 23 | 140 |
| Soda ... ... ... | ... | 1 | ... | 94 | 95 |
| Sodium Chloride ... | ... | 1 | ... | ... | 1 |
| Sulphur ... ... | ... | 3 | ... | 14 | 17 |
| Tellurium ... ... | ... | ... | ... | 1 | 1 |
| Tin ... ... ... | 1 | 11 | ... | 4 | 16 |
| Titanium ... ... | ... | 4 | 1 | ... | 5 |
| Tungsten ... ... | ... | 6 | ... | ... | 6 |
| Yttrium ... ... | ... | 1 | ... | ... | 1 |
| Zinc ... ... ... | ... | 2 | ... | ... | 2 |
| Mineral Determinations ... | 3 | 243 | 35 | 34 | 315 |
| Miscellaneous— | | | | | |
| Tests for: | | | | | |
| Burning ... ... | 3 | 1 | ... | ... | 4 |
| Calorific value ... | 7 | 1 | 6 | 5 | 19 |
| Clay ... ... ... | ... | 6 | ... | 3 | 9 |
| Concentration ... | ... | 2 | ... | ... | 2 |
| Grading ... ... | ... | 1 | ... | 2 | 3 |
| Graphite extraction ... | ... | 9 | ... | 1 | 10 |
| Metallurgical ... ... | ... | 2 | ... | 2 | 4 |
| Pigment ... ... | 1 | 32 | ... | 2 | 35 |
| Plaster ... ... | 1 | 8 | ... | 9 | 18 |
| Miscellaneous ... | ... | 2 | 1 | 12 | 15 |
| Total ... ... | 94 | 803 | 109 | 1,297 | 2,303 |

*Clays.*—An extensive research into the clays of extra-tropical Western Australia has been carried on for several years past, with the added help of a small subsidy from the Federal Government. The first stages of this were completed during the year and a start made to prepare a Bulletin which will give, in a convenient form for reference, the many valuable results obtained. Meanwhile, a short report upon each individual clay received has been issued to the person submitting it, and the general results of the research, as well as all the test pieces, are available to manufacturers on application. It was found possible during the investigation to give much help in the establishment of the roofing tile industry, in improving the locally made refractories and sanitary ware, and in laying the foundations of a white-ware industry.

*Gypsum.*—The search still continues for a high grade gypsum which will yield a pure white plaster. This matter was dealt with in my last report, when it was pointed out that our visible supplies of gypsum consisted chiefly of:—

(1.) Wind blown dunes of kopi (flour gypsum) always strongly tinted with organic matter and yielding a cream coloured to ash grey plaster;

(2.) Surface deposits of "seed gypsum," usually less strongly coloured than the kopi;

(3.) Subsurface layers of gypsum crystals embedded in the muddy beds of dry lakes. These usually give a good plaster when washed free from mud, a process which is simplified by the slow solution and coagulating effect of the gypsum itself.

The most promising deposit disclosed during the year was that of seed gypsum on the south shore of Lake Seabrook, an average sample of which had the following composition:

| | A. | B. |
|---|---|---|
| Gypsum, $CaSO_4 \cdot 2H_2O$ ... | 96·31 ... | 95·29 per cent. |
| Calcite, $CaCO_3$ ... ... | 1·50 ... | 4·44 „ |
| Insoluble in Acids ... | 1·88 ... | ·44 „ |

This yields a pure white plaster which sets quickly to a strong body, and is therefore suitable for all building and modelling purposes. A large tonnage is said to be available, but the deposit is very inconveniently situated, being 26 miles by road from Southern Cross, which is 237 miles by rail from Perth.

*Ochres.*—The establishment of a paint and distemper factory in Perth and the continued demand for ochres by Eastern States manufacturers have maintained the interest in the search for suitable earths and soft rocks for the production of red and yellow pigments. Thirty-five samples of such material have been dealt with. The wide discrepancy between the prices offered to producers for the crude rock and those charged the public for the same material ground into pigment has adversely affected the prospects of opening up local deposits on an extensive scale. Further difficulty is caused by the fact that no scientific colour standard has ever been adopted in the local trade, each maker and merchant being a law unto himself in the matter of colour nomenclature.

An exhibit of paints prepared in the Laboratory from local ochres was shown at the Royal Society's Conversazione in June, and again, with some additions, at the Western Australian Chemical Society's Conversazione in October. In both cases the exhibit attracted a large amount of attention.

*Asbestos.*—Excellent chrysotile asbestos has been known at Soanesville in the Pilbara Goldfield for many years and small quantities were mined at one time, but the expense of getting it to market from such an adversely situated deposit caused the locality to be abandoned. During recent years almost equally good chrysotile has been found in a more convenient locality at Hale's Well on the same field, and already a small tonnage has been placed on the market with

excellent results. During the present year a third find of the same mineral was found in this district at Eginba, and small quantities of short fibre (three-eighths to one-half inch) at Murrin on the Mt. Margaret Goldfield. F. R. Feldtmann has also detected minute veinlets of chrysotile in association with the actinolite asbestos at Bulong.

The only asbestos deposits now being worked are those of chrysotile at Hale's Well and anthophyllite at Walebing, east of Moora. It is to be noted that a recent price list received from America showed that from £500 to £600 per ton was being quoted for the highest quality chrysotile. Such a price is altogether exceptional and must not be expected to prevail for long.

*Potash Supplies.*—Further investigations have been made into the possibility of obtaining sources of agricultural and industrial potash within the State. The three most promising sources hitherto disclosed are:—

(1) Alunite, a basic sulphate of aluminium, potassium and sodium.
(2) Jarosite, a basic sulphate of iron, potassium and sodium.
(3) Glauconite, a hydrous silicate of iron and potassium.

The utilisation of alunite has been dealt with at some length in Bulletin 77, "Sources of Industrial Potash," and in my Annual Reports for 1918 and 1919. The chemistry of this mineral has not previously been worked out in detail, though it must necessarily form the basis of all its industrial applications. For this reason great interest attaches to the paper entitled "Contribution to the Chemistry of Alunite" read by Mr. H. Bowley, Assistant Government Mineralogist and Chemist, to the Royal Society during this year, and shortly to be published in their Journal. The use of this mineral in conjunction with lime for agricultural purposes is sufficiently encouraging for the Government to have authorised an extensive series of plot experiments with potatoes, which are now in progress. Later it is hoped to make further experiment with grapes, sugar beets, and other leading crops requiring much potash.

A very big deposit of jarosite having been discovered at Ravensthorpe (S.W. Division), a large number of analyses were made of the mineral and a series of experiments upon the utilisation of the contained potash.

This deposit is genetically related to the large pyrites vein which traverses the Ravensthorpe Range, the weathering of the vein giving rise to large quantities of ferrous sulphate and sulphuric acid, the latter attacking adjacent micas and felspars, and the combined iron alkali sulphate solution precipitating jarosite on reaching the surface of the ground on the slopes of Cordingup Gully.

Jarosite and natrojarosite are completely isomorphous, and the mineral in the deposit varies from a high grade jarosite to a fairly high grade natrojarosite, the former with 5.42 per cent. of acid soluble potash and 0.89 per cent. soda, the latter with 1.57 potash and 3.47 per cent. soda. The average of thirteen samples was: acid soluble potash 3.54 per cent. A complete analysis of a sample approaching this average gave:—

*Jarosite, Ravensthorpe.*

| | per cent. |
|---|---|
| $K_2O$ ... ... ... ... | 3·70 |
| $Na_2O$ ... ... ... ... | 1·97 |
| NaCl ... ... ... ... | ·44 |
| $Fe_2O_3$ ... ... ... ... | 38·83 |
| FeO ... ... ... ... | 2·25 |
| $SO_3$, $H_2O$ sol. 2·50 ... ... | 26·54 |
| ,, Acid sol. 24·04 ... ... | |
| $H_2O+$ ... ... ... ... | 8·79 |
| $H_2O-$ ... ... ... ... | ·20 |
| Insoluble ... ... ... ... | 17·40 |
| | 100·12 |

An approximate mineral composition deduced from these figures is:—

| | per cent. |
|---|---|
| Jarosite ... ... ... ... | 70·2 |
| Melanterite ... ... ... ... | 5·3 |
| Basic ferric sulphate ... ... | 4·1 |
| Limonite ... ... ... ... | 2·5 |
| Insoluble ... ... ... ... | 17·4 |
| Salt ... ... ... ... ... | ·4 |
| Moisture ... ... ... ... | ·2 |
| | 100·1 |

After calcining at a temperature of about 900° C. practically the whole of the potash present can be leached out as sulphate, leaving a rich red residue which forms an excellent pigment.

It has been proved that jarosite and natrojarosite are completely broken up by warm weak solutions (1.3N) of caustic soda or potash, the whole of the alkali going into solution. Very weak solutions (0.03N) of caustic lime also attack these minerals, the alkalis and sulphate radicle going into solution. It is hoped shortly to publish in another place the results of all the experiments made on this and other specimens of jarosite. The mineral looks quite promising as a source of industrial potash, as it is much less rare than was hitherto supposed.

## Mineral Notes.

*Mendozite* (hydrated sulphate of aluminium and sodium), Denmark and Bremer Bay.—This natural soda alum, not previously recognised in Australia,* has been found to constitute a large proportion of certain yellowish efflorescences occurring along the south coast on the outcrops of carbonaceous shales, possibly of Miocene Age, which include many nodules of marcasite. Specimens from these two localities contained approximately:—

| | Denmark. per cent. | Bremer Bay. per cent. |
|---|---|---|
| Mendozite ... ... | 74·3 | 26.7 |
| Natroalunite ... ... | 6·9 | Trace ? |
| Natrojarosite ... ... | Trace ? | 20·1 |
| Quartz and Silicates ... | 9·0 | 27·5 |

*Corundum* (oxide of aluminium), Southern Cross.—The discovery of corundum is not only of interest because it can be made into a useful abrasive, but also because the rare gem forms, sapphire and ruby, may be found with common corundum. Grey opaque corundum with occasional small specimens of rich blue corundum, not sufficiently translucent to constitute a gem, was found some years ago in sedi-

*A soda-potash alum has been described from Mt. Flinders, near Ipswich, Queensland.

mentary material at Jacob's Well, S.E. of York. This year a specimen was received consisting of grey corundum with a thick crust of semi-translucent rich blue material, sufficiently promising to warrant a search being made for gem sapphire. This specimen was said to have been obtained a little south of Southern Cross. As it was intergrown with coarsely crystallised mica it was evidently derived from a pegmatite. A corundum-bearing pegmatite was previously known at Ubini, between Southern Cross and Coolgardie.

*Halloysite* (hydrous silicate of aluminium), Dundas.—Halloysite is a mineral which is wax-like when dry, but like soft tallow when wet. It is an important constituent of ball clays and Fuller's earths, and occurs in small quantities in all clays, though seldom found in pure masses. In Fuller's earth it is the active cleansing constituent. Recently it has been strongly recommended as an ingredient of soaps, whose detergent properties and capacity for lathering are said thereby to be improved. A good sample of unusually pure halloysite suitable for this purpose has been received from the Dundas district.

*Manganese Ore,* Horseshoe.—The existence of commercially important quantities of psilomelane at Horseshoe has been known for some years, and in my annual report for 1919 an analysis of a picked specimen was given. During this year the two adjacent deposits were examined and sampled by the State Mining Engineer, and the samples were analysed in the Laboratory. They consist of intimate mixtures in variable proportions of psilomelane (hydrated manganite of potassium and manganese) and limonite (hydrated oxide of iron), forming a "saddle" across the Horseshoe Range. Individual samples from the main (southern) ore body varied from

| | | | | |
|---|---|---|---|---|
| | Mn 24·16% | Fe 34·49% | $SiO_2$ | 0·63% |
| to | Mn 50·81 | Fe 7·61 | $SiO_2$ | 0·36 |

The average compositions of eleven of the better samples from the southern deposit and of all four samples taken from the much smaller northern deposit were:—

*Manganese Ore, Horseshoe.*

| | Southern deposit. per cent. | Northern deposit. per cent. |
|---|---|---|
| $MnO_2$ | 66·32 | 75·78 |
| MnO | 6·04 | 3·51 |
| $Fe_2O_3$ | 14·59 | 8·05 |
| $SiO_2$ | ·90 | ·68 |
| CoO | ·23 | ·24 |
| NiO | *Nil* | trace |
| BaO | ·62 | ·43 |
| $K_2O$ | 1·97 | 2·54 |
| $Na_2O$ | ·30 | ·30 |
| CaO | *Nil* | *Nil* |
| MgO | ·25 | ·10 |
| $Al_2O_3$ | 2·43 | 2·84 |
| $TiO_2$ | ·12 | ·07 |
| $CO_2$ | *Nil* | *Nil* |
| $P_2O_5$ | ·17 | ·11 |
| $SO_3$ | ·25 | ·10 |
| $H_2O$ + 100° | 5·76 | 4·55 |
| $H_2O$ − 100° | ·67 | ·69 |
| | 100·62 | 99·99 |
| On dry Ore: | | |
| Total Mn | 46·90 | 50·63 |
| Fe | 10·28 | 5·68 |
| P | ·074 | ·048 |
| | ·101 | ·040 |

No gold or silver could be detected in either deposit. They have been very fully described by Mr. A. Montgomery in a pamphlet issued by the Government Printer in 1920. He estimates that over a million tons of marketable ore are in sight within 12 feet of the surface.

*Bitumen,* Texas Station, Kimberley Division.—Some notable specimens were received from the bed of the Negri River at this locality consisting of limestone and calcareous claystone with ramifying veins of a bright black bitumen, resembling glance pitch. The veins range from about one inch in width down to the thickness of a sheet of paper. Some of the carefully selected black mineral was found to be brittle, not sticky; it ignited and burnt freely, and did not melt at temperatures up to 300° C. Analyses showed:—

| | per cent. |
|---|---|
| Moisture | 0·37 |
| Volatile matter | 41·54 |
| Fixed carbon | 56·27 |
| Ash | 1·82 |
| | 100·00 |

A low temperature distillation test showed that the volatile matter was made up of:—

| | per cent. |
|---|---|
| Water | 1·74 |
| Oil | 19·89 |
| Gas | 19·91 |
| | 41·54 |

The gas burnt freely with a slightly luminous flame. The oil had a density of 0.758 at 25° C., and a low viscosity. It was dark brown in colour, translucent and fluorescent.

The calorific value of the mineral was 16,570 B.T.U. Treatment with carbon bisulphide in the cold extracted 15.38 per cent. of a bright black bitumen.

*Publications.*—During the year the sixth of a series of monographs on regional mineralogy was written. This deals with the minerals of the Kimberley Division. The other papers of the series are:—

1. Kalgoorlie-Boulder ... Published 1912, Bulletin 42
2. Meekatharra ... ... Published 1916, Bulletin 68
3. Westonia ... ... Published 1917, Bulletin 71
4. Comet Vale and Goongarrie ... ... Written 1918: Not yet printed
5. Ashburton and Gascoyne Valleys ... Written 1919: Not yet printed.

As time affords, papers are submitted to scientific societies giving results of importance which emerge during the course of the work of the laboratory but which are not suited for inclusion in Departmental Bulletins. During 1920 a paper entitled "A graphic method for the comparison of minerals with four variable components forming two isomorphous pairs" was submitted to the Mineralogical Society (London) and has since been printed in the Mineralogical Magazine. Papers entitled "Cobaltiferous Epsomite at Parkerville," and "Notes on Staurolite from the Mogumber District" were read before the Royal Society of Western Australia, as also was a paper "Contributions to the chemistry of Alunite," by Mr. H. Bowley. These will shortly appear in print in the Journal of the Society.

## PETROLOGICAL WORK, 1920.

(R. A. FARQUHARSON.)

The work for the past year, which has been both large in amount and varied in character, may be conveniently summarised, as usual, under the following heads:—

I. Determinations and Reports for the Geological Survey Staff.
II. Determinations and Reports for Mine Managers, for other Departments, for Prospectors, and the public generally.
III. Miscellaneous.

I.—*Determinations and Reports for the Geological Survey Staff*:—

As in previous years, a considerable part of the work has been the determination, description and correlation of rocks collected by the officers in the field, discussions with the officers concerned of the geological problems of each district, and, after careful consideration of these problems in the light of the field occurrence of the rocks and the ascertained microscopic characters, an interpretation of all the facts disclosed. The results of this work are that, so far as field data and specimens can be obtained, the general and mining geology of the various districts and the mapping, which should be, and is, of the utmost importance to prospectors and in live mining fields to mine managers, is as accurate as possible.

Owing, however, to the revival in mining during the year, due to the discoveries at Hampton Plains, Mount Monger, etc., a larger part than usual of the work has been investigations for mine managers of problems arising in the course of their work, upon the solution of which the future development of their mines, to a large extent, depends, and investigations for prospectors anxious to know what class of country they are in and what is its geological relation to already proved areas in its vicinity.

The total number of sections cut and registered during the year was 314, but in addition to these, I have myself cut 294, or over 100 more than in any previous year; a number due to the large increase in the work for individual mines and prospecting shows.

The suites of rocks examined include those from—

1. Noongall (Melville), Yalgoo Goldfield:—

These rocks are chiefly greenstones, acid rocks, and gabbroid rocks.

The greenstones comprise—

(a) Fine and medium-grained metamorphosed dolerites, some of which are quartzose, and some of which are both granulated and foliated.

(b) Coarse-grained rocks that are probably metamorphosed gabbros.

(c) More basic varieties, of which some were almost certainly ultra-basic and are now tremolite-chlorite rocks and hornblendites.

The greenstones vary greatly in the amount of shearing visible to the naked eye, some being extremely foliated and others almost massive. A few exceptional facies occur which may be due in part to silicification, in part to assimilation of incorporated greenstone fragments by granite.

The acid rocks comprise quartz porphyries, granite porphyries, biotite microcline granite and pegmatite dykes. It is in the pegmatites, or rather in the quartz genetically connected with them, that the bismuth ores of Melville are found.

The gabbroid rocks are probably related to the later basaltic dolerites of other centres. Some are decomposed with amphibolised augite, and others are micro-pegmatitic quartz epidiorites with relics of original augite.

2. Rothesay:—

The country at Rothesay consists of a mass of basic and ultra-basic igneous rocks (greenstones) which have been more or less sheared, a few pegmatite dykes and a few basaltic dolerite dykes. The greenstones include epidiorites and hornblende schists, hornblendites, tremolite rocks and serpentines. The serpentines contain tremolite probably derived from olivine. From the field occurrence of the rocks, from their mineral composition and structure, it would appear that all varieties are but differentiations from one magma.

The basaltic dolerite dykes intrude the zoisitic epidiorites and all cut through a quartz vein on the British Queen Lease.

3. Payne's Find (Goodingnow):—

The rocks occurring in this locality are:

(a) Greenstones: epidiorite, hornblende schist, serpentine.
(b) Hornblende-biotite gneiss.
(c) Foliated quartz porphyry.
(d) Granite, porphyry, aplite and pegmatite dykes.

The greenstones and serpentines are perhaps contemporaneous, but their relation to the gneiss is unknown. Some of the acid dykes intrude the greenstones and are hence younger than the latter, and as some of them also cut through the quartz veins, they are of later age than these.

The epidiorites and hornblende schists are all dark-green in colour, fine in texture, and distinctly sheared, and a few contain large phenocrystal plates of felspar broken down by dynamic agency. The serpentines are bluish-green in colour, soft and mostly massive, with an appearance on decomposition suggestive of fragmental structure. Both epidiorites and serpentines have been dynamically metamorphosed, both rocks are cut by acid dykes, and the serpentines are probably basic segregations or differentiates from the magma that gave rise to the greenstones.

The hornblende-biotite-gneisses are the most interesting rocks at Payne's Find, both economically and geologically. In general appearance they are all foliated, dark-grey in colour, and composed of strings of biotite or of hornblende or of both minerals, separated by lighter-coloured strings of felspar and quartz or of felspar alone.

Two varieties are recognised, a foliated, granulated hornblende gneiss with a little biotite and a few grains of quartz (in addition to felspar elongated parallel to the foliation) and a similar rock in which biotite is the chief constituent and hornblende much less common, and in which quartz is very common in grains and elongated rectangular plates. The quartz veinlets in the Payne's Find gneiss are very suggestive of a *lit par lit* injection of quartz into a finely foliated gneiss, and, as dynamic metamorphism combined with quartz injection acting on the hornblende gneiss would produce finer foliation and lenticles of quartz, and would convert the hornblende (and chlorite) to biotite, it is most probable that the two varieties of gneiss are genetically the same. The recognition of a foliated granodiorite differing but slightly from many specimens of the hornblende-

biotite-quartz gneiss suggests that the original rock of the gneiss was granodioritic.

The important feature of these gneissic rocks is their very strong resemblance to those at Westonia which are associated with high gold values, and the very marked differences between them and any of the gold-bearing rocks from the Eastern Goldfields. It would appear that the Payne's Find and Westonia gneiss belong to a totally different rock suite from the rocks of Kalgoorlie, Southern Cross, etc., that they are genetically related, and that, in consequence, the country west and north-west of Westonia and between the latter and Payne's Find is well worth prospecting.

The foliated quartz-porphyry is a light-yellow, highly sheared and weathered rock of somewhat doubtful character. It is older than any of the acid rocks noted below and recalls the gold-bearing porphyries of Leonora District.

4. Neighbourhood of Mt. Burges:—

These specimens were collected by Mr. Clarke, partly to elucidate his own work and partly to enable blanks in the general geological map of Western Australia to be filled in.

The rocks comprise—

Actinolitic chloritic amphibolites and hornblendites,
Schistose or foliated epidiorites,
Chlorite rock,
Hornblendic porphyrite,
Serpentines (some chloritic),
Finely fibrous fine-grained amphibolite derived from a basaltic dolerite.

5. Payne's Find, Kurrawang Woodline:—

These rocks were collected by Mr. Talbot to enable an investigation to be made into the origin of the jaspers. Evidence was obtained proving that a gradual passage can be traced from a fine-grained amphibolite or epidiorite, through a severely sheared facies of this rock, to a facies still severely sheared but in which the green colour is replaced by brown, and thence to a foliated highly ferruginous jasper. There can be no doubt from the evidence afforded by this suite that some at least of the jaspers are but highly sheared and metamorphosed zones in the epidiorites. It is intended shortly to publish a paper embodying the facts accumulated to date in regard to these rocks.

6. Boogardie:—

An examination was made for Mr. Feldtmann of quartz collected by him from the Mount Zion mine and of specimens obtained from the same mine by Mr. Jutson, with the object of throwing light on the origin of the quartz and of the gold. The results have been embodied in the report by Mr. Feldtmann on the Mt. Zion mine.

7. Mount Monger and St. Ives:—

From time to time small suites of rocks were sent down by Mr. Clarke for determination and correlation to enable light to be thrown on the mining operations in these two localities, and to enable short interim reports to be written by Mr. Clarke for the benefit of prospectors and small leaseholders. The results of examinations of these rocks have all been embodied in Mr. Clarke's reports, pending the publication of the general geological report on the Mt. Monger and St. Ives field.

The rocks from Mt. Monger and St. Ives obtained by Mr. Clarke include: quartz porphyries, sheared micacised quartz porphyries, sheared micacised quartz porphyrites and chloritised porphyrites, coarse and fine serpentines, fresh olivine serpentines, talc rock and talc schist, deep green chlorite rock, zoisitised quartz epidiorite, black quartz porphyrite, fresh ophitic dolerite, olivine basaltic dolerite or porphyritic olivine picrite, coarse fibrous epidiorite, talc serpentine and talc-chlorite schist, graphitised phyllitic slates, sheared porphyritic fragmental rocks, etc.

Details of the occurrence of the rocks, descriptions and correlations of them, will be found in Mr. Clarke's reports and in the general report on the whole field now in course of preparation.

8. Paris Mine:—

In this mine it was found that the nature and relations of the rocks would throw much light on its mining geology. Specimens were therefore examined for Mr. Clarke to determine these, and it was found that all the rocks were facies of the same mass and were but varieties of epidiorite.

9. Country between Long. 122° 30′ and 123° 30′ E., and between Lat. 25° 30′ and 28° 15′ S., in the Central and Eastern Divisions:—

The rocks from this district were collected by Mr. Talbot and comprise:—

Boulder clay and grey granite and gneiss boulders.
Limestones.
Conglomerates, grits, sandstones, quartzites and shales.
Granites (pink and grey microcline).
Epidiorites (some epidotised, some foliated).
Hornblendites and hornblende schists.
Quartz-porphyries and pegmatites.
Hæmatite-quartz schists.
Felspathic and chloritic gabbro.
Dolerites (as dykes).

The details of the rocks have all been embodied in Mr. Talbot's report.

10. Northampton Lead Mines, Jarosite Deposit at Kalgan River, etc.:—

Short investigations for officers of the Staff have been made from these and other localities, and the results appear in their reports.

11. Sectioning the general collection of rocks from the Mines, the Prospecting Shows, and the Country of Mount Monger and St. Ives:—

These rocks have been collected by Mr. Clarke in addition to those of the small suites sent down from time to time during the course of his work for the clearing up of problems of immediate interest to those engaged in mining and prospecting on the field. Fully 130 sections have had to be prepared, and the majority of these were ready by the end of the year. The results of investigation of these form part of the work of 1921 and will be embodied in the Bulletin on Mount Monger and St. Ives.

*II.—Determinations and Reports for Mine Managers, for other Departments, for Prospectors, and for the Public generally*:—

A. For Mine Managers, for other Departments, and for Prospectors.

Owing to the new discoveries at Hampton Plains and Mount Monger and the consequent renewed interest in prospecting and mining in other parts of the State, the number and variety of requests for petrological information from mine managers and others engaged in mining and prospecting shows a distinct increase on the figures for 1919, and again

bears witness to the importance of the results of microscopical research in the investigation of the problems arising in actual mining operations and in operations other than mining which may give rise to discoveries of great value to the State.

The work carried out under this head includes:—

1. Examination of Bore Cores from the Edna May Consolidated Mine for Mr. Stokes, and correlation of these with the rocks of the Edna May Lens.

2. Determination of and notes on rocks from the Golden Hope, and Agnes May mines, and from St. Ives and the Rothesay mine for Mr. C. M. Harris.

3. Determination and notes on rocks from Block 45, Hampton Plains. These were sent in by a syndicate of Returned Soldiers with a request for all information that could be given concerning both the rocks and the contained minerals.

4. Determination of and notes on rocks from the Edna May Golden Point Lease at Hampton Plains and from the Golden Hope Mine for Mr. H. G. Stokes.

5. Determinations of and notes on rocks from the Hampton Celebration Mine for Mr. Hawkins. After inquiry as to whether the work could be done, the manager of the Celebration forwarded fourteen rock specimens for determination and correlation and any other information that could be given to assist him in interpreting the mining geology of the mine.

Of the fourteen rocks all except one were more or less altered and decomposed. In fact, so decomposed were they that by ordinary methods only four of them admitted of being sectioned, and, had it not been for the employment of a process of mine for the treatment of decomposed rocks, only these four could have been determined with any degree of accuracy. By the use, however, of special methods all were sectioned and 36 sections were examined. As pointed out in the report, the determination of very decomposed rock depends entirely on whether the decomposition is so far advanced that all relics of original structure and composition have been obliterated. If any relict structures remain, the rock can be determined with a greater or less degree of accuracy according to the definiteness of these structures. If no relict structures are recognisable, then nothing of any practical value can be said about the rock, for though the present composition of the specimen may be made out, as a product of alteration it may have been formed from any one of several different types. Of the fourteen samples, ten were definitely determined, but the other four were of doubtful character.

The rocks comprised:—

(a) Very fine-grained quartz-porphyry.
(b) Felsitic quartz-porphyry.
(c) Sheared or schistose decomposed quartz-porphyry.
(d) Decomposed forms of a serpentine with veinlets of chloropal.
(e) Sheared coarse-grained epidiorite, very similar to that forming the country rock of the White Hope Mine.
(f) Very decomposed epidiorite.
(g) Several somewhat doubtful clayey rocks.

All information possible was given Mr. Hawkins, and the results were discussed with him in the light of his knowledge of the peculiarities of the mine.

6. Sectioning and determination of rocks from Mount Monger for State Mining Engineer. These included the well-known "chlorite rock," fresh olivine serpentines, and talc schists and talc chlorite schists.

7. Determination of rocks for Mr. Blatchford from Ives' Find, Mount Monger, and Mount Goddard.

These comprised—

Fine-grained serpentines.
Talc-chlorite rocks.
Carbonate-chlorite-quartz rocks probably derived from epidiorites.
Chloritised and sheared quartz-dolerite greenstone.
Quartz porphyries.
Porphyritic olivine picrite (or fine-grained basaltic olivine dolerite).
Black albitic porphyrite.
Sheared green porphyrite.

The relations of the rocks were fully discussed with Mr. Blatchford previous to the writing of his preliminary report, and appear in his report and on his maps.

8. Determination of rocks from four miles north of the Celebration Mine for Inspector Gourley. These were prospectors' samples about which information was desired in regard to their relationships to the rocks of proved auriferous areas in the neighbourhood. They comprised chloritised carbonated quartz-epidiorites, fibrous tourmaline, quartz with tourmaline.

9. Report on samples of ferruginous clayey greenstones as a source of pigments and iron ore for the State Mining Engineer. These specimens were all merely very much weathered somewhat schistose greenstones, which by oxidation have had the ferromagnesian decomposed with the production of brown iron ore. They were too hard and gritty for pigments and too poor in iron to be of any value as an iron ore.

10. Determination of and notes on rocks from Whim Well and Mons Cupri for Mr. Blatchford. This work was undertaken in connection with the report by Mr. Blatchford on the ore resources and the mining geology of these mines, and necessitated the overhaul of specimens formerly collected from the same localities. The rocks included chloritic sheared slates, acid porphyry, granodiorite, a fine-grained volcanic agglomerate or tuff, black chloritic slates, etc. The results were discussed with Mr. Blatchford in the light of the occurrence of the specimens and of the ore.

11. Determination of rocks from the Wilga Coal Bore for the State Mining Engineer, as to the probable occurrence of further seams, the proximity of the bed rock, and the character of the limestone band.

12. Determination of and report on samples from the Robert Street Water Bore, Osborne Park. The samples so far examined are as follow:—

0ft.-31ft.:—
A white quartz sand, fine granular and somewhat similar to the Lake Gnangara sand.

31ft.-39ft.:—
A brown quartz sand of medium to fine grain.

39ft.-89ft. 6in.:—
Brown ferruginous sand, largely consolidated into friable sandstone by brown oxide of iron.

89ft. 6in.-97ft.:—
A brown quartz sand with coarse and fine grains.

97ft.-101:—
A small amount of round and sub-angular brownish quartz grains forming a sand; pieces of dirty-brown clay in part gritty; pieces of

black carbonaceous gritty clay or silt; pieces of sandy clay or silt.

101ft.-105ft.:—
Greenish-brown limey clay (marl) with grains of quartz and fragments of felspar, and with fragments of small shells. The greenish hue is probably due to glauconite.

105ft.-200ft.:—
A black very sandy carbonaceous clay or silt.

360ft.-375ft.:—
Fine greenish-white glauconitic sand.

375ft.-450ft.:—
Black carbonaceous grit.

450ft.-470ft.:—
Typical fine-grained greensand.

470ft.-490ft.:—
Black gritty carbonaceous clay, possibly in places glauconitic, with pyritic nodules.

490ft.-538ft.:—
Medium-fine quartz sand.

538ft.-550ft.:—
Black carbonaceous shaly mudstone.

550ft.-600ft.:—
Coarse quartz sand, in part compacted.

600ft.-625ft.:—
Same as at 538ft.-550ft.; black carbonaceous mudstone.

625ft.-645ft.:—
Medium coarse to fine-grained sand with microcline felspar grains.

645ft.-652ft.:—
Coarse gritty carbonaceous mudstone.

652ft.-676ft.:—
Medium coarse sand.

676ft.-681ft.:—
Carbonaceous shaly mudstone with pyritic nodules.

13. Examination, determination, and registration of the core from a bore put down at Collie by the Public Works Department.

B. For the public generally:—

1. Determination of rock in a water bore from Karonie in connection with the prospects of obtaining a water supply. The rock, though resembling a black shale, proved to be a decomposed dolerite.

2. Determination of and report on samples of opal, with hints on the occurrence of precious opal. It was pointed out that precious opal may always be looked for in deposits of common opal.

3. Determination of rocks from the Mica Find near Mount Morrison for Mr. Underwood, and discussion with him on the characters, occurrence, and origin of the mineral.

4. Determination of and notes on additional rocks from the Kimberley Division. These were old specimens sent in for the collection from time to time by prospectors and travellers and a few specimens collected by E. T. Hardman traced to some drawers in the Museum. The rocks include: Fresh ophitic dolerites, epidiorites, basaltic dolerites (some vesicular), quartzites of several varieties, diorites and quartz-epidiorites.

5. Determination of and report on supposed oil stones from near Kelmscott, and on a rock as a source of pigment.

6. Determination of rocks in connection with the occurrence of glance pitch, sent in by Mr. Durack. This occurrence is of some importance in that a certain amount of petroleum has been distilled from the pitch, and hence the associations of the mineral are specially worthy of note. The rocks proved to be very decomposed basaltic dolerite in places more or less carbonated.

7. Investigation of the probable place of origin of a rock for the Wallman Pistol Company. In a consignment of pistols from Spain, some rock had been placed as a make weight in the place of pistols, and the company were desirous of discovering whether the rock had probably been inserted in Spain or elsewhere. The rock was an organic limestone (foraminiferal), and by reference to the geological map and accounts of the geology of Spain it was possible to show that, as the actual rock found in the consignment occurred in great extent in the vicinity of the town in which the pistols were manufactured, and is rather uncommon, and does not occur in Western Australia, it was most probably inserted in that town.

8. Determination of rocks from Broome. These comprised basic slag, decomposed epidotised basaltic dolerite, epidotised vesicular dolerite, epidote and chalcedonic quartz, etc.

### III.—*Miscellaneous.*

While the above is an outline of a large part of the work which occupied my attention during the year, it by no means represents the whole of it. In addition to investigating problems in general and mining geology from the standpoint of the rocks, I have been called on to devote quite a considerable amount of time to the following:—

1. Determining specimens of rocks and minerals for prospectors, the Mines Department, and the general public, and giving information both orally and in notes on the values of ores and their mode of occurrence and associations. Fully 190 determinations of this nature were made during 1920, and in quite a number of instances short reports on the minerals were written for prospectors.

2. Writing the Annual Report for 1919.

3. Correcting proofs of reports and bulletins, both in typescript and in printed form, and editing Bulletin 83.

4. Registering rocks and minerals, record work and sectioning rocks.—This work devolved on me during Mr. Welsh's absence on long service leave.

5. Cutting sections of minerals and rocks. During 1920 I have myself cut 294 sections for microscopical examination from mine managers, prospectors, and the public, and these are exclusive of those cut and registered for the collections.

6. Repairing the grinding machine.—The old belting, which latterly had certainly not given satisfaction, having worn out, I had it replaced by horizontal shafting, flat pulleys, a starting switch, and a new frame, and the machine is now much more efficient than it ever has been.

7. Arranging the rock and mineral collections of the Survey.—As opportunity could be made, the whole of the rocks and minerals belonging to the Survey have been arranged in consecutive numbers and a plan has been drawn up showing the exact drawer any particular registered specimen may be found in. This was a work of some magnitude, for approximately 17,000 specimens had to be handled, but the time expended on it is more than compensated for by the celerity with which any specimen can now be obtained.

8. Preparing collections of rocks and minerals of the State for prospectors, the general public, etc. During the year no fewer than eight collections have been made up and despatched, this number including, amongst others:

(1) A collection of Western Australian rocks for use in teaching agriculture at the Narrogin State Farm.

(2) Collections of the ores of base metals and rocks for soldier prospectors.

(3) A collection of economic minerals of the State for Sheffield University.

## GEOLOGICAL SURVEY MUSEUM AND COLLECTIONS.

The Geological Survey collections, for the reasons which have been fully set out in previous Annual Reports, remain precisely in the same unsatisfactory condition as heretofore.

The accessions during the year 1920, which included rocks, minerals, fossils and suites of bore cores, amounted to 379, bringing the total number of specimens registered up to 17,009, most of which are in duplicate.

The number of micro-sections cut and registered during the period under review was 314, which brings the total number of micro-slides up to 4,542, for the storing of which a new cabinet is essential.

Special acknowledgment must be made of the donation to the Geological Survey collections of the following:—

| Registered No. | Donor. | Mineral. | Locality. |
|---|---|---|---|
| 2620 | D. Lambie ... | Marble, Garnets | Ashburton River, N'th-West Division |
| 2630 | A. Stephens ... | Gypsum ... ... | Stuart Range, 148 miles North of Tarcoola, South Australia |
| 2629 | C. F. Vickery | Muscovite Mica | Prothero Lead Mine, *via* Geraldton |
| 2634 | C. J. LeMesurier | Barytes ... ... | Four miles west of Cranbrook |
| 2635 | Do. ... | Calcite ... ... | Near Cave House, Yallingup |
| 2768 | A. Ballantine... | Gypsum Crystal | Salt Lake, west of Wougan Hills |
| 2771 | — Rae... ... | Rutile Needles on Chlorite Rock | Mt. Monger |
| 2802 | F. Piesse ... | Tinstone with Tourmaline | Near Boyanup, South-West Division |
| 2820 | E. S. Simpson | Brown Iron Ore... | Main Quarry, loc. 17564, Clackline |
| 2862 | F. Ward ... | Epidote Crystals with Quartz Crystals | Ashburton River, N'th-West Division |
| 2504 | A. Montgomery | Stalactitic psilomelane and Limonite | Main Manganese Deposit, Horseshoe. |
| 2607 | Inspector Gourley | High grade Alunite | Ende and Currans claim, Breakaways, Kanowna. |
| 2848 | C. M. Harris | Sulphide ore ... | 70ft. level, Golden Hope, G.M., near Mt. Goddard. |

Eight mineral collections, comprising not less than 20 specimens each, were made up and distributed.

Owing to the extent to which the reserve of duplicates have been drawn upon, there is very little now left available for such purposes.

### *Library.*

The Geological Survey Library was enriched during 1920 by direct gifts from cognate institutions throughout the world of 838 publications, in addition to which 159 volumes were added by purchase and one volume bound. The full titles are recorded in the official catalogue.

The distribution of the official publications of the Geological Survey during 1920 amounted to 6,867.

## PUBLICATIONS.

The publications for the year 1920 have been as follow:—

Annual Progress Report for the year 1919.

There are, in addition, the following in the hands of the Government Printer:—

Memoir No. 1.—The Mining Handbook of Western Australia, of which the following Chapters and Sections have been issued:—

Chapter I.—A Summary of the Geology of Western Australia.

Chapter II.—

Sections—Antimony.
Artesian Water.
Bauxite.
Coal.
Copper.
Iron.
Lead.
Magnesite.
Manganese.
Mica.
Molybdenite.
Rare Metals.
Rutile.
Tin.
Tungsten.

Chapter III.—The Physiography of Western Australia in its Relation of Prospecting and Mining.

Chapter IV.—Minerals of Economic Value.

Chapter V.—Petrology.

Chapter VI.—Relation of the Law to Prospecting and Mining in Western Australia.

Chapter VII.—Assistance to Prospecting and Mining.

Chapter VIII.—Glossary of Some Terms used in Mining, Field, and Physiographical Geology.

The publication of the following Bulletins has been authorised, and these are being proceeded with as rapidly as exigencies will at present permit:—

LXXVIII.—The Mining Geology of Kookynie, Niagara, and Tampa, North Coolgardie Goldfield: by J. T. Jutson, Field Geologist.

LXXIX.—The Mining Geology of Comet Vale and Goongarrie, North Coolgardie Goldfield: by J. T. Jutson, Field Geologist.

LXXX.—The Mining Centres of Quinn's and Jasper Hill, Murchison Goldfield: by F. R. Feldtmann, Field Geologist.

LXXXI.—The Geology and Mineral Resources of the Yalgoo Goldfield, Part I. The Warriedar Goldmining Centre: by F. R. Feldtmann, Field Geologist.

The following have been completed:—

LXXXIV.—The Field Geology and Broader Mining Features of the Leonora-Duketon District, including Parts of the North Coolgardie, Mount Margaret, and East Murchison Goldfields; and a Report on the Anaconda Copper Mine and Neighbourhood, Mount Margaret Goldfield: by E. de C. Clarke, Field Geologist.

LXXXV.—A Geological Reconnaissance of Part of the Ashburton Drainage Basin, with Notes on the Country Southwards to Meekatharra: by H. W. B. Talbot, Field Geologist.

LXXXVI.—The Geology and Mineral Resources of the Yalgoo Goldfield, Part II., the Geology of

Goodingow (Payne's Find), Rothesay, and of Noongal (Melville): by E. de C. Clarke, Field Geologist.

LXXXVII.—A Geological Reconnaissance in the Country between Longitude 122° 30′ and 123° 30′ East, and between Latitude 25° 30′ and 28° 15′, in the Central and Eastern Divisions: by H. W. B. Talbot, Field Geologist.

There are in active preparation or contemplated:—

The Present Condition of our Knowledge of the Geology and Mineral Resources of the Kimberley Division: A. Gibb Maitland.

The Artesian Water Resources of Western Australia: A. Gibb Maitland.

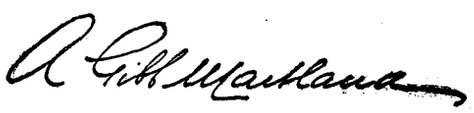
The Clay Deposits of Western Australia: E. S. Simpson, and others.

General Geology and Mineral Resources of the Monger-St. Ives District-Coolgardie and East Coolgarie Goldfields: E. de C. Clarke.

Geological Sketch Map of Western Australia, Four Sheets, Scale 25 miles per inch, Natural Scale 1 : 1,584,000.

It is very much to be regretted that in the public interest arrangements cannot be made to have the whole of the outstanding bulletins of the Geological Survey issued by extra-official printers and thus ensure more prompt publication than is otherwise possible, until all the present arrears have been wiped out.

A very large part of the usefulness of the Geological Survey depends almost entirely upon the promptitude with which the final results of its work are made available to the public. Whilst this is the case, it ought not to be forgotten that reports which are expected to have scientific and official accuracy take time to prepare—which only those who are called upon to do it adequately realise—and that for those who have to accept the responsibility in connection therewith it is, *inter alia*, essential that the necessary facts should be definitely ascertained, and their accuracy assured, rather than that demands for hastily written and badly digested reports, not based on accurate survey, which tend to defeat their own ends, should be acceded to.



Government Geologist.

Geological Survey Office,
Perth, 10th March, 1921.

# INDEX.

# DIVISION V.

## SCHOOL OF MINES OF W.A.

School of Mines,
Kalgoorlie, 1st March, 1921.

*The Under Secretary for Mines, Perth.*

I beg to forward, for the information of the Hon. Minister, my report for the year 1920.

The number of individual students in attendance was slightly in excess of the number for the previous year. Notwithstanding the serious break of three weeks which occurred in the classwork in the middle of the second term, the attendance was well maintained, and the school year ended with five more on the roll than in 1919. Every effort was made by the the lecturers to minimise the effect of the cessation of classwork during July. The students worked diligently to make up for lost time, with the result that at the annual examinations more passes were obtained than in 1919, although the number of credit passes was somewhat diminished.

Increased office work necessitated the appointment of a junior, whose assistance proved very helpful in keeping a close check upon the attendance of students. Early in 1920 when the former lecturer received an appointment as Lecturer in French at the University of Western Australia, Mr. E. H. Illidge, B.Sc., was appointed Lecturer in Mathematics. He has shown himself to be a capable officer. The Mathematics Department, which has a direct bearing upon the whole work of the School, has reached a stage when permanent extra assistance is necessary for the proper conduct of classwork. A knowledge of Mathematics is essential in the study of every other subject in the school, and the present staff is unable to devote sufficient time and attention to this very important subject.

The accommodation and classrooms of the school were again taxed to their utmost to make adequate provision for the large number of students who entered the junior classes in Mathematics, Chemistry, Physics, Drawing, and Geology. These preparatory classes meet a much-felt want, and constitute an excellent preparation for the more advanced classwork in the subjects laid down for the Associateship Courses of the School. Although many of the students do not complete the higher work, the introduction into scientific methods which they receive in the preparatory classes will always be useful to them, whatever may be their future occupations.

The Gas Engine Section of the Mechanical Engineering Department has been satisfactorily conducted by a part-time instructor, Mr. Bosustow, who has given students a good training in gas engine practice, which will be particularly valuable to those who will be stationed in the out-districts. This arrangement has enabled the Lecturer in Mechanical Engineering to devote a large amount of his energies to classes in Drawing and Machine Design.

In April, 1920, the Hon. Minister and the Under Secretary for Mines visited Kalgoorlie and met the staff of the School and the Committee of the Students' Association. The Association placed before the Minister various matters dealing with the welfare of the School and pointed out the necessity of additional accommodation for the proper conduct of the classwork, and also the need for a Metallurgical Laboratory. In strongly urging the formation of short courses for which students may be granted course certificates, the Committee pointed out that students engaged in daily occupations could not complete the full associateship course under nine or ten years, and that many of the past students who had attended classes for various periods up to seven or eight years had left the district before completing all the subjects required for the associateship, and consequently had been unable to secure their diploma. It was desirable that something in the way of half-way courses should be established to enable such men in the future to obtain a course certificate which would indicate the work they had completed as a result of four or five years' study at the School. The Staff placed before the Hon. Minister questions relating to salaries and to extensive additions to the school. As a result, a scheme of short courses has been drawn up and approved. Sketch plans have been drawn up for various alterations and additions to the main building which, when completed, will provide for the most pressing immediate requirements in the way of extensions. The wood and iron building for the metallurgical experimental plant has been erected and a number of machines and appliances have been secured. It has not been possible to secure all of the equipment originally proposed, nor is the work of installation of the machines on hand sufficiently advanced to allow of any experimental work being conducted. It is hoped that early in the new year the placing of machines in position will be expedited, and material secured to enable the staff to carry out working tests. The experimental plant will be under the charge of the Lecturer in Chemistry, and to enable the work of the Chemistry Department to be carried out efficiently while working tests are being conducted on trial parcels in the Metallurgical Laboratory, approval has been given for the appointment of an Assistant Lecturer in Chemistry to take up his duties early in 1921.

During 1920, members of the staff who were not on the maximum of their classification and had not received an increase in salary during the previous 12 months, were given an increase of £24 per annum as from January 1st, 1919, and a recommendation has

gone forward to provide further increases of £48 per annum to Lecturers, and £24 per annum to the Assistant in Physics. Pending the final settlement of the claims for increased classification put forward by the staff, a classification similar to that proposed for the staff of the Technical School has been suggested, to date from January 1st, 1921.

There has been considerable difficulty in obtaining supplies of apparatus from abroad. In several instances where quotations were received for material proposed to be indented, the cost was found so great that lecturers preferred to cancel requisitions, and, pending the time when apparatus can be obtained at a more reasonable figure, to content themselves with material and apparatus which can be procured locally or in the Commonwealth.

Nine show cases and a valuable collection of 125 samples of American rocks have been added to the Geology museum. The show cases have been filled with samples, and all the available space in the museum is now occupied. The school possesses a considerable quantity of rocks and minerals for the display of which additional accommodation is required.

By the terms of the affiliation with the University, the work done at the School in Chemistry, Mathematics and Physics is recognised up to first year University standard, and the following regulation dealing with the recognition of the associateship course has been approved by the Senate:—

> Any Associate of the School of Mines of Western Australia who has matriculated may be permitted to obtain a reduction in the period of attendance at the University necessary to qualify for his B.E. degree, provided that the time during which he attends the University shall not be less than two years, and the Dean of Faculty shall certify, before he is allowed to sit for his final examination, that the standard of his engineering and general education is equivalent to that of students who are taking the ordinary course.
>
> A candidate must make application to the Faculty and furnish with such application evidence as to previous training and examinations.
>
> The Faculty may give such credit as it deems fit for—
>
> (1) Subjects passed in the course of the Associateship.
>
> (2) Additional subjects passed at the School of Mines, Kalgoorlie, which are not included in the course for the Associateship by the candidate.
>
> (3) Subjects of any year of the course for the degree to which he wishes to proceed which have been passed by the candidate at a University Annual Examination prior to matriculation.

Arrangements have been made whereby two Associateship students each year may obtain admission into the Midland Junction Workshops for the purpose of gaining twelve months' practical experience, and two students have now commenced work at the workshops.

Students who have been through a comprehensive course of training at the School experience no difficulty in securing lucrative appointments, but each year local positions are becoming scarcer and students in search of employment have to journey further afield.

During 1920 the Chemistry Laboratory of the School was used by the Inspector of Explosives for the conduct of tests of the underground air of some of the mines on the Golden Mile.

The volume of public assay work has been well up to the average. By furnishing reports as to assay values and by indicating the means of utilising and disposing of base metal ores, every effort has been made to give prospectors information likely to be of assistance to them.

During 1920, 494 free assays and mineral determinations were made for prospectors of material from Crown lands not held under lease for mining purposes, as follows:—

| | |
|---|---|
| Assays for gold and silver .. .. | 390 |
| Assays for copper .. .. .. | 4 |
| Analyses .. .. .. .. | 13 |
| Determinations of rocks, minerals, etc. | 87 |
| | 494 |

The statistics dealing with the enrolment of students, examinations results, etc., are forwarded herewith.

I have, etc.,

F. B. ALLEN,
Director School of Mines.

## W.A. SCHOOL OF MINES.

The following account of the movements during 1920 of past and present students of the School will give an idea of how the work of students is appreciated in various mining centres:—

R. G. Agnew is Assistant Surveyor on the Ivanhoe Mine.

A. S. Anderson, after demobilisation, returned to his home, and then proceeded to a position in Siam.

R. Banks, who was Assistant to Mr. E. H. B. Macartney on Hampton Plains, is now Head Surveyor on the Ivanhoe Mine.

J. H. Cain is in charge of the large treatment plant of the Dutch Company which has a tin concession over the whole island of Billiton, East Indies.

G. L. Ditchburn is Surveyor with the Yukon Gold Dredging Company, Kuala Lumpur, Federated Malay States.

J. Gabel, who was demobilised from the British Army early in the year, took up a position as Sampler and Assistant Surveyor on the Block Ten Mine, Misima, New Guinea.

L. J. Gill is gaining practical experience at the Midland Junction Workshops.

F. W. Godden is Mining Engineer to the Hampton Plains Proprietary, Blocks 45 and 50.

J. Grigg, lately Head Surveyor on the Pahang Consolidated Tin Mine, Federated Malay States, is now Mining Engineer to the Yukon Gold Dredging Company, an American organisation at Kuala Lumpur.

H. Ingle and R. Kirkcaldy are gaining experience at Hoskin's Foundry, Perth.

R. A. Macbeth, after completing his engineering course, entered the Midland Junction Workshops to gain the necessary practical experience.

C. R. le Mesurier is Chemist on steel testing at the works of the Broken Hill Proprietary, Newcastle, N.S.W.

E. B. Mundle is Surveyor on the South Kalgurli Consolidated.

C. J. McDermott and J. McDermott are Assistant Surveyor and Assistant to the Engineer, respectively, on the Ivanhoe Mine.

J. Noall is Head Surveyor on the Pahang Consolidated Mine, Federated Malay States.

L. Nowland is Engineer on the Block Ten Mine, Misima, New Guinea.

T. W. Nairn, lately Assistant to the Engineer on the Sons of Gwalia, is now at the Great Boulder Proprietary.

G. W. Osborne is an officer of the Yukon Gold Dredging Company, Federated Malay States.

C. C. Shaw is in charge of the tribute ore treatment plant on the Lake View and Star Mine.

T. Powell is Assistant Surveyor on the Golden Horseshoe.

J. H. Terrell has joined the Pahang Consolidated Mine.

T. A. Waite left in March to take up a position as Assistant Surveyor to the Dutch Company working tin deposits on the island of Billiton, but up to the present has been in charge of one of the outside tin dressing plants.

F. Nicholas, J. Holman and J. C. Butement still hold their positions on the Burma Mines, Ltd., Burma, the first as Assistant on the metallurgical side, the second in charge of a coal mine, and the third as Construction Engineer.

### SCHOOL OF MINES OF WESTERN AUSTRALIA.

EXAMINERS.

The following Examiners conducted the Examinations in November' 1920 :—

| Subject. | Examiners. |
|---|---|
| Preparatory Mathematics ... | F. B. Allen, M.A., B.Sc. |
| Preparatory Chemistry ... ... | B. H. Moore, B.E., F.S.A.S.M. |
| Preparatory Physics and Electricity | C. Cecil. |
| Preparatory Geology ... ... | C. O. G. Larcombe, B.Sc., F.S.T.C., F.G.S. |
| Preparatory Mechanical Drawing | C. Cecil. |
| Mathematics I. ... ... ... | E. H. Illidge, B.Sc., and W. E. Thomas, B.A. |
| Mechanics—Theoretical ... | R. Davis and E. H. Illidge, B.Sc. |
| Physics I. ... ... ... | R. Davis. / D. McDougall, A.I.E.E. |
| Chemistry I. ... ... ... | B. H. Moore, B.E., F.S.A.S.M., and R. R. Baxter, B.Sc. |
| Engineering Chemistry I. ... | L. W. Phillips, B.Sc., and B. H. Moore, B.E., F.S.A.S.M. |
| Assaying I. and II. ... | B. H. Moore, B.E., F.S.A.S.M. |
| Metallurgy I. and II. ... | G. S. Compton, A.W.A.S.M. |
| Petrology ... ... ... | C. O. G. Larcombe B.Sc., F.S.T.C., |
| Mineralogy ... ... | F.G.S., and G. S. Compton, |
| Geology ... ... ... | A.W.A.S.M. |
| Mining Geology ... ... ... | C. O. G. Larcombe, B.Sc., F.S.T.C., F.G.S. |
| Practical Mathematics ... ... | E. H. Illidge, B.Sc. |
| Mechanical Drawing I. and II. ... | J. H. Tate. |
| Machine Design ... ... | H. J. Clucas, B.C.E. |
| Applied Mechanics ... | J. H. Tate. |
| Building Construction ... | |
| Mechanical Engineering I. and II. | |
| Surveying I. and II. ... | T. Butement, A.O.U.S.M. |
| Mining I. and II. ... | |
| Electrical Engineering I. and II. ... | D. McDougall, A.I.E.E. |
| Fitting and Turning I. and II. ... | W. J. Troup. |
| Engine Driving I. and II. ... | C. C. Meredith. |
| Gas Engine ... ... | A. R. E. Bosustow. |
| Indicator ... ... ... | |

### JUNIOR SCHOLARSHIP.

| Subject. | Examiners. |
|---|---|
| English ... ... ... ... | B. H. Moore, B.E., F.S.A.S.M. |
| Physical Geology ... ... ... | C. O. G. Larcombe, B.Sc., F.S.T.C., F.G.S. |
| Mathematics ... ... ... | F. B. Allen, M.A., B.Sc. |

### W.A. SCHOOL OF MINES, KALGOORLIE.

ATTENDANCES, 1920.

| Subject. | Effective Enrolment. | | |
|---|---|---|---|
| | 1st Term. | 2nd Term. | 3rd Term. |
| Elementary Mathematics (Thursday) ... | 27 | 24 | 18 |
| Elementary Mathematics (Friday) ... | 13 | 11 | 9 |
| Preparatory Mathematics (Monday) ... | 33 | 37 | 36 |
| Preparatory Mathematics (Tuesday) ... | 15 | 11 | 7 |
| Preparatory Drawing (Thursday) ... | 25 | 23 | 18 |
| Preparatory Drawing (Friday) ... ... | 47 | 43 | 40 |
| Preparatory Physics ... ... ... | 54 | 49 | 40 |
| Preparatory Chemistry ... ... ... | 78 | 67 | 46 |
| Preparatory Geology ... ... ... | 11 | 11 | 10 |
| Mathematics—First Course ... ... | 38 | 33 | 28 |
| Theoretical Mechanics ... ... ... | 8 | 8 | 7 |
| Physics—First Course ... ... ... | 27 | 22 | 16 |
| Chemistry—First Course ... ... ... | 14 | 15 | 14 |
| Engineering Chemistry I. ... ... ... | 1 | 1 | 1 |
| Engineering Chemistry II. ... ... | 1 | 1 | ... |
| Assaying—First Course ... ... ... | 9 | 10 | 8 |
| Assaying—Second Course ... ... ... | 2 | 1 | ... |
| Metallurgy—First Course ... ... ... | 3 | 2 | 2 |
| Metallurgy—Second Course ... ... | 1 | 1 | 1 |
| Geology ... ... ... ... ... | 6 | 6 | 6 |
| Mineralogy ... ... ... ... ... | 5 | 5 | 5 |
| Petrology ... ... ... ... ... | 3 | 3 | 3 |
| Mining Geology ... ... ... ... | 1 | 1 | 1 |
| Mining I. ... ... ... ... ... | 4 | 3 | 2 |
| Mining II. (Mine Sampling) ... ... | 4 | 4 | ... |
| Mining II. (Ore Dressing) ... ... ... | 3 | 3 | 3 |
| Mining II. (Mine Accounts) ... ... | ... | ... | 1 |
| Mining II. (Mine Administration) ... | ... | ... | 1 |
| Surveying I. ... ... ... ... ... | 5 | 5 | 4 |
| Surveying II. ... ... ... ... ... | 5 | 6 | 5 |
| Mechanical Drawing I. ... ... ... | 26 | 23 | 21 |
| Mechanical Drawing II. ... ... ... | 9 | 8 | 7 |
| Applied Mechanics ... ... ... ... | 1 | 1 | 1 |
| Mechanical Engineering I. ... ... | 12 | 11 | 11 |
| Mechanical Engineering II. ... ... | 2 | 2 | 2 |
| Machine Design ... ... ... ... | 9 | 10 | 9 |
| Building Construction ... ... ... | 9 | 9 | 9 |
| Engine Driving I. ... ... ... | 17 | 13 | 12 |
| Engine Driving II. ... ... ... ... | 5 | 3 | ... |
| Electrical Engineering I. ... ... ... | 8 | 8 | 6 |
| Electrical Engineering II. ... ... ... | 7 | 7 | 8 |
| Fitting and Turning I. ... ... ... | 20 | 20 | 16 |
| Fitting and Turning II. ... ... ... | 8 | 7 | 6 |
| Gas Engine ... ... ... ... ... | 17 | 19 | 17 |
| Practical Mathematics ... ... ... | 4 | 5 | 4 |
| | 597 | 552 | 461 |

ATTENDANCES, 1920—*continued.*

| | 1919. | | | 1920. | | |
|---|---|---|---|---|---|---|
| | 1st Term. | 2nd Term. | 3rd Term. | 1st Term. | 2nd Term. | 3rd Term. |
| Total Enrolment | 569 | 521 | 452 | 597 | 552 | 461 |
| Individual Students | 232 | 220 | 192 | 254 | 239 | 197 |

## EXAMINATION RESULTS, 1920.

The following table shows the passes obtained by students of the Western Australian School of Mines, Kalgoorlie, at the Annual Examinations held in November, 1920, including the Supplementary Examination results of February, 1920 —

| Subject. | Class of Pass. | | |
|---|---|---|---|
| | Credit. | Pass. | Total. |
| Elementary Mathematics | ... | 9 | 9 |
| Preparatory Mathematics | 1 | 6 | 7 |
| Preparatory Mathematics, Arithmetic | 2 | 21 | 23 |
| Preparatory Mathematics, Algebra | 1 | 5 | 6 |
| Preparatory Mathematics, Geometry | ... | 3 | 3 |
| Preparatory Mechanical Drawing | 6 | 25 | 31 |
| Preparatory Chemistry | ... | 13 | 13 |
| Preparatory Physics | 4 | 21 | 25 |
| Preparatory Geology | ... | 7 | 7 |
| Mathematics I. | 1 | 2 | 3 |
| Mathematics I., Algebra | 1 | 2 | 3 |
| Mathematics I., Geometry | ... | 4 | 4 |
| Mathematics I., Trigonometry | 1 | 2 | 3 |
| Theoretical Mechanics | ... | 4 | 4 |
| Physics | 1 | 8 | 9 |
| Chemistry I. | 1 | 9 | 10 |
| Engineering Chemistry I. | 1 | 1 | 2 |
| Engineering Chemistry II. | ... | ... | ... |
| Assaying I. | 3 | 4 | 7 |
| Assaying II. | ... | ... | ... |
| Metallurgy I. | ... | 2 | 2 |
| Metallurgy II. | ... | ... | ... |
| Geology | ... | 4 | 4 |
| Mineralogy | ... | 3 | 3 |
| Petrology | 2 | 1 | 3 |
| Mining Geology | ... | 2 | 2 |
| Mining I. | ... | 3 | 3 |
| Mining II. (Mine Sampling) | 3 | 1 | 4 |
| Mining II. (Mine Administration, etc.) | ... | 1 | 1 |
| Surveying I. | 1 | 4 | 5 |
| Surveying II. | 1 | 4 | 5 |
| Mechanical Drawing I. | 2 | 18 | 20 |
| Mechanical Drawing II. | 1 | 6 | 7 |
| Applied Mechanics | ... | 5 | 5 |
| Mechanical Engineering I. | ... | 9 | 9 |
| Mechanical Engineering I. (Gas Engine) | 10 | 5 | 15 |
| Mechanical Engineering I. (Indicator) | 8 | 4 | 12 |
| Building Construction | ... | 6 | 6 |
| Engine-driving I. | ... | 7 | 7 |
| Engine-driving II. | ... | ... | ... |
| Electrical Engineering I. | ... | 5 | 5 |
| Electrical Engineering II. | ... | 5 | 5 |
| Fitting and Turning I. | 5 | 9 | 14 |
| Fitting and Turning II. | 4 | 2 | 6 |
| Mechanical Engineering II. | 1 | 2 | 3 |
| Practical Mathematics | ... | 5 | 5 |
| Machine Design | ... | 8 | 8 |
| | 61 | 267 | 328 |

## ASSAYERS' CERTIFICATES.

The following have gained Certificates :—

| | | |
|---|---|---|
| Adams, H. | P.T.S. | March, 1904. |
| Adams, P. | P.T.S. | February, 1905. |
| Beech, S. J. | K.S.M. | November, 1906. |
| Brown, T. | P.T.S. | November, 1906. |
| Brooking, J. | P.T.S. | November, 1906. |
| Hutchinson, D. M. | K.S.M. | November, 1906. |
| Banks, R. | K.S.M. | November, 1908. |
| Gabel, J. | K.S.M. | November, 1908. |
| Pike, R. W. | P.T.S. | November, 1908. |
| Baxter, R. R. | P.T.S. | November, 1909. |
| Bradley, W. S. | K.S.M. | November, 1909. |
| Burrows, M. F. | P.T.S. | November, 1909. |
| Compton, G. S. | P.T.S. | November, 1909. |
| Cook, H. J. | P.T.S. | November, 1909. |
| Klem, L. G. | P.T.S. | November, 1909. |
| Fraser, W. | K.S.M. | November, 1910. |
| Rowledge, H. P. | P.T.S. | November, 1910. |
| Benjamin, L. R. | P.T.S. | November, 1911. |
| Jackson, L. T. C. | P.T.S. | November, 1911. |
| Leevers, J. C. | K.S.M. | November, 1911. |
| Lapsley, R. G. | P.T.S. | November, 1912. |
| Kurth, E. E. | K.S.M. | November, 1913. |
| Grace, J. N. A. | P.T.S. | November, 1916. |
| Noall, J. C. | K.S.M. | November, 1917. |
| Cecil, Clyde | K.S.M. | November, 1918. |
| Terrell, J. H. | K.S.M. | November, 1018. |
| Nairn, T. W. | K.S.M. | November, 1918. |
| Roberts, T. J. | K.S.M. | November, 1919. |

## MINE SURVEYORS' CERTIFICATES.

The following have gained certificates :—

| | | |
|---|---|---|
| Peat, J. | K.S.M. | November, 1909. |
| Adams, H. | K.S.M. | November, 1910. |
| Banks, R. | K.S.M. | November, 1911. |
| Gabel, J. | K.S.M. | November, 1911. |
| Pike, R. W. | K.S.M. | November, 1912. |
| Godden, F. W. R. | K.S.M. | November, 1915. |
| Mundle, E. B. | K.S.M. | November, 1915. |
| Leevers, J. C. | K.S.M. | November, 1916. |

## DIPLOMAS.

The following students have gained Diplomas :—

Beech, S. J. (K.S.M.), Diploma in Metallurgy, November, 1906.
Adams, P. (P. and K.), Diploma in Metallurgy, November, 1907.
Adams, H. (P. and K.), Diploma in Metallurgy, November, 1908.
Banks, R. (C. and K.), Diploma in Metallurgy, November, 1910.
Burrows, M. F. (P. and K.), Diploma in Metallurgy, November, 1910.
Compton, G. S. (P.T.S.), Diploma in Metallurgy, November, 1910.
Cook, H. J. (P.T.S.), Diploma in Metallurgy, November, 1910.
Gabel, J. (K.S.M.), Diploma in Metallurgy, November, 1910.
Gabel, J. (K.S.M.), Diploma in Mining, November, 1911.
Pike, R. W. (P. and K.), Diploma in Metallurgy, November, 1911.
Galt, W. (K.S.M.), Diploma in Mechanical and Electrical Engineering, November, 1915.
Butement, J. C. (K.S.M.), Diploma in Mechanical and Electrical Engineering, November, 1915.
Edmondson, F. C. (K.S.M.), Diploma in Mechanical and Electrical Engineering, November, 1915.
Lang, J. H. (K.S.M.), Diploma in Mechanical and Electrical Engineering, November, 1915.
Grace, J. N. A. (P.T.S.), Diploma in Metallurgy, November, 1915.
Bradley, W. S. (K.S.M.), Diploma in Metallurgy, November, 1915.
Kurth, E. E. (K.S.M.), Diploma in Metallurgy, November, 1916.
LeMesurier, C. R. (K.S.M.), Diploma in Metallurgy, November, 1916.
Leevers, J. C. (K.S.M.), Diploma in Mining, November, 1916.
Davies, Watcyn (K.S.M.), Diploma in Mechanical and Electrical Engineering, November, 1917.
Weselman, Carl (K.S.M.), Diploma in Mechanical and Electrical Engineering, November, 1917.
Nairn, T. W. (K.S.M.), Diploma in Metallurgy, November, 1919.
Mundle, E. B. (K.S.M.), Diploma in Mining, November, 1920.
Thompson, E. P. (K.S.M.), Diploma in Mechanical and Electrical Engineering, November, 1920.

## ENGINE-DRIVERS' CERTIFICATES.

The following Students of the School of Mines passed Examinations held by the Chief Inspector of Machinery during 1919 and 1920, for various Engine-drivers' Certificates :—

| | |
|---|---|
| Beames, H. M. | Mundy, E. J. |
| Brown, Somerville | Rosenberg, J. M. |
| Gardiner, R. | Rosekelly, W. G. |
| Head, B. | Williams, A. F. |
| Jones, H. T. | Willmott, E. |
| McCaskill, V. | Worthington, L. W. |
| McDonald, F. C. | |

## SCHOLARSHIP EXAMINATIONS, 1920.

### JUNIOR SCHOLARSHIPS.

| Candidates. | District. |
|---|---|
| Doyle, J. | Boulder. |
| Hopkins, A. J. | Boulder. |
| Courtis, E. C. | Kalgoorlie. |
| Turner, F. | Boulder. |
| McQuoid, G. A. | Lakeside. |
| Keegan, R. | Boulder. |

J. Doyle gains the Junior Scholarship.

### ENTRANCE SCHOLARSHIPS.

| Candidates. | District. |
|---|---|
| Moody, C. O. V. | Boulder. |
| Hopgood, S. J. | Boulder. |
| Fulcher, J. H. E. | Boulder. |

C. O. V. Moody gains the Entrance Scholarship.

### SENIOR SCHOLARSHIP.

| Candidate. | District. |
|---|---|
| Carrigg, C. C. | Kalgoorlie. |

Scholarship not awarded.

## CHAMBER OF MINES' MECHANICAL DRAWING SCHOLARSHIP.

| Candidate. | District. |
|---|---|
| Sinclair, R. J. ... ... ... | Boulder. |

R. J. Sinclair gains this Scholarship.

## CRITCHLEY PARKER PRIZE.

The following has been recommended for the prize offered by Critchley Parker, Esq., Melbourne :—

Macbeth, R. A., The Industrial Australian and Mining Standard, 1921.

## KALGOORLIE MINERS' INSTITUTE PRIZES.

The following have been recommended for the year 1921 :—

T. Boulter
C. W. Brown
J. H. Downie
J. H. Greer
R. T. Hallahan
H. V. Lethlean
W. L. Phillips
J. Spalding

## ANNUAL EXAMINATIONS, 1920.

T denotes Terminal Pass only.

### PREPARATORY CHEMISTRY.

Pass—
Evans, David J.
Rudwick, Fred J.
Powell, Thomas
Moody, Charles O. V.
White, Daniel G.
Fulcher, James H. E.
Hopgood, Lionel J.
Freeman, Reginald J.
Scott, Thomas C.
Lloyd, Robert F.
McCahon, John H.
Downie, James H.
Baistow, Leslie J.

### PREPARATORY MECHANICAL DRAWING.

Credit—
Duke, Ronald A.
Scott, Thomas C.
Sinclair, Robert J.
Dingle, Cyril W.
Flood, John
Moody, Charles O. V.

Pass—
T Jennings, Walter J.
Hopgood, Lionel J.
T Leggett, Stanley
Fulcher, James H. E.
Sansum, Harold A.
Wright, Frank N.
T Allan, Finlay J.
T Morrow, Arthur E.
Trevaskis, William J.
White Herbert V.
Willcocks, William F.
Boulter, Tom
T Yews, Douglas C.
Downie, James H.
Green, Frank H. T.
Baker, Stanley
Noble, William J.
Gidney, William H.
Kyle, Ronald J.
Smith, Roland T.
Lester, B. T. R. H.
Griffiths, John T.
Softley, William J.
T Warrick, John G.
Warrick, Richard H.

### PREPARATORY PHYSICS.

Credit—
Brown, Charles W.
White, Herbert V.
Fulcher, James H. E.
Moody, Charles O. V.

Pass—
Duke, Ronald A.
T Franks, Kendall T.
Boulter, Tom
Griffiths, John T.
Hopgood, Lionel J.
Noble, William J.
T Guyatt, David McG.
Warrick, Richard H.
Wright, Frank N.
Downie, James H.
Webb, William
Sansum, Harold A.
Newman, Henry B.
Flood, John
Willcocks, William F.
T Leggett, Stanley
Lester, B. T. R. H.
Underwood, Stanley L.
Fitzgerald, Sydney L.
Green, Frank H. T.
Smith, Thomas

### PREPARATORY GEOLOGY.

Pass—
Agnew, Rudolph J.
Greer, Jack H.
Paterson, Arthur V.
Moody, Charles O. V.
Hallahan, Robert T.
Cribb, Arthur H.
Hopgood, Lionel J.

### PREPARATORY MATHEMATICS.

Credit—
T Fels, Herbert J.

Pass—
T Hunter, Richard T.
Downie, James H.
T Carter, Arnold J.
Hopgood, Lionel J.
Fulcher, James H. E.
Moody, Charles O. V.

### PREPARATORY MATHEMATICS.

ARITHMETIC SECTION.

Credit—
Hallahan, Robert T.
Freeman, Reginald J.

Pass—
Griffiths, John T.
Trevaskis, Clement J.
Dingle, Cyril W.
Sansum, Harold A.
Morrow, Arthur E.
Leggett, Stanley
Mitchell, Frank
Newman, Henry B.
Moylan, Francis M. J.
Kyle, Ronald J.
Bowen, Cecil E.
McCahon, John H.
Flood, John
Jennings, Walter J.
Green, Frank H. T.
Noble, William J.
Underwood, Stanley L.
Ainsworth, Lancelot A.
Duke, Ronald A.
Ehlers, Fred L.
Manners, Mark S.

ALGEBRA SECTION.

Credit—
Webb, William

Pass—
Hallahan, Robert T.
Griffiths, John T.
Keating, Keith
Leggett, Stanley
Trevaskis, Clement J.

GEOMETRY SECTION.

Pass—
Dingle, Cyril W.
Guyatt, David McG.
Raven, Stanley C.

### ELEMENTARY MATHEMATICS.

Pass—
Willcocks, William F.
White, Herbert V.
Boulter, Tom
Lynch, Thomas
Cooper, James W.
Stewart, Reginald G.
Manners, Mark S.
Healey, George C.
Maxwell, Norman

### MATHEMATICS—FIRST COURSE.

Credit—
Sinclair, Robert J.

Pass—
Scott, Thomas C.
Rosenbrock, Ernest L.

ALGEBRA SECTION.

Credit—
Carrigg, Clifford G.

Pass—
Ehlers, Charles R.

TRIGONOMETRY SECTION.

Credit—
Carrigg, Clifford R.

Pass—
Evans, David J.

GEOMETRY SECTION.

Pass—
Baistow, Leslie J.
Johns, Edward N.
Evans, David J.
Yews, Douglas C.

### THEORETICAL MECHANICS.

Pass—
Meredyth, Cyril C.
Dingle, Mervyn M.
Thrupp, Thomas W.
Rosenbrock, Ernest L.

### PHYSICS—FIRST COURSE.

Credit—
Carrigg, Clifford G.

Pass—
Blurton, Norman C.
Greer, Jack H.
Evans, David J.
Sinclair, Robert J.
Johns, Edward N.

### CHEMISTRY—FIRST COURSE.

Credit—
Carrigg, Clifford G.

Pass—
Gill, Leslie J.
Greer, Jack H.
Steel, Archie
Blurton, Norman C.
Paterson, Arthur V.
Lethlean, Hedley V.
Sinclair, Robert J.
Hallahan, Robert T.

### ENGINEERING CHEMISTRY—FIRST COURSE.

Credit—
MacLellan, Miss Christina

### ASSAYING—FIRST COURSE.

Credit—
Carrigg, Clifford G.
Brown, Charles W.
MacLellan, Miss Christina

Pass—
Steel, Archie
T Hallahan, Robert T.
McDermott, James J.
Scott, Thomas C. (Sen.)

### METALLURGY—FIRST COURSE.

Pass—
MacLellan, Miss Christina
Lethlean, Hedley V.

### METALLURGY—SECOND COURSE.

Credit—
Nairn, Thomas W. (Thesis accepted. Complete. Written examination, 1918).

### GEOLOGY.

Pass—
T Davies, Idris
Powell, Thomas
Phillips, William L.
Gibbons, Leo P. J.

### MINERALOGY.

Pass.—
Powell, Thomas
Phillips, William L.
Gibbons, Leo. P. J.

### PETROLOGY.

Credit—
Cecil, Clyde
MacLellan, Miss Christina

Pass—
Terrell, James H.

### MINING AND ECONOMIC GEOLOGY.

Pass—
T Eddy, John T.

### MINING—FIRST COURSE.

Pass—
Agnew, Rudolph J.
Terrell, James H.
T Crutchett, Edgar G.

### MINING—SECOND COURSE. (MINE SAMPLING.)

Credit—
Powell, Thomas
T Agnew, Rudolph J.
Phillips, William L.

Pass—
Gibbons, Leo. P. J.

### MINING—SECOND COURSE. (ALL SECTIONS.)

Pass—
Gibbons, Leo. P. J.

### SURVEYING—FIRST COURSE.

Credit—
Macbeth, Robert A.

Pass—
Agnew, Rudolph J.
T Roberts, Thomas J.
Gibbons, Leo. P. J.

### SURVEYING—SECOND COURSE.

Provisional Passes pending Plan.
T Eddy, John T.
Terrell, James H.
McDermott, Charles J.
Davies, Idris
Crutchett, Ivanhoe A.

### MECHANICAL DRAWING—FIRST COURSE.

Credit—
Oates, William H.
Johns, Edward N.

Pass—
Carrigg, Clifford G.
Evans, David J.
Blurton, Norman C.
Bryant, William C.
T Armstrong, Daniel T.
Brown, Alexander O.
McDermott, Charles J.
Lapham, Edgar M.
Wakeling, Ronald D.
Thrupp, Thomas W.
Mills, Stanley C.
Maguire, David E.
Manners, Joseph E.
Freeman, Reginald J.
McClelland, Jack
T Davies, Idris
McCahon, John H.
Lloyd, Robert F.

### MECHANICAL DRAWING—SECOND COURSE.

Credit—
Ehlers, Charles R.

Pass—
Coad, William
Baistow, Leslie J.
Rosenbrock, Ernest L.
Blackmore, Frederick J.
T Ingle, Harold J.

### MECHANICAL ENGINEERING—FIRST COURSE.

Pass—
McClelland, Jack
Wilson, Albert W.
Dingle, Mervyn M.
Rosenbrock, Ernest L.
Thrupp, Thomas W.
Stanton, Harry D.
Ehlers, Charles R.
Crutchett, Alexander J.
Bryant, William C.

### GAS ENGINE.

Credit—
Allan, William P.
Stirling, Roy E.
Stanton, Harry D.
Bosustow, Ernest C.
Harris, Clifford R.
Willmott, Edward
Woodward, James
Wishart, Gordon D.
McLean, Charles E.
Hanks, Alfred H. F.

Pass—
Martin, Andrew
Smith, James E.
Bayley, Dudley H.
McIlheney, Alexander J.
Odell, Reuben E.

### INDICATOR.

Credit—
Stirling, Roy E.
Woodward, James
Harris, Clifford R.
Hanks, Alfred H. F.
Wishart, Gordon D.
Stanton, Harry D.
Bosustow, Ernest C.
McLean, Charles E.

Pass—
Allan, William P.
Martin, Andrew
Smith, James E.
Bayley, Dudley H.

### MECHANICAL ENGINEERING—SECOND COURSE.

Credit—
Macbeth, Robert A.

Pass—
Spalding, John

ANNUAL EXAMINATIONS—continued.

T denotes Terminal Pass only.

BUILDING CONSTRUCTION.

PROVISIONAL PASSES PENDING THESES.

Gill, Leslie J.
Head, Bert
Taylor, Harry
T Hamilton, Arthur V.
Spalding, John
Taylor, Frank

Complete Pass—
(Written examination, 1916. Thesis now accepted.)
Thompson, Eugene P.

ENGINE DRIVING—FIRST COURSE.

Pass—
Brown, Alexander O.
Mason, George R.
T Keating, Keith
T Cairns, Matthew R.
Smith, James E.
T Quick, Harold
Bayley, Dudley H.

ELECTRICAL ENGINEERING—FIRST COURSE.

Pass—
Dingle, Mervyn M.
Ehlers, Charles R.
Rosenbrock, Ernest L;
Dunstan, Gordon T.
Wilson, Albert W.

ELECTRICAL ENGINEERING—SECOND COURSE.

Provisional Passes pending Theses—
Spalding, John
Macbeth, Robert A.
T McCaskill, Victor J.
T Rowe, Brice L.
T Taylor, Harry

Complete Pass—
(Written Examination, 1914, Thesis now accepted.)
Thompson, Eugene P.

FITTING AND TURNING—FIRST COURSE.

Credit—
Rosenbrock, Ernest L.
Yews, Douglas C.
Blurton, Norman C.
McCahon, John H.
Wakeling, Ronald D.

Pass—
T Boulter, Tom
Sansum, William A.
T Lloyd, Robert F.
T Collins, Willlam D.
T Cooper, James W.
T Hanks. Alfred H. F.
T Considine, Albert E.
T Loxton, Bruce L.
T McKay, Stanley S.

FITTING AND TURNING—SECOND COURSE.

Credit—
Barker, George J.
Ehlers, Charles R.
Wilson, Albert W.
Dingle, Mervyn M.

Pass—
Jones, Herbert T.
Openshaw, Harold

MACHINE DESIGN.

Provisional Passes pending Theses.
Macbeth, Robert A.
Gill, Leslie J.
Spalding, John
Taylor, Harry
T Hamilton, Arthur V.
Rosenberg, Julius
T Ingle, Harold J.
T Phillips, William L.

Complete Pass with Credit.
(Written Examination, 1918, Thesis now accepted.)
Dunstan, Gordon T.

Complete Pass.—
(Written Examination, 1918, Thesis now accepted.)
Fenton, Edmund F.
Midgley, Frank M.
Thompson, Eugene P.

PRACTICAL MATHEMATICS.

Pass—
Rosenbrock, Ernest L.
Gill, Leslie J.
T McCaskill, Victor J.
T Thompson, Eugene P.
Dingle, Mervyn M.

Supplementary Examinations held in February, 1920—
MATHEMATICS—FIRST COURSE.
ALGEBRA SECTION.

Dingle, Mervyn M.

TRIGONOMETRY SECTION.

Spalding, John

PHYSICS—FIRST COURSE.

Ehlers, Charles R.
Lethlean, Hedley V.
Roberts, Thomas J.

CHEMISTRY—FIRST COURSE.
Ehlers, Charles R.

MINING AND ECONOMIC GEOLOGY.
Terrell, James H.

SURVEYING—FIRST COURSE.

McDermott, Charles J.

APPLIED MECHANICS.
Gill, Leslie J.
Rose, Louis A.
Parker, Stanley C.
Taylor, Harry
Saplding, John

MECHANICAL DRAWING—SECOND COURSE.
Hamilton, Arthur V.

MECHANICAL ENGINEERING—SECOND COURSE.
Hamilton, Arthur V.

ENGINEERING CHEMISTRY I.
(Formerly called Chemistry—Second Course.)
Mundle, Edward B.
(Recommended for Pass without Examination on work done before enlistment in A.I.F.)

# DIVISION VI.

## OPERATIONS UNDER "THE INSPECTION OF MACHINERY ACT, 1904."

## Annual Report of the Chief Inspector of Machinery and Chairman of the Board of Examiners for Engine-drivers, for the Year ending 31st December, 1920, with Statistics.

*The Under Secretary for Mines.*

Office of the Chief Inspector of Machinery,
Perth, 3rd March, 1921.

Sir,—

I have the honour to submit, for the information of the Hon. the Minister for Mines, the following report on the operations of "The Inspection of Machinery Act, 1904," in the Districts proclaimed thereunder, together with statistical tables for the year ending 31st December, 1920.

For easy reference I have divided the report as follows:—

(1) Inspection of boilers.
(2) Explosions and interesting defects.
(3) Inspection of Machinery.
(4) Prosecutions under the Act.
(5) Accidents to persons caused by machinery.
(6) Engine-drivers' examinations and kindred matters.
(7) General.

### DIVISION I.

*Inspection of Boilers.*

The number of boilers useful as steam generators on the register at the end of the year was 2,894, as against 2,926 at the end of 1919, showing a decrease of 32 boilers. There were 27 new boilers registered during the year; seven permanently condemned boilers were thoroughly repaired at considerable expense, and reinstated. As against this, there were 33 permanently condemned, and 38 transferred beyond the jurisdiction of the Act; 30 of these latter were exported to the Eastern States.

*Operations in the various districts.*

The following return shows the operations in the various proclaimed districts in connection with boilers, as compared with 1919:—

*Return showing operations in the Proclaimed Districts (Boilers only) during the Year ended 31st December, 1920.*

| | Totals. | |
|---|---|---|
| | 1920. | 1919. |
| Total number of boilers registered and capable of being used as steam generators | 2,894 | 2,926 |
| New boilers registered during the year | 27 | 16 |
| Boilers re-instated ... ... | 12 | 4 |
| Inspections for year— | | |
| Thorough ... ... ... | 1,397 | 1,349 |
| Working ... ... | 123 | 145 |
| Boilers condemned during year— | | |
| Temporarily ... ... | 50 | 47 |
| Permanently ... ... | 33 | 53 |
| Boilers converted into tanks, air receivers, etc., during year | 5 | ... |
| Boilers transferred beyond the jurisdiction of this Act | 32 | 34 |
| Number of notices issued for repairs during the year | 351 | 311 |
| Number of certificates issued (including those issued under Section 30) during the year | 1,435 | 1,329 |
| Number of useful boilers out of use at end of the year | 1,411 | 1,515 |
| | £ s. d. | £ s. d. |
| Total amount of fees for 1920 ... | 2,975 2 0 | ... |
| Total amount of fees for 1919 ... | ... | 2,783 0 4 |
| Total number of Inspectors ... | *8 | 7 |

* Seven only up to December.

The number of thorough and working inspections was 1,397, and 123 respectively, making a total of 1,520, showing an increase of 48 thorough inspections, and decrease of 22 working inspections.

In the South-Western district 1,080 inspections were made, or 71½ per cent. of the total number made in all districts. The inspections made in this district show an increase of 27 as against 1919.

In the Kalgoorlie group 334 inspections were made, being 22 per cent. of the total inspections. The inspections in this district showed a decrease of 11.

In the North Coolgardie and Mount Margaret districts 83 inspections were made, or 5.4 per cent. of the total number. The inspections showed an increase of 34, which is accounted for owing to the usual tour of inspection in these districts for last year being held over until early this year.

In the East Murchison, and Murchison and Yalgoo districts 23 inspections were made, or 1.5 per cent. of total number, and the inspections showed a decrease of 20.

The total number of boilers out of use at the end of the year was 1,411, against 1,515 in 1919, thus an improvement on last year of 104 boilers.

The revenue from boiler inspections was £2,975 2s., as against £2,783 0s. 4d. for the previous year, showing an increase of £191 1s. 8d.

The number of boilers permanently condemned was 33, or 20 less than last year; and 32 boilers were removed from the jurisdiction of the Act, nearly all being exported to the Eastern States, where the demand for boilers continues.

During the year seven boilers, which had been permanently condemned, were thoroughly repaired, and brought back into use, while five more in use outside the provisions of the Act reverted to the jurisdiction of this Department.

The following table shows the number of boilers temporarily or permanently condemned as a percentage of inspections made, since the inception of an Act controlling boilers:—

*Number of Temporarily and Permanently Condemned Boilers per* 100 *Inspections made, since* 1899.

| Year. | Temporarily. | Permanently. |
|---|---|---|
| | Per cent. | Per cent. |
| 1899 ... ... ... | 2·64 | 1·42 |
| 1900 ... ... ... | 2·21 | ·498 |
| 1901 ... ... ... | 4·34 | ·511 |
| 1902 ... ... ... | 5·00 | ·958 |
| 1903 ... ... ... | 2·43 | ·697 |
| 1904 ... ... ... | 3·08 | ·389 |
| 1905 ... ... ... | 2·84 | ·388 |
| 1906 ... ... ... | 3·98 | ·960 |
| 1907 ... ... ... | 4·36 | ·802 |
| 1908 ... ... ... | 3·18 | ·599 |
| 1909 ... ... ... | 2·89 | ·797 |
| 1910 ... ... ... | 4·49 | 1·382 |
| 1911 ... ... ... | 3·54 | 8·070 |
| 1912 ... ... ... | 3·93 | 2·471 |
| 1913 ... ... ... | 2·64 | 2·431 |
| 1914 ... ... ... | 2·97 | 2·178 |
| 1915 ... ... ... | 4·72 | 1·538 |
| 1916 ... ... ... | 3·97 | 1·456 |
| 1917 ... ... ... | 3·19 | 1·301 |
| 1918 ... ... ... | 3·25 | 1·563 |
| 1919 ... ... ... | 3·14 | 3·547 |
| 1920 ... ... ... | 3·28 | 2·171 |

## DIVISION II.

*Explosions and Interesting Defects.*

I am again able to report that there has been no explosion of any boiler under the jurisdiction of the Act.

An example of peculiar corrosion occurred to a boiler of loco. portable type at Greenbushes, just too late for last year's report. In the smoke box there was a washout plug; the thread of the hole in tube plate had become worn, and an Inspector advised that the hole be enlarged and bushed. A steel bush was fitted in February, 1919, and the plug was screwed into it, everything being well fitted. In December, the bush with the plug in it was blown right through the smoke-box door (this was a good deal thinned by corrosion). The boiler had about 80lbs. pressure on it at the time. On examining the bush it was found that nearly all the external thread, where it screwed into the tube plate, was corroded away. The thread in the bush into which the plug was screwed, and also the thread in the tube plate being unaffected. It is most remarkable that such severe and peculiar corrosion should have taken place in so short a time, and it is fortunate that no one was in the line of fire when the bush blew out.

An accident happened to a traction engine, also in the neighbourhood of Greenbushes, which might have had serious results. The lever of the third motion pinion is held in position by a pin. When on a fairly steep down grade, this pin is said to have worked loose. The engine got out of control, and the driver noticing a cart immediately in front with five persons in it, turned the engine into the bush and ran it against a tree. Beyond crumpling up the smoke-box, little damage was done.

A portable boiler of circular firebox type, working in East Beverley district, had a new set of tubes fitted. Whilst expanding the tubes, one of the ends split, and the tube was plugged by driving a round piece of iron into each end of it. It was used in this condition for two or three weeks, when suddenly the plug in the firebox end of the tube blew out through the open firebox door, and struck the driver on the chest (a slanting blow), and escaping steam and water scalded his arm.

The external diameter of the tubes in this boiler is 2in., so the diameter of the iron plug would probably be about 1⅞ins., with an area of about 2¾ square inches—the working pressure of the boiler was 90lbs., so the total pressure on the plug was close on 250lbs. The driver can be considered lucky that the blow was a slanting one.

It is much safer when plugging a tube to secure the plugs by a bolt running right through the tube.

In July last, a wrought iron steam pipe, 8in. in diameter, which was one of the branch pipes leading from a range of boilers to the main steam pipe at the Ivanhoe Gold Mine, failed in a rather peculiar way. A piece of the lower side of the pipe, three feet long and eight inches wide, was blown out, and on examination the metal was found so brittle that it could be broken almost like porcelain.

This pipe was renewed, and in September the stop valve on the same boiler, connected to the new pipe, was split in halves.

In both cases the accidents happened just after opening a drain pipe, close to the stop valve, when

about to couple the boilers to the main steam pipe, and there is little doubt that "water hammer" was the cause of the accident in each case. There was no direct injury to person caused by either accident, though the fireman who was on top of the boiler, and had just opened the drain cock, which was attached to the portion of pipe which failed, had a narrow escape. He was not scalded, but when jumping off the boiler fell and sprained his ankle.

The matter of the quality of the rest of the steam pipes was carefully gone into, and certain alterations to the pipe line were made with a view of avoiding any similar occurrence in the future.

The pipe which failed was reported to have been supplied by a well known maker as best steam quality, and is stated had only been in use since 1911. The cause of its extreme brittleness must, I fear, remain a mystery.

In October an 8in. wrought iron steam pipe on the Associated Gold Mine, conveying steam to the winding engine, failed, and caused a good deal of damage to the pipe line, flanges and valves.

Nine Babcock and Wilcox boilers, working at 140 lbs. per square inch, were coupled to this pipe. Under the circumstances, it is fortunate that no personal injury occurred.

The pipe line, which was lagged throughout, failed by the screwed portion of the pipe (which was 1in. long), pulling out of the screwed cast iron flange, and stripping the thread. After the accident the whole line was carefully examined, and all injured flanges and fittings were renewed. An interesting point in connection with the accident is that the winding engine control valve, situated nearly 150 feet away, was fractured, and therefore more or less useless. The engine was in motion at the time, but fortunately it is fitted with gravity brakes, which at once controlled the cages and brought them to a standstill. The incident shows the great value of this class of brake, and the necessity of installing it wherever possible.

A curious accident occurred to a boiler at North Greenbushes. The boiler is a portable loco. type, with engine on top. It was situated at least 60ft. from the nearest tree, and was left in perfect order when last used. When next visited, it could scarcely be found, being almost hidden by the branches of a large red gum tree which had fallen on it. The tree was about 80 feet high by 3 feet 6 inches diameter at base.

The engine was hopelessly smashed up, the smoke-box torn off the boiler, the barrel of boiler badly crushed in near smoke-box, and two cracks, about 8 inches long, show through the plate.

It is most fortunate that the boiler was not under steam when the tree fell. If it had been, I fear I should have had to report a serious explosion.

## DIVISION III.

### *Inspection of Machinery.*

The following return shows a classification of the power-driven machinery in the proclaimed districts. This year the number of groups driven by oil engines (including kerosene, petrol, and benzine engines) continues to keep the highest place. There are now 2,618 registered groups of such engines, as against 2,491 last year, showing an increase of 127.

Electrically driven groups again take second place with 2,109, showing an increase of 154 during the year. Steam driven groups take third place, with 1,287, as against 1,285 last year, showing an increase of two. Suction gas groups have decreased by 10, ordinary town gas groups have decreased by 10, hydraulic groups have decreased by one, and compressed air groups remain as they were.

*Return showing Classification of various sources of Power-driven Machinery in use or likely to be used again in Proclaimed Districts during the Year ended 31st December, 1920.*

| Classification. | Totals. | |
|---|---|---|
| | 1920. | 1919. |
| No. of groups driven by— | | |
| Steam engines ... ... ... | 1,287 | 1,285 |
| Oil engines ... ... ... | 2,618 | 2,491 |
| Ordinary gas engines ... ... | 20 | 30 |
| Suction gas engines ... ... | 224 | 234 |
| Compressed air engines ... | 38 | 38 |
| Electric motors ... ... | 2,109 | 1,955 |
| Hydraulic pressure ... ... | 9 | 10 |
| Totals ... ... | 6,305 | 6,043 |

The following table shows the number and description of all the lifts in this State:—

| | |
|---|---|
| Passenger Lifts— | |
| Electrically driven . . . . | 64 |
| Hydraulically driven . . . . | 0 |
| Goods Lifts— | |
| Electrically driven . . . . | 93 |
| Hydraulically driven . . | 8 |
| Belt driven . . . . . | 13 |
| Total . . | 178 |

There has been an increase of four only in the number of lifts registered.

All electrically driven lifts in Perth and Fremantle are now working on the alternating current, and though the difficulty owing to variable voltage still continues, it has not caused any accident or any very serious inconvenience.

Larger stocks of wire ropes are now held by dealers, and there is no longer any great anxiety with regard to replacing worn ropes.

Several lifts, which were formerly fitted with iron collapsible gates, have been reorganised during the year, and are now fitted with good wooden, sliding doors, controlled by electro-mechanical locks, thus adding greatly to the general safety of the lifts concerned. During the year several ropes were found, at the annual inspections, to be in a condition rapidly verging on being dangerous, and I again wish to record my opinion that annual inspections of passenger lifts are not sufficient. I sincerely trust that the proposed new Act may pass Parliament this year, and that the necessary authority will be given to inspect twice a year.

The following return shows the work done in connection with machinery inspections:—

***Return showing Operations in the Proclaimed Districts (Machinery only) during the Year ended 31st December, 1920.***

| | Totals. | |
|---|---|---|
| | 1920. | 1919. |
| Total registrations of useful machinery | 6,305 | 6,043 |
| Total inspections made ... | 3,247 | 3,462 |
| Certificates bearing fees ... | 2,685 | 2,906 |
| Certificates (steam) without fees | 562 | 556 |
| Notices issued "Machinery dangerous" | 305 | 320 |
| | £ s. d. | £ s. d. |
| Total amount of fees for 1920 ... | 1,065 4 5 | ... |
| Total amount of fees for 1919 ... | ... | 1,200 14 0 |
| Number of Inspectors ... | *8 | 7 |

* Seven only up to December.

There has again been a satisfactory increase of 262 in the total number of machinery registrations. In the South-Western district, the increase was 256, or from 4,496 to 4,752.

In the Kalgoorlie groups, the registrations increased by three, or from 826 to 829. In the remaining districts there was an increase of 3, or from 721 to 724. The total number of inspections made shows a decrease of 215, the cause for which is referred to later under heading of "Staff."

*Dangerous Machinery.*

Three hundred and five notices were issued ordering various guards and fences to be erected; the number of notices issued being about 9.39 per cent. of the number of inspections made.

## DIVISION IV.

*Prosecutions under the Act.*

No prosecution in regard to boilers or machinery was instituted during the year.

## DIVISION V.

*Accidents to persons caused by machinery.*

During the year 44 accidents were reported, including four which ended fatally. This shows a decrease of seven in the total number, and an increase of two fatal, as compared with 1919. There has been a decrease of 16 in the number of accidents in the Goldfields districts, and an increase of seven in the South-Western District, as against 1919.

The following table shows the number of accidents and the percentage of these, based on the total number recorded, caused by the various kinds of machinery mentioned:—

| No. of accidents. | Class of Machinery. | Percentage of total accidents. |
|---|---|---|
| 13 | Circular saws, band saws, and docking saws | 29·6 per cent. |
| 6 | Buzzers ... ... ... | 12·63 ,, |
| 2 (1) | Ore treating machinery | 6·8 ,, |
| 1 (1) | Flywheels, Pulleys, and Shafting | 4·54 ,, |
| 1 (1) | Belting ... ... ... | 4·54 ,, |
| 2 | Belt Conveyors ... | 4·54 ,, |
| 1 (1) | Goods Lifts ... ... | 4·54 ,, |
| 2 | Scalds, etc., burst pipes and Glass water gauges | 4·54 ,, |
| 12 | Other sources ... ... | 27·27 per cent. - or ·2·27 per cent. each. |
| 40 (4) | Total 44 | |

The accidents from circular saws during the year again head the list, and account for 29.6 per cent. of the whole number. Most of these accidents were caused by carelessness on the part of the injured men.

Buzzer accidents show an increase, and account for 13.6 per cent. of the total number.

Several of these accidents were undoubtedly caused by the operators removing the guards, which had been provided. The average timber machine hand appears to have a rooted objection to guards, which is very difficult to overcome. Some of them seem to think the insistence on using a guard is an affront to their capability of looking after themselves, which, of course, is a very mistaken idea.

The four fatal accidents which occurred during the year are as follows:—

(1) A worker in a timber mill at Pindalup met his death through being struck on the head by a metal belt fastener. One of his duties was to clean out an underground sawdust conveyor. This work was usually done when the machinery was stopped, but on this occasion the deceased arranged with the engine-driver to run the engine slowly in order that he might more easily clean the conveyor. He, unfortunately, stood upright under the main driving pulley, and was struck on the head by a belt fastener. His skull was fractured, and he subsequently died of the injury. The operation would have been quite safe if the engine had not been running. The verdict of the coroner's jury was that death was due to being struck on the head by a clip on the main driving belt. A rider was added to the effect that proper precautions were not taken by the management to prevent men from working in the pit.

(2) This accident occurred on the Ivanhoe G.M. The deceased man was attending to a Gates' Crusher, and by some means apparently tripped, and fell into the crusher, receiving such injuries to the head as to cause death. The verdict of the jury was that "deceased met his death by being crushed in an ore crusher, there being no evidence to show how he got there." The jury added a remark that "there was negligence on the part of the Company in not seeing that the surroundings of the cracker had been made more secure."

(3) This accident occurred at the Lancefield G.M. Death was caused by deceased's neck scarf becoming wound round a shaft while putting on a belt. The result was that he was strangled. The verdict was in accordance with above facts, and jury added a rider "That it should be made compulsory for employees on mines to wear such apparel as would not endanger attendants whilst working about machinery."

(4) The 4th and last fatal accident occurred at Boan Bros, Perth. The deceased was one of the storemen, and was working a goods lift. He had been up to the top floor, and was on his way down again, when on arriving on the ground floor he stepped off the cage, *while it was still in motion,* with one leg on to a ledge at the ground floor door. He evidently overbalanced, caught at the control lever to steady himself, and so reversed the motion, sending the lift up. He fell under the cage bottom off the ledge and so into the basement, receiving such injuries to his skull that he died about a fortnight after the accident. The verdict of the Coroner's jury was death by misadventure.

There is no doubt that the cause of the accident was stepping off the lift while it was in motion.

## DIVISION VI.

*Engine Driver's examinations and kindred matters.*

During the year four examinations were held in Perth, two in Kalgoorlie, two in Bunbury, and one in Albany. Examinations were advertised to be held at Southern Cross, Leonora, Mt. Magnet, and Geraldton, but fell through owing to the necessary number of candidates not being forthcoming.

The following table shows the certificates granted and their classification:—

*Return showing total number of Engine-drivers' Certificates (all Classes) granted in* 1920, *and compared with* 1919.

| Class of Certificate. | Number granted. | |
|---|---|---|
| | 1920. | 1919. |
| First Class Competency (including certificates issued under Regulation 27 and Section 63 of the Act) | 2 | 3 |
| Second Class Competency (including certificates issued under Regulation 27 and Section 63 of the Act) | 29 | 23 |
| Third Class Competency (including certificates issued under Regulation 27 and Section 63 of the Act) | 52 | 43 |
| Locomotive Competency ... ... | 7 | 15 |
| Traction Competency ... ... ... | 6 | 6 |
| Interim ... ... ... ... ... | 10 | 4 |
| Copies ... ... ... ... ... | 9 | 7 |
| Totals ... ... ... | 115 | 101 |

There is an increase in the number of certificates granted, the number being fourteen more than last year.

The total number of certificates granted under this Act up to the 31st December, 1920, is 2,900.

The revenue from engine-drivers' fees for the year was £159 5s. as against £137 5s. for 1919.

A curious fact noticeable in connection with engine-drivers' certificates is the marked falling-off in the number of applicants for "first class certificates." From 1909 to 1914 inclusive, 113 such certificates were granted, or an average of nearly 19 per year.

From 1915 to 1920 inclusive, there were only 27 granted, or an average of 4.5 per year. (In 1920 there were only two first class certificates granted.)

The supply of "first class" men is not equal to the demand, and I have had several letters from mine managers in the Murchison and other outlying districts complaining of the difficulty they are experiencing in procuring such men. Unless more applicants are forthcoming, it may be necessary to consider the advisability of making some temporary provision which will meet the situation, and relieve the Mining Industry, which is already suffering from a variety of causes. I should indeed be loath, in the interest of safety, to recommend this course, but unless more candidates present themselves for First Class Certificates, it is obvious that something must be done to relieve the position. I, therefore, sincerely trust that during the coming year the deficiency will be met.

I should be glad to have the cordial assistance of the Western Australian Executive of the Federated Engine-drivers and Firemen's Association in this connection to spur on their eligible younger members to qualify for First Class Certificates to meet the essential requirements of the Mining Industry.

*Inquiries, Prosecutions, etc.*

In October last S. C. Wilmott and Ed. Wilmott were prosecuted, the former for knowingly employing an uncertificated engine-driver, and the latter for driving an engine without a certificate.

The charges were admitted and a verdict obtained in both cases; S. C. Wilmott being fined £1 with £2 4s. 4d. costs, and Ed. Wilmott, £2 fine with 9s. costs.

The Board inquired into six cases of overwinding at mining shafts. One of these was caused by the uncertificated driver above mentioned. In this case and four of the other cases, the damage done was very slight, and the circumstances under which the overwinds occurred were merely recorded against the various drivers.

The sixth case was more serious. The driver in question came on duty whilst in an inebriated condition. Two men were waiting to be lowered, but seeing driver's condition refused to enter cage. The driver then proceeded to run the cage through the shaft presumably to show that he was able to do so, and in some way managed to release the clutch and drop the cage, and the whole of the rope to the bottom of the shaft. Fortunately, the men were not in the cage. The rope was a new one and was completely ruined, and the cage and shaft were damaged.

The case is at present being dealt with by the Board, and its decision will be given shortly.

A serious smash occurred at the Boya Quarry, owing to the culpable negligence of the driver in charge of an air compressor. The compressor was badly wrecked. The driver was starting it in the early morning, and evidently omitted to open the various drain cocks. The condensed water in the pipes entered the cylinder, and resulted in just the kind of smash that could be anticipated.

The driver was instantly dismissed, and has disappeared, probably to one of the Eastern States. The Board inquired into the matter, but as the man was not available, no action could be taken beyond advising the various Boards in the Eastern States, and giving them full particulars. The Board is of the opinion that the case was one of gross carelessness, and that the other Boards should be notified of the circumstances in case he should apply for a "reciprocity" certificate. Should he return to this State at any time his case will be dealt with.

## DIVISION VII.

*General.*

During the year 30 second-hand boilers were transferred to the Eastern States. Nearly all of these boilers were inspected for the prospective buyers by this Department, and adequate fees were charged for this work. No complaints have been received as to the condition of any boiler so inspected, and our services appear to be appreciated.

In connection with the purchase of second-hand boilers, I should like to point out that it is not so generally known as it ought to be, that an intending purchaser, if authorised by a letter from the last registered owner of a boiler, and on payment of the small fee prescribed, can examine the records of any boiler registered in this State. As these records are

very complete, including the history of the boiler from its date of make, and generally a maker's test certificate and blue print of the boiler, the purchaser procures much valuable information, which enables him in a few minutes to form a correct estimate of the state of his intended purchase. Many plants have recently changed hands, and no doubt a large number of others will still do so. Buyers should keep in mind the facilities offered by this Department and so save themselves a lot of trouble.

Eight boilers were cut up for plates for repair and constructional work. In 1918 there were 28 boilers similarly treated, so it would appear that the stocks of boilers and plates are assuming a more normal condition.

In the course of the year many extensive boiler repairs were ordered. These were carried out by skilled workmen, and as far as possible under the supervision of Inspectors. With regard to repair work, it is the aim of this Department that the work be done in such a manner that the original strength of the boiler be retained or restored as far as possible. The list of repairs becomes heavier each year, as boilers increase in age, and, of course, involves a good deal of more work by Inspectors.

Many new industries are starting in this State, especially in the South-West District; *e.g.*:

(a.) At Lake Clifton, a plant has been installed by the W.A. Portland Cement Co. with a view of utilising the extensive lime deposits in the lake. The plant includes 16 miles of railway, a steam boiler and electric generator, and various motors for the machinery. The lime will be conveyed to the Company's works at Burswood (not yet completed), where it will be converted into Portland Cement, and also a large quantity of it will be available for fertilizing purposes. About 40 men are at present employed at Lake Clifton, and as many more will be required at Burswood.

(b) A Plaster of Paris Works has been started in Perth, and I understand is turning out a good product, and utilising another of our natural products, viz., gypsum.

(c) A paint and porcelain works has started in East Perth, which will utilise a quantity of our fine clays, and other mineral earths.

(d) A steel works is being erected in West Guildford, which should supply a long felt want, and will employ a good deal of labour.

(e) Several sawmills, including some small spot mills, are being installed, the latter chiefly by members of the fruit growing industry, as a result of the present rather prohibitive prices for fruit cases.

(f) A small tannery and fur business has been started in one of the South-Western centres, and is, I believe, experimenting successfully with new methods and materials.

(g) The Hume Pipe Company are erecting a plant to handle their reinforced concrete pipes. I understand it will be driven electrically, and will supply considerable employment.

(h) A Company has been formed for the manufacture of Asbestos Slate and Sheet, which will be another outlet for some of our natural products.

(i) A Factory, on modern lines, for the manufacture of electric generators, motors, etc., and for repairing and re-winding old motors, has been started in East Perth, and I understand is turning out very satisfactory work.

Many other smaller industries, hitherto unheard of in this State, are starting.

All the existing timber mills are running at their full capacity.

With these new industries, and a revival of some of the older ones, I anticipate the ensuing year will be a busy one. I hope, now that matters are becoming more normal, and materials more easily procurable that the manufacture of engines and boilers will be taken up in earnest in this State. We have considerable leeway to make up in this respect.

On December 21st, another fine sawmill, viz., the No. 1 Mornington Mill, was completely burnt down. Much damage was done and it will be some months before the mill can be reconstructed. Between 70 and 80 men were employed at this mill, and though a number of them have been absorbed by other mills, many, no doubt, are out of employment as a consequence of the fire.

The Gold Mining Industry is suffering from the high cost of production. Industrial troubles and the high prices of mining requirements and stores contribute largely to this unsatisfactory state of things, and, of course, the output is seriously affected, some of the lower grade mines having to cease operations.

Tin mining is at present suffering from a severe post-war slump in the price of tin.

Coal mining appears to be prosperous. Several of the largest companies have amalgamated, and under more concentrated management, and with better methods, this industry should give a good account of itself.

In my report for the year ending December, 1919, I referred fully to a Conference held in Sydney for the purpose of discussing uniformity of examination and certification of engine-drivers, etc. None of the States, as far as I know, has as yet introduced the legislation agreed on.

Acting under instructions, I included in the proposed new Inspection of Machinery Bill the recommendations made at the above Conference. This Bill was to have been introduced last year, but this was not found practicable. It is to be hoped that it will become law during the coming session.

There are still several minor points, particularly those dealing with Regulations, which remain to be settled at a future conference, but no further action has been taken during the year under review.

The question of uniformity of engine-driver's certificates, as well as that of standard examinations, is of urgent necessity, and the desired results will not be attained until the necessary legislation is introduced, and a further Conference held to settle the details referred to.

*Work done for other Departments.*

A good deal of Advisory work, sometimes accompanied by valuations, has been done during the past year for other Departments.

I was also requested to act as Adjudicator on certain disputed points in connection with a section of the Wyndham Meat Works engine-room staff, affect-

ing wages and conditions of work. A satisfactory settlement was arrived at.

*Inspectorial Staff.*

On August 3rd one of the Inspectors was transferred to another Department, and no appointment was made to fill his place for four months.

The Senior Inspector at Kalgoorlie started his Long Service Leave on September 1st and was thus absent for four months of the year, and between the various Inspectors four weeks' sick leave was granted.

Work throughout the Civil Service ceased for 19 days during July, which with seven Inspectors is equivalent to 19 weeks for one Inspector.

In all, this lost time amounts to 61 weeks four days, or more than a year for one Inspector, exclusive of annual leave taken during the year.

In spite of this fact, I am pleased to be able to report a slight increase of revenue as pointed out elsewhere.

The work of inspection of boilers has been kept fairly up to date, but many inspections of machinery are overdue, as was only to be expected. I anticipate, however, that by the end of the financial year all of the work will be well in hand.

After considerable difficulty in procuring suitably qualified men, two new Inspectors were appointed early in December. One of them will replace the transferred Inspector, and the other will be available to relieve wherever he is most required, thus meeting a long felt want.

I am pleased to report that the work of the Inspectors throughout the year has been uniformly good, and that every endeavour has been made to overtake the arrears of work regardless of official working hours.

*Clerical Staff.*

This staff remains practically as in 1919, with the exception of some changes in the Junior Clerks.

The officers are fully occupied and are doing good work..

*Revenue.*

The total revenue from all sources during the year was £4,273 15s., made up as follows:—

| | £ | s. | d. |
|---|---|---|---|
| Fees for Boilers ... ... ... ... ... | 2,975 | 2 | 0 |
| Fees for Machinery ... ... ... ... | 1,065 | 4 | 5 |
| Fees, Engine-drivers' Certificates ... ... | 159 | 5 | 0 |
| Incidentals (being fees for special inspections, special expenses, etc.) ... ... ... | 74 | 4 | 5 |
| | £4,273 | 15 | 10 |

This shows an increase of £41 14s. 8d., which is satisfactory in view of remarks under "Inspectorial Staff." This increase is made up as follows:—

| —— | Increase. | | | Decrease. | | |
|---|---|---|---|---|---|---|
| | £ | s. | d. | £ | s. | d. |
| Boiler Fees ... ... ... | 192 | 1 | 8 | ... | | |
| Machinery Fees ... ... | ... | | | 135 | 9 | 7 |
| Engine-drivers' Fees ... ... | 22 | 0 | 0 | ... | | |
| Incidentals ... ... ... | ... | | | 36 | 17 | 5 |
| | 214 | 1 | 8 | 172 | 7 | 0 |
| | 172 | 7 | 0 | | | |
| Total Increase ... ... | £41 | 14 | 8 | | | |

On analysing the Increases from the district point of view:—

| —— | Increase. | | | Decrease. | | |
|---|---|---|---|---|---|---|
| | £ | s. | d. | £ | s. | d. |
| S.W. Group ... ... ... | 67 | 4 | 8 | ... | | |
| Kalgoorlie ... ... ... | ... | | | 42 | 9 | 2 |
| North Coolgardie and Mt. Margaret | 12 | 15 | 11 | ... | | |
| East Murchison and Murchison and Yalgoo | ... | | | 17 | 16 | 9 |
| Engine-drivers' Fees ... ... | 22 | 0 | 0 | ... | | |
| | 102 | 0 | 7 | 60 | 5 | 11 |
| | 60 | 5 | 11 | | | |
| Total Increase ... | £41 | 14 | 8 | | | |

The loss in Revenue to this Department for past year, owing to fees not charged to Government non-trading concerns, was £49 5s., and the expenses connected with these inspections amounted to £18 18s. 9d.

During the year, it has been necessary to write off as bad debts, three items totalling £3 5s. The amount represents only .07 per cent. of the total revenue.

*Mileage.*

The total distance travelled by Inspectors during the year was 41,893 miles, of which 16,081 were by rail, 25,758 by road, and 54 by water. The distance travelled shows an increase of 923 miles as against 1,919 with a decrease of 189 in the number of inspections made. The average miles travelled per inspection were 8.78, showing an increase of .52 miles per inspection as against last year.

*Conclusion.*

In conclusion, I wish to again tender my sincere thanks for kindly assistance rendered by the officers attached to the Crown Law, Police, and Postal Departments in various districts, in matters connected with the administration of the Act.

My staff have continued to carry out their duties efficiently, and to them also my thanks are due.

I have, etc.,
C. J. MATHEWS, M.Inst.C.E.,
Chief Inspector of Machinery and
Chairman of the Board of Examiners.

# DIVISION VII.

## Report of the Chief Inspector of Explosives and Government Analyst for the Year 1920.

*The Under Secretary for Mines.*

I have the honour to submit, for the information of the Hon. Minister for Mines, my twenty-fifth Annual Report dealing with the work of this Department during the year 1920, grouping my remarks under the headings of the three principal divisions of the work entrusted to me.

### GOVERNMENT ANALYST.

The ordinary work of the laboratory has been more difficult to carry on at a reasonable cost during the past year than in any preceding period, owing to the high cost of apparatus and chemicals, and the difficulty in some cases of obtaining supplies even at any cost. The isolation of this Department from main centres of manufacture makes it practically impossible to obtain some of those supplies which may be considered as absolute necessities in an ordinary chemical laboratory. It is to be hoped, however, that with the return to more normal conditions, which is hoped for during the next twelve months, some of these disadvantages may disappear.

*Staff.*—The only change which has taken place in my staff has been the resignation towards the end of the year of Mr. R. G. Lapsley, who was employed as Milling Assistant, and who has left the Department to take up agricultural work in the country. The staff is now somewhat depleted from what it was in past years, but it is hoped that the pending reclassification will lead to the filling up of gaps and putting the whole Department on a better working basis than it has been since the outbreak of war.

During the year Messrs. F. J. Malloch and J. C. Hood, two of the officers from this Department who served as Munition Chemists in England during the war, have been gazetted by the Imperial Government as recipients of the medal of the Order of the British Empire.

It is a source of great gratification that out of the four officers from this Department who took up this special work two should have received this high honour, and I think that the notices in the London gazette concerning these two officers are worthy of reproduction here, as follow:—

> *"Malloch, Francis John.*—For great courage in continuing to work in a poisonous atmosphere, although repeatedly burned and gassed.
>
> *"Hood, James Chalmers.*—For great courage shown on the occasion of an explosion, when he stopped a serious fire, although at the time suffering from injuries incurred in previous services of a similar nature."

*General Analytical Work.*—Very few investigations outside of the ordinary routine work claimed attention during the year in this branch of the laboratory. A number of tests have been made on behalf of the representatives of Messrs. Brunner, Mond & Co., who are making investigations in the South-Western district of the State in order to test the possibilities of the establishment of alkali works in Western Australia.

A fair number of analyses of foods in connection with inquiries by the Health Department for the purposes of the Pure Foods Advisory Committee, of which I am a member, have been carried out during the year, and several lectures have been delivered on the question of Pure Foods and Cheap Foods, especially with a view to increasing public knowledge on the theory of vitamines and the part they play in nutrition, which has of late come into such prominence in all parts of the world.

In connection with the toxicological work carried out for the Crown Law Department, one case was of more than usual interest, in which death had occurred from hydrochloric acid poisoning. As has been noted by other observers in such cases, that even where considerable quantities of the acid have been administered no reaction for free acid could be obtained, and it is believed that under certain conditions in the presence of protein bodies combination takes place between the acid and the tissue which materially modifies the properties of the former. In such cases the ordinary methods of treatment recommended in text-books, viz., the addition of carbonates, is ineffective, and it is probable that greater opportunity of saving life would be afforded by the use of lime water, or milk of lime. In consequence of the observations made, a communication was sent to the Medical Department, and the medical practitioners of the State were circularised on the subject.

The following table gives a summary of the chemical analyses performed during the year:—

TABLE No. 1.

*General Analytical Work.*

| | |
|---|---|
| Spirits | 96 |
| Powellising | 145 |
| Hydrometers | 9 |
| Foodstuffs | 84 |
| Waters | 318 |
| Milks and Cream | 149 |
| Sewage | 324 |
| Soils and Deposits | 70 |
| Criminal | 50 |
| Medicinal Compounds | 10 |
| Ciders | 8 |
| Barks | 7 |
| Disinfectants | 19 |
| Inks | 12 |
| Salts | 5 |
| Limes | 15 |
| Miscellaneous | 34 |
| Total | 1,355 |

## CHIEF INSPECTOR OF EXPLOSIVES.

The following tables show the importations of explosives into this State during the year 1920 as compared with previous years:—

TABLE No. 2.

*Importations* 1919–1920.

| —— | 1919. | | 1920. | |
|---|---|---|---|---|
| | Quantity. | Value. | Quantity. | Value. |
| | lbs. | £ | lbs. | £ |
| Gelignite ... ... ... ... ... | 950,000 | 39,783 | 2,035,300 | 111,192 |
| Gel. Dynamite ... ... ... ... | 180,000 | 11,154 | 149,050 | 9,130 |
| Blasting Gelatine ... ... ... ... | 64,000 | 4,998 | 67,950 | 5,425 |
| Dynamite ... ... ... ... ... | ... | ... | ... | ... |
| Permitted Explosives ... ... ... | ... | ... | ... | ... |
| Detonators ... ... ... ... | ... | 248 | ... | 10,309 |
| Fuse (coils) ... ... ... ... | 54,000 | 1,593 | 121,003 | 4,776 |
| Powder, Blasting ... ... ... ... | 40,025 | 1,453 | 172,500 | 9,507 |
| Powder, Sporting ... ... ... | ... | ... | 10,675 | 1,627 |
| Explosives, N.E.I. ... ... ... | ... | 543 | ... | 4,449 |
| Fireworks, N.E.I. ... ... ... ... | ... | 349 | ... | 1,144 |
| Totals ... ... ... | 1,288,025 | £60,121 | 2,556,478 | £157,559 |

*Comparisons of Importations for last five years.*

| —— | 1916. | 1917. | 1918. | 1919. | 1920. |
|---|---|---|---|---|---|
| | £ | £ | £ | £ | £ |
| Nitro Compounds ... ... ... | 183,269 | 93,377 | 77,166 | 55,935 | 125,747 |
| Blasting Powder ... ... ... ... | 3,123 | 13,339 | 4,030 | 1,453 | 9,507 |
| Sporting Powder ... ... ... ... | ... | 36 | 189 | ... | 1,627 |
| Fuse ... ... ... ... ... | 4,701 | 5,005 | 4,779 | 1,593 | 4,776 |
| Fireworks ... ... ... ... ... | 92 | 1 | 240 | 349 | 1,144 |
| Detonators ... ... ... ... | 4,465 | 7,619 | 3,500 | 248 | 10,309 |
| N.E.I. ... ... ... ... ... | 2,170 | 4,784 | 193 | 543 | 4,449 |
| Totals ... ... ... | 197,820 | 124,161 | 90,097 | 60,121 | 157,559 |

It is very probable that in the future the whole method of conducting the explosives trade in this State will be very considerably modified through the combination of explosives interests which has taken place by the formation of the powerful syndicate known as "The Explosives Trades, Ltd." The full effect of this cannot yet be seen, but it would appear as though the element of competition will be largely done away with. It is probable that this will throw greater responsibility upon this Department, demanding greater care in the supervision of the quality of the explosives used.

One immediate result of the changed conditions has been the accumulation of importations in very large shipments at longer intervals than hitherto, and the question has arisen with a view to the safety of the Port of Fremantle as to whether the size of these shipments should not be restricted. Representations have been made to importers on the matter, and it is hoped that it will not be necessary to use statutory measures in order to bring this about. Unfortunately, though accidents with shipments of explosives have been rare they have always been disastrous, and it is obvious that one of the elementary means of preventing wide-spread damage is by a reasonable restriction of the quantity of explosives in any one place.

*Ships' Magazines.*—In a previous report reference was made to the unsatisfactory mode of construction adopted in ships' magazines as arriving in this State with explosives, and attention was drawn to modifications which have been permitted by the Board of Trade in the construction of these magazines to which exception was taken. Communications through the Agent General on the matter have not been very effective, and I think it is desirable to set out a little more fully the position of affairs.

It was formerly the custom for a ship's magazine to be lined throughout with wood, and roofed over with wood beneath the plating of the upper deck. By modified rules issued by the Board of Trade this lining was not required to be continuous, but could be in the form of separated battens. The result of this alteration was that moisture condensed on the under side of the decks, derived from sweating in the ship's cargo, could run down and find admission to the magazines, and has in more than one case effected serious damage in the explosives. The Board of Trade authorities appear to regard the representations made on this matter as unimportant, though the efficiency, or otherwise, of the particular form of construction can obviously only be determined at the end of a voyage.

The Home authorities seem to consider that by improving methods of ventilation the difficulty could be met, and a certain amount of improvement has in this way been introduced. Nevertheless, partial dam-

age to the explosive cargo now and then occurs, and is likely to recur. Fortunately, the nature of the damage is not such as to increase the risks to the ship, but results in financial loss to the owners of the explosives, so that the Department has taken no further steps in the matter. It seems strange, however, that in order to save the comparatively small expense in timber and labour required to make the magazine effective the risk should be run of considerably greater monetary loss through damage to the explosives.

*Air in Mines.*—During the year the Department was approached by the Labour Unions of Kalgoorlie with a request that investigations might be carried out as to the condition of the air in mines and the nature of gases caused by explosives with a view to providing evidence before the Arbitration Court, which was expected to hear certain claims by the men based upon the conditions under which their work is carried out.

The Department undertook to make any tests desired either by the Unions or by the Chamber of Mines, which constituted the two parties in the case, and my assistant (Mr. T. N. Kirton) conducted a careful series of tests, which were afterwards laid before the court. The full text of his report was published in the Journal of the Chamber of Mines in September last year.

*Commonwealth Explosives.*—The Commonwealth Government has for some time held stocks of explosives on the transcontinental railway line, in the Commonwealth territory, at a point very remote from centres of population. As the Commonwealth has no official to deal with these matters it has on various occasions sought the assistance of this Department in testing and examining these explosives, and during the year a special visit was made to overhaul and examine these stocks. Very extensive deterioration was found, and arrangements were made for the destruction of the deteriorated explosive. This was successfully carried out although the conditions surrounding the destruction rendered the operations unusually dangerous, and a report was forwarded to the Commonwealth with a view to preventing a recurrence of these undesirable conditions. The total quantity of explosive destroyed is included in Table No. 3.

*Magazine Reserves.*—It is very probable that the new conditions of the explosives trade in this State (to which reference has already been made) may render it desirable to modify in important particulars the methods of control on reserves throughout the State, but matters have not yet gone far enough for me to make definite recommendations.

No new reserves have been declared during the year, and the number still remains at fifty, with a total area of 3,051 acres. On these reserves there are erected and licensed 75 magazines owned by private firms, and three Government magazines, with a total capacity of 1,118 tons. There are also 51 magazines erected on private property, with a total storage capacity of 32 tons.

Ninety-five store licenses for the storage and sale of explosives were issued during the year, and 209 licenses for the storage and sale of fireworks only.

*Inspections.*—During the year 165 inspections of magazines and licensed premises were made, and the following places were visited: Woodman's Point Explosives Reserve, Perth, Fremantle, Northam, York, Beverley, Brookton, Narrogin, Wagin, Katanning, Gnowangerup, Albany, Ravensthorpe, Hopetoun, Kundip, Denmark, Westonia, Bullfinch, Southern Cross, Coolgardie, Norseman, Kalgoorlie, Broad Arrow, Kanowna, Menzies, Comet Vale, Kookynie, Malcolm, Morgans, Leonora, Laverton, Moora, Geraldton, Yalgoo, Magnet, Youanmi, Cue-Day Dawn, Nannine, Meekatharra, Collie, Bunbury, Donnybrook, Busselton, Capel, Greenbushes, Balingup, and Bridgetown.

As a result of these inspections it was not found necessary to take proceedings under the Explosive Act, but the following explosives were destroyed:—

TABLE No. 3.

| Date. | Place. | Kind and Quantity. | Remarks. |
|---|---|---|---|
| 26-2-20 | Fremantle ... ... | 1,750lbs. Gelignite ... ... | Owing to having been damaged by water. |
| 26-2-20 | Do. ... ... | 1,400lbs. Blasting Gelatine ... | do. |
| 26-2-20 | Do. ... ... | 8,950lbs. Gelignite ... ... | do. |
| 26-2-20 | Do. ... ... | 4,500lbs. Gel. Dynamite ... | do. |
| 26-2-20 | Do. ... ... | 600lbs. Blasting Gelatine ... | do |
| 10-3-20 | Beverley ... ... | 2lbs. Gelignite ... ... | Owing to chemical deterioration. |
| 17-3-20 | Narrogin ... ... | 1lb. Lig. Dynamite... ... | do. |
| 23-3-20 | Albany ... ... | 125lbs. Blasting Powder ... | Owing to having absorbed moisture. |
| 23-3-20 | Do. ... ... | 15lbs. Sporting Powder ... | do. |
| 21-3-20 | Fremantle ... ... | 80lbs. Gel. Dynamite ... | do. |
| 21-5-20 | Do. ... ... | 100lbs. Gelignite ... ... | do. |
| 8-6-20 | Naretha ... ... | 1,112lbs. Blasting Powder ... | do. |
| 8-6-20 | Do. ... ... | 80lbs. Lig. Dynamite ... | Chemical deterioration. |
| 8-6-20 | Do. ... ... | 7,400lbs. Gelignite ... ... | Chemical deterioration and absorption of moisture. |
| 9-9-20 | Cue ... ... | 50lbs. Gelignite ... ... | Owing to exudation. |
| 9-9-20 | Do. ... ... | 10lbs. Gelignite ... ... | do. |
| 11-9-20 | Meekatharra ... ... | 4lbs. Gelignite ... ... | Chemical deterioration. |
| 13-9-20 | Nannine ... ... | 3lbs. Gelignite ... ... | do. |
| 18-9-20 | Geraldton ... ... | 25lbs. Viking Powder ... | do. |
| 18-9-20 | Do. ... ... | 5lbs. Gelignite ... ... | Owing to exudation. |
| 18-9-20 | Do. ... ... | 10lbs. Viking Powder ... | Chemical deterioration. |
| 18-9-20 | Do. ... ... | 4lbs. Gelignite ... ... | Absorption of moisture. |
| 18-9-20 | Do. ... ... | 100lbs. Detonators ... ... | Damaged by oil and moisture. |
| 8-10-20 | Fremantle ... ... | 325lbs. Blasting Powder ... | Owing to being damaged by water through ship's hold sweating. |
| 14-12-20 | Collie ... ... ... | 1,850lbs. Blasting Powder ... | Owing to having absorbed moisture. |
| 14-12-20 | Do. ... ... | 700lbs. Miners' Friend ... | Chemical deterioration. |
| 14-12-20 | Do. ... ... | 20lbs. Stomonal ... ... | do. |
| 16-12-20 | Bunbury ... ... | 8lbs. Gelignite ... ... | do. |
| 16-12-20 | Do. ... ... | 3lbs. Gelignite ... ... | do. |
| 20-12-20 | Busselton ... ... | ½lb. Gelignite ... ... | do. |

The tests carried out in connection with the inspection of explosives were as follows:—

TABLE No. 4.

| | |
|---|---|
| Heat Tests on Explosives .. | 967 |
| Fuse tests .. .. .. | 136 |
| Air in mines .. .. | 161 |
| Total .. .. | 1,264 |

## AGRICULTURAL CHEMIST.

The chemical work carried out under this heading comprises the following tests:—

| | |
|---|---|
| Soils .. .. .. | 78 |
| Fertilisers .. .. .. | 94 |
| Wheats and Flours .. .. | 118 |
| Fodders .. .. .. | 18 |
| Waters .. .. .. | 34 |
| Milks .. .. .. | 22 |
| Salts .. .. .. | 9 |
| Miscellaneous .. .. | 30 |
| Total .. .. | 403 |

One or two investigations of more than special interest have been carried out during the year, notably one with regard to the possibilities of obtaining supplies of irrigation water in the Avon River valley. During the year my attention was drawn to the possibility of conserving during the wet season large quantities of fresh water which now flows away in the Avon River and escapes over the weir at Northam. I therefore recommended to the Agricultural Department that careful gaugings and tests of the water should be made every week throughout the wet season, and a parallel series of tests was also carried out in one of the large pools between Northam and York on the property of Mr. Burges, at Tipperary. The results are extremely interesting and, I think, are sufficiently important to be embodied in this report. They are, therefore, included in Appendix I. attached hereto. The results have been forwarded to the Public Works Department for the information of the engineers connected with water supply.

Investigations into the orchard soils of Bridgetown referred to in my last Annual Report were completed and formed the subject of a special address to the fruitgrowers in that district. A number of analyses were carried out during the year of rocks from various agricultural areas, in order to study the relation between the principal rock formations and the soils formed therefrom. These studies are of great interest and value in suggesting advice which has to be given to settlers in connection with soil treatment.

A series of pot experiments was carried out during the year in order to test the efficacy of a manure made from West Australian alunite and sold under a proprietary name as a source of potash. The result of the experiments, however, was inconclusive as applied to potatoes in pot experiments, and on my recommendation further and more extensive trials have been undertaken in the field by the field officers of the Agricultural Department.

The experimental flour mill attached to the Department after a number of years in constant work showed serious signs of wear and tear, and has had to undergo complete overhaul during the year. It is now working satisfactorily, but unfortunately the resignation of Mr. Lapsley will again hinder the full use of this mill. I hope, however, to make arrangements for the carrying on of such work as may be required during the early part of the year, and trust that a special assistant will be available before the heavier work later in the year comes to hand.

*Botanical and Pathological.*—The work of the Botanical and Pathological section has been continued to be carried out by Mr. Herbert. It is satisfactory to note that as the result of some of the special research work which he carried out, especially in connection with the Western Australian Christmas Tree, Mr. Herbert has been granted the degree of Master of Science by his University in Melbourne. Mr. Herbert is to be very much congratulated on his success in this academic inquiry, and has also ably performed the routine work of the Department during the year.

Owing to changes in the University staff special arrangements were made between the University authorities and the Government by which Mr. Herbert, during the last term of the university year, delivered lectures on Botany incidental to a biological course. This temporary arrangement, however, has now ceased through the appointment of other members to the regular staff of the University.

Early in 1920 Miss V. McN. Prowse, B.Sc., was engaged as a special assistant to carry out the reorganisation of the herbarium, and to carry on other work so as to make Mr. Herbert's services more available for special investigations. Her duties have been well carried out, although the work for which she was engaged is still far from complete.

The details of the work done by this branch are contained in the following report submitted by Mr. Herbert on his work:—

"The botanical work of the year has included a large number of life-tests on suspected poison plants, and also on plants of known toxicity. Several species of plants new to science were described, including *Isopogon occidentalis* from Cranbrook and the Stirling Range, *Conospermum suaveolente* from Kelmscott, *Xanthorrhoea nana* from Bruce Rock and Merredin, *Xanthorrhoea brevistyla* from Narrogin. The two latter are allied to the common blackboy, but are dwarf and almost trunkless. A new species of Xanthorrhoea, described last year, had a tall trunk very similar in habit to that of the ordinary species found in the hills. In addition, a number of fungi previously unrecorded for this State were found.

"*Ustilago cynodontis*, the Loose Smut of couch grass, has been obtained from the grounds of the Technical School, along the Esplanade. This disease is present in the Eastern States but has not previously been noted from Western Australia. It is not likely to cause much damage, as it confines its attacks to the flower of the couch grass.

"Early Blight, Irish Blight, Dry Rot, Rhizoctonia Rot, and Wet Rot have all been present in potato samples received in the laboratory. A number of fungicides were tried in connection with the Red Root disease of onions in the Fremantle area, but, though salt promised well at first, none were found effective in the long run.

"In wheat Take-all has been the disease most commonly sent in. Sometimes this has been due to the fungus *Ophiobolus graminis,* but very frequently water-logging of the soil is the trouble. Septoria has also been found.

"Two fungi new to this State but not causing disease are *Lysurus Gardneri,* a foul-smelling species from South Perth, and *Polyporus mylittae,* commonly known as blackfellow's bread. Both these are present in the Eastern States. The former is useless and objectionable on account of its fetid smell, but the latter has a slight food value. It is common at Denmark.

"Amongst diseases not due to specific organisms two are deserving of mention: a leaf scorch of strawberries at Bullsbrook and a scald in cool-stored apples at Mt. Barker. The former was found to be due to the excessive use of superphosphate, which had the effect of producing a physiological drought as far as the plant was concerned. The symptoms were a scorched appearance round the edges of the leaves and a general weakening of the plant, accompanied by a reduced yield of fruit. The scald in the apples at Mount Barker was found to be mainly in apples which had been put in at that stage half-way between immaturity and ripeness, and was not due to any fluctuation of temperature in the store.

"Quarantine samples sent in for examination prior to their admission to the State have trebled their number as compared with the previous year. They are examined for weed and disease impurities. The most noteworthy sample was some wheat from Japan which was badly infested with ear cockle (*Tylenchus tritici*)."

"*Publications.*—The following publications were issued during the year or are in print:—

"Confusion between three Western Australian Species of Acacia," "Noxious Weeds of W.A.," "Potato Diseases" (part of Bulletin No. 72), "Contributions to the Flora of Western Australia No. I.," "Contributions to the Flora of Western Australia No. II.," "A Revision of the Western Australian Species of Xanthorrhoea," "Parasitism of the Quandong," "Improvement of Pastures," and revision of Bulletin No. 61, "Onions: Their Culture and Diseases."

"*Lectures.*—No country lectures were delivered, but a course of lectures in Botany and Plant Pathology was delivered at the University pending the appointment of a permanent lecturer. Visits were paid to Westonia, Nornalup, Popanyinning, Beverley, Capel and elsewhere on various investigations, and several hundred specimens (some being new species) were obtained for the herbarium.

"The numerical census of the work done is as follows:—

| | |
|---|---|
| Botanical Identification .. .. | 376 |
| Pathological Diagnoses .. .. | 161 |
| Post-mortem examinations of stock | 7 |
| Quarantine samples .. .. | 89 |
| Seed examination and Germination tests .. .. .. .. | 18 |
| Total .. .. .. | 651 |

"During the year the herbarium has been reorganised by Miss V. McN. Prowse, B.Sc., who was specially appointed for the purpose. Previously it consisted of about 5,000 specimens arranged in alphabetical order, and about 8,000 (some named) in bundles, which had been accumulating for many years, and which contained some rare and valuable species. Much of this unclassified material was not included in the herbarium, but the named portion has now been incorporated, and under the new scheme of arrangement the collection is the best in the State, and forms a good basis for future work on the flora of Western Australia. A number of plants new to science have been described as a result of the rearrangement, as they could be compared with closely related species which were not previously in the herbarium. The collection of known poison plants has been completed. Though the old herbarium contained about 5,000 specimens, many of these were unnamed, incorrectly named, or useless, or consisted of duplicates; and on revision the number of useful specimens amounted to about 1,500 distinct species. When the previously unclassified material was added, however, the number rose to something over 6,000, which are all classified and card indexed. Some 3,000 specimens collected by previous Government Botanists and others still remain to be identified, and will probably yield a large number of new species. The task, however, will be a long one, as it is a much slower operation than the reorganising and correction of already named specimens. In addition to these there are about 500 specimens recently collected by the Forestry Department, and about 500 more collected during the year during journeys to Westonia and Nornalup Inlet with Professor Wilson. A number of these are new, and a large number of little known species have been obtained."

The following table gives a summary of the total scientific work performed in this Laboratory and the Departments for which it was carried out:—

TABLE No. 7.

| | |
|---|---|
| Explosives .. .. .. .. | 1,103 |
| Railways .. .. .. .. | 24 |
| State Hotels .. .. .. .. | 91 |
| Health .. .. .. .. | 315 |
| Government Stores .. .. .. | 12 |
| Council of Indus. Development .. | 8 |
| Police .. .. .. .. | 50 |
| Public Works Department .. .. | 123 |
| Mines Department .. .. .. | 163 |
| Water Supply Department .. .. | 488 |
| Agricultural and Forestry .. .. | 1,054 |
| Miscellaneous .. .. .. .. | 38 |
| Private .. .. .. .. | 204 |
| Total .. .. .. | 3,673 |

E. A. MANN, F.I.C.,

Government Analyst, Chief Inspector of Explosives, and Agricultural Chemist.

## APPENDIX No. 1.

23rd November, 1920.

*The Under Secretary for Agriculture, Perth.*

UTILISATION OF THE AVON RIVER WATER.

The gaugings and tests of the water flowing over from the Northam Weir have now been completed for this year, and I forward herewith three tables showing:—

(1) The weekly gaugings of overflow and estimation of certain ingredients therein.

(2) A graph in which the overflow has been converted into acre feet.

(3) A table showing a series of tests made of Burges' Pool at Tipperary, between Spencer's Brook and York.

The results are very interesting, and it will be seen that during the week ended 23rd August no less than thirty-three thousand acre feet of water flowed over the Northam weir, containing only thirty-one grains per gallon of salt. The overflow during this week is over nine thousand million gallons, or approximately twice the capacity of the Mundaring Weir. There seems to me little doubt that, if this water supply were controlled, such a huge volume of fresh water could be utilised to advantageously change the whole of the content of the Avon River.

The examination of the figures for the Tipperary Pool shows that this pool seriously lags behind the water in the Northam Weir, since it freshens much later, becomes salt much earlier, and never reaches the same degree of freshness as the water flowing to waste over the weir. This is to be expected, and must be largely due to the condition of the river bed, which effectually prevents a proper freshening of the stream during flood times, and thus the lower depths of the river are at present forming reservoirs of saline water which are detrimental.

I am of opinion that if the river bed was cleaned and snagged, these pools could all be sluiced and left full of comparatively fresh water at the end of the wet season. The effect of this could be greatly enhanced by the construction of weirs at various points as already suggested, through which bottom sluicing could be conducted to keep the river bed scoured.

The tables which I forward to you are very interesting as constituting the first systematic examination of the variations in salinity of this water, and should, combined with engineering data, afford particulars for exact mathematical calculations by which the proposals to utilise the Avon River could be critically examined. As the water has now ceased flowing over the Northam Weir the further tests cannot be made until the overflow has begun next wet season, but I would strongly urge that a similar record be continued from year to year during each winter.

I beg to recommend that these data may be forwarded to the Engineer-in-Chief for his examination. As I understand that some question has been raised by the Engineers of the Water Supply Department as to why I should make suggestions in connection with this matter, which is looked upon as an intrusion upon their work, I would like to make it perfectly clear that I had no intention whatever of trespassing upon the domain of other officers. The matter has come before me in quite a legitimate fashion from two sources:—

In the first place, owing to the inquiry of the Special Committee appointed to report on the establishment of an Agricultural College, of which I was a member, and in connection with which it was necessary to ascertain data as to the possibilities of irrigation in the Avon Valley.

In the second place, the same question has arisen in connection with inquiries made by Mr. Hampshire as to the possibility of dairy development in that district.

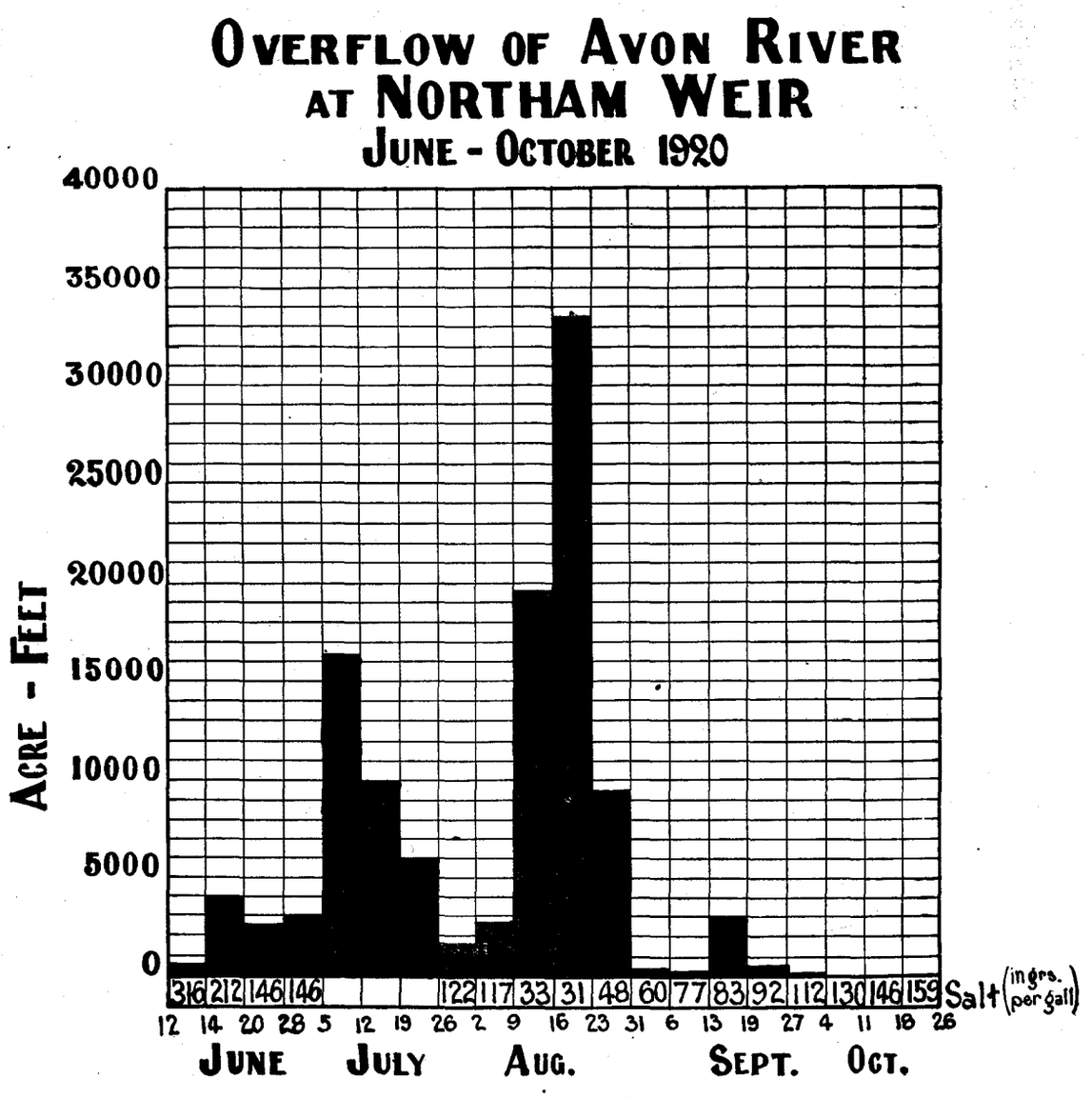
As Agricultural Chemist it was necessary for me to obtain certain facts, and as these facts appear to me of value I am now forwarding them through you with the desire that they may be of some value to the engineering officers of the Public Works Department in dealing with this scheme. As I understand that Parliament has recently passed a resolution that inquiry should be held into the utilisation of this water, these facts may be particularly opportune at the present time.

(Sgd.) E. A. MANN,
Agricultural Chemist and Government Analyst.

## WATER FROM NORTHAM WEIR, 1920.

Figures represent grains per gallon.

| Date. | Overflow (gallons). | Chlorine. | Sodium Chloride. | Total Magnesium Oxide. | Total Solids. | —— |
|---|---|---|---|---|---|---|
| 12–5–20 | ... ... ... ... ... ... | 408·80 | 674·52 | 71·40 | 721·00 | Taken by Mr. Jones of the Avon Co-operative Co. |
| 1–6–20 | ... ... ... ... ... ... | 380·80 | 628·32 | 38·36 | 711·48 | Reduced level 477·51. |
| 7–6–20 | ... ... ... ... ... ... | 378·00 | 623·70 | 38·15 | 702·73 | Do. |
| 14–6–20 | 102,000,000 from 10 p.m. on 12–6–20 to 10 a.m. on 14–6–20 | 191·80 | 316·47 | 27·22 | 361·20 | Reduced level 480·42. |
| 21–6–20 | 989,000,000 from 14–6–20 to 21–6–20 | 129·08 | 212·98 | 20·50 | 238·70 | Reduced level 480·63 |
| 28–6–20 | 814,000,000 from 21–6–20 to 28–6–20 | 88·90 | 146·68 | 14·19 | 168·00 | Reduced level 480·46. |
| 5–7–20 | 893,000,000 from 28–6–20 to 5–7–20 | 88·90 | 146·68 | 14·44 | 165·20 | Reduced level 480·63. |
| 12–7–20 | 4,630,000,000 approx., from 5–7–20 to 12–7–20 | Not sampled owing to strike. | | | | |
| 19–7–20 | 2,816,000,000 approx., from 12–7–20 to 19–7–20 | Not sampled owing to strike. | | | | |
| 26–7–20 | 1,676,000,000 approx., from 19–7–20 to 26–7–20 | Not sampled owing to strike. | | | | |
| 2–8–20 | 428,000,000 approx., from 26–7–20 to 2–8–20 | 74·20 | 122·43 | 11·91 | 144·90 | Reduced level 480·38. |
| 9–8–20 | 700,000,000 from 2–8–20 to 9–8–20 ... | 71·40 | 117·81 | 10·89 | 141·40 | Reduced level 480·71. |
| 16–8–20 | 5,427,000,000 from 9–8–20 to 16–8–20 | 20·30 | 33·49 | 6·08 | 51·10 | Reduced level 482·29. |
| 23–8–20 | 9,159,000,000 from 16–8–20 to 23–8–20 | 18·76 | 30·95 | 1·77 | 44·80 | Reduced level 481·09. |
| 31–8–20 | 2,653,000,000 from 23–8–20 to 30–8–20 | 29·40 | 48·51 | 4·05 | 63·70 | Reduced level 480·71. |
| 6–9–20 | 1,600,000 from 31–8–20 to 6–9–20 ... | 36·40 | 60·06 | 5·07 | 70·63 | Reduced level 480·67. |
| 13–9–20 | 1,213,000 from 6–9–20 to 13–9–20 ... | 46·76 | 77·15 | 6·84 | 95·90 | Reduced level 480·67. |
| 20–9–20 | 882,000,000 from 13–9–20 to 20–9–20 | 50·47 | 83·27 | 8·29 | 104·30 | Reduced level 480·34. |
| 27–9–20 | 158,000,000 from 20–9–20 to 27–9–20 | 56·0 | 92·40 | 9·38 | 119·0 | Reduced level 480·21. |
| 4–10–20 | 13,000,000 from 27–9–20 to 4–10–20 ... | 68·32 | 112·75 | 11·33 | 148·12 | Reduced level 480·17. |
| 11–10–20 | 2,000,000 from 4–10–20 to 11–10–20 | 79·24 | 130·73 | 13·36 | 170·66 | Reduced level 480·13. |
| 18–10–20 | 700,000 from 11–10–20 to 18–10–20 ... | 88·48 | 146·00 | 15·49 | 194·11 | Reduced level 480·13. |
| 26–10–20 | *Nil*, 18–10–20 to 26–10–20 ... ... | 96·6 | 159·39 | 16·95 | 212·80 | Reduced level 480·09. |



## ANALYSES OF WATERS.

| Particulars of Sample. | Date. | Chlorine. | Sodium Chloride. | Magnesium Oxide. | Total Solids. |
|---|---|---|---|---|---|
| | grains per gallon. | grains per gallon. | grains per gallon. | grains per gallon. | grains per gallon. |
| Creek below stable 100 yards from Railway (Sermon's) | July, 1919 | 196·0 | 323·4 | 53·41 | 441·07 |
| Large pool in N.E. end of Estate, about 10ft. from tank (Sermon's) | ... | 204·4 | 337·25 | 37·10 | 401·1 |
| Centre of river, S.E. corner, running (Sermon's) ... | ... | 218·4 | 360·35 | 37·6 | 423·85 |
| From centre of stream opposite Mr. Klopper's house ... | ... | 301·0 | 496·65 | 41·43 | 622·3 |
| Sump—Mortlock's River (Mr. Klopper's) ... ... | ... | 207·2 | 341·9 | 49·15 | 429·24 |
| Burges' Pool (Tipperary) ... ... ... ... | ... | 225·4 | 371·85 | 33·85 | 435·05 |
| From pool at foot of Sermon's property, 12ft. from water's bank | 11–7–19 | 196·7 | 324·55 | 36·89 | 399·0 |
| Tipperary Pool ... ... ... ... ... ... | 17–8–19 | 96·25 | 158·81 | 16·06 | 183·08 |
| Do. ... ... ... ... ... ... | 30–8–19 | 123·20 | 203·28 | 20·40 | 235·30 |
| Do. ... ... ... ... ... ... | 14–9–19 | 89·6 | 147·84 | 17·78 | 171·78 |
| Do. ... ... ... ... ... ... | 28–9–19 | 104·3 | 172·09 | 15·42 | 203·38 |
| Do. ... ... ... ... ... ... | 14–10–19 | 140·0 | 231·0 | 22·68 | 292·39 |
| Do. ... ... ... ... ... ... | 26–10–19 | 126·0 | 207·9 | 18·81 | 259·0 |
| Do. ... ... ... ... ... ... | 10–11–19 | 159·6 | 263·34 | 26·32 | 326·62 |
| Do. ... ... ... ... ... ... | 23–11–19 | 169·4 | 279·5 | 26·88 | 344·4 |
| Do. ... ... ... ... ... ... | 8–12–19 | ... | 285·4 | ... | 335·3 |
| Do. ... ... ... ... ... ... | 22–12–19 | ... | 293·7 | ... | 336·7 |
| Do. ... ... ... ... ... ... | 4–1–20 | 182·0 | 300·3 | 28·0 | 352·1 |
| Do. ... ... ... ... ... ... | 18–1–20 | 188·3 | 310·7 | 29·02 | 378·7 |
| Do. ... ... ... ... ... ... | 6–3–20 | 202·3 | 333·79 | 16·91 | 398·72 |
| Do. ... ... ... ... ... ... | 21–3–20 | 207·2 | 341·88 | 18·89 | 411·11 |
| Do. ... ... ... ... ... ... | 4–4–20 | 218·4 | 360·36 | 31·86 | 393·68 |
| Do. ... ... ... ... ... ... | 20–4–20 | 221·2 | 364·98 | 33·34 | 399·14 |
| Do. ... ... ... ... ... ... | 2–5–20 | 219·8 | 362·67 | 33·04 | 387·66 |
| Do. ... ... ... ... ... ... | 17–5–20 | 229·60 | 378·84 | 36·23 | 430·08 |
| Do. ... ... ... ... ... ... | 1–6–20 | 242·20 | 397·63 | 36·54 | 431·20 |
| Do. ... ... ... ... ... ... | 13–6–20 | 215·6 | 355·74 | 27·97 | 378·28 |
| Do. ... ... ... ... ... ... | 25–6–20 | 98·00 | 161·70 | 14·42 | 185·50 |
| Do. ... ... ... ... ... ... | 18–7–20 | 72·10 | 118·96 | 9·87 | 142·10 |
| Do. ... ... ... ... ... ... | 9–8–20 | 72·10 | 118·96 | 10·36 | 141·40 |
| Do. ... ... ... ... ... ... | 29–8–20 | 32·2 | 53·13 | 4·94 | 64·12 |
| Do. ... ... ... ... ... ... | 10–9–20 | 56·0 | 92·4 | 7·12 | 119·7 |
| Do. ... ... ... ... ... ... | 17–9–20 | 47·6 | 78·54 | 8·54 | 102·90 |
| Do. ... ... ... ... ... ... | 26–9–20 | 65·80 | 108·57 | 10·74 | 140·49 |
| Do. ... ... ... ... ... ... | 4–10–20 | 77·00 | 127·06 | 12·06 | 166·95 |
| Do. ... ... ... ... ... ... | 20–10–20 | 98·7 | 162·87 | 15·84 | 215·25 |
| Do. ... ... ... ... ... ... | 31–10–20 | 108·50 | 179·04 | 17·39 | 234·85 |

WESTERN AUSTRALIA.

# DEPARTMENT OF MINES.

# MINING STATISTICS,

# 1920.

# MINING STATISTICS TO 31st DECEMBER, 1920.

## TABLE OF CONTENTS.

# AUSTRALASIAN MINERAL PRODUCTION.

COMPARATIVE TABLE showing the Output of all Mineral Products from the Several States of Australia and the Dominion of New Zealand during 1920.

| 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 | 617,842 | 2,624,427 | 48,907 | 207,746 | 115,230 | 489,701 | 168,979 | 648,969 | 6,246 | 29,796 | 1,697 | 7,209 | 432,558 | 1,837,389 |
| Copper ... ... statute tons | 137 | 2,698 | 1,296 | 127,978 | 15,897 | 1,551,995 | ... | ... | 4,792 | 528,237 | 4,339 | 423,601 | ... | ... |
| Copper Ore ... do. | 1,511 | 22,467 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Pyritic Ore ... do. | 6,020 | 7,276 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Lead and Silver Lead do. | 5,357 | 153,879 | 9,303 | 86,539 | 1,709 | 65,098 | ... | ... | 3,856 | 142,268 | 82 | 2,420 | ... | ... |
| Manganese ... ... do. | ... | ... | 2,431 | 2,008 | 15 | 60 | ... | ... | ... | ... | 514 | 4,626 | 2 | 10 |
| Platinum ... ... fine ounces | ... | ... | 796 | 16,672 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Silver ... ... do. | 130,692 | 36,605 | 158,934 | 36,942 | 274,235 | 70,461 | 6,231 | 1,714 | 623,359 | 166,767 | 1,005 | 226 | 716,215 | 190,658 |
| Tin (Ore and Ingot) statute tons | 243 | 49,449 | 2,486 | 413,794 | 1,487 | 252,054 | 3,105 | 12,815 | 1,311 | 369,362 | ... | ... | ... | ... |
| Asbestos ... ... do. | 156 | 7,286 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Scheelite ... ... do. | 2½ | 395 | 21 | 3,805 | 3 | 462 | ... | ... | 105 | 17,905 | ... | ... | } 39 | 1,956 |
| Wolfram ... ... do. | ... | ... | 14 | 2,212 | 81 | 14,027 | 8 | 355 | 71 | 13,626 | ... | ... | } | |
| Zinc (Spelter and Concentrates) do. | ... | ... | 71,043 | 249,456 | ... | ... | ... | ... | 10 | 334 | ... | ... | ... | ... |
| Antimony (Metal and Ore) do. | 2½ | 45 | 200 | 2,505 | ... | ... | 691 | 14,238 | ... | ... | ... | ... | ... | ... |
| Bismuth (Metal and Ore) do. | ... | ... | 76 | 33,886 | 1 | 530 | ... | ... | 1 | 9 | ... | ... | ... | ... |
| Alunite ... ... do | ... | ... | 634 | 2,536 | ... | ... | ... | ... | ... | ... | 20 | 150 | ... | ... |
| Coal ... ... do. | 62,021 | 350,346 | 10,715,999 | 7,723,355 | 1,109,913 | 841,551 | 604,989 | 528,919 | 75,429 | 64,005 | ... | ... | 80,088 | 128,509 |
| Coke ... ... do. | ... | ... | 567,569 | 844,191 | ... | ... | ... | ... | ... | ... | ... | ... | 20 | 63 |
| Shale (Oil) ... do. | ... | ... | 21,004 | 46,082 | ... | ... | ... | ... | 140 | 172 | ... | ... | ... | ... |
| Iron ... ... do. | ... | ... | 86,096 | 645,720 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Iron "Oxide" ... do. | ... | ... | 1,574 | 1,247 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Ironstone ... do. | ... | ... | 2,881 | 3,726 | 19,709 | 24,852 | ... | ... | ... | ... | 413,038 | 478,436 | ... | ... |
| Lime ... ... do. | ... | ... | 33,505 | 80,412 | ... | ... | ... | ... | ... | ... | ... | ... | 15 | 68 |
| Limestone ... do. | ... | ... | 80,145 | 30,920 | 105,068 | 42,921 | ... | ... | ... | ... | 30,308 | 9,538 | ... | ... |
| Magnesite ... ... do. | ... | ... | 6,474 | 9,891 | ... | ... | 151 | 453 | ... | ... | 183 | 347 | ... | ... |
| Molybdenite ... do. | ½ | 5 | 40 | 8,442 | 29 | 13,333 | 1,339 | 13,390 | ... | ... | ... | ... | ... | ... |
| Phosphate Rock ... do. | ... | ... | ... | ... | ... | ... | 4,222 | 4,222 | ... | ... | 8,753 | 12,309 | ... | ... |
| Precious Stones ... do. | ... | ... | ... | 29,882 | ... | 66,331 | ... | ... | ... | ... | ... | 24,000 | ... | ... |
| Arsenical Ore ... do. | 1,765 | 4,260 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| N.E.I. ... ... ... ... | ... | 273 | ... | 801,515 | ... | 28,838 | ... | 8,422 | ... | 88,623 | ... | 191,880 | ... | 568,970 |
| **Total Values** ... ... | ... | 3,259,411 | ... | 11,411,462 | ... | 3,462,514 | ... | 1,233,497 | ... | 1,421,104 | ... | 1,154,742 | ... | 2,727,623 |

# PART I.—GOLD.

## TABLE I.

MONTHLY PRODUCTION OF GOLD, IN FINE OUNCES, SHOWING THE QUANTITY REPORTED TO THE MINES DEPARTMENT DURING 1920.

| GOLDFIELD. | DISTRICT. | JANUARY. | | FEBRUARY. | | MARCH. | | APRIL. | | MAY. | | JUNE. | | JULY. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | District. | Goldfield. | District. | Goldfield. | District. | Goldfield. | District. | Goldfield. | District. | Goldfield. | District. | Goldfield. | District. | Goldfield. |
| | | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. |
| Kimberley ... | ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Pilbara ... ... | Marble Bar ... | 156·94 | 173·89 | 161·36 | 161·36 | 21·50 | 30·40 | ... | 6·00 | 393·13 | 393·13 | 161·90 | 186·84 | ... | 556·47 |
| Do. ... | Nullagine ... | 16·95 | | ... | | 8·90 | | 6·00 | | ... | | 24·94 | | 556·47 | |
| West Pilbara ... | ... ... | ... | 3·17 | ... | 2·07 | ... | 11·35 | ... | 1·63 | ... | 1·89 | ... | 32·22 | ... | ... |
| Ashburton ... | ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Gascoyne ... | ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Peak Hill ... | ... ... | ... | 98·09 | ... | 120·96 | ... | 101·50 | ... | 41·00 | ... | ... | ... | 401·09 | ... | ... |
| East Murchison ... | Lawlers ... | 214·90 | | 268·22 | | 282·40 | | 250·22 | | 327·17 | | 153·46 | | 298·07 | |
| Do. ... | Wiluna ... | 556·92 | 1,942·21 | 430·18 | 1,761·96 | 453·41 | 2,475·78 | 376·43 | 997·68 | 546·17 | 1,127·29 | 430·28 | 727·64 | 524·96 | 1,946·69 |
| Do. ... | Black Range | 1,170·39 | | 1,063·56 | | 1,739·97 | | 371·03 | | 253·95 | | 143·90 | | 1,123·66 | |
| Murchison ... | Cue ... ... | 1,126·05 | | 948·92 | | 710·08 | ... | 968·44 | ... | 696·62 | | 853·80 | | 531·72 | |
| Do. ... | Meekatharra... | 2,863·16 | 5,139·87 | 2,512·90 | 4,091·82 | 2,329·94 | 3,667·62 | 1,919·57 | 3,184·60 | 2,816·34 | 4,730·87 | 2,552·07 | 4,808·41 | 2,526·80 | 4,332·28 |
| Do. ... | Day Dawn ... | 674·44 | | 299·20 | | 197·35 | | 71·09 | | 594·99 | | 1,208·52 | | 620·03 | |
| Do. ... | Mt. Magnet ... | 476·22 | | 330·80 | | 430·25 | | 225·50 | | 622·92 | | 194·02 | | 653·73 | |
| Yalgoo ... ... | ... ... | ... | 327·38 | ... | 48·31 | ... | 24·72 | ... | 272·54 | ... | 748·81 | ... | 74·84 | ... | 57·99 |
| Mt. Margaret ... | Mt. Morgans... | 101·09 | | 441·40 | | 719·00 | | 207·00 | | 590·50 | | 343·35 | | 241·20 | |
| Do. ... | Mt. Malcolm... | 4,028·94 | 7,019·16 | 3,704·77 | 6,803·77 | 3,410·60 | 7,218·63 | 2,094·06 | 4,380·16 | 3,862·36 | 6,805·83 | 3,619·57 | 6,098·63 | 3,776·16 | 6,109·30 |
| Do. ... | Mt. Margaret | 2,889·13 | | 2,657·60 | | 3,089·03 | | 2,079·10 | | 2,352·97 | | 2,135·71 | | 2,091·94 | |
| North Coolgardie | Menzies ... | 938·89 | | 1,167·10 | | 923·46 | | 1,029·30 | | 1,203·32 | | 1,071·35 | | 877·75 | |
| Do. ... | Ularring ... | ... | 938·89 | ... | 1,167·10 | ... | 923·46 | ... | 1,029·30 | ... | 1,366·17 | 31·67 | 1,187·59 | ... | 890·68 |
| Do. ... | Niagara ... | ... | | ... | | ... | | ... | | ... | | ... | | ... | |
| Do. ... | Yerilla ... | ... | | ... | | ... | | ... | | 162·85 | | 84·57 | | 12·93 | |
| Broad Arrow ... | ... ... | ... | 1,006·54 | ... | 930·53 | ... | 1,279·88 | ... | 854·76 | ... | 1,967·24 | ... | 19·98 | ... | 57·45 |
| N.E. Coolgardie ... | Kanowna ... | 96·48 | 260·71 | 8·18 | 8·18 | 615·01 | 647·43 | ... | ... | 42·07 | 89·54 | 56·31 | 63·76 | 77·42 | 77·42 |
| Do. ... | Kurnalpi ... | 164·23 | | ... | | 32·42 | | ... | | 47·47 | | 7·45 | | ... | |
| East Coolgardie ... | East Coolgardie | 26,223·37 | 26,223·37 | 29,368·31 | 29,368·31 | 37,498·43 | 37,509·97 | 34,826·93 | 34,826·93 | 35,305·83 | 35,305·83 | 32,704·22 | 32,704·22 | 37,609·33 | 37,614·84 |
| Do. ... | Bulong ... | ... | | ... | | 11·54 | | ... | | ... | | ... | | 5·54 | |
| Coolgardie ... | Coolgardie ... | 22·19 | 22·19 | ... | ... | 884·89 | 1,073·57 | 322·46 | 336·54 | 183·57 | 183·57 | 71·73 | 565·57 | 156·57 | 203·05 |
| Do. ... | Kunanalling ... | ... | | ... | | 188·68 | | 14·08 | | ... | | 493·84 | | 46·48 | |
| Yilgarn ... ... | ... ... | ... | 2,041·90 | ... | 2,204·78 | ... | 3,434·53 | ... | 2,758·27 | ... | 1,956·80 | ... | 2,192·50 | ... | 3,674·77 |
| Dundas ... ... | ... ... | ... | 437·59 | ... | 326·12 | ... | 465·54 | ... | 563·15 | ... | 649·08 | ... | 796·30 | ... | 264·53 |
| Phillips River ... | ... ... | ... | ·70 | ... | 35·01 | ... | 98·50 | ... | 59·84 | ... | ... | ... | 52·84 | ... | 57·63 |
| State generally ... | | ... | ... | ... | 7·25 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **TOTAL** | **Fine Ounces ...** | ... | **45,635·66** | ... | **47,037·53** | ... | **58,962·88** | ... | **49,312·40** | ... | **55,326·05** | ... | **49,912·43** | ... | **55,843·10** |
| | **Sterling Value** | **£193,848** | | **£199,803** | | **£250,458** | | **£209,466** | | **£235,010** | | **£212,015** | | **£237,206** | |

TABLE II.—*Total Yearly Production of Gold, in Fine Ounces, etc.*—continued.

| GOLDFIELD. | DISTRICT. | 1914. | | 1913. | | 1912. | | 1911. | | Previous to 1911. | | Total to December 31st, 1920. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | District. | Goldfield. | District. | Goldfield. | District. | Goldfield. | District. | Goldfield. | District. | Goldfield. | District. | Goldfield. |
| | | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. |
| Kimberley ... ... | ... ... ... | ... | 453·29 | ... | ... | ... | 271·63 | ... | 171·45 | ... | 16,569·67 | ... | 18,020·35 |
| Pilbara ... ... | Marble Bar ... | 3,304·94 | 5,177·46 | 3,845·81 | 5,598·21 | 3,441·44 | 5,999·11 | 2,346·74 | 4,608·08 | 94,395·33 | 156,307·02 | 128,892·25 | 208,742·48 |
| Do. ... ... | Nullagine ... | 1,872·52 | | 1,752·40 | | 2,557·67 | | 2,261·34 | | 61,911·69 | | 79,850·23 | |
| West Pilbara ... | ... ... ... | ... | 1,022·70 | ... | 1,421·15 | ... | 1,118·20 | ... | 983·17 | ... | 20,500·61 | ... | 27,816·00 |
| Ashburton ... ... | ... ... ... | ... | ... | ... | 11·70 | ... | 38·73 | ... | 256·33 | ... | 8,569·98 | ... | 8,883·24 |
| Gascoyne ... ... | ... ... ... | ... | 3·76 | ... | 31·45 | ... | 6·55 | ... | 7·87 | ... | 531·58 | ... | 676·54 |
| Peak Hill ... ... | ... ... ... | ... | 2,602·62 | ... | 2,765·59 | ... | 1,861·64 | ... | 1,747·01 | ... | 234,704·89 | ... | 255,638·29 |
| East Murchison ... | Lawlers ... ... | 4,324·57 | 70,008·46 | 4,843·05 | 87,977·47 | 7,307·72 | 99,130·78 | 27,193·85 | 102,390·79 | 837,219·38 | 1,195,770·82 | 910,068·63 | 1,770,053·54 |
| Do. ... ... | Wiluna ... ... | 6,936·34 | | 7,501·11 | | 7,728·33 | | 7,829·83 | | *14,258·17 | | 95,420·65 | |
| Do. ... ... | Black Range ... | 59,547·55 | | 75,633·31 | | 84,094·73 | | 67,367·11 | | 344,292·77 | | 764,564·26 | |
| Murchison ... ... | Cue ... ... | 4,491·02 | 115,722·42 | 6,525·65 | 122,027·56 | 8,993·26 | 105,372·78 | 11,455·56 | 119,653·40 | 294,284·01 | 2,105,428·14 | 376,483·36 | 3,003,442·15 |
| Do. ... ... | Meekatharra ... | 80,400·07 | | 72,701·81 | | 50,558·20 | | 54,241·79 | | 381,050·87 | | 916,098·98 | |
| Do. ... ... | Day Dawn ... | 18,926·64 | | 27,126·72 | | 28,283·42 | | 37,947·41 | | 1,124,628·48 | | 1,309,194·40 | |
| Do. ... ... | Mt. Magnet ... | 11,904·69 | | 15,673·38 | | 17,537·90 | | 16,008·64 | | 305,464·78 | | 401,665·41 | |
| Yalgoo ... ... | ... ... ... | ... | 6,025·92 | ... | 8,163·47 | ... | 6,165·92 | ... | 1,162·04 | ... | 68,022·55 | ... | 124,540·91 |
| Mt. Margaret ... | Mt. Morgans ... | 4,880·95 | 96,792·51 | 1,255·47 | 91,272·70 | 3,438·55 | 102,969·60 | 5,484·08 | 152,474·39 | 461,400·01 | 1,982,736·24 | 514,834·02 | 2,986,130·07 |
| Do. ... ... | Mt. Malcolm ... | 66,071·07 | | 72,738·73 | | 34,288·81 | | 92,811·29 | | 1,020,377·51 | | 1,645,988·43 | |
| Do. ... ... | Mt. Margaret ... | 25,840·49 | | 17,278·50 | | 25,242·24 | | 54,179·02 | | 500,958·72 | | 825,307·62 | |
| North Coolgardie ... | Menzies ... ... | 53,789·52 | 72,188·05 | 44,227·89 | 68,526·60 | 36,126·25 | 58,270·47 | 39,062·97 | 64,759·69 | 636,352·32 | 1,502,600·90 | 988,809·45 | 1,977,674·55 |
| Do. ... ... | Ularring ... ... | 5,026·09 | | 7,710·48 | | 9,526·65 | | 9,472·85 | | 243,940·79 | | 288,011·98 | |
| Do. ... ... | Niagara ... ... | 6,724·42 | | 6,941·08 | | 6,342·67 | | 8,423·55 | | 465,157·19 | | 501,892·80 | |
| Do. ... ... | Yerilla ... ... | 6,648·02 | | 9,647·15 | | 6,274·90 | | 7,800·32 | | 157,150·60 | | 198,960·32 | |
| Broad Arrow ... | ... ... ... | ... | 9,285·98 | ... | 34,739·33 | ... | 13,375·43 | ... | 7,152·73 | ... | 338,151·03 | ... | 487,028·77 |
| N.E. Coolgardie ... | Kanowna ... | 9,560·02 | 10,134·10 | 11,133·30 | 12,392·88 | 11,364·53 | 13,855·71 | 17,958·07 | 19,554·75 | 608,919·89 | 630,657·93 | 691,256·13 | 720,978·67 |
| Do. ... ... | Kurnalpi ... | 574·08 | | 1,259·58 | | 2,491·18 | | 1,596·68 | | 21,738·04 | | 29,722·54 | |
| East Coolgardie ... | East Coolgardie | 680,494·61 | 682,895·41 | 719,323·42 | 719,928·72 | 755,368·56 | 756,795·14 | 775,050·60 | 776,493·74 | 11,679,063·84 | 11,831,096·07 | 17,737,414·18 | 17,898,699·19 |
| Do. ... ... | Bulong ... ... | 2,400·80 | | 605·30 | | 1,426·58 | | 1,443·14 | | 152,032·23 | | 161,285·01 | |
| Coolgardie ... ... | Coolgardie ... | 17,009·37 | 20,981·45 | 28,407·27 | 31,891·49 | 37,246·77 | 42,181·59 | 28,982·04 | 33,753·71 | 823,313·07 | 996,969·83 | 975,736·92 | 1,187,760·32 |
| Do. ... ... | Kunanalling ... | 3,972·08 | | 3,484·22 | | 4,934·82 | | 4,771·67 | | 173,656·76 | | 212,023·40 | |
| Yilgarn ... ... | ... ... ... | ... | 88,744·72 | ... | 82,333·96 | ... | 30,675·40 | ... | 18,811·40 | ... | 358,283·69 | ... | 998,616·32 |
| Dundas ... ... | ... ... ... | ... | 26,590·76 | ... | 27,039·47 | ... | 25,314·35 | ... | 28,989·86 | ... | 407,041·25 | ... | 613,893·89 |
| Phillips River ... | ... ... ... | ... | 4,665·42 | ... | 2,788·47 | ... | 4,201·36 | ... | 5,656·54 | ... | 48,181·34 | ... | 87,064·75 |
| †Donnybrook ... | ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 841·76 | ... | 841·76 |
| State generally ... | ... ... | ... | 144·16 | ... | 178·60 | ... | 240·40 | ... | 359·99 | ... | 5,539·34 | ... | 7,727·78 |
| **TOTAL** | **Fine Ounces** ... | ... | 1,214,239·19 | ... | 1,299,088·82 | ... | 1,267,844·79 | ... | 1,338,986·94 | ... | 21,908,504·64 | ... | 32,384,229·57 |
| | **Sterling Value** ... | **£5,157,760** | | **£5,518,179** | | **£5,385,462** | | **£5,687,655** | | **£93,061,412** | | **£137,559,463** | |

* Previous to March, 1910, included in Lawlers District. † Abolished 4th March, 1908.

# PART I.—GOLD.

## TABLE I.

MONTHLY PRODUCTION OF GOLD, IN FINE OUNCES, SHOWING THE QUANTITY REPORTED TO THE MINES DEPARTMENT DURING 1920.

| GOLDFIELD. | DISTRICT. | JANUARY. | | FEBRUARY. | | MARCH. | | APRIL. | | MAY. | | JUNE. | | JULY. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | District. | Goldfield. | District. | Goldfield. | District. | Goldfield. | District. | Goldfield. | District. | Goldfield. | District. | Goldfield. | District. | Goldfield. |
| | | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. |
| Kimberley ... | ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Pilbara ... ... | Marble Bar ... | 156·94 | 173·89 | 161·36 | 161·36 | 21·50 | 30·40 | ... | 6·00 | 393·13 | 393·13 | 161·90 | 186·84 | ... | 556·47 |
| Do. ... | Nullagine ... | 16·95 | | ... | | 8·90 | | 6·00 | | ... | | 24·94 | | 556·47 | |
| West Pilbara ... | ... ... | ... | 3·17 | ... | 2·07 | ... | 11·35 | ... | 1·63 | ... | 1·89 | ... | 32·22 | ... | ... |
| Ashburton ... | ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Gascoyne ... | ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Peak Hill ... | ... ... | ... | 98·09 | ... | 120·96 | ... | 101·50 | ... | 41·00 | ... | ... | ... | 401·09 | ... | ... |
| East Murchison ... | Lawlers ... | 214·90 | 1,942·21 | 268·22 | 1,761·96 | 282·40 | 2,475·78 | 250·22 | 997·68 | 327·17 | 1,127·29 | 153·46 | 727·64 | 298·07 | 1,946·69 |
| Do. ... | Wiluna ... | 556·92 | | 430·18 | | 453·41 | | 376·43 | | 546·17 | | 430·28 | | 524·96 | |
| Do. ... | Black Range | 1,170·39 | | 1,063·56 | | 1,739·97 | | 371·03 | | 253·95 | | 143·90 | | 1,123·66 | |
| Murchison ... | Cue ... ... | 1,126·05 | 5,139·87 | 948·92 | 4,091·82 | 710·08 | 3,667·62 | 968·44 | 3,184·60 | 696·62 | 4,730·87 | 853·80 | 4,808·41 | 531·72 | 4,332·28 |
| Do. ... | Meekatharra... | 2,863·16 | | 2,512·90 | | 2,329·94 | | 1,919·57 | | 2,816·34 | | 2,552·07 | | 2,526·80 | |
| Do. ... | Day Dawn ... | 674·44 | | 299·20 | | 197·35 | | 71·09 | | 594·99 | | 1,208·52 | | 620·03 | |
| Do. ... | Mt. Magnet ... | 476·22 | | 330·80 | | 430·25 | | 225·50 | | 622·92 | | 194·02 | | 653·73 | |
| Yalgoo ... ... | ... ... | ... | 327·38 | ... | 48·31 | ... | 24·72 | ... | 272·54 | ... | 748·81 | ... | 74·84 | ... | 57·99 |
| Mt. Margaret ... | Mt. Morgans... | 101·09 | 7,019·16 | 441·40 | 6,803·77 | 719·00 | 7,218·63 | 207·00 | 4,380·16 | 590·50 | 6,805·83 | 343·35 | 6,098·63 | 241·20 | 6,109·30 |
| Do. ... | Mt. Malcolm... | 4,028·94 | | 3,704·77 | | 3,410·60 | | 2,094·06 | | 3,862·36 | | 3,619·57 | | 3,776·16 | |
| Do. ... | Mt. Margaret | 2,889·13 | | 2,657·60 | | 3,089·03 | | 2,079·10 | | 2,352·97 | | 2,135·71 | | 2,091·94 | |
| North Coolgardie | Menzies ... | 938·89 | 938·89 | 1,167·10 | 1,167·10 | 923·46 | 923·46 | 1,029·30 | 1,029·30 | 1,203·32 | 1,366·17 | 1,071·35 | 1,187·59 | 877·75 | 890·68 |
| Do. ... | Ularring ... | ... | | ... | | ... | | ... | | ... | | 31·67 | | ... | |
| Do. ... | Niagara ... | ... | | ... | | ... | | ... | | ... | | ... | | ... | |
| Do. ... | Yerilla ... | ... | | ... | | ... | | ... | | 162·85 | | 84·57 | | 12·93 | |
| Broad Arrow ... | ... ... | ... | 1,006·54 | ... | 930·53 | ... | 1,279·88 | ... | 854·76 | ... | 1,967·24 | ... | 19·98 | ... | 57·45 |
| N.E. Coolgardie ... | Kanowna ... | 96·48 | 260·71 | 8·18 | 8·18 | 615·01 | 647·43 | ... | ... | 42·07 | 89·54 | 56·31 | 63·76 | 77·42 | 77·42 |
| Do. ... | Kurnalpi ... | 164·23 | | ... | | 32·42 | | ... | | 47·47 | | 7·45 | | ... | |
| East Coolgardie ... | East Coolgardie | 26,223·37 | 26,223·37 | 29,368·31 | 29,368·31 | 37,498·43 | 37,509·97 | 34,826·93 | 34,826·93 | 35,305·83 | 35,305·83 | 32,704·22 | 32,704·22 | 37,609·33 | 37,614·84 |
| Do. ... | Bulong ... | ... | | ... | | 11·54 | | ... | | ... | | ... | | 5·54 | |
| Coolgardie ... | Coolgardie ... | 22·19 | 22·19 | ... | ... | 884·89 | 1,073·57 | 322·46 | 336·54 | 183·57 | 183·57 | 71·73 | 565·57 | 156·57 | 203·05 |
| Do. ... | Kunanalling ... | ... | | ... | | 188·68 | | 14·08 | | ... | | 493·84 | | 46·48 | |
| Yilgarn ... ... | ... ... | ... | 2,041·90 | ... | 2,204·78 | ... | 3,434·53 | ... | 2,758·27 | ... | 1,956·80 | ... | 2,192·50 | ... | 3,674·77 |
| Dundas ... ... | ... ... | ... | 437·59 | ... | 326·12 | ... | 465·54 | ... | 563·15 | ... | 649·08 | ... | 796·30 | ... | 264·53 |
| Phillips River ... | ... ... | ... | ·70 | ... | 35·01 | ... | 98·50 | ... | 59·84 | ... | ... | ... | 52·84 | ... | 57·63 |
| State generally ... | | ... | ... | ... | 7·25 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **TOTAL** | **Fine Ounces ...** | ... | **45,635·66** | ... | **47,037·53** | ... | **53,962·88** | ... | **49,312·40** | ... | **55,326·05** | ... | **49,912·43** | ... | **55,843·10** |
| | **Sterling Value** | **£193,848** | | **£199,803** | | **£250,458** | | **£209,466** | | **£235,010** | | **£212,015** | | **£237,206** | |

TABLE I.—*Monthly Production of Gold in Fine Ounces*—continued.

| GOLDFIELD. | DISTRICT. | AUGUST. | | SEPTEMBER. | | OCTOBER. | | NOVEMBER. | | DECEMBER. | | Total for 1920. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | District. | Goldfield. | District. | Goldfield. | District. | Goldfield. | District. | Goldfield. | District. | Goldfield. | District. | Goldfield. |
| | | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. |
| Kimberley ... | ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Pilbara ... ... | Marble Bar ... | 193·55 | 196·63 | 370·53 | 371·78 | 691·56 | 692·64 | 987·82 | 997·99 | 25·86 | 285·36 | 3,164·15 | 4,052·49 |
| Do. ... | Nullagine ... | 3·08 | | 1·25 | | 1·08 | | 10·17 | | 259·50 | | 888·34 | |
| West Pilbara ... | ... ... ... | ... | 21·90 | ... | 8·18 | ... | ... | ... | ... | ... | 51·50 | ... | 133·91 |
| Ashburton ... | ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Gascoyne ... ... | ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Peak Hill ... | ... ... ... | ... | 115·33 | ... | 119·52 | ... | 366·76 | ... | 164·16 | ... | 127·30 | ... | 1,655·71 |
| East Murchison ... | Lawlers ... ... | 183·32 | 1,745·35 | 270·36 | 1,799·71 | 250·43 | 2,000·42 | 114·20 | 1,561·57 | 80·40 | 1,513·95 | 2,693·15 | 19,600·25 |
| Do. ... | Wiluna ... ... | 547·71 | | 410·21 | | 417·47 | | 434·53 | | 350·72 | | 5,478·99 | |
| Do. ... | Black Range ... | 1,014·32 | | 1,119·14 | | 1,332·52 | | 1,012·84 | | 1,082·83 | | 11,428·11 | |
| Murchison ... | Cue ... ... | 1,126·06 | 4,409·44 | 631·62 | 4,489·45 | 499·66 | 1,841·95 | 760·47 | 2,152·15 | 789·19 | 3,755·61 | 9,642·63 | 46,604·07 |
| Do. ... | Meekatharra ... | 3,079·39 | | 2,783·93 | | 1,213·99 | | 831·83 | | 2,733·53 | | 28,163·45 | |
| Do. ... | Day Dawn ... | 2·62 | | 651·84 | | ... | | 310·72 | | 40·74 | | 4,671·54 | |
| Do. ... | Mt. Magnet ... | 201·37 | | 422·06 | | 128·30 | | 249·13 | | 192·15 | | 4,126·45 | |
| Yalgoo ... ... | ... ... ... | ... | 5·98 | ... | ... | ... | 417·30 | ... | 537·61 | ... | 449·95 | ... | 2,965·43 |
| Mt. Margaret ... | Mt. Morgans ... | 836·21 | 7,425·07 | 245·81 | 6,260·04 | 583·55 | 6,966·76 | 251·76 | 5,976·89 | 1,000·00 | 6,271·60 | 5,560·87 | 77,335·84 |
| Do. ... | Mt. Malcolm ... | 3,580·57 | | 3,526·58 | | 4,292·87 | | 3,153·32 | | 3,751·03 | | 42,800·83 | |
| Do. ... | Mt. Margaret ... | 3,008·29 | | 2,487·65 | | 2,090·34 | | 2,571·81 | | 1,520·57 | | 28,974·14 | |
| North Coolgardie... | Menzies ... ... | 933·68 | 959·54 | 771·10 | 771·10 | 912·62 | 926·17 | 907·45 | 921·99 | 732·48 | 942·19 | 11,468·50 | 12,024·18 |
| Do. ... | Ularring ... ... | 25·86 | | ... | | ... | | ... | | ... | | 57·53 | |
| Do. ... | Niagara ... ... | ... | | ... | | 13·55 | | ... | | 209·71 | | 223·26 | |
| Do. ... | Yerilla ... ... | ... | | ... | | ... | | 14·54 | | ... | | 274·89 | |
| Broad Arrow ... | ... ... ... | ... | 361·86 | ... | 761·45 | ... | 79·08 | ... | 7·17 | ... | 119·29 | ... | 7,445·23 |
| N.E. Coolgardie ... | Kanowna ... | 75·21 | 126·97 | 80·45 | 87·49 | 60·38 | 61·86 | 13·64 | 13·64 | 122·99 | 301·80 | 1,248·14 | 1,738·80 |
| Do. ... | Kurnalpi ... | 51·76 | | 7·04 | | 1·48 | | ... | | 178·81 | | 490·66 | |
| East Coolgardie ... | East Coolgardie ... | 37,407·70 | 37,410·20 | 34,369·65 | 34,369·65 | 32,496·30 | 32,496·30 | 38,105·70 | 38,105·70 | 25,501·24 | 25,560·59 | 401,417·01 | 401,495·91 |
| Do. ... | Bulong ... ... | 2·50 | | ... | | ... | | ... | | 59·35 | | 78·90 | |
| Coolgardie ... | Coolgardie ... | 246·40 | 499·10 | 243·79 | 358·23 | 99·62 | 99·62 | 521·62 | 1,029·19 | 729·95 | 1,615·80 | 3,482·79 | 5,986·43 |
| Do. ... | Kunanalling ... | 252·70 | | 114·44 | | ... | | 507·57 | | 885·85 | | 2,503·64 | |
| Yilgarn ... ... | ... ... ... | ... | 6,886·32 | ... | 3,089·29 | ... | 2,948·40 | ... | 3,605·61 | ... | 2,843·34 | ... | 37,636·51 |
| Dundas ... ... | ... ... ... | ... | 1,153·50 | ... | 297·35 | ... | 405·71 | ... | 266·42 | ... | 915·89 | ... | 6,541·18 |
| Phillips River ... | ... ... ... | ... | 6·16 | ... | 58·87 | ... | ·88 | ... | 1,015·24 | ... | 37·09 | ... | 1,422·76 |
| State generally ... ... | | ... | ... | ... | 13 42 | ... | ... | ... | ... | ... | ... | ... | 20·67 |
| TOTAL Fine ounces ... | | ... | 61,323·35 | ... | 52,£55 53 | ... | 49,303·85 | ... | 56,355·33 | ... | 44,791·26 | ... | 626,£59·37 |
| TOTAL Sterling value | | £260,485 | | £224,516 | | £209,430 | | £239,382 | | £190,261 | | £2,661,880 | |

The total gold yield of the State is as shown at page 5, being the amount of gold exported and also that lodged at the Royal Mint, which total includes alluvial and other gold not reported to the Department.

## TABLE II.

TOTAL YEARLY PRODUCTION OF GOLD, IN FINE OUNCES, AS REPORTED TO THE MINES DEPARTMENT, TO 31ST DECEMBER, 1920.

| GOLDFIELD. | DISTRICT. | 1920. | | 1919. | | 1918. | | 1917. | | 1916. | | 1915. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | District. | Goldfield. | District. | Goldfield. | District. | Goldfield. | District. | Goldfield. | District. | Goldfield. | District. | Goldfield. |
| | | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. |
| Kimberley ... ... | ... ... ... | ... | ... | ... | 150·73 | ... | 15·08 | ... | 82·25 | ... | 161·91 | ... | 144·34 |
| Pilbara ... ... | Marble Bar ... | 3,164·15 | 4,052·49 | 2,960·51 | 3,421·39 | 2,991·73 | 3,748·40 | 2,463·66 | 5,406·75 | 3,515·58 | 5,881·60 | 6,462·36 | 8,541·97 |
| Do. ... ... ... | Nullagine ... | 888·34 | | 460,88 | | 756·67 | | 2,943·09 | | 2,366·02 | | 2,079·61 | |
| West Pilbara ... | ... ... ... | ... | 133·91 | ... | 95·26 | ... | 120·37 | ... | 304·77 | ... | 608·84 | ... | 1,507·02 |
| Ashburton ... ... | ... ... ... | ... | ... | ... | ... | ... | ... | ... | 6·50 | ... | ... | ... | ... |
| Gascoyne ... ... | ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 14·48 | ... | 80·85 |
| Peak Hill ... ... | ... ... ... | ... | 1,655·71 | ... | 2,255·38 | ... | 1,089·31 | ... | 1,743·72 | ... | 2,389·29 | ... | 2,823·13 |
| East Murchison ... | Lawlers ... ... | 2,693·15 | 19,600·25 | 4,951·82 | 27,413·89 | 4,115·55 | 29,210·72 | 4,784·50 | 32,856·56 | 6,579·41 | 46,811·44 | 6,055·13 | 58,082·36 |
| Do. ... ... ... | Wiluna* ... ... | 5,478·99 | | 7,035·72 | | 7,909·60 | | 9,523·65 | | 14,472·13 | | 6,746·78 | |
| Do. ... ... ... | Black Range ... | 11,428·11 | | 15,426·35 | | 17,185·57 | | 18,548·41 | | 25,759·90 | | 45,280·45 | |
| Murchison ... ... | Cue ... ... | 9,642·63 | | 9,020·49 | | 10,183·75 | | 9,689·81 | | 6,011·29 | | 6,185·89 | |
| Do. ... ... | Meekatharra ... | 28,163·45 | 46,604·07 | 35,436·80 | 50,569·85 | 44,119·86 | 63,285·43 | 44,269·00 | 82,305·83 | 51,322·56 | 84,422·89 | 73,834·57 | 108,049·78 |
| Do. ... ... | Day Dawn ... | 4,671·54 | | 2,383·58 | | 4,176·83 | | 23,746·93 | | 18,134·71 | | 19,168·14 | |
| Do. ... ... | Mt. Magnet ... | 4,126·45 | | 3,728·98 | | 4,804·99 | | 4,600·09 | | 8,954·33 | | 8,861·18 | |
| Yalgoo ... ... | ... ... ... | ... | 2,965·43 | ... | 4,788·38 | ... | 4,397·89 | ... | 5,812·74 | ... | 8,194·69 | ... | 8,841·88 |
| Mt. Margaret ... | Mt. Morgans ... | 5,560·87 | 77,335·84 | 5,302·34 | 88,151·93 | 5,294·03 | 85,346·97 | 6,314·21 | 101,874·54 | 8,439·99 | 100,612·34 | 7,463·52 | 106,563·01 |
| Do. ... ... | Mt. Malcolm ... | 42,800·83 | | 49,506·74 | | 46,368·64 | | 59,488·04 | | 57,541·13 | | 63,995·64 | |
| Do. ... ... ... | Mt. Margaret ... | 28,974·14 | | 33,342·85 | | 33,684·30 | | 36,072·29 | | 34,631·22 | | 35,103·85 | |
| North Coolgardie ... | Menzies ... ... | 11,468·50 | 12,024·18 | 20,859·22 | 23,019·41 | 30,345·06 | 36,829·91 | 30,725·13 | 34,795·55 | 36,756·35 | 45,146·57 | 49,096·24 | 59,513·22 |
| Do. ... ... | Ularring ... | 57·53 | | 931·66 | | 4,791·82 | | 1,090·35 | | 2,989·66 | | 2,474·10 | |
| Do. ... ... | Niagara ... ... | 223·26 | | 746·51 | | 1,203·81 | | 1,185·17 | | 1,790·01 | | 3,155·13 | |
| Do. ... ... | Yerilla ... ... | 274·89 | | 482·02 | | 489·22 | | 1,794·90 | | 3,610·55 | | 4,787·75 | |
| Broad Arrow ... | ... ... ... | ... | 7,445·23 | ... | 11,728·57 | ... | 4,125·88 | ... | 16,518·64 | ... | 22,215·92 | ... | 22,290·03 |
| N.E. Coolgardie ... | Kanowna ... | 1,248·14 | 1,738·80 | 5,250·96 | 5,472·08 | 3,439·60 | 3,700·25 | 5,912·39 | 5,933·17 | 6,392·00 | 6,678·02 | 10,077·23 | 10,860·98 |
| Do. ... ... | Kurnalpi ... | 490·66 | | 221·12 | | 260·65 | | 20·78 | | 286·02 | | 783·75 | |
| East Coolgardie ... | East Coolgardie... | 401,417·01 | 401,495·91 | 396,995·28 | 397,054·89 | 524,729·46 | 524,823·36 | 557,874·83 | 557,983·37 | 578,183·41 | 579,344·34 | 668,913·16 | 670,788·24 |
| Do. ... ... | Bulong ... ... | 78·90 | | 59·61 | | 93·90 | | 108·54 | | 1,160·93 | | 1,875·08 | |
| Coolgardie ... ... | Coolgardie ... | 3,482·79 | 5,986·43 | 4,222·21 | 5,814·30 | 5,334·36 | 7,962·75 | 6,980·68 | 10,285·68 | 8,768·13 | 13,618·32 | 11,990·23 | 18,314·77 |
| Do. ... ... | Kunanalling ... | 2,503·64 | | 1,592·09 | | 2,628·39 | | 3,305·00 | | 4,850·19 | | 6,324·54 | |
| Yilgarn ... ... | ... ... ... | ... | 37,636·51 | ... | 54,002·74 | ... | 70,765·88 | ... | 78,244·77 | ... | 87,993·68 | ... | 91,123·57 |
| Dundas ... ... | ... ... ... | ... | 6,541·18 | ... | 12,529·61 | ... | 15,949·44 | ... | 18,419·01 | ... | 21,594·78 | ... | 23,884·18 |
| Phillips River ... | ... ... ... | ... | 1,422·76 | ... | 1,700·12 | ... | 4,478·49 | ... | 4,734·52 | ... | 5,418·97 | ... | 3,816·76 |
| †Donnybrook ... | ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| State generally ... | ... | ... | 20·67 | ... | 46·41 | ... | 195·43 | ... | 111·41 | ... | 618·78 | ... | 272·59 |
| **TOTAL** | **Fine Ounces ...** | ... | **626,659·37** | ... | **688,214·94** | ... | **856,045·56** | ... | **957,419·78** | ... | **1,031,726·86** | ... | **1,195,498·68** |
| | **Sterling Value** | **£2,661,880** | | **£2,923,351** | | **£3,636,250** | | **£4,066,861** | | **£4,382,497** | | **£5,078,156** | |

* Previous to 1st March, 1910, included in Lawlers District. † Abolished 4th March, 1908.

TABLE II.—*Total Yearly Production of Gold, in Fine Ounces, etc.*—continued.

| GOLDFIELD. | DISTRICT. | 1914. | | 1913. | | 1912. | | 1911. | | Previous to 1911. | | Total to December 31st, 1920. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | District. | Goldfield. | District. | Goldfield. | District. | Goldfield. | District. | Goldfield. | District. | Goldfield. | District. | Goldfield. |
| | | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. |
| Kimberley ... ... | ... ... ... | ... | 453·29 | ... | ... | ... | 271·63 | ... | 171·45 | ... | 16,569·67 | ... | **18,020·35** |
| Pilbara ... ... | Marble Bar ... | 3,304·94 | 5,177·46 | 3,845·81 | 5,598·21 | 3,441·44 | 5,999·11 | 2,346·74 | 4,608·08 | 94,395·33 | 156,307·02 | **128,892·25** | **208,742·48** |
| Do. ... ... | Nullagine ... | 1,872·52 | | 1,752·40 | | 2,557·67 | | 2,261·34 | | 61,911·69 | | **79,850·23** | |
| West Pilbara ... | ... ... ... | ... | 1,022·70 | ... | 1,421·15 | ... | 1,118·20 | ... | 983·17 | ... | 20,500·61 | ... | **27,816·00** |
| Ashburton ... ... | ... ... ... | ... | ... | ... | 11·70 | ... | 38·73 | ... | 256·33 | ... | 8,569·98 | ... | **8,883·24** |
| Gascoyne ... ... | ... ... ... | ... | 3·76 | ... | 31·45 | ... | 6·55 | ... | 7·87 | ... | 531·58 | ... | **676·54** |
| Peak Hill ... ... | ... ... ... | ... | 2,602·62 | ... | 2,765·59 | ... | 1,861·64 | ... | 1,747·01 | ... | 234,704·89 | ... | **255,638·29** |
| East Murchison ... | Lawlers ... ... | 4,324·57 | | 4,843·05 | | 7,307·72 | | 27,193·85 | | 837,219·38 | | **910,068·63** | |
| Do. ... ... | Wiluna ... ... | 6,936·34 | 70,008·46 | 7,501·11 | 87,977·47 | 7,728·33 | 99,130·78 | 7,829·83 | 102,390·79 | *14,258·17 | 1,195,770·82 | **95,420·65** | **1,770,053·54** |
| Do. ... ... | Black Range ... | 59,547·55 | | 75,633·31 | | 84,094·73 | | 67,367·11 | | 344,292·77 | | **764,564·26** | |
| Murchison ... ... | Cue ... ... | 4,491·02 | | 6,525·65 | | 8,993·26 | | 11,455·56 | | 294,284·01 | | **376,483·36** | |
| Do. ... ... | Meekatharra ... | 80,400·07 | 115,722·42 | 72,701·81 | 122,027·56 | 50,558·20 | 105,372·78 | 54,241·79 | 119,653·40 | 381,050·87 | 2,105,428·14 | **916,098·98** | **3,003,442·15** |
| Do. ... ... | Day Dawn ... | 18,926·64 | | 27,126·72 | | 28,283·42 | | 37,947·41 | | 1,124,628·48 | | **1,309,194·40** | |
| Do. ... ... | Mt. Magnet ... | 11,904·69 | | 15,673·38 | | 17,537·90 | | 16,008·64 | | 305,464·78 | | **401,665·41** | |
| Yalgoo ... ... | ... ... ... | ... | 6,025·92 | ... | 8,163·47 | ... | 6,165·92 | ... | 1,162·04 | ... | 68,022·55 | ... | **124,540·91** |
| Mt. Margaret ... | Mt. Morgans ... | 4,880·95 | | 1,255·47 | | 3,438·55 | | 5,484·08 | | 461,400·01 | | **514,834·02** | |
| Do. ... ... | Mt. Malcolm ... | 66,071·07 | 96,792·51 | 72,738·73 | 91,272·70 | 34,288·81 | 102,969·60 | 92,811·29 | 152,474·39 | 1,020,377·51 | 1,982,736·24 | **1,645,988·43** | **2,986,130·07** |
| Do. ... ... | Mt. Margaret ... | 25,840·49 | | 17,278·50 | | 25,242·24 | | 54,179·02 | | 500,958·72 | | **825,307·62** | |
| North Coolgardie ... | Menzies ... ... | 53,789·52 | | 44,227·89 | | 36,126·25 | | 39,062·97 | | 636,352·32 | | **988,809·45** | |
| Do. ... ... | Ularring ... ... | 5,026·09 | 72,188·05 | 7,710·48 | 68,526·60 | 9,526·65 | 58,270·47 | 9,472·85 | 64,759·69 | 243,940·79 | 1,502,600·90 | **288,011·98** | **1,977,674·55** |
| Do. ... ... | Niagara ... ... | 6,724·42 | | 6,941·08 | | 6,342·67 | | 8,423·55 | | 465,157·19 | | **501,892·80** | |
| Do. ... ... | Yerilla ... ... | 6,648·02 | | 9,647·15 | | 6,274·90 | | 7,800·32 | | 157,150·60 | | **198,860·32** | |
| Broad Arrow ... | ... ... ... | ... | 9,285·98 | ... | 34,739·33 | ... | 13,375·43 | ... | 7,152·73 | ... | 338,151·03 | ... | **487,028·77** |
| N.E. Coolgardie ... | Kanowna ... | 9,560·02 | 10,134·10 | 11,133·30 | 12,392·88 | 11,364·53 | 13,855·71 | 17,958·07 | 19,554·75 | 608,919·89 | 630,657·93 | **691,256·13** | **720,978·67** |
| Do. ... ... | Kurnalpi ... | 574·08 | | 1,259·58 | | 2,491·18 | | 1,596·68 | | 21,738·04 | | **29,722·54** | |
| East Coolgardie ... | East Coolgardie | 680,494·61 | 682,895·41 | 719,323·42 | 719,928·72 | 755,368·56 | 756,795·14 | 775,050·60 | 776,493·74 | 11,679,063·84 | 11,831,096·07 | **17,737,414·18** | **17,898,699·19** |
| Do. ... ... | Bulong ... ... | 2,400·80 | | 605·30 | | 1,426·58 | | 1,443·14 | | 152,032·23 | | **161,285·01** | |
| Coolgardie ... ... | Coolgardie ... | 17,009·37 | 20,981·45 | 28,407·27 | 31,891·49 | 37,246·77 | 42,181·59 | 28,982·04 | 33,753·71 | 823,313·07 | 996,969·83 | **975,736·92** | **1,187,760·32** |
| Do. ... ... | Kunanalling ... | 3,972·08 | | 3,484·22 | | 4,934·82 | | 4,771·67 | | 173,656·76 | | **212,023·40** | |
| Yilgarn ... ... | ... ... ... | ... | 88,744·72 | ... | 82,333·96 | ... | 30,675·40 | ... | 18,811·40 | ... | 358,283·69 | ... | **998,616·32** |
| Dundas ... ... | ... ... ... | ... | 26,590·76 | ... | 27,039·47 | ... | 25,314·35 | ... | 28,989·86 | ... | 407,041·25 | ... | **613,893·89** |
| Phillips River ... | ... ... ... | ... | 4,665·42 | ... | 2,788·47 | ... | 4,201·36 | ... | 5,656·54 | ... | 48,181·34 | ... | **87,064·75** |
| †Donnybrook ... | ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 841·76 | ... | **841·76** |
| State generally ... | ... ... | ... | 144·16 | ... | 178·60 | ... | 240·40 | ... | 359·99 | ... | 5,539·34 | ... | **7,727·78** |
| **TOTAL** | **Fine Ounces** ... | ... | **1,214,239·19** | ... | **1,299,088·82** | ... | **1,267,844·79** | ... | **1,338,986·94** | ... | **21,908,504·64** | ... | **32,384,229·57** |
| | **Sterling Value** ... | **£5,157,760** | | **£5,518,179** | | **£5,385,462** | | **£5,687,655** | | **£93,061,412** | | **£137,559,463** | |

* Previous to March, 1910, included in Lawlers District. † Abolished 4th March, 1908.

## TABLE III

## GENERAL RETURN.

RETURN SHOWING, FOR THE RESPECTIVE GOLDFIELDS AND DISTRICTS, THE AREA IN SQUARE MILES, LEASES IN FORCE, PARTICULARS OF PLANT, MEN EMPLOYED AND DIGGERS, ALLUVIAL DOLLIED, AND SPECIMEN GOLD AND ORE TREATED, WITH GOLD AND SILVER YIELD, IN FINE OUNCES, AS REPORTED TO THE MINES DEPARTMENT FOR THE YEAR 1920.

| Goldfield. | District. | Date of Proclamation of Goldfield. | | | | Area in Square Miles. | | Leases in force. 31-12-1920 | | Particulars of Plant. | | | | | Average Number of Men engaged in Gold Mining. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Milling. | | Cyaniding. | | | Men employed. | | Diggers. |
| | | Proclamation gazetted. | To take effect from. | Latest Amendment of Boundaries gazetted. | To take effect from. | Goldfield. | District. | No. | Area in Acres. | Stamps. | Other Mills. | Leaching Vats. | Agitating Vats. | Vacuum Filters and Presses. | Above Ground. | Under Ground. | |
| Kimberley | ... | 20-5-86 | 20-5-86 | 31-10-02 | 1-11-02 | 33,833 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 5 |
| West Kimberley | ... | 19-3-20 | 1-3-20 | ... | ... | 98,600 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Pilbara | Marble Bar | 1-10-88 | 1-10-88 | 1-3-07 | 1-3-07 | 32,696 | 25,809 | 20 | 227 | 38 | 2 | 8 | ... | ... | 18 | 32 | 17 |
| | Nullagine | | | | | | 6,887 | 3 | 24 | 25 | 2 | 16 | ... | ... | 14 | 5 | 21 |
| West Pilbara | ... | 20-9-95 | 1-11-95 | 1-3-07 | 1-3-07 | 10,843 | ... | 3 | 36 | 20 | 1 | ... | ... | ... | 3 | 4 | 10 |
| Ashburton | ... | 11-12-90 | 11-12-90 | 18-10-01 | 14-10-01 | 14,230 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Gascoyne | ... | 25-6-97 | 15-4-97 | ... | ... | 5,313 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Peak Hill | ... | 19-3-97 | 1-4-97 | 13-11-14 | 1-12-14 | 23,650 | ... | 13 | 137 | 20 | 3 | 13 | ... | ... | 26 | 8 | 3 |
| East Murchison | Lawlers | 28-6-95 | 28-6-95 | 2-2-20 | 2-2-20 | 26,058 | 6,691 | 18 | 297 | 45 | 1 | 26 | ... | ... | 36 | 30 | 1 |
| | Wiluna | | | | | | 10,496 | 29 | 517 | 80 | 10 | 8 | 9 | 5 | 74 | 38 | ... |
| | Black Range | | | | | | 8,871 | 19 | 326 | 70 | 8 | 22 | 3 | 2 | 104 | 83 | ... |
| Murchison | Cue | 24-9-91 | 24-9-91 | 28-11-13 | 1-1-14 | 25,474 | 8,593 | 33 | 474 | 68 | 6 | 37 | ... | ... | 76 | 45 | 6 |
| | Meekatharra | | | | | | 12,250 | 33 | 451 | 97 | 15 | 17 | 10 | 4 | 94 | 196 | 11 |
| | Day Dawn | | | | | | 896 | 11 | 116 | 50 | 9 | 14 | 8 | ... | 19 | 13 | 7 |
| | Mt. Magnet | | | | | | 3,735 | 14 | 144 | 30 | 2 | 17 | ... | ... | 50 | 43 | 1 |
| Yalgoo | ... | 8-2-95 | 23-1-95 | 30-7-15 | 9-8-15 | 23,230 | ... | 25 | 364 | 48 | 6 | 7 | 6 | ... | 45 | 48 | ... |
| Mt. Margaret | Mt. Morgans | 12-3-97 | 1-4-97 | 2-2-20 | 2-2-20 | 59,918 | 14,007 | 22 | 379 | 45 | 5 | 20 | 2 | 1 | 61 | 63 | 5 |
| | Mt. Malcolm | | | | | | 6,018 | 59 | 1,276 | 127 | 15 | 1 | 4 | 2 | 176 | 273 | 2 |
| | Mt. Margaret | | | | | | 39,893 | 50 | 965 | 50 | 23 | 18 | 7 | 3 | 139 | 142 | 4 |
| North Coolgardie | Menzies | 28-6-95 | 28-6-95 | 7-9-17 | 17-9-17 | 13,746 | 6,805 | 26 | 417 | 65 | 13 | 49 | 4 | 2 | 92 | 102 | 1 |
| | Ularring | | | | | | 3,093 | 16 | 221 | 20 | 7 | 5 | 4 | ... | 17 | 17 | 1 |
| | Niagara | | | | | | 688 | 4 | 60 | 25 | 4 | 13 | ... | 8 | 11 | 4 | ... |
| | Yerilla | | | | | | 3,160 | 6 | 108 | 20 | 1 | 9 | ... | ... | 19 | 21 | 1 |
| Broad Arrow | ... | 17-11-96 | 20-11-96 | 8-6-06 | 1-7-06 | 1,038 | ... | 25 | 415 | 45 | 18 | 17 | ... | 2 | 50 | 76 | 9 |
| North-East Coolgardie | Kanowna | 20-3-96 | 15-4-96 | 27-3-08 | 1-4-08 | 20,604 | 1,094 | 29 | 434 | 55 | 3 | 8 | ... | ... | 28 | 34 | 6 |
| | Kurnalpi | | | | | | 19,510 | 6 | 47 | 5 | 1 | ... | ... | ... | 5 | 5 | 3 |
| East Coolgardie | East Coolgardie | 21-9-94 | 1-10-94 | 27-3-08 | 1-4-08 | 1,800 | 810 | 380 | 7,173 | 500 | 308 | 155 | 165 | 103 | 1,438 | 1,897 | 9 |
| | Bulong | | | | | | 990 | 15 | 323 | ... | ... | ... | ... | ... | 12 | 12 | 6 |
| Coolgardie | Coolgardie | 6-4-94 | 6-4-94 | 1-3-07 | 1-3-07 | 11,702 | 9,384 | 338 | 7,233 | 63 | 3 | 26 | 4 | ... | 187 | 197 | 26 |
| | Kunanalling | | | | | | 2,318 | 15 | 203 | 30 | 2 | 11 | ... | ... | 37 | 41 | 13 |
| Yilgarn | ... | 1-10-88 | 1-10-88 | 28-1-16 | 1-2-16 | 17,700 | ... | 91 | 1,584 | 180 | 25 | 46 | 8 | 5 | 276 | 258 | ... |
| Dundas | ... | 31-8-93 | 31-8-93 | 1-3-07 | 1-3-07 | 11,430 | ... | 34 | 451 | 55 | 13 | 37 | 8 | 2 | 47 | 54 | ... |
| Phillips River | ... | 21-9-00 | 14-9-00 | 28-1-16 | 1-2-16 | 5,078 | ... | 10 | 138 | 45 | 2 | ... | 4 | ... | 8 | 10 | ... |
| State generally | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | 5 | 1 | ... |
| | **Total** | ... | ... | ... | ... | **436,943** | ... | **1,347** | **24,540** | **1,921** | **510** | **600** | **246** | **139** | **3,167** | **3,752** | **168** |

TABLE III.—*Return showing for the respective Goldfields and Districts, etc.*—continued.

| Goldfield. | District. | 1920 GOLD AND SILVER YIELD—DISTRICTS. | | | | | | 1920 GOLD AND SILVER YIELD—GOLDFIELDS. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Total Gold. | Silver. | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Total Gold. | Silver. |
| | | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. | Fine ozs. | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. | Fine ozs. |
| Kimberley ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Pilbara ... ... | Marble Bar ... | 47·31 | 1·37 | 2,311·00 | 3,115·47 | 3,164·15 | ... | 119·68 | 1·37 | 2,494·00 | 3,931·44 | 4,052·49 | ... |
| Do. ... ... | Nullagine ... | 72·37 | ... | 183·00 | 815·97 | 888·34 | ... | | | | | | |
| West Pilbara ... | ... | ... | ... | ... | ... | ... | ... | 44·07 | ... | 70·00 | 89·84 | 133·91 | ... |
| Ashburton ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Gascoyne ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Peak Hill ... | ... | ... | ... | ... | ... | ... | ... | 5·18 | 57·76 | 11,003·00 | 1,592·77 | 1,655·71 | ·04 |
| East Murchison ... | Lawlers ... | ... | 29·04 | 8,933·00 | 2,664·11 | 2,693·15 | 24·96 | | | | | | |
| Do. ... | Wiluna ... | ... | ... | 12,365·75 | 5,478·99 | 5,478·99 | ... | 4·21 | 73·04 | 38,286·75 | 19,523·00 | 19,600·25 | 152·56 |
| Do. ... ... | Black Range | 4·21 | 44·00 | 16,988·00 | 11,379·90 | 11,428·11 | 127·60 | | | | | | |
| Murchison ... | Cue ... ... | 15·23 | 370·78 | 15,958·25 | 9,256·62 | 9,642·63 | 85·29 | | | | | | |
| Do. ... ... | Meekatharra ... | 42·11 | 804·79 | 49,905·82 | 27,316·55 | 28,163·45 | ... | | | | | | |
| Do. ... ... | Day Dawn ... | ... | 1,654·95 | 2,156·59 | 3,016·59 | 4,671·54 | ... | 64·25 | 2,926·96 | 75,572·81 | 43,612·86 | 46,604·07 | 85·29 |
| Do. ... ... | Mt. Magnet ... | 6·91 | 96·44 | 7,552·15 | 4,023·10 | 4,126·45 | ... | | | | | | |
| Yalgoo ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 3,378·50 | 2,965·43 | 2,965·43 | ... |
| Mt. Margaret ... | Mt. Morgans ... | 1·31 | 43·25 | 15,359·65 | 5,516·31 | 5,560·87 | ... | | | | | | |
| Do. ... ... | Mt. Malcolm ... | 52·75 | 126·87 | 121,793·00 | 42,621·21 | 42,800·83 | 3,769·64 | 63·72 | 588·79 | 225,403·90 | 76,683·33 | 77,335·84 | 7,115·00 |
| Do. ... ... | Mt. Margaret... | 9·66 | 418·67 | 88,251·25 | 28,545·81 | 28,974·14 | 3,345·36 | | | | | | |
| North Coolgardie | Menzies ... | ... | 20·66 | 20,246·10 | 11,447·84 | 11,468·50 | 214·52 | | | | | | |
| Do. ... ... | Ularring ... | ... | ... | 14·42 | 57·53 | 57·53 | 12·10 | | | | | | |
| Do. ... ... | Niagara ... | ... | 1·83 | 196·50 | 221·43 | 223·26 | ... | ... | 22·49 | 20,867·52 | 12,001·69 | 12,024·18 | 226·62 |
| Do. ... ... | Yerilla ... | ... | ... | 410·30 | 274·89 | 274·89 | ... | | | | | | |
| Broad Arrow ... | ... | ... | ... | ... | ... | ... | ... | ... | 281·73 | 12,693·82 | 7,163·50 | 7,445·23 | ... |
| N.E. Coolgardie ... | Kanowna ... | 5·80 | ... | 2,732·61 | 1,242·34 | 1,248·14 | ... | | | | | | |
| Do. ... ... | Kurnalpi ... | 1·74 | 424·25 | 36·00 | 64·67 | 490·66 | ... | 7·54 | 424·25 | 2,768·61 | 1,307·01 | 1,738·80 | ... |
| East Coolgardie ... | East Coolgardie | 235·13 | 228·00 | 724,521·83 | 400,953·88 | 401,417·01 | 84,235·11 | | | | | | |
| Do. ... ... | Bulong ... | ... | 1·87 | 45·70 | 77·03 | 78·90 | ... | 235·13 | 229·87 | 724,567·53 | 401,030·91 | 401,495·91 | 84,235·11 |
| Coolgardie ... | Coolgardie ... | 47·56 | 98·79 | 14,638·28 | 3,336·44 | 3,482·79 | ... | | | | | | |
| Do. ... ... | Kunanalling ... | 33·42 | ... | 2,378·10 | 2,470·22 | 2,503·64 | ... | 80·98 | 98·79 | 17,016·38 | 5,806·66 | 5,986·43 | ... |
| Yilgarn ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 6·92 | 104,298·75 | 37,629·59 | 37,636·51 | 3,929·84 |
| Dundas ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 282·56 | 10,527·75 | 6,258·62 | 6,541·18 | ... |
| Phillips River ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 657·55 | 1,422·76 | 1,422·76 | ... |
| State generally ... ... | | ... | ... | ... | ... | ... | ... | ... | 7·25 | ... | 13·42 | 20·67 | ... |
| Total for 1920 ... | | ... | ... | ... | ... | ... | ... | **624·76** | **5,001·78** | **1,249,606·87** | **621,032·83** | **626,659·37** | **95,744·46** |

TABLE III.—*Return showing for the respective Goldfields and Districts, etc.*—continued.

| Goldfield. | District. | Total Gold and Silver Yield—Districts. | | | | | | Total Gold and Silver Yield—Goldfields. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Total Gold. | * Silver. | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Total Gold. | * Silver. |
| | | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. | Fine ozs. | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. | Fine ozs. |
| Kimberley ... ... | ... | ... | ... | ... | ... | ... | ... | 3,893·10 | ... | 17,597·50 | 14,127·25 | 18,020·35 | ... |
| Pilbara ... ... | Marble Bar ... | 11,903·09 | 3,316·63 | 74,867·93 | 113,672·53 | 128,892·25 | 574·01 | 18,392·92 | 3,722·87 | 115,445·17 | 186,626·69 | 208,742·48 | 574·01 |
| Do. ... ... | Nullagine ... | 6,489·83 | 406·24 | 40,577·24 | 72,954·16 | 79,850·23 | ... | | | | | | |
| West Pilbara ... | ... | ... | ... | ... | ... | ... | ... | 5,620·51 | 275·00 | 19,162·71 | 21,920·49 | 27,816·00 | 1,331·07 |
| Ashburton ... ... | ... | ... | ... | ... | ... | ... | ... | 8,567·60 | 315·64 | ... | ... | 8,883·24 | 7,787·69 |
| Gascoyne ... ... | ... | ... | ... | ... | ... | ... | ... | 320·20 | 18·51 | 356·70 | 337·83 | 676·54 | ... |
| Peak Hill ... ... | ... | ... | ... | ... | ... | ... | ... | 1,966·83 | 4,048·15 | 500,355·76 | 249,623·31 | 255,638·29 | 2,287·63 |
| East Murchison ... | Lawlers ... | 5,614·49 | 7,234·60 | 2,021,750·86 | 897,219·54 | 910,068·63 | 25,846·11 | | | | | | |
| Do. ... ... | Wiluna ... | 90·79 | 197·27 | 189,480·00 | 95,132·59 | 95,420·65 | 232·00 | 7,168·74 | 22,738·31 | 3,377,203·82 | 1,740,146·49 | 1,770,053·54 | 42,422·76 |
| Do. ... ... | Black Range... | 1,463·46 | 15,306·44 | 1,165,972·96 | 747,794·36 | 764,564·26 | 16,344·65 | | | | | | |
| Murchison ... ... | Cue ... ... | 1,094·90 | 5,245·02 | 440,823·55 | 370,143·44 | 376,483·36 | 505·80 | | | | | | |
| Do. ... ... | Meekatharra ... | 10,321·13 | 11,632·26 | 1,306,147·67 | 894,145·59 | 916,098·98 | 5,028·90 | | | | | | |
| Do. ... ... | Day Dawn ... | 2,285·32 | 8,868·52 | 1,966,323·65 | 1,298,040·56 | 1,309,194·40 | 169,210·44 | 15,460·94 | 39,717·92 | 4,253,193·62 | 2,948,263·29 | 3,003,442·15 | 175,919·32 |
| Do. ... ... | Mt. Magnet ... | 1,759·59 | 13,972·12 | 539,898·75 | 385,933·70 | 401,665·41 | 1,174·18 | | | | | | |
| Yalgoo ... ... | ... | ... | ... | ... | ... | ... | ... | 1,451·29 | 1,816·53 | 180,061·39 | 121,273·09 | 124,540·91 | 167·40 |
| Mt. Margaret ... | Mt. Morgans ... | 1,737·94 | 3,761·47 | 931,742·19 | 509,334·61 | 514,834·02 | 5,775·05 | | | | | | |
| Do. ... ... | Mt. Malcolm ... | 2,615·35 | 7,324·31 | 3,233,986·88 | 1,636,048·77 | 1,645,988·43 | 76,559·35 | 7,777·27 | 18,710·11 | 5,788,496·27 | 2,959,642·69 | 2,986,130·07 | 138,131·88 |
| Do. ... ... | Mt. Margaret | 3,423·98 | 7,624·33 | 1,622,767·20 | 814,259·31 | 825,307·62 | 55,797·48 | | | | | | |
| North Coolgardie... | Menzies ... | 1,073·47 | 3,668·77 | 1,167,678·85 | 984,067·21 | 988,809·45 | 18,639·21 | | | | | | |
| Do. ... ... | Ularring ... | 21·46 | 1,144·32 | 293,403·18 | 286,846·20 | 288,011·98 | 5,672·05 | | | | | | |
| Do. ... ... | Niagara ... | 1,475·19 | 1,411·27 | 898,353·27 | 499,006·34 | 501,892·80 | 5,603·42 | 3,816·46 | 13,796·73 | 2,575,355·51 | 1,960,061·36 | 1,977,674·55 | 29,977·72 |
| Do. ... ... | Yerilla ... | 1,246·34 | 7,572·37 | 215,920·21 | 190,141·61 | 198,960·32 | 63·04 | | | | | | |
| Broad Arrow ... | ... | ... | ... | ... | ... | ... | ... | 19,245·52 | 13,181·56 | 832,128·59 | 454,601·69 | 487,028·77 | 2,181·96 |
| N.E. Coolgardie ... | Kanowna ... | 104,402·60 | 10,786·14 | 931,307·24 | 576,067·39 | 691,256·13 | 2,522·12 | 116,393·59 | 16,077·32 | 936,436·25 | 588,507·76 | 720,978·67 | 2,533·34 |
| Do. ... ... | Kurnalpi ... | 11,990·99 | 5,291·18 | 5,129·01 | 12,440·37 | 29,722·54 | 11·22 | | | | | | |
| East Coolgardie ... | East Coolgardie | 27,467·28 | 31,386·18 | 27,879,851·70 | 17,678,560·72 | 17,737,414·18 | 1,721,080·12 | 54,053·17 | 46,373·61 | 28,033,891·47 | 17,798,272·41 | 17,898,699·19 | 1,721,093·04 |
| Do. ... ... | Bulong ... | 26,585·89 | 14,987·43 | 154,039·77 | 119,711·69 | 161,285·01 | 12·92 | | | | | | |
| Coolgardie ... ... | Coolgardie ... | 8,885·94 | 10,782·32 | 1,518,239·79 | 956,068·66 | 975,736·92 | 881·79 | 9,617·73 | 15,818·82 | 1,789,997·52 | 1,162,323·77 | 1,187,760·32 | 930·46 |
| Do. ... ... | Kunanalling ... | 731·79 | 5,036·50 | 271,757·73 | 206,255·11 | 212,023·40 | 48·67 | | | | | | |
| Yilgarn ... ... | ... | ... | ... | ... | ... | ... | ... | 91·65 | 1,401·62 | 2,203,089·54 | 997,123·05 | 998,616·32 | 31,308·34 |
| Dundas ... ... | ... | ... | ... | ... | ... | ... | ... | 2,027·12 | 13,281·93 | 892,988·95 | 598,584·84 | 613,893·89 | 36,392·90 |
| Phillips River ... | ... | ... | ... | ... | ... | ... | ... | 472·20 | 781·93 | 89,797·07 | 85,810·62 | 87,064·75 | 15,688·17 |
| †Donnybrook ... | ... | ... | ... | ... | ... | ... | ... | 23·24 | ... | 1,653·30 | 818·52 | 841·76 | ... |
| State generally ... ... | | ... | ... | ... | ... | ... | ... | 124·89 | 209·56 | 27·00 | 7,393·33 | 7,727·78 | 9,829·22 |
| **Total to 31st December, 1920** | | ... | ... | ... | ... | ... | ... | **276,484·97** | **212,286·12** | **51,607,238·14** | **31,895,458·48** | **32,384,229·57** | **2,218,556·91** |

* By-product in the treatment of auriferous ore except Ashburton and State generally. † Abolished 4th March, 1908.

# TABLE IV.

PRODUCTION OF GOLD AND SILVER FROM ALL SOURCES, SHOWING IN FINE OUNCES THE OUTPUT AS REPORTED TO THE MINES DEPARTMENT DURING 1920, AND THE TOTAL PRODUCTION TO DATE.

## Kimberley Goldfield.

| MINING CENTRE. | NUMBER OF LEASE. | REGISTERED NAME OF COMPANY OR LEASE. | TOTAL FOR 1920. | | | | | TOTAL PRODUCTION. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. |
| | | | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. |
| Hall's Creek... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 423·00 | 477·76 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 94·55 | 62·68 | ... |
| Mt. Dockrell | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 44·00 | 435·93 | ... |
| Ruby Creek... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 12,633·50 | 9,435·13 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 151·00 | 127·28 | ... |
| The Brockman | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 1,352·75 | 1,404·40 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 2,462·00 | 1,820·33 | ... |
| The Mary ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 399·00 | 210·03 | ... |
| The Panton ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 34·70 | 138·70 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 3·00 | 15·01 | ... |
| | *From Goldfields generally :—* Reported by Banks and Gold Dealers ... ... | | ... | ... | ... | ... | ... | 3,893·10 | ... | ... | ... | ... |
| | | **Total** ... ... ... | ... | ... | ... | ... | ... | **3,893·10** | ... | **17,597·50** | **14,127·25** | ... |

## Pilbara Goldfield.

### MARBLE BAR DISTRICT.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bamboo Creek | 807 ... ... | Bonney Doon ... ... ... | ... | ... | 130·00 | 58·32 | ... | ... | ... | 190·00 | 80·21 | ... |
| Do. ... | 795 ... ... | Bulletin ... ... ... ... | ... | ... | 13·75 | 28·34 | ... | ... | ... | 57·75 | 135·22 | ... |
| Do. ... | 707 ... ... | Kitchener ... ... ... | ... | ... | 395·25 | 921·16 | ... | ... | ... | 2,482·50 | 5,461·32 | ... |
| Do. ... | 806 ... ... | Lloyd George ... ... ... | ... | ... | 22·00 | 8·98 | ... | ... | ... | 22·00 | 8·98 | ... |
| Do. ... | 740 ... ... | (Mount Prophecy) ... ... | ... | ... | ... | ... | ... | ... | 1·11 | 1,040·50 | 1,898·07 | ... |
| Do. ... | 740, 794 ... ... | Mount Prophecy leases ... | ... | ... | 284·00 | 431·06 | ... | ... | ... | 838·25 | 1,455·17 | ... |
| Do. ... | 794 ... ... | (Perseverance) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 290·50 | 584·21 | ... |
| Do. ... | 789 ... ... | Princess May and Charlie ... | ... | ... | 9·50 | 51·83 | ... | ... | ... | 131·75 | 317·55 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 454·61 | 14,824·50 | 22,818·89 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 28·50 | 40·88 | ... | ... | 307·83 | 895·35 | 1,133·24 | ... |
| Boodalyerrie ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 292·07 | 120·25 | 587·86 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 7·16 | ... | ... | ... |
| Breen's Find | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 14·00 | 66·82 | ... |
| Elsie ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 178·00 | 352·06 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 10·25 | 19·81 | ... |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lalla Rookh | 786, R.C. 112 ... | Haig ... ... ... ... | ... | ... | 799·00 | 693·28 | ... | ... | ... | 1,149·00 | 882·09 | ... |
| Do. ... | ... | Voided leases ... ... | ... | ... | ... | ... | ... | ... | ... | 224·50 | 2,186·65 | 5740·1 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | 12·32 | ... | ... | ... | 6,969·00 | 6,870·36 | ... |
| Marble Bar ... | 803 ... ... | Australian Heroes ... ... | ... | ... | 102·00 | 100·10 | ... | ... | ... | 102·00 | 100·10 | ... |
| Do. ... | 805 ... ... | Homeward Bound East ... | ... | ... | 48·50 | 59·22 | ... | ... | ... | 132·50 | 134·29 | ... |
| Do. ... | 694 ... ... | Jo Jo ... ... ... ... | ... | ... | 222·00 | 128·20 | ... | ... | 33·97 | 2,309·00 | 2,453·79 | ... |
| Do. ... | 790 ... ... | Rufus Henry ... ... ... | ... | ... | 146·75 | 147·03 | ... | ... | ... | 557·75 | 961·49 | ... |
| Do. ... | 804 ... ... | Verdun ... ... ... ... | ... | ... | 24·00 | 39·29 | ... | ... | ... | 43·00 | 59·12 | ... |
| Do. ... | 722 ... ... | Viking ... ... ... ... | ... | ... | 10·00 | 18·39 | ... | ... | ... | 1,437·25 | 1,537·81 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 147·90 | 15,932·45 | 21,078·48 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 75·75 | 78·39 | ... | 38·68 | 149·23 | 4,651·39 | 5,11 ·31 | ... |
| North Pole ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 474·00 | 340·75 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 50·50 | 69·56 | ... |
| North Shaw ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 7·53 | ... | 351·45 | 674·72 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 567·06 | ... | ... | ... |
| Sharks ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 145·08 | 19·37 | 24·50 | 93·14 | ... |
| Shaw River ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 101·00 | 49·63 | ... |
| Talga Talga ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 83·83 | 574·50 | 975·98 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 50·26 | 68·99 | 204·65 | 520·25 | ... |
| Tambourah ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 1,438·50 | 1,739·44 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 79·29 | 639·25 | 797·44 | ... |
| Warrawoona | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 16·99 | 10,072·80 | 18,136·84 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 44·30 | 362·50 | 1,127·04 | 2,163·74 | ... |
| Western Shaw | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 1,222·50 | 957·80 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 12·52 | 67·47 | ... | ... | ... |
| Wyman's Well | 744 ... ... | Euro ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 438·00 | 443·68 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 33·55 | 115·04 | 493·98 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | 1·37 | ... | ... | ... | ·93 | 18·09 | 355·86 | 592·18 | ... |
| Yandicoogina | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 140·76 | 2,733·20 | 5,824·23 | ... |
| Do. ... | ... | Sundry claims ) .... ... | ... | ... | ... | ... | ... | ... | 238·35 | 103·75 | 120·34 | ... |
| | *From District generally :—* | | | | | | | | | | | |
| | Sundry Parcels treated at : | | | | | | | | | | | |
| | State Battery, Bamboo Creek ... ... ... | | ... | ... | ... | 298·68 | ... | ... | ... | ... | 2,137·96 | ... |
| | State Battery, Marble Bar ... ... ... | | ... | ... | ... | ... | ... | ... | ... | ... | 34·06 | ... |
| | Various Works ... ... ... ... ... | | ... | ... | ... | ... | ... | ... | ... | 237·95 | 1,204·91 | ... |
| | Reported by Banks and Gold Dealers ... ... | | 47·31 | ... | ... | ... | ... | 11,603·79 | 226·50 | ... | ... | ... |
| | **Total ... ... ...** | | **47·31** | **1·37** | **2,311·00** | **3,115·47** | ... | **11,903·09** | **3,316·63** | **74,867·93** | **113,672·53** | **574·01** |

## NULLAGINE DISTRICT.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Eastern Creek | 180L ... ... | Crescent ... ... ... ... | ... | ... | 98·00 | 233·51 | ... | ... | ... | 1,067·75 | 2,117·52 | ... |
| Do. ... | 176L ... ... | (Doherty Reward) ... ... | ... | ... | ... | ... | ... | ... | ... | 142·25 | 171·43 | ... |
| Do. ... | 176L ... ... | Doherty Reward ... ... | ... | ... | 85·00 | 559·18 | ... | ... | ... | 1,450·00 | 2,755·53 | ... |
| Do. ... | 176L (177L) ... ... | (Doherty Reward leases) ... | ... | ... | ... | ... | ... | ... | ... | 219·00 | 1,007·68 | ... |
| Do. ... | (182L) ... ... | Morning Star ... ... ... | ... | ... | ... | ... | ... | ... | 4·19 | 367·00 | 834·03 | ... |
| Do. ... | (178L) ... ... | Shamrock ... ... ... | ... | ... | ... | ... | ... | ... | 4·00 | 395·25 | 683·06 | ... |
| Do. ... | ... ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 695·75 | 1,041·02 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 3·77 | 301·50 | 523·27 | ... |

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

**PILBARA GOLDFIELD**—continued.

NULLAGINE DISTRICT—*continued.*

| Mining Centre. | Number of Lease. | Registered Name of Company or Lease. | Total for 1920. | | | | | Total Production. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. |
| | | | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. |
| Elsie ... ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 408·25 | 1,323·85 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 24·00 | 27·48 | ... |
| McPhee's Creek | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 113·00 | 137·92 | ... |
| Middle Creek | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 6,211·90 | 8,433·68 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 286·00 | 408·82 | ... |
| Mosquito Creek | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 1·07 | 21·42 | 7,259·80 | 12,464·00 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 166·47 | 2,188·94 | 3,116·77 | ... |
| Nullagine ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 13·96 | 7,453·25 | 11,335·12 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 104·70 | 133·14 | 3,984·75 | 9,336·03 | ... |
| Twenty-mile Sandy | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 3·20 | 5,093·70 | 7,786·99 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 33·10 | 20·55 | 2,802·65 | 3,855·08 | ... |
| | *From District generally :—* | | | | | | | | | | | |
| | Sundry Parcels treated at : | | | | | | | | | | | |
| | Doherty's Works ... ... ... ... ... | | ... | ... | ... | ... | ... | ... | ... | ... | 1,177·32 | ... |
| | Fremantle Trading Co.'s Works ... ... | | ... | ... | ... | ... | ... | ... | ... | ... | 8·29 | ... |
| | State Battery, Twenty-mile Sandy ... ... | | ... | ... | ... | 23·28 | ... | ... | ... | 62·00 | 1,767·60 | ... |
| | Various Works ... ... ... ... ... | | ... | ... | ... | ... | ... | ... | ... | 50·50 | 2,641·67 | ... |
| | Reported by Banks and Gold Dealers ... ... | | 72·37 | ... | ... | ... | ... | 6,350·96 | 35·54 | ... | ... | ... |
| | **Total ... ... ...** | | **72·37** | ... | **183·00** | **815·97** | ... | **6,489·83** | **406·24** | **40,577·24** | **72,954·16** | ... |

## West Pilbara Goldfield.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Croydon ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 8·00 | 5·44 | ... |
| Hong Kong ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 331·00 | 44·245 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 21·40 | ·02 | 9·00 | 3·15 | ... |
| Lower Nicol ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 1·10 | 653·20 | 402·22 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 10·44 | 2·71 | 10·00 | 11·51 | ... |
| Mallina ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 141·60 | 128·44 | ... |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nicol ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 30·00 | 11·47 | ... |
| Pilbara ... | 168 ... ... | Black Prince ... ... ... | ... | ... | 70·00 | 89·84 | ... | ... | ... | ... | 70·00 | 89·84 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 48·12 | 152·00 | 299·16 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 1·11 | 86·24 | 68·00 | 101·06 | ... |
| Roebourne ... | M.L. 174 ... | Good Fortune ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 3·96 | 112·83 |
| Do. ... | M.L. 183 ... | Carlow Castle: Roebourne Copper Mines, Ltd. | ... | ... | ... | ... | ... | ... | ... | ... | 6·12 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 113·36 | 573·91 | 237·91 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 108·60 | 93·85 | 96·53 |
| Station Peak | 165 ... ... | Belladonna ... ... ... | ... | ... | ... | ... | ... | ... | 7·93 | 943·00 | 262·93 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 177·74 | 23·44 | 9,993·00 | 11,084·49 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 37·50 | 48·19 | ... |
| Towranna ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 2·62 | 3,965·80 | 5,187·51 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 22·00 | 12·35 | ... |
| Upper Nicol ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 6·50 | 2·57 | ... |
| Weerianna ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 2,436·15 | 3,079·81 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 64·00 | 62·90 | ... |
| Whim Creek ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 883·80 |
| | | *From Goldfield generally :—* Reported by Banks and Gold Dealers ... ... | 44·07 | ... | ... | ... | ... | 44·07 | 92·82 | ... | 7·16 | ... |
| | | **Total ... ... ...** | **44·07** | **...** | **70·00** | **89·84** | **...** | **5,620·51** | **275·00** | **19,162·71** | **21,920·49** | **1,331·07** |

## Ashburton Goldfield.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mt. Mortimer | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 354·37 | 315·64 | ... | ... | 74·47 |
| Uaroo ... | M.L. 43, M.L. (49) | Uaroo Silver-Lead Mines, Ltd. ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 7,551·20 |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 162·02 |
| | | *From Goldfield generally :—* Reported by Banks and Gold Dealers ... ... | ... | ... | ... | ... | ... | 8,213·23 | ... | ... | ... | ... |
| | | **Total ... ... ...** | **...** | **...** | **...** | **...** | **...** | **8,567·60** | **315·64** | **...** | **...** | **7,787·69** |

## Gascoyne Goldfield.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bangemall ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 6·22 | 350·70 | 313·82 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 12·29 | 6·00 | 24·01 | ... |
| | | *From Goldfield generally :—* Reported by Banks and Gold Dealers ... ... | ... | ... | ... | ... | ... | 320·20 | ... | ... | ... | ... |
| | | **Total ... ... ...** | **...** | **...** | **...** | **...** | **...** | **320·20** | **18·51** | **356·70** | **337·83** | **...** |

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

## Peak Hill Goldfield.

| Mining Centre. | Number of Lease. | Registered Name of Company or Lease | Total for 1920. | | | | | Total Production. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. |
| | | | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. |
| Egerton ... | 352P ... ... | Hibernian ... ... ... | ... | ... | ... | ... | ... | ... | ... | 4,099·00 | 1,596·03 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ·91 | 315·25 | 360·00 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 23·51 | 1,093·75 | 506·79 | ... |
| Horseshoe ... | (466P) ... ... | Dinkum ... ... ... ... | ... | ... | ... | ... | ... | ... | 11·70 | ... | ... | ... |
| Do. ... | ... ... ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 1,950·96 | 728·38 | 1,973·46 | 2·00 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 639·53 | 6·05 | 45·14 | ... |
| Mt. Fraser ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 389·50 | 320·96 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 80·00 | 55·41 | ... |
| Peak Hill ... | 459P ... ... | Atlantic ... ... ... ... | ... | ... | 15·50 | 45·67 | ... | ... | ... | 125·00 | 489·83 | ... |
| Do. ... | 462P ... ... | Enterprise ... ... ... | ... | ... | ... | ... | ... | ... | ... | 112·00 | 388·48 | ... |
| Do. ... | 448P ... ... | Evening Star ... ... ... | ... | ... | 270·00 | 195·85 | ... | ... | ... | 983·00 | 2,600·87 | ... |
| Do. ... | 5P, 306P ... | No. 1 North leases ... ... | ... | 50·51 | 343·00 | 230·65 | ·04 | ... | 61·10 | 2,380·50 | 2,033·12 | ·04 |
| Do. ... | (455P) ... ... | North Star ... ... ... | ... | ... | ... | ... | ... | ... | ... | 246·00 | 222·42 | ... |
| Do. ... | (1P), (2P), (4P), 5P, (6P), (8P), (9P), (13P), (15P), (16P), (26P) (27P), (28P), (29P), (35P), (36P), (43P), (53P), (54P), (63P), (146P), (152P), (190P), (213P), (222P), (239P), (248P), (252P), (262P), (274P), 306P, (313P) | (Peak Hill Goldfields, Ltd.) ... ... | ... | ... | ... | ... | ... | ... | 191·46 | 462,057·01 | 223,273·59 | 2,285·59 |
| Do. ... | 468P ... ... | Simpson ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 190·00 | 19·28 | ... |
| Do. ... | 398P ... ... | Temperance ... ... ... | ... | ... | ... | ... | ... | ... | 6·65 | 797·00 | 509·20 | ... |
| Do. ... | 465P ... ... | Wowser ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 37·50 | 97·54 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 521·54 | 5,213·62 | 4,621·49 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | 7·25 | 10,374·50 | 957·28 | ... | 23·54 | 167·39 | 16,498·25 | 4,489·06 | ... |
| Ravelstone ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 101·64 | 4,219·85 | 3,117·68 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 553·60 | 283·17 | ... |
| Wilgeena ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 23·54 | 128·50 | 146·79 | ... |
| Wilthorpe ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 47·00 | 20·93 | ... |
| | *From Goldfield generally :—* Sundry Parcels treated at : Purcell's Works ... ... ... ... ... | | ... | ... | ... | 163·32 | ... | ... | ... | ... | 521·41 | ... |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| State Battery—Egerton ... ... ... ... | | ... | ... | ... | ... | ... | ... | ... | ... | ... | 294·87 | ... |
| State Battery—Ravelstone ... ... ... | | ... | ... | ... | ... | ... | ... | 3·05 | 15·00 | 1,315·82 | ... |
| Various Works ... ... ... ... | | ... | ... | ... | ... | ... | ... | ... | 30·00 | 319·97 | ... |
| Reported by Banks and Gold Dealers ... ... | | 5·18 | ... | ... | ... | ... | 1,943·29 | 345·17 | ... | ... | ... |
| **Total** ... ... ... | | **5·18** | **57·76** | **11,003·00** | **1,592·77** | **·04** | **1,966·83** | **4,048·15** | **500,355·76** | **249,623·31** | **2,287·63** |

## East Murchison Goldfield.

### LAWLERS DISTRICT.

NOTE.—On the 1st March, 1910, the Lawlers District was subdivided into Wiluna and Lawlers. The gold produced after that date by the mines at Wiluna will be found in the Wiluna District, and the lease numbers of both districts are shown in each case.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bronzewing ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 468·00 | 318·03 | 1·94 |
| Cork Tree ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 29·90 | 3,767·00 | 3,292·87 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 25·50 | 13·00 | 9·32 | ... |
| Kathleen Valley | 382 ... ... | (Yellow Aster) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 37,605·00 | 27,051·42 | ... |
| Do. ... | ... | (Yellow Aster)... ... ... | ... | ... | ... | ... | ... | ... | ... | 1,714·00 | 949·04 | ... |
| Do. ... | 382, 1197 ... | Yellow Aster leases ... ... | ... | ... | 597·00 | 363·61 | ... | ... | ... | 2,206·00 | 1,253·47 | ... |
| Do. ... | 382 ... ... | (Yellow Aster: Yellow Aster G.M. Co., N.L.) | ... | ... | ... | ... | ... | ... | ... | 10,359·75 | 5,425·26 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 141·57 | 23,291·50 | 11,350·24 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 478·40 | 1,429·75 | 855·82 | ... |
| Lake Darlot... | 1207 [1515c] ... | New Discovery ... ... ... | ... | ... | ... | ... | ... | ... | ... | 220·00 | 84·11 | ... |
| Do. ... | 273 [1514c] ... | St. George ... ... ... | ... | ... | ... | ... | ... | ... | 3,251·30 | 899·00 | 7,974·00 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 1,997·12 | 64,266·30 | 40,682·33 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 1·16 | 474·45 | 3,972·64 | 3,387·61 | 2·60 |
| Lawlers ... | 1211 ... | Donegal ... ... ... ... | ... | ... | 471·00 | 151·03 | ... | ... | ... | 471·00 | 151·03 | ... |
| Do. ... | (22), (37), 58, 62, (70), (155), (156), (157), (158), (376), (377), (381), (385), (399), (426), (427), (459), (474), (500), (508), (509), (510), (511), (512), (552), (562), (563), (573), (811), (840) | (East Murchison United, Ltd.) ... | ... | ... | ... | ... | ... | ... | ... | 291,797·00 | 155,594·26 | 900·48 |
| Do. ... | 1171 ... ... | (Great Eastern) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 927·00 | 337·72 | ... |
| Do. ... | 1171, (1186) ... | Great Eastern leases ... ... | ... | ... | ... | ... | ... | ... | ... | 1,601·74 | 1,352·43 | ... |
| Do. ... | (37), 58, 62, (70), (155,) (156), (157), (158), (376), (377), (381), (385), (399), (426), (427), (459), (474), (500), (508), (509), (510), (511), (512), (552), (562), (563), (573), (811), (840) | (London and Western Australian Exploration Co., Ltd.)... ... ... | ... | ... | ... | ... | ... | ... | ... | 179,563·00 | 40,438·14 | 2,560·31 |
| Do. ... | 1163 ... ... | (May Bee) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 4,157·00 | 1,270·06 | ... |
| Do. ... | 1163 ... ... | May Bee ... ... ... | ... | ... | ... | ... | ... | ... | ... | 1,014·00 | 238·21 | ... |
| Do. ... | 1163, (1189) ... | (May Bee leases)... ... ... | ... | ... | ... | ... | ... | ... | ... | 935·00 | 303·93 | ... |

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

## East Murchison Goldfield—*continued.*

LAWLERS DISTRICT—*continued.*

| Mining Centre. | Number of Lease. | Registered Name of Company or Lease. | Total for 1920. | | | | | Total Production. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. | Alluvial | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. |
| | | | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. |
| Lawlers ... | (22), (37), 58, 62, (70, (155), (156), (157), (158), (376), (377), (385), (459), (508, (509), (562),) (563), (811), (840), 918, (1053), (1106), (1109), (1110), (1123), (1160) | (Northern Mines, Ltd.) ... ... | ... | ... | ... | ... | ... | ... | ... | 398,856·50 | 102,005·52 | 8,356·89 |
| Do. ... | (1172) ... ... | Queen ... ... ... ... | ... | ... | 97·00 | 128·78 | ... | ... | ... | 3,170·50 | 3,554·20 | 245·70 |
| Do. ... | 1212 ... ... | Queen ... ... ... ... | ... | ... | 92·00 | 77·69 | ... | ... | ... | 92·00 | 77·69 | ... |
| Do. ... | 910, (923) ... | (Sunrise leases) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 8,644·00 | 4,076·63 | ... |
| Do. ... | 1188 ... ... | Try It ... ... ... ... | ... | ... | 320·00 | 63·32 | ... | ... | ... | 1,256·00 | 328·09 | ... |
| Lawlers ... | 58, 62, 918 ... | Waroonga G.M. Co., Ltd. ... ... | ... | ... | 6,797·00 | 1,146·95 | ... | ... | ... | 46,449·00 | 8,937·36 | ... |
| Do. ... | 62, (562), (563) | (Waroonga South leases) ... | ... | ... | ... | ... | ... | ... | ... | 42,150·00 | 14,329·48 | ... |
| Do. ... | 58 ... ... | (Woroonga: London and Western Australian Exploration Co., Ltd.) | ... | ... | ... | ... | ... | ... | ... | 2,438·50 | 2,755·45 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 14·81 | 687·39 | 284,386·98 | 147,157·83 | 2,287·55 |
| Do. ... | ... | Sundry claims ... ... | ... | 29·04 | 171·00 | 99·23 | ... | ... | 247·83 | 10,842·48 | 6,578·46 | 268·34 |
| New England | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 57·54 | 899·00 | 720·25 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 4·32 | 554·50 | 465·23 | ... |
| Sir Samuel ... | 1190 ... ... | Bellevue South ... ... ... | ... | ... | 98·00 | 24·67 | ... | ... | ... | 254·00 | 139·13 | ... |
| Do. ... | 1214 ... ... | Bluey's Release ... ... ... | ... | ... | 198·50 | 110·38 | ... | ... | ... | 198·50 | 110·38 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 13·49 | 265,433·00 | 138,468·17 | 10,225·58 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 91·50 | 47·44 | ... | ... | 21·37 | 3,809·50 | 2,774·35 | ... |
| Wiluna ... | (140), ([2J]), 162, [4J] (163), ([5J]) ... | (Golden Age Consolidated, Ltd.) ... | ... | ... | ... | ... | ... | ... | ... | 42,521·00 | 19,750·45 | ... |
| Do. ... | 542, [6J], 548, [7J], 550, [8J], (906), ([11J]), (930), ([13J]), (931), ([14J]), (932), ([15J]). (937), ([17J]), (938), ([18J]), (943), ([21J]), (944), ([22J]), (952), ([26J]) | (Gwalia Consolidated, Ltd.) ... ... | ... | ... | ... | ... | ... | ... | ... | 210,230·32 | 74,536·14 | 69·03 |
| Do. ... | 162, [4J], (163), ([5J]) | (Lake Way leases) ... ... | ... | ... | ... | ... | ... | ... | .. | 630·00 | 369·60 | ... |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Do. ... | 162, [4J] ... | (Lake Way: Western Australian Goldfields, Ltd.) | ... | ... | ... | ... | ... | ... | ... | 2,786·00 | 1,238·44 | ... |
| Do. ... | 870, [10J] ... | (Moonlight) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 1,856·00 | 787·66 | ... |
| Do. ... | 917 [12J] ... | (Squib) ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 276·50 | 67·00 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 537·27 | 58,149·75 | 41,452·53 | 124·00 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 5·30 | ... | 2,841·15 | 1,516·76 | ... |
| | *From District generally*:— | | | | | | | | | | | |
| | Sundry parcels treated at: | | | | | | | | | | | |
| | Great Eastern Battery ... ... ... ... | | ... | ... | ... | ... | ... | ... | ... | ... | 2,468·07 | ... |
| | Queen Works ... ... ... ... | | ... | ... | ... | 437·17 | 24·96 | ... | ... | ... | 1,218·14 | 39·36 |
| | State Battery, Lake Darlot ... ... ... | | ... | ... | ... | ... | ... | ... | ... | 315·00 | 1,097·09 | ... |
| | State Battery, Sir Samuel ... ... ... | | ... | ... | ... | ... | ... | ... | ... | 23·50 | 1,290·13 | ... |
| | State Battery, Wiluna ... ... ... ... | | ... | ... | ... | ... | ... | ... | ... | 390·00 | 2,047·17 | 20·00 |
| | Western Machinery Co., Ltd. ... ... ... | | ... | ... | ... | 13·84 | ... | ... | ... | ... | 13·84 | ... |
| | Various Works ... ... ... ... ... | | ... | ... | ... | ... | ... | ... | ... | 1,619·50 | 14,563·26 | 744·33 |
| | Reported by Banks and Gold Dealers ... ... | | ... | ... | ... | ... | ... | 5,593·22 | 67·15 | ... | 5·74 | ... |
| | **Total** ... ... ... | | ... | **29·04** | **8,933·00** | **2,664·11** | **24·96** | **5,614·49** | **7,234·60** | **2,021,750·86** | **897,219·54** | **25,846·11** |

## WILUNA DISTRICT.

*Note.*—Previous to the 1st March, 1910, Wiluna formed part of the Lawlers District. The gold produced by mines at Wiluna previous to that date will be found in the Lawlers District, and the lease numbers of both districts are shown in each case.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Collavilla ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 1,518·00 | 496·28 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 30·00 | 21·47 | ... |
| Gum Creek ... | 226J, [1386N] ... | Alma May ... ... ... | ... | ... | 150·00 | 143·28 | ... | ... | ... | 1,014·00 | 449·72 | ... |
| Mt. Keith ... | (201J) ... ... | Aurora ... ... ... ... | ... | ... | 28·25 | 98·68 | ... | ... | ... | 2,151·25 | 1,650·28 | ... |
| Do. ... | 207J ... ... | Miss Deal ... ... ... | ... | ... | 238·00 | 145·28 | ... | ... | ... | 2,021·00 | 1,776·96 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 8·29 | 3,966·25 | 3,392·39 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 78·26 | 1,406·75 | 883·20 | ... |
| New England | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 952·00 | 309·11 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 115·00 | 100·62 | ... |
| Wiluna ... | 91J, [940] ... | (Adelaide) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 401·00 | 33·29 | ... |
| Do. ... | 242J ... ... | Cromarty East ... ... ... | ... | ... | 43·25 | 68·81 | ... | ... | ... | 43·25 | 68·81 | ... |
| Do. ... | 233J ... ... | Double Gee Reward ... ... | ... | ... | 28·50 | 48·91 | ... | ... | ... | 28·50 | 48·91 | ... |
| Do. ... | 218J ... ... | Great Zig Zag ... ... ... | ... | ... | 213·25 | 93·76 | ... | ... | ... | 685·25 | 390·08 | ... |
| Do. ... | 6J, [542], 7J, [548], 8J, [550], (11J), (13J), (14J), (15J), 17J), (18J), (21J), (22J), (24J), (25J), (26J), (39J), (161J) (163J) ... | (Gwalia Consolidated, Ltd.) ... ... | ... | ... | ... | ... | ... | ... | ... | 29,774·50 | 10,780·42 | 20·29 |
| Do. ... | 119J ... ... | (Happy Jack) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 743·00 | 236·41 | ... |
| Do. ... | 202J ... ... | Happy Jack South: Wiluna G.Ms., Ltd. | ... | ... | 100·00 | 36·25 | ... | ... | ... | 1,464·75 | 803·75 | ... |
| Do. ... | (210) ... ... | Just in Time ... ... ... | ... | ... | ... | ... | ... | ... | ... | 1,214·25 | 853·75 | ... |
| Do. ... | 230J ... ... | Just in Time ... ... ... | ... | ... | 118·00 | 64·40 | ... | ... | ... | 118·00 | 64·40 | ... |
| Do, ... | 4J, [162] (5J), ([163]) ... | Lake Way leases: Wiluna G.M.s, Ltd. | ... | ... | ... | ... | ... | ... | ... | 2,044·00 | 975·78 | ... |
| Do. ... | 10J, [870] ... | (Moonlight) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 5,181·00 | 1,078·40 | ... |
| Do. ... | 10J, [870], 37, 91, 109, (123) | Moonlight leases ... ... | ... | ... | 1,252·50 | 810·45 | ... | ... | ... | 26,143·50 | 10,429·10 | ... |

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

## EAST MURCHISON GOLDFIELD—*continued.*

### WILUNA DISTRICT—*continued.*

| Mining Centre. | Number of Lease. | Registered Name of Company or Lease. | Total for 1920. | | | | | Total Production. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. | Alluvial | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver |
| | | | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. |
| Wiluna ... | 6J, [542], 7J, [548], 8J, [550], (11J), (13J,) (14J), (15J), (17J), (21J), (161J), (163J), 193J, 194J | Western Machinery Co., Ltd. ... | ... | ... | 9,229·00 | 3,347·41 | ... | ... | ... | 60,195·50 | 27,581·40 | ... |
| Do. ... | 12J, [917], (23J), (28J), (30J), (33J), (36J), (43J), (76J), (113J), 119J, 124J, (137J), ([1002]) | Wiluna Gold Mines, Ltd. ... ... | ... | ... | 360·25 | 291·08 | ... | ... | ... | 24,295·50 | 10,704·02 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 27·92 | 17,040·50 | 6,925·28 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 604·75 | 330·68 | ... | 87·59 | 79·88 | 6,731·25 | 3,038·83 | ·33 |
| | *From District generally* :— | | | | | | | | | | | |
| | Sundry Parcels treated at : | | | | | | | | | | | |
| | State Battery, Mt. Keith ... ... ... | | ... | ... | ... | ... | ... | ... | ... | ... | 556·95 | 12·68 |
| | State Battery, Wiluna ... ... ... | | ... | ... | ... | ... | ... | ... | ... | 202·00 | 11,482·98 | 198·70 |
| | Reported by Banks and Gold Dealers ... ... | | ... | ... | ... | ... | ... | 3·20 | 2·92 | ... | ... | ... |
| | **Total** ... ... ... | | ... | ... | **12,365·75** | **5,478·99** | ... | **90·79** | **197·27** | **189,480·00** | **95,132·59** | **232·00** |

### BLACK RANGE DISTRICT.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Barrambie ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 455·50 | 1,862·24 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 16·01 | 127·00 | 127·18 | ... |
| Bellchambers | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 45·00 | 36·62 | ... |
| Birrigrin ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 820·68 | 12,018·16 | 15,040·45 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 34·52 | 744·50 | 678·89 | ... |
| Curran's Find | 641B ... ... | Red, White, and Blue ... ... | ... | ... | 701·00 | 512·71 | ... | ... | 24·58 | 6,874·00 | 2,929·20 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 107·70 | 164·50 | 71·82 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 160·00 | 27·56 | ... | ... | 27·20 | 540·50 | 228·39 | ... |
| Erroll's ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 14·17 | 132·04 | 72·00 | 426·68 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 6·53 | 335·16 | 228·00 | 327·90 | ... |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hancock's ... | 875B ... ... | Comedy King ... ... ... | ... | ... | 42·00 | 88·58 | ... | ... | ... | 42·00 | 88·58 | ... |
| Do. ... | (837B) ... ... | Comedy King ... ... ... | ... | ... | ... | ... | ... | ... | 365·90 | 754·00 | 1,553·36 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 6,123·94 | 25,937·25 | 25,789·68 | 52·08 |
| Do. ... | ... | Sundry claims ... ... | 4·21 | ... | 237·00 | 122·20 | ... | 4·21 | 119·02 | 1,906·00 | 1,103·75 | ... |
| Maninga Marley | 203B ... ... | (Havilah) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 1,507·50 | 2,315·74 | ... |
| Do. ... | 203B ... ... | (Havilah) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 638·00 | 716·05 | ... |
| Do. ... | 203B, (243B), (249B), (254B), (287B), (288B), (289B), (305B), (350B), (504B) | (Havilah G.M. Co., N.L.) ... ... | ... | ... | ... | ... | ... | ... | ... | 36,508·00 | 20,052·80 | 22·55 |
| Do. ... | 203B, (243B), (287B), (289B), (350B) | (Havilah G.M. Co., N.L.) ... ... | ... | ... | ... | ... | ... | ... | ... | 6,026·00 | 5,029·69 | ... |
| Do. ... | 203B, (243B), (249B), (254B), (287B), (288B), (289B), (305B) | (Havilah leases) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 2,240·00 | 2,432·48 | ... |
| Do. ... | 203B, 345B ... | Havilah leases ... ... ... | ... | ... | ... | 71·76 | ... | ... | ... | ... | 127·54 | ... |
| Do. ... | 203B, (243B), (289B) | (Havilah leases: Tailings Treatment, Ltd.) | ... | ... | ... | ... | ... | ... | ... | 371·00 | 2,086·50 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 195·02 | 11,977·23 | 14,442·35 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 158·16 | 853·50 | 669·68 | ... |
| Montagu ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 94·39 | 9,133·40 | 7,223·46 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 45·67 | 794·50 | 471·76 | ... |
| Nungarra ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 25·94 | 986·09 | 12,171·25 | 8,808·41 | 3·64 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 149·00 | 60·08 | ... | 46·67 | 1,455·98 | 3,601·90 | 2,212·33 | ... |
| Sandstone ... | (4B) ... ... | (Adelaide) ... ... ... | ... | ... | ... | ... | ... | ... | 7·21 | 7,443·00 | 12,675·94 | ... |
| Do. ... | (4B), 5B, (11B), (17B), (26B), (70B), (140B), (150B) | (Adelaide leases) ... ... | ... | ... | ... | ... | ... | ... | ... | 21,010·00 | 30,255·28 | ... |
| Do. ... | 5B ... ... | (Black Range) ... ... ... | ... | ... | ... | ... | ... | ... | 152·68 | 637·00 | 1,477·66 | 5·60 |
| Do. ... | (4B), 5, 255, 332, 562, 850 | Black Range Consolidated Mines, N.L. | ... | ... | 256·00 | 104·05 | ... | ... | ... | 389·00 | 258·90 | ... |
| Do. ... | (4B), 5B, (9B), (11B), (17B), (26B), (70B), (140B), (150B), (256B), (494B), (509B), (620B), (627B) | (Black Range Mining Co., N.L.) ... | ... | ... | ... | ... | ... | 4·75 | 199·90 | 227,485·00 | 159,278·43 | 1,315·00 |
| Do. ... | (4B), 5B, (11B), (70B), (140B) | (Black Range Pinnacles Co., N.L.) ... | ... | ... | ... | ... | ... | ... | ... | 1,228·50 | 1,684·82 | ... |
| Do. ... | 255B ... ... | (Black Range West G.M. Co., N.L.) ... | ... | ... | ... | ... | ... | ... | ... | 1,077·65 | 1,035·43 | ... |
| Do. ... | 255B, 332B, (562B) (601B) | (Black Range West G.M. Co., N.L.) ... | ... | ... | ... | ... | ... | ... | 51·62 | 613·00 | 377·95 | ... |
| Do. ... | (4B), 5B, 255B, 332B, 562B, (601B), 850B | (Black Range West G.M. Co., N.L.) ... | ... | ... | ... | ... | ... | ... | ... | 87·50 | 100·67 | ... |
| Do. ... | (876B) ... ... | Digger ... ... ... ... | ... | ... | 17·00 | 15·16 | ... | ... | ... | 17·00 | 15·16 | ... |
| Do. ... | 854B ... ... | Entente ... ... ... ... | ... | ... | 72·00 | 53·37 | ... | ... | 10·83 | 1,320·00 | 974·90 | ... |
| Do. ... | 856B ... ... | Nancy's Reward ... ... | ... | 44·00 | ... | ... | ... | ... | 44·00 | 647·00 | 657·46 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 2,685·27 | 424,943·12 | 232,212·20 | 10,433·62 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 482·00 | 192·03 | ... | 24·01 | 972·03 | 3,184·00 | 1,993·20 | ... |
| Youanmi ... | 514B ... ... | United ... ... ... ... | ... | ... | 501·00 | 110·28 | ... | ... | 11·86 | 15,912·00 | 4,352·15 | ... |
| Do. ... | 863B, 864B, 865B, 866B | Yuanmi G.M.s, Ltd. ... ... ... | ... | ... | 14,371·00 | 9,303·09 | 127·60 | ... | ... | 38,726·00 | 27,736·66 | 1,502·91 |

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

**EAST MURCHISON GOLDFIELD**—*continued.*

BLACK RANGE DISTRICT—*continued.*

| Mining Centre. | Number of Lease. | Registered Name of Company or Lease. | Total for 1920. | | | | | Total Production | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. | Alluvial | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. |
| | | | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. |
| Youanmi ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ·36 | 115·06 | 283,509·75 | 132,261·45 | 2,949·72 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 2·31 | 1,773·75 | 456·26 | ... |
| | | *From District generally :—* | | | | | | | | | | |
| | | Sundry Parcels treated at : | | | | | | | | | | |
| | | State Battery, Black Range ... ... ... | ... | ... | ... | 668·03 | ... | ... | ... | 202·00 | 14,570·72 | 59·53 |
| | | State Battery, Youanmi ... ... ... ... | ... | ... | ... | ... | 51·00 | ... | ... | ... | 2,900·81 | ... |
| | | Various Works ... ... ... | ... | ... | ... | ... | ... | ... | ... | 37·00 | 5,664·78 | ... |
| | | Reported by Banks and Gold Dealers ... ... | ... | ... | ... | ... | ... | 1,336·82 | 11·43 | ... | ... | ... |
| | | **Total ... ... ...** | **4·21** | **44·00** | **16,988·00** | **11,379·90** | **127·60** | **1,463·46** | **15,306·44** | **1,165,972·96** | **747,794·36** | **16,344·65** |

## Murchison Goldfield.

CUE DISTRICT.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Barrambie ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 22·49 | 16,903·92 | 14,338·52 | 125·60 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 70·50 | 35·81 | ... |
| Cuddingwarra | 1860 ... ... | Big Bell ... ... ... ... | ... | ... | 9,420·00 | 1,676·38 | 85·29 | ... | ... | 40,564·36 | 7,304·96 | 85·29 |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 10·59 | 124·53 | 35,855·75 | 43,796·59 | 15·42 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 41·80 | 498·54 | 1,064·83 | ... |
| Cue ... ... | 203, 1148 ... | (Cue Consolidated G.Ms., Ltd.) ... | ... | ... | ... | ... | ... | ... | ... | 23,427·50 | 18,382·10 | ... |
| Do. ... | 203 ... ... | Cue No. 1 ... ... ... | ... | ... | ... | 8·10 | ... | ... | ... | 7,753·75 | 12,955·86 | 20·40 |
| Do. ... | 1148 ... ... | (Light of Asia) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 10,175·00 | 7,302·20 | ... |
| Do. ... | 1148, (1299), (1300), (1634), (1666), (1667) | (Light of Asia leases) ... ... | ... | ... | ... | ... | ... | ... | ... | 14,024·00 | 9,078·43 | ... |
| Do. ... | 1148, 1151, 1252, (1300), 1362, 1498, (1634), (1667), 1884, 1892, 1904, 1906 | (Light of Asia and Queen of the May leases) | ... | ... | ... | ... | ... | ... | ... | 23,043·00 | 18,341·27 | ... |
| Do. ... | 1148, 1151, 1252, 1362, 1498, 1884, 1892, 1904, 1906 | Mararoa G.M. Co., N.L. ... ... | ... | ... | 5,262·00 | 4,823·20 | ... | ... | ... | 5,262·00 | 4,823·20 | ... |
| Do. ... | (1949) ... ... | Pathe ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 9·50 | 15·07 | ... |
| Do. ... | 1151, 1252, 1362, (1391), 1498, (1689) | (Queen of the May leases) ... | ... | ... | ... | ... | ... | ... | ... | 6,926·00 | 6,974·06 | ... |
| Do. ... | 1978 ... ... | Vera ... ... ... ... | ... | 5·89 | 103·00 | 65·53 | ... | ... | 5·89 | 172·00 | 76·12 | ... |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 34·72 | 529·45 | 182,371·12 | 129,204·39 | 43·3 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 597·75 | 344·26 | ... | 20·95 | 393·28 | 15,732·84 | 9,884·20 | ... |
| Eelya ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 8·78 | 971·00 | 1,778·94 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 30·00 | 7·30 | ... | ... | 101·86 | 569·65 | 602·43 | ... |
| Erroll's ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 20·25 | 14,098·50 | 8,902·24 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 227·00 | 92·86 | ... |
| Mindoolah ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 3·07 | ... | 7,935·50 | 4,773·33 | 42·97 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 9·81 | 1,004·00 | 1,123·77 | ... |
| Reedy's Find | 1932 ... ... | Culculli ... ... ... ... | ... | ... | 46·75 | 234·35 | ... | ... | ... | 184·75 | 1,243·83 | ... |
| Do. ... | 1977 ... ... | Emu ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 159·50 | 101·35 | ... |
| Do. ... | 1981 ... ... | Emu North ... ... ... | ... | ... | 104·00 | 43·45 | ... | ... | ... | 104·00 | 43·45 | ... |
| Do. ... | 1991 ... ... | Rand Extended ... ... ... | ... | ... | 11·00 | 4·52 | ... | ... | ... | 11·00 | 4·52 | ... |
| Do. ... | 1934 ... ... | Tuckanarra ... ... ... | ... | ... | 9·00 | 23·89 | ... | ... | ... | 46·00 | 173·02 | ... |
| Do. ... | 1923 ... ... | Turn of the Tide ... ... | ... | ... | 93·00 | 840·66 | ... | ... | 4·00 | 301·50 | 3,123·30 | ... |
| Do. ... | (1941) ... ... | Wild Rabbit ... ... ... | ... | ... | ... | ... | ... | ... | ... | 82·00 | 127·87 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 210·65 | 540·00 | 673·20 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 164·88 | 75·28 | 353·80 | 226·12 | ... |
| Tuckabianna | (1926) ... ... | Nigel ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 589·00 | 2,078·66 | ... |
| Do. ... | 1914 ... ... | Triplicate ... ... ... ... | ... | ... | 102·00 | 37·15 | ... | ... | ... | 631·00 | 243·00 | ... |
| Do. ... | 1924 ... ... | Triplicate North ... ... | ... | ... | ... | ... | ... | ... | ... | 191·00 | 229·16 | ... |
| Do. ... | (1929) ... ... | Tuckabianna North ... ... | ... | ... | ... | ... | ... | ... | ... | 341·50 | 140·42 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 162·70 | 1,217·00 | 1,529·45 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 47·75 | 44·79 | ... | 23·44 | 92·04 | 252·25 | 120·92 | ... |
| Tuckanarra ... | 1337 ... ... | Nemesis ... ... ... | ... | 123·25 | 30·00 | 43·97 | ... | ... | 742·25 | 2,244·00 | 6,121·04 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 14·65 | 2,095·42 | 15,584·10 | 14,405·28 | 172·77 |
| Do. ... | ... | Sundry claims ... ... | 15·23 | 241·64 | 102·00 | 219·31 | ... | 67·17 | 597·00 | 2,951·70 | 6,571·32 | ... |
| | *From District generally :—* | | | | | | | | | | | |
| | Sundry Parcels treated at : | | | | | | | | | | | |
| | Cue No. 1 Works ... ... ... ... ... | | ... | ... | ... | ... | ... | ... | ... | 1,870·50 | 6,684·54 | ... |
| | State Battery—Tuckanarra ... ... ... | | ... | ... | ... | 65·68 | ... | ... | ... | 518·50 | 3,336·59 | ... |
| | Triplicate Works ... ... ... ... ... | | ... | ... | ... | 774·08 | ... | ... | ... | ... | 3,546·56 | ... |
| | Various Works ... ... ... ... ... | | ... | ... | ... | ... | ... | ... | ... | 5,055·02 | 18,568·66 | ... |
| | Reported by Banks and Gold Dealers ... ... ... | | ... | ... | ... | ... | ... | 755·43 | 7·54 | ... | ... | ... |
| | **Total ... ... ...** | | **15·23** | **370·78** | **15,958·25** | **9,256·62** | **85·29** | **1,094·90** | **5,245·02** | **440,823·55** | **370,143·44** | **505·80** |

## MEEKATHARRA DISTRICT.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Abbott's ... | (1446N) ... ... | Venture ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 26·00 | 8·89 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 26·45 | 35,184·60 | 37,115·51 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 55·60 | 90·87 | ... |
| Burnakura ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 3,239·43 | 38,480·95 | 30,579·03 | 26·90 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 12·51 | 81·11 | 137·00 | 111·87 | ... |
| Chesterfield ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 29·02 | 409·15 | 6,756·26 | 7,445·01 | ·80 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 38·83 | 428·60 | 472·64 | ... |
| Gabanintha ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 16·93 | 21,918·00 | 13,447·58 | 815·57 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 13·05 | 74·38 | 1,063·50 | 715·19 | ... |
| Garden Gully | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 26·36 | 74·91 | 29,854·06 | 21,435·37 | 1,102·59 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 3·32 | 238·10 | 320·01 | ... |

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

**MURCHISON GOLDFIELD**—*continued.*

MEEKATHARRA DISTRICT—*continued.*

| Mining Centre. | Number of Lease. | Registered Name of Company or Lease. | Total for 1920. | | | | | Total Production. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. |
| | | | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. |
| Gum Creek ... | 1386N, [226J] ... | Alma May ... ... ... | ... | ... | ... | ... | ... | ... | ... | 1,082·00 | 248·83 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 25·27 | 88·12 | 2,557·08 | 3,110·73 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 338·00 | 278·36 | ... |
| Holden's Find | (1436N) ... ... | Unlimited ... ... ... | ... | 3·23 | 15·00 | 9·27 | ... | ... | 3·23 | 36·00 | 29·88 | ... |
| Do. ... | 1291N ... ... | Waterloo ... ... ... | ... | ... | 2,075·00 | 553·31 | ... | ... | ... | 11,207·00 | 3,532·67 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 14·77 | 1,237·25 | 957·74 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 55·00 | 40·40 | ... | ... | 44·63 | 196·00 | 161·73 | ... |
| Jillawarra ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 1,134·68 | 1,499·55 | 2,801·53 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 169·02 | 142·95 | 23·50 | 53·81 | ... |
| Meeka Pools | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 111·58 | 82·27 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 2·84 | 211·72 | 184·83 | ... |
| Meekatharra... | 597N ... ... | (Commodore) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 498·00 | 1,268·71 | ... |
| Do. ... | 597N, (915N), (1041N), (1365N) | (Commodore G.M. Co., N.L.) ... | ... | ... | ... | ... | ... | ... | ... | 40,527·00 | 16,121·38 | 3·32 |
| Do. ... | 477N ... ... | (Fenian) ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 8,831·75 | 18,289·22 | ... |
| Do. ... | 477N, 814N ... | Fenian leases ... ... ... | ... | ... | 19,570·77 | 11,960·50 | ... | ... | ... | 277,699·77 | 231,958·30 | ... |
| Do. ... | 1331N ... ... | Gwalia ... ... ... ... | ... | ... | 146·00 | 435·25 | ... | ... | 115·72 | 2,731·00 | 8,556·87 | ... |
| Do. ... | 1457N ... ... | Halcyon Extended ... ... | ... | ... | 43·55 | 67·20 | ... | ... | ... | 43·55 | 67·20 | ... |
| Do. ... | 1466N ... ... | Havelock ... ... ... ... | ... | ... | 30·00 | 17·42 | ... | ... | ... | 30·00 | 17·42 | ... |
| Do. ... | 555N ... ... | (Ingliston) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 1,202·49 | 2,332·27 | ... |
| Do. ... | 475N ... ... | (Ingliston Consols Extended) ... | ... | ... | ... | ... | ... | ... | ... | 1,536·25 | 4,248·25 | ·30 |
| Do. ... | 475N, 515N, 729N, 822N | Ingliston Extended Consols leases | ... | ... | 25,262·00 | 11,889·29 | ... | ... | ... | 247,888·22 | 138,558·54 | ... |
| Do. ... | 1461N ... ... | Ingliston Extended ... ... | ... | ... | 9·00 | 25·41 | ... | ... | ... | 9·00 | 25·41 | ... |
| Do. ... | 555N, 1239N ... | Ingliston leases ... ... | ... | ... | 2,045·00 | 1,722·91 | ... | ... | ... | 16,394·85 | 15,094·55 | ... |
| Do. ... | 1453N ... ... | Ingliston United ... ... | ... | 63·38 | 15·00 | 57·72 | ... | ... | 63·38 | 15·00 | 57·72 | ... |
| Do. ... | (507N), (637N), (931N), 933N, (964N), (1071N), (1142N) | (Lake View and Oroya Exploration, Ltd.) | ... | ... | ... | ... | ... | ... | ... | 117,650·26 | 45,208·20 | 2,448·42 |
| Do. ... | (1440N) ... ... | Lone Hand ... ... ... | ... | ... | 27·00 | 13·86 | ... | ... | ... | 206·00 | 90·03 | ... |
| Do. ... | (915N ) ... ... | (Macquarrie) ... ... ... | ... | ... | ... | ... | ... | ... | 40·05 | 4,315·08 | 1,148·10 | ... |
| Do. ... | 533N ... ... | Marmont ... ... ... ... | ... | ... | 138·50 | 234·88 | ... | ... | ... | 54,464·60 | 38,352·32 | ... |
| Do. ... | 580N ... ... | (Marmont Extended) ... | ... | ... | ... | ... | ... | ... | ... | 43·00 | 38·03 | ... |
| Do. ... | 580N, 888N ... | Marmont Extended leases ... | ... | ... | ... | ... | ... | ... | ... | 152·00 | 129·61 | ... |
| Do. ... | 597N, (915N), (1041N), (1365N) | New Commodore G.M. Co., N.L. ... | ... | ... | ... | ... | ... | ... | ... | 127·10 | 76·78 | ... |
| Do. ... | (507N), (637N), (931N), (933N), (964N), (1071N), (1142N), (1366N) | Queenhills Gold Mines, Ltd. ... ... | ... | ... | ... | ... | ... | ... | ... | 212·00 | 159·06 | ... |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Do. | (931N) | (Queen of the Hill) | ... | ... | ... | ... | ... | ... | ... | ... | 549·00 | 158·59 | ... |
| Do. | | Voided leases | ... | ... | ... | ... | ... | ... | 3·88 | 348·55 | 160,869·06 | 95,098·36 | 3·00 |
| Do. | | Sundry claims | ... | 4·48 | 359·00 | 170·91 | ... | 181·83 | 183·34 | 4,818·55 | 2,402·82 | ... |
| Munara Gully | | Voided leases | ... | ... | ... | ... | ... | ... | ... | 13,167·75 | 6,489·65 | ... |
| Do. | | Sundry claims | ... | ... | ... | 7·36 | ... | ... | 11·62 | 80·00 | 47·33 | ... |
| Nannine | 166N | Nannine | ... | 40·07 | 25·00 | 56·35 | ... | ... | 218·15 | 199·00 | 154·74 | ... |
| Do. | (16N), (25N), 166N | (Nannine leases) | ... | ... | ... | ... | ... | ... | 8·71 | 23,649·60 | 24,385·66 | 127·69 |
| Do. | | Voided leases | ... | ... | ... | ... | ... | 34·02 | 372·54 | 68,097·02 | 43,048·73 | 39·85 |
| Do. | | Sundry claims | ... | 7·30 | ... | ... | ... | 14·93 | 243·73 | 2,327·20 | 1,803·14 | ... |
| Quinn's | (1430N) | Nowthanna | ... | ... | 54·00 | 12·00 | ... | ... | ... | 119·00 | 13·75 | ... |
| Do. | | Voided leases | ... | ... | ... | ... | ... | 7·30 | 1,186·50 | 18,812·16 | 8,868·04 | 90·70 |
| Do. | | Sundry claims | ... | 282·48 | ... | ... | ... | 2·25 | 1,095·80 | 1,671·50 | 1,281·62 | ... |
| Ruby Well | | Voided leases | ... | ... | ... | ... | ... | ... | ... | 7,443·00 | 3,988·36 | ... |
| Do. | | Sundry claims | ... | ... | ... | ... | ... | ... | 8·48 | 261·00 | 341·66 | ... |
| Stake Well | | Voided leases | ... | ... | ... | ... | ... | ... | 200·12 | 21,362·00 | 9,566·18 | ... |
| Do. | | Sundry claims | ... | ... | 36·00 | 42·51 | ... | ... | 31·79 | 222·00 | 234·51 | ... |
| Star of the East | | Voided leases | ... | ... | ... | ... | ... | ... | ... | 27,244·00 | 20,305·40 | ... |
| Do. | | Sundry claims | ... | ... | ... | ... | ... | ... | ... | 127·62 | 94·97 | ... |
| Yaloginda | 1434N | Rocklee South Extended | ... | 385·33 | ... | ... | ... | ... | 611·71 | ... | 126·88 | ... |
| Do. | | Voided leases | ... | ... | ... | ... | ... | ... | 951·84 | 25,744·02 | 13,122·85 | 8·68 |
| Do. | | Sundry claims | ... | 25·82 | ... | ... | ... | 10·89 | 530·71 | 1,978·17 | 1,588·80 | ... |
| | *From District generally :—* | | | | | | | | | | | |
| | Sundry Parcels treated at : | | | | | | | | | | | |
| | | Connecticut Battery | ... | ... | ... | ... | ... | ... | ... | ... | 173·61 | ... |
| | | Ruby Well Battery | ... | ... | ... | ... | ... | ... | ... | ... | 699·32 | ... |
| | | State Battery—Meekathara | ... | ... | ... | ... | ... | ... | ... | 14·00 | 10,242·65 | 19·00 |
| | | State Battery—Quinn's | ... | ... | ... | ... | ... | ... | ... | ... | 618·79 | ... |
| | | Various Works | ... | ... | ... | ... | ... | ... | ... | 172·75 | 4,301·81 | 342·17 |
| | Reported by Banks and Gold Dealers | | ... | 34·81 | ... | ... | ... | 9,790·80 | 13·79 | ... | ... | ... |
| | **Total** | | ... | **42·11** | **804·79** | **49,905·82** | **27,316·55** | ... | **10,321·13** | **11,632·26** | **1,306,147·67** | **894,145·59** | **5,028·90** |

## DAY DAWN DISTRICT.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Day Dawn | 1D, 2D, 86D, (87D), (99D), (119D), 129D, (158D), (159D), 170D, 185D, (191D), (209D), 210D, (211D), (212D), (213D), (224D), (225D), (249D), (424D), 453D, (455D), (467D) | Great Fingall Consolidated, Ltd. | ... | ... | ... | 1,799·59 | 1,846·11 | ... | ... | ... | 1,864,752·85 | 1,184,648·91 | 169,210·20 |
| Do. | (119D) | (West Fingall, No. 6) | ... | ... | ... | ... | ... | ... | ... | ... | 43·00 | 15·32 | ... |
| Do. | | Voided leases | ... | ... | ... | ... | ... | ... | 126·30 | 511·03 | 45,040·38 | 30,749·52 | ·24 |
| Do. | | Sundry claims | ... | ·74 | 153·00 | 60·92 | ... | ... | 259·13 | 2,187·08 | 1,706·97 | ... |
| Jasper Hill | (513D), (517D), (518D), (520D), (535D) | Black Range Pinnacles Co., N.L. | ... | ... | ... | ... | ... | ... | ... | 9,158·00 | 3,893·26 | ... |
| Do. | (513D) | (Comet) | ... | ... | ... | ... | ... | ... | ... | 67·20 | 36·23 | ... |

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

**MURCHISON GOLDFIELD**—*continued.*

DAY DAWN DISTRICT—*continued.*

| Mining Centre. | Number of Lease. | Registered Name of Company or Lease. | Total for 1920. | | | | | Total Production. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. | Alluvial. | Dollied and Specimens. | Ore treated: | Gold therefrom. | Silver. |
| | | | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. |
| Jassper Hill | (516D) ... ... | Neptune ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 25·00 | 4·63 | ... |
| Do. ... | (548D) ... ... | Night Watch ... ... ... | ... | ... | ... | ... | ... | ... | 400·22 | ... | ... | ... |
| Do. ... | 551 ... ... | Night Watch ... ... ... | ... | 28·73 | ... | ... | ... | ... | 28·73 | ... | ... | ... |
| Do. ... | 550D ... ... | Snake ... ... ... ... | ... | ... | 42·00 | 159·27 | ... | ... | ... | 42·00 | 159·27 | ... |
| Do. ... | ... | Voided leases ... ... | ... | ... | ... | ... | ... | 4·90 | 781·28 | 6,058·55 | 5,040·17 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | 6·91 | 77·00 | 54·13 | ... | ... | 397·17 | 290·00 | 439·01 | ... |
| Lake Austin (Island) | 536D ... ... | Eureka ... ... ... ... | ... | 1,147·95 | 40·25 | 764·68 | ... | ... | 1,200·74 | 40·25 | 764·68 | ... |
| Do. ... | ... | Voided leases ... ... | ... | ... | ... | ... | ... | 590·52 | 1,568·02 | 29,774·37 | 45,386·70 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | 27·18 | 26·25 | 60·06 | ... | 17·74 | 318·73 | 536·14 | 367·86 | ... |
| Mainland ... | ... | Voided leases ... ... | ... | ... | ... | ... | ... | ·41 | 2,706·26 | 7,272·13 | 23,129·51 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | 443·44 | 18·50 | 71·42 | ... | 3·24 | 677·12 | 95·95 | 160·45 | ... |
| | *From District generally :—* | | | | | | | | | | | |
| | Sundry Parcels treated at : | | | | | | | | | | | |
| | [redacted] Various Works ... ... ... | ... ... | ... | ... | ... | ... | ... | ... | 16·61 | 940·75 | 1,537·30 | ... |
| | Reported by Banks and Gold Dealers ... | ... | ... | ... | ... | ... | ... | 1,542·21 | 3·48 | ... | ·77 | ... |
| | **Total ... ... ...** | | ... | **1,654·95** | **2,156·59** | **3,016·59** | ... | **2,285·32** | **8,868·52** | **1,966,323·65** | **1,298,040·56** | **169,210·44** |

MOUNT MAGNET DISTRICT.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lennonville ... | 964M ... ... | (Empress)) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 1,649·00 | 7,361·81 | ... |
| Do. ... | 964M, (1078M), (1079M), (1115M), (1116M), (1117M) | Empress leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 4,813·00 | 3,171·33 | ... |
| Do. ... | (1158M) ... ... | Galtee Moore ... ... ... | ... | ... | ... | ... | ... | ... | ... | 116·50 | 129·89 | ... |
| Do. ... | ... | Voided leases ... ... | ... | ... | ... | ... | ... | ... | 3,196·79 | 133,314·98 | 112,492·50 | 458·82 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 52·25 | 25·84 | ... | 7·11 | 93·23 | 1,936·67 | 1,559·95 | ... |
| Mt. Magnet ... | (1167M) ... ... | Bel Bird ... ... ... ... | ... | 3·24 | 22·25 | 77·22 | ... | ... | 241·65 | 416·00 | 598·58 | ... |
| Do. ... | (1182M) ... ... | Carbine ... ... ... ... | ... | ... | 97·00 | 32·33 | ... | ... | ... | 127·50 | 49·73 | ... |
| Do. ... | 1181M ... ... | Fortune of War ... ... | ... | ... | 403·25 | 148·21 | ... | ... | 5·77 | 624·75 | 274·41 | ... |
| Do. ... | (1155M) ... ... | Gift ... ... ... ... | ... | ... | 32·50 | 88·33 | ... | ... | 250·89 | 152·75 | 2,136·07 | ... |
| Do. ... | 1156M ... ... | Leap Year ... ... ... | ... | ... | 330·00 | 205·64 | ... | ... | ... | 804·75 | 760·85 | ... |
| Do. ... | 1013M ... ... | Mars ... ... ... ... | ... | ... | ... | 7·53 | ... | ... | ... | 8,078·15 | 2,040·25 | ... |
| Do. ... | 1151M ... ... | Morning Star ... ... ... | ... | ... | 97·60 | 122·07 | ... | ... | 9·76 | 1,031·30 | 1,188·62 | ... |
| Do. ... | 1183M ... ... | Mount Zion ... ... ... | ... | ... | 4,628·25 | 1,219·88 | ... | ... | ... | 4,907·00 | 1,333·98 | ... |
| Do. ... | 1075M ... ... | New Havelock ... ... ... | ... | ... | 260·00 | 48·15 | ... | ... | 15·77 | 1,531·00 | 675·31 | ... |
| Do. ... | 1095M ... ... | Pearl ... ... ... ... | ... | ... | ... | ... | ... | ... | 2·36 | 221·82 | 214·19 | ... |
| Do. ... | (1191M) ... ... | Poverty View ... ... ... | ... | ... | 37·00 | 26·34 | ... | ... | ... | 37·00 | 26·34 | ... |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Do. ... | (1175M) ... ... | St. Patrick ... ... ... | ... | ... | 16·25 | 4·68 | ... | ... | ... | 703·75 | 629·38 | ... |
| Do. ... | (1165M) ... ... | Trevallen ... ... ... ... | ... | ... | ... | ... | ... | ... | 2·07 | 1,521·00 | 401·59 | ... |
| Do. ... | 1069M ... ... | Turning Point ... ... ... | ... | ... | 41·75 | 9·73 | ... | ... | 8·35 | 142·25 | 128·66 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 27·83 | 7,861·63 | 349,034·14 | 198,802·43 | 714·36 |
| Do. ... | ... | Sundry claims ... ... | ... | 12·63 | 1,306·55 | 487·42 | ... | 1·82 | 1,130·64 | 19,157·21 | 10,882·04 | ... |
| Mt. Magnet East | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 63·29 | 764·53 | 5,522·28 | 2,811·75 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 37·22 | 214·50 | 144·10 | ... |
| Moyagee ... | 1099M ... ... | Moyagee ... ... ... ... | ... | ... | 200·00 | 593·15 | ... | ... | ... | 1,014·50 | 2,288·39 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 5·08 | 2,053·15 | 2,416·74 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 111·10 | 557·73 | 682·58 | ... |
| Paynesville ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 152·90 | 19·75 | 26·62 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | 80·57 | ... | 16·65 | ... | ... | 82·03 | 27·75 | 616·62 | ... |
| Youanmi ... | ... | Sundry claims ... ... ... | ... | ... | ... | ... | ... | ... | ... | 33·00 | 44·58 | ... |
| | | *From District generally :—* | | | | | | | | | | |
| | | Sundry Parcels treated at : | | | | | | | | | | |
| | | Early Bird Works ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 109·15 | ... |
| | | Fremantle Trading Co.'s Works ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 143·80 | ... |
| | | Morning Star Battery ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 863·23 | ... |
| | | State Battery, Boogardie ... ... ... | ... | ... | 27·50 | 909·93 | ... | ... | ... | 92·51 | 15,208·66 | ... |
| | | State Battery, Lennonville ... ... ... | ... | ... | ... | ... | ... | ... | ... | 18·06 | 6,576·77 | ... |
| | | Various Works ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 25·00 | 9,142·80 | 1·00 |
| | | Reported by Banks and Gold Dealers ... ... | 6·91 | ... | ... | ... | ... | 1,659·54 | ·35 | ... | ... | ... |
| | | **Total ... ... ...** | **6·91** | **96·44** | **7,552·15** | **4,023·10** | ... | **1,759·59** | **13,972·12** | **539,898·75** | **385,933·70** | **1,174·18** |

## Yalgoo Goldfield.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adavale ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 10·00 | 12·56 | ... |
| Bilberatha ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 554·00 | 200·07 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 2·90 | ... | ... | ... |
| Carlaminda ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 947·32 | 524·72 | 3·30 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 114·00 | 71·96 | ... |
| Field's Find ... | 850 ... ... | Commodore ... ... ... | ... | ... | 29·00 | 30·19 | ... | ... | ... | 183·50 | 284·70 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 204·26 | 35,966·80 | 26,508·33 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 5·77 | 157·03 | 371·75 | 384·49 | ... |
| Goodingnow | (681) ... ... | Aster Consolidated ... ... | ... | ... | ... | ... | ... | ... | 2·77 | 1,455·50 | 1,091·94 | ... |
| Do. ... | 878 ... ... | Carnation ... ... ... | ... | ... | 589·00 | 1,018·62 | ... | ... | ... | 2,048·00 | 3,562·63 | ... |
| Do. ... | 606 ... ... | (Lake View) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 163·00 | 185·46 | ... |
| Do. ... | 606 ... ... | Lake View : Payne's Find Development Co.. N.L. | ... | ... | 848·50 | 889·46 | ... | ... | 15·58 | 7,224·50 | 6,818·28 | ... |
| Do. ... | (892) ... ... | Mariposa ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 91·00 | 68·69 | ... |
| Do. ... | 613 ... ... | Orchid ... ... ... ... | ... | ... | 365·50 | 482·69 | ... | ... | ... | 2,644·25 | 4,487·71 | ... |
| Do. ... | 849 ... ... | Princess Mary ... ... ... | ... | ... | 38·00 | 18·82 | ... | ... | ... | 303·00 | 348·01 | ... |
| Do. ... | 607 ... ... | Sweet William ... ... ... | ... | ... | 53·00 | 34·84 | ... | ... | 75·56 | 1,889·50 | 2,402·96 | ... |
| Do. ... | 607 ... ... | (Sweet William) ... ... ... | ... | ... | ... | ... | ... | ... | 2·16 | 4·85 | 81·59 | ... |
| Do. ... | 607, (608), (662) | (Sweet William Consolidated Mines, N.L.) | ... | ... | ... | ... | ... | ... | 7·68 | 907·46 | 1,564·84 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 146·70 | 168·98 | 6,243·00 | 6,394·05 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 189·50 | 122·58 | ... | 148·00 | 80·76 | 2,544·00 | 1,328·61 | ... |

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

**YALGOO GOLDFIELD**—*continued.*

| Mining Centre. | Number of Lease. | Registered Name of Company or Lease. | Total for 1920. | | | | | Total Production. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. | Alluvial | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. |
| | | | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. |
| Gullewa | | Voided leases | ... | ... | ... | ... | ... | ... | ... | 2,3056·50 | 15,128·2 | ... |
| Do. | | Sundry claims | ... | ... | ... | ... | ... | ... | ... | 629·50 | 531·62 | ... |
| Kirkalucka | | Sundry claims | ... | ... | ... | ... | ... | ... | ... | 8·80 | 4·01 | ... |
| Messenger's Patch | | Voided leases | ... | ... | ... | ... | ... | ... | 315·99 | 587·20 | 305·89 | ... |
| Do. | | Sundry claims | ... | ... | ... | ... | ... | 463·12 | 315·11 | 438·55 | 280·85 | ... |
| Mt. Farmer | | Voided leases | ... | ... | ... | ... | ... | ... | ... | 64·00 | 40·19 | ... |
| Do. | | Sundry claims | ... | ... | ... | ... | ... | ... | ... | 5·00 | 3·22 | ... |
| Mt. Gibson | 722, 723 | Golden Harp leases | ... | ... | ... | ... | ... | ... | 6·44 | 187·50 | 706·10 | ... |
| Do. | | Voided leases | ... | ... | ... | ... | ... | ... | ... | 147·00 | 70·90 | ... |
| Do. | | Sundry claims | ... | ... | ... | ... | ... | ... | ... | 76·00 | 40·84 | ... |
| Ninghan | | Voided leases | ... | ... | ... | ... | ... | ... | ... | 10·00 | 1·41 | ... |
| Do. | | Sundry claims | ... | ... | ... | ... | ... | ... | ... | 5·00 | 17·89 | ... |
| Noongal | | Voided leases | ... | ... | ... | ... | ... | ... | 15·86 | 3,086·95 | 1,847·66 | ... |
| Do. | | Sundry claims | ... | ... | ... | ... | ... | 11·55 | 64·97 | 286·50 | 198·64 | ... |
| Nyounda | 880 | Gnow's Nest | ... | ... | ... | ... | ... | ... | ... | 57·00 | 60·86 | ... |
| Do. | | Voided leases | ... | ... | ... | ... | ... | ... | 217·63 | 416·00 | 183·91 | ... |
| Do. | | Sundry claims | ... | ... | ... | ... | ... | ... | 4·28 | 18·00 | 21·67 | ... |
| Pinyalling | | Voided leases | ... | ... | ... | ... | ... | ... | 1·36 | 2,281·60 | 902·03 | ... |
| Do. | | Sundry claims | ... | ... | ... | ... | ... | ... | 2·59 | 160·50 | 132·57 | ... |
| Rothesay | | Voided leases | ... | ... | ... | ... | ... | ... | ... | 8,971·00 | 3,331·15 | ... |
| Wadgingarra | | Voided leases | ... | ... | ... | ... | ... | ... | ... | 541·61 | 600·91 | ... |
| Do. | | Sundry claims | ... | ... | ... | ... | ... | ... | ... | 71·50 | 38·21 | ... |
| Warriedar | 841 | Highland Chief | ... | ... | 92·50 | 52·45 | ... | ... | ... | 672·25 | 419·15 | ... |
| Do. | 890 | Iron Clads | ... | ... | 325·00 | 68·27 | ... | ... | ... | 585·50 | 163·78 | ... |
| Do. | 708 | Mug's Luck | ... | ... | 521·25 | 109·71 | ... | ... | ... | 6,823·00 | 2,093·58 | ... |
| Do. | 731 | Porcupine | ... | ... | 164·75 | 30·78 | ... | ... | ... | 231·00 | 43·51 | ... |
| Do. | | Voided leases | ... | ... | ... | ... | ... | ... | ... | 3,206·25 | 1,362·35 | 7·30 |
| Do. | | Sundry claims | ... | ... | 60·50 | 33·34 | ... | ... | 1·80 | 556·75 | 268·56 | ... |
| Yalgoo | | Voided leases | ... | ... | ... | ... | ... | ... | 3·23 | 6,314·50 | 9,965·18 | ... |
| Do. | | Sundry claims | ... | ... | 2·00 | 2·36 | ... | ... | 17·77 | 850·50 | 513·97 | ... |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Yuin ... ... | 712 (735) ... | Bullrush Gold Estates, N.L. ... .... | ... | ... | ... | ... | ... | ... | ... | 23,690·00 | 7,302·83 | 130·13 |
| Do. ... | ... | Voided leases ... .... ... | ... | ... | ... | ... | ... | ... | 127·12 | 31,381·50 | 14,957·04 | ... |
| Do. ... | ... | Sundry claims ... .... ... | ... | ... | ... | ... | ... | ... | 4·70 | 276·50 | 57·88 | ... |
| | *From Goldfield generally:* | | | | | | | | | | | |
| | Sundry Parcels treated at: | | | | | | | | | | | |
| | Field's Find Extended, Treatment Works ... | | ... | ... | ... | ... | ... | ... | ... | ... | 152·40 | ... |
| | Goodingnow (Payne's Find) State Battery ... | | ... | ... | ... | 71·32 | ... | ... | ... | 38·50 | 1,555·44 | ... |
| | Yuanmi G.Ms., Ltd., Works (Warriedar Options) | | ... | ... | ... | ... | ... | ... | ... | ... | 310·93 | 26·67 |
| | Various Works ... ... ... ... ... | | ... | ... | ... | ... | ... | 9·42 | ... | 664·00 | 1,332·45 | ... |
| | Reported by Banks and Gold Dealers ... ... ... | | ... | ... | ... | ... | ... | 666·73 | ... | ... | ... | ... |
| | **Total** ... .. .. | | ... | ... | **3,378·50** | **2,965·43** | ... | **1,451·29** | **1,816·53** | **180,961·39** | **121,273·09** | **167·40** |

## Mount Margaret Goldfield.

### MOUNT MORGANS DISTRICT.

NOTE.—Prior to 31st August, 1917, the mining centres of Eucalyptus, Linden, Mt. Celia, Mt. Howe, and Yundamindera were included in Yerilla District, and the output is recorded in that district. From 1st September, 1917, the output from these centres is shown in Mt. Morgans District, to which they were transferred.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Australia United ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 1,911·63 | 15,913·69 | 23,305·76 | 1·76 |
| Do. ... | ... | Sundry claims ... ... | ... | 43·25 | ... | ... | ... | ... | 580·98 | 799·25 | 2,072·62 | ... |
| Eucalpytus ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 11·00 | 5·40 | ... |
| Federation Well ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 1,248·50 | 1,782·71 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 108·07 | 64·68 | ... |
| Korong ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 17·95 | 72·23 | 2,722·00 | 3,473·45 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 34·97 | 279·28 | 232·89 | ... |
| Linden ... | 344F, [998R] ... | Bindah ... ... ... ... | ... | ... | 5,860·00 | 1,807·91 | ... | ... | ... | 6,962·00 | 2,101·50 | ... |
| Do. ... | 348F, [1035R] ... | Danube ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 78·25 | 81·99 | ... |
| Do. ... | 340F, [871R] ... | Democrat ... ... ... | ... | ... | 116·00 | 155·08 | ... | ... | ... | 598·50 | 822·43 | ... |
| Do. ... | 342F, [942R] ... | Great Junction ... ... ... | ... | ... | 84·00 | 112·41 | ... | ... | ... | 693·50 | 474·24 | ... |
| Do. ... | 375F ... ... | Olympic ... ... ... ... | ... | ... | 10·00 | 3·05 | ... | ... | ... | 10·00 | 3·05 | ... |
| Do. ... | 341F, [903R], 343F, [985R] | Torquay leases ... ... ... | ... | ... | 122·00 | 160·95 | ... | ... | ... | 3,940·77 | 1,651·06 | ·68 |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 183·50 | 196·69 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 156·50 | 95·99 | ... | ... | ... | 676·75 | 388·22 | ... |
| Mt. Margaret ... | (314F) ... ... | Mt. Morven ... ... ... | ... | ... | ... | ... | ... | ... | ... | 2,437·00 | 1,584·34 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ·37 | ... | 3,969·00 | 2,699·62 | 12·55 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 16·61 | 44·03 | 365·50 | 281·86 | ... |
| Mt. Morgans... | 6F ... ... | (Lily of the Valley South: Westralia Mt. Morgans G.M. Co., Ltd.) | ... | ... | ... | ... | ... | ... | ... | 1,587·50 | 808·18 | ... |
| Do. ... | 6F ... ... | (Lily of the Valley South: Westralia Mt. Morgans Syndicate, Ltd.) | ... | ... | ... | ... | ... | ... | ... | 3,002·00 | 1,022·90 | ... |
| Do. ... | 325F ... ... | Millionaire ... ... ... | ... | ... | ... | ... | ... | ... | ... | 206·50 | 728·27 | ... |
| Do. ... | 5F. (10F), (19F), (22F), (32F), (73F) | (Westralia Mt. Morgans G.M. Co.,, Ltd.) | ... | ... | ... | ... | ... | ... | ... | 575,148·00 | 294,758·28 | 5,552·63 |
| Do. ... | 7F, (20F), (21F) ... | (Westralia Mt. Morgans G.M. Co., Ltd.) | ... | ... | ... | ... | ... | ... | ... | 18,261·00 | 8,127·69 | ... |

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

## MT. MARGARET GOLDFIELD—*continued.*

### MT. MORGANS DISTRICT—continued.

| MINING CENTRE. | NUMBER OF LEASE. | REGISTERED NAME OF COMPANY OR LEASE. | TOTAL FOR 1920. | | | | | TOTAL PRODUCTION. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. |
| | | | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. |
| Mt Morgans | 5F, 6F, 7F, (10F), (19F), (20F), (22F), (32F), 301F | Westralia Mt. Morgans Mines, N.L. ... | ... | ... | 8,865·00 | 2,766·55 | ... | ... | ... | 123,762·00 | 30,875·27 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 76·56 | 34,127·75 | 20,210·28 | 77·86 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 6·61 | 22·66 | 1,362·10 | 1,619·49 | ... |
| Murrin Murrin | 372F ... ... | Murrin Queen G.M. ... ... | ... | ... | 69·00 | 20·20 | ... | ... | ... | 69·00 | 20·20 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 10·43 | 222·93 | 127,364·72 | 100,606·89 | 29·60 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 64·80 | 66·90 | ... | ... | 222·89 | 1,123·55 | 1,176·61 | ... |
| Redcastle ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 4·49 | 436·54 | 2,509·95 | 2,169·63 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 103·58 | 139·00 | 163·01 | ... |
| Yundamindera | 357F ... ... | Big Stone ... ... ... | ... | ... | ... | 1·63 | ... | ... | ... | 296·25 | 226·82 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 230·00 | 337·18 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 12·35 | 51·52 | ... | ... | ... | 504·60 | 335·76 | ... |
| | *From District generally :—* | | | | | | | | | | | |
| | Sundry Parcels treated at : | | | | | | | | | | | |
| | Battles Ville Battery ... ... ... ... | | ... | ... | ... | 274·12 | ... | ... | ... | 126·00 | 370·00 | 15·94 |
| | Hainault Sulphide Plant, Kalgoorlie ... ... | | ... | ... | ... | ... | ... | ... | ... | 127·21 | 83·91 | ... |
| | Mt. Morven Cyanide Works ... ... ... | | ... | ... | ... | ... | ... | ... | ... | ... | 129·48 | ... |
| | State Battery—Linden ... ... ... ... | | ... | ... | ... | ... | ... | ... | ... | 10·00 | 1,179·08 | ... |
| | Westralia Mt. Morgans Works ... ... ... | | ... | ... | ... | ... | ... | ... | ... | ... | 153·10 | ... |
| | Various Works ... ... ... ... ... | | ... | ... | ... | ... | ... | ... | ... | 788·50 | 3,010·07 | 84·03 |
| | Reported by Banks and Gold Dealers ... ... ... | | 1·31 | ... | ... | ... | ... | 1,681·48 | 32·47 | ... | ... | ... |
| | **Total ... ... ...** | | **1·31** | **43·25** | **15,359·65** | **5,516·31** | ... | **1,737·94** | **3,761·47** | **931,742·19** | **509,334·61** | **5,775·05** |

### MOUNT MALCOLM DISTRICT.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cardinia ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 1,568·29 | 1,628·24 | 3,550·42 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | 22·37 | 8·00 | 24·24 | ... | ... | 22·37 | 8·00 | 24·24 | ... |
| Diorite King... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 819·15 | 34,470·53 | 31,460·33 | 24·05 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 82·50 | 92·18 | ... | 1·40 | 131·02 | 2,537·80 | 3,025·03 | ... |
| Dodger's Well | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 57·90 | 1,299·30 | 1,927·94 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 3·37 | 786·25 | 644·95 | ... |
| Leonora ... | 1473C ... ... | (Auckland) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 226·50 | 82·22 | ... |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Do. ... | 1473c ... ... | Auckland: Chaffers G.M. Co. (1916), Ltd. | ... | ... | ... | ... | ... | ... | ... | 300·00 | 56·92 | ... |
| Do. ... | (1522c) ... ... | Champion Main Reef ... ... | ... | ... | 77·00 | 19·16 | ... | ... | ... | 77·00 | 19·16 | ... |
| Do. ... | 1504c ... ... | Dawn of Hope ... ... ... | ... | ... | 40·00 | 62·84 | ... | ... | ... | 119·50 | 282·10 | ... |
| Do. ... | 198c ... ... | (Eastern) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 302·00 | 321·72 | ... |
| Do. ... | 1530c ... ... | Leonora Gold Blocks ... ... | ... | ... | 54·50 | 76·34 | ... | ... | ... | 54·50 | 76·34 | ... |
| Do. ... | (1482c) ... ... | Leonora Gold Blocks ... ... | ... | ... | ... | 49·29 | ... | ... | 10·15 | 5,069·00 | 1,969·09 | ... |
| Do. ... | 1485c ... ... | Ping Pong ... ... ... | ... | ... | 40·00 | 57·62 | ... | ... | 79·35 | 499·50 | 531·91 | ... |
| Do. ... | (1486c) ... ... | Rajah ... ... ... ... | ... | ... | ... | ... | ... | ... | 96·45 | 150·25 | 614·71 | ... |
| Do. ... | 190c, 198c, 207c, 352c, 353c, 380c, 446c, 447c, 450c, 476c, 489c, 490c, 504c, 523c, 741c, 742c, 807c, 809c, 811c, 812c, 813c, 814c, 980c, 981c, 1082c, 1225c, 1226c, 1227c, 1228c, 1229c, 1230c, 1231c, 1232c, 1259c, 1291c, 1292c, 1341c, 1342c, 1343c, 1344c, 1345c, 1346c, 1347c | Sons of Gwalia, Ltd. ... ... ... | ... | ... | 120,780·00 | 41,870·00 | 3,769·64 | ... | ... | 2,675,758·50 | 1,245,094·81 | 74,835·36 |
| Do. ... | 198c, 1082c ... | (Sons of Gwalia South G.M. Co., N.L.) | ... | ... | ... | ... | ... | ... | ... | 631·00 | 903·61 | ... |
| Do. ... | 198c, 1082c, (1257c), (1258c), 1259c, (1284c), (1285c), (1300c), (1301c) | (Sons of Gwalia South G.M.'s, Ltd.) ... | ... | ... | ... | ... | ... | ... | ... | 98,239·00 | 51,593·99 | 8·66 |
| Do. ... | 198c, 1082c, 1259c, | (Sons of Gwalia South G.M.'s, Ltd.) ... | ... | ... | ... | ... | ... | ... | ... | 9,909·00 | 3,169·89 | ... |
| Do. ... | 263c ... ... | (Trump) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 562·50 | 2,393·40 | ... |
| Do. ... | 263c ... ... | Trump: Gwalia Central G.M.'s Ltd. | ... | ... | 380·00 | 129·89 | ... | ... | ... | 1,541·00 | 2,983·69 | ... |
| Do. ... | 263c, (774c), (793c) | (Trump leases) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 21,794·45 | 16,002·07 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 1,661·47 | 131,797·00 | 62,178·12 | 10·71 |
| Do. ... | ... | Sundry claims ... ... | ... | 19·53 | 43·00 | 98·67 | ... | 6·59 | 214·60 | 8,512·55 | 8,009·60 | ... |
| Malcolm ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 47·07 | 62,301·78 | 47,425·54 | ... |
| Do. ... | ... | Sundry claims ... ... | 5·75 | ... | ... | ... | ... | 5·75 | 8·88 | 2,981·90 | 2,085·85 | ... |
| Mertondale ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 88,663·00 | 60,840·00 | 1,497·58 |
| Do. ... | ... | Sundry claims ... ... | ... | 6·31 | ... | ... | ... | ... | 61·55 | 1,092·46 | 1,538·97 | ... |
| Mt. Clifford ... | 1329c ... ... | Victory No. 1 ... ... | ... | 41·20 | 185·00 | 87·77 | ... | ... | 249·29 | 870·46 | 7,136·44 | ... |
| Do. ... | ... | Voided leases ... ... | ... | ... | ... | ... | ... | ... | 1,364·45 | 3,274·00 | 7,060·57 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | 3·41 | 87·00 | 42·72 | ... | 12·89 | 256·77 | 836·50 | 1,310·38 | ... |
| Pig Well ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 13,575·32 | 14,673·13 | 63·68 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 34·61 | 2,598·40 | 1,102·78 | ... |
| Randwick ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 239·49 | 8,065·15 | 8,671·57 | ... |
| Do. ... | ... | Sundry claims ... ... ... | ... | 34·05 | ... | ... | ... | 66·57 | 145·23 | 1,282·14 | 944·20 | ... |
| Webster's Find | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 30·30 | ... | 21,760·00 | 13,970·17 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 36·37 | 15·73 | 1,397·80 | 939·58 | ... |

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

## MT. MARGARET GOLDFIELD—*continued.*

MOUNT MALCOLM DISTRICT—*continued.*

| Mining Centre. | Number of Lease. | Registered Name of Company or Lease. | Total for 1920. | | | | | Total Production. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. |
| | | | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. |
| Wilson's Creek | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 333·50 | 168·27 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 4·24 | 5·00 | 19·04 | ... |
| Wilson's Patch | 1496c ... ... | Great Western ... ... ... | ... | ... | ... | 5·69 | ... | ... | ... | 1,047·00 | 162·61 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 99·38 | 26,348·10 | 12,475·57 | 1·05 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 16·00 | 4·80 | ... | ... | 1·50 | 814·00 | 1,086·36 | ... |
| | *From District generally :—* | | | | | | | | | | | |
| | Sundry Parcels treated at : | | | | | | | | | | | |
| | Fremantle Trading Co.'s Works ... ... | | ... | ... | ... | ... | ... | ... | ... | ... | 1·42 | ... |
| | State Battery, Leonora ... ... ... ... | | ... | ... | ... | ... | ... | ... | ... | 95·50 | 10,370·34 | 98·14 |
| | Various Works ... ... ... ... ... | | ... | ... | ... | ... | ... | ... | ... | 371·50 | 7,149·72 | 20·12 |
| | Reported by Banks and Gold Dealers ... ... | | 47·00 | ... | ... | ... | ... | 2,455·48 | 131·00 | ... | ... | ... |
| | **Total ... ... ...** | | **52·75** | **126·87** | **121,793·00** | **42,621·21** | **3,769·64** | **2,615·35** | **7,328·31** | **3,233,986·88** | **1,636,048·77** | **76,559·35** |

## MOUNT MARGARET DISTRICT.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Burtville ... | 2095T ... ... | Bell ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 12·00 | 12·15 | ... |
| Do. ... | (2034T) ... ... | General Bridges ... ... ... | ... | ... | ... | ... | ... | ... | ... | 58·00 | 43·39 | ... |
| Do. ... | 2103T ... ... | Mac's Lucky Ridge ... ... | ... | ... | 97·50 | 17·68 | ... | ... | ... | 97·50 | 17·68 | ... |
| Do. ... | 1044T ... ... | Nil Desperandum ... ... | ... | ... | 323·00 | 1,259·94 | ... | ... | ... | 8,396·00 | 13,449·27 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 2·29 | 411·46 | 57,700·18 | 89,088·82 | 275·27 |
| Do. ... | ... | Sundry claims ... ... | ... | 67·35 | ... | ... | ... | ... | 122·10 | 3,171·40 | 2,862·31 | ... |
| Duketon ... | 2102T ... ... | Dolorite ... ... ... ... | ... | 52·15 | ... | ... | ... | ... | 167·17 | ... | ... | ... |
| Do. ... | 2114T ... ... | Hematite ... ... ... ... | ... | 252·74 | ... | ... | ... | ... | 252·74 | ... | ... | ... |
| Do. ... | 2029T ... ... | Limenite ... ... ... ... | ... | ... | ... | ... | ... | ... | 294·51 | ·42 | 26·44 | ... |
| Do. ... | (2110T) ... ... | Silver Wedding ... ... ... | ... | ... | ... | ... | ... | ... | 31·42 | ... | ... | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 3·54 | 2,400·33 | 31,442·50 | 22,096·60 | ... |
| Do. ... | ... | Sundry claims ... ... ... | ... | 46·43 | ... | ... | ... | ... | 65·43 | 238·50 | 366·37 | ... |
| Eagle's Nest... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 145·34 | 331·00 | 1,215·78 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 4·00 | 193·75 | 70·00 | 45·65 | ... |
| Erlistoun ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 11·66 | 27,012·07 | 18,461·35 | ... |
| Do. ... | ... | Sundry claim ... ... | ... | ... | ... | ... | ... | 1,179·43 | 116·81 | 2,120·98 | 1,837·10 | ... |
| Euro ... | 1984T ... ... | (Lone Star) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 2,840·00 | 714·96 | ... |
| Do. ... | 1984T, 1991T, 2009T, 2014T | Lone Star leases ... ... | ... | ... | ... | ... | ... | ... | ... | 4,752·00 | 910·81 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 65·14 | 83,964·25 | 35,957·12 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 46·52 | 259·50 | 116·69 | ... |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Laverton ... | 2058T ... ... | Augusta | ... | ... | ... | 17·00 | 6·26 | ... | ... | 3·95 | 248·51 | 167·20 | ... |
| Do. ... | 2083T ... ... | Beria Main Reef ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 627·00 | 90·80 | ... |
| Do. ... | 838T ... ... | (General Wabash) ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 100·00 | 288·72 | ... |
| Do. ... | 829T ... ... | (Ida H) ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 111·0 | 285·13 | ... |
| Do. ... | 829T, 838T, 846T, (1219T), (1310T), (1671T), (1894T) | Ida H. G.M. Co., Ltd. ... ... | ... | ... | 98·50 | 537·02 | ... | ... | ... | 229,995·96 | 170,654·90 | 4,674·69 | |
| Do. ... | 715T, 806T, 1206T, (1207T), (1483T), 1523T, 1524T, 1525T, 1542T, (1544T), (1548T) | (Kalgoorlie and Boulder Firewood Co., Ltd.) | ... | ... | ... | ... | ... | ... | ... | 71,802·00 | 25,003·11 | 3,364·01 | |
| Do. ... | 1897T ... ... | (Lady Harriet) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 991·00 | 98·94 | ... | |
| Do. ... | 715T, 806T, 1206T, (1207T), (1483T), 1523T, 1524T, 1525T, 1542T, (1544T), (1548T) | (Lancefield G.M. Co., Ltd.) ... ... | ... | ... | ... | ... | ... | ... | ... | 102,179·78 | 39,402·81 | ... | |
| Do. ... | 715T, 806T, 1206T, (1207T), (1483T), 1523T, 1524T, 1525T, 1542T, (1544T), (1548T) | (Lancefield G.M. Co., Ltd.) ... ... | ... | ... | ... | ... | ... | ... | ... | 153,829·00 | 58,842·47 | 5,824·39 | |
| Do. ... | 715T, 806T, 1206T, (1207T), (1483T), 1523T, 1524T, 1525T, 1542T, (1544T), (1548T) | (Lancefield G.M. Co., Ltd.) ... ... | ... | ... | ... | ... | ... | ... | ... | 260,749·00 | 103,535·54 | 21,612·29 | |
| Do. ... | 715T, 806T, 1206T, 1523T, 1524T, 1525T, 1542T, 2050T, 2051T | Lancefield Gold Mines, Ltd. ... ... | ... | ... | 78,235·00 | 25,565·79 | 3,345·36 | ... | ... | 350,975·00 | 124,170·85 | 20,046·83 | |
| Do. ... | 1897T, 1900T, (1948T), 1949T, (1950T), 1962T, (1974T), (1996T), (1997T) | Mary Mac G.M. Co., N.L. ... ... | ... | ... | 9,424·00 | 1,089·91 | ... | ... | ... | 42,107·00 | 8,555·41 | ... | |
| Do. ... | 1949T ... ... | (Pinnacles) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 96·00 | 36·51 | ... | |
| Do. ... | 2112T ... ... | South Lancefield ... ... | ... | ... | 22·00 | 5·93 | ... | ... | ... | 22·00 | 5·93 | ... | |
| Do. ... | (2108T) ... ... | White Horse ... ... ... | ... | ... | ... | ... | ... | ... | ... | 26·25 | 7·23 | ... | |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 181,425·45 | 79,934·55 | ... | |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 34·25 | 63·28 | ... | 17·66 | 2,020·16 | 4,069·45 | 3,711·75 | ... | |
| | | | | | | | | 195·37 | 1,275·84 | | | | |
| Mt. Barnicoat | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 652·00 | 359·12 | ... | |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 23·00 | 23·37 | ... | |
| Quartz Hill ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 10·00 | 3·86 | ... | |
| Red Hill ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 27·00 | 13·76 | ... | |
| | *From District generally :—* | | | | | | | | | | | | |
| | Sundry Parcels treated at : | | | | | | | | | | | | |
| | Brown Hill Consols Works, Kalgoorlie ... | | ... | ... | ... | ... | ... | ... | ... | ... | 13·70 | ... | |
| | Mulga Queen Works ... ... ... | | ... | ... | ... | ... | ... | ... | ... | 6·00 | 181·20 | ... | |
| | State Battery, Burtville ... ... ... | | ... | ... | ... | ... | ... | ... | ... | 62·00 | 6,548·22 | ... | |
| | State Battery, Laverton ... ... ... | | ... | ... | ... | ... | ... | ... | ... | 77·50 | 2,046·52 | ... | |
| | Various Works ... ... ... ... | | ... | ... | ... | ... | ... | ... | ... | 89·00 | 3,055·22 | ... | |
| | Reported by Banks and Gold Dealers ... ... | | 9·66 | ... | ... | ... | ... | 2,021·69 | ... | ... | ... | ... | |
| | **Total ... ... ...** | | **9·66** | **418·67** | **88,251·25** | **28,545·81** | **3,345·36** | **3,423·98** | **7,624·33** | **1,622,767·20** | **814,259·31** | **55,797·48** | |

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

## North Coolgardie Goldfield.

MENZIES DISTRICT.

| Mining Centre. | Number of Lease. | Registered Name of Company or Lease. | Total for 1920. | | | | | Total Production. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. |
| | | | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. |
| Comet Vale ... | 5217z ... ... | (Gladsome) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 10,879·50 | 8,678·16 | 95·29 |
| Do. ... | 5217z, 5333z, (5380z) | Gladsome leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 64,870·00 | 47,739·62 | 1,410·36 |
| Do. ... | 5300z ... ... | Happy Jack: Forwood, Down, & Co., Ltd. | ... | ... | ... | ... | ... | ... | ... | 136·00 | 53·00 | ... |
| Do. ... | 5300z ... ... | (Happy Jack) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 1,363·50 | 776·10 | ... |
| Do. ... | 5300z, (5325z) | (Happy Jack leases) ... ... | ... | ... | ... | ... | ... | ... | ... | 7,691·50 | 3,922·48 | ... |
| Do. ... | (5325z) ... ... | (Iron King) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 41·50 | 20·62 | ... |
| Do. ... | 5410z ... ... | Lake View ... ... ... | ... | ... | 67·25 | 17·72 | ... | ... | 6·66 | 325·96 | 108·63 | ... |
| Do. ... | 5300z, (5325z), (5451z) | (Princess Royal G.M. Co., N.L.) ... | ... | ... | ... | ... | ... | ... | ... | 1,110·00 | 427·34 | ... |
| Do. ... | (5312z) ... ... | (Sand King) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 35·50 | 30·33 | ... |
| Do. ... | (5211z) ... ... | (Sand Queen) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 3,436·75 | 3,639·12 | 2·00 |
| Do. ... | (5208z), (5211z), (5224z), (5320z) | (Sand Queen G.Ms., Ltd.) ... ... | ... | ... | ... | ... | ... | ... | ... | 6,803·50 | 2,949·83 | ... |
| Do. ... | (5211z), (5224z), (5312z), (5320z) | Sand Queen G.Ms., Ltd. ... ... | ... | ... | ... | 1,012·71 | 176·52 | ... | ... | 116,425·22 | 101,675·17 | 3,835·28 |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 409·70 | 10,067·60 | 5,528·34 | 2·00 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 31·91 | 632·75 | 435·72 | ... |
| Goongarrie ... | (5466z) ... ... | Little Grace ... ... ... | ... | ... | ... | ... | ... | ... | 372·13 | 18·50 | 463·85 | ... |
| Do. ... | (5414z) ... ... | (New Boddington) ... ... | ... | ... | ... | ... | ... | ... | 191·83 | 412·70 | 1,785·68 | ... |
| Do. ... | ... | Voided leases ... ... | ... | ... | ... | ... | ... | ·94 | 463·55 | 26,767·09 | 15,179·31 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | 20·66 | 131·35 | 145·64 | ... | 33·72 | 502·15 | 1,106·15 | 1,226·58 | ... |
| Menzies ... | 5440z ... ... | Crusoe North ... ... ... | ... | ... | 161·00 | 162·27 | ... | ... | ... | 1,356·00 | 1,228·27 | ... |
| Do. ... | 5423z ... ... | Lady Shenton ... ... ... | ... | ... | 97·75 | 145·34 | ... | ... | ... | 4,807·25 | 3,656·31 | ... |
| Do. ... | 4931z, 4934z, 4935z, 4936z, 5074z, 5075z, 5260z, 5261z, 5315z | Menzies Consolidated G.Ms., Ltd. ... | ... | ... | 18,352·00 | 8,325·15 | ... | ... | ... | 453,721·00 | 239,777·86 | 78·67 |
| Do. ... | (2832z), (2844z), (3100z), (3138z) (4966z), (5392z) | Menzies Mining and Exploration Corporation, Ltd. | ... | ... | ... | ... | ... | ... | ... | 26,410·00 | 29,963·12 | ... |
| Do. ... | (5392z) ... ... | (Re ival) ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 22·50 | 5·90 | ... |
| Do. ... | 2823z ... ... | Robinson Crusoe... ... ... | ... | ... | 107·50 | 56·19 | ... | ... | 13·24 | 5,073·75 | 2,781·04 | ... |
| Do. ... | 2823z ... ... | (Robinson Crusoe: Crusoe Gold Claims, Ltd.) | ... | ... | ... | ... | ... | ... | ... | 33,135·00 | 32,978·74 | 1,038·47 |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 45·42 | 1,035·80 | 307,281·71 | 356,961·65 | 10,224·59 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 677·25 | 287·87 | 8·00 | 6·69 | 359·68 | 17,716·00 | 12,939·43 | 776·49 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mt. Ida ... | 5467z ... ... | Forest Belle ... ... ... | ... | ... | 484·00 | 266·17 | ... | ... | ... | 484·00 | 266·17 | ... |
| Do. ... | 5471z ... ... | Lucknow ... ... ... ... | ... | ... | 71·00 | 50·83 | ... | ... | ... | 138·00 | 170·95 | ... |
| Do. ... | (5290z) ... ... | (Unexpected South) ... ... | ... | ... | ... | ... | ... | ... | ... | 1,136·00 | 714·65 | 8·25 |
| Do. ... | (5290z, (5329z), (5381z) | (Unexpected South leases) ... | ... | ... | ... | ... | ... | ... | ... | 4,524·00 | 8,179·29 | 35·64 |
| Do. ... | (5290z), (5451z) | Unexpected South leases ... | ... | ... | ... | ... | ... | ... | ... | 23·00 | 7·4 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 77·07 | 50,266·37 | 58,044·67 | 62·74 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 62·00 | 48·56 | ... | 31·22 | 9·57 | 4,842·00 | 2,771·08 | ... |
| | *From District generally :—* | | | | | | | | | | | |
| | Sundry Parcels treated at : | | | | | | | | | | | |
| | Balkis Battery ... ... ... ... ... | | ... | ... | 15·00 | 189·54 | ... | ... | ... | 65·75 | 4,648 28 | ... |
| | Crusoe Wedderburn Cyanide Works ... ... | | ... | ... | ... | ... | ... | ... | ... | ... | 1,497·89 | ... |
| | Fremantle Trading Co., Ltd. Works ... ... | | ... | ... | ... | ... | ... | ... | ... | ... | 212·98 | ... |
| | Gidney's Cyanide Works ... ... ... ... | | ... | ... | ... | 494·53 | ... | ... | ... | ... | 663·58 | ... |
| | Lady Harriet Battery ... ... ... ... | | ... | ... | 20·00 | 245·32 | 30·00 | ... | ... | 264·00 | 3,099·98 | 30·00 |
| | Menzies Mining and Exploration Corporation, Ltd, Works | | ... | ... | ... | ... | ... | ... | ... | 639·50 | 732·04 | ... |
| | Mt. Ida Meteor Works ... ... ... ... | | ... | ... | ... | ... | ... | ... | ... | ... | 1,916·49 | ... |
| | State Battery—Mt. Ida ... ... ... ... | | ... | ... | ... | ... | ... | ... | ... | 1,842·25 | 4,484·34 | ... |
| | Various Works ... ... ... ... ... | | ... | ... | ... | ... | ... | ... | ... | 1,807·05 | 21,725·38 | 1,039·43 |
| | Reported by Banks and Gold Dealers ... ... | | ... | | ... | ... | ... | 955·48 | 195·48 | ... | ... | ... |
| | **Total ... ... ...** | | ... | **20·66** | **20,246·10** | **11,447·84** | **214·52** | **1,073·47** | **3,668·77** | **1,167,678·85** | **984,067·21** | **18,639·21** |

## ULARRING DISTRICT.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Davyhurst ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 2·93 | 138·99 | 155,644·73 | 123,063·43 | 5,403·14 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 30·12 | 5,891·85 | 3,096·68 | ... |
| Diemel's Find | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 7·37 | 102·50 | 119·13 | ... |
| Mulline ... | 139u, (235u), (555u), (670u), (671u), (679u), (732u), (862u) | (Lady Gladys G.M. Co., N.L.) ... | ... | ... | ... | ... | ... | ... | ... | 16,871·50 | 17,777·42 | ... |
| Do. ... | 139u, (235u), (555u, (670u) | (Lady Gladys G.M. Co. N.L.) ... | ... | ... | ... | ... | ... | ... | ... | 1,220·50 | 513·52 | ... |
| Do. ... | 139u, (235u), (555u) | (Lady Gladys leases) ... ... | ... | ... | ... | ... | ... | ... | 170·89 | 7,741·00 | 15,025·05 | ... |
| Do. ... | 139u, (235u), (555u), (670u) | Lady Gladys leases ... ... | ... | ... | ... | ... | ... | ... | ... | 997·50 | 482·14 | ... |
| Do. ... | 324u, 600u, 730u, 969u, 970u, 974u, 975u, 982u, 983u | Riverina South G.M. Co., N.L. ... | ... | ... | ... | ... | ... | ... | ... | 5,017,25 | 5,055·02 | 227·04 |
| Do. ... | 324u, 600u, 730u | (Riverina South leases) ... | ... | ... | ... | ... | ... | ... | 43·87 | 18,480·50 | 13,442·65 | ... |
| Do. ... | 763u ... ... | Young Australian ... ... | ... | ... | ... | ... | ... | ... | ... | 531·25 | 723·72 | ... |
| Do. ... | 763u ... ... | (Young Australian) ... ... | ... | ... | ... | ... | ... | ... | ... | 1,295·00 | 3,609·26 | ... |
| Do. ... | 7638u, (938u), (939u) | (Young Australian leases) ... | ... | ... | ... | ... | ... | ... | ... | 2,672·25 | 5,763·88 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 59·33 | 39,761·72 | 33,971·35 | 2·71 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 35·53 | 5,794·76 | 4,588·63 | ·69 |
| Mulwarrie ... | 992u ... ... | Ularing Westralia ... ... | ... | ... | 8·11 | 44·07 | 12·10 | ... | ... | 8·11 | 44·07 | 12·10 |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 56·84 | 18,397·64 | 25 527·59 | 26·37 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 6·31 | 13·46 | ... | ... | 21·45 | 2,088·67 | 1,869·01 | ... |

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

## NORTH COOLGARDIE GOLDFIELD—*continued.*

### ULARRING DISTRICT—*continued.*

| Mining Centre. | Number of Lease. | Registered Name of Company or Lease. | Total for 1920. | | | | | Total Production. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. |
| | | | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. |
| Ularring ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 563·34 | 9,429·60 | 13,647·97 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 143·00 | 113·15 | ... |
| | | *From District generally :—* | | | | | | | | | | |
| | | Sundry Parcels treated at : | | | | | | | | | | |
| | | Expansion Battery ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 96·00 | 188·65 | ... |
| | | Hannan's Centra Battery—Kalgoorlie ... ... | ... | ... | ... | ... | ... | ... | ... | 18·40 | 4·66 | ... |
| | | State Battery—Mulline ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 513·50 | 12,992·19 | ... |
| | | State Battery—Mulwarrie ... ... ... | ... | ... | ... | ... | ... | ... | ... | 595·20 | 4,762·31 | ... |
| | | Various Works ... ... ... ... ... | ... | ... | ... | ... | ... | ... | 15·82 | 90·25 | 465·72 | ... |
| | | Reported by Banks and Gold Dealers ... ... | ... | ... | ... | ... | ... | 18·53 | ·77 | ... | ... | ... |
| | | **Total ... ... ...** | ... | ... | **14·42** | **57·53** | **12·10** | **21·46** | **1,144·32** | **293,403·18** | **286,846·20** | **5,672·05** |

### NIAGARA DISTRICT.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Desdemona ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 5·73 | 9,585·25 | 7,471·39 | 12·04 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 8·99 | 1,331·70 | 634·19 | ... |
| Kookynie ... | (756G) ... ... | Cosmopolitan No. 1 ... ... | ... | ... | ... | ... | ... | ... | ... | 96·50 | 60·85 | ... |
| Do. ... | (756G) ... ... | (Cosmopolitan No. 1 : Cosmopolitan Proprietary, Ltd.) | ... | ... | ... | ... | ... | ... | ... | 578·00 | 793·00 | ... |
| Do. ... | (756G) ... ... | (Cosmopolitan No. 1 : Western Machinery Co., Ltd.) | ... | ... | ... | ... | ... | ... | ... | 449·84 | 377·71 | ... |
| Do. ... | 757G ... ... | (Cosmopolitan No. 2 : Cosmopolitan Proprietary, Ltd.) | ... | ... | ... | ... | ... | ... | ... | 710·00 | 909·66 | ... |
| Do. ... | 757G ... ... | Cosmopolitan No. 2 : Western Machinery Co., Ltd. | ... | ... | 150·00 | 160·98 | ... | ... | ... | 3,231·00 | 3,757·66 | ... |
| Do. ... | 769G ... ... | (Two Ds.) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 100·00 | 14·01 | ... |
| Do. ... | 769G, 770G, 771G | Two Ds leases ... ... ... | ... | ... | ... | 13·55 | ... | ... | ... | 810·00 | 494·37 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 257·33 | 728,797·47 | 382,319·79 | 5,375·97 |
| Do. ... | ... | Sundry claims ... ... | ... | 1·83 | 46·50 | 46·90 | ... | 30·59 | 91·97 | 4,726·85 | 4,341·24 | ... |
| Niagara ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 104·54 | 84,472·50 | 51,887·97 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 13·27 | 70·23 | 9,818·79 | 6,039·66 | ... |
| Tampa ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 15·66 | 49,271·87 | 22,173·80 | 174·24 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 5·07 | 69·44 | 3,202·00 | 1,888·09 | ... |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *From District generally :—* | | | | | | | | | | | | | |
| Sundry Parcels treated at : | | | | | | | | | | | | | |
| Grafter Battery ... ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 98·00 | 448·91 | ... |
| Hainault Sulphide Plant, Kalgoorlie ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 9·03 | ... |
| Lubra Queen G.M. Co., N.L., Works ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 153·47 | ... |
| State Battery—Niagara ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 622·50 | 8,875·11 | ... |
| Various Works ... ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 451·00 | 6,356·43 | 41·17 |
| Reported by Banks and Gold Dealers ... ... ... | ... | ... | ... | ... | ... | ... | 1,426·26 | 787·38 | ... | ... | ... | ... |
| **Total ... ... ...** | ... | **1·83** | **196·50** | **221·43** | ... | **1,475·19** | **1,411·27** | **898,353·27** | **499,006·34** | **5,603·42** |

## YERILLA DISTRICT.

NOTE.—Prior to 31st August, 1917, the mining centres of Eucalyptus, Linden, Mt. Celia, Mt. Howe, and Yundamindera were included in Yerilla District, and the output is recorded in that District. From 1st September, 1917, the output from these centres is shown in Mt. Morgans District, to which they were transferred.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Edjudina ... | (1054R) ... ... | Missing Link ... ... ... | ... | ... | 39·50 | 26·81 | ... | ... | ... | 84·00 | 53·46 | ... |
| Do. ... | 1011R ... ... | Neta ... ... ... ... | ... | ... | 22·00 | 14·54 | ... | ... | ... | 145·75 | 96·82 | ... |
| Do. ... | (1018R) ... ... | Neta Extended ... ... ... | ... | ... | ... | ... | ... | ... | ... | 634·58 | 647·78 | ... |
| Do. ... | (1010R), 1011R ... | (Neta leases) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 407·00 | 340·01 | ... |
| Do. ... | 1015R ... ... | Senate ... ... ... ... | ... | ... | 143·00 | 102·84 | ... | ... | 4·38 | 1,421·50 | 1,633·94 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 14·06 | 29,649·12 | 39,077·22 | 37·79 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 9·00 | 12·93 | ... | ... | 21·26 | 3,107·50 | 2,599·10 | ... |
| Eucalyptus ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 2,864·77 | 1,351·35 | 3,020·68 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 367·50 | 362·50 | 381·82 | ... |
| Linden ... | 998R, [344F] ... | Bindah ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 1,462·50 | 531·95 | ... |
| Do. ... | 871R, [340F] ... | Democrat ... ... ... | ... | ... | ... | ... | ... | ... | 9·01 | 2,245·25 | 5,026·30 | ... |
| Do. ... | 1024R, [346F] ... | Great Carbine ... ... ... | ... | ... | ... | ... | ... | ... | ... | 67·75 | 20·30 | ... |
| Do. ... | 942R, [342E] ... | Great Junction ... ... ... | ... | ... | ... | ... | ... | ... | 6·11 | 1,086·75 | 1,030·90 | ... |
| Do. ... | (1005R), ([345F]) | Olympic ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 442·50 | 655·11 | ... |
| Do. ... | 903R, [341F], 985R, [343F] | Torquay leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 325·68 | 107·45 | ... |
| Do. ... | 903R, [341F], (904R), 985R, [343F], (992R) | (Westralia United Goldfields, Ltd.) ... | ... | ... | ... | ... | ... | ... | ... | 1,995·00 | 1,452·42 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 7·53 | 538·04 | 11,942·60 | 14,854·48 | .. |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 77·81 | 35·11 | 6,493·25 | 4,798·42 | .. |
| Mt. Celia ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 14·00 | 5·39 | ... |
| Mt. Howe ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 5·00 | 11·13 | ... |
| Mt. Remarkable | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 17·74 | 528·72 | 415·09 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 4·00 | 1·32 | ... |
| Pingin ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 46·99 | 14,637·80 | 10,306·68 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 99·36 | 3,422·35 | 2,297·51 | ... |
| Yarri ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 6·30 | 87·08 | 36,822·75 | 19,124·10 | 2·00 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 197·00 | 117·77 | ... | ... | 5·31 | 5,615·60 | 2,983·21 | ... |
| Yerilla ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 3,089·51 | 15,619·21 | 12,313·06 | 13·93 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 19·30 | 15·88 | 2,401·00 | 1,338·07 | ... |
| Yilgangie ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 218·75 | 295·45 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 121·67 | 29·83 | 25·50 | 46·17 | ... |

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

**NORTH COOLGARDIE GOLDFIELD**—*continued.*

YERILLA DISTRICT—continued.

| Mining Centre. | Number of Lease. | Registered Name of Company or Lease. | Total for 1920. | | | | | Total Production. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. |
| | | | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. |
| Yundamindera | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 80·47 | 69,067·85 | 46,004·87 | 5·82 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 85·22 | 3,151·25 | 2,740·75 | ... |
| | *From District generally:—* | | | | | | | | | | | |
| | Sundry Parcels treated at: | | | | | | | | | | | |
| | Battles Ville Battery ... ... ... ... | | ... | ... | ... | ... | ... | ... | ... | ... | 621·83 | ... |
| | Fremantle Trading Co., Ltd., Works ... | | ... | ... | ... | ... | ... | ... | ... | ... | 4·92 | ... |
| | Neta Battery ... ... ... ... ... | | ... | ... | ... | ... | ... | ... | ... | ... | 325·69 | ... |
| | State Battery—Linden ... ... ... ... | | ... | ... | ... | ... | ... | ... | ... | 72·00 | 4,030·90 | ... |
| | State Battery—Pingin ... ... ... ... | | ... | ... | ... | ... | ... | ... | ... | 125·50 | 1,278·16 | ... |
| | State Battery—Yarri ... ... ... ... | | ... | ... | ... | ... | ... | ... | ... | 231·50 | 4,412·89 | 3·50 |
| | State Battery—Yerilla ... ... ... ... | | ... | ... | ... | ... | ... | 2·17 | ... | 72·00 | 1,257·22 | ... |
| | Various Works ... ... ... ... ... | | ... | ... | ... | ... | ... | ... | ... | 660·85 | 3,999·04 | ... |
| | Reported by Banks and Gold Dealers ... ... ... | | ... | ... | ... | ... | ... | 1,011·56 | 154·74 | ... | ... | ... |
| | **Total ... ... ...** | | ... | ... | **410·50** | **274·89** | ... | **1,246·34** | **7,572·37** | **215,920·21** | **190,141·61** | **63·04** |

## Broad Arrow Goldfield.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bardoc ... | 1807w ... ... | Birthday ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 8·34 | 8·32 | ... |
| Do. ... | 1886w ... ... | Delta ... ... ... ... | ... | ... | 108·00 | 207·83 | ... | ... | ... | 108·00 | 207·83 | ... |
| Do. ... | 1833w ... ... | Zoroastrian ... ... ... | ... | ... | ... | ... | ... | ... | 23·25 | 6·45 | 80·41 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 1,863·68 | 73,120·21 | 51,607·49 | 203·60 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 64·67 | 24·34 | ... | 43·02 | 559·27 | 3,104·90 | 2,703·73 | ... |
| Black Flag ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 27·81 | 373·99 | 40,332·13 | 24,451·48 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 18·90 | 43·64 | ... | 686·51 | 171·64 | 2,132·38 | 2,042·68 | ... |
| Broad Arrow | (1825w) ... ... | Credo: Credo Gold Mining Syndicate, No Liability | ... | ... | ... | ... | ... | ... | ... | 18·92 | 3·67 | ... |
| Do. ... | 1771w ... ... | North Duke ... ... ... | ... | 281·73 | 43·00 | 114·48 | ... | ... | 560·84 | 127·30 | 488·06 | ... |
| Do. ... | 1799w ... ... | Oversight ... ... ... | ... | ... | 283·00 | 1,054·48 | ... | ... | 1,214·31 | 421·00 | 1,500·93 | ... |
| Do. ... | 1735w ... ... | Tara ... ... ... ... | ... | ... | ... | ... | ... | ... | 3,164·85 | 349·90 | 1,378·68 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 54·85 | 2,313·89 | 117,735·69 | 97,599·82 | 15·85 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 150·65 | 82·97 | ... | 969·86 | 1,219·84 | 8,622·20 | 6,204·66 | ... |
| Carnage ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 138·00 | 251·97 | ... |
| Paddington ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 5,557·72 | 257·75 | 175,109·58 | 82,198·30 | 18·96 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 1,714·16 | 2·13 | 10,202·98 | 6,580·14 | ... |
| Siberia ... | 1399w, 1424w, 1429w, 1442w, (1655w) | Associated Northern Blocks (W.A.), Ltd. | ... | ... | 9,696·00 | 5,174·11 | ... | ... | ... | 236,590·59 | 85,612·98 | 1,664·70 |
| Do. ... | (1774w) ... ... | Christmas Lone Hand ... ... | ... | ... | ... | ... | ... | ... | ... | 39·00 | 187·70 | ... |
| Do. ... | 1371w ... ... | Gimblet South ... ... ... | ... | ... | ... | ... | ... | ... | ... | 71,592·50 | 12,016·48 | ... |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Do. | 1399w | (Gimblet South Extended) | ... | ... | ... | ... | ... | ... | ... | ... | 525·00 | 835·44 | ... |
| Do. | 1399w, 1424w, 1429w, 1442w | (Gimblet South Extended leases) | ... | ... | ... | ... | ... | ... | ... | ... | 215·00 | 39·98 | ... |
| Do. | 1338w | (Gimblet West) | ... | ... | ... | ... | ... | ... | ... | ... | 680·50 | 482·83 | ... |
| Do. | 1289w | Lady Evelyn | ... | ... | 11·00 | 5·05 | ... | ... | ... | ... | 11·00 | 5·05 | ... |
| Do. | 1289w, (1308w) | (Lady Evelyn leases) | ... | ... | ... | ... | ... | ... | 25·26 | 5,376·25 | 5,267·70 | ... |
| Do. | (1736w) | Pole | ... | ... | ... | ... | ... | ... | ... | 60·00 | 15·62 | ... |
| Do. | (1823w) | Reality | ... | ... | ... | ... | ... | ... | ... | 111·00 | 712·85 | ... |
| Do. | 1375w | (Siberia Consols) | ... | ... | ... | ... | ... | ... | 41·58 | 1,013·50 | 3,136·03 | ... |
| Do. | 1375w | Siberia Consols | ... | ... | ... | ... | ... | ... | ... | 581·25 | 1,236·74 | ... |
| Siberia | 1375w, (1610w), (1720w) | (Siberia Consols G.M. Co., N.L.) | ... | ... | ... | ... | ... | ... | 39·23 | 352·50 | 598·52 | ... |
| Do. | 1336w | (Slippery Gimblet) | ... | ... | ... | ... | ... | ... | ... | 26,110·50 | 8,217·79 | ... |
| Do. | 1336w, 1338w, (1419w) | Slippery Gimblet leases: Associated Northern Blocks (W.A.), Ltd. | ... | ... | ... | ... | ... | ... | ... | 4,697·00 | 1,774·52 | ... |
| Do. | ... | Voided leases | ... | ... | ... | ... | ... | ... | 789·17 | 23,606·92 | 13,012·03 | ... |
| Do. | ... | Sundry claims | ... | ... | 2,270·60 | 362·05 | ... | 126·49 | 537·09 | 9,899·49 | 7,288·20 | ... |
| Smithfield | ... | Voided leases | ... | ... | ... | ... | ... | ... | ... | 1,027·00 | 200·90 | ... |
| Do. | ... | Sundry claims | ... | ... | ... | ... | ... | ... | 23·79 | 49·50 | 149·47 | ... |
| | | *From Goldfield generally:—* | | | | | | | | | | |
| | | Sundry Parcels treated at: | | | | | | | | | | |
| | | Brown Hill Consols Works—Kalgoorlie | ... | ... | ... | ... | ... | ... | ... | 38·99 | 15·32 | ... |
| | | Fremantle Trading Co., Ltd., Works | ... | ... | ... | ... | ... | ... | ... | ... | 80·10 | ... |
| | | Hannan's Central Works—Kalgoorlie | ... | ... | ... | ... | ... | ... | ... | 8·70 | 15·47 | ... |
| | | Hainault Sulphide Plant—Kalgoorlie | ... | ... | ... | ... | ... | ... | ... | ... | 9·57 | ... |
| | | Pole Works | ... | ... | ... | ... | ... | ... | ... | ... | 356·07 | ... |
| | | Regan's Carnage Battery | ... | ... | ... | ... | ... | ... | ... | 27·00 | 598·81 | ... |
| | | State Battery—Ora Banda | ... | ... | ... | 85·73 | ... | ... | ... | 47·00 | 1,610·79 | ... |
| | | State Battery—Siberia | ... | ... | ... | ... | ... | ... | ... | 40·00 | 746·57 | ... |
| | | Zoroastrian Works | ... | ... | ... | ... | ... | ... | ... | 116·50 | 1,082·23 | ... |
| | | Various Works | ... | ... | ... | ... | ... | 2,271·17 | ... | 16,622·68 | 31,760·91 | 278·85 |
| | | Cement from Alluvial Claims at Paddington | ... | ... | ... | ... | ... | ... | ... | 50·94 | 8·72 | ... |
| | | Cement from Alluvial Claims at Siberia | ... | ... | 48·00 | 8·82 | ... | ... | ... | 1,100·30 | 218·13 | ... |
| | | Reported by Banks and Gold Dealers | ... | ... | ... | ... | ... | 7,793·93 | ... | ... | ... | ... |
| | | **Total** | ... | **281·73** | **12,693·82** | **7,163·50** | ... | **19,245·52** | **13,181·56** | **832,128·79** | **454,601·69** | **2,181·96** |

## North-East Coolgardie Goldfield.

KANOWNA DISTRICT.

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Black Swan | ... | Voided leases | ... | ... | ... | ... | ... | ... | ... | ... | 160·00 | 141·76 | ... |
| Gambier | ... | Voided leases | ... | ... | ... | ... | ... | ... | ... | 38·73 | 12,729·00 | 6,638·30 | ·07 |
| Do. | ... | Sundry claims | ... | ... | ... | ... | ... | ... | 24·70 | 245·94 | 858·75 | 750·42 | ... |
| Gindalbie | ... | (1394x) | ... | ... | Sunbeam East | ... | ... | ... | ... | 8·20 | 3·43 | ... | ... | 8·20 | 3·43 | ... |
| Do. | ... | Voided leases | ... | ... | ... | ... | ... | ... | ... | 19·94 | 43,605·08 | 39,435·32 | 38·31 |
| Do. | ... | Sundry claims | ... | ... | 18·52 | 12·16 | ... | ... | ... | 674·82 | 1,036·27 | 1,219·96 | ... |
| Gordon | ... | 1835x | ... | ... | Pride of the Morning | ... | ... | ... | ... | 1,335·00 | 401·97 | ... | ... | 3,505·00 | 635·66 | ... |
| Do. | ... | Voided leases | ... | ... | ... | ... | ... | ... | ... | 268·25 | 40,607·30 | 11,425·99 | ... |
| Do. | ... | Sundry claims | ... | ... | ... | ... | ... | ... | ... | 54·65 | 630·50 | 577·80 | ... |
| Kanowna | ... | 1389x | ... | ... | Golden Valley | ... | ... | ... | ... | 532·00 | 188·64 | ... | ... | 1,294·00 | 398·09 | ... |
| Do. | ... | 1019x | ... | ... | Kanowna | ... | ... | ... | ... | 356·00 | 472·03 | ... | 5·84 | 691·94 | 9,588·50 | 14,544·42 | ... |
| Do. | ... | 1299x | ... | ... | (Kanowna Consol) | ... | ... | ... | ... | ... | ... | ... | ... | ... | 713·50 | 129·30 | ... |
| Do. | ... | 1299x | ... | ... | (Kanowna Consol) | ... | ... | ... | ... | ... | ... | ... | ... | ... | 339·00 | 207·36 | ... |

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

**NORTH-EAST COOLGARDIE GOLDFIELD**—*continued.*

KANOWNA DISTRICT—*continued.*

| Mining Centre. | Number of Lease. | Registered Name of Company or Lease. | Total for 1920. | | | | | Total Production. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver |
| | | | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. |
| Kanowna ... | 1299x, (1300x) ... | (Kanowna Consol leases) ... | ... | ... | ... | ... | ... | ... | 6·76 | 312·00 | 261·31 | ... |
| Do. ... | 1398x ... ... | Kanowna Consols Junction ... | ... | ... | 74·34 | 27·04 | ... | ... | ... | 74·34 | 27·04 | ... |
| Do. ... | 1299x, 1379x ... | Kanowna Consol leases ... | ... | ... | ... | ... | ... | ... | ... | 1,247·00 | 933·58 | ... |
| Do. ... | 1401x ... ... | Kanowna East ... ... ... | ... | ... | 31·00 | 11·91 | ... | ... | ... | 31·00 | 11·91 | ... |
| Do. ... | 18x, (19x) ... | (Lily Australis G.M.'s, Ltd.) ... | ... | ... | ... | ... | ... | ... | ... | 197·00 | 119·18 | ... |
| Do. ... | (3x), (14x), 15x, 18x, (19x), (60x), (81x), (938x), (974x), (1035x), (1103x), (1263x) | (North White Feather G.M.'s, Ltd.) | ... | ... | ... | ... | ... | ... | ... | 147,974·75 | 74,343·01 | 159·19 |
| Do. ... | (14x), 15x, 18x, (19x), (974x), (1035x), (1103x), (1263x), (1276x), (1278x) ... | (North White Feather G.M.'s, Ltd.)... | ... | ... | ... | ... | ... | ... | ... | 37,768·50 | 10,594·79 | ... |
| Do. ... | 12x, 13x, (14x), 15x, 18x, (19x), (72x), (855x), (974x), (1035x), (1103x), (1263x), (1278x) | North White Feather G.M.'s, Ltd. ... | ... | ... | ... | ... | ... | ... | ... | 54,316·27 | 24,349·63 | ... |
| Do. ... | 12x, 13x, (14x), 15x, (855x), (1001x), (1012x), (1103x), (1107x), (1108x), (1109x) | (White Feather Main Reefs, Ltd.) ... | ... | ... | ... | ... | ... | ... | ... | 123,327·56 | 82,334·52 | 1,675·68 |
| Do. ... | (9x), (10x), 12x, 13x, (72x), (83x), (201x), (855x), (1001x), (1012x), (1108x), (1249x) | (White Feather Main Reefs (1906), Ltd.) | ... | ... | ... | ... | ... | ... | 20·45 | 24,393·00 | 9,138·31 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 3·59 | 3,674·54 | 246,178·46 | 137,452·71 | 647·37 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 39·55 | 28·68 | ... | 88·95 | 1,364·75 | 13,916·46 | 7,001·32 | 1·50 |
| Mulgarrie ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 1,216·63 | 5,843·26 | 3,567·48 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 338·00 | 96·48 | ... | ... | 13·29 | 1,184·00 | 596·64 | ... |
| Six-Mile ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 1,595·63 | 559·00 | 767·72 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 31·44 | 141·50 | 103·37 | ... |
| | | *From District generally :—* | | | | | | | | | | |
| | | Sundry Parcels treated at : | | | | | | | | | | |
| | | Kalgoorlie Foundry, Ltd., Works ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 553·56 | ... |
| | | Lady Pratt Works ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 16·00 | 277·83 | ... |
| | | Old Cement Works, Martin's ... ... ... | ... | ... | ... | ... | ... | ... | ... | 102·78 | 14,923·44 | ... |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Reidel and Norton's Works ... ... ... | ... | ... | ... | ... | ... | ... | ... | 642·00 | 2,306·21 | ... |
| | | Various Works ... ... ... ... ... | ... | ... | ... | ... | ... | 25·01 | ... | 903·10 | 23,131·41 | ... |
| | | Totals for Leases and Quartz Claims | ... | ... | 2,732·61 | 1,242·34 | ... | 148·09 | 9,917·76 | 774,203·08 | 575,892·78 | 2,522·12 |
| | | Cement from Alluvial Claims: | | | | | | | | | | |
| | | Reported by Owners ... ... ... ... | ... | ... | ... | ... | ... | 305·41 | 867·52 | 26,376·40 | 12,715 90 | ... |
| | | Treated locally (not reported by Owners): | | | | | | | | | | |
| | | Kalgoorlie Foundry Ltd., Works ... ... | ... | ... | ... | ... | ... | ... | ... | 50·00 | 12·75 | ... |
| | | Lady Pratt Works ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 15·00 | 3·18 | ... |
| | | Old Cement Works, Martin's ... ... ... | ... | ... | ... | ... | ... | ... | ... | 10,791·00 | 3,527·94 | ... |
| | | Reidel & Norton's Works ... ... ... | ... | ... | ... | ... | ... | ... | ... | 14,717·00 | 2,190·47 | ... |
| | | Various Works ... ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 77,350·21 | 54,918·51 | ... |
| | | Treated outside District (not reported by Owners) | ... | ... | ... | ... | ... | ... | ... | 27,804·55 | 36,711·17 | ... |
| | | Reported by Banks and Gold Dealers ... ... | 5·80 | ... | ... | ... | ... | 103,949·10 | ·86 | ... | 84·69 | ... |
| | | **Total ... ... ...** | **5·80** | ... | **2,732·61** | **1,242·34** | ... | **104,402·60** | **10,786·14** | **931,307·24** | **576,067·39** | **2,522·12** |

KURNALPI DISTRICT.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jubilee ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 145·13 | 1,821·25 | 1,408·51 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 18·87 | ... | 46·00 | 28·91 | ... |
| Kurnalpi ... | 427K ... ... | Agoriad Aur ... ... ... | ... | ... | 14·00 | 48·70 | ... | ... | 118·11 | 14·00 | 48·70 | ... |
| Do. ... | 429K ... ... | Kurnalpi Gem ... ... ... | ... | 50·02 | ... | ... | ... | ... | 50·02 | ... | ... | ... |
| Do. ... | 432K ... ... | Kurnalpi Gem South ... ... | ... | 178·81 | ... | ... | ... | ... | 178·81 | ... | ... | ... |
| Do. ... | 423K ... ... | Kurnalpi Pride ... ... ... | ... | ... | ... | ... | ... | ... | 578·45 | 11·80 | 231·73 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 371·18 | 1,785·95 | 2,805·31 | 2,245·39 | 6·27 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 22·00 | 14·49 | ... | 226·49 | 77·08 | 152·00 | 171·68 | ... |
| Mulgabbie ... | 428K ... ... | Try Again ... ... ... | ... | 195·42 | ... | ... | ... | ... | 298·43 | ... | ... | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 606·79 | 84·65 | 7,290·69 | 4·95 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | 1·48 | ... | 6·50 | 1,432·79 | 137·50 | 821·61 | ... |
| | | *From District generally :—* | | | | | | | | | | |
| | | Sundry Parcels treated at: | | | | | | | | | | |
| | | Various Works ... ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 56·50 | 193·15 | ... |
| | | Reported by Banks and Gold Dealers ... ... | 1·74 | ... | ... | ... | ... | 11,367·95 | 19·62 | ... | ... | ... |
| | | **Total ... ... ...** | **1·74** | **424·25** | **36·00** | **64·67** | ... | **11,990·99** | **5,291·18** | **5,129·01** | **12,440·37** | **11·22** |

## East Coolgardie Goldfield.

EAST COOLGARDIE DISTRICT.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Binduli ... | 5091E ... ... | Belle of Kalgoorlie ... ... | ... | ... | 12·30 | 8·96 | ... | ... | ... | 12·30 | 8·96 | ... |
| Do. ... | 5144E ... ... | Blue Bell ... ... ... ... | ... | ... | 61·00 | 10·00 | ... | ... | ... | 61·00 | 10·00 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 175·80 | 97·60 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 138·47 | 74·34 | ... |
| Boorara ... | 4635E ... ... | Florence May ... ... ... | ... | ... | 26·00 | 41·58 | ... | ... | ... | 26·00 | 41·58 | ... |
| Do. ... | 3908E, 3910E, (3912E), (4033E), (4045E), (4327E) | (Golden Ridge G.M. Co., Ltd.) ... | ... | ... | ... | ... | ... | ... | ... | 239,600·10 | 132,893·92 | 408·36 |
| Do. ... | 4629E ... ... | Jewel ... ... ... ... | ... | ... | 21·00 | 35·61 | ... | ... | ... | 139·50 | 232·45 | ... |
| Do. ... | 3908E, 3910E, 4625E | Waterfall Gold Mine leases ... | ... | ... | 698·50 | 404·51 | ... | ... | ... | 6,671·50 | 4,097·17 | ... |
| Do. ... | 3908E, 3910E, (3912E), (4033E) | (Waterfall leases) ... ... | ... | ... | ... | ... | ... | ... | ... | 2,849·00 | 2,389·48 | ... |
| Do. ... | 4634E ... ... | Waterfall South ... ... ... | ... | ... | 31·20 | 24·77 | ... | ... | ... | 81·20 | 49·15 | ... |

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

**EAST COOLGARDIE GOLDFIELD**—*continued.*

EAST COOLGARDIE DISTRICT—*continued.*

| Mining Centre. | Number of Lease. | Registered Name of Company or Lease. | Total for 1920. | | | | | Total Production. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. |
| | | | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. |
| Boorara ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 381·56 | 57,072·15 | 31,673·52 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ·49 | 53·46 | 397·60 | 419·09 | ... |
| Boulder ... | 392E ... ... | (Acrobat: Paringa Consolidated Mines, Ltd.) | ... | ... | ... | ... | ... | ... | ... | 10·25 | 37·15 | ... |
| Do. ... | 392E ... ... | Acrobat: Paringa Mines (1909), Ltd. | ... | ... | 270·46 | 35·61 | ... | ... | ... | 14,551·07 | 6,709·28 | ... |
| Do. ... | 38E, 71E, 72E, (101E) | Associated G.Ms. of W.A., Ltd. ... | ... | ... | 61,440·73 | 24,277·05 | 595·14 | ... | 8·49 | 1,897,063·93 | 1,040,566·50 | 31,644·05 |
| Do. ... | 49E, (4211E) ... | Associated Northern Blocks (W.A.), Ltd. | ... | ... | 12,900·39 | 11,023·06 | ... | ... | 524·18 | 405,216·99 | 490,778·42 | 4,844·50 |
| Do. ... | (682E), 902E, 923E, 986E, (1064E), 1124E, 1196E, 4075E | (Boulder Deep Levels, Ltd.) ... ... | ... | ... | ... | ... | ... | ... | ... | 3,043·00 | 1,778·10 | 26·71 |
| Do. ... | 902E, 923E, 986E, 1124E, 1196E, 4075E | (Boulder Deep Levels (1907), Ltd.) ... | ... | ... | ... | ... | ... | ... | ... | 787·50 | 210·30 | ... |
| Do. ... | 281E ... ... | (Brookman Bros.: Boulder G.M. Co., Ltd.) | ... | ... | ... | ... | ... | ... | ... | 8,655·00 | 8,417·00 | ... |
| Do. ... | 4633E ... ... | Brownhill Extended: Brownhill Extended, Ltd. | ... | ... | 152·00 | 23·34 | ... | ... | ... | 332·23 | 45·72 | ... |
| Do. ... | 24E, (888E), 949E | Central and West Boulder G.Ms., Ltd. | ... | ... | 2,795·92 | 1,925·16 | ... | ... | ... | 68,872·78 | 35,347·33 | ... |
| Do. ... | 352E ... ... | (Chaffer's G.M. Co., Ltd.) ... ... | ... | ... | ... | ... | ... | ... | ... | 4,256·00 | 1,299·03 | 161·50 |
| Do. ... | 352E, 873E, 4334E | (Chaffer's G.M. Co., Ltd.) ... ... | ... | ... | ... | ... | ... | ... | ... | 111,111·00 | 44,796·77 | ... |
| Do. ... | 352E, 873E, 4334E | (Chaffer's Gold Mining Co. (1913), Ltd.) | ... | ... | ... | ... | ... | ... | ... | 13,350·00 | 3,334·91 | 129,57 |
| Do. ... | 1621E ... ... | (Croesus Proprietary G.M. Co.) ... | ... | ... | ... | ... | ... | ... | ... | 79·00 | 45·87 | ... |
| Do. ... | 4617E ... ... | Croesus South ... ... ... | ... | ... | 659·50 | 334·30 | ... | ... | ... | 1,842·50 | 919·90 | ... |
| Do. ... | 35E ... ... | Eureka ... ... ... ... | ... | ... | 41·12 | 46·94 | ... | ... | ... | 41·12 | 46·94 | ... |
| Do. ... | 4627E ... ... | Garvagh ... ... ... ... | ... | ... | 230·00 | 376·28 | ... | ... | ... | 422·00 | 601·42 | ... |
| Do. ... | 351E, 1001E, 1002E, 1085E, 1113E, 1219E, 1326E, 1397E | Golden Horseshoe Estates Co., Ltd. ... | ... | ... | 125,340·00 | 54,697·44 | 35,345·10 | ... | ... | 4,253,990·00 | 2,659,118·91 | 522,170·29 |
| Do. ... | 750E ... ... | (Golden Link Consolidated G.Ms., Ltd.) | ... | ... | ... | ... | ... | ... | ... | 10,729·00 | 6,096·80 | ... |
| Do. ... | 2325E, 2326E ... | (Golden Link Consolidated G.Ms., Ltd.) | ... | ... | ... | ... | ... | ... | ... | 1,525·00 | 733·48 | ... |
| Do. ... | 750E, 1621E ... | (Golden Links, Ltd.) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 87,115·02 | 43,504·60 | 19·06 |
| Do. ... | (4972E) ... ... | Golden Star ... ... ... | ... | ... | 15·80 | 3·40 | ... | ... | ... | 15·80 | 3·40 | ... |
| Do. ... | 873E ... ... | (Great Boulder Main Reefs, Ltd.) ... | ... | ... | ... | ... | ... | ... | ... | 143,292·39 | 119,541·14 | 761·98 |
| Do. ... | 50E ... ... | Great Boulder No. 1, Ltd. ... ... | ... | ... | 61·57 | 43·22 | ... | ... | ... | 18,593·84 | 14,538·30 | ... |
| Do. ... | 66E ... ... | Great Boulder Perseverance G.M. Co., Ltd. | ... | ... | 44,655·81 | 51,414·56 | 11,289·49 | ... | ... | 3,179,501·60 | 1,697,219·47 | 178,622·39 |
| Do. ... | 16E, 51E, 61E, 102E, 280E, 1109E, 4366E | Great Boulder Proprietary G.Ms., Ltd. | ... | ... | 100,756·00 | 71,535·70 | 15,577·00 | ... | ... | 3,271,498·00 | 2,915·598,01 | 317,952·10 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Do. | ... | 902E, 1124E ... | (Great Boulder South G.M. Co., Ltd.) | ... | ... | ... | ... | ... | ... | ... | ... | 437·00 | 122·11 | ... |
| Do. | ... | 3643E ... ... | (Hainault G.M., Ltd.) ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 517,345·70 | 184,570·02 | 113·30 |
| Do. | ... | 6E ... ... | (Hannan's Block 45, Ltd.) ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 2,343·55 | 3,226·69 | ... |
| Do. | ... | 131E, 245E, 269E, 743E, (794E), 969E | (Hannan's Central G.Ms., Ltd.) ... | ... | ... | ... | ... | ... | ... | ... | ... | 6,098·00 | 3,360·33 | ... |
| Do. | ... | 739E ... ... | (Hannan's Croesus G.M. Co., Ltd.) ... | ... | ... | ... | ... | ... | ... | ... | ... | 4,256·75 | 4,416·90 | ... |
| Do. | ... | 1004E ... ... | (Hannan's North Croesus G.M. Co., Ltd.) | ... | ... | ... | ... | ... | ... | ... | ... | 50·00 | 13·21 | ... |
| Do. | ... | 15E, 60E, 902E, 923E, 986E, 1116E, 1124E, 1196E, 4075E | (Hannan's Star Consolidated, Ltd.) ... | ... | ... | ... | ... | ... | ... | ... | ... | 360·00 | 175·59 | ... |
| Do. | ... | 15E, 60E, 1116E | (Hannan's Star G.M. Co., Ltd.) ... | ... | ... | ... | ... | ... | ... | ... | ... | 85,652·75 | 40,438·85 | 2,142·59 |
| Do. | ... | 15E, 60E, 1116E | (Hannan's Star, Ltd.) ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 13,470·50 | 4,716·66 | 191·22 |
| Do. | ... | 4317E, 4318E, (4442E) | Idaho leases ... ... ... | ... | 136·39 | 12,405·00 | 6,484·54 | ... | ... | 4,437·51 | | 122,861·77 | 59,677·31 | ... |
| Do. | ... | 946E, (4370E), 4531E | Ironsides North leases ... ... | ... | ... | 4,121·00 | 3,672·05 | ... | ... | ... | | 71,103·64 | 126,759·25 | ... |
| Do. | ... | 946E ... ... | (Ironsides North G.M. Co., N.L.) ... | ... | ... | ... | ... | ... | ... | ... | | 1,348·00 | 807·48 | ... |
| Do. | ... | 31E, 1357E, 1413E, 1507E, 4399E, 4445E, 4476E | Ivanhoe Gold Corporation, Ltd. ... | ... | ... | 125,625·00 | 56,456·63 | 17,958·00 | ... | ... | | 3,814,307·00 | 2,354,003·20 | 387,638·55 |
| Do. | ... | 1507E, (2899E), (3712E), (3713E) | (Ivanhoe Junction G.M. Co., N.L.) ... | ... | ... | ... | ... | ... | ... | ... | | 1,764·00 | 121·43 | ... |
| Do. | ... | 6E, 131E, 245E, 269E, (301E), 739E, 743E, (794E), 969E | (Kalgoorlie Amalgamated, Ltd.) ... | ... | ... | ... | ... | ... | ... | ... | | 32,589·00 | 8,859·95 | ... |
| Do. | ... | 6E, 131E, 245E, 269E, (301E), 739, 743E, (794E), 969E | (Kalgoorlie Amalgamated (New), Ltd.) | ... | ... | ... | ... | ... | ... | ... | | 27,145·00 | 6,265·27 | ... |
| Do. | ... | 6E, 131E, 245E, 269E, (301E), 739E, 743E, (794E), 969E | (Kalgoorlie Amalgamated (1909), Ltd.) | ... | ... | ... | ... | ... | ... | ... | | 7,940·50 | 1,568·40 | ... |
| Do. | ... | 33E ... ... | (Kalgoorlie Bank of England G.M. Co., Ltd.) | ... | ... | ... | ... | ... | ... | ... | | 11,775·50 | 7,080·49 | ... |
| Do. | ... | 73E, (74E) ... | (Kalgoorlie Mint and Iron King Gold Estates, Ltd.) | ... | ... | ... | ... | ... | ... | ... | | 3,020·00 | 1,762·00 | ... |
| Do. | ... | 73E, (74E) ... | (Kalgoorlie Mint and Iron King G.Ms., Ltd.) | ... | ... | ... | ... | ... | ... | ... | | 3,647·00 | 7,454·80 | ... |
| Do. | ... | 1004E ... ... | (Kalgurli Golden Eagle) ... | ... | ... | ... | ... | ... | ... | ... | | 4,891·50 | 1,289·65 | ... |
| Do. | ... | 1004E ... ... | (Kalgurli Golden Eagle: Golden Links, Ltd.) | ... | ... | ... | ... | ... | ... | ... | | 193·00 | 31·63 | ... |
| Do. | ... | 22E, 34E, ... | Kalgurli G.Ms., Ltd. ... ... ... | ... | ... | 37,260·67 | 17,198·01 | ... | ... | ... | | 1,664,302·16 | 1,059·908,44 | 188·24 |
| Do. | ... | 15E, 25E, 32E, 60E, 352E, 873E, 902E, 923E, 986E, 1116E, 1124E, 1196E, 2325E, 2326E, 4075E, 4334E, (4432E), (4433E), (4434E), 4493E | Lake View and Star, Ltd. ... ... | ... | ... | 102,466·98 | 40,172·24 | 2,119·95 | ... | ... | | 1,585,752·34 | 526,949·77 | 49,989·53 |
| Do. | ... | 25E, 32E, 2325E, 2326E | (Lake View Consols, Ltd.) ... ... | ... | ... | ... | ... | ... | ... | ... | | 1,179·303,55 | 1,016,875·27 | 38,491·89 |
| Do. | ... | (4626E) ... ... | Lake View Extended ... ... | ... | ... | 20·38 | 4·53 | ... | ... | ... | | 20·38 | 4·53 | ... |

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

**EAST COOLGARDIE GOLDFIELD**—*continued.*

EAST COOLGARDIE DISTRICT—*continued.*

| Mining Centre. | Number of Lease. | Registered Name of Company or Lease. | Total for 1920. | | | | | Total Production. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. |
| | | | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. |
| Boulder ... | 5159E ... ... | Lake View South ... ... | ... | ... | 19·24 | 32·62 | ... | ... | ... | 19·24 | 32·62 | ... |
| Do. ... | 33E, 975E ... | New North Boulder G.Ms., Ltd. ... | ... | ... | 106·20 | 106·86 | ... | ... | ... | 23,394·31 | 14,707·55 | ... |
| Do. ... | 33E, 35E, 975E ... | (North Boulder G.M. Co., Ltd.) ... | ... | ... | ... | ... | ... | ... | ... | 33,549·15 | 47,532·52 | ... |
| Do. ... | 33E, 35E, 975E ... | (North Boulder G.Ms., Ltd.) ... ... | ... | ... | ... | ... | ... | ... | ... | 4,542·50 | 4,256·55 | ·63 |
| Do. ... | 281E, 287E, 444E | (North Kalgurli Co., Ltd.) ... ... | ... | ... | ... | ... | ... | 43·99 | ... | 104,116·49 | 60,229·47 | 7,202·47 |
| Do. ... | 281E, 287E, 444E | North Kalgurli (1912), Ltd. ... ... | ... | ... | 2,285·47 | 937·67 | ... | ... | ... | 27,599·56 | 12,362·91 | ... |
| Do. ... | 73E, 410E, 448E, 532E, 578E, 698E, 944E, 1395E, (3031E), (4180E) | (Oroya Brown Hill Co., Ltd.) ... | ... | ... | ... | ... | ... | ... | ... | 1,075,862·55 | 1,163,881·77 | 61,682·30 |
| Do. ... | 6E, 73E, 131E, 245E, 269E, (301E), 410E, 448E, 532E, 578E, 698E, 739E, 743E, 750E, (794E), 944E, 969E, 1004E, 1395E, 1621E, (3031E), (4180E) | Oroya Links, Ltd. ... ... ... | ... | ... | 16,714·06 | 17,892·76 | 717·81 | ... | ... | 860,622·56 | 336,894·84 | 28,462·05 |
| Do. ... | 392E ... ... | (Paringa Mines (1909), Ltd.) ... | ... | ... | ... | ... | ... | ... | ... | 26,890·74 | 12,599·54 | ... |
| Do. ... | 1208E, 3612E, 3643E | South Kalgurli Consolidated, Ltd. ... | ... | ... | 63,264·00 | 29,609·89 | 487·00 | ... | ... | 673,103·00 | 226,736·28 | 15,071·52 |
| Do. ... | 1208E, 3612E ... | (South Kalgurli G.Ms., Ltd.) ... ... | ... | ... | ... | ... | ... | ... | ... | 826,909·00 | 347,222·75 | 17,609·67 |
| Do. ... | 4537E ... ... | Union Jack ... ... ... | ... | ... | 576·00 | 294·16 | ... | ... | ... | 686·00 | 335·16 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 109·90 | 5,780·86 | 206,996·39 | 133,369·66 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 91·28 | 32·22 | ... | 24·58 | ... | 1,622·37 | 1,150·94 | ... |
| Feysville ... | 4949E, 5152E ... | Britannia G.Ms., N.L. ... ... | ... | 28·59 | 31·00 | 71·61 | ... | ... | 28·59 | 31·00 | 71·61 | ... |
| Do ... | Block 48 ... | Hampton Gold Mining Areas, Ltd. | | | | | | | | | | |
| | | P.P.L. 98—Red Indian ... ... | ... | ... | 8·50 | 11·20 | ... | ... | ... | 8·50 | 11·20 | ... |
| | | P.P.L. 37—Ring Neck ... ... | ... | 15·36 | 4·40 | 58·25 | ... | ... | 15·36 | 4·40 | 58·25 | ... |
| | | P.P.L. 78—Triangle ... ... | ... | ... | 17·10 | 66·95 | ... | ... | ... | 17·10 | 66·95 | ... |
| Do. ... | Block 48 ... | (Hampton Plains Estate, Ltd.) ... | ... | ... | ... | ... | ... | 4,565·62 | 21·59 | 20,615·28 | 2,502·56 | ... |
| Do. ... | Block 50 ... | (Hampton Plains Estate (1906), Ltd.) | ... | ... | ... | ... | ... | ... | ... | 85·00 | 108·82 | ... |
| Do. ... | Block 41 ... | Hampton Properties, Ltd. ... ... | ... | ... | ... | ... | ... | ... | ... | 41·00 | 22·66 | ... |
| Do. ... | Block 45 ... | Hampton Properties, Ltd. ... ... | ... | ... | ... | ... | ... | ... | 52·75 | 51·75 | 76·63 | ... |
| Do. ... | Block 50 ... | (Hampton Properties, Ltd.) ... | ... | ... | ... | ... | ... | ... | 7·26 | 6,348·00 | 3,956·22 | ... |
| Do. ... | Block 50 ... | Hampton Properties Ltd. ... | ... | ... | ... | ... | ... | ... | 106·23 | 671·73 | 579·99 | ... |
| | | P.P.L. 138—Eva May Hampton ... | ... | ... | 14·00 | 6·70 | ... | ... | ... | 14·00 | 6·70 | ... |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | P.P.Ls. 183, 184—Melvina leases ... | ... | ... | 170·00 | 44·00 | ... | ... | ... | 170·00 | 44·00 | ... | | |
| | | | P.P.L. 23—Mutooroo Copper Corporation, N.L. | ... | ... | 310·06 | 630·86 | ... | ... | ... | 310·06 | 630·86 | ... | | |
| | | | P.P.L. 10—Pernatty Central Copper Mining Co., N.L. | ... | ... | 25·11 | 12·18 | ... | ... | ... | 25·11 | 12·18 | ... | | |
| | | | P.P.L. 25—Pioneer ... | ... | ... | 10·40 | 5·41 | ... | ... | ... | 10·40 | 5·41 | ... | | |
| Do. | ... | 5081E ... ... | Mineral King ... ... ... | ... | ... | 4·75 | 2·40 | ... | ... | ... | 4·75 | 2·40 | ... | | |
| Do. | ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 22·86 | 305·70 | 111·90 | ... | | |
| Do. | ... | ... | Sundry claims ... ... | ... | ... | 26·21 | 19·31 | ... | ... | 4·86 | 222·55 | 131·25 | ... | | |
| Kalgoorlie | ... | 5168E ... ... | Albert ... ... ... ... | ... | ... | 16·00 | 1·90 | ... | ... | ... | 16·00 | 1·90 | ... | | |
| Do. | ... | (4644E) ... ... | All In ... ... ... ... | ... | ... | 10·00 | 3·10 | ... | ... | ... | 10·00 | 3·10 | ... | | |
| Do. | ... | (4560E) ... ... | Belgravia Hill ... ... ... | ... | ... | ... | ... | ... | ... | ... | 529·00 | 122·33 | ... | | |
| Do. | ... | 796E, 1228E ... | (Bonnie Lass leases) ... ... | ... | ... | ... | ... | ... | ... | 160·69 | 6,011·00 | 5,945·22 | ... | | |
| Do. | ... | 796E, 1228E, (3771E) | Lonnie Lass leases ... ... | ... | ... | ... | ... | ... | ... | ... | 16,329·65 | 8,403·33 | ... | | |
| Do. | ... | (4623E) ... ... | Cassidy Hill ... ... ... | ... | ... | 264·00 | 33·70 | ... | ... | ... | 368·00 | 181·83 | ... | | |
| Do. | ... | 5101E ... ... | Corn Cob North ... ... | ... | ... | 41·00 | 7·20 | ... | ... | ... | 41·00 | 7·20 | ... | | |
| Do. | ... | 4557E ... ... | Corn Cob ... ... ... ... | ... | ... | 14·23 | 8·64 | ... | ... | ... | 87·65 | 41·58 | ... | | |
| Do. | ... | 4585E ... ... | (Creswick)... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 88·00 | 78·65 | ... | | |
| Do. | ... | 4585E, 4597E, 4598E | Creswick leases ... ... ... | ... | ... | 298·00 | 607·00 | ... | ... | ... | 3,920·00 | 2,548·66 | ... | | |
| Do. | ... | (4509E) ... ... | (Enterprise) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 219·00 | 76·49 | ... | | |
| Do. | ... | 4609E ... ... | Fair Play ... ... ... | ... | ... | 10·00 | 33·92 | ... | ... | ... | 88·21 | 196·89 | ... | | |
| Do. | ... | 4546E, 4547E, 4548E | Hannan's Reward, Ltd. ... ... | ... | ... | 1,642·00 | 357·70 | ... | ... | 5·72 | 29,291·00 | 7,847·19 | ... | | |
| Do. | ... | 796E, 1228E ... | (Hannan's Reward North G.M. Co., N.L. | ... | ... | ... | ... | ... | ... | 16·87 | 334·00 | 247·34 | ... | | |
| Do. | ... | 4001E, (4035E), 4036E | Hidden Secret leases ... ... | ... | ... | 12·80 | 11·58 | ... | ... | 105·65 | 10,761·75 | 15,303·83 | 43,383·29 | | |
| Do. | ... | 4586E ... ... | Hidden Secret West ... ... | ... | ... | ... | ... | ... | ... | ... | 18·00 | 2·90 | ... | | |
| Do. | ... | (4653E) ... | Hurroo ... ... ... ... | ... | ... | 18·00 | 6·30 | ... | ... | ... | 34·00 | 11·96 | ... | | |
| Do. | ... | (4628E) ... ... | Kalgoorlie Star ... ... ... | ... | ... | ... | ... | ... | ... | ... | 99·03 | 43·58 | ... | | |
| Do. | ... | 4477E ... ... | Lord Nelson ... ... ... | ... | ... | 82·90 | 71·82 | ... | ... | 123·27 | 2,932·54 | 1,478·50 | ... | | |
| Do. | ... | 4587E ... ... | Mayman's Consols ... ... | ... | ... | 67·75 | 48·72 | ... | ... | ... | 140·75 | 59·26 | ... | | |
| Do. | ... | 5112E ... ... | Mite ... ... ... ... | ... | ... | 88·00 | 82·69 | ... | ... | ... | 88·00 | 82·69 | ... | | |
| Do. | ... | 5160E ... ... | North Collier ... ... ... | ... | ... | 6·00 | 4·10 | ... | ... | ... | 6·00 | 4·10 | ... | | |
| Do. | ... | 4632E ... ... | North End ... ... ... | ... | ... | ... | ... | ... | ... | ... | 24·00 | 3·30 | ... | | |
| Do. | ... | 1228E ... ... | (Red, White, and Blue) ... | ... | ... | ... | ... | ... | ... | ... | 130·00 | 25·56 | ... | | |
| Do. | ... | 5147E ... ... | Reservoir ... ... ... ... | ... | ... | 38·79 | 17·34 | ... | ... | ... | 38·79 | 17·34 | ... | | |
| Do. | ... | 4542E ... ... | Successful ... ... ... | ... | ... | ... | ... | ... | ... | ... | 20·00 | 10·12 | ... | | |
| Do. | ... | 4499E ... ... | Williamstown ... ... ... | ... | ... | 530·77 | 306·51 | ... | ... | ... | 3,395·49 | 1,573·71 | ... | | |
| Do. | ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 242·48 | 9,072·33 | 867,092·12 | 329,103·67 | 633·83 | | |
| Do. | ... | ... | Sundry claims ... ... | ... | 47·66 | 5,231·80 | 1,475·91 | ... | 207·69 | 332·26 | 25,652·17 | 7,007·58 | ... | | |
| Wombola | ... | 4574E ... ... | Creedon's Welcome ... ... | ... | ... | 71·80 | 236·35 | ... | ... | ... | 357·51 | 1,644·34 | ... | | |
| Do. | ... | 4600E ... ... | Daisy ... ... ... ... | ... | ... | 81·10 | 300·84 | ... | ... | ... | 289·25 | 1,611 19 | ... | | |
| Do. | ... | 4555E ... ... | Dinnie ... ... ... ... | ... | ... | 62·90 | 165·42 | ... | ... | ... | 345·40 | 1,183·47 | ... | | |
| Do. | ... | 4770E ... ... | Great Hope North ... ... | ... | ... | 125·24 | 837·09 | ... | ... | ... | 125·24 | 837·09 | ... | | |
| Do. | ... | 4824E ... ... | Lass O'Gowrie East: Lass O'Gowrie East G.M. Co., N.L. | ... | ... | 17·30 | 8·99 | ... | ... | ... | 17·30 | 8·99 | ... | | |
| Do. | ... | 4607E ... ... | Little Jean ... ... ... | ... | ... | 8·00 | 25·06 | ... | ... | ... | 53·00 | 280·06 | ... | | |
| Do. | ... | 4774E ... ... | Mount View: McCahon's Treasure G.M. Co., N.L. | ... | ... | 7·80 | 9·07 | ... | ... | ... | 7·80 | 9·07 | ... | | |
| Do. | ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 613·86 | 4,935·13 | 3,501·03 | ... | | |
| Do. | ... | ... | Sundry claims ... ... | ... | ... | 22·10 | 89·17 | ... | ... | ... | 662·66 | 630·90 | ... | | |

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

**EAST COOLGARDIE GOLDFIELD**—*continued.*

EAST COOLGARDIE DISTRICT—*continued.*

| Mining Centre. | Number of Lease. | Registered Name of Company or Lease. | Total for 1920. Alluvial. Fine ozs. | Dollied and Specimens. Fine ozs. | Ore treated. Tons (2,240lbs.) | Gold therefrom. Fine ozs. | Silver. Fine ozs. | Total Production. Alluvial Fine ozs. | Dollied and Specimens. Fine ozs. | Ore treated. Tons (2,240lbs.) | Gold therefrom. Fine ozs. | Silver. Fine ozs. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *From District generally :—* | | | | | | | | | | |
| | | Sundry claims ... ... | ... | ... | ... | ... | ... | 10,907·93 | 431·95 | 5,208·00 | 1,560·12 | ... |
| | | Sundry Parcels treated at : | | | | | | | | | | |
| | | Adeline Works ... ... ... ... ... | ... | ... | ... | ... | ... | 42·64 | 35·12 | 127·90 | 20,900·12 | ... |
| | | Associated Northern Works ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 287·41 | ... |
| | | Bonnie Lass leases ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 55·00 | 1,297·73 | ... |
| | | Brown Hill Consols Works ... ... ... | ... | ... | ... | ... | ... | ... | ... | 753·26 | 45,148·48 | ... |
| | | Dunstan and Cumming's Works... ... ... | ... | ... | ... | 1,454·96 | ... | ... | ... | ... | 8,958·36 | 1,194·00 |
| | | Fremantle Trading Co., Ltd., Works ... ... | ... | ... | ... | 1,130·92 | 145·62 | ... | ... | ... | 9,834·53 | 7,596·90 |
| | | Hainault Sulphide Plant ... ... ... ... | ... | ... | ... | 274·41 | ... | ... | ... | 35·66 | 1,799·60 | 711·79 |
| | | Hannan's Central Lakeside Works (A.W.A. Slimes Plant) | ... | ... | ... | 277·29 | ... | ... | ... | 58·06 | 4,788·43 | ... |
| | | Hannan's Central Works ... ... ... ... | ... | ... | ... | 2,585·00 | ... | ... | ... | 142·80 | 61,845·10 | 67·17 |
| | | Kalgurli G.Ms., Ltd. ... ... ... ... | ... | ... | 7·44 | 396·64 | ... | ... | ... | 7·44 | 396·64 | ... |
| | | Lone Hand Works ... ... ... ... | ... | ... | ... | ... | ... | ... | 14·43 | 200·00 | 1,437·30 | ... |
| | | North Kalgurli Battery ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 810·22 | ... |
| | | Various Works ... ... ... ... ... | ... | ... | ... | ... | ... | 341·72 | 15·15 | 38,756·72 | 75,908·77 | 1,968·67 |
| | | Reported by Banks and Gold Dealers ... ... | 235·13 | ... | ... | ... | ... | 10,980·24 | 9,013·32 | ... | 4·57 | ... |
| | | **Total ... ... ...** | **235·13** | **228·00** | **724,521·83** | **400,953·88** | **84,235·11** | **27,467·28** | **31,386·18** | **27,879,851·70** | **17,678,560·72** | **1,721,080·12** |
| | | BULONG DISTRICT. | | | | | | | | | | |
| Balagundi ... | | ... Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 2,408·98 | 1,110·68 | 1,473·73 | 12·92 |
| Do. ... | | ... Sundry claims ... ... | ... | 1·87 | ... | ... | ... | ... | 120·34 | 215·40 | 197·91 | ... |
| Bulong ... | | ... Voided leases ... ... ... | ... | ... | ... | ... | ... | 107·54 | 8,433·70 | 99,606·01 | 82,419·97 | ... |
| Do. ... | | ... Sundry claims ... ... | ... | ... | 3·80 | 47·58 | ... | 1,648·60 | 987·93 | 6,839·76 | 14,543·35 | ... |
| Hogan's Find | | ... Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 908·82 | 309·50 | 276·51 | ... |
| Majestic ... | | ... Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 1,101·25 | 318·78 | ... |
| Do. ... | | ... Sundry claims ... ... | ... | ... | 34·90 | 19·55 | ... | ... | 43·20 | 51·90 | 26·97 | ... |
| Mt. Monger ... | 1124 | ... ... Golden Shovel East ... ... | ... | ... | 7·00 | 9·90 | ... | ... | ... | 7·00 | 9·90 | ... |
| Do. ... | | ... Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 1,862·57 | 1,121·35 | 969·69 | ... |
| Do. ... | | ... Sundry claims ... ... | ... | ... | ... | ... | ... | 215·60 | ... | 369·80 | 302·47 | ... |
| Randalls ... | | ... Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 60·04 | 31,820·04 | 10,645·98 | ... |
| Do. ... | | ... Sundry claims ... ... | ... | ... | ... | ... | ... | 20·45 | ... | 1,893·55 | 486·04 | ... |
| Sudden Jerk | | ... Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 63·91 | 14·25 | 53·67 | ... |
| Do. ... | | ... Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | ·15 | 10·23 | ... |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Taurus ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 2·06 | 3·70 | 1,678·15 | 760·83 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 112·69 | ... | 276·00 | 411·01 | ... |
| Woodline ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 792·75 | 610·57 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 39·33 | 61·57 | ... |
| | *From District generally*:— | | | | | | | | | | | |
| | Sundry claims ... ... ... ... ... | | ... | ... | ... | ... | ... | 5·64 | 41·85 | 790·75 | 284·26 | ... |
| | Sundry parcels treated at: | | | | | | | | | | | |
| | Various Works ... ... ... ... | | ... | ... | ... | ... | ... | ... | ... | 6,102·15 | 5,848·25 | ... |
| | Reported by Banks and Gold Dealers ... | | ... | ... | ... | ... | ... | 24,473·31 | 52·39 | ... | ... | ... |
| | **Total** ... ... ... | | ... | **1·87** | **45·70** | **77·03** | ... | **26,585·89** | **14,987·43** | **154,039·77** | **119,711·69** | **12·92** |

## Coolgardie Goldfield.

### COOLGARDIE DISTRICT.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bonnievale ... | 4554 ... ... | Lorna ... ... ... ... | ... | ... | ... | ... | ... | ... | 8·36 | 335·75 | 330·37 | ... |
| Do. ... | 4600 ... ... | Melva Maie ... ... ... | ... | ... | 20·00 | 94·86 | ... | ... | ... | 50·00 | 160·27 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 16·64 | 350,509·09 | 187,753·75 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 23·54 | 1,945·68 | 1,165·56 | ... |
| Bulla Bulling | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 612·38 | 346·15 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 12·82 | 314·60 | 182·17 | ... |
| Burbanks ... | (134), (135), (136), 1527, (1705), 2761, (3571), (3661), (3806), (3996), (4025), (4032) | (Burbanks Birthday Gift G.M., Ltd.) | ... | ... | ... | ... | ... | ... | ... | 132,706·00 | 126,351·59 | ... |
| Do. ... | (134), (135), (136), 1527, (1705), 2761, (3571), (3661), (3806), (3996), (4025), (4032) | (Burbanks Birthday G.Ms., Ltd.) ... | ... | ... | ... | ... | ... | ... | ... | 36,677·20 | 25,186·99 | 334·85 |
| Do. ... | (134), (135), (136), 1527, 2761, (3571), (3661) | Burbanks Birthday G.Ms., Ltd. ... | ... | ... | ... | ... | ... | ... | ... | 34,992·18 | 22,337·68 | 89·38 |
| Do. ... | (4593) ... ... | Burbanks Surprise ... ... | ... | ... | ... | ... | ... | ... | ... | 26·00 | 12·10 | ... |
| Do. ... | (4597) ... ... | General Foch ... ... ... | ... | ... | ... | ... | ... | ... | ... | 20·00 | 29·20 | ... |
| Do. ... | (4471) ... ... | Ivanhoe Burbanks ... ... | ... | ... | 95·00 | 59·12 | ... | ... | ... | 2,353·75 | 1,567·79 | ... |
| Do. ... | (4442) ... ... | Ivanhoe North ... ... ... | ... | ... | ... | ... | ... | ... | ... | 81·75 | 39·27 | ... |
| Do. ... | 2160 ... ... | Lady Robinson ... ... ... | ... | ... | ... | 47·33 | ... | ... | ... | 5,733·00 | 2,233·49 | ... |
| Do. ... | 2160 ... ... | (Lady Robinson) ... ... | ... | ... | ... | ... | ... | ... | ... | 5,315·40 | 3,327·12 | ... |
| Do. ... | 2160, (3950), (4125) | (Lady Robinson G.M. Co., N.L.) ... | ... | ... | ... | ... | ... | ... | ... | 16,823·50 | 7,797·88 | ... |
| Do. ... | 4623 ... ... | National ... ... ... ... | ... | ... | 248·00 | 267·05 | ... | ... | ... | 248·00 | 267·05 | ... |
| Do. ... | 4601 ... ... | Victor ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 18·50 | 30·81 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 13·36 | 331·61 | 172,349·83 | 111,558·58 | 96·83 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 160·50 | 114·03 | ... | 43·37 | 141·95 | 4,069·50 | 3,261·80 | ... |
| Cave Rocks ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 132·00 | 28·04 | ... |
| Coolgardie ... | 4559 ... ... | Cockshot ... ... ... ... | ... | 6·60 | 57·55 | 37·17 | ... | ... | 126·74 | 265·43 | 693·67 | ... |
| Do. ... | 4555 ... ... | (Dreadnought) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 867·85 | 870·10 | ... |
| Do. ... | 4555, 4561, (4563), 5065 | Dreadnought leases ... ... | ... | ... | 173·74 | 221·95 | ... | ... | ... | 457·92 | 373·83 | ... |

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

**COOLGARDIE GOLDFIELD**—*continued.*

COOLGARDIE DISTRICT—*continued.*

| Mining Centre. | Number of Lease. | Registered Name of Company or Lease. | Total for 1920. | | | | | Total Production. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. | Alluvial | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver |
| | | | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. |
| Coolgardie ... | 4567 ... ... | Griffith's Gold Mine ... ... | ... | ... | 11,428·00 | 1,240·88 | ... | ... | 1·70 | 14,788·00 | 1,743·14 | ... |
| Do. ... | Block 35 ... | Hampton Plains Estate, Ltd. ... | ... | ... | ... | ... | ... | ... | ... | 100·50 | 28·76 | ... |
| Do. ... | Block 49 ... | Hampton Plains Estate, Ltd. ... | ... | ... | ... | ... | ... | ... | 10·94 | 150·00 | 157·31 | ... |
| Do. ... | Block 53 ... | Hampton Plains Estate, Ltd. ... | ... | ... | ... | ... | ... | ... | 358·42 | 67·00 | 112·49 | ... |
| Do. ... | Block 59 ... | Hampton Plains Estate, Ltd. ... | ... | ... | 168·00 | 45·04 | ... | ... | 4·12 | 8,008·25 | 7,194·52 | ... |
| Do. ... | 4556 ... ... | Lady Carmen ... ... ... | ... | ... | 11·88 | 12·40 | ... | ... | 74·83 | 833·38 | 392·63 | ... |
| Do. ... | (4435) ... ... | Prosperity ... ... ... | ... | 7·07 | ... | ... | ... | 2·52 | 324·28 | 6,766·25 | 2,250·61 | ... |
| Do. ... | (4479) ... ... | Rio Tinto ... ... ... | ... | ... | ... | ... | ... | ... | ... | 428·30 | 130·12 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 1,296·50 | 3,912·76 | 532,691·23 | 314,116·41 | ·96 |
| Do. ... | ... | Sundry claims ... ... ... | 5·85 | 38·50 | 1,858·70 | 501·16 | ... | 86·14 | 1,868·22 | 32,741·99 | 13,558·71 | ... |
| Eundynie ... | (4253) ... ... | (Hidden Secret North) ... ... | ... | ... | ... | ... | ... | ... | ... | 68·00 | 60·72 | ... |
| Do. ... | (4253), (4266), (4351), (4405), (4406), (4462) | Hidden Secret North leases ... | ... | ... | ... | ... | ... | ... | ... | 28,271·00 | 14,261·73 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 1,473·50 | 644·31 | 1·75 |
| Do. ... | ... | Sundry claims ... ... ... | ... | ... | ... | ... | ... | ... | ... | 117·00 | 31·11 | ... |
| Gibraltar ... | 4586 ... ... | Carlton ... ... ... ... | ... | ... | 100·00 | 74·11 | ... | ... | ... | 309·00 | 455·52 | ... |
| Do. ... | (4602) ... ... | Great Gnarlbine ... ... ... | ... | ... | ... | ... | ... | ... | ... | 17·00 | 8·95 | ... |
| Do. ... | 4604 ... ... | Limerick ... ... ... ... | ... | ... | 60·00 | 22·79 | ... | ... | ... | 60·00 | 22·79 | ... |
| Do. ... | 4580 ... ... | Lloyd George ... ... ... | ... | ... | 24·00 | 12·40 | ... | ... | ... | 341·75 | 289·27 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 953·75 | 600·96 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 48·55 | 613·25 | 358·42 | ... |
| Gnarlbine ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 10·94 | 1,899·75 | 1,049·90 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 1·31 | 184·75 | 97·36 | ... |
| Higginsville ... | (4184), (4185), (4191), (4206), (4207) | (Red Hill Westralia G.Ms., Ltd.) ... | ... | ... | ... | ... | ... | ... | ... | 16,983·00 | 6,848·02 | 127·78 |
| Do. ... | (4184) ... ... | (Sons of Erin : Forwood, Down & Co., Ltd.) | ... | ... | ... | ... | ... | ... | ... | 117·00 | 1,000·35 | ... |
| Do. ... | (4184), (4185) ... | (Sons of Erin G.M. Co., N.L.) ... | ... | ... | ... | ... | ... | ... | 285·20 | 4,742·00 | 2,938·77 | ... |
| Do. ... | (4184), (4185), (4191), (4206), (4207) | (Sons of Erin leases) ... ... | ... | ... | ... | ... | ... | ... | ... | 1,394·00 | 911·95 | ... |
| Do. ... | (4184), (4428), (4432) | Sons of Erin leases : Forwood, Down & Co.. Ltd. | ... | ... | ... | ... | ... | ... | ... | 3,606·00 | 2,121·82 | 7·01 |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 2·06 | 5,274·00 | 1,020·45 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 16·52 | 720·90 | 492·89 | ... |
| Londonderry | 4594 ... ... | Cheapside ... ... ... | ... | ... | 57·50 | 52·13 | ... | ... | ... | 205·50 | 118·85 | ... |
| Do. ... | 4545 ... ... | Royal Standard ... ... ... | ... | ... | 76·89 | 173·12 | ... | ... | ... | 481·75 | 755·40 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 46·25 | 26,237·66 | 17,510·31 | ... |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Do. ... | ... | Sundry claims ... ... | ... | ... | 32·50 | 10·43 | ... | ... | 6·00 | 1,632·35 | 1,366·06 | ... | | |
| Mungari ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 17·71 | 735·00 | 331·78 | ... | | |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 107·82 | 340·01 | 200·77 | ... | | |
| Paris ... | 4669 ... ... | Coo-ee ... ... ... ... | ... | ... | ... | 128·65 | ... | ... | ... | ... | 128·65 | ... | | |
| Do. ... | 4673 ... ... | Saltbush ... ... ... | ... | 4·30 | ... | ... | ... | ... | 4·30 | ... | ... | ... | | |
| Red Hill ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 1,541·48 | 40,793·20 | 31,064·05 | ... | | |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 34·62 | 160·42 | 287·90 | ... | | |
| Ryan's Find... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 47·16 | 142·55 | ... | | |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ·44 | 75·69 | 220·14 | ... | | |
| St. Ives ... | 4849 ... ... | Guiding Star ... ... ... | ... | ... | ... | 1·56 | ... | ... | ... | ... | 1·56 | ... | | |
| Do. ... | 4971 ... ... | Iolanthe ... ... ... ... | ... | 1·51 | ... | ... | ... | ... | 1·51 | ... | ... | ... | | |
| Do. ... | 4942 ... ... | Southern Light ... ... ... | ... | 1·24 | ... | ... | ... | ... | 1·24 | ... | ... | ... | | |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 2·17 | 1·62 | ... | ... | ... | 2·17 | 1·62 | ... | | |
| Widgiemooltha | 4028 ... ... | Flinders ... ... ... ... | ... | ... | ... | ... | ... | ... | 57·25 | 518·60 | 2,644·89 | ... | | |
| Do. ... | 5000 ... ... | Great Reward ... ... ... | ... | ... | 23·00 | 11·48 | ... | ... | ... | 23·00 | 11·48 | ... | | |
| Do. ... | 4923 ... ... | Host ... ... ... ... | ... | ... | 8·60 | 5·28 | ... | ... | ... | 8·60 | 5·28 | ... | | |
| Do. ... | 4694 ... ... | Mistletoe ... ... ... ... | ... | ... | 11·25 | 4·57 | ... | ... | ... | 11·25 | 4·57 | ... | | |
| Do. ... | 5114 ... ... | Rebel ... ... ... ... | 9·42 | 10·65 | ... | ... | ... | 9·42 | 10·65 | ... | ... | ... | | |
| Do. ... | ... | Sundry claims ... ... | ... | 28·92 | 21·00 | 69·09 | ... | 9·21 | 64·53 | 3,164·68 | 1,363·35 | ... | | |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 763·97 | 8,678·28 | 3,656·20 | ·17 | | |
| | *From District generally :—* | | | | | | | | | | | | | |
| | Sundry parcels treated at : | | | | | | | | | | | | | |
| | Burbanks Main Lode Works ... ... ... | | ... | ... | ... | ... | ... | 2·77 | ... | 557·50 | 1,261·60 | 114·17 | | |
| | Fremantle Trading Co's. Works ... ... | | ... | ... | ... | ... | ... | ... | ... | ... | 20·08 | ... | | |
| | Highgate Works ... ... ... ... ... | | ... | ... | ... | 13·04 | ... | ... | ... | 100·00 | 334·15 | ... | | |
| | Imperial Battery ... ... ... ... ... | | ... | ... | ... | ... | ... | ... | ... | ... | 2·60 | ... | | |
| | Lady Robinson Cyanide Works ... ... | | ... | ... | ... | ... | ... | ... | ... | 70·00 | 348·28 | ... | | |
| | State Battery—Coolgardie ... ... | | ... | ... | ... | 117·18 | ... | ... | ... | 687·50 | 9,863·17 | ... | | |
| | Various Works ... ... ... ... ... | | ... | ... | ... | ... | ... | 4·98 | ... | 3,083·61 | 15,618·12 | 108·89 | | |
| | Reported by Banks and Gold Dealers ... ... | | 32·29 | ... | ... | ... | ... | 7,417·67 | 543·04 | ... | ... | ... | | |
| | **Total** ... ... ... | | **47·56** | **98·79** | **14,638·28** | **3,336·44** | ... | **8,885·94** | **10,782·32** | **1,518,239·79** | **956,068·66** | **881·79** | | |

## KUNANALLING DISTRICT.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Balgarrie ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 10·94 | 75·48 | 5,124·25 | 4,805·74 | 1·38 | | |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 18·57 | 1,050·25 | 383·04 | ... | | |
| Carbine ... | 33s ... ... | (Carbine) ... ... ... | ... | ... | ... | ... | ... | ... | 10·85 | 2,401·00 | 1,164·53 | ... | | |
| Do. ... | 33s, 710s, 711s ... 807s, 863s | Carbine leases ... ... | ... | ... | 1,600·50 | 1,593·22 | ... | ... | 677·13 | 37,482·86 | 24,403·61 | ... | | |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 3,347·00 | 3,233·60 | ... | | |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 73·00 | 55·69 | ... | | |
| Carnage ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 176·04 | 659·31 | 2,402·00 | 2,170·67 | ... | | |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 61·00 | 27·50 | ... | | |
| Cashman's (Siberia) | 716s, [1289w] ... | Lady Evelyn ... ... ... | ... | ... | ... | ... | ... | ... | ... | 241·75 | 479·81 | ... | | |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 67·51 | 793·44 | 7,187·90 | 6,395·33 | ... | | |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 6·16 | 116·00 | 67·61 | ... | | |
| Chadwin ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 1,111·75 | 2,062·12 | ... | | |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 8·87 | 507·00 | 449·22 | ... | | |

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued

**COOLGARDIE GOLDFIELD**—*continued.*

KUNANALLING DISTRICT—*continued.*

| Mining Centre. | Number of Lease. | Registered Name of Company or Lease. | Total for 1920. | | | | | Total Production. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. |
| | | | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. |
| Dunnsville ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 181·12 | 17,407·10 | 7,982·23 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 4·10 | 36·03 | ... | ·43 | 89·26 | 297·19 | 301·14 | ... |
| Jourdie Hills | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 18·00 | 28,009·74 | 19,401·09 | 28·45 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 760·50 | 422·33 | ... |
| Kandana ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 465·00 | 68·12 | ... |
| Kintore ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 6·66 | 143·66 | 44,174·14 | 31,882·70 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 100·30 | ·78 | 1,217·70 | 1,150·90 | ... |
| Siberia ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 1·07 | 1,557·81 | 8,216·85 | 10,530·14 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 30·91 | ... | 223·00 | 349·86 | ... |
| 25-Mile ... | 696s ... ... | (Blue Bell) ... ... ... | ... | ... | ... | ... | ... | ... | 8·05 | 697·00 | 429·47 | ... |
| Do. ... | 727s ... ... | (Blue Bell Extended) ... ... | ... | ... | ... | ... | ... | ... | ... | 113·00 | 71·32 | ... |
| Do. ... | 696s, 727s ... | Blue Bell leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 1,693·00 | 1,644·11 | ... |
| Do. ... | 845s ... ... | Sadie ... ... ... ... | ... | ... | 119·50 | 130·92 | ... | ... | ... | 1,873·50 | 1,698·14 | ... |
| Do. ... | 871s ... ... | Shamrock ... ... ... | ... | ... | 40·00 | 19·94 | ... | ... | 2·96 | 449·00 | 303·07 | ... |
| Do. ... | 645s ... ... | Star of Fremantle ... ... | 32·67 | ... | 26·00 | 42·80 | ... | 32·67 | ... | 5,301·00 | 3,546·11 | ... |
| Do. ... | 603s ... ... | Sydney Mint ... ... ... | ... | ... | 90·00 | 99·27 | ... | ... | 229·72 | 1,519·75 | 3,301·69 | ... |
| Do. ... | 847s ... ... | Turn of the Tide ... ... | ... | ... | 437·50 | 462·72 | ... | ... | 2·72 | 2,677·80 | 3,571·43 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 453·30 | 87,359·49 | 66,468·64 | 18·84 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 60·50 | 69·67 | ... | 13·22 | 98·21 | 6,445·95 | 3,401·58 | ... |
| | *From District generally :—* | | | | | | | | | | | |
| | Sundry parcels treated at : | | | | | | | | | | | |
| | Blue Bell Battery ... ... ... ... ... | | ... | ... | ... | 15·65 | ... | 3·77 | ... | 72·00 | 1,641·62 | ... |
| | Stanley Works ... ... ... ... ... | | ... | ... | ... | ... | ... | 14·86 | ... | 402·60 | 384·93 | ... |
| | Various Works ... ... ... ... ... | | ... | ... | ... | ... | ... | 9·22 | ... | 1,276·66 | 2,006·02 | ... |
| | Reported by Banks and Gold Dealers ... ... | | ·75 | ... | ... | ... | ... | 264·19 | 1·10 | ... | ... | ... |
| | | **Total ... ... ...** | **33·42** | **...** | **2,378·10** | **2,470·22** | **...** | **731·79** | **5,036·50** | **271,757·73** | **206,255·11** | **48·67** |

## Yilgarn Goldfield.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Blackbourne... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 1,282·50 | 341·37 | ... |
| Bullfinch ... | 914, 915, 916, 926, 928, 942, 960 | (Bullfinch leases) ... ... | ... | ... | ... | ... | ... | ... | ... | 1,027·52 | 10,958·88 | ... |
| Do. ... | 914, 915, 916, 926, 928, 930, 942, 960 | Bullfinch Proprietary (W.A.), Ltd. ... | ... | ... | 58,026·00 | 13,826·06 | 3,929·84 | ... | ... | 468,503·42 | 163,180·39 | 26,863·41 |
| Do. ... | (3198) ... ... | Greenfinch ... ... ... | ... | 3·57 | ... | ... | ... | ... | 3·57 | ... | ... | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 360·65 | 364·67 | ... |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Do. ... | ... | Sundry claims ... ... | ... | ... | 9·75 | 4·24 | ... | ... | ... | 55·15 | 71·29 | ... |
| Corinthian ... | 896, (934), (946), | Corinthian North G.Ms., Ltd. ... | ... | ... | ... | ... | ... | ... | ... | 131,222·00 | 27,795·29 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 3,286·00 | 1,529·54 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 104·50 | 77·35 | ... |
| Ennuin ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 134·56 | 361·34 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 117·00 | 72·12 | ... |
| Forrestonia ... | 2909 ... ... | Great Southern ... ... ... | ... | ... | ... | ... | ... | ... | ... | 77·00 | 58·26 | ... |
| Golden Valley | 2272 ... ... | Glide Away ... ... ... | ... | ... | 125·00 | 232·87 | ... | ... | ... | 1,794·00 | 2,042·23 | ... |
| Do. ... | 2948 ... ... | Greenharp New ... ... ... | ... | ... | ... | ... | ... | ... | ... | 626·50 | 806·04 | ... |
| Do. ... | 2994 ... ... | Radio ... ... ... ... | ... | ... | 582·50 | 1,254·11 | ... | ... | ... | 1,336·00 | 3,576·69 | ... |
| Do. ... | 3138 ... ... | Rona Daphne ... ... ... | ... | ... | 47·00 | 122·41 | ... | ... | ... | 92·00 | 215·54 | ... |
| Do. ... | 2739 ... ... | Rosalie ... ... ... ... ... | ... | ... | 133·00 | 73·67 | ... | ... | ... | 383·75 | 253·14 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 18·05 | 4,718·99 | 4,751·23 | 2·00 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 80·00 | 56·67 | ... | ... | 2·75 | 1,952·22 | 1,633·55 | ... |
| Greenmount | (2787) ... ... | Gold Mount ... ... ... | ... | ... | ... | ... | ... | ... | ... | 45·00 | 11·14 | ... |
| Do. ... | 3179 ... ... | Jean Nichol ... ... ... | ... | ... | 88·00 | 76·94 | ... | ... | ... | 129·00 | 153·37 | ... |
| Do. ... | 550 ... ... | (Sunbeam) ... ... ... | ... | ... | ... | ... | ... | 14·00 | ... | 4,472·00 | 1,427·25 | ... |
| D . ... | 550 ... ... | Sunbeam ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 200·00 | 100·14 | ... |
| Do. ... | 550, (565) ... | (Sunbeam leases) ... ... | ... | ... | ... | ... | ... | ... | ... | 3,191·00 | 816·42 | ... |
| Do. ... | 536 ... ... | (Transvaal) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 30,233·00 | 7,340·62 | 579·78 |
| Do. ... | 536 ... ... | Transvaal ... ... ... | ... | ... | ... | ... | ... | ... | ... | 3,088·00 | 830·09 | ... |
| Do. ... | 536, (1358) ... | (Transvaal leases) ... ... | ... | ... | ... | ... | ... | ... | ... | 11,924·00 | 2,891·60 | ... |
| Do. ... | 3201 ... ... | Triumph ... ... ... ... | ... | ... | 46·50 | 41·05 | ... | ... | ... | 46·50 | 41·05 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 31·99 | 21·62 | 70,329·00 | 17,477·32 | 364·72 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 17·00 | 9·83 | ... | ... | 4·12 | 819·50 | 303·81 | ... |
| Hope's Hill ... | 2544 ... ... | Colleen Bawn ... ... ... | ... | ... | 30·00 | 128·32 | ... | ... | ... | 360·20 | 1,570·76 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 56·97 | 129,884·85 | 33,899·78 | 1·00 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 25·38 | 1,622·50 | 506·06 | ... |
| Kennyville ... | 911, 3170, 3171 | Edna May Battler G.M. Co., N.L. ... | ... | ... | 800·00 | 100·77 | ... | ... | ... | 800·00 | 100·77 | ... |
| Do. ... | 570 ... ... | (Great Leviathan) ... ... | ... | ... | ... | ... | ... | ... | ... | 3,821·85 | 2,948·67 | ... |
| Do. ... | 570 ... ... | Great Leviathan ... ... | ... | ... | 170·00 | 53·87 | ... | ... | ... | 5,722·00 | 3,634·58 | ·50 |
| Do. ... | 570 ... ... | (Great Leviathan: Northern Blocks Syndicate, Ltd.) | ... | ... | ... | ... | ... | ... | ... | 10,705·00 | 2,974·64 | ... |
| Do. ... | 911 ... ... | (Trafalgar) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 1,984·00 | 1,499·02 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 18·76 | 3,487·50 | 2,405·25 | ·09 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 463·00 | 208·45 | ... |
| Koolyanobbing | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 308·00 | 116·74 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 55·00 | 11·24 | ... |
| Marvel Loch... | 3069 ... ... | Banker ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 1,043·00 | 926·75 | ... |
| Do. ... | 923 ... ... | Bohemian ... ... ... | ... | 2·22 | 215·00 | 71·23 | ... | ... | 19·66 | 3,962·00 | 3,704·44 | ... |
| Do. ... | 1689 ... ... | (Bronco) ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 217·00 | 22·17 | ... |
| Do. ... | 1689 ... ... | Bronco: Bronco Horseshoe Proprietary Mining Co., N.L. | ... | ... | 510·00 | 87·97 | ... | ... | ... | 2,921·00 | 847·59 | ... |
| Do. ... | (3140) ... ... | Bulimba ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 51·00 | 23·02 | ... |
| Do. ... | 719 ... ... | (Great Victoria) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 1,356·00 | 281·53 | ... |
| Do. ... | 719, 944, 945, 1227, 1228, 1606 | Great Victia leorases ... ... | ... | ... | 14,075·00 | 2,444·61 | ... | ... | ... | 128,784·26 | 17,540·60 | ... |
| Do. ... | 3161 ... ... | Lucky Seven ... ... ... | ... | ... | 45·00 | 13·39 | ... | ... | ... | 58·00 | 19·11 | ... |
| Do. ... | 852 ... ... | May Queen ... ... ... | ... | ... | 40·00 | 43·27 | ... | ... | 4·07 | 825·50 | 4,127·76 | ... |
| Do. ... | 3186 ... ... | Never Never ... ... ... | ... | ... | 1,843·00 | 324·43 | ... | ... | ... | 1,843·00 | 324·43 | ... |

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

**YILGARN GOLDFIELD**—*continued.*

| Mining Centre. | Number of Lease. | Registered Name of Company or Lease. | Total for 1920. | | | | | Total Production. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. | Alluvial | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. |
| | | | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. |
| Marvel Loch... | (3110) ... ... | Pathfinder ... ... ... | ... | ... | ... | ... | ... | ... | ... | 45·00 | 10·84 | ... |
| Do. ... | (3017) ... ... | Pro Patria ... ... ... | ... | ... | 96·00 | 126·50 | ... | ... | ... | 637·00 | 847·44 | ... |
| Do. ... | 1011 ... ... | Rising Star: Bronco Horseshoe Proprietary Mining Co., N.L. | ... | ... | ... | ... | ... | ... | ... | 140·00 | 11·48 | ... |
| Do. ... | 2998 ... ... | St. George ... ... ... | ... | ... | 252·00 | 59·49 | ... | ... | ... | 2,500·00 | 912·82 | ... |
| Do. ... | 3190 ... ... | Undaunted ... ... ... | ... | ... | 150·00 | 21·91 | ... | ... | ... | 150·00 | 21·91 | ... |
| Do. ... | 3011 ... ... | Victory ... ... ... ... | ... | ... | 123·00 | 55·49 | ... | ... | ... | 766·00 | 501·00 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 80·78 | 232,676·00 | 81,628·15 | 771·03 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 616·00 | 277·83 | ... | 7·72 | 68·81 | 9,441·49 | 4,864·42 | ... |
| Mt. Jackson ... | 2053 ... ... | Great Unknown ... ... ... | ... | ... | ... | ... | ... | ... | 37·22 | 1394·93 | 3,608·73 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 77·66 | 35,791·10 | 24,067·74 | 2,305·28 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 4·42 | 25·43 | 1,481·75 | 1,062·53 | ... |
| Mt. Rankin ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 3·84 | 5·20 | 496·00 | 122·17 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 170·00 | 54·38 | ... |
| Parker's Range | 2801 ... ... | Scots Grey ... ... ... | ... | ... | 66·00 | 57·92 | ... | ... | ... | 801·00 | 309·74 | ... |
| Do. ... | 724 ... ... | (Spring Hill) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 3,232·00 | 607·21 | ... |
| Do. ... | 724, (760) ... | (Spring Hill leases) ... ... | ... | ... | ... | ... | ... | ... | ... | 8,910·00 | 2,215·59 | ... |
| Do. ... | 724, 2633, (2793) | Spring Hill G.M. Co., N.L. ... ... | ... | ... | 17·00 | 55·61 | ... | ... | ... | 1,232·00 | 200·55 | ... |
| Do. ... | (2806) ... ... | Star of the Range ... ... | ... | ... | ... | ... | ... | ... | ... | 121·75 | 213·11 | ... |
| Do. ... | 2951 ... ... | White Horseshoe ... ... | ... | ... | 184·00 | 248·00 | ... | ... | ... | 1,658·50 | 1,519·38 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 105·14 | 13,564·50 | 9,799·93 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 101·00 | 107·29 | ... | ... | ... | 1,814·75 | 1,208·73 | ... |
| Southern Cross | (3185) ... ... | Artilleryman ... ... ... | ... | ... | ... | ... | ... | ... | ... | 145·00 | 152·30 | ... |
| Do. ... | (3166) ... ... | Central ... ... ... ... | ... | ... | 45·00 | 9·89 | ... | ... | ... | 70·00 | 17·41 | ... |
| Do. ... | (3177) ... ... | Glen Innes ... ... ... | ... | ... | ... | ... | ... | ... | ... | 118·00 | 66·38 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 2·13 | 211·22 | 432,827·20 | 211,358·53 | 364·41 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 5·50 | 595·45 | 3,826·10 | 1,156·27 | ... |
| Weston's ... | 2180 ... ... | (Edna May) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 581·00 | 919·27 | ... |
| Do. ... | 2291, 2585, 2615 | Edna May Central G.Ms., N.L. ... | ... | ... | 12,195·00 | 7,025·69 | ... | ... | ... | 136,657·00 | 59,556·68 | 19·38 |
| Do. ... | 2570, 2617, 2644 | Edna May Consolidated G.M. Co., N.L. | ... | ... | 562·00 | 161·07 | ... | ... | ... | 22,341·00 | 9,021·80 | ... |
| Do. ... | 2168, 2238, 2777 | Edna May Deep Levels G.M. Co., N.L. | ... | ... | 11,980·00 | 8,975·07 | ... | ... | ... | 34,848·00 | 27,110·78 | ... |
| Do. ... | 2608, 2716, 2831 | Edna May Golden Point, N.L. ... | ... | ... | 576·00 | 587·48 | ... | ... | ... | 576·00 | 587·48 | ... |
| Do. ... | 2180 (2605) ... | Edna May G.M. Co., N.L. ... ... | ... | ... | 247·00 | 240·28 | ... | ... | ... | 191,824·00 | 171,325·44 | ... |
| Do. ... | (2086), (2087), (2088) (2635), (2841) | Greenfinch Proprietary G.M., N.L. ... | ... | ... | ... | ... | ... | ... | ... | 8,465·27 | 3,153·55 | ... |
| Do. ... | 3097 ... ... | Le Trois ... ... ... ... | ... | ... | 96·00 | 102·66 | ... | ... | ... | 132·00 | 126·65 | ... |
| Do. ... | 2291 ... ... | (Myrtle Central) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 751·00 | 243·96 | ... |
| Do. ... | 2168, 2238 ... | (Myrtle Consols leases) ... ... | ... | ... | ... | ... | ... | ... | ... | 4,009·00 | 3,696·32 | ·20 |
| Do. ... | 2570 ... ... | (Myrtle East) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 202·00 | 116·12 | ... |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Do. ... | 2816 ... ... | Pertha M. ... ... ... | ... | ... | 72·00 | 54·50 | ... | ... | ... | 1,021·00 | 791·73 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 4·06 | 4,881·75 | 4,436·98 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | 1·13 | 38·00 | 30·93 | ... | ... | 12·17 | 838·75 | 863·57 | ... |
| | | *From Goldfields generally :—* | | | | | | | | | | |
| | | Sundry parcels treated at : | | | | | | | | | | |
| | | Australia Battery ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 38·00 | 124·94 | ... |
| | | Fremantle Trading Co., Ltd., Works ... | ... | ... | ... | ... | ... | ... | ... | 21·28 | 592·34 | 33·90 |
| | | Great Victoria Cyanide Works ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 5,832·18 | ... |
| | | Greenfinch Proprietary G.M. Works ... | ... | ... | ... | ... | ... | ... | ... | ... | 2,387·29 | ... |
| | | Hainault Sulphide Plant, Kalgoorlie ... | ... | ... | ... | ... | ... | ... | ... | ... | 18·58 | ... |
| | | Hope's Hill Cyanide Works ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 1,210·29 | ... |
| | | Howlett's Battery ... ... ... ... | ... | ... | ... | 99·40 | ... | ... | ... | ... | 239·14 | ... |
| | | Marvel Loch Mining Co., N.L. ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 4,711·07 | ... |
| | | Never Never Works ... ... ... | ... | ... | ... | 318·46 | ... | ... | ... | ... | 1,382·90 | ... |
| | | Spring Hill Works ... ... ... ... | ... | ... | ... | 48·41 | ... | ... | ... | ... | 618·11 | ... |
| | | Sunbeam Works ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 8·00 | 6,330·85 | ... |
| | | Violet Works ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 968·68 | ... |
| | | Various Works ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 59·00 | 17,042·52 | 2·64 |
| | | Reported by Banks and Gold Dealers ... | ... | ... | ... | ... | ... | 22·05 | 3·53 | ... | ... | ... |
| | | **Total** ... ... ... | ... | **6·92** | **104,298·75** | **37,629·59** | **3,929·84** | **91·65** | **1,401·62** | **2,203,089·54** | **997,123·05** | **31,308·34** |

## Dundas Goldfield.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Buldania ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 3·02 | 846·05 | 708·99 | ... |
| Do. ... | ... | Sundry Claims ... ... | ... | ... | ... | ... | ... | ... | 36·53 | 341·27 | 519·77 | ... |
| Dundas ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 4,543·23 | 2,208·48 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | 385·37 | 182·50 | 143·88 | ... |
| Killaloe ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 20·65 | 6·88 | ... |
| Norseman ... | (1226) ... ... | Cumberland ... ... ... | ... | ... | ... | ... | ... | ... | 9·53 | 162·00 | 323·44 | ... |
| Do. ... | (1183) ... ... | Edith Eleanor ... ... ... | ... | ... | ... | ... | ... | ... | 272·76 | 303·50 | 552·19 | ... |
| Do. ... | 1277 ... ... | Hardy Junction ... ... ... | ... | ... | 83·00 | 100·71 | ... | ... | ... | 83·00 | 100·71 | ... |
| Do. ... | 1209 ... ... | Hoffman's Gold Mines ... ... | ... | ... | 141·00 | 46·81 | ... | ... | ... | 956·25 | 685·28 | ... |
| Do. ... | (1239) ... ... | Iron King ... ... ... | ... | ... | 191·50 | 12·86 | ... | ... | ... | 561·00 | 92·22 | ... |
| Do. ... | 852 ... ... | (Mararoa) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 9,167·00 | 4,484·90 | ... |
| Do. ... | 852, 912, (966), 977, (979), (980), 985, (987),(1031), 1166, (1190), (1192), 1203, 1238 | Mararoa G.M. Co., N.L. ... ... | ... | ... | 5,920·00 | 2,647·19 | ... | ... | ... | 314,263·50 | 149,765·79 | 24,310·24 |
| Do. ... | 1261 ... ... | Mararoa South Extended ... ... | ... | ... | 253·25 | 42·48 | ... | ... | ... | 253·25 | 42·48 | ... |
| Do. ... | (1260) ... ... | Mountain View ... ... ... | ... | ... | ... | ... | ... | ... | 137·75 | ... | ... | ... |
| Do. ... | 1249 ... ... | Myrtle ... ... ... | ... | ... | ... | ... | ... | ... | ... | 89·25 | 86·69 | ... |
| Do. ... | 1259 ... ... | Myrtle Extended (O.K.) ... ... ... | ... | ... | 159·00 | 333·94 | ... | ... | ... | 181·50 | 375·25 | ... |
| Do. ... | 903 ... ... | O.K. leases ... ... ... | ... | ... | ... | ... | ... | ... | 21·23 | 1,147·25 | 1,293·01 | ... |
| Do. ... | 903, 1138 ... | O.K. North ... ... ... | ... | ... | 144·75 | 414·37 | ... | ... | ... | 2,364·00 | 3,455·06 | ... |
| Do. ... | 1244 ... ... | Red, White, and Blue ... ... | ... | ... | 63·25 | 106·23 | ... | ... | ... | 226·75 | 317·63 | ... |
| Do. ... | 1242 ... ... | Stapleton ... ... ... ... | ... | ... | 719·25 | 140·42 | ... | ... | ... | 2,481·75 | 533·08 | ... |
| Do. ... | 1266 ... ... | (Sun) ... ... ... ... | ... | ... | 16·00 | 2·09 | ... | ... | ... | 16·00 | 2·09 | ... |
| Do. ... | 1092 ... ... | Sun ... ... ... ... | ... | ... | ... | ... | ... | ... | 142·26 | 655·50 | 737·49 | ... |
| Do. ... | 1092 ... ... | (Sun leases) ... ... ... | ... | ... | 395·00 | 210·71 | ... | ... | ... | 1,456·00 | 1,470·27 | ... |
| Do. ... | 1092, (1125) ... | Surprise ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 337·00 | 692·34 | ... |
| Do. ... | (1210) ... ... | Victor ... ... ... ... | ... | ... | ... | ... | ... | ... | 1,622·53 | 128·00 | 417·51 | 6·48 |
| Do. ... | 1220 ... ... | (Viking Extended) ... ... | ... | ... | ... | ... | ... | ... | 215·51 | 10·25 | 21·14 | ... |
| Do. ... | 1016 ... ... | | ... | ... | ... | ... | ... | ... | 133·35 | 72·50 | 419·67 | 4·90 |

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

DUNDAS GOLDFIELD—*continued.*

| Mining Centre. | Number of Lease. | Registered Name of Company or Lease. | Total for 1920. | | | | | Total Production | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. | Alluvial | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. |
| | | | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. |
| Norseman ... | 990 ... ... | (Viking No. 1) ... ... ... | ... | ... | ... | ... | ... | ... | ... | 1,274·00 | 3,095·95 | ... |
| Do. ... | 990, 1060 ... | (Viking No. 1 leases) ... ... | ... | ... | ... | ... | ... | ... | ... | 775·50 | 1,176·13 | 16·89 |
| Do. ... | 990, 1016, 1060, 1117, (1194) | Viking No. 1 leases ... ... | ... | ... | 1,657·00 | 1,582·41 | ... | ... | ... | 47,656·25 | 43,427·34 | 242·83 |
| Do. ... | 1180 ... ... | Viking South ... ... ... | ... | ... | 67·75 | 95·58 | ... | ... | ... | 592·25 | 816·57 | ... |
| Do. ... | (986) ... ... | Vini Vidi Vici ... ... ... | ... | ... | ... | ... | ... | ... | 2,482·06 | 351·50 | 916·53 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 4·23 | 5,273·80 | 473,525·79 | 343,459·76 | 10,279·11 |
| Do. ... | ... | Sundry claims ... ... | ... | 282·56 | 665·00 | 405·45 | ... | 996·60 | 2,474·10 | 19,312·21 | 10,789·75 | ·59 |
| Peninsula ... | 1273 ... ... | Hinemoa ... ... ... ... | ... | ... | 23·00 | 107·40 | ... | ... | ... | 23·00 | 107·40 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 17·61 | 7,764·00 | 4,705·10 | ... |
| | | *From Goldfields generally :—* | | | | | | | | | | |
| | | Sundry parcels treated at : | | | | | | | | | | |
| | | Lady Mary Works ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 90·25 | 1,071·85 | ... |
| | | Mararoa Crushing and Cyaniding Works ... | ... | ... | ... | ... | ... | ... | ... | 232·50 | 2,543·56 | 38·75 |
| | | Rawlings, Bullen and Rumble Works ... ... | ... | ... | 29·00 | 9·97 | ... | ... | ... | 56·00 | 3,491·40 | ... |
| | | State Battery—Norseman ... ... ... | ... | ... | ... | ... | ... | ... | ... | 383·75 | 10,578·77 | 885·41 |
| | | Various Works ... ... ... ... ... | ... | ... | ... | ... | ... | ... | 54·52 | 103·00 | 2,947·45 | 607·70 |
| | | Reported by Banks and Gold Dealers ... ... | ... | ... | ... | ... | ... | 1,026·29 | ... | ... | 1·04 | ... |
| | | **Total ... ... ...** | ... | **282·56** | **10,527·75** | **6,258·62** | ... | **2,027·12** | **13,281·93** | **892,988·95** | **598,584·84** | **36,392·90** |

## Phillips River Goldfield.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Kundip ... | 147, 179 ... | Fair Play leases ... ... | ... | ... | 340·16 | 1,014·42 | ... | ... | ... | 4,659·72 | 8,617·63 | 12·63 |
| Do. ... | 184 ... ... | Gem ... ... ... ... | ... | ... | 75·27 | 65·92 | ... | ... | ... | 2,897·23 | 2,483·54 | ... |
| Do. ... | 151 ... ... | (Gem Consolidated) ... ... | ... | ... | ... | ... | ... | ... | ... | 777·50 | 616·30 | ... |
| Do. ... | 151, 156 ... | Gem Consolidated leases ... | ... | ... | ... | ... | ... | ... | ... | 6,308·92 | 5,683·90 | 8·00 |
| Do. ... | M.L. 52, M.L. 94 | Harbour View Gold and Copper Co., Ltd. | ... | ... | 32·79 | 21·46 | } | | | | | |
| | | | | | ... | *28·62 | } ... | ... | ... | 1,395·89 | 1,784·73 | 360·11 |
| Do. ... | M.L. 52, M.L. 94 | (Harbour View leases) ... ... | ... | ... | ... | ... | ... | ... | 379·86 | 3,619·25 | 1,560·86 | 61·41 |
| Do. ... | M.L. 52, M.L. 94 | (Harbour View leases) ... ... | ... | ... | ... | ... | ... | ... | ... | 3,403·50 | 2,227·62 | 1·88 |
| Do. ... | 98 ... ... | Hillsborough ... ... ... | ... | ... | 141·65 | 205·39 | ... | ... | ... | 2,796·15 | 5,175·00 | 118·03 |
| Do. ... | M.L. 370 ... | North Harbour View ... ... | ... | ... | ... | ... | ... | ... | ... | 35·27 | 21·75 | ... |
| Do. ... | M.L. 52, M.L. 94 | (Ravensthorpe G.M. Syndicate, N.L.) | ... | ... | ... | ... | ... | ... | ... | 1,124·00 | 433·94 | 164·98 |
| Do. ... | 74 ... ... | Two Boys ... ... ... | ... | ... | ... | ... | ... | ... | 3·90 | 11,254·71 | 8,349·12 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 113·28 | 172·41 | 26,421·32 | 17,082·62 | 3,070·20 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | 67·68 | 65·74 | ... | 79·05 | 71·58 | 829·87 | 516·26 | 15·45 |
| Mt. Desmond | M.L. 203 ... | (British Flag) ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 7·76 | ... |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Do. ... | M.L. 203 ... | British Flag: Phillip's River Gold and Copper Co., Ltd. | ... | ... | ... | ... | ... | ... | ... | ... | 4·08 | ... |
| Do. ... | M.L. 208 ... | (Desmond) ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ·77 | ... |
| Do. ... | M.L. 208 ... | Desmond ... ... ... ... | ... | ... | ... | *2·70 | ... | ... | ... | ... | 155·38 | ... |
| Do. ... | M.L. 208 ... | (Desmond: Phillip's River Gold and Copper Co., Ltd.) | ... | ... | ... | ... | ... | ... | ... | ... | 219·59 | 14·55 |
| Do. ... | M.L. 95 ... ... | Elverdton ... ... ... | ... | ... | ... | *·53 | ... | ... | ... | ... | 519·69 | ... |
| Do. ... | M.L. 95 ... ... | (Elverdton: Phillip's River Gold and Copper Co., Ltd.) | ... | ... | ... | ... | ... | ... | ... | ... | 2,569·38 | 6,537·35 |
| Do. ... | M.L. 95 ... ... | (Elverdton: Phillip's River Option Syndicate, N.L.) | ... | ... | ... | ... | ... | ... | ... | ... | 9·63 | ... |
| Do. ... | M.L. 168 ... | (Elverton South: Phillip's River Gold and Copper Co., Ltd.) | ... | ... | ... | ... | ... | ... | ... | ... | ·94 | ... |
| Do. ... | M.L. 109 ... | (Mt. Desmond) ... ... ... | ... | ... | ... | ... | ... | ... | 1·40 | ... | 36·97 | ... |
| Do. ... | M.L. 109 ... | Mt. Desmond: Phillip's River Gold and Copper Co., Ltd. | ... | ... | ... | ... | ... | ... | ... | ... | 228·19 | 180·16 |
| Do. ... | M.L. 199 ... | (P.L.P.) ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 13·69 | 7·41 |
| Do. ... | M.L. 199 ... | P.L.P.: Phillip's River Gold and Copper Co., Ltd. | ... | ... | ... | ... | ... | ... | ... | ... | 3·14 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | 9·00 | 136·25 | 152·22 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | *1·60 | ... | ... | ... | ... | 32·81 | 51·01 |
| Mt. Purchas... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 4·38 | 346·05 | 293·13 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 4·75 | 4·68 | ... |
| Ravensthorpe | M.L. 379 ... | Ballarat ... ... ... ... | ... | ... | ... | *·68 | ... | ... | ... | ... | 1·07 | ... |
| Do. ... | M.L. 378 ... | Bickerton ... ... ... | ... | ... | ... | *·40 | ... | ... | ... | ... | ·40 | ... |
| Do. ... | M.L. 16 ... | (Marion Martin) ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 20·09 | ... |
| Do. ... | M.L. 16 ... | Marion Martin ... ... ... | ... | ... | ... | *7·98 | ... | ... | ... | ... | 240·70 | ... |
| Do. ... | M.L. 16 ... ... | (Marion Martin: Phillip's River Gold and Copper Co., Ltd.) | ... | ... | ... | ... | ... | ... | ... | ... | 275·33 | 205·97 |
| Do. ... | M.L. (363) ... | Mt. Benson ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 115·76 | ... |
| Do. ... | M.L. 15 ... ... | (Mt. Cattlin) ... ... ... | ... | ... | ... | ... | ... | ... | ·49 | 200·00 | 85·50 | ... |
| Do. ... | M.L. 15 ... ... | Mt. Cattlin ... ... ... | ... | ... | ... | *·80 | ... | ... | ... | ... | 789·34 | ... |
| Do. ... | M.L. 15 ... ... | (Mt. Cattlin: Mt. Cattlin Copper Mining Co., Ltd.) | ... | ... | ... | ... | ... | ... | ... | ... | 1,496·92 | 52·92 |
| Do. ... | M.L. 15 ... ... | (Mt. Cattlin: Phillips River Gold and Copper Co., Ltd.) | ... | ... | ... | ... | ... | ... | ... | ... | 387·33 | ... |
| Do. ... | M.L. 15 ... ... | (Mt. Cattlin: Phillips River Gold and Copper Co., Ltd.) | ... | ... | ... | ... | ... | ... | ... | ... | 3,077·08 | 3,814·45 |
| Do. ... | M.L. 342 ... | Surprise ... ... ... ... | ... | ... | ... | *1·02 | ... | ... | ... | ... | 32·55 | ... |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | 141·31 | 21,716·76 | 18,615·87 | 310·73 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | *5·16 | ... | 157·82 | 6·60 | 1,997·18 | 1,239·14 | 20·65 |
| West River ... | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 10·34 | 31·06 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | *·34 | ... | ... | ... | ... | 3·29 | 3·44 |
| | *From Goldfield generally:—* | | | | | | | | | | | |
| | Sundry parcels treated at: | | | | | | | | | | | |
| | Gem Battery ... ... ... ... ... | | ... | ... | ... | ... | ... | ... | ... | ... | 138·89 | ... |
| | Phillips River Smelter ... ... ... ... | | ... | ... | ... | ... | ... | ... | ... | ... | 385·96 | 493·66 |
| | Two Boys Works ... ... ... ... ... | | ... | ... | ... | ... | ... | ... | ... | ... | 100·95 | ... |
| | Various Works ... ... ... ... ... | | ... | ... | ... | ... | ... | ... | ... | ... | 4·76 | ... |
| | Reported by Banks and Gold Dealers ... ... | | ... | ... | ... | ... | ... | 122·05 | ... | ... | ... | ... |
| | **Total ... ... ...** | | ... | ... | **657·55** | **1,422·76** | ... | **472·20** | **781·93** | **89,797·07** | **85,810·62** | **15,688·17** |

* From Copper ore.

TABLE IV.—*Production of Gold and Silver from all sources, etc.*—continued.

## † Donnybrook Goldfield.

| Mining Centre. | Number of Lease. | Registered Name of Company or Lease | Total for 1920. | | | | | Total Production. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. | Alluvial. | Dollied and Specimens. | Ore treated. | Gold therefrom. | Silver. |
| | | | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. | Fine ozs. | Fine ozs. | Tons (2,240lbs.) | Fine ozs. | Fine ozs. |
| Donnybrook | ... | Voided leases ... ... ... | ... | ... | ... | ... | ... | 23·24 | ... | 1,613·30 | 816·23 | ... |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | ... | ... | 40·00 | 2·29 | ... |
| | | **Total** ... ... ... | ... | ... | ... | ... | ... | **23·24** | ... | **1,653·30** | **818·52** | ... |

## State generally.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Coobana Creek | (28H) ... ... | Cubana Reward ... ... ... | ... | 7·25 | ... | ... | ... | ... | 53·66 | ... | ... | ... |
| | | Sundry parcels treated at : | | | | | | | | | | |
| | | Fremantle Trading Co., Ltd., Fremantle ... | ... | ... | ... | 13·42 | ... | ... | ... | ... | 2,919·71 | 9,347·45 |
| | | Hainault Sulphide Plant, Kalgoorlie ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 21·28 | ... |
| | | State Smelter, Ravensthorpe ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 41·20 | ... |
| | | Various Works ... ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | 27·00 | 4,411·14 | 481·77 |
| | | Sundry Specimens ... ... ... ... ... | ... | ... | ... | ... | ... | ... | 2·87 | ... | ... | ... |
| | | Reported by Banks and Gold Dealers ... ... | ... | ... | ... | ... | ... | 124·89 | 153·03 | ... | ... | ... |
| | | **Total** ... ... ... | ... | **7·25** | ... | **13·42** | ... | **124·89** | **209·56** | **27·00** | **7,393·33** | **9,829·22** |

† Abolished 4th March, 1908.

## TABLE V.

COMPARATIVE RETURN OF GOLD BULLION ENTERED FOR EXPORT AND RECEIVED AT THE PERTH BRANCH OF THE ROYAL MINT, DURING THE YEARS 1918, 1919, AND 1920, SHOWING IN FINE OUNCES THE QUANTITY RECORDED EACH MONTH, AND ITS VALUE.

| MONTHS AND QUARTERS. | 1918. | | | | 1919. | | | | 1920. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 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 ... ... ... ... | 687·00 | 73,703·44 | 74,390·44 | 315,990 10 8¾ | ... | 69,953·61 | 69,953·61 | 297,144 0 11½ | 836·72 | 25,670·66 | 26,507·38 | 112,596 3 10½ |
| FEBRUARY ... ... ... | 816·00 | 76,987·39 | 77,803·39 | 330,487 15 10½ | 733·10 | 66,310·48 | 67,043·58 | 284,783 0 6¼ | 1,927·85 | 49,452·81 | 51,380·66 | 218,251 3 5 |
| MARCH ... ... ... ... | 2,568·00 | 69,730·59 | 72,298·59 | 307,104 17 9½ | ... | 66,158·54 | 66,158·54 | 281,023 12 3½ | ... | 54,020·93 | 54,020·93 | 229,466 6 6 |
| *1st January to 31st March* ... | **4,071·00** | **220,421·42** | **224,492·42** | **953,583 4 4¼** | **733·10** | **202,422·63** | **203,155·73** | **862,950 13 9¼** | **2,764·57** | **129,144·40** | **131,908·97** | **560,313 13 9½** |
| APRIL ... ... ... ... | 406·61 | 66,079·30 | 66,485·91 | 282,414 3 10¾ | 32·96 | 63,464·81 | 63,497·77 | 269,721 7 7¾ | 835·05 | 56,256·47 | 57,091·52 | 242 509 7 2¾ |
| MAY ... ... ... ... | 3,823·04 | 73,701·65 | 77,524·69 | 329,303 19 0¼ | 524·99 | 68,654·55 | 69,179·54 | 293,856 0 1¾ | 227·15 | 50,976·12 | 51,203·27 | 217,497 13 3¾ |
| JUNE ... ... ... ... | 577·67 | 74,904·52 | 75,482·19 | 320,627 19 3 | 1,050·48 | 73,546·47 | 74,596·95 | 316,867 14 0½ | 502·15 | 56,679·78 | 57,181·93 | 242 893 8 0 |
| *1st January to 30th June* ... | **8,878·32** | **435,106·89** | **443,985·21** | **1,885,929 6 6¾** | **2,341·53** | **408,088·46** | **410,429·99** | **1,743,395 15 7½** | **4,328·92** | **293,056·77** | **297,385·69** | **1,263,214 2 4** |
| JULY ... ... ... ... | 1,511·28 | 72,081·85 | 73,593·13 | 312,603 14 11 | 680·07 | 68,028·11 | 68,708·18 | 291,853 15 11¼ | ... | 48,341·22 | 48,341·22 | 205,340 9 0 |
| AUGUST ... ... ... ... | 106·74 | 76,156·04 | 76,262·78 | 323,943 13 11½ | 835·49 | 58,117·09 | 58,952·58 | 250,414 12 10¼ | 167·61 | 54,258·14 | 54,425·75 | 231,185 17 9¾ |
| SEPTEMBER ... ... ... | 964·04 | 74,057·80 | 75,021·84 | 318,672 10 4¾ | ... | 36,241·61 | 36,241·61 | 153,944 11 5¾ | 141·25 | 54,798·76 | 54,940·01 | 233,370 6 7 |
| *1st January to 30th September* ... | **11,460·38** | **657,402·58** | **668,862·96** | **2,841,149 5 10** | **3,857·09** | **570,475·27** | **574,332·36** | **2,439,608 15 10½** | **4,637·78** | **450,454·89** | **455,092·67** | **1,933,110 15 8¾** |
| OCTOBER ... ... ... ... | ... | 71,438·95 | 71,438·95 | 303,453 7 5 | 585·71 | 64,987·11 | 65,572·82 | 278,535 12 8¼ | 174·15 | 53,801·21 | 53,975·36 | 229,272 15 1½ |
| NOVEMBER ... ... ... | 1,444·66 | 70,711·35 | 72,156·01 | 306,499 4 11½ | 1,171·33 | 64,823·40 | 65,994·73 | 280,327 15 10¾ | 128·09 | 54,729·33 | 54,857·42 | 233,019 10 2 |
| DECEMBER ... ... ... | 2,739·08 | 61,314·15 | 64,053·23 | 272,080 16 6½ | 831·76 | 27,334·12 | 28,165·88 | 119,641 1 0¾ | 321·11 | 53,595·57 | 53,916·68 | 229,023 9 11¾ |
| **Total** ... ... ... | **15,644·12** | **860,867·03** | **876,511·15** | **3,723,182 14 9** | **6,445·89** | **727,619·90** | **734,065·79** | **3,118,113 5 6¼** | **5,261·13** | **612,581·00** | **617,842·13** | **2,624,426 11 0** |

## Total Output of Gold Bullion entered for EXPORT, and received at the Perth Branch of the Quantity obtained each Year from the respective

| Year. | Kimberley. | | | Pilbara. | | | *a* West Pilbara. | | | Ashburton. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Export. | Mint. | Total. | Export. | Mint. | Total. | Export. | Mint. | Total. | Export. | Mint. | Total. |
| | fine ozs. | fine ozs. | fine ozs. | fine ozs. | fine ozs. | fine ozs. | fine ozs. | fine ozs. | fine ozs. | fine ozs. | fine ozs. | fine ozs. |
| 1886 | 270·17 | ... | 270·17 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1887 | 4,359·37 | ... | 4,359·37 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1888 | 3,124·82 | ... | 3,124·82 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1889 | 2,204·28 | ... | 2,204·28 | 9,992·63 | ... | 9,992·63 | ... | ... | ... | ... | ... | ... |
| 1890 | 4,002·42 | ... | 4,002·42 | 14,363·01 | ... | 14,363·01 | ... | ... | ... | ... | ... | ... |
| 1891 | 2,415·07 | ... | 2,415·07 | 10,623·32 | ... | 10,623·32 | ... | ... | ... | 750·31 | ... | 750·31 |
| 1892 | 974·08 | ... | 974·08 | 11,533·84 | ... | 11,533·84 | ... | ... | ... | ·63 | ... | ·63 |
| 1893 | 1,450·77 | ... | 1,450·77 | 10,465·43 | ... | 10,465·43 | ... | ... | ... | 418·43 | ... | 418·43 |
| 1894 | 526·59 | ... | 526·59 | 14,541·20 | ... | 14,541·20 | ... | ... | ... | 255·20 | ... | 255·20 |
| 1895 | 784·27 | ... | 784·27 | 17,464·65 | ... | 17,464·65 | ... | ... | ... | 483·76 | ... | 483·76 |
| 1896 | 797·85 | ... | 797·85 | 10,565·27 | ... | 10,565·27 | ... | ... | ... | 598·64 | ... | 598·64 |
| 1897 | 495·67 | ... | 495·67 | 10,695·67 | ... | 10,695·67 | ... | ... | ... | 928·75 | ... | 928·75 |
| 1898 | 257·54 | ... | 257·54 | 10,433·27 | ... | 10,433·27 | 1,814·48 | ... | 1,814·48 | 402·46 | ... | 402·46 |
| 1899 | 728·52 | 275·94 | 1,004 46 | 17,888·69 | 473·96 | 18,362·65 | 1,749·39 | ... | 1,749·39 | 214·26 | 252·10 | 466·36 |
| 1900 | 29·16 | 576·14 | 605·30 | 8,629·83 | 6,703·99 | 15,333·82 | 522·76 | 122·85 | 645·61 | 44·82 | 424·27 | 469·09 |
| 1901 | ... | 601·26 | 601·26 | 36·68 | 10,223·75 | 10,260·43 | 78·38 | 357·46 | 435·84 | 7·70 | 50·24 | 57·94 |
| 1902 | 1·48 | 378·02 | 379·50 | ... | 9,199·50 | 9,199·50 | ... | 2,822·20 | 2,822·20 | ... | ... | ... |
| 1903 | ... | 433·71 | 433·71 | 2·26 | 12,049·52 | 12,051·78 | ... | 5,493·23 | 5,493·23 | ... | 114·67 | 114·67 |
| 1904 | ... | 31·51 | 31·51 | ... | 6,931·27 | 6,931·27 | ... | 4,320·82 | 4,320·82 | ... | 125·96 | 125·96 |
| 1905 | ... | 545·95 | 545·95 | 48·33 | 13,353·49 | 13,401·82 | ... | 1,164·92 | 1,164·92 | ... | 42·05 | 42·05 |
| 1906 | ... | 647·77 | 647·77 | ... | 4,956·14 | 4,956·14 | ... | 755·35 | 755·35 | ... | 138·84 | 138·84 |
| 1907 | ... | 362·06 | 362·06 | ... | 4,130·48 | 4,130·48 | ... | 332·30 | 332·30 | ... | 41·85 | 41·85 |
| 1908 | ... | 338·00 | 338·00 | ... | 8,172·26 | 8,172·26 | ... | 1,076·68 | 1,076·68 | ... | 45·87 | 45·87 |
| 1909 | ... | 168·95 | 168·95 | ... | 5,529·19 | 5,529·19 | ... | 1,396·22 | 1,396·22 | ... | 228·16 | 228·16 |
| 1910 | ... | 487·25 | 487·25 | ... | 5,894·32 | 5,894·32 | 63·66 | 1,387·66 | 1,451·32 | ... | 173·06 | 173·06 |
| 1911 | ... | 148·53 | 148·53 | ... | 4,874·00 | 4,874·00 | 58·00 | 819·35 | 877·35 | ... | 270·68 | 270·68 |
| 1912 | ... | 294·55 | 294·55 | ... | 6,274·04 | 6,274·04 | ... | 747·34 | 747·34 | ... | 38·73 | 38·73 |
| 1913 | ... | 266·41 | 266·41 | ... | 4,207·37 | 4,207·37 | ... | 1,237·85 | 1,237·85 | ... | 39·26 | 39·26 |
| 1914 | ... | 196·46 | 196·46 | ... | 5,544·64 | 5,544·64 | ... | 1,262·73 | 1,262·73 | ... | 46·14 | 46·14 |
| 1915 | ... | 220·94 | 220·94 | ... | 7,411·06 | 7,411·06 | ·64 | 1,239·94 | 1,240·58 | ... | 16·63 | 16·63 |
| 1916 | ... | 249·58 | 249·58 | ... | 6,700·93 | 6,700·93 | ... | 560·79 | 560·79 | ... | 31·16 | 31·16 |
| 1917 | ... | 108·90 | 108·90 | ... | 4,673·40 | 4,673·40 | 63·80 | 559·95 | 623·75 | ... | 21·21 | 21·21 |
| 1918 | ... | 116·34 | 116·34 | 2·35 | 2,951·81 | 2,954·16 | ... | 267·48 | 267·48 | ... | 6·29 | 6·29 |
| 1919 | ... | 239·74 | 239·74 | ... | 3,849·66 | 3,849·66 | ... | 23·90 | 23·90 | ... | 3·30 | 3·30 |
| 1920 | ... | 131·53 | 131·53 | 9·42 | 5,295·85 | 5,305·27 | ... | 114·20 | 114·20 | ... | 2·96 | 2·96 |
| Total | 22,422·06 | 6,819·54 | 29,241·60 | 147,295·85 | 139,400·63 | 286,696·48 | 4,351·11 | 26,063·22 | 30,414·33 | 4,104·96 | 2,113·43 | 6,218·39 |

| Year. | *d* Yalgoo. | | | *c* Mt. Margaret. | | | *e* North Coolgardie. | | | *f* Broad Arrow. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1886 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1887 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1888 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1889 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1890 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1891 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1892 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1893 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1894 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1895 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1896 | ... | ... | ... | ... | ... | ... | 15,351·71 | ... | 15,351·71 | ... | ... | ... |
| 1897 | 1,819·81 | ... | 1,819·81 | 7,770·22 | ... | 7,770·22 | 66,697·57 | ... | 66,697·57 | 3,720·87 | ... | 3,720·87 |
| 1898 | 3,360·44 | ... | 3,360·44 | 38,706·19 | ... | 38,706·19 | 63,181·09 | ... | 63,181·09 | 22,035·17 | ... | 22,035·17 |
| 1899 | 5,089·83 | 4,643·00 | 9,732·83 | 58,064·19 | 15,128·98 | 73,193·17 | 54,489·26 | 40,059·43 | 94,548·69 | 32,224·04 | 7,607·18 | 39,831·22 |
| 1900 | 462·55 | 7,918·53 | 8,381·08 | 65,998·38 | 60,607·45 | 126,605·83 | 15,660·11 | 79,340·01 | 95,000·12 | 29,955·07 | 12,860·80 | 42,815·87 |
| 1901 | 6·80 | 8,330·42 | 8,337·22 | 65,352·46 | 114,840·17 | 180,192·63 | 6,620·82 | 122,806·58 | 129,427·40 | 9,313·50 | 17,066·09 | 26,379·59 |
| 1902 | 483·32 | 4,396·91 | 4,880·23 | 61,846·01 | 124,306·49 | 186,152·50 | 4,064·18 | 156,856·06 | 160,920·24 | 2,128·49 | 13,665·52 | 15,794·01 |
| 1903 | 47·08 | 1,430·59 | 1,477·67 | 65,416·09 | 125,437·19 | 190,853·28 | 1,348·74 | 167,153·90 | 168,502·64 | 5,201·12 | 18,245·41 | 23,446·53 |
| 1904 | ... | 2,796·23 | 2,796·23 | 63,180·89 | 119,889·93 | 183,070·82 | 1,614·64 | 139,518·37 | 141,133·01 | 318·83 | 20,660·78 | 20,979·61 |
| 1905 | 76·75 | 4,549·25 | 4,626·00 | 34,949·75 | 153,203·05 | 188,152·80 | 1,193·71 | 145,615·47 | 146,809·18 | 603·66 | 15,300·58 | 15,904·24 |
| 1906 | ... | 4,883·17 | 4,883·17 | 21,869·88 | 137,022·23 | 158,892·11 | 1,140·45 | 107,890·76 | 109,031·21 | 1,245·75 | 16,841·70 | 18,087·45 |
| 1907 | ... | 3,199·60 | 3,199·60 | 23,989·43 | 154,059·92 | 178,049·35 | 13,240·87 | 72,701·05 | 85,941·92 | 4,292·34 | 13,610·81 | 17,903·15 |
| 1908 | ... | 456·43 | 456·43 | 19,324·02 | 147,879·90 | 167,203·92 | 6,701·28 | 76,700·77 | 83,402·05 | 3,613·64 | 7,946·35 | 11,559·99 |
| 1909 | ... | 626·80 | 626·80 | 24,123·15 | 135,914·94 | 160,038·09 | 6,389·19 | 66,631·79 | 73,020·98 | 6,711·37 | 4,863·50 | 11,574·87 |
| 1910 | ... | 725·79 | 725·79 | 28,507·31 | 131,976·01 | 160,483·32 | 1,889·24 | 60,886·71 | 62,775·95 | ... | 321·40 | 321·40 |
| 1911 | ... | 294·80 | 294·80 | 21,302·54 | 131,280·97 | 152,583·51 | 209·17 | 60,270·42 | 60,479·59 | 176·57 | 280·54 | 457·11 |
| 1912 | ... | 1,169·18 | 1,169·18 | 4,835·73 | 101,353·79 | 106,189·52 | 53·68 | 49,946·08 | 49,999·76 | ... | 4·33 | 4·33 |
| 1913 | ... | 2,837·97 | 2,837·97 | 157·14 | 89,408·71 | 89,565·85 | ... | 60,855·69 | 60,855·69 | ... | 8,947·58 | 8,947·58 |
| 1914 | ... | 1,403·35 | 1,403·35 | 184·66 | 103,550·71 | 103,735·37 | ... | 73,943·49 | 73,943·49 | ... | 3,074·74 | 3,074·74 |
| 1915 | ... | 4,218·34 | 4,218·34 | 68·20 | 107,934·53 | 108,002·73 | 638·99 | 56,372·00 | 57,010·99 | ... | 14,447·56 | 14,447·56 |
| 1916 | ... | 4,336·27 | 4,336·27 | 642·48 | 111,277·58 | 111,920·06 | ... | 39,714·46 | 39,714·46 | ... | 6,815·74 | 6,815·74 |
| 1917 | ... | 1,108·11 | 1,108·11 | ... | 111,357·98 | 111,357·98 | ... | 28,306·34 | 28,306·34 | ... | 9,185·65 | 9,185·65 |
| 1918 | ... | 878·62 | 878·02 | ... | 95,186·67 | 95,186·67 | ... | 30,273·00 | 30,273·00 | ... | 2,493·63 | 2,493·63 |
| 1919 | ... | 648·81 | 648·81 | ... | 95,129·83 | 95,129·83 | ... | 21,535·19 | 21,535·19 | ... | 2,782·50 | 2,782·50 |
| 1920 | ... | 243·26 | 243·26 | ... | 82,976·60 | 82,976 60 | ... | 11,221·31 | 11,221·31 | ... | 5,642·42 | 5,642·42 |
| Total | 11,346·58 | 61,094·83 | 72,441·41 | 606,288·72 | 2,449,723·63 | 3,056,012·35 | 260,484·70 | 1,668,598·88 | 1,929,083·58 | 121,540·42 | 202,664·81 | 324,205·23 |

| Year. | *h* Dundas. | | | *i* Phillips River. | | | ¶ Donnybrook. | | | State generally. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1886 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1887 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1888 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1889 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1890 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1891 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1892 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1893 | 132·37 | ... | 132·37 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1894 | 204·31 | ... | 204·31 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1895 | 216·40 | ... | 216·40 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1896 | 3,891·77 | ... | 3,891·77 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1897 | 17,275·36 | ... | 17,275·36 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1898 | 28,655·52 | ... | 28,655·52 | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1899 | 39,980·65 | 423·71 | 40,404·36 | ... | ... | ... | 277·27 | 175·49 | 452·76 | ... | 809·07 | 809·07 |
| 1900 | 8,144·72 | 28,254·19 | 36,398·91 | ... | ... | ... | ... | 237·56 | 237·56 | 5,644·83 | 1,450·08 | 7,094·91 |
| 1901 | 5,411·46 | 29,752·16 | 35,163·62 | ... | ... | ... | ... | 4·20 | 4·20 | 215·91 | 1,511·63 | 1,727·54 |
| 1902 | 4,401·31 | 26,714·16 | 31,115·47 | 2,946·53 | 4,422·56 | 7,369·09 | 4·94 | 57·64 | 62·58 | 7·77 | 2,115·52 | 2,123·29 |
| 1903 | 1,311·53 | 33,905·88 | 35,217·41 | 2,136·09 | 5,441·68 | 7,577·77 | ... | 82·64 | 82·64 | 53·44 | 2,839·44 | 2,892·88 |
| 1904 | 1,834·03 | 31,347·06 | 33,181·09 | 936·76 | 2,047·59 | 2,984·35 | ... | ... | ... | ·86 | 1,344·25 | 1,345·11 |
| 1905 | 1,324·48 | 27,411·31 | 28,735·79 | 2,060·46 | 1,458·44 | 3,518·90 | ... | ... | ... | 70·41 | 1,515·58 | 1,585·99 |
| 1906 | 1,111·18 | 20,198·62 | 21,309·80 | 945·65 | 1,439·03 | 2,384·68 | ... | ... | ... | 284·38 | 763·15 | 1,047·53 |
| 1907 | ... | 22,830·71 | 22,830·71 | 4,043·86 | 1,514·90 | 5,558·76 | ... | ... | ... | 799·48 | 285·47 | 1,084·95 |
| 1908 | ... | 41,203·39 | 41,203·39 | 969·00 | 3,631·02 | 4,600·02 | ... | ... | ... | 15·91 | 1,953·56 | 1,969·47 |
| 1909 | ... | 35,894·72 | 35,894·72 | 4,025·81 | 3,605·75 | 7,631·56 | ... | ... | ... | 46·78 | 455·34 | 502·12 |
| 1910 | ... | 43,260·55 | 43,260·55 | 3,271·89 | 5,031·60 | 8,303·49 | ... | ... | ... | 48·67 | 222·89 | 271 56 |
| 1911 | ... | 48,361·14 | 48,361·14 | 1,374·96 | 4,241·05 | 5,616·01 | ... | ... | ... | 209·03 | 129·01 | 338·04 |
| 1912 | ... | 38,373·40 | 38,373·40 | ... | 3,292·05 | 3,292·05 | ... | ... | ... | 687·32 | 142·72 | 830·04 |
| 1913 | ... | 27,090·46 | 27,090·46 | ... | 3,515·02 | 3,515·02 | ... | ... | ... | 385·58 | 230·17 | 615·75 |
| 1914 | ... | 27,803·51 | 27,803 51 | ... | 395 67 | 395·67 | ... | ... | ... | 280·34 | 287·86 | 568·20 |
| 1915 | ... | 24,148·61 | 24,148·61 | 2,011·73 | 263·06 | 2,274·79 | ... | ... | ... | 188·32 | 318·59 | 506·91 |
| 1916 | ... | 21,956·42 | 21,956·42 | 4,119·93 | 181·13 | 4,301·06 | ... | ... | ... | 8,188·93 | 357·85 | 8,546·78 |
| 1917 | ... | 19,346·27 | 19,346·27 | 2,995·76 | 196·24 | 3,192·00 | ... | ... | ... | 356·72 | 216·30 | 573·02 |
| 1918 | ... | 16,215·83 | 16,215·83 | 4,463·52 | 400·11 | 4,863·63 | ... | ... | ... | 1·89 | 562·96 | 564·85 |
| 1919 | ... | 13,631·96 | 13,631·96 | ... | 349·49 | 349·49 | ... | ... | ... | ... | 88·12 | 88·12 |
| 1920 | ... | 7,156·82 | 7,156·82 | ... | 34·62 | 34·62 | ... | ... | ... | ... | 129·31 | 129·31 |
| Total | 113,895·09 | 585,280·88 | 699,175·97 | 36,301·95 | 41,461·01 | 77,762·96 | 282·21 | 557·53 | 839·74 | 17,483·57 | 17,728·87 | 35,215·44 |

*a* Prior to 1st May, 1898, included with Pilbara. *d* Prior to 1st April, 1897, included with Murchison. *c* From 1st August, 1897.
*e* Prior to 1st May, 1896, included with Coolgardie. *f* From 1st September, 1897. *h* Prior to 1893 included with Yilgarn.
*i* Prior to 1902, included in State generally. ¶ Abolished 4th March, 1908.

ROYAL MINT, FROM 1ST JANUARY, 1886, TO 31ST DECEMBER 1920, SHOWING, IN FINE OUNCES, THE GOLDFIELDS, AND THE TOTAL ANNUAL VALUE.

| Year. | *b* GASCOYNE. | | | *c* PEAK HILL. | | | *c* EAST MURCHISON. | | | MURCHISON. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Export. | Mint. | Total. | Export. | Mint. | Total. | Export. | Mint. | Total. | Export. | Mint. | Total. |
| | fine ozs. | fine ozs. | fine ozs. | fine ozs. | fine ozs. | fine ozs. | fine ozs. | fine ozs. | fine ozs. | fine ozs. | fine ozs. | fine ozs. |
| 1886 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1887 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1888 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1889 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1890 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1891 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1,846·83 | ... | 1,846·83 |
| 1892 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 21,789·19 | ... | 21,789·19 |
| 1893 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 18,974·77 | ... | 18,974·77 |
| 1894 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 47,365·54 | ... | 47,365·54 |
| 1895 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 58,575·66 | ... | 58,575·66 |
| 1896 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 63,769·17 | ... | 63,769·17 |
| 1897 | ... | ... | ... | 4,571·38 | ... | 4,571·38 | 8,457·34 | ... | 8,457·34 | 74,154·67 | ... | 74,154·67 |
| 1898 | ... | ... | ... | 12,288·93 | ... | 12,288·93 | 35,393·19 | ... | 35,393·19 | 83,794·22 | ... | 83,794·22 |
| 1899 | 297·96 | 76·63 | 374·59 | 14,064·24 | 14,558·64 | 28,622·88 | 33,826·08 | 3,361·95 | 37,188·03 | 61,586·09 | 22,074·71 | 83,660·80 |
| 1900 | ... | 77·02 | 77·02 | 9,528·14 | 16,119·79 | 25,647·93 | 23,545·54 | 28,671·55 | 52,217·09 | 53,815·70 | 43,423·77 | 97,239·47 |
| 1901 | 6·59 | 16·82 | 23·41 | 231·85 | 19,352·44 | 19,584·29 | 29,780·63 | 40,557·07 | 70,337·70 | 92,149·56 | 38,996·10 | 131,145·66 |
| 1902 | ... | 107·29 | 107·29 | 85·93 | 28,044·55 | 28,130·48 | 25,450·63 | 53,583·10 | 79,033·73 | 141,731·91 | 40,926·08 | 182,657·99 |
| 1903 | ... | 30·76 | 30·76 | 203·60 | 29,395·32 | 29,598·92 | 21,878·06 | 65,334·05 | 87,212·11 | 154,012·88 | 54,348·53 | 208,361·41 |
| 1904 | ... | 10·95 | 10·95 | ... | 17,475·33 | 17,475·33 | 21,296·85 | 64,550·36 | 85,847·21 | 165,232·67 | 52,683·16 | 217,915·83 |
| 1905 | ... | 21·34 | 21·34 | 125·01 | 13,371·75 | 13,496·76 | 1,361·68 | 89,249·93 | 90,611·61 | 131,656·36 | 92,742·05 | 224,398·41 |
| 1906 | ... | 78·73 | 78·73 | ... | 2,038·62 | 2,038·62 | 140·68 | 95,168·89 | 95,309·57 | 79,172·69 | 109,936·80 | 189,109·49 |
| 1907 | ... | 8·44 | 8·44 | ... | 5,918·75 | 5,918·75 | 2,891·66 | 117,735·69 | 120,627·35 | 54,811·74 | 115,497·50 | 170,309·24 |
| 1908 | ... | 31·82 | 31·82 | ... | 9,864·36 | 9,864·36 | 10,701·24 | 137,028·14 | 147,729·38 | 45,483·05 | 111,540·54 | 157,023·59 |
| 1909 | ... | 7·37 | 7·37 | ... | 7,322·29 | 7,322·29 | 11,599·83 | 136,637·67 | 148,237·50 | 24,682·47 | 107,167·27 | 131,849·74 |
| 1910 | ... | 26·31 | 26·31 | ... | 3,057·25 | 3,057·25 | 1,557·78 | 137,190·44 | 138,748·22 | 19,568·85 | 111,414·23 | 130,983·08 |
| 1911 | ... | 7·87 | 7·87 | ... | 134·23 | 134·23 | 11·77 | 96,442·87 | 96,454·64 | 13,919·70 | 109,444·91 | 123,364·61 |
| 1912 | ... | 6·55 | 6·55 | ... | 196·11 | 196·11 | ... | 90,397·82 | 90,397·82 | 6,377·17 | 105,245·32 | 111,622·49 |
| 1913 | ... | ... | ... | ... | 258·10 | 258·10 | 195·78 | 80,122·11 | 80,317·89 | 5,749·47 | 115,694·96 | 121,444·43 |
| 1914 | ... | 4·11 | 4·11 | ... | 85·66 | 85·66 | 354·75 | 65,609·61 | 65,964·36 | 6,443·82 | 111,822·67 | 118,266·49 |
| 1915 | ... | 65·55 | 65·55 | ·56 | 446·00 | 446·56 | 268·57 | 52,926·34 | 53,194·91 | 8,669·79 | 96,610·36 | 105,280·15 |
| 1916 | ... | 60·53 | 60·53 | ... | 155·01 | 155·01 | 902·67 | 30,284·85 | 31,187·52 | 6,694·02 | 77,369·19 | 84,063·21 |
| 1917 | ... | ... | ... | ... | ... | ... | ... | 7,942·96 | 7,942·96 | 1,082·93 | 94,142·67 | 95,225·60 |
| 1918 | ... | ... | ... | ... | ... | ... | ... | 768·08 | 768·08 | 214·23 | 75,478·06 | 75,692·29 |
| 1919 | ... | ... | ... | ... | 57·83 | 57·83 | ... | 766·30 | 766·30 | ... | 64,425·15 | 64,425·15 |
| 1920 | ... | 3·19 | 3·19 | ... | 18·78 | 18·78 | ... | 98 82 | 98·82 | 835 05 | 56,338·49 | 57,173·54 |
| Total | 304·55 | 641·28 | 945·83 | 41,099·64 | 167,870·81 | 208,970·45 | 229,614·73 | 1,394,428·60 | 1,624,043·33 | 1,444,160·20 | 1,807,322·52 | 3,251,482·72 |

| Year. | *e* NORTH-EAST COOLGARDIE. | | | *e* EAST COOLGARDIE. | | | *g* COOLGARDIE. | | | YILGARN. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1886 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1887 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1888 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1889 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1,662·61 | ... | 1,662·61 |
| 1890 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2,036·99 | ... | 2,036·99 |
| 1891 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 11,480·61 | ... | 11,480·61 |
| 1892 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 18,973·91 | ... | 18,973·91 |
| 1893 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 67,760·73 | ... | 67,760·73 |
| 1894 | ... | ... | ... | ... | ... | ... | 94,227·58 | ... | 94,227·58 | 28,178·31 | ... | 28,178·31 |
| 1895 | ... | ... | ... | ... | ... | ... | 111,919·21 | ... | 111,919·21 | 17,666·25 | ... | 17,666·25 |
| 1896 | 3,679·63 | ... | 3,679·63 | 76,297·42 | ... | 76,297·42 | 61,848·03 | ... | 61,848·03 | 14,819·20 | ... | 14,819·20 |
| 1897 | 29,437·40 | ... | 29,437·40 | 268,411·95 | ... | 268,411·95 | 93,312·00 | ... | 93,312·00 | 16,097·78 | ... | 16,097·78 |
| 1898 | 112 039·58 | ... | 112,039·58 | 402,847·31 | ... | 402,847·31 | 113,816·75 | ... | 113,816·75 | 10,463 35 | ... | 10,463·35 |
| 1899 | 57,674·82 | 14,940·55 | 72,615·37 | 796,696·63 | 29,567·58 | 826,264·21 | 101,589·22 | 24,700·89 | 126,290·11 | 6,919·11 | 8,114·60 | 15,033·71 |
| 1900 | 10,400·57 | 36,233·90 | 46,634·47 | 600,328·29 | 125,105·24 | 725,433·53 | 60,988·33 | 46,167·62 | 107,155·95 | 688·47 | 25,628·83 | 26,317·30 |
| 1901 | 6,798·56 | 39,024·18 | 45,822·74 | 698,042·56 | 238,840·93 | 936,883·49 | 9,584·35 | 70,720·21 | 80,304·56 | 49·15 | 26,677·85 | 26,727·00 |
| 1902 | 549·07 | 46,316·67 | 46,865·74 | 460,462·26 | 546,964·68 | 1,007,426·94 | 2,872·61 | 80,887·85 | 83,760·46 | 3·31 | 22,232·80 | 22,236·11 |
| 1903 | 4,308·99 | 36,145·75 | 40,454·74 | 570,447·27 | 580,790·97 | 1,151,238·24 | 7,318·63 | 69,681·38 | 77,000·01 | ... | 22,761·00 | 22,761·00 |
| 1904 | 55·09 | 33,262·10 | 33,317·19 | 555,016·48 | 584,579·88 | 1,139,596·36 | 1,100·07 | 61,073·11 | 62,173·18 | 28·87 | 29,965·37 | 29,994·24 |
| 1905 | 2,187·11 | 40,220·19 | 42,407·30 | 479,254·37 | 613,103·20 | 1,092,357·57 | 177·80 | 62,066·34 | 62,244·14 | ... | 25,291·11 | 25,291·11 |
| 1906 | 1,590·31 | 30,943·82 | 32,534·13 | 454,645·84 | 612,546·81 | 1,067,192·65 | 103·78 | 60,474·81 | 60,578·59 | ... | 25,570·77 | 25,570·77 |
| 1907 | 3,132·83 | 25,399·75 | 28,532·58 | 323,550·05 | 643,139·11 | 966,689·16 | 1,050·88 | 61,670·65 | 62,721·53 | ... | 23,311·41 | 23,311·41 |
| 1908 | 925·44 | 23,902·44 | 24,827·88 | 267,748·62 | 657,936 89 | 925,685·51 | 871·76 | 40,982·65 | 41,854·41 | ... | 20,866·10 | 20,866·10 |
| 1909 | 1,774·45 | 24,566·87 | 26,341·32 | 306,462·21 | 620,612·07 | 927,074·28 | 350·91 | 36,311·70 | 36,662·61 | 204·41 | 20,958·23 | 21,162·64 |
| 1910 | ... | 19,082·01 | 19,082·01 | 179,062·94 | 653,211·05 | 832,273·99 | ... | 38,264·02 | 38,264·02 | ... | 24,049·13 | 24,049·13 |
| 1911 | ... | 18,528·97 | 18,528·97 | 123,160·54 | 686,386·80 | 809,547·34 | ... | 33,840·93 | 33,840·93 | ... | 14,688·17 | 14,688·17 |
| 1912 | 194·22 | 14,475·38 | 14,669·60 | 71,429·00 | 717,356·45 | 788,785·45 | ... | 42,327·65 | 42,327·65 | ... | 27,439·38 | 27,439·38 |
| 1913 | ... | 11,210·69 | 11,210·69 | 70,078·57 | 722,593·22 | 792,671·79 | ... | 35,593·00 | 35,593·00 | 9,688·59 | 63,679·58 | 73,368·17 |
| 1914 | ... | 5,210·22 | 5,210·22 | 40,393·05 | 677,609·26 | 718,002·31 | ... | 21,957·78 | 21,957·78 | 3,798·03 | 81,713·56 | 85,511·59 |
| 1915 | ... | 8,773·97 | 8,773·97 | 5,493·67 | 709,061·79 | 714,555·46 | ... | 17,590·21 | 17,590·21 | ... | 90,705·75 | 90,705·75 |
| 1916 | ... | 1,996·06 | 1,996·06 | 6,194·14 | 635,425·68 | 641,619·82 | ... | 12,381·82 | 12,381·82 | ... | 84,800·82 | 84,800·82 |
| 1917 | ... | 769·16 | 769·16 | 4,523·28 | 602,459·51 | 606,982·79 | ... | 6,500·66 | 6,500·66 | ... | 74,399·36 | 74,399·36 |
| 1918 | ... | 145·91 | 145·91 | 10,216·56 | 560,438·18 | 570,654·74 | ... | 6,727·82 | 6,727·82 | 745·57 | 67,956·84 | 68,702·41 |
| 1919 | ... | 116·83 | 116·83 | 6,445·89 | 459,912·83 | 466,358·72 | ... | 3,918·19 | 3,918·19 | ... | 60,140·27 | 60,140·27 |
| 1920 | ... | 350·26 | 350 26 | 2,186·57 | 402,861·25 | 405,047·82 | ... | 4,031·16 | 4,031·16 | 2,230·09 | 35,930·17 | 38,160·26 |
| Total | 234,748·07 | 431,615·68 | 666,363·75 | 6,779,395·47 | 12,080,503·38 | 18,859,898·85 | 661,131·91 | 837,870·45 | 1,499,002·36 | 213,495·34 | 876,881·10 | 1,090,376·44 |

| Year. | GRAND TOTAL. | | | |
|---|---|---|---|---|
| | Export. | Mint. | Total. | Value. |
| | fine ozs. | fine ozs. | fine ozs. | £ s. d. |
| 1886 | 270·17 | ... | 270·17 | 1,147 12 2½ |
| 1887 | 4,359·37 | ... | 4,359·37 | 18,517 8 6½ |
| 1888 | 3,124·82 | ... | 3,124·82 | 13,273 7 10½ |
| 1889 | 13,859·52 | ... | 13,859·52 | 58,871 9 11½ |
| 1890 | 20,402·42 | ... | 20,402·42 | 86,663 19 5 |
| 1891 | 27,116·14 | ... | 27,116·14 | 115,182 0 10½ |
| 1892 | 53,271·65 | ... | 53,271·65 | 226,283 11 8 |
| 1893 | 99,202·50 | ... | 99,202·50 | 421,385 8 8½ |
| 1894 | 185,298·73 | ... | 185,298·73 | 787,098 19 6 |
| 1895 | 207,110·20 | ... | 207,110·20 | 879,748 4 2½ |
| 1896 | 251,618·69 | ... | 251,618·69 | 1,068,808 5 2 |
| 1897 | 603,846·44 | ... | 603,846·44 | 2,564,976 12 9½ |
| 1898 | 939,489·49 | ... | 939,489·49 | 3,990,697 13 10 |
| 1899 | 1,283,360·25 | 187,244·41 | 1,470,604·66 | 6,246,731 10 7½ |
| 1900 | 894,387·27 | 519,923·59 | 1,414,310·86 | 6,007,610 13 4½ |
| 1901 | 923,686·96 | 779,729·56 | 1,703,416·52 | 7,235,653 9 1 |
| 1902 | 707,039·75 | 1,163,997·60 | 1,871,037·35 | 7,947,661 9 7½ |
| 1903 | 833,685·78 | 1,231,115·62 | 2,064,801·40 | 8,770,718 17 0½ |
| 1904 | 810,616·04 | 1,172,614·03 | 1,983,230·07 | 8,424,225 17 3½ |
| 1905 | 655,089·88 | 1,300,226·00 | 1,955,315·88 | 8,305,653 18 5½ |
| 1906 | 562,250·59 | 1,232,296·01 | 1,794,546·60 | 7,622,749 8 7 |
| 1907 | 431,803·14 | 1,265,750·45 | 1,697,553·59 | 7,210,749 6 2½ |
| 1908 | 356,353·96 | 1,291,557·17 | 1,647,911·13 | 6,999,881 10 10½ |
| 1909 | 386,370·58 | 1,208,898·83 | 1,595,269·41 | 6,776,273 14 7½ |
| 1910 | 233,970·34 | 1,236,661·68 | 1,470,632·02 | 6,246,847 15 0 |
| 1911 | 160,422·28 | 1,210,445·24 | 1,370,867·52 | 5,823,075 1 9½ |
| 1912 | 83,577·12 | 1,199,080·87 | 1,282,657·99 | 5,448,384 16 5½ |
| 1913 | 86,255·13 | 1,227,788·15 | 1,314,043·28 | 5,581,701 1 2½ |
| 1914 | 51,454·65 | 1,181,522·17 | 1,232,976·82 | 5,237,352 12 6½ |
| 1915 | 17,340·47 | 1,192,771·23 | 1,210,111·70 | 5,140,227 15 5½ |
| 1916 | 26,742·17 | 1,034,655·87 | 1,061,398·04 | 4,508,532 5 11 |
| 1917 | 9,022·49 | 961,294·67 | 970,317·16 | 4,121,645 6 2½ |
| 1918 | 15,644·12 | 860,867·03 | 876,511·15 | 3,723,182 14 9 |
| 1919 | 6,445·89 | 727,619·90 | 734,065·79 | 3,118,113 5 6½ |
| 1920 | 5,261·13 | 612,581·00 | 617,842·13 | 2,624,426 11 0 |
| TOTAL | 10,949,750·13 | 22,798,641·08 | 33,748,391·21 | 143,354,053 16 4½ |

*b* Prior to March, 1899, included with Ashburton. *c* From 1st August, 1897. *e* Prior to 1st May, 1896, included with Coolgardie. *g* Declared 5th April, 1894, to which date included with Yilgarn.

## TABLE VII.

MONTHLY RETURN OF GOLD, CONTAINED IN BULLION, FURNACE PRODUCTS, AND ORE, ENTERED FOR EXPORT DURING 1920.

| MONTH | UNITED KINGDOM. | | | VICTORIA. | | | NEW SOUTH WALES. | | | SOUTH AUSTRALIA. | | | TOTALS. | | | Minted Gold Exported* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Bullion. | Furnace Products. | Ore. | Bullion. | Furnace Products. | Ore. | Bullion. | Furnace Products. | Ore. | Bullion. | Furnace Products. | Ore. | Bullion. | Furnace Products. | Ore. | |
| 1920. | Fine ozs. | Estimated fine ozs. | Estimated fine ozs. | Fine ozs. | Estimated fine ozs. | Estimated fine ozs. | Fine ozs. | Estimated fine ozs. | Estimated fine ozs. | Fine ozs. | Estimated fine ozs. | Estimated fine ozs. | Fine ozs. | Estimated fine ozs. | Estimated fine ozs. | Fine ozs. |
| January ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| February ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 1,927·85 | ... | ... | ... | ... | ... | 1,927·85 | ... |
| March ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| April ... ... ... | ... | ... | ... | ... | ... | ... | | 835·05 | ... | ... | ... | ... | ... | 835·05 | ... | 52·26 |
| May ... ... ... | ... | ... | ... | ... | ... | ... | ... | 227·15 | ... | ... | ... | ... | ... | 227·15 | ... | ... |
| June ... ... ... | ... | ... | ... | ... | ... | ... | ... | 502·15 | ... | ... | ... | ... | ... | 502·15 | ... | 28·44 |
| July ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| August ... ... ... | ... | ... | ... | ... | ... | ... | ... | 167·61 | ... | ... | ... | ... | ... | 167·61 | ... | ... |
| September ... ... ... | ... | ... | ... | ... | ... | ... | ... | 141·25 | ... | ... | ... | ... | ... | 141·25 | ... | ... |
| October ... ... ... | ... | ... | ... | ... | ... | 174·15 | ... | ... | ... | ... | ... | ... | ... | ... | 174·15 | ... |
| November ... ... ... | ... | ... | ... | ... | ... | 128·09 | ... | ... | ... | ... | ... | ... | ... | ... | 128·09 | ... |
| December ... ... ... | ... | ... | ... | ... | ... | ... | ... | 321·11 | ... | ... | ... | ... | ... | 321·11 | ... | ... |
| TOTALS ... ... | ... | ... | ... | ... | ... | 302·24 | ... | 2,194·32 | 1,927·85 | ... | ... | ... | ... | 2,194·32 | 2,230·09 | 80.70 |

*When considering the total production of gold for this State, these amounts must be disregarded, having been already recorded in the total receipts of gold at the Mint.

## TABLE VIII.

RETURN OF GOLD BULLION RECEIVED AT THE PERTH BRANCH OF THE ROYAL MINT FROM MAY, 1899, TO THE 31ST DECEMBER, 1920, SHOWING IN GROSS OUNCES THE QUANTITY OBTAINED FROM THE RESPECTIVE GOLDFIELDS AND OTHER COUNTRIES, AND THE ACTUAL VALUE THEREOF.

| Year. | Kimberley. | Pilbara. | West Pilbara. | Ashburton. | Gascoyne. | Peak Hill. | East Murchison. | Murchison. | Yalgoo. | Mt. Margaret. | North Coolgardie. | Broad Arrow. | North-East Coolgardie. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. |
| 1899 ... ... | 308·45 | 529·80 | ... | 281·80 | 85·65 | 16,274·00 | 3,758·07 | 24,675·64 | 5,190·05 | 16,911·54 | 44,779·38 | 8,503·50 | 16,700·90 |
| 1900 ... ... | 644·02 | 7,493·88 | 137·33 | 474·26 | 86·10 | 18,019·08 | 32,049·74 | 48,540·12 | 8,851·52 | 67,748·45 | 88,688·14 | 14,376·10 | 40,503·12 |
| 1901 ... ... | 663·37 | 11,279·93 | 394·38 | 55·42 | 18·56 | 21,351·67 | 44,746·88 | 43,024·65 | 9,191·01 | 126,703·91 | 135,493·31 | 18,829·13 | 43,055·63 |
| 1902 ... ... | 439·93 | 10,706·03 | 3,284·37 | ... | 124·86 | 32,637·17 | 62,357·98 | 47,628·18 | 5,116·94 | 144,663·12 | 182,543·06 | 15,903·42 | 53,901·58 |
| 1903 ... ... | 511·75 | 14,217·53 | 6,481·58 | 135·30 | 36·29 | 34,684·27 | 77,089·29 | 64,127·18 | 1,687·99 | 148,006·49 | 197,229·08 | 21,528·20 | 42,649·25 |
| 1904 ... ... | 37·69 | 8,293·58 | 5,170·06 | 150·73 | 13·10 | 20,909·99 | 77,237·31 | 63,037·71 | 3,345·82 | 143,453·51 | 166,939·82 | 24,721·53 | 39,799·55 |
| 1905 ... ... | 656·34 | 16,053·42 | 1,400·46 | 50·54 | 25·65 | 16,075·36 | 107,295·17 | 111,493·34 | 5,469·06 | 184,178·87 | 175,057·14 | 18,394·17 | 48,352·22 |
| 1906 ... ... | 785·23 | 6,007·79 | 915·63 | 168·30 | 95·43 | 2,471·21 | 115,363·22 | 133,264·79 | 5,919·37 | 166,097·63 | 130,784·60 | 20,415·43 | 37,509·91 |
| 1907 ... ... | 431·72 | 4,924·97 | 396·22 | 49·89 | 10·06 | 7,057·22 | 140,382·15 | 137,713·43 | 3,815·06 | 183,693·29 | 86,685·09 | 16,228·85 | 30,285·39 |
| 1908 ... ... | 400·19 | 9,676·11 | 1,292·97 | 54·32 | 37·68 | 11,679·58 | 162,243·76 | 132,066·00 | 2,625·14 | 175,092·47 | 90,815·08 | 9,408·64 | 28,300·91 |
| 1909 ... ... | 203·59 | 6,662·82 | 1,682·49 | 274·93 | 8·89 | 8,823·58 | 164,652·43 | 129,139·74 | 755·31 | 163,781·55 | 80,293·29 | 5,860·66 | 29,603·84 |
| 1910 ... ... | 586·44 | 7,094·46 | 1,670·20 | 208·31 | 31·67 | 3,679·72 | 165,123·37 | 134,098·94 | 873·58 | 158,847·24 | 73,283·66 | 386·84 | 22,967·23 |
| 1911 ... ... | 183·78 | 6,033·33 | 1,014·60 | 334·38 | 9·78 | 165·36 | 119,267·86 | 135,342·96 | 363·85 | 162,319·77 | 74,536·34 | 346·78 | 22,917·38 |
| 1912 ... ... | 361·11 | 7,674·55 | 912·60 | 47·77 | 8·09 | 237·96 | 110,585·25 | 128,679·43 | 1,410·49 | 124,123·10 | 61,018·13 | 5·32 | 17,705·86 |
| 1913 ... ... | 319·55 | 5,048·77 | 1,491·66 | 47·37 | ... | 564·67 | 96,270·04 | 139,021·56 | 3,410·52 | 107,391·67 | 73,160·41 | 10,814·52 | 13,452·90 |
| 1914 ... ... | 238·83 | 6,750·56 | 1,538·31 | 56·09 | 5·00 | 104·45 | 79,785·02 | 135,990·48 | 1,705·85 | 125,937·60 | 89,904·49 | 3,727·56 | 6,318·12 |
| 1915 ... ... | 270·76 | 9,084·52 | 1,540·93 | 20·50 | 81·05 | 550·77 | 65,111·82 | 118,861·14 | 5,208·56 | 132,819·64 | 69,318·34 | 17,810·14 | 10,808·78 |
| 1916 ... ... | 306·92 | 8,265·75 | 692·68 | 38·34 | 74·07 | 190·21 | 37,169·30 | 95,071·24 | 5,320·33 | 136,731·10 | 48,799·86 | 8,415·40 | 2,441·68 |
| 1917 ... ... | 133·03 | 5,770·70 | 683·84 | 25·85 | ... | ... | 9,660·88 | 115,360·36 | 1,366·18 | 136,343·74 | 34,650·24 | 11,300·38 | 936·97 |
| 1918 ... ... | 144·31 | 3,643·49 | 339·36 | 7·87 | ... | ... | 949·78 | 93,501·94 | 1,090·10 | 118,132·80 | 37,572·67 | 3,087·67 | 179·83 |
| 1919 ... ... | 293·46 | 4,813·34 | 29·62 | 4·10 | ... | 71·92 | 958·91 | 79,921·84 | 806·04 | 117,763·53 | 26,692·84 | 3,455·12 | 144·34 |
| 1920 ... ... | 164·07 | 6,589·24 | 137·59 | 3·79 | 4·03 | 22·62 | 121·47 | 70,428·05 | 307·48 | 103,788·16 | 14,038·70 | 6,997·95 | 440·84 |
| Total ... | **8,084·54** | **166,614·57** | **31,206·88** | **2,489·86** | **755·96** | **195,570·81** | **1,672,179·70** | **2,180,988·72** | **73,830·25** | **2,944,529·18** | **1,982,283·67** | **240,517·31** | **508,976·23** |

| Year. | East Coolgardie. | Coolgardie. | Yilgarn. | Dundas. | *Phillips River. | †Donny-brook. | State generally. | TOTAL. Western Australia. Quantity. | Western Australia. Actual Value. | Other Countries. Quantity. | Other Countries. Actual Value. | GRAND TOTAL. Quantity. | Grand Total. Actual Value. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | ozs. | £ s. d. | ozs. | £ s. d. | ozs. | £ s. d. |
| 1899 ... | 33,051·33 | 27,611·24 | 9,070·70 | 473·63 | ... | 196·17 | 904·39 | **209,306·24** | **762,546 11 6** | 103·46 | 336 18 3 | 209,409·70 | 762,883 9 9 |
| 1900 ... | 139,845·60 | 51,607·26 | 28,648·51 | 31,583·20 | ... | 265·55 | 1,620·93 | **581,182·91** | **2,096,212 14 2** | 17·49 | 44 15 7 | 581,200·40 | 2,096,257 9 9 |
| 1901 ... | 263,514·75 | 78,026·07 | 29,433·84 | 32,825·75 | ... | 4·64 | 1,667·79 | **860,280·69** | **3,033,311 0 4** | 92·25 | 297 5 8 | 860,372·94 | 3,033,608 6 0 |
| 1902 ... | 636,536·52 | 94,134·17 | 25,873·68 | 31,088·91 | 5,146·80 | 67·08 | 2,461·98 | **1,354,615·78** | **4,791,303 18 1** | 16·27 | 38 10 2 | 1,354,632·05 | 4,791,342 8 3 |
| 1903 ... | 685,289·82 | 82,218·79 | 26,856·28 | 40,006·39 | 6,420·79 | 97·52 | 3,350·32 | **1,452,624·11** | **5,139,852 11 9** | 294·78 | 703 14 10 | 1,452,918·89 | 5,140,556 6 7 |
| 1904 ... | 699,475·35 | 73,076·66 | 35,854·87 | 37,508·11 | 2,450·03 | ... | 1,608·47 | **1,403,083·89** | **4,955,870 9 0** | 263·05 | 614 11 9 | 1,403,346·94 | 4,956,485 0 9 |
| 1905 ... | 737,065·14 | 74,615·36 | 30,404·65 | 32,953·56 | 1,753·32 | ... | 1,821·99 | **1,563,115·76** | **5,475,841 2 10** | 525·80 | 1,491 0 7 | 1,563,641·56 | 5,477,332 3 5 |
| 1906 ... | 742,525·99 | 73,307·24 | 30,996·76 | 24,484·65 | 1,744·38 | ... | 925·10 | **1,493,782·66** | **5,330,245 12 1** | 413·86 | 974 16 0 | 1,494,196·52 | 5,331,220 8 1 |
| 1907 ... | 766,846·83 | 73,532·99 | 27,795·35 | 27,222·21 | 1,806·30 | ... | 340·39 | **1,509,217·41** | **5,416,812 0 7** | 640·51 | 1,663 4 3 | 1,509,857·92 | 5,418,475 4 10 |
| 1908 ... | 779,009·10 | 48,524·18 | 22,835·58 | 48,785·54 | 4,299·19 | ... | 2,080·42 | **1,529,226·86** | **5,386,858 15 8** | 1,313·84 | 3,885 2 3 | 1,530,540·70 | 5,390,743 17 11 |
| 1909 ... | 747,856·04 | 43,756·68 | 25,255·30 | 43,254·22 | 4,345·04 | ... | 548·71 | **1,456,759·11** | **5,143,035 17 1** | 882·56 | 1,109 6 7 | 1,457,641·67 | 5,144,145 3 8 |
| 1910 ... | 786,209·41 | 46,054·82 | 28,945·68 | 52,068·70 | 6,056·08 | ... | 268·26 | **1,488,454·61** | **5,163,100 17 11** | 2,251·71 | 1,670 11 7 | 1,490,706·32 | 5,164,771 9 6 |
| 1911 ... | 848,725·06 | 41,861·54 | 18,190·20 | 59,831·49 | 5,242·16 | ... | 159·90 | **1,496,846·52** | **5,143,795 10 5** | 452·22 | 915 19 4 | 1,497,298·74 | 5,144,711 9 9 |
| 1912 ... | 876,900·05 | 51,732·78 | 33,429·29 | 52,220·76 | 4,026·32 | ... | 174·26 | **1,471,253·12** | **5,106,466 9 1** | 641·47 | 1,527 8 0 | 1,471,894·59 | 5,107,993 17 1 |
| 1913 ... | 867,887·30 | 42,738·63 | 76,581·73 | 47,535·02 | 4,221·40 | ... | 277·70 | **1,490,235·42** | **5,204,738 18 3** | 697·50 | 1,247 12 7 | 1,490,932·92 | 5,205,986 10 10 |
| 1914 ... | 824,280·77 | 26,696·51 | 99,410·57 | 47,487·27 | 480·65 | ... | 350·48 | **1,450,768·61** | **5,016,905 19 0** | 915·24 | 1,726 5 1 | 1,451,683·85 | 5,018,632 4 1 |
| 1915 ... | 872,406·66 | 21,593·44 | 111,539·75 | 42,283·16 | 324·48 | ... | 392·28 | **1,480,026·72** | **5,060,196 7 6** | 1,260·07 | 2,610 8 11 | 1,481,286·79 | 5,062,806 16 5 |
| 1916 ... | 780,354·90 | 15,238·33 | 104,136·12 | 36,653·26 | 221·89 | ... | 437·33 | **1,280,558·71** | **4,405,278 13 10** | 1,059·26 | 2,060 6 9 | 1,281,617·97 | 4,407,339 0 7 |
| 1917 ... | 737,833·22 | 7,968·62 | 91,168·91 | 34,685·39 | 238·50 | ... | 264·27 | **1,188,391·08** | **4,074,112 6 7** | 1,016·70 | 1,905 17 7 | 1,189,407·78 | 4,076,018 4 2 |
| 1918 ... | 695,564·50 | 8,338·10 | 84,297·45 | 29,649·05 | 494·27 | ... | 705·32 | **1,077,698·51** | **3,655,942 4 5** | 1,468·02 | 2,476 6 11 | 1,079,166·53 | 3,658,418 11 4 |
| 1919 ... | 569,081·41 | 4,866·10 | 74,493·69 | 20,346·85 | 434·47 | ... | 109·08 | **904,286·66** | **3,089,243 3 1** | 1,358·71 | 2,611 16 1 | 905,645·37 | 3,091,854 19 2 |
| 1920 ... | 507,113·25 | 5,035·18 | 45,007·22 | 9,865·14 | 43·29 | ... | 161·46 | **770,269·53** | **2,595,167 17 9** | 1,375·73 | 1,531 18 5 | 771,645·26 | 2,596,699 16 2 |
| Total ... | **14,597,373·00** | **992,534·69** | **1,060,226·13** | **782,812·26** | **49,749·36** | **630·96** | **20,630·83** | **27,511,984·91** | **96,046,839 0 11** | **17,060·50** | **31,443 17 2** | **27,529,045·41** | **96,078,282 18 1** |

* Prior to 1902 included in State generally.

† Abolished 4th March, 1908.

# PART II.—MINERALS OTHER THAN GOLD.

**TABLE IX.**—GENERAL RETURN OF ORE AND MINERALS, OTHER THAN GOLD, SHOWING THE QUANTITY PRODUCED AND THE VALUE THEREOF AS REPORTED TO THE MINES DEPARTMENT FROM THE RESPECTIVE GOLDFIELDS AND MINERAL FIELDS, DURING 1920, AND PREVIOUS YEARS.

## BLACK TIN.

| Period. | Pilbara Goldfield—Marble Bar District. | | | | Greenbushes Mineral Field. | | | | Total. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Quantity. | | | Value. | Quantity. | | | Value. | Quantity. | | | Value. |
| | Lode. | Stream. | Total. | | Lode. | Stream. | Total. | | Lode. | Stream. | Total. | |
| | tons. | tons. | tons. | £ | tons. | tons. | tons. | £ | tons. | tons. | tons. | £ |
| Previous to 1899 ... | ... | 75·45 | 75·45 | 4,419 | ... | 1,590·33 | 1,590·33 | 66,108 | ... | 1,665·78 | 1,665·78 | 70,527 |
| 1899 ... ... ... | ... | 57·50 | 57·50 | 3,612 | ... | 277·32 | 277·32 | 21,658 | ... | 334·82 | 334·82 | 25,270 |
| 1900 ... ... ... | ... | 387·87 | 387·87 | 27,174 | ... | 435·62 | 435·62 | 29,528 | ... | 823·49 | 823·49 | 56,702 |
| 1901 ... ... ... | ... | 412·98 | 412·98 | 21,148 | ... | 321·34 | 321·34 | 18,852 | ... | 734·32 | 734·32 | 40,000 |
| 1902 ... ... ... | ... | 216·35 | 216·35 | 15,103 | ... | 403·21 | 403·21 | 24,680 | ... | 619·56 | 619·56 | 39,783 |
| 1903 ... ... ... | ... | 292·11 | 292·11 | 21,528 | ... | 524·94 | 524·94 | 34,362 | ... | 817·05 | 817·05 | 55,890 |
| 1904 ... ... ... | ... | 320·86 | 320·86 | 24,355 | ... | 533·64 | 533·64 | 34,462 | ... | 854·50 | 854·50 | 58,817 |
| 1905 ... ... ... | ... | 435·74 | 435·74 | 33,880 | ... | 643·52 | 643·52 | 52,960 | ... | 1,079·26 | 1,079·26 | 86,840 |
| 1906 ... ... ... | 36·59 | 675·06 | 711·65 | 78,449 | 26·18 | 757·10 | 783·28 | 79,195 | 62·77 | 1,432·16 | 1,494·93 | 157,644 |
| 1907 ... ... ... | 104·13 | 749·56 | 853·69 | 85,603 | 40·40 | 729·60 | 770·00 | 73,045 | 144·53 | 1,479·16 | 1,623·69 | 158,648 |
| 1908 ... ... ... | 31·00 | 372·03 | 403·03 | 30,636 | 13·90 | 562·43 | 576·33 | 41,046 | 44·90 | 934·46 | 979·36 | 71,682 |
| 1909 ... ... ... | 81·75 | 212·21 | 293·96 | 22,431 | 44·40 | 414·35 | 458·75 | 34,786 | 126·15 | *628·08 | *754·23 | †57,335 |
| 1910 ... ... ... | 33·75 | 119·75 | 153·50 | 12,899 | 25·06 | 292·65 | 317·71 | 27,974 | 58·81 | 412·40 | 471·21 | 40,873 |
| 1911 ... ... ... | 27·35 | 121·30 | 148·65 | 16,064 | 27·82 | 383·30 | 411·12 | 44,638 | 55·17 | 504·60 | 559·77 | 60,702 |
| 1912 ... ... ... | 10·25 | 113·13 | 123·38 | 14,993 | 14·90 | 415·55 | 430·45 | 50,166 | 25·15 | 528·68 | 553·83 | 65,159 |
| 1913 ... ... ... | 14·15 | 124·95 | 139·10 | 16,506 | 29·06 | 429·42 | 458·48 | 50,954 | 43·21 | ‡557·72 | ‡600·93 | §67,717 |
| 1914 ... ... ... | 12·35 | 75·05 | 87·40 | 8,168 | 5·32 | 239·22 | 244·54 | 21,145 | 17·67 | 314·27 | 331·94 | 29,313 |
| 1915 ... ... ... | 5·05 | 73·60 | 78·65 | 7,633 | 7·55 | 239·78 | 247·33 | 21,431 | 12·60 | 313·38 | 325·98 | 29,064 |
| 1916 ... ... ... | 6·50 | 146·67 | 153·17 | 15,939 | 9·94 | 271·80 | 281·74 | 27,319 | 16·44 | 418·47 | 434·91 | 43,258 |
| 1917 ... ... ... | 4·05 | 65·00 | 69·05 | 9,264 | 11·18 | 226·74 | 237·92 | 29,928 | 15·23 | 291·74 | 306·97 | 39,192 |
| 1918 ... ... ... | 5·70 | 93·80 | 99·50 | 20,984 | 50·52 | 245·28 | 295·80 | 57,653 | 56·22 | 339·08 | 395·30 | 78,637 |
| 1919 ... ... ... | ... | 36·70 | 36·70 | 5,871 | 23·66 | 220·95 | 244·61 | 34,959 | 23·66 | 257·65 | 281·31 | 40,830 |
| 1920 ... ... ... | ... | 41·50 | 41·50 | 7,616 | 10·25 | 179·84 | 190·09 | 31,249 | 10·25 | 221·34 | 231·59 | 38,865 |
| **Total ... ...** | **372·62** | **5,219·17** | **5,591·79** | **504,275** | **340·14** | **10,337·93** | **10,678·07** | **908,098** | **712·76** | **15,561·97** | **16,274·73** | **1,412,748** |

* Includes tons 1·52, the produce of Cue District. † Includes £118, value of tons 1·52, the produce of Cue District, ‡ Includes tons 3·20, the produce of Cue District and tons ·15 of Coolgardie District. § Includes £242, value of tons 3·20 the produce of Cue District, and £15, value of ·15 tons of Coolgardie District.

## TANTALITE.

| Period. | Pilbara Goldfield—Marble Bar District. | | | | Greenbushes Mineral Field. | | | | Total. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Quantity. | | | Value. | Quantity. | | | Value. | Quantity. | | | Value. |
| | Lode. | Stream. | Total. | | Lode. | Stream. | Total. | | Lode. | Stream. | Total. | |
| | tons. | tons. | tons. | £ | tons. | tons. | tons. | £ | tons. | tons. | tons. | £ |
| Previous to 1899 ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1899 ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1900 ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1901 ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1902 ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1903 ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1904 ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1905 ... ... ... | ... | 70·95 | 70·95 | 8,925 | ... | 2·34 | 2·34 | 1,590 | ... | 73·29 | 73·29 | 10,515 |
| 1906 ... ... ... | 1·80 | 12·85 | 14·65 | 2,644 | ... | ... | ... | ... | 1·80 | 12·85 | 14·65 | 2,644 |
| 1907 ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1908 ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1909 ... ... ... | ·45 | ... | ·45 | 113 | ... | ·85 | ·85 | 214 | ·45 | ·85 | 1·30 | 327 |
| 1910 ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1911 ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1912 ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1913 ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1914 ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1915 ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1916 ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1917 ... ... ... | ... | 12·50 | 12·50 | 1,782 | ... | ... | ... | ... | ... | 12·50 | 12·50 | 1,782 |
| 1918 ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1919 ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1920 ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **Total ... ...** | **2·25** | **96·30** | **98·55** | **13,464** | **...** | **3·19** | **3·19** | **1,804** | **2·25** | **99·49** | **101·74** | **15,268** |

| Period. | Pyritic Ore. | | Copper Ore. | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mt. Margaret G.F. Mt. Morgans D.. | | West Kimberley Goldfield | | Pilbara Goldfield. Marble Bar D. | | Pilbara Goldfield. Nullagine D. | | West Pilbara Gf. | | Ashburton Gf. | | Peak Hill Gf. | | E. Murchison Gf. Lawlers D. | |
| | Quantity.‖ | Value. | Q'ntity. | Value. | Quantity. | Value. | Quantity, | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| | tons. | £ | tons. | £ | tons. | £ | tons. | £ | tons. | £ | tons. | £ | tons. | £ | tons. | £ |
| Previous to 1899 ... | ... | ... | ... | ... | ... | ... | ... | ... | 7,018·00 | 55,270 | ... | ... | ... | ... | ... | ... |
| 1899 ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 2,555·00 | 29,478 | ... | ... | ... | ... | ... | ... |
| 1900 ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 1,605·00 | 12 139 | ... | ... | ... | ... | ... | ... |
| 1901 ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 1,162·00 | 15,891 | ... | ... | ... | ... | ... | ... |
| 1902 ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1903 ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1904 ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1905 ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1906 ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1907 ... ... ... | ... | ... | ... | ... | 7·77 | 190 | ... | ... | 3,365·50 | 63,548 | ... | ... | ... | ... | ... | ... |
| 1908 ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 1,486·00 | 17,691 | 188·00 | 2,311 | ... | ... | 6·77 | 69 |
| 1909 ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 7,135·50 | 62,447 | 10·75 | 259 | ... | ... | ... | ... |
| 1910 ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 8,479·80 | 64,861 | ... | ... | ... | ... | ... | ... |
| 1911 ... 9,938·92 | 3,529 | ... | ... | 25·10 | 196 | 5·00 | 120 | 9,082·02 | 69,140 | ... | ... | ... | ... | ... | ... | ... |
| 1912 ... 7,625·80 | 2,543 | ... | ... | ... | ... | ... | ... | 12,284·02 | 104,289 | ... | ... | ... | ... | ... | ... | ... |
| 1913 ... 10,216·18 | 3,658 | ... | ... | ... | ... | ... | ... | 12,621·73 | 76,878 | ... | ... | ... | ... | ... | ... | ... |
| 1914 ... 9,758·83 | 3,485 | 38·50 | 426 | ... | ... | ... | ... | 7,764·18 | 40,607 | ... | ... | 112·70 | 2,409 | ... | ... | ... |
| 1915 ... 6,557·62 | 2,368 | 67·55 | 1,247 | ... | ... | ... | ... | 314·75 | 3,546 | 146·00 | 3,744 | 237·58 | 7,618 | 10·93 | 147 | ... |
| 1916 ... 4,409·22 | 2,263 | 3·47 | 36 | ... | ... | ... | ... | 48·87 | 16,116 | 2·61 | 27 | 250·93 | 8,268 | 63·42 | 1,311 | ... |
| 1917 ... 3,575·46 | 1,752 | ... | ... | ... | ... | ... | ... | 783·61 | 13,406 | 3·71 | 67 | 287·84 | 9,683 | 75·00 | 1,523 | ... |
| 1918 ... 2,251·81 | 1,629 | ... | ... | ... | ... | ... | ... | 1,844·19 | 28,961 | ... | ... | 76·28 | 2,480 | 82·44 | 1,314 | ... |
| 1919 ... 4,135·93 | 4,919 | ... | ... | ... | ... | ... | ... | 1,030·78 | 15,807 | ... | ... | 14·39 | 353 | ... | ... | ... |
| 1920 ... 6,019·98 | 7,276 | ... | ... | ... | ... | 9·00 | 360 | 1,700·50 | 32,059 | ... | ... | 35·39 | 1,401 | ... | ... | ... |
| **Total ... 64,489·75** | **33,422** | **109·52** | **1,709** | **32·87** | **386** | **14·00** | **480** | **81,181·45** | **722,134** | **351·07** | **6,408** | **1,015·11** | **32,212** | **238·56** | **4,364** | |

‖ Represents the value of the sulphur only the copper contents not having been treated yet.

TABLE IX.—*Minerals other than Gold, etc.*—continued.

COPPER ORE—*continued.*

| Period. | Murchison Gf. | | | | Yalgoo Gf. | | Northampton Mf. | | Yandanooka Mf. | | Mt. Margaret Goldfield. | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Meekatharra D. | | Day Dawn D. | | | | | | | | Mt. Morgans District. | | Mt. Margaret District. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| | tons. | £ | tons. | £ | tons. | £ | tons. | £ | tons. | £ | tons. | £ | tons. | £ |
| Previous to 1899 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1899 ... ... | ... | ... | ... | ... | ... | ... | 98·00 | 1,715 | 38·00 | 407 | 273·00 | 4,338 | ... | ... |
| 1900 ... ... | ... | ... | 5·15 | 91 | ... | ... | ... | ... | ... | ... | 4,539·00 | 30,718 | ... | ... |
| 1901 ... ... | ... | ... | 10·50 | 76 | ... | ... | 38·50 | 277 | ... | ... | 7,660·00 | 40,738 | ... | ... |
| 1902 ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1,954·00 | 6,852 | ... | ... |
| 1903 ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 18,965·00 | 45,557 | ... | ... |
| 1904 ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 500·00 | 900 | ... | ... |
| 1905 ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 60·00 | 674 | ... | ... |
| 1906 ... ... | 133·50 | 2,816 | ... | ... | 13·91 | 91 | ... | ... | ... | ... | 4,361·05 | 21,934 | ... | ... |
| 1907 ... ... | ... | ... | 31·71 | 274 | 10·00 | 130 | ... | ... | ... | ... | 5,141·52 | 58,888 | 2·85 | 26 |
| 1908 ... ... | ... | ... | ... | ... | 9·50 | 97 | ... | ... | 133·55 | 1,482 | 4,404·10 | 20,221 | ... | ... |
| 1909 ... ... | 608·00 | 2,823 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1910 ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1911 ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1912 ... ... | ... | ... | 4·80 | 54 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1913 ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1914 ... ... | 15·19 | 248 | 3·40 | 27 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1915 ... ... | 33·70 | 492 | ... | ... | 4·99 | 95 | ... | ... | ... | ... | ... | ... | ... | ... |
| 1916 ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1917 ... ... | 82·92 | 2,164 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1918 ... ... | 78·34 | 1,794 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1919 ... ... | 16·81 | 377 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1920 ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Total ... | 968·46 | 10,714 | 55·56 | 522 | 38·40 | 4·13 | 136·50 | 1,992 | 171·55 | 1,889 | 47,857·67 | 230,820 | 2·85 | 26 |

COPPER ORE—*continued.*

| Period. | North Coolgardie Goldfield. | | East Coolgardie Goldfield. | | Phillips River Goldfield. | | State generally. | | Total. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Menzies District. | | E. Coolgardie D. | | | | | | | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| | tons. | £ | tons. | £ | tons. | £ | tons. | £ | tons. | £ |
| Previous to 1899 ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 7,018·00 | 55,270 |
| 1899 ... ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 2,964·00 | 35,938 |
| 1900 ... ... ... ... ... | ... | ... | ... | ... | 34·00 | 725 | ... | ... | 6,183·15 | 43,673 |
| 1901 ... ... ... ... ... | ... | ... | ... | ... | 1,089·14 | 12,918 | ... | ... | 9,960·14 | 69,900 |
| 1902 ... ... ... ... ... | ... | ... | ... | ... | 308·25 | 1,238 | ... | ... | 2,262·25 | 8,090 |
| 1903 ... ... ... ... ... | ... | ... | ... | ... | 1,561·33 | 10,984 | ... | ... | 20,526·33 | 56,541 |
| 1904 ... ... ... ... ... | ... | ... | ... | ... | 3,468·89 | 24,280 | ... | ... | 3,968·89 | 25,180 |
| 1905 ... ... ... ... ... | ... | ... | ... | ... | 2,329·04 | 15,592 | ... | ... | 2,389·04 | 16,266 |
| 1906 ... ... ... ... ... | 4·70 | 33 | ... | ... | 2,885·00 | 25,270 | 13·50 | 193 | 7,411·66 | 50,337 |
| 1907 ... ... ... ... ... | 1·42 | 18 | ... | ... | 10,414·57 | 57,273 | 3·08 | 40 | 18,978·42 | 130,387 |
| 1908 ... ... ... ... ... | ... | ... | 50·67 | 330 | 2,015·71 | 9,233 | ... | ... | 8,294·30 | 51,434 |
| 1909 ... ... ... ... ... | ... | ... | ... | ... | 7,330·70 | 29,815 | ... | ... | 15,084·95 | 95,344 |
| 1910 ... ... ... ... ... | ... | ... | ... | ... | 25,871·65 | 96,745 | ... | ... | 34,351·45 | 161,606 |
| 1911 ... ... ... ... ... | ... | ... | ... | ... | 13,563·68 | 46,862 | ... | ... | 22,675·80 | 116,318 |
| 1912 ... ... ... ... ... | ... | ... | ... | ... | 1,318·38 | 15,815 | ... | ... | 13,607·20 | 120,158 |
| 1913 ... ... ... ... ... | ... | ... | ... | ... | 806·95 | 9,737 | ... | ... | 13,428·68 | 86,615 |
| 1914 ... ... ... ... ... | ... | ... | ... | ... | 4,841·15 | 37,524 | ... | ... | 12,775·12 | 81,241 |
| 1915 ... ... ... ... ... | ... | ... | ... | ... | 3,681·03 | 24,093 | 2·03 | 16 | 4,498·56 | 40,998 |
| 1916 ... ... ... ... ... | ... | ... | ... | ... | 5,428·08 | 48,618 | ... | ... | 6,697·38 | 74,376 |
| 1917 ... ... ... ... ... | ... | ... | ... | ... | 5,255·57 | 66,868 | ... | ... | 6,488·65 | 93,711 |
| 1918 ... ... ... ... ... | ... | ... | ... | ... | 2,901·66 | 42,978 | ... | ... | 4,982·91 | 77,527 |
| 1919 ... ... ... ... ... | ... | ... | ... | ... | 215·02 | 4,993 | ... | ... | 1,277·00 | 21,530 |
| 1920 ... ... ... ... ... | ... | ... | ... | ... | 217·27 | 4,125 | ... | ... | 1,962·16 | 37,945 |
| Total ... ... | 6·12 | 51 | 50·67 | 330 | 95,537·07 | 585,686 | 18·61 | 249 | 227,786·04 | 1,600·385 |

| Period. | IRONSTONE. | | | | | | | | LEAD ORE. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | W. Pilbara Gf. | | E. Coolgardie Gf. / E. Coolgardie D. | | State generally. | | Total. | | Northampton Mf. | | West Pilbara Gf. | | Total. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| | tons. | £ | tons. | £ | tons. | £ | tons. | £ | tons. | £ | tons. | £ | tons. | £ |
| Previous to 1899 | 100·00 | 300 | ... | ... | ... | ... | 100·00 | 300 | ... | ... | ... | ... | ... | ... |
| 1899 ... | ... | ... | ... | ... | 12,852·00 | 8,939 | 12,852·00 | 8,939 | 82·75 | 912 | ... | ... | 82·75 | 912 |
| 1900 ... | ... | ... | ... | ... | 12,251·00 | 9,258 | 12,251·00 | 9,258 | 268·00 | 533 | ... | ... | 268·00 | 533 |
| 1901 ... | ... | ... | 450·00 | 247 | 20,119·00 | 12,999 | 20,569·00 | 13,246 | ... | ... | ... | ... | ... | ... |
| 1902 ... | ... | ... | ... | ... | 4,800·00 | 2,040 | 4,800·00 | 2,040 | ... | ... | ... | ... | ... | ... |
| 1903 ... | ... | ... | ... | ... | 220·00 | 88 | 220·00 | 88 | ... | ... | ... | ... | ... | ... |
| 1904 ... | ... | ... | ... | ... | 1,441·50 | 577 | 1,441·50 | 577 | ... | ... | ... | ... | ... | ... |
| 1905 ... | ... | ... | ... | ... | 3,212·60 | 1,285 | 3,212·60 | 1,285 | ... | ... | ... | ... | ... | ... |
| 1906 ... | ... | ... | ... | ... | 1,279·87 | 512 | 1,279·87 | 512 | ... | ... | ... | ... | ... | ... |
| 1907 ... | ... | ... | ... | ... | 1,093·53 | 438 | 1,093·53 | 438 | 10·00 | 128 | ... | ... | 10·00 | 128 |
| 1908 ... | ... | ... | ... | ... | ... | ... | ... | ... | 57·00 | 461 | ... | ... | 57·00 | 461 |
| 1909 ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1910 ... | ... | ... | ... | ... | † 10·50 | † 12 | 10·50 | 12 | 185·10 | 1,777 | ... | ... | 185·10 | 1,777 |
| 1911 ... | ... | ... | ... | ... | ... | ... | ... | ... | 8,194·76 | 17,663 | ... | ... | 8,194·76 | 17,663 |
| 1912 ... | ... | ... | ... | ... | ... | ... | ... | ... | 11,098·50 | 24,412 | ... | ... | 11,098·50 | 24,412 |
| 1913 ... | ... | ... | ... | ... | ... | ... | ... | ... | 26,589·53 | 50,474 | ... | ... | 26,589·53 | 50,474 |
| 1914 ... | ... | ... | ... | ... | ... | ... | ... | ... | 15,334·62 | 38,351 | ... | ... | 15,334·62 | 38,351 |
| 1915 ... | ... | ... | ... | ... | ... | ... | ... | ... | 15,678·30 | 29,396 | ... | ... | 15,678·30 | 29,396 |
| 1916 ... | ... | ... | ... | ... | ... | ... | ... | ... | 34,578·34 | 110,872 | 44·00 | 770 | 34,622·34 | 111,642 |
| 1917 ... | ... | ... | ... | ... | ... | ... | ... | ... | 46,801·97 | 143,925 | 62·57 | 759 | 46,864·54 | 144,684 |
| 1918 ... | ... | ... | ... | ... | ... | ... | ... | ... | 47,079·68 | 176,330 | ... | ... | 47,079·68 | 176,330 |
| 1919 ... | ... | ... | ... | ... | ... | ... | ... | ... | 7,385·70 | 29,841 | ... | ... | 7,385·70 | 29,841 |
| 1920 ... | ... | ... | ... | ... | ... | ... | ... | ... | 27,716·40 | 172,483 | ... | ... | 27,716·40 | 172,483 |
| Total ... | 100·00 | 300 | 450·00 | 247 | 57,280·00 | 36,148 | 57,830·00 | 36,695 | 241,060·65 | 797,558 | 106·57 | 1,529 | 241,167·22 | 799,087 |

† Iron ore from Koolan Island, Yampi Sound.

TABLE IX.—*Minerals other than Gold, etc.*—continued.

| Period. | Silver Lead Ore. | | Coal. | | Tungsten Ores. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Scheelite. | | | | | | | | | |
| | Ashburton Gf. | | Collie River Mf. | | North Coolgardie Gf. Menzies District. | | Broad Arrow Goldfield. | | Coolgardie Gf. Coolgardie District. | | Dundas Goldfield. | | Total. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Q'nty. | Value. | Quantity. | Value. | Q'nty. | Value. | Quantity. | Value. |
| | tons. | £ | tons. | £ | tons. | £ | tons. | £ | tons. | £ | tons. | £ | tons. | £ |
| Previous to 1899 | ... | ... | 3,508·00 | 1,761 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1899 ... ... | ... | ... | 54,336·00 | 25,951 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1900 ... ... | ... | ... | 118,410·10 | 54,835 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1901 ... ... | 21·05 | 152 | 117,835·80 | 68,561 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1902 ... ... | 35·85 | 277 | 140,883·90 | 86,188 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1903 ... ... | ... | ... | 133,426·62 | 69,128 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1904 ... ... | ... | ... | 138,550·04 | 67,174 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1905 ... ... | ... | ... | 127,364·06 | 55,312 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1906 ... ... | ... | ... | 149,755·27 | 57,998 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1907 ... ... | ... | ... | 142,372·54 | 55,158 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1908 ... ... | 727·25 | 6,914 | 175,247·92 | 75,694 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1909 ... ... | 440·00 | 3,520 | 214,301·98 | 90,965 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1910 ... ... | ... | ... | 262,166·06 | 113,699 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1911 ... ... | ... | ... | 249,899·15 | 111,154 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1912 ... ... | ... | ... | 295,078·91 | 135,857 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1913 ... ... | 125·50 | 1,757 | 313,817·96 | 153,614 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1914 ... ... | 715·10 | 9,807 | 319,210·32 | 148,684 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1915 ... ... | 298·96 | 4,429 | 286,666·35 | 137,859 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1916 ... ... | 67·83 | 554 | 301,525·97 | 147,823 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1917 ... ... | ... | ... | 326,550·07 | 191,822 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1918 ... ... | 237·48 | 3,461 | 337,039·24 | 204,319 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1919 ... ... | 214·76 | 3,116 | 401,713·18 | 270,355 | 273·06 | 829 | ... | ... | 45·71 | 101 | ... | ... | 318·77 | 930 |
| 1920 ... ... | ... | ... | 462,020·78 | 350,346 | 134·25 | 113 | 3·35 | 175 | 40·00 | 54 | ·41 | 10 | 178·01 | 352 |
| Total ... | 2,883·78 | 33,987 | 5,071,680·22 | 2,674,257 | 407·31 | 942 | 3·35 | 175 | 85·71 | 155 | ·41 | 10 | 496·78 | 1,282 |

| Period. | Tungsten Ores—*contd.* | | Gadolinite. | | Asbestos. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Wolfram. | | Pilbara Gf. | | Pilbara Gf. | | | | Total. | |
| | State generally. | | Marble Bar D. | | Marble Bar D. | | Nullagine D. | | | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| | tons. | £ | tons. | £ | tons. | £ | tons. | £ | tons. | £ |
| Previous to 1899 ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1899 ... ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1900 ... ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1901 ... ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1902 ... ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1903 ... ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1904 ... ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1905 ... ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1906 ... ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1907 ... ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1908 ... ... ... ... ... | ... | ... | ... | ... | 40·00 | 1,600 | ... | ... | 40·00 | 1,600 |
| 1909 ... ... ... ... ... | *5·00 | 90 | ... | ... | 2·83 | 154 | ... | ... | 2·83 | 154 |
| 1910 ... ... ... ... ... | † 42·00 | 115 | ... | ... | ... | ... | ... | ... | ... | ... |
| 1911 ... ... ... ... ... | ‡ 194·00 | 877 | ... | ... | ... | ... | ... | ... | ... | ... |
| 1912 ... ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1913 ... ... ... ... ... | ‡ 4·64 | 69 | 1·00 | 112 | ... | ... | ... | ... | ... | ... |
| 1914 ... ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1915 ... ... ... ... ... | ** ·25 | 27 | ... | ... | ... | ... | ... | ... | ... | ... |
| 1916 ... ... ... ... ... | 20·00 | 117 | ... | ... | ... | ... | ... | ... | ... | ... |
| 1917 ... ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1918 ... ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1919 ... ... ... ... ... | ... | ... | ... | ... | ... | ... | 53·00 | 1,443 | 53·00 | 1,443 |
| 1920 ... ... ... ... ... | ... | ... | ... | ... | 32·00 | 1,900 | 124·50 | 5,386 | 156·50 | 7,286 |
| Total ... ... ... | 265·89 | 1,295 | 1·00 | 112 | 74·83 | 3,654 | 177·50 | 6,829 | 252·33 | 10,483 |

| Period. | Limestone. | | | | | | | | Diamonds. | | Magnesite. | | Antimony. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Murchison Gf. Cue District. | | Yilgarn Goldfield. | | State generally. | | Total. | | Pilbara Gf. Nullagine District. | | East Coolgardie Goldfield. Bulong District. | | West Pilbara Goldfield. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| | tons. | £ | tons. | £ | tons. | £ | tons. | £ | carats. | £ | tons. | £ | tons. | £ |
| Previous to 1899 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1899 ... ... | ... | ... | ... | ... | 17,593·00 | 2,838 | 17,593·00 | 2,838 | § | 24 | ... | ... | ... | ... |
| 1900 ... ... | ... | ... | 269·85 | 273 | 15,657·00 | 3,321 | 15,926·85 | 3,594 | ... | ... | ... | ... | ... | ... |
| 1901 ... ... | ... | ... | 1,642·00 | 919 | 16,568·00 | 3,429 | 18,210·00 | 4,348 | ... | ... | ... | ... | ... | ... |
| 1902 ... ... | ... | ... | 535·00 | 340 | 4,545·35 | 1,000 | 5,080·35 | 1,340 | ... | ... | ... | ... | ... | ... |
| 1903 ... ... | ... | ... | 102·00 | 75 | 1,177·50 | 103 | 1,279·50 | 178 | ... | ... | ... | ... | ... | ... |
| 1904 ... ... | ... | ... | ... | ... | 13,397·20 | 1,699 | 13,397·20 | 1,699 | ... | ... | ... | ... | ... | ... |
| 1905 ... ... | ... | ... | ... | ... | 9,144·60 | 1,220 | 9,144·60 | 1,220 | ... | ... | ... | ... | ... | ... |
| 1906 ... ... | ... | ... | ... | ... | 9,472·28 | 1,691 | 9,472·28 | 1,691 | ... | ... | ... | ... | ... | ... |
| 1907 ... ... | 298·00* | 772 | ... | ... | 3,303·95 | 610 | 3,601·95 | 1,382 | ... | ... | ... | ... | ... | ... |
| 1908 ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1909 ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1910 ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1911 ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1912 ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1913 ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1914 ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1915 ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 601·50 | 601 | ... | ... |
| 1916 ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 97·50 | 97 | 20·78 | 491 |
| 1917 ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 20·50 | 21 | ... | ... |
| 1918 ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 105·25 | 334 | ... | ... |
| 1919 ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1920 ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| Total ... | 298·00 | 772 | 2,548·85 | 1,607 | 90,858·88 | 15,911 | 93,705·73 | 18,290 | ... | 24 | 824·75 | 1,053 | 20·78 | 491 |

* Produced within the West Kimberley Goldfield. † Tons 22·00, value £30, the produce of West Kimberley, and tons 20·00, value £85, the produce of Cue. ‡ The produce of Cue District. § Weight unknown. ** The produce of Yalgoo Goldfield.

NOTE.—As the collection of Statistics of Minerals other than Gold commenced during 1899, the total production from the different localities can only be approximately estimated by the Customs Records, the latest available returns of which are to be found in Table XXV., pages 76–81.

# TABLE X.

QUANTITY AND VALUE OF BLACK TIN REPORTED TO THE MINES DEPARTMENT DURING 1920, AND TOTALS TO DATE.

| LOCALITY. | NUMBER OF LEASE, CLAIM, OR AREA. | REGISTERED NAME OF COMPANY OR LEASE. | 1920. Quantity. Lode. | 1920. Quantity. Stream. | 1920. Quantity. Total. | 1920. Value. | TOTALS TO DATE. Quantity. Lode. | TOTALS TO DATE. Quantity. Stream. | TOTALS TO DATE. Quantity. Total. | TOTALS TO DATE. Value. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | tons. | tons. | tons. | £ | tons. | tons. | tons. | £ |
| **PILBARA GOLDFIELD.** | | | | | | | | | | |
| **MARBLE BAR DISTRICT.** | | | | | | | | | | |
| Cooglegong | | Sundry claims | ... | 14·00 | 14·00 | 2,529 | ... | 1,689·27 | 1,689·27 | 149,924 |
| Mill's Find | | Sundry claims | ... | ... | ... | ... | ... | ·85 | ·85 | 69 |
| Moolyella | | Voided leases | ... | ... | ... | ... | ... | 330·53 | 330·53 | 21,340 |
| Do. | | Sundry claims | ... | 23·00 | 23·00 | 4,246 | ... | 2,788·21 | 2,788·21 | 264,015 |
| Old Shaw | | Voided leases | ... | ... | ... | ... | ... | 6·75 | 6·75 | 424 |
| Do. | | Sundry claims | ... | ... | ... | ... | ... | 214·04 | 214·04 | 14,525 |
| Tabba Tabba | | Sundry claims | ... | 4·50 | 4·50 | 8·41 | ... | 114·77 | 114·77 | 12,905 |
| Wodgina | M.Ls. 86, 87, 95 | H.M. and Anchorite leases | ... | ... | ... | ... | ... | 5·00 | 5·00 | 500 |
| Do. | M.L. 84 | (Mount Cassiterite) | ... | ... | ... | ... | 113·52 | 13·85 | 147·37 | 14,184 |
| Do. | M.Ls. 84, (93), 148) | Mount Cassiterite leases | ... | ... | ... | ... | 195·50 | 1·60 | 197·10 | 16,913 |
| Do. | | Voided leases | ... | ... | ... | ... | 37·82 | 6·10 | 43·92 | 4,414 |
| Do. | | Sundry claims | ... | ... | ... | ... | 5·78 | 48·20 | 53·98 | 5,062 |
| | | **Totals** | ... | 41·50 | 41·50 | 7,616 | 372·62 | 5,219·17 | 5,591·79 | 504,275 |
| **MURCHISON GOLDFIELD.** | | | | | | | | | | |
| **CUE DISTRICT.** | | | | | | | | | | |
| Poona | | Sundry claims | ... | ... | ... | ... | ... | 1·52 | 1·52 | 118 |
| Cuddingwarra | | Sundry claims | ... | ... | ... | ... | ... | 3·20 | 3·20 | 242 |
| | | **Totals** | ... | ... | ... | ... | ... | 4·72 | 4·72 | 360 |
| **COOLGARDIE GOLDFIELD.** | | | | | | | | | | |
| **COOLGARDIE DISTRICT.** | | | | | | | | | | |
| Bulla Bulling | | Sundry claims | ... | ... | ... | ... | ... | ·15 | ·15 | 15 |
| | | **Totals** | ... | ... | ... | ... | ... | ·15 | ·15 | 15 |
| **GREENBUSHES MINERAL FIELD.** | | | | | | | | | | |
| Greenbushes | 472 | (Aqua) | ... | ... | ... | ... | ... | 1·50 | 1·50 | 128 |
| Do. | 296 | (Central) | ... | ... | ... | ... | ... | 100·16 | 100·16 | 9,728 |
| Do. | 511 | Champion | ... | 22·35 | 22·35 | 3,044 | 1·60 | 211·80 | 213·40 | 23,641 |
| Do. | 615 | Cornwall | ·60 | ... | ·60 | 140 | 3·35 | ... | 3·35 | 580 |
| Do. | (369) | Enterprise | ... | ... | ... | ... | ·20 | 7·29 | 7·49 | 667 |
| Do. | 510 | (Excelsior Extended) | ... | ... | ... | ... | ... | ·05 | ·05 | 5 |
| Do. | 472, 497, 510 | Excelsior leases | ... | 31·75 | 31·75 | 5,340 | ... | 109·80 | 109·80 | 16,941 |
| Do. | 497 | (Excelsior Tin Mining Co., Ltd.) | ... | ... | ... | ... | ... | 4·05 | 4·05 | 281 |
| Do. | 617 | Found at Last | ·57 | ... | ·57 | 130 | ·57 | ... | ·57 | 130 |
| Do. | (35,)(169), (218), (272), (287), (295,) 296, (331), (375), (395), (421), (425), (428), (432), (448), (453) | Greenbushes Development Co., Ltd. | ... | ·40 | ·40 | 93 | ·35 | 970·81 | 971·16 | 86,905 |
| Do. | 515 | Kapanga | 2·62 | ... | 2·62 | 372 | 30·28 | ·76 | 31·04 | 3,989 |
| Do. | 73, 233, 271, 504 | King Tin leases | ... | 18·00 | 18·00 | 3,224 | 6·52 | 102·44 | 108·96 | 14,294 |
| Do. | 271 | (King Tin North) | ... | ... | ... | ... | ... | 1·84 | 1·84 | 117 |
| Do. | 598 | Last Chance | ... | ·31 | ·31 | 45 | ... | ·46 | ·46 | 66 |
| Do. | 605 | Lost and Found | ... | ... | ... | ... | ·50 | ... | ·50 | 87 |
| Do. | 606 | Lost and Found North | ... | ... | ... | ... | 4·80 | ... | 4·80 | 975 |
| Do. | 73 | (Nelson) | ... | ... | ... | ... | ... | 22·40 | 22·40 | 1,675 |
| Do. | 73, 233 | (Nelson leases) | ... | ... | ... | ... | ... | 61·01 | 61·01 | 4,164 |
| Do. | 504 | (Old Bunbury) | ... | ... | ... | ... | ... | 37·62 | 37·62 | 3,619 |
| Do. | 529, 555, (571) | (Phœnix Sluicing Co., Ltd.) | ... | ... | ... | ... | ... | 58·95 | 58·95 | 5,553 |
| Do. | 616 | Returned Soldier | 3·42 | ·60 | 4·02 | 715 | 7·23 | ·60 | 7·83 | 1,346 |
| Do. | (588) | Satin Bird | ... | ... | ... | ... | 4·56 | 1·05 | 5·61 | 951 |
| Do. | 505, (519), 614 | Scotia leases | ... | 4·35 | 4·35 | 720 | ... | 53·92 | 53·92 | 5,542 |
| Do. | 580 | Southern Cross | ... | ... | ... | ... | 3·85 | ... | 3·85 | 719 |
| Do. | 529 | (Three C's) | ... | ... | ... | ... | ... | 53·33 | 53·33 | 4,314 |
| Do | 529, 555 | Three C's leases | ... | 9·15 | 9·15 | 1,513 | ... | 9·15 | 9·15 | 1,513 |
| Do. | 565 | Turn of the Tide | ... | 4·00 | 4·00 | 626 | ... | 15·96 | 15·96 | 2,307 |
| Do. | (381), (435), (436), 472, (478) | (Westralian Gully Tin Co,. Ltd.) | ... | ... | ... | ... | 6·38 | 34·38 | 40·76 | 3,235 |
| Do. | Loc. 289, 290 | Freehold Ground (Clarth & others) | ... | ... | ... | ... | ... | 318·04 | 318·04 | 28,959 |
| Do. | Loc. 290 | Freehold Ground (McKay & Struthers) | ... | 4·84 | 4·84 | 723 | ... | 4·84 | 4·84 | 723 |
| Do. | | Voided leases | ... | ... | ... | ... | 199·08 | 1,630·18 | 1,829·26 | 180,455 |
| Do. | | Sundry claims | 3·04 | 84·09 | 87·13 | 14,564 | 70·87 | 6,525·54 | 6,596·41 | 504,489 |
| | | **Totals** | 10·25 | 179·84 | 190·09 | 31,249 | 340·14 | 10,337·93 | 10,678·07 | 908,098 |

# TABLE XI.

QUANTITY AND VALUE OF TANTALITE REPORTED TO THE MINES DEPARTMENT DURING 1920, AND TOTALS TO DATE.

| LOCALITY. | NUMBER OF LEASE, CLAIM, OR AREA. | REGISTERED NAME OF COMPANY OR LEASE. | 1920. | | | | TOTAL TO DATE. | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Quantity. | | | Value. | Quantity. | | | Value. |
| | | | Lode. | Stream. | Total. | | Lode. | Stream. | Total. | |
| | | | tons. | tons. | tons. | £ | tons. | tons. | tons. | £ |
| **PILBARA GOLDFIELD.** | | | | | | | | | | |
| MARBLE BAR DISTRICT. | | | | | | | | | | |
| Wodgina ... | 86, 87, 95 ... | H.M. and Anchorite leases ... | ... | ... | ... | ... | 2·25 | 44·80 | 47·05 | 7,340 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | ... | ... | 51·50 | 51·50 | 6,124 |
| | | **Totals ... ...** | ... | ... | ... | ... | 2·25 | 96·30 | 98·55 | 13,464 |
| GREENBUSHES MINERAL FIELD. | | | | | | | | | | |
| Greenbushes ... | (369) ... ... | Enterprise ... ... ... | ... | ... | ... | ... | ... | 3·19 | 3·19 | 1,804 |
| | | **Totals ... ...** | ... | ... | ... | ... | ... | 3·19 | 3·19 | 1,804 |

# TABLE XII.

QUANTITY AND VALUE OF PYRITIC ORE REPORTED TO THE MINES DEPARTMENT DURING 1920, AND TOTALS TO DATE.

| LOCALITY. | NUMBER OF LEASE, CLAIM, OR AREA. | REGISTERED NAME OF COMPANY OR LEASE. | 1920. | | TOTAL TO DATE. | |
|---|---|---|---|---|---|---|
| | | | Quantity. | †Value. | Quantity. | †Value. |
| | | | tons. | £ | tons. | £ |
| **MT. MARGARET GOLDFIELD.** | | | | | | |
| MT. MORGANS DISTRICT. | | | | | | |
| Eulaminna ... | M.Ls. 4F, 5F, (11F), (12F) | West Australian Copper Co., Ltd. ... ... ... ... ... ... | 5,446·03 | 6,662 | 53,090·94 | 27,743 |
| Murrin Murrin... | M.L. 18F ... | Nangeroo: Nangaroo Mines, Ltd. ... ... ... ... ... ... | 573·95 | 614 | 11,398·81 | 5,679 |
| | | **Totals ... ... ... ... ...** | 6,019·98 | 7,276 | 64,489·75 | 33,422 |

† Represents the value of the sulphur only, the copper contents not yet having been treated.

# TABLE XIII.

QUANTITY AND VALUE OF COPPER ORE REPORTED TO THE MINES DEPARTMENT DURING 1920, AND TOTALS TO DATE.

| LOCALITY. | NUMBER OF LEASE, CLAIM, OR AREA. | REGISTERED NAME OF COMPANY OR LEASE. | 1920. | | | TOTAL TO DATE. | | |
|---|---|---|---|---|---|---|---|---|
| | | | Quantity. | | Value. | Quantity. | | Value. |
| | | | Ore. | Metallic Copper. | | Ore. | Metallic Copper. | |
| | | | tons. | tons. | £ | tons. | tons. | £ |
| **WEST KIMBERLEY GOLDFIELDS.** | | | | | | | | |
| Berylton ... | ... | Voided leases ... ... ... | ... | ... | ... | 13·19 | 2·76 | 200 |
| Yampi Sound ... | M.L. (1), [221H] | Yampi Sound Copper Mine ... ... | ... | ... | ... | 92·86 | 22·80 | 1,473 |
| Do. ... | ... ... ... | Sundry claims ... ... ... ... | ... | ... | ... | 3·47 | ·36 | 36 |
| | | **Totals ... ... ...** | ... | ... | ... | 109·52 | 25·92 | 1,709 |
| **PILBARA GOLDFIELD.** | | | | | | | | |
| MARBLE BAR DISTRICT. | | | | | | | | |
| Marble Bar ... | ... ... ... | Voided Leases ... ... ... ... | ... | ... | ... | 11·00 | 1·64 | 90 |
| Do. ... | ... ... ... | Sundry claims ... ... ... ... | ... | ... | ... | 4·75 | ·48 | 25 |
| North Pole ... | ... ... ... | Voided leases ... ... ... ... | ... | ... | ... | 9·35 | 1·39 | 81 |
| North Shaw ... | ... ... ... | Voided leases ... ... ... ... | ... | ... | ... | 7·77 | 1·90 | 190 |
| | | **Totals ... ... ...** | ... | ... | ... | 32·87 | 5·41 | 386 |
| NULLAGINE DISTRICT. | | | | | | | | |
| Lionel ... ... | ... ... ... | Sundry claims ... ... ... ... | 9·00 | 4·75 | 360 | 9·00 | 4·75 | 360 |
| McPhee's Creek | ... ... ... | Voided leases ... ... ... ... | ... | ... | ... | 5·00 | 2·22 | 120 |
| | | **Totals ... ... ...** | 9·00 | 4·75 | 360 | 14·00 | 6·97 | 480 |
| **WEST PILBARA GOLDFIELD.** | | | | | | | | |
| Croydon ... | ... ... ... | Voided leases ... ... ... ... | ... | ... | ... | 604·00 | 108·65 | 7,333 |
| Egina ... ... | ... ... ... | Voided leases ... ... ... ... | ... | ... | ... | 542·00 | 104·15 | 6,643 |
| Roebourne ... | M.L. 183 ... | Carlow Castle: (Roebourne Copper Mines, Ltd.) | ... | ... | ... | 69·00 | 7·80 | 7·80 |
| Do. ... | M.L. 174 ... | Good Fortune ... ... ... ... | ... | ... | ... | 56·77 | 8·58 | 904 |
| Do. ... | M.Ls. 174, (175) | (Good Fortune leases) ... ... ... | ... | ... | ... | 63·40 | 9·58 | 1,011 |
| Do. ... | M.L. 184 ... | Good Luck ... ... ... ... | ... | ... | ... | 5·21 | 1·01 | 111 |
| Do. ... | M.L. (178) ... | Lily Blanche ... ... ... ... | ... | ... | ... | 16·98 | 2·97 | 272 |
| Do. ... | M.L. 167 ... | (Quod Est) ... ... ... ... | ... | ... | ... | 22·43 | 3·49 | 256 |
| Do. ... | M.L.s 167, 183 | Roebourne Copper Mines, Ltd. ... ... | 34·50 | 4·95 | 495 | 122·45 | 18·50 | 1,855 |
| Do. ... | M.L. 192 ... | (Whundo) ... ... ... ... ... | 213·00 | 38·34 | 4,260 | 213·00 | 38·34 | 4,260 |
| Do. ... | M.L. 193 ... | (Whundo West) ... ... ... ... | 113·00 | 20·34 | 2,260 | 113·00 | 20·34 | 2,260 |
| Do. ... | M.Ls. 144, 192, 193 | Yannery & Whundo Copper Mining Co., Ltd. | 312·50 | 65·44 | 6,581 | 312·50 | 65·44 | 6,581 |
| Do. ... | M.L. 144 ... | (Yannery Hill Copper Mine) ... ... | 134·00 | 24·12 | 2,680 | 469·25 | 113·81 | 9,961 |
| Do. ... | ... ... ... | Voided leases ... ... ... ... | ... | ... | ... | 2,386·30 | 454·18 | 37,667 |
| Do. ... | ... ... ... | Sundry claims ... ... ... ... | ... | ... | ... | 77·41 | 13·61 | 800 |
| Whim Creek ... | M.L. 34 ... | (Balla Balla Copper Mines, Ltd.) ... ... | ... | ... | ... | 2,009·00 | 166·33 | 12,036 |
| Do. ... | M.L. 34 ... | Mons Cupri: Whim Hill Copper Mines, Ltd. | ... | ... | ... | 282·50 | 33·75 | 2,979 |
| Do. ... | Loc. 71 ... | Pilbara Copper Fields, Ltd. ... ... | 893·50 | 160·53 | 15,783 | 1,223·50 | 219·53 | 21,683 |
| Do. ... | Loc. 71 ... | (Whim Well Copper Mines, Ltd.) ... | ... | ... | ... | 72,562·75 | 9,343·89 | 604,492 |
| Do. ... | ... ... ... | Voided leases ... ... ... ... | ... | ... | ... | 30·00 | 5·50 | 250 |
| | | **Totals ... ... ...** | 1,700·50 | 313·72 | 32,059 | 81,181·45 | 10,739·45 | 722,134 |

TABLE XIII.—*Quantity and Value of COPPER ORE, etc.*—continued.

| LOCALITY. | NUMBER OF LEASE, CLAIM, OR AREA. | REGISTERED NAME OF COMPANY OR LEASE. | 1920. | | | TOTALS TO DATE. | | |
|---|---|---|---|---|---|---|---|---|
| | | | Quantity. | | Value. | Quantity. | | Value. |
| | | | Ore. | Metallic Copper. | | Ore. | Metallic Copper. | |
| | | | tons. | tons. | £ | tons. | tons. | £ |
| **ASHBURTON GOLDFIELD.** | | | | | | | | |
| Ashburton ... | ... | Sundry claims ... ... ... ... | ... | ... | ... | 6·32 | ·79 | 94 |
| Red Hill ... | ... | Voided leases ... ... ... ... | ... | ... | ... | 175·50 | 33·85 | 2,126 |
| Uaroo ... ... | ... | Voided leases ... ... ... ... | ... | ... | ... | 169·25 | 62·49 | 4,188 |
| | | **Totals** ... ... ... | ... | ... | ... | **351·07** | **97·13** | **6,408** |
| **PEAK HILL GOLDFIELD.** | | | | | | | | |
| Peak Hill ... | M.L. 35P ... | Burra Copper Mines, Ltd. ... ... ... ... | ... | ... | ... | 25·84 | 8·85 | 943 |
| Do. ... | M.Ls. 37P, 38P | Sonia Leases ... ... ... ... | 25·00 | 10·00 | 900 | 135·04 | 47·26 | 4,807 |
| Do. ... | M.L. 9P ... | Sons of Gwalia ... ... ... ... | 10·39 | 4·39 | 501 | 458·49 | 169·89 | 15,680 |
| Do. ... | M.Ls. (29P), (30P) 31P | (Two Sisters leases) ... ... ... | ... | ... | ... | 64·04 | 30·93 | 1,466 |
| Do. ... | M.L. 31P ... | Two Sisters North ... ... ... ... | ... | ... | ... | 115·76 | 31·40 | 3,594 |
| Do. ... | ... ... ... | Voided leases ... ... ... ... | ... | ... | ... | 153·91 | 43·02 | 3,885 |
| Do. ... | ... ... ... | Sundry claims ... ... ... ... | ... | ... | ... | 62·03 | 21·96 | 1,837 |
| | | **Totals** ... ... ... | **35·39** | **14·39** | **1,401** | **1,015·11** | **353·31** | **32,212** |
| **EAST MURCHISON GOLDFIELD.** | | | | | | | | |
| LAWLERS DISTRICT. | | | | | | | | |
| Kathleen Valley ... | ... | Voided leases ... ... ... ... | ... | ... | ... | 6·77 | 1·32 | 69 |
| Lawlers ... | ML.. (29) ... | Bungarra ... ... ... ... | ... | ... | ... | 157·44 | 23·85 | 2,837 |
| Do. ... | ... | Sundry claims ... ... ... ... | ... | ... | ... | 74·35 | 13·25 | 1,458 |
| | | **Totals** ... ... ... | ... | ... | ... | **238·56** | **38·42** | **4,364** |
| **MURCHISON GOLDFIELD.** | | | | | | | | |
| MEEKATHARRA DISTRICT. | | | | | | | | |
| Gabanintha ... | ... | Voided leases ... ... ... ... | ... | ... | ... | 920·56 | 119·84 | 9,381 |
| Do. ... | ... | Sundry claims ... ... ... ... | ... | ... | ... | 34·42 | 9·23 | 1,072 |
| Holden's Find... | ... | Sundry claims ... ... ... ... | ... | ... | ... | 6·72 | 1·11 | 111 |
| Yaloginda ... | ... | Sundry claims ... ... ... ... | ... | ... | ... | 6·76 | 1·41 | 150 |
| | | **Totals** ... ... ... | ... | ... | ... | **968·46** | **131·59** | **10,714** |
| DAY DAWN DISTRICT | | | | | | | | |
| Day Dawn ... | ... ... ... | Voided leases ... ... ... ... | ... | ... | ... | 26·95 | 5·17 | 305 |
| Do. ... | ... ... ... | Sundry claims ... ... ... ... | ... | ... | ... | 28·61 | 2·93 | 217 |
| | | **Totals** ... ... ... | ... | ... | ... | **55·56** | **8·10** | **522** |
| **YALGOO GOLDFIELD.** | | | | | | | | |
| Mount Gibson ... | ... ... ... | Sundry claims ... ... ... ... | ... | ... | ... | 4·99 | 1·10 | 95 |
| Twin Peaks ... | ... ... ... | Sundry claims ... ... ... ... | ... | ... | ... | 19·50 | 3·49 | 227 |
| Wadgingarra ... | ... ... ... | Voided leases ... ... ... ... | ... | ... | ... | 13·91 | ·98 | 91 |
| | | **Totals** ... ... ... | ... | ... | ... | **38·40** | **5·57** | **413** |
| **NORTHAMPTON MINERAL FIELD.** | | | | | | | | |
| Geraldine ... | ... ... ... | Voided leases ... ... ... ... | ... | ... | ... | 136·50 | 36·05 | 1,992 |
| | | **Totals** ... ... ... | ... | ... | ... | **136·50** | **36·05** | **1,992** |
| **YANDANOOKA MINERAL FIELD.** | | | | | | | | |
| Arrino ... ... | ... ... ... | Sundry claims ... ... ... ... | ... | ... | ... | 126·05 | 18·48 | 1,386 |
| Yandanooka ... | Freehold Gd. ... | Muggawa Copper Mines ... ... ... | ... | ... | ... | 7·50 | 1·20 | 96 |
| Do. ... | ... ... ... | Voided leases ... ... ... ... | ... | ... | ... | 38·00 | 7·95 | 407 |
| | | **Totals** ... ... ... | ... | ... | ... | **171·55** | **27·63** | **1,889** |
| **MOUNT MARGARET GOLDFIELD.** | | | | | | | | |
| MOUNT MORGANS DISTRICT. | | | | | | | | |
| Eulaminna ... | [10C, 11C], 4F, 5F (12C, 37C) | (Mt. Malcolm Copper Mine leases) ... | ... | ... | ... | 13,516·00 | 1,001·98 | 70,754 |
| Do. ... | [10C, 11C], 4F, 5F | (Mt. Malcolm Copper Mine leases) ... | ... | ... | ... | 3,839·00 | 418·00 | 17,065 |
| Do. ... | [10C, 11C], 4F, 5F (12C, 37C) | (Murrin Copper Mines, Ltd.) ... ... | ... | ... | ... | 19,165·00 | 798·50 | 45,817 |
| Do. ... | 4F, 5F (11F) (12F) | West Australian Copper Co., Ltd. ... ... | ... | ... | ... | 9,794·05 | 1,976·08 | 80,199 |
| Mt. Margaret ... | ... ... ... | Voided leases ... ... ... ... | ... | ... | ... | 11·53 | 2·40 | 163 |
| Murrin Murrin... | 18F ... ... | Nangeroo: Nangaroo Mines, Ltd. ... ... | ... | ... | ... | 6·80 | 3·00 | 160 |
| Do. ... | ... ... ... | Voided leases ... ... ... ... | ... | ... | ... | 1,525·29 | 248·04 | 16,662 |
| | | **Totals** ... ... ... | ... | ... | ... | **47,857·67** | **4,448·00** | **230,820** |

TABLE XIII.—*Quantity and Value of COPPER ORE, etc.*—continued.

| LOCALITY. | NUMBER OF LEASE, CLAIM, OR AREA. | REGISTERED NAME OF COMPANY OR LEASE. | 1920. Quantity. Ore. | 1920. Quantity. Metallic Copper. | 1920. Value. | TOTALS TO DATE. Quantity. Ore. | TOTALS TO DATE. Quantity. Metallic Copper. | TOTALS TO DATE. Value. |
|---|---|---|---|---|---|---|---|---|
| | | | tons. | tons. | £ | tons. | tons. | £ |
| **MOUNT MARGARET GOLDFIELD—*continued*.** | | | | | | | | |
| **MOUNT MARGARET DISTRICT.** | | | | | | | | |
| Burtville ... ... ... ... | | Voided leases ... ... ... ... | ... | ... | ... | 2·85 | ·29 | 26 |
| | | **Totals** ... ... ... | ... | ... | ... | **2·85** | **·29** | **26** |
| **NORTH COOLGARDIE GOLDFIELD.** | | | | | | | | |
| **MENZIES DISTRICT.** | | | | | | | | |
| Goongarrie ... ... ... ... | | Voided leases ... ... ... ... | ... | ... | ... | 4·70 | ·42 | 33 |
| Do. ... ... ... ... | | Sundry claims ... ... ... ... | ... | ... | ... | 1·42 | ·40 | 18 |
| | | **Totals** ... ... ... | ... | ... | ... | **6·12** | **·82** | **51** |
| **EAST COOLGARDIE GOLDFIELD.** | | | | | | | | |
| **EAST COOLGARDIE DISTRICT.** | | | | | | | | |
| Boorara ... ... ... ... | | Voided leases ... ... ... ... | ... | ... | ... | 50·67 | 6·22 | 330 |
| | | **Totals** ... ... ... | ... | ... | ... | **50·67** | **6·22** | **330** |
| **PHILLIPS RIVER GOLDFIELD.** | | | | | | | | |
| Kundip ... | G.M.Ls. 147, 179 | Fair Play leases ... ... ... ... | ... | 11·66 | 990 | 130·09 | 131·30 | 11,975 |
| Do. ... | G.M.L. 184 ... | Gem ... ... ... ... ... | ... | ·23 | 20 | 90·98 | 20·69 | 2,271 |
| Do. ... | G.M.L. 151, 156 | Gem Consolidated leases ... ... | ... | ... | ... | 48·00 | 76·75 | 8,327 |
| Do. ... | M.Ls. 52, 94 ... | Harbour View Gold & Copper Co., Ltd. ... | 36·64 | 1·54 | 167 | 1,204·65 | 89·81 | 8,215 |
| Do. ... | M.Ls. 52, 94 ... | (Harbour View leases) ... ... ... | ... | ... | ... | 604·36 | 76·80 | 4,524 |
| Do. ... | M.Ls. 52, 94 ... | (Harbour View leases) ... ... ... | ... | ... | ... | 508·27 | 64·66 | 3,642 |
| Do. ... | G.M.L. 98 ... | Hillsborough ... ... ... ... | ... | 6·60 | 652 | 692·84 | 56·79 | 4,688 |
| Do. ... | M.L. 370 ... | North Harbour View ... ... ... | ... | ... | ... | 13·80 | ·80 | 99 |
| Do. ... | M.Ls. 52, 94 ... | (Ravensthorpe G.M. Syndicate, N.L.) ... | ... | ... | ... | 132·56 | 24·36 | 1,382 |
| Do. ... | G.M.L. 74 ... | Two Boys ... ... ... ... ... | ... | ... | ... | ... | 28·30 | 3,249 |
| Do. ... | ... ... ... | Voided leases ... ... ... ... | ... | ... | ... | 3,428·18 | 290·75 | 19,130 |
| Do. ... | ... ... ... | Sundry claims ... ... ... ... | ... | ·23 | 20 | 87·56 | 14·48 | 1,197 |
| Mt. Desmond ... | M.L. 203 ... | British Flag: Phillips River Gold & Copper Co., Ltd. | ... | ... | ... | 19·90 | 3·64 | 250 |
| Do. ... | M.L. 208 ... | Desmond ... ... ... ... ... | 26·98 | 4·28 | 411 | 1,392·85 | 164·82 | 16,993 |
| Do. ... | M.L. 208 ... | (Desmond: Phillips River Gold & Copper Co., Ltd.) | ... | ... | ... | 1,234·05 | 215·74 | 14,956 |
| Do. ... | M.L. 95 ... | Elverdton ... ... ... ... ... | 4·73 | ·70 | 60 | 7,418·57 | 675·84 | 67,229 |
| Do. ... | M.L. 95 ... | (Elverdton)... ... ... ... ... | ... | ... | ... | 130·00 | 5·70 | 570 |
| Do. ... | M.L. 95 ... | (Elverdton: Phillips River Gold & Copper Co., Ltd.) | ... | ... | ... | 30,574·23 | 2,186·64 | 124,252 |
| Do. ... | M.L. 95 ... | (Elverdton: Phillips River Option Syndicate, N.L.) | ... | ... | ... | 2,946·02 | 401·43 | 22,657 |
| Do. ... | M.L. 168 ... | Elverton South: Phillips River Gold & Copper Co., Ltd. | ... | ... | ... | 15·73 | 1·46 | 92 |
| Do. ... | M.L. 168 ... | (Elverton South) ... ... ... ... | ... | ... | ... | 18·48 | 2·39 | 119 |
| Do. ... | M.L. 109 ... | Mt. Desmond: Phillips River Gold & Copper Co., Ltd. | ... | ... | ... | 1,762·22 | 216·76 | 18,128 |
| Do. ... | M.L. 109 ... | (Mt. Desmond) ... ... ... ... | ... | ... | ... | 198·87 | 30·77 | 1,640 |
| Do. ... | M.L. 199 ... | P.L.P.: Phillips River Gold & Copper Co., Ltd. | ... | ... | ... | 17·56 | 1·88 | 121 |
| Do. ... | M.L. 199 ... | (P.L.P.) ... ... ... ... ... | ... | ... | ... | 208·66 | 33·69 | 2,277 |
| Do. ... | ... ... ... | Voided Leases ... ... ... ... | ... | ... | ... | 1,015·17 | 166·71 | 9,770 |
| Do. ... | ... ... ... | Sundry claims ... ... ... ... | 15·16 | 1·31 | 130 | 140·25 | 25·17 | 1,901 |
| Ravensthorpe ... | M.L. 379 ... | Ballarat ... ... ... ... ... | 9·71 | 1·41 | 137 | 9·71 | 1·41 | 137 |
| Do. ... | M.L. 378 ... | Bickerton ... ... ... ... ... | 2·45 | ·30 | 31 | 2·45 | ·30 | 31 |
| Do. ... | M.L. 16 ... | Marion Martin ... ... ... ... | 47·92 | 5·22 | 513 | 2,270·63 | 256·94 | 26,496 |
| Do. ... | M.L. 16 ... | (Marion Martin) ... ... ... ... | ... | ... | ... | 865·69 | 130·61 | 6,650 |
| Do. ... | M.L. 16 ... | (Marion Martin: Phillips River Gold & Copper Co., Ltd.) | ... | ... | ... | 2,855·96 | 375·44 | 23,506 |
| Do. ... | M.L. 15 ... | Mount Cattlin ... ... ... ... | 3·32 | ·28 | 28 | 2,178·01 | 142·64 | 15,296 |
| Do. ... | M.L. 15 ... | (Mount Cattlin) ... ... ... ... | ... | ... | ... | 281·56 | 31·35 | 1,716 |
| Do. ... | M.L. 15 ... | (Mount Cattlin: Mount Cattlin Copper Mining Co., Ltd.) | ... | ... | ... | 6,608·76 | 333·59 | 28,841 |
| Do. ... | M.L. 15 ... | (Mount Cattlin: Phillips River Gold & Copper Co., Ltd.) | ... | ... | ... | 1,263·76 | 80·26 | 7,646 |
| Do. ... | M.L. 15 ... | (Mount Cattlin: Phillips River Gold & Copper Co., Ltd.) | ... | ... | ... | 14,432·25 | 714·90 | 40,313 |
| Do. ... | M.L. 342 ... | Surprise ... ... ... ... ... | 18·00 | 3·52 | 331 | 885·05 | 157·92 | 11,914 |
| Do. ... | ... ... ... | Voided leases ... ... ... ... | ... | ... | ... | 6,988·65 | 826·92 | 51,347 |
| Do. ... | ... ... ... | Sundry claims ... ... ... ... | 47·08 | 5·99 | 513 | 1,033·73 | 109·49 | 9,904 |
| West River ... | ... ... ... | Voided leases ... ... ... ... | ... | ... | ... | 44·04 | 7·41 | 414 |
| Do. ... | ... ... ... | Sundry claims ... ... ... ... | 5·28 | 1·03 | 122 | 150·69 | 25·84 | 2,061 |
| | | From Goldfields generally ... ... | ... | ... | ... | 1,637·88 | 128·64 | 9,760 |
| | | **Totals** ... ... ... | **217·27** | **44·30** | **4,125** | **95,537·07** | **8,331·79** | **585,686** |
| **STATE GENERALLY.** | | | | | | | | |
| ... | ... ... ... | Voided leases ... ... ... ... | ... | ... | ... | 5·11 | 1·54 | 56 |
| ... | ... ... ... | Sundry claims ... ... ... ... | ... | ... | ... | 13·50 | 2·27 | 193 |
| | | **Totals** ... ... ... | ... | ... | ... | 18·61 | 3·81 | 249 |

# TABLE XIV.

QUANTITY AND VALUE OF IRONSTONE REPORTED TO THE MINES DEPARTMENT DURING 1920, AND TOTALS TO DATE.

| LOCALITY. | NUMBER OF LEASE, CLAIM, OR AREA. | REGISTERED NAME OF COMPANY OR LEASE. | 1920. | | TOTALS TO DATE. | |
|---|---|---|---|---|---|---|
| | | | Quantity. | Value. | Quantity. | Value. |
| | | | tons. | £ | tons. | £ |
| | | WEST PILBARA GOLDFIELD. | | | | |
| Whim Creek ... | ... ... ... | Voided leases ... ... ... ... ... ... ... | ... | ... | 100·00 | 300 |
| | | **Totals** ... ... ... | ... | ... | **100·00** | **300** |
| | | EAST COOLGARDIE GOLDFIELD. | | | | |
| | | EAST COOLGARDIE DISTRICT. | | | | |
| Boulder ... | ... ... ... | Voided leases ... ... ... ... ... ... ... | ... | ... | 450·00 | 247 |
| | | **Totals** ... ... ... | ... | ... | **450·00** | **247** |
| | | STATE GENERALLY. | | | | |
| | | Avon ... ... ... ... ... ... ... ... ... | ... | ... | 22,223·00 | 16,241 |
| | | Clackline ... ... ... ... ... ... ... ... | ... | ... | 18,253·50 | 8,789 |
| | | Coate's Paddock ... ... ... ... ... ... ... | ... | ... | 4,712·00 | 3,277 |
| | | Greenbushes ... ... ... ... ... ... ... | ... | ... | 7,481·00 | 4,629 |
| | | Koolan Island—Yampi Sound ... ... ... ... ... | ... | ... | 10·50 | 12 |
| | | Werribee ... ... ... ... ... ... ... ... | ... | ... | 4,600·00 | 3,200 |
| | | **Totals** ... ... ... | ... | ... | **57,280·00** | **36,148** |

# TABLE XV.

QUANTITY AND VALUE OF LEAD ORE REPORTED TO THE MINES DEPARTMENT DURING 1920, AND TOTALS TO DATE.

| LOCALITY. | NUMBER OF LEASE, CLAIM, OR AREA. | REGISTERED NAME OF COMPANY OR LEASE. | 1920. | | | TOTALS TO DATE. | | |
|---|---|---|---|---|---|---|---|---|
| | | | Lead Ore. | Metal therefrom. | Value. | Lead Ore. | Metal therefrom. | Value. |
| | | | tons. | tons. | £ | tons. | tons. | £ |
| | | NORTHAMPTON MINERAL FIELD. | | | | | | |
| Geraldine ... | Loc. 1 ... | Geraldine Mine ... ... ... | ... | ... | ... | 774·59 | 257·13 | 5,139 |
| Do. ... | M.L. 150 ... | Surprise ... ... ... ... | 8,127·25 | 3,244·45 | 107,789 | 10,961·43 | 4,819·20 | 145,934 |
| Do. ... | M.L. 158 ... | Surprise South ... ... ... | ... | ... | ... | 14·00 | 5·41 | 170 |
| Do. ... | M.L. 153 ... | Three Sisters ... ... ... | ... | ... | ... | 6·25 | 3·94 | 112 |
| Do. ... | M.L. 159 ... | Welcome Lead Mine ... ... | ... | ... | ... | 5·74 | 3·59 | 68 |
| Do. ... | M.L. 19PP ... | Wheal Lily ... ... ... | 38·26 | 26·54 | 653 | 38·26 | 26·54 | 653 |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | 57·00 | 41·61 | 461 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | 327·04 | 175·65 | 3,408 |
| Narra Tarra ... | Loc. 833 ... | Narra Tarra: Fremantle Trading Co., Ltd. | 14,804·80 | 1,090·16 | 39,036 | 90,825·25 | 9,469·53 | 283,927 |
| Do. ... | Loc. 118, 119 ... | Lauder & Raven (Tributers) ... | 24·52 | 13·60 | 478 | 106·21 | 60·02 | 1,345 |
| Do. ... | ... | Sundry claims ... ... | 13·16 | 7·18 | 257 | 238·16 | 34·18 | 442 |
| Northampton ... | Loc. 1472 ... | Baddera: Fremantle Trading Co., Ltd. | 4,401·20 | 622·83 | 22,115 | 129,264·56 | 13,888·33 | 317,631 |
| Do. ... | Loc. 436 ... | Fortune Exploration Co., N.L. ... | 98·81 | 36·40 | 1,004 | 123·38 | 51·17 | 1,316 |
| Do. ... | M.Ls., 127, 128, 129 | Kirton's leases ... ... ... | ... | ... | ... | 2,136·76 | 379·89 | 7,572 |
| Do. ... | Loc. 1146 ... | Wheal Ellen: Fremantle Trading Co., Ltd. | 208·40 | 31·52 | 1,151 | 4,685·08 | 647·58 | 18,939 |
| Do. ... | Loc. 436 ... | (Wheal of Fortune Extended Syndicate) | ... | ... | ... | 125·82 | 43·13 | 793 |
| Do. ... | ... | Voided leases ... ... ... | ... | ... | ... | 1,130·00 | 343·24 | 6,757 |
| Do. ... | ... | Sundry claims ... ... | ... | ... | ... | 222·12 | 132·14 | 2,679 |
| Victoria ... | ... | Voided leases ... ... ... | ... | ... | ... | 19·00 | 12·54 | ł 212 |
| | | **Totals** ... ... | **27,716·40** | **5,072·68** | **172,483** | **241,060·65** | **30,394·82** | **797,558** |
| | | WEST PILBARA GOLDFIELD. | | | | | | |
| Roebourne ... | ... ... ... | Sundry claims ... ... | ... | ... | ... | 2·57 | 1·36 | 39 |
| Whim Creek ... | ... ... ... | Voided leases ... ... | ... | ... | ... | 104·00 | 46·00 | 1,490 |
| | | **Totals** ... ... | ... | ... | ... | **106·57** | **47·36** | **1,529** |

# TABLE XVI.

QUANTITY AND VALUE OF SILVER-LEAD ORE REPORTED TO THE MINES DEPARTMENT DURING 1920, AND TOTALS TO DATE.

| LOCALITY. | NUMBER OF LEASE, CLAIM, OR AREA. | REGISTERED NAME OF COMPANY OR LEASE. | 1920. | | TOTALS TO DATE. | |
|---|---|---|---|---|---|---|
| | | | Quantity. | Value. | Quantity. | Value. |
| | | | tons. | £ | tons. | £ |
| | | ASHBURTON GOLDFIELD. | | | | |
| Ashburton ... | ... ... ... | Voided leases ... ... ... ... ... ... ... | ... | ... | 56·90 | 429 |
| Do. ... | ... ... ... | Sundry claims ... ... ... ... ... ... ... | ... | ... | 2·83 | 40 |
| Uaroo ... ... | M.Ls. 43, (49), (84) | Uaroo Silver Lead Mines, Ltd. ... ... ... ... ... | ... | ... | 2,824·05 | 33,518 |
| | | **Totals** ... ... ... ... | ... | ... | **2,883·78** | **33,987** |

# TABLE XVII.

QUANTITY AND VALUE OF COAL REPORTED TO THE MINES DEPARTMENT DURING 1920, AND TOTALS TO DATE.

| LOCALITY. | NUMBER OF LEASE, CLAIM, OR AREA. | REGISTERED NAME OF COMPANY OR LEASE. | 1920. | | TOTALS TO DATE. | |
|---|---|---|---|---|---|---|
| | | | Quantity. | Value. | Quantity. | Value. |
| | | | tons. | £ | tons. | £ |
| | | COLLIE RIVER MINERAL FIELD. | | | | |
| Collie ... ... | 197, etc. ... | Amalgamated Collieries of W.A., Ltd. (Cardiff leases) ... | 18,521·00 | 14,810 | 18,521·00 | 14,810 |
| Do. ... | 244, etc. ... | Amalgamated Collieries of W.A., Ltd. (Co-operative leases) ... | 91,915·00 | 73,270 | 91,915·00 | 73,270 |
| Do. ... | 85, etc. ... | Amalgamated Collieries of W.A., Ltd. (Proprietary leases) ... | 43,752·92 | 37,027 | 43,752·92 | 37,027 |
| Do. ... | 151, etc. ... | Amalgamated Collieries of W.A., Ltd. (Scottish leases) ... | 380·00 | 251 | 380·00 | 251 |
| Do. ... | 197, etc. ... | (Cardiff Coal Mining Co., Ltd.) ... ... ... ... ... | 82,976·00 | 53,983 | 976,824·78 | 471,417 |
| Do. ... | 151, etc. ... | (Collie Boulder Coal Co., Ltd.) ... ... ... ... ... | ... | ... | 71,512·70 | 26,139 |
| Do. ... | 244, etc. ... | (Collie Co-operative Collieries, Ltd.) ... ... ... ... | 3,359·00 | 2,603 | 970,044·30 | 511,862 |
| Do. ... | 88 (part of) ... | (Collie Proprietary Coalfields of W.A., Ltd.) ... ... ... | ... | ... | 477,781·55 | 242,918 |
| Do. ... | 85–100 ... | (Collie Proprietary Coalfields of W.A., Ltd.) ... ... ... | ... | ... | 580,392·15 | 289,246 |
| Do. ... | 260–6, 271 ... | Premier Coal Mining Co., Ltd. ... ... ... ... ... | 38,828·88 | 29,617 | 193,352·81 | 111,630 |
| Do. ... | 151, etc. ... | (Scottish Collieries, Ltd.) ... ... ... ... ... ... | ... | ... | 2,314·51 | 1,210 |
| Do. ... | 151, etc. ... | (Scottish Co-operative Collieries Co., Ltd.) ... ... ... | ... | ... | 430,796·95 | 171,303 |
| Do. ... | 85–100, 267 ... | (The Proprietary Coal Mines of W.A., Ltd.) ... ... ... | 90,819·23 | 66,848 | 693,045·34 | 413,755 |
| Do. ... | 88 (part of) ... | (The Proprietary Coal Mines of W.A., Ltd.) ... ... ... | ... | ... | 109·00 | 54 |
| Do. ... | 250, etc. ... | Westralia Coal Mining Co., Ltd. ... ... ... ... | 91,468·75 | 71,937 | 495,367·36 | 296,435 |
| Do. ... | ... | Voided leases ... ... ... ... ... ... ... | ... | ... | 25,569·85 | 12,930 |
| | | **Totals** ... ... ... ... | **462,020·78** | **350,346** | **5,071,680·22** | **2,674,257** |

# TABLE XVIII.

QUANTITY AND VALUE OF LIMESTONE REPORTED TO THE MINES DEPARTMENT DURING 1920, AND TOTALS TO DATE.

| LOCALITY. | NUMBER OF LEASE, CLAIM, OR AREA. | REGISTERED NAME OF COMPANY OR LEASE. | 1920. | | TOTALS TO DATE. | |
|---|---|---|---|---|---|---|
| | | | Quantity. | Value. | Quantity. | Value |
| | | | tons. | £ | tons. | £ |
| | | MURCHISON GOLDFIELD. | | | | |
| | | CUE DISTRICT. | | | | |
| Cuddingwarra ... | ... ... ... | Voided leases ... ... ... ... ... ... ... | ... | ... | 298·00 | 772 |
| | | Totals ... ... ... ... | ... | ... | 298·00 | 772 |
| | | YILGARN GOLDFIELD. | | | | |
| Southern Cross | ... ... ... | Voided leases ... ... ... ... ... ... ... | ... | ... | 2,548·85 | 1,607 |
| | | Totals ... ... ... ... | ... | ... | 2,548·85 | 1,607 |
| | | STATE GENERALLY. | | | | |
| Fremantle ... | ... ... ... | ... ... ... ... ... ... ... ... ... ... ... | ... | ... | 90,858·88 | 15,911 |
| | | Totals ... ... ... ... | ... | ... | 90,858·88 | 15,911 |

# TABLE XIX.

QUANTITY AND VALUE OF ASBESTOS REPORTED TO THE MINES DEPARTMENT DURING 1920, AND TOTALS TO DATE.

| LOCALITY. | NUMBER OF LEASE, CLAIM, OR AREA. | REGISTERED NAME OF COMPANY OR LEASE. | 1920. | | TOTALS TO DATE. | |
|---|---|---|---|---|---|---|
| | | | Quantity. | Value. | Quantity. | Value. |
| | | | tons. | £ | tons. | £ |
| | | PILBARA GOLDFIELD. | | | | |
| | | MARBLE BAR DISTRICT. | | | | |
| Cooglegong ... | M.Ls. 274, 275 | Chrysotile No. 1 leases ... ... ... ... ... ... | 32·00 | 1,900 | 32·00 | 1,900 |
| Soanesville ... | ... ... ... | Voided leases ... ... ... ... ... ... ... | ... | ... | 42·83 | 1,754 |
| | | Total ... ... ... ... | 32·00 | 1,900 | 74·83 | 3,654 |
| | | NULLAGINE DISTRICT. | | | | |
| Hales Well ... | M.Ls. 18L, 19L, 20L | Barnett's Asbestos, Nos. 1, 2, and 3 ... ... ... ... | 121·00 | 4,975 | 164·00 | 6,043 |
| Do. ... | M.L. 16L ... | Marjorie ... ... ... ... ... ... ... ... | ... | ... | 4·00 | 100 |
| Do. ... | M.Ls. 21L, 22L | Nullagine, Nos. 1 and 2 ... ... ... ... ... ... | 1·00 | 251 | 7·00 | 526 |
| Do. ... | ... ... ... | Sundry claims ... ... ... ... ... ... ... | 2·50 | 160 | 2·50 | 160 |
| | | Totals ... ... ... ... | 124·50 | 5,386 | 177·50 | 6,829 |

# TABLE XX.

QUANTITY AND VALUE OF GADOLINITE REPORTED TO THE MINES DEPARTMENT DURING 1920, AND TOTALS TO DATE.

| LOCALITY. | NUMBER OF LEASE, CLAIM, OR AREA. | REGISTERED NAME OF COMPANY OR LEASE. | 1920. | | TOTALS TO DATE. | |
|---|---|---|---|---|---|---|
| | | | Quantity. | Value. | Quantity. | Value. |
| | | | tons. | £ | tons. | £ |
| | | PILBARA GOLDFIELD. | | | | |
| | | MARBLE BAR DISTRICT. | | | | |
| Cooglegong ... | (M.L. 254) ... | Iverna ... ... ... ... ... ... ... ... ... ... | ... | ... | 1·00 | 112 |
| | | Totals ... ... ... ... | ... | ... | 1·00 | 112 |

# TABLE XXI.

QUANTITY AND VALUE OF TUNGSTEN ORES REPORTED TO THE MINES DEPARTMENT DURING 1920, AND TOTALS TO DATE.

## SCHEELITE.

| LOCALITY. | NUMBER OF LEASE, CLAIM, OR AREA. | REGISTERED NAME OF COMPANY OR LEASE. | 1920. | | | TOTALS TO DATE. | | |
|---|---|---|---|---|---|---|---|---|
| | | | Ore. | Contents Tungstic Trioxide. | Value. | Ore. | Contents Tungstic Trioxide. | Value. |
| | | | tons. | units. | £ | tons. | units. | £ |
| **NORTH COOLGARDIE GOLDFIELD.** | | | | | | | | |
| **MENZIES DISTRICT.** | | | | | | | | |
| Comet Vale ... | G.M.L. 5410z... | Lake View ... ... ... ... | 134·25 | 69·72 | 113 | 380·84 | 338·39 | 818 |
| Do. ... | ... ... ... | Sundry claims ... ... | ... | ... | ... | 26·47 | 47·38 | 124 |
| | | **Totals** ... ... ... | **134·25** | **69·72** | **113** | **407·31** | **385·77** | **942** |
| **BROAD ARROW GOLDFIELD.** | | | | | | | | |
| Ora Banda ... | ... ... ... | Sundry claims ... ... | 3·35 | 66·50 | 175 | 3·35 | 66·50 | 175 |
| | | **Totals** ... ... | **3·35** | **66·50** | **175** | **3·35** | **66·50** | **175** |
| **COOLGARDIE GOLDFIELD.** | | | | | | | | |
| **COOLGARDIE DISTRICT.** | | | | | | | | |
| Higginsville ... | ... ... ... | Sundry claims ... ... | 40·00 | 20·53 | 54 | 85·71 | 59·07 | 155 |
| | | **Totals** ... ... | **40·00** | **20·53** | **54** | **85·71** | **59·07** | **155** |
| **DUNDAS GOLDFIELD.** | | | | | | | | |
| Norseman ... | ... ... ... | Sundry claims ... ... | ·41 | 3·98 | 10 | ·41 | 3·98 | 10 |
| | | **Totals** ... ... | **·41** | **3·98** | **10** | **·41** | **3·98** | **10** |

## WOLFRAM.

| LOCALITY. | NUMBER OF LEASE, CLAIM, OR AREA. | REGISTERED NAME OF COMPANY OR LEASE. | 1920. | | | TOTALS TO DATE. | | |
|---|---|---|---|---|---|---|---|---|
| | | | Ore. | Metallic contents. | Value. | Ore. | Metallic contents. | Value. |
| | | | tons. | tons. | £ | tons. | tons. | £ |
| **MURCHISON GOLDFIELD.** | | | | | | | | |
| **CUE DISTRICT.** | | | | | | | | |
| Callie Spring ... | ... ... ... | Voided leases ... ... ... | ... | ... | ... | 194·00 | 6·11 | 877 |
| Do. ... | ... ... ... | Sundry claims ... ... | ... | ... | ... | 44·64 | 2·30 | 271 |
| | | **Totals** ... ... ... | ... | ... | ... | **238·64** | **8·41** | **1,148** |
| **YALGOO GOLDFIELD.** | | | | | | | | |
| Yalgoo ... ... | M.L. (36) ... | Yandanoo King North ... ... | ... | ... | ... | ·25 | ·12 | 27 |
| | | **Totals** ... ... ... | ... | ... | ... | **·25** | **·12** | **27** |
| **STATE GENERALLY.** | | | | | | | | |
| Derby ... ... | (146H) ... | Taylor's Wolfram Reward ... | ... | ... | ... | 27·00 | 2·00 | 120 |
| | | **Totals** ... ... ... | ... | ... | ... | **27·00** | **2·00** | **120** |

# TABLE XXII.

QUANTITY AND VALUE OF MAGNESITE REPORTED TO THE MINES DEPARTMENT DURING 1920, AND TOTALS TO DATE.

| LOCALITY. | NUMBER OF LEASE, CLAIM, OR AREA. | REGISTERED NAME OF COMPANY OR LEASE. | 1920. | | TOTALS TO DATE. | |
|---|---|---|---|---|---|---|
| | | | Quantity. | Value. | Quantity. | Value. |
| | | | tons. | £ | tons. | £ |
| EAST COOLGARDIE GOLDFIELD. | | | | | | |
| BULONG DISTRICT. | | | | | | |
| Bulong ... ... | ... ... ... | Sundry claims ... ... ... ... ... ... ... | ... | ... | 824·75 | 1,053 |
| | | Totals ... ... ... ... | ... | ... | 824·75 | 1,053 |

# TABLE XXIII.

QUANTITY AND VALUE OF DIAMONDS REPORTED TO THE MINES DEPARTMENT DURING 1920, AND TOTALS TO DATE.

| LOCALITY. | NUMBER OF LEASE, CLAIM, OR AREA. | REGISTERED NAME OF COMPANY OR LEASE. | 1920. | | TOTALS TO DATE. | |
|---|---|---|---|---|---|---|
| | | | Quantity. | Value. | Quantity. | Value. |
| | | | carats. | £ | carats. | £ |
| PILBARA GOLDFIELD. | | | | | | |
| NULLAGINE DISTRICT. | | | | | | |
| Nullagine ... | M.R.C. 6L ... | (Morgans, A. E.) ... ... ... ... ... ... ... | ... | ... | ... | 24 |
| | | Totals ... ... ... ... | ... | ... | ... | 24 |

# TABLE XXIV.

QUANTITY AND VALUE OF ANTIMONY REPORTED TO THE MINES DEPARTMENT DURING 1920, AND TOTALS TO DATE

| LOCALITY. | NUMBER OF LEASE, CLAIM OR AREA. | REGISTERED NAME OF COMPANY OR LEASE. | 1920. | | | TOTALS TO DATE. | | |
|---|---|---|---|---|---|---|---|---|
| | | | Ore. | Metallic contents. | Value. | Ore. | Metallic contents. | Value. |
| | | | tons. | tons. | £ | tons. | tons. | £ |
| WEST PILBARA GOLDFIELD. | | | | | | | | |
| Balla Balla ... | M.L. (185) ... | Star ... ... ... ... ... | ... | ... | ... | 20·78 | 11·58 | 491 |
| | | Totals ... ... ... | ... | ... | ... | 20·78 | 11·58 | 491 |

**TABLE**

RETURN OF ORE AND MINERALS OTHER THAN GOLD

| YEAR. | COPPER. | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | COPPER ORE. | | | | | | | | | | COPPER INGOT, MATTE, ETC. | | Total Value of Copper Exported. |
| | West Pilbara Gf. | | Northampton Mf. | | Phillips River Gf. | | State generally. | | Total. | | State generally. | | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | |
| | tons. | £ | tons. | £ | tons. | £ | tons. | £ | tons. | £ | tons. | £ | £ |
| 1850 ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1 ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 2 ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 3 ... | ... | ... | [2]† | 7 | ... | ... | ... | ... | ... | 7 | ... | ... | 7 |
| 4 ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 5 ... | ... | ... | 2 | 26 | ... | ... | ... | ... | 2 | 26 | ... | ... | 26 |
| 6 ... | ... | ... | 57 | 1,018 | ... | ... | ... | ... | 57 | 1,018 | ... | ... | 1,018 |
| 7 ... | ... | ... | 80 | 1,920 | ... | ... | ... | ... | 80 | 1,920 | ... | ... | 1,920 |
| 8 ... | ... | ... | 433 | 9,531 | ... | ... | ... | ... | 433 | 9,531 | ... | ... | 9,531 |
| 9 ... | ... | ... | 941 | 14,122 | ... | ... | ... | ... | 941 | 14,122 | ... | ... | 14,122 |
| 1860 ... | ... | ... | 517 | 8,021 | ... | ... | ... | ... | 517 | 8,021 | ... | ... | 8,021 |
| 1 ... | ... | ... | 409 | 6,339 | ... | ... | ... | ... | 409 | 6,339 | ... | ... | 6,339 |
| 2 ... | ... | ... | 783 | 12,536 | ... | ... | ... | .. | 783 | 12,536 | ... | ... | 12,536 |
| 3 ... | ... | ... | 763 | 12,208 | ... | ... | ... | ... | 763 | 12,208 | ... | ... | 12,208 |
| 4 ... | ... | ... | 1,076 | 17,216 | ... | ... | ... | ... | 1,076 | 17,216 | ... | ... | 17,216 |
| 5 ... | ... | ... | 886 | 13,290 | ... | ... | ... | ... | 886 | 13,290 | ... | ... | 13,290 |
| 6 ... | ... | ... | 557 | 8,362 | ... | ... | ... | ... | 557 | 8,362 | ... | ... | 8,362 |
| 7 ... | ... | ... | 337 | 5,055 | ... | ... | ... | ... | 337 | 5,055 | ... | ... | 5,055 |
| 8 ... | ... | ... | 83 | 1,245 | ... | ... | ... | ... | 83 | 1,245 | ... | ... | 1,245 |
| 9 ... | ... | ... | 155 | 2,325 | ... | ... | ... | ... | 155 | 2,325 | ... | ... | 2,325 |
| 1870 ... | ... | ... | 6 | 90 | ... | ... | ... | ... | 6 | 90 | ... | ... | 90 |
| 1 ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 2 ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 3 ... | ... | ... | 56 | 848 | ... | ... | ... | ... | 56 | 848 | ... | ... | 848 |
| 4 ... | ... | ... | 67 | 998 | ... | ... | ... | ... | 67 | 998 | ... | ... | 998 |
| 5 ... | ... | ... | 205 | 3,071 | ... | ... | ... | ... | 205 | 3,071 | ... | ... | 3,071 |
| 6 ... | ... | ... | 279 | 4,185 | ... | ... | ... | ... | 279 | 4,185 | ... | ... | 4,185 |
| 7 ... | ... | ... | 54 | 803 | ... | ... | ... | ... | 54 | 803 | ... | ... | 803 |
| 8 ... | ... | ... | 9 | 135 | ... | ... | ... | ... | 9 | 135 | ... | ... | 135 |
| 9 ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1880 ... | ... | ... | 8 | 120 | ... | ... | ... | ... | 8 | 120 | ... | ... | 120 |
| 1 ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 2 ... | ... | ... | 2 | 23 | ... | ... | ... | ... | 2 | 23 | ... | ... | 23 |
| 3 ... | ... | ... | 5 | 75 | ... | ... | ... | ... | 5 | 75 | ... | ... | 75 |
| 4 ... | ... | ... | 118 | 1,770 | ... | ... | ... | ... | 118 | 1,770 | ... | ... | 1,770 |
| 5 ... | ... | ... | 120 | 1,793 | ... | ... | ... | ... | 120 | 1,793 | ... | ... | 1,793 |
| 6 ... | ... | ... | 249 | 3,735 | ... | ... | ... | ... | 249 | 3,735 | ... | ... | 3,735 |
| 7 ... | ... | ... | 23 | 345 | ... | ... | ... | ... | 23 | 345 | ... | ... | 345 |
| 8 ... | ... | ... | 88 | 1,488 | ... | ... | ... | ... | 88 | 1,488 | ... | ... | 1,488 |
| 9 ... | ... | ... | 112 | 1,904 | ... | ... | ... | ... | 112 | 1,904 | ... | ... | 1,904 |
| 1890 ... | ... | ... | 8 | 136 | ... | ... | ... | ... | 8 | 136 | ... | ... | 136 |
| 1 ... | 263 | 4,462 | ... | ... | ... | ... | ... | ... | 263 | 4,462 | ... | ... | 4,462 |
| 2 ... | [1]†412 | 6,319 | 155 | 2,377 | ... | ... | ... | ... | 567 | 8,696 | ... | ... | 8,696 |
| 3 ... | 50 | 606 | ... | ... | ... | ... | ... | ... | 50 | 606 | ... | ... | 606 |
| 4 ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 5 ... | 802 | 12,832 | 24 | 120 | ... | ... | ... | ... | 826 | 12,952 | ... | ... | 12,952 |
| 6 ... | 6 | 100 | ... | ... | ... | ... | ... | ... | 6 | 100 | ... | ... | 100 |
| 7 ... | 65 | 731 | 21 | 302 | ... | ... | ... | ... | 86 | 1,033 | ... | ... | 1,033 |
| 8 ... | 281 | 3,334 | 75 | 932 | ... | ... | ... | ... | 356 | 4,266 | ... | ... | 4,266 |
| 9 ... | 1,404 | 31,979 | 587 | 9,473 | ... | ... | ... | ... | 1,991 | 41,452 | ... | ... | 41,452 |
| 1900 ... | 544 | 10,696 | ... | ... | 105 | 2,411 | 197 | 3,355 | 846 | 16,462 | 249 | 17,475 | 33,937 |
| 1 ... | 1,058 | 26,464 | 1 | 10 | 1,205 | 22,107 | 397 | 6,322 | 2,661 | 54,903 | 880 | 55,866 | 110,769 |
| 2 ... | 68 | 1,698 | 20 | 330 | 162 | 2,469 | 33 | 489 | 283 | 4,986 | 175 | 7,918 | 12,904 |
| 3 ... | 4 | 180 | 25 | 460 | 302 | 3,538 | 15 | 349 | 346 | 4,527 | 1,075 | 33,288 | 37,815 |
| 4 ... | 50 | 500 | ... | ... | 11 | 154 | 310 | 3,378 | 371 | 4,032 | 102 | 3,827 | 7,859 |
| 5 ... | ... | ... | ... | ... | 80 | 2,808 | 713 | 8,576 | 793 | 11,384 | 794 | 53,867 | 65,251 |
| 6 ... | 112 | 323 | ... | ... | ... | ... | 224 | 2,930 | 336 | 6,162 | 343 | 30,367 | 36,529 |
| 7 ... | ... | ... | ... | ... | ... | ... | 3,727 | 61,493 | 3,727 | 61,493 | 1,602 | 141,883 | 203,376 |
| 8 ... | ... | ... | ... | ... | ... | ... | 2,503 | 29,272 | 2,503 | 29,272 | 479 | 27,819 | 57,091 |
| 9 ... | ... | ... | ... | ... | ... | ... | 6,959 | 59,541 | 6,959 | 59,541 | 833 | 45,100 | 104,641 |
| 1910 ... | ... | ... | ... | ... | ... | ... | 6,309 | 27,271 | 6,309 | 27,271 | 1,281 | 68,657 | 95,928 |
| 1 ... | ... | ... | ... | ... | ... | ... | 9,825 | 33,709 | 9,825 | 33,709 | 828 | 44,409 | 78,118 |
| 2 ... | ... | ... | ... | ... | ... | ... | 9,536 | 58,688 | 9,536 | 58,688 | 28 | 1,136 | 59,824 |
| 3 ... | ... | ... | ... | ... | ... | ... | 4,339 | 136,472 | 4,339 | 136,472 | 82 | 5,891 | 142,363 |
| 4 ... | ... | ... | ... | ... | ... | ... | 3,913 | 33,654 | 3,913 | 33,654 | 183 | 4,520 | 38,174 |
| 5 ... | ... | ... | ... | ... | ... | ... | 737 | 13,768 | 737 | 13,768 | 946 | 77,401 | 91,169 |
| 6 ... | ... | ... | ... | ... | ... | ... | 650 | 14,971 | 650 | 14,971 | 457 | 49,862 | 64,833 |
| 7 ... | ... | ... | ... | ... | ... | ... | 966 | 20,878 | 966 | 20,878 | 535 | 64,860 | 85,738 |
| 8 ... | ... | ... | ... | ... | ... | ... | 1,643 | 24,877 | 1,643 | 24,877 | 478 | 41,269 | 66,146 |
| 9 ... | ... | ... | ... | ... | ... | ... | 455 | 9,740 | 455 | 9,740 | 4 | 365 | 10,105 |
| 1920 ... | ... | ... | ... | ... | ... | ... | 1,511 | 22,467 | 1,511 | 22,467 | 137 | 2,698 | 25,165 |
| **Total** | ... | ... | ... | ... | .. | .. | ... | ... | **71,342** | **857,564** | **11,491** | **778,478** | **1,636,042** |

[1]†*See* Woodward's Mining Handbook, Perth: By Authority, 1895; page 123. [2]† Weight not stated.

XXV.

ENTERED FOR EXPORT FROM 1850 TO 1920, INCLUSIVE.

| TIN. | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BLACK TIN (Dressed Tin ore). | | | | | | | | TIN INGOT. | | Total Value of Tin Exported. | YEAR. |
| Pilbara Gf. | | Greenbushes Mf. | | [3]†State generally. | | Total. | | Greenbushes Mf. | | | |
| Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | | |
| tons. | £ | tons. | £ | tons. | £ | tons. | £ | tons. | £ | £ | |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1850 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 3 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 4 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 5 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 6 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 7 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 8 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 9 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1860 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 3 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 4 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 5 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 6 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 7 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 8 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 9 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1870 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 3 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 4 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 5 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 6 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 7 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 8 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 9 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1880 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 3 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 4 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 5 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 6 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 7 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 8 |
| ... | ... | 5 | 300 | ... | ... | 5 | 300 | ... | ... | 300 | 9 |
| ... | ... | 68 | 5,400 | ... | ... | 68 | 5,400 | ... | ... | 5,400 | 1890 |
| ... | ... | 204 | 10,200 | ... | ... | 204 | 10,200 | ... | ... | 10,200 | 1 |
| ... | ... | 265 | 13,843 | ... | ... | 265 | 13,843 | ... | ... | 13,843 | 2 |
| 57 | 3,470 | 171 | 7,664 | ... | ... | 228 | 11,134 | ... | ... | 11,134 | 3 |
| 19 | 949 | 371 | 14,325 | ... | ... | 390 | 15,274 | ... | ... | 15,274 | 4 |
| ... | ... | 277 | 9,703 | ... | ... | 277 | 9,703 | ... | ... | 9,703 | 5 |
| ... | ... | 137 | 4,338 | ... | ... | 137 | 4,338 | ... | ... | 4,338 | 6 |
| ... | ... | 96 | 3,275 | ... | ... | 96 | 3,275 | ... | ... | 3,275 | 7 |
| ... | ... | 68 | 2,760 | ... | ... | 68 | 2,760 | ... | ... | 2,760 | 8 |
| 30 | 2,025 | 278 | 21,138 | ... | ... | 308 | 23,163 | ... | ... | 23,163 | 9 |
| 368 | 30,146 | 102 | 8,032 | ... | ... | 470 | 38,178 | 142 | 18,872 | 57,050 | 1900 |
| 439 | 34,600 | 68 | 4,895 | ... | ... | 507 | 39,495 | 97 | 12,607 | 52,102 | 1 |
| 248 | 19,698 | 31 | 2,870 | ... | ... | 279 | 22,568 | 141 | 16,830 | 39,398 | 2 |
| 267 | 20,988 | 25 | 1,868 | ... | ... | 292 | 22,856 | 235 | 29,277 | 52,133 | 3 |
| 64 | 4,932 | 24 | 1,389 | 379 | 20,797 | 467 | 27,118 | 129 | 16,155 | 43,273 | 4 |
| 188 | 16,853 | 119 | 8,177 | 666 | 51,748 | 973 | 76,778 | [2]† | 1 | 76,779 | 5 |
| 329 | 28,375 | 444 | 46,254 | 624 | 64,005 | 1,397 | 138,634 | 45 | 8,746 | 147,380 | 6 |
| ... | ... | ... | ... | 1,424 | 151,414 | 1,424 | 151,414 | 78 | 14,725 | 166,139 | 7 |
| ... | ... | ... | ... | 1,093 | 83,294 | 1,093 | 83,594 | [2]† | 1 | 83,595 | 8 |
| ... | ... | ... | ... | 698 | 62,989 | 698 | 62,989 | ... | ... | 62,989 | 9 |
| ... | ... | ... | ... | 500 | 45,129 | 500 | 45,129 | ... | ... | 45,129 | 1910 |
| ... | ... | ... | ... | 495 | 55,220 | 495 | 55,220 | ... | ... | 55,220 | 1 |
| ... | ... | ... | ... | 651 | 79,738 | 651 | 79,738 | ... | ... | 79,738 | 2 |
| ... | ... | ... | ... | 484 | 72,142 | 484 | 72,142 | ... | ... | 72,142 | 3 |
| ... | ... | ... | ... | 363 | 35,649 | 363 | 35,649 | ... | ... | 35,649 | 4 |
| ... | ... | ... | ... | 429 | 41,391 | 429 | 41,391 | ... | ... | 41,391 | 5 |
| ... | ... | ... | ... | 463 | 49,101 | 463 | 49,101 | ... | ... | 49,101 | 6 |
| ... | ... | ... | ... | 383 | 45,288 | 383 | 45,288 | ... | ... | 45,288 | 7 |
| ... | ... | ... | ... | 415 | 76,952 | 415 | 76,952 | ... | ... | 76,952 | 8 |
| ... | ... | ... | ... | 318 | 47,269 | 318 | 47,269 | ... | ... | 47,269 | 9 |
| ... | ... | ... | ... | 243 | 49,449 | 243 | 49,449 | ... | ... | 49,449 | 1920 |
| ... | ... | ... | ... | ... | ... | 14,390 | 1,360,342 | 867 | 117,214 | 1,477,556 | Total. |

[2]† Weight not stated. [3]† Probably the produce of Pilbara Goldfield and Greenbushes Mineral Field.

TABLE XXV.—*Return of Ore and Minerals other than Gold*

| Year. | Silver. | | ‡ Lead. | | ‡ Lead and Silver-Lead. | | Pig Lead. | | Zinc Ingots and Concentrates. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | State generally. | | Northampton Mf. | | State generally. | | State generally. | | State generally. | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. |
| | ozs. | £ | tons. | £ | tons. | £ | tons. | £ | tons. | £ |
| 1850 | ... | ... | 5 | 55 | ... | ... | ... | ... | ... | ... |
| 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 3 | ... | ... | [2]† | 4 | ... | ... | 55 | 1,200 | ... | ... |
| 4 | ... | ... | ... | ... | ... | ... | 122 | 2,440 | ... | ... |
| 5 | ... | ... | 25 | 250 | ... | ... | 134 | 2,675 | ... | ... |
| 6 | ... | ... | ... | ... | ... | ... | 60 | 1,200 | ... | ... |
| 7 | ... | ... | ... | ... | ... | ... | 120 | 2,410 | ... | ... |
| 8 | ... | ... | ... | ... | ... | ... | 61 | 1,220 | ... | ... |
| 9 | ... | ... | 13 | 135 | ... | ... | 25 | 495 | ... | ... |
| 1860 | ... | ... | 98 | 985 | ... | ... | ... | ... | ... | ... |
| 1 | ... | ... | 79 | 790 | ... | ... | ... | ... | ... | ... |
| 2 | ... | ... | 9 | 90 | ... | ... | ... | ... | ... | ... |
| 3 | ... | ... | 230 | 2,300 | ... | ... | ... | ... | ... | ... |
| 4 | ... | ... | 80 | 800 | ... | ... | ... | ... | ... | ... |
| 5 | ... | ... | 703 | 8,436 | ... | ... | ... | ... | ... | ... |
| 6 | ... | ... | 273 | 3,282 | ... | ... | ... | ... | ... | ... |
| 7 | ... | ... | 902 | 10,824 | ... | ... | [4]†3 | 50 | ... | ... |
| 8 | ... | ... | 1,100 | 13,206 | ... | ... | ... | ... | ... | ... |
| 9 | ... | ... | 699 | 8,394 | ... | ... | ... | ... | ... | ... |
| 1870 | ... | ... | 1,209 | 14,514 | ... | ... | ... | ... | ... | ... |
| 1 | ... | ... | 420 | 5,040 | ... | ... | ... | ... | ... | ... |
| 2 | ... | ... | 364 | 4,368 | ... | ... | ... | ... | ... | ... |
| 3 | ... | ... | 965 | 11,586 | ... | ... | ... | ... | ... | ... |
| 4 | ... | ... | 2,144 | 25,725 | ... | ... | ... | ... | ... | ... |
| 5 | ... | ... | 2,289 | 27,468 | ... | ... | 4 | 89 | ... | ... |
| 6 | ... | ... | 2,192 | 26,298 | ... | ... | [4]†7 | 155 | ... | ... |
| 7 | ... | ... | 3,956 | 47,466 | ... | ... | [4]†1 | 15 | ... | ... |
| 8 | ... | ... | 3,618 | 43,410 | ... | ... | ... | ... | ... | ... |
| 9 | ... | ... | 2,775 | 33,300 | ... | ... | ... | ... | ... | ... |
| 1880 | ... | ... | 1,921 | 15,368 | ... | ... | [4]†5 | 89 | ... | ... |
| 1 | ... | ... | 1,401 | 11,204 | ... | ... | [4]†1 | 20 | ... | ... |
| 2 | ... | ... | 1,794 | 14,348 | ... | ... | ... | ... | ... | ... |
| 3 | ... | ... | 1,038 | 7,266 | ... | ... | ... | ... | ... | ... |
| 4 | ... | ... | 696 | 4,872 | ... | ... | ... | ... | ... | ... |
| 5 | ... | ... | 465 | 3,255 | ... | ... | ... | ... | ... | ... |
| 6 | ... | ... | 611 | 4,277 | ... | ... | ... | ... | ... | ... |
| 7 | ... | ... | 471 | 4,710 | ... | ... | [4]†6 | 120 | ... | ... |
| 8 | ... | ... | 532 | 5,320 | ... | ... | [4]†2 | 40 | ... | ... |
| 9 | ... | ... | 250 | 2,500 | ... | ... | ... | ... | ... | ... |
| 1890 | ... | ... | 214 | 2,135 | ... | ... | ... | ... | ... | ... |
| 1 | ... | ... | 25 | 250 | ... | ... | ... | ... | ... | ... |
| 2 | ... | ... | 30 | 150 | ... | ... | ... | ... | ... | ... |
| 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 4 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 6 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 7 | ... | ... | [2]† | 4 | ... | ... | [4]†1 | 11 | ... | ... |
| 8 | ... | ... | 5 | 33 | ... | ... | ... | ... | ... | ... |
| 9 | ... | ... | 16 | 96 | ... | ... | 77 | 1,077 | ... | ... |
| 1900 | 28,749 | 3,594 | 27 | 242 | ... | ... | ... | ... | ... | ... |
| 1 | 60,869 | 7,609 | ... | ... | ... | ... | ... | ... | ... | ... |
| 2 | 83,293 | 9,190 | ... | ... | ... | ... | ... | ... | ... | ... |
| 3 | 168,113 | 19,153 | ... | ... | ... | ... | ... | ... | ... | ... |
| 4 | 399,190 | 45,912 | ... | ... | ... | ... | ... | ... | ... | ... |
| 5 | 359,744 | 44,278 | ... | ... | ... | ... | ... | ... | ... | ... |
| 6 | 282,145 | 37,612 | ... | ... | ... | ... | ... | ... | ... | ... |
| 7 | 189,265 | 25,382 | ... | ... | 211 | 1,866 | ... | ... | 73 | 3,390 |
| 8 | 168,455 | 18,877 | ... | ... | 518 | 5,006 | ... | ... | 11 | 98 |
| 9 | 176,843 | 18,778 | ... | ... | 211 | 1,199 | ... | ... | 19 | 244 |
| 1910 | 176,139 | 18,777 | 248 | 1,433 | ... | ... | ... | ... | 12 | 147 |
| 1 | 169,043 | 18,333 | 1,549 | 15,002 | ... | ... | ... | ... | 12 | 189 |
| 2 | 165,371 | 19,725 | 1,868 | 22,270 | ... | ... | ... | ... | 14 | 217 |
| 3 | 188,020 | 23,420 | 3,169 | 59,002 | ... | ... | ... | ... | ... | ... |
| 4 | 193,057 | 23,227 | 3,554 | 46,285 | ... | ... | ... | ... | 22 | 379 |
| 5 | 222,159 | 24,295 | ... | ... | 2,883 | 39,032 | 13 | 302 | 7 | 143 |
| 6 | 173,012 | 22,258 | ... | ... | 428 | 12,033 | 3,523 | 74,930 | 14 | 630 |
| 7 | 222,075 | 38,339 | ... | ... | 22 | 593 | 4,661 | 139,940 | ... | ... |
| 8 | 109,830 | 22,711 | ... | ... | 282 | 3,045 | 5,489 | 163,880 | ... | ... |
| 9 | 223,332 | 55,342 | ... | ... | 248 | 3,704 | 1,780 | 48,462 | ... | ... |
| 1920 | 130,692 | 36,605 | ... | ... | 3,427 | 84,743 | 1,930 | 69,136 | ... | ... |
| **Total** | **3,889,396** | **533,417** | **44,032** | **508,748** | **8,230** | **151,221** | **18,080** | **509,956** | **184** | **5,437** |

[2] †Weight not stated. [4] † Estimated. ‡ Ore and Concentrates.

*entered for EXPORT from 1850 to 1920, inclusive*—continued.

| Tungsten Ore. | | | | Arsenical Ore. | | Tantalite. | | Non-Metallic Minerals. | | | | Year. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Wolfram. | | Scheelite. | | | | | | Graphite. | | Magnesite. | | |
| State generally. | | State generally. | | State generally. | | State generally. | | State generally. | | State generally. | | |
| Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | |
| tons. | £ | tons. | £ | tons. | £ | tons. | £ | tons. | £ | tons. | £ | |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1850 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 3 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 4 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 5 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 6 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 7 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 8 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 9 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1860 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 3 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 4 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 5 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 6 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 7 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 8 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 9 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1870 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 3 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 4 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 5 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 6 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 7 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 8 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 9 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1880 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 3 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 4 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 5 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 6 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 7 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 8 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 9 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1890 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 3 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 4 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 5 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 6 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 7 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 8 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 9 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1900 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 |
| ... | ... | ... | ... | ... | ... | ... | ... | 1 | 6 | ... | ... | 2 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 3 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 4 |
| ... | ... | ... | ... | ... | ... | 18 | 5,729 | ... | ... | ... | ... | 5 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 6 |
| ... | ... | 4 | 140 | ... | ... | ... | ... | ... | ... | ... | ... | 7 |
| ... | ... | ... | ... | ... | ... | [2]† | 400 | ... | ... | ... | ... | 8 |
| 1 | 100 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 9 |
| 2 | 190 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1910 |
| 9 | 826 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 |
| 1 | 86 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 3 |
| ½ | 40 | ... | ... | ... | ... | ... | ... | 7 | 40 | ... | ... | 4 |
| ½ | 25 | ... | ... | ... | ... | ... | ... | ... | ... | 688 | 1,196 | 5 |
| 1 | 128 | 3 | 438 | 11 | 19 | 47 | 9,375 | 21 | 284 | 12 | 47 | 6 |
| ... | ... | ½ | 42 | 57 | 707 | 17 | 2,513 | 18 | 158 | 42 | 50 | 7 |
| ¼ | 31 | 5 | 720 | 679 | 2,564 | ... | ... | 5 | 75 | 62 | 225 | 8 |
| ½ | 15 | 6 | 772 | ... | ... | ¼ | 75 | ... | ... | ... | ... | 9 |
| ... | ... | 2½ | 395 | 1,765 | 4,260 | ... | ... | 13 | 130 | ... | ... | 1920 |
| **15** | **1,441** | **21** | **2,507** | **2,512** | **7,550** | **...** | **18,092** | **65** | **693** | **804** | **1,518** | **Total** |

[2]† Weight not stated.

TABLE XXV.—*Return of Ore and Minerals other than Gold*

| Year. | Non-Metallic Minerals—*continued.* | | | | | | Minerals not Elsewhere Included. | | Total Value of Minerals other than Gold exported to Date. | Year. |
|---|---|---|---|---|---|---|---|---|---|---|
| | Asbestos. | | Coal. | | Mica. | | | | | |
| | State generally. | | Collie River Mf. | | State generally. | | | | | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | | |
| | tons. | £ | tons. | £ | tons. | £ | tons. | £ | £ | |
| 1850 | ... | ... | ... | ... | ... | ... | ... | ... | 55 | 1850 |
| 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 |
| 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 |
| 3 | ... | ... | ... | ... | ... | ... | ... | ... | 1,211 | 3 |
| 4 | ... | ... | ... | ... | ... | ... | ... | ... | 2,440 | 4 |
| 5 | ... | ... | ... | ... | ... | ... | ... | ... | 2,951 | 5 |
| 6 | ... | ... | ... | ... | ... | ... | ... | ... | 2,218 | 6 |
| 7 | ... | ... | ... | ... | ... | ... | ... | ... | 4,330 | 7 |
| 8 | ... | ... | ... | ... | ... | ... | ... | ... | 10,751 | 8 |
| 9 | ... | ... | ... | ... | ... | ... | ... | ... | 14,752 | 9 |
| 1860 | ... | ... | ... | ... | ... | ... | ... | ... | 9,006 | 1860 |
| 1 | ... | ... | ... | ... | ... | ... | ... | ... | 7,129 | 1 |
| 2 | ... | ... | ... | ... | ... | ... | ... | ... | 12,626 | 2 |
| 3 | ... | ... | ... | ... | ... | ... | ... | ... | 14,508 | 3 |
| 4 | ... | ... | ... | ... | ... | ... | ... | ... | 18,016 | 4 |
| 5 | ... | ... | ... | ... | ... | ... | ... | ... | 21,726 | 5 |
| 6 | ... | ... | ... | ... | ... | ... | ... | ... | 11,644 | 6 |
| 7 | ... | ... | ... | ... | ... | ... | ... | ... | 15,929 | 7 |
| 8 | ... | ... | ... | ... | ... | ... | ... | ... | 14,451 | 8 |
| 9 | ... | ... | ... | ... | ... | ... | ... | ... | 10,719 | 9 |
| 1870 | ... | ... | ... | ... | ... | ... | ... | ... | 14,604 | 1870 |
| 1 | ... | ... | ... | ... | ... | ... | ... | ... | 5,040 | 1 |
| 2 | ... | ... | ... | ... | ... | ... | ... | ... | 4,368 | 2 |
| 3 | ... | ... | ... | ... | ... | ... | ... | ... | 12,434 | 3 |
| 4 | ... | ... | ... | ... | ... | ... | ... | ... | 26,723 | 4 |
| 5 | ... | ... | ... | ... | ... | ... | ... | ... | 30,628 | 5 |
| 6 | ... | ... | ... | ... | ... | ... | ... | ... | 30,638 | 6 |
| 7 | ... | ... | ... | ... | ... | ... | ... | ... | 48,284 | 7 |
| 8 | ... | ... | ... | ... | ... | ... | ... | ... | 43,545 | 8 |
| 9 | ... | ... | ... | ... | ... | ... | ... | ... | 33,300 | 9 |
| 1880 | ... | ... | ... | ... | ... | ... | ... | ... | 15,577 | 1880 |
| 1 | ... | ... | ... | ... | ... | ... | ... | ... | 11,224 | 1 |
| 2 | ... | ... | ... | ... | ... | ... | ... | ... | 14,371 | 2 |
| 3 | ... | ... | ... | ... | ... | ... | ... | ... | 7,341 | 3 |
| 4 | ... | ... | ... | ... | ... | ... | ... | ... | 6,642 | 4 |
| 5 | ... | ... | ... | ... | ... | ... | ... | ... | 5,048 | 5 |
| 6 | ... | ... | ... | ... | ... | ... | ... | ... | 8,012 | 6 |
| 7 | ... | ... | ... | ... | ... | ... | ... | ... | 5,175 | 7 |
| 8 | ... | ... | ... | ... | ... | ... | ... | ... | 6,848 | 8 |
| 9 | ... | ... | ... | ... | ... | ... | ... | ... | 4,704 | 9 |
| Carried forward | | | | | | | | | | |

*entered for EXPORT from 1850 to 1920, inclusive*—continued.

| Year. | Non-Metallic Minerals—*continued.* | | | | | | Minerals not Elsewhere Included. | | Total Value of Minerals other than Gold exported to Date. | Year. |
|---|---|---|---|---|---|---|---|---|---|---|
| | Asbestos. State generally. | | Coal. Collie River Mf. | | Mica. State generally. | | | | | |
| | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | Quantity. | Value. | | |
| | tons. | £ | tons. | £ | tons. | £ | tons. | £ | | |
| Brought forward | | | | | | | | | | |
| 1890 | ... | ... | ... | ... | ... | ... | ... | ... | 7,671 | 1890 |
| 1 | ... | ... | ... | ... | ... | ... | ... | ... | 14,912 | 1 |
| 2 | ... | ... | ... | ... | [2]† | 25 | ... | ... | 22,714 | 2 |
| 3 | ... | ... | ... | ... | [2]† | 4 | ... | ... | 11,744 | 3 |
| 4 | ... | ... | ... | ... | ... | ... | ... | ... | 15,274 | 4 |
| 5 | ... | ... | ... | ... | [2]† | 3 | ... | ... | 22,658 | 5 |
| 6 | ... | ... | ... | ... | ... | ... | ... | ... | 4,438 | 6 |
| 7 | ... | ... | ... | ... | [2]† | 209 | ... | ... | 4,532 | 7 |
| 8 | ... | ... | 1 | 1 | ... | ... | ... | ... | 7,060 | 8 |
| 9 | ... | [2]† | 1 798 | 772 | [2]† | 50 | ... | ... | 66,611 | 9 |
| 1900 | ... | ... | 355 | 350 | [2]† | 3 | 5 | 85 | 95,261 | 1900 |
| 1 | ... | ... | 971 | 969 | ... | ... | ... | 4 | 171,453 | 1 |
| 2 | ... | ... | 12 | 12 | ... | ... | [6]† 2 | 41 | 61,551 | 2 |
| 3 | ... | [5]† | 10 110 | 127 | ... | ... | [7]† 22 | 230 | 109,468 | 3 |
| 4 | ... | ... | 11 | 7 | ... | ... | 7 | 81 | 97,132 | 4 |
| 5 | ... | ... | 108 | 87 | ... | ... | 62 | 127 | 192,251 | 5 |
| 6 | ... | ... | 86 | 65 | ... | ... | 10 | 1,035 | 222,621 | 6 |
| 7 | ... | ... | 26<br>*1,447 | 28<br>1,138 | ... | ... | [8]† 96 | 1,447 | 402,906 | 7 |
| 8 | ... | [2]† | 1,242 | 13<br>*9,612 | 11<br>7,747 | [2]† | 10 | 42 | 2,750 | 176,827 | 8 |
| 9 | ... | ... | 353<br>*85,647 | 183<br>93,781 | ... | ... | [9]† 263 | 735 | 282,650 | 9 |
| 1910 | ... | ... | 3<br>*48,876 | 2<br>38,400 | ... | ... | ½ | 100 | 200,106 | 1910 |
| 1 | ... | ... | ... | *40,063 | 29,344 | ... | ... | [10]† 14 | 407 | 197,439 | 1 |
| 2 | ... | ... | ... | 6<br>*42,602 | 6<br>30,721 | ... | ... | [11]† | 8 | 212,509 | 2 |
| 3 | ... | ... | ... | *54,228 | 39,125 | ... | ... | 5 | 17 | 336,155 | 3 |
| 4 | ... | ... | ... | *54,416 | 38,244 | 4 | 323 | [12]† 9 | 635 | 182,996 | 4 |
| 5 | ... | ... | ... | 1,667<br>*26,167 | 1,513<br>19,288 | [2]† | 26 | [13]† | 115 | 218,495 | 5 |
| 6 | ... | ... | ... | 2,447<br>*37,590 | 1,857<br>28,387 | [2]† | 10 | [14]† | 713 | 265,043 | 6 |
| 7 | ... | ... | ... | *31,951 | 29,359 | ... | ... | [15]† | 440 | 343,167 | 7 |
| 8 | ... | ... | 1 | 25 | *23,238 | 24,424 | ... | ... | [16]† 5 | 97 | 360,895 | 8 |
| 9 | ... | ... | 36 | 752 | *69,708 | 76,924 | 1 | 514 | [17]† | 116 | 244,050 | 9 |
| 1920 | ... | ... | 31 | 2,525 | *78,788 | 104,665 | [18]† | 120 | [19]† | 223 | 377,416 | 1920 |
| Total | ... | ... | ... | 4,555 | 611,300 | 567,537 | ... | 1,297 | ... | 9,406 | 5,436,973 | Total |

* Bunker Coal. [2]† Weight not stated. [5]† 4 cwts. [6]† Cobalt ore. [7]† Antimony ore. [12]† Bismuth. [16]† Molybdenite. [18]† 7 cwts.

[8]† Includes—

| | | |
|---|---|---|
| Antimony ore, 25 tons | = | £630 |
| N.E.I., 71 tons ... | = | 817 |
| Total ... | ... | £1,447 |

[10]† Includes—

| | | |
|---|---|---|
| Iron ore, 9 tons ... | = | £7 |
| Ores, N.E.I., 5 tons | = | 400 |
| Total ... | ... | £407 |

[13]† Includes—

| | | |
|---|---|---|
| Bismuth, 1 ton ... | = | £37 |
| Fireclay, 12 tons | = | 75 |
| Manganese, 3 cwt. | = | 3 |
| Total ... | ... | £115 |

[15]† Includes—

| | | |
|---|---|---|
| Antimony, 12 tons | = | £258 |
| Bismuth, 9cwt. ... | = | 24 |
| Molybdenite, 14 tons | = | 158 |
| Total ... | ... | £440 |

[9]† Includes—

| | | |
|---|---|---|
| Other Concentrates, 29 tons | = | £108 |
| N.E.I., 234 tons | = | 627 |
| Total ... | ... | £735 |

[11]† Includes—

| | | |
|---|---|---|
| Manganese, 2 tons | = | £4 |
| N.E.I. ... ... | = | 4 |
| Total ... | ... | £8 |

[14]† Includes—

| | | |
|---|---|---|
| Antimony, 27 tons | = | £580 |
| Bismuth, 4 cwt. ... | = | 133 |
| Total ... | ... | £713 |

[17]† Includes—

| | | |
|---|---|---|
| Bismuth, 1 cwt. ... | = | £15 |
| Corundum, 1 ton ... | = | 1 |
| Molybdenite, 7 tons | = | 100 |
| Total ... | ... | £116 |

[19]† Includes—

| | | |
|---|---|---|
| Antimony, 2¼ tons | ... | £45 |
| Clay, 6 cwt. | ... ... | 6 |
| Gadolinite, 1 ton | ... | 150 |
| Iron Concentrates, 1 ton | | 17 |
| Molybdenite, 10 cwt. | ... | 5 |
| Total ... | ... | £223 |

# PART III.—ALL MINES.

## TABLE XXVI.

MILLING AND CYANIDING PLANTS ERECTED IN THE RESPECTIVE GOLDFIELDS, DISTRICTS, AND MINERAL FIELDS ON THE 31ST DECEMBER, 1920, AND THE TOTAL VALUE OF MINING MACHINERY.

| Mining Centre and Lease or Area. | Name of Mine, Company, or Works. | Milling. | | | | | | | | | Cyaniding. | | | Value of all Mining Machinery. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Batteries. | Other Mills. | | | | | | | | | | | |
| | | Number of Heads of Stampers. | Prospecting Mills. | Ball Mills. | Griffin Mills. | Huntington Mills. | Puddlers. | Other Crushers. | Flint Mills. | Grinding Pans. | Leaching Vats. | Agitating Vats. | Vacuum Filters and Presses. | |
| | **PILBARA GOLDFIELD.** | | | | | | | | | | | | | |
| | MARBLE BAR DISTRICT. | | | | | | | | | | | | | |
| *Bamboo Creek.* 795 ⋀ *Elsie.* M.A. 36 *Lalla Rookh.* R.C. 112 *Marble Bar.* 694 ⋀ | Bulletin | 10 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| | State Battery, Bamboo Creek | 5 | ... | ... | ... | ... | ... | ... | ... | 1 | 5 | ... | ... | ... |
| | Trio | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| | Lalla Rookh | 10 | ... | ... | ... | ... | ... | ... | ... | ... | 3 | ... | ... | ... |
| | Jo Jo | 5 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... |
| | State Battery, Marble Bar | 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| | **Total** | **38** | ... | ... | ... | ... | ... | ... | ... | **2** | **8** | ... | ... | **£11,134** |
| | NULLAGINE DISTRICT. | | | | | | | | | | | | | |
| *Eastern Creek.* M.A. 11L. *Middle Creek.* 212L. *20-Mile Sandy.* ⋀ | Doherty's Works | 10 | ... | ... | ... | ... | ... | ... | ... | ... | 4 | ... | ... | ... |
| | Barton | 10 | ... | ... | ... | ... | ... | ... | ... | 1 | 6 | ... | ... | ... |
| | State Battery, 20-Mile Sandy | 5 | ... | ... | ... | ... | ... | ... | ... | 1 | 6 | ... | ... | ... |
| | **Total** | **25** | ... | ... | ... | ... | ... | ... | ... | **2** | **16** | ... | ... | **£4,237** |
| | **WEST PILBARA GOLDFIELD.** | | | | | | | | | | | | | |
| *Pilbara.* 168 *Station Peak.* M.A. 14. *Weerianna.* M.A. 12. | Black Prince | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| | Belladonna | 10 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| | Porteminna | 10 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| | **Total** | **20** | **1** | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | **£2,100** |
| | **PEAK HILL GOLDFIELD.** | | | | | | | | | | | | | |
| *Mt. Egerton.* ⋀ *Peak Hill.* M.A. 14P. ⋀ ⋀ | State Battery, Mt. Egerton | 5 | ... | ... | ... | ... | ... | ... | ... | ... | 4 | ... | ... | ... |
| | Connelly's Battery | 10 | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... |
| | Purcell's Works | ... | ... | ... | ... | ... | ... | ... | ... | ... | 5 | ... | ... | ... |
| | State Battery, Peak Hill | 5 | ... | ... | ... | ... | ... | ... | ... | 1 | 4 | ... | ... | ... |
| | **Total** | **20** | ... | ... | ... | ... | ... | ... | ... | **3** | **13** | ... | ... | **£8,762** |
| | **EAST MURCHISON GOLDFIELD.** | | | | | | | | | | | | | |
| | LAWLERS DISTRICT. | | | | | | | | | | | | | |
| *Kathleen Valley.* 382 *Lawlers.* 1171 T.A. 11 1212 910 1188 58, etc. *Sir Samuel.* ⋀ | Yellow Aster | 10 | ... | ... | ... | ... | ... | ... | ... | ... | 4 | ... | ... | ... |
| | Great Eastern | 5 | ... | ... | ... | ... | ... | ... | ... | 1 | 6 | ... | ... | ... |
| | Lawler's Public Battery | ... | ... | ... | ... | ... | ... | ... | ... | ... | 4 | ... | ... | ... |
| | Queen | 5 | ... | ... | ... | ... | ... | ... | ... | ... | 5 | ... | ... | ... |
| | Sunrise | 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| | Try It | 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| | Waroonga G.M. Co., Ltd. | 10 | ... | ... | ... | ... | ... | ... | ... | ... | 4 | ... | ... | ... |
| | State Battery, Sir Samuel | 5 | ... | ... | ... | ... | ... | ... | ... | ... | 3 | ... | ... | ... |
| | **Total** | **45** | ... | ... | ... | ... | ... | ... | ... | **1** | **26** | ... | ... | **£13,631** |
| | WILUNA DISTRICT. | | | | | | | | | | | | | |
| *Gum Creek.* 226J *Mt. Keith.* ⋀ *Wiluna.* 10J ⋀ 6J etc. 12J | Alma May | 5 | ... | ... | ... | ... | ... | ... | ... | ... | 4 | ... | ... | ... |
| | State Battery, Mt. Keith | 5 | ... | ... | ... | ... | ... | ... | ... | 1 | 4 | ... | ... | ... |
| | Moonlight | 10 | ... | ... | ... | ... | ... | ... | ... | 2 | ... | 6 | 1 | ... |
| | State Battery, Wiluna | 10 | ... | ... | ... | ... | ... | ... | 1 | ... | ... | 3 | 1 | ... |
| | Western Machinery Co., Ltd. | 30 | ... | ... | ... | ... | ... | ... | ... | 4 | ... | ... | 2 | ... |
| | Wiluna Gold Mines, Ltd. | 20 | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | 1 | ... |
| | **Total** | **80** | ... | ... | ... | ... | ... | ... | **1** | **9** | **8** | **9** | **5** | **£36,830** |
| | BLACK RANGE DISTRICT. | | | | | | | | | | | | | |
| *Curran's Find.* 641B *Maninga Marley.* 203B *Sandstone.* M.A. 13B ⋀ *Youanmi.* 863B, etc. ⋀ | Red White and Blue | 5 | ... | ... | ... | ... | ... | ... | ... | ... | 6 | ... | ... | ... |
| | Havilah | 10 | ... | ... | ... | ... | ... | ... | ... | 1 | 2 | ... | ... | ... |
| | Youanmi G.M., Ltd. | 20 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... |
| | State Battery, Black Range | 10 | ... | ... | ... | ... | ... | 1 | ... | 2 | 6 | ... | ... | ... |
| | Youanmi G.M., Ltd. | 20 | ... | 1 | ... | ... | ... | ... | 1 | 2 | 6 | 3 | ... | ... |
| | State Battery, Youanmi | 5 | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... |
| | **Total** | **70** | ... | **1** | ... | ... | ... | **1** | **1** | **5** | **22** | **3** | **2** | **£97,229** |

TABLE XXVI.—*Milling and Cyaniding Plants erected in the respective Goldfields, Districts, etc.*—continued.

| Mining Centre and Lease or Area. | Name of Mine, Company, or Works. | Milling. | | | | | | | | | Cyaniding. | | | Value of all Mining Machinery. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Batteries. | Other Mills. | | | | | | | | | | | |
| | | Number of Heads of Stampers. | Prospecting Mills. | Ball Mills. | Griffin Mills. | Huntington Mills. | Puddlers. | Other Crushers. | Flint Mills. | Grinding Pans. | Leaching Vats. | Agitating Vats. | Vacuum Filters and Presses. | |
| | **MURCHISON GOLDFIELD.** | | | | | | | | | | | | | |
| | CUE DISTRICT. | | | | | | | | | | | | | |
| *Cuddingwarra.* 1860 | Big Bell ... ... ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | 1 | 12 | ... | ... | ... |
| *Cue.* (1833) | Agamemnon ... ... ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 203 | Cue No. 1 ... ... ... ... ... | 20 | ... | ... | ... | ... | ... | ... | ... | 1 | 6 | ... | ... | ... |
| (1889) | Gem of Cue Extended ... ... ... | 15 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1148, etc. | Mararoa G.M. Co., N.L. ... ... ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | 6 | ... | ... | ... |
| P.A. 1374 | Late Hidden Treasure ... ... ... | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| ⋀ | State Battery, Cue ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | 5 | ... | ... | ... |
| *Reedy's Find.* 1977 | Emu ... ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... |
| *Tuckabianna.* 1914 | Triplicate ... ... ... ... ... | ... | ... | ... | ... | ... | ... | ..... | ... | ... | 3 | ... | ... | ... |
| *Tuckanarra.* ⋀ | State Battery, Tuckanarra ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | 2 | 3 | ... | ... | ... |
| | **Total** ... ... ... | **68** | ... | ... | ... | ... | ... | **2** | ... | **4** | **37** | ... | ... | **£36,361** |
| | MEEKATHARRA DISTRICT. | | | | | | | | | | | | | |
| *Gabanintha.* (1324N) | Hamburg Belle ... ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | 3 | ... | ... | ... |
| *Garden Gully.* M.A. 16N | Kyarra G.M. Co., N.L. ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... |
| *Holden's Find.* 1921N | Waterloo ... ... ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Meekatharra.* 477N, etc. | Fenian leases ... ... ... ... | 15 | ... | ... | ... | ... | ... | 2 | ... | 8 | ... | 8 | 1 | ... |
| 555N | Ingliston ... ... ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 475N | Ingliston Consols Extended ... ... | 15 | ... | ... | ... | ... | ... | ... | ... | 1 | 6 | ... | ... | ... |
| (1447N) | Ingliston Extended ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | 2 | 2 | 2 | 1 | ... |
| 533N | Marmont ... ... ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| (931N) | Queenhills G.Ms., Ltd. ... ... ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 1 | ... |
| ⋀ | State Battery, Meekatharra ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | 6 | ... | ... | ... |
| *Nannine.* 166N | Nannine ... ... ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... |
| *Quinn's* ⋀ | State Battery, Quinns ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Ruby Well.* (1261N) | Harder to Find ... ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| | **Total** ... ... ... | **97** | ... | ... | ... | ... | ... | **2** | ... | **13** | **17** | **10** | **4** | **£76,730** |
| | DAY DAWN DISTRICT. | | | | | | | | | | | | | |
| *Day Dawn.* 1D, etc. | Great Fingall Consolidated, Ltd. ... ... | 40 | ... | ... | ... | ... | ... | 3 | ... | 6 | 14 | 8 | ... | ... |
| (138D) | Murchison Associated ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| | **Total** ... ... ... | **50** | ... | ... | ... | ... | ... | **3** | ... | **6** | **14** | **8** | ... | **£6,200** |
| | MT. MAGNET DISTRICT. | | | | | | | | | | | | | |
| *Lennonville.* 964M | Empress ... ... ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... |
| *Mt. Magnet.* M.A. 6M | Great Boulder No. 1, Ltd. ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1156M | Leap Year ... ... ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1013M | Mars ... ... ... ... ... ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | 8 | ... | ... | ... |
| 1075M | New Havelock ... ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | 4 | ... | ... | ... |
| ⋀ | State Battery, Boogardie ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | 5 | ... | ... | ... |
| | **Total** ... ... ... | **30** | ... | **1** | ... | ... | ... | ... | ... | **1** | **17** | ... | ... | **£18,243** |
| | **YALGOO GOLDFIELD.** | | | | | | | | | | | | | |
| *Field's Find.* 850 | Commodore ... ... ... ... ... | 3 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Goodingnow.* ⋀ | State Battery, Payne's Find ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | 1 | 3 | ... | ... | ... |
| *Warriedar.* 708 | Mug's Luck ... ... ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | ... | 4½ | 6 | ... | ... |
| ⋀ | State Battery, Warriedar ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Yalgoo.* M.A. 17 | Ivanhoe Works ... ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Yuin.* 712 | Bullrush Gold Estates, N.L. ... ... | 20 | ... | ... | ... | ... | ... | ... | ... | 5 | ... | ... | ... | ... |
| | **Total** ... ... ... | **48** | ... | ... | ... | ... | ... | ... | ... | **6** | **7** | **6** | ... | **£27,393** |
| | **MT. MARGARET GOLDFIELD.** | | | | | | | | | | | | | |
| | MT. MORGANS DISTRICT. | | | | | | | | | | | | | |
| *Linden.* 344F [998R] | Bindah ... ... ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | 3 | ... | ... | ... |
| ⋀ | State Battery, Linden ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | 2 | 6 | ... | ... | ... |
| 341F [903R] | Torquay ... ... ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | 4 | ... | ... | ... |
| *Mt. Margaret.* (314F) | Mt. Morven ... ... ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | 3 | ... | ... | ... |
| *Mt. Morgans.* 325F | Millionaire ... ... ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 5F, etc. | Westralia Mt. Morgans Mines, N.L. ... | 10 | ... | ... | ... | ... | ... | ... | ... | 3 | ... | 2 | 1 | ... |
| *Yundamindra.* M.A., 9F | Battlesville Battery ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | 4 | ... | ... | ... |
| | **Total** ... ... ... | **45** | ... | ... | ... | ... | ... | ... | ... | **5** | **20** | **2** | **1** | **£13,102** |

TABLE XXVI.—*Milling and Cyaniding Plants erected in the respective Goldfields, Districts, etc.*—continued.

| Mining Centre and Lease or Area. | Name of Mine, Company, or Works. | Milling. | | | | | | | | | Cyaniding. | | | Value of all Mining Machinery. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Batteries. | Other Mills. | | | | | | | | | | | |
| | | Number of Heads of Stampers. | Prospecting Mills. | Ball Mills. | Griffin Mills. | Huntington Mills. | Puddlers. | Other Crushers. | Flint Mills. | Grinding Pans. | Leaching Vats. | Agitating Vats. | Vacuum Filters and Presses. | |
| | MT. MARGARET GOLDFIELD—*contd.* | | | | | | | | | | | | | |
| | MT. MALCOLM DISTRICT. | | | | | | | | | | | | | |
| *Lake Darlot.* | | | | | | | | | | | | | | |
| ⋀ | State Battery: Lake Darlot ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... |
| *Leonora.* | | | | | | | | | | | | | | |
| 1473C | Chaffers G.M. Co. (1916), Ltd. ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 263C | Gwalia Central G.Ms., Ltd. ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| (1482C) | Leonora Gold Blocks ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 190C, etc. | Sons of Gwalia, Ltd. ... ... ... | 50 | ... | ... | ... | ... | ... | 1 | ... | 4 | 1 | 4 | ... | ... |
| 198C, etc. | Sons of Gwalia South G.Ms., Ltd. ... ... | 10 | ... | ... | ... | ... | ... | ... | 4 | 10 | ... | ... | 2 | ... |
| ⋀ | State Battery, Leonora ... ... ... | 10 | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... |
| *Mt. Clifford.* | | | | | | | | | | | | | | |
| 1229Q | Victory, No. 1 ... ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... |
| *Mt. Malcolm.* | | | | | | | | | | | | | | |
| (1175C) | North Star: Malcolm Prospecting Co., N.L. | 10 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| (1470C) | Never Tire ... ... ... ... ... | 2 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Pig Well.* | | | | | | | | | | | | | | |
| (1295C) | Starlight G.M. Syndicate, N.L. ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... |
| | **Total ... ... ...** | **127** | ... | ... | ... | ... | ... | **2** | **4** | **19** | **1** | **4** | **2** | **£234,704** |
| | MT. MARGARET DISTRICT. | | | | | | | | | | | | | |
| *Burtville.* | | | | | | | | | | | | | | |
| 1044T | Nil Desperandum ... ... ... ... | ... | ... | 1 | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... |
| *Duketon.* | | | | | | | | | | | | | | |
| (1990T) | Mulga Queen Consols ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | ... | 4 | ... | ... | ... |
| *Euro.* | | | | | | | | | | | | | | |
| 1984T | Lone Star ... ... ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | ... | 6 | ... | ... | ... |
| *Laverton.* | | | | | | | | | | | | | | |
| 829T, etc. | Ida H. G.M. Co., Ltd. ... ... ... | 10 | ... | ... | ... | ... | ... | 1 | ... | 1 | ... | ... | ... | ... |
| 715, etc. | Lancefield G.Ms., Ltd. ... ... ... | ... | ... | 5 | ... | ... | ... | 1 | ... | 8 | ... | 6 | 3 | ... |
| 1897T | Mary Mac G.M. Co. N.L. ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | 4 | 3 | 1 | ... | ... |
| ⋀ | State Battery, Laverton ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | 1 | 5 | ... | ... | ... |
| | **Total ... ... ...** | **50** | ... | **6** | ... | ... | ... | **2** | ... | **15** | **18** | **7** | **3** | **£47,229** |
| | NORTH COOLGARDIE GOLDFIELD. | | | | | | | | | | | | | |
| | MENZIES DISTRICT. | | | | | | | | | | | | | |
| *Comet Vale.* | | | | | | | | | | | | | | |
| 5217Z | Gladsome ... ... ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | 3 | 14 | ... | ... | ... |
| *Goongarrie.* | | | | | | | | | | | | | | |
| (5414Z) | New Boddington G.M. Syndicate, Ltd. ... | 10 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Menzies.* | | | | | | | | | | | | | | |
| (5354Z) | Balkis ... ... ... ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | 1 | 1 | ... | ... | ... |
| M.A., 60Z | Lady Harriet Battery ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | 4 | ... | ... | ... |
| 4931Z, etc. | Menzies Consolidated G.Ms., Ltd. ... ... | 20 | ... | ... | ... | ... | ... | ... | ... | 9 | 14 | 4 | 1 | ... |
| 3100Z, etc. | Menzies Mining and Exploration Corp., Ltd. | 10 | ... | ... | ... | ... | ... | ... | ... | ... | 8 | ... | 1 | ... |
| T.A., 47Z | Gidney's Works ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 8 | ... | ... | ... |
| *Mt. Ida.* | | | | | | | | | | | | | | |
| ⋀ | State Battery, Mt. Ida ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| | **Total ... ... ...** | **65** | ... | ... | ... | ... | ... | ... | ... | **13** | **49** | **4** | **2** | **£33,760** |
| | ULARRING DISTRICT. | | | | | | | | | | | | | |
| *Mulline.* | | | | | | | | | | | | | | |
| 324U, etc. | Riverina South G.M. Co., N.L. ... ... | 10 | ... | ... | ... | ... | ... | 1 | 1 | 2 | ... | 4 | ... | ... |
| ⋀ | State Battery, Mulline ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | 3 | 5 | ... | ... | ... |
| | **Total ... ... ...** | **20** | ... | ... | ... | ... | ... | **1** | **1** | **5** | **5** | **4** | ... | **£27,953** |
| | NIAGARA DISTRICT. | | | | | | | | | | | | | |
| *Kookynie.* | | | | | | | | | | | | | | |
| 769G | Two D's ... ... ... ... ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | 2 | ... | 8 | ... |
| *Niagara.* | | | | | | | | | | | | | | |
| T.L. 108H | Bright's Cyanide Works ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 3 | ... | ... | ... |
| M.A. 35G | Eagle Hawk Heather ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| ⋀ | State Battery, Niagara ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | 2 | 5 | ... | ... | ... |
| *Tampa.* | | | | | | | | | | | | | | |
| M.A. 59G | Grafter ... ... ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | 1 | 3 | ... | ... | ... |
| | **Total ... ... ...** | **25** | ... | **1** | ... | ... | ... | ... | ... | **3** | **13** | ... | **8** | **£5,286** |
| | YERILLA DISTRICT. | | | | | | | | | | | | | |
| *Edjudina.* | | | | | | | | | | | | | | |
| 1011R | Neta ... ... ... ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | ... | 3 | ... | ... | ... |
| *Yarri.* | | | | | | | | | | | | | | |
| ⋀ | State Battery, Yarri ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | 1 | 6 | ... | ... | ... |
| | **Total ... ... ...** | **20** | ... | ... | ... | ... | ... | ... | ... | **1** | **9** | ... | ... | **£3,740** |

TABLE XXVI.—*Milling and Cyaniding Plants erected in the respective Goldfields, Districts, etc.*—continued.

| Mining Centre and Lease or Area. | Name of Mine, Company, or Works. | Milling. | | | | | | | | | Cyaniding. | | | Value of all Mining Machinery |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Batteries. | Other Mills. | | | | | | | | | | | |
| | | Number of Heads of Stampers. | Prospecting Mills. | Ball Mills. | Griffin Mills. | Huntington Mills. | Puddlers. | Other Crushers. | Flint Mills. | Grinding Pans. | Leaching Vats. | Agitating Vats. | Vacuum Filters and Presses. | |
| | **BROAD ARROW GOLDFIELD.** | | | | | | | | | | | | | |
| *Bardoc.* | | | | | | | | | | | | | | |
| (1833W) | Zoroastrian ... ... ... ... ... | 5 | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... |
| *Carnage.* | | | | | | | | | | | | | | |
| M.A. 22W | Regan's Carnage Battery ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... |
| *Siberia.* | | | | | | | | | | | | | | |
| 1399W, etc. | Associated Northern Blocks (W.A.), Ltd. ... | ... | ... | 1 | ... | 2 | 3 | 1 | ... | 10 | 7 | ... | 2 | ... |
| 1371W | Gimblet South ... ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1289W | Lady Evelyn ... ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 1736W | Pole Battery ... ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | 3 | ... | ... | ... |
| ⋀ | State Battery, Ora Banda ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | 5 | ... | ... | ... |
| ⋀ | State Battery, Siberia ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| | **Total** ... ... ... | **45** | ... | **1** | ... | **2** | **3** | **2** | ... | **10** | **17** | ... | **2** | **£64,260** |
| | **NORTH-EAST COOLGARDIE GOLDFIELD.** | | | | | | | | | | | | | |
| | KANOWNA DISTRICT. | | | | | | | | | | | | | |
| *Gordon.* | | | | | | | | | | | | | | |
| 1385X | Pride of the Morning ... ... ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... |
| 891X | Sirdar ... ... ... ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | ... | 8 | ... | ... | ... |
| ***Kanowna.*** | | | | | | | | | | | | | | |
| M.A. 19X | Martin's Battery ... ... ... ... | 15 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... |
| 12X, etc. | North White Feather G.Ms., Ltd ... ... | 20 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| M.A. 58X | Lady Pratt ... ... ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Mulgarrie.* | | | | | | | | | | | | | | |
| 1426X | Palm ... ... ... ... ... ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... |
| | **Total** ... ... ... | **55** | ... | ... | ... | **2** | ... | ... | ... | **1** | **8** | ... | ... | **£9,048** |
| | KURNALPI DISTRICT. | | | | | | | | | | | | | |
| *Kurnalpi.* | | | | | | | | | | | | | | |
| M.A. 5K | Success Battery ... ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Mulgabbie.* | | | | | | | | | | | | | | |
| M.A. 1K | Simmon's Battery ... ... ... ... | ... | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| | **Total** ... ... ... | **5** | **1** | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | **£250** |
| | **EAST COOLGARDIE GOLDFIELD.** | | | | | | | | | | | | | |
| | EAST COOLGARDIE DISTRICT. | | | | | | | | | | | | | |
| *Boulder.* | | | | | | | | | | | | | | |
| 38E etc. | Associated G.Ms. of W.A., Ltd. ... ... | ... | ... | 9 | ... | ... | ... | 1 | ... | 20 | ... | 6 | 7 | ... |
| 351E, etc. | Golden Horseshoe Estates Co., Ltd. ... | 140 | ... | 1 | ... | ... | 3 | 6 | 15 | 24 | 20 | 22 | 20 | ... |
| 50E | Great Boulder No. 1, Ltd. ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 66E | Great Boulder Perseverance G.M. Co., Ltd. ... | ... | ... | 8 | ... | ... | ... | 4 | 2 | 17 | ... | 24 | 13 | ... |
| M.A. 59E. | Great Boulder Proprietary G.Ms., Ltd. ... | ... | 1 | 6 | 13 | ... | 1 | 9 | ... | 20 | ... | 23 | 14 | ... |
| 3643E | Hainault Sulphide Plant ... ... ... | ... | ... | 1 | ... | ... | ... | ... | ... | 1 | 6 | 2 | 1 | ... |
| M.A. 7E | Hannan's Central Battery ... ... ... | 20 | ... | ... | ... | ... | ... | 1 | 1 | ... | 8 | 4 | 2 | ... |
| 4317E | Idaho ... ... ... ... ... ... | 10 | ... | ... | ... | ... | ... | 1 | ... | 1 | 6 | ... | ... | ... |
| 946E | Ironsides North ... ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | 1 | 5 | ... | ... | ... |
| 31E, etc. | Ivanhoe Gold Corporation, Ltd. ... ... | 100 | ... | ... | ... | ... | ... | 3 | 2 | 25 | 32 | 13 | 3 | ... |
| 22E, etc. | Kalgurli G.Ms., Ltd. ... ... ... | ... | ... | 9 | ... | ... | ... | 6 | ... | 18 | ... | 16 | 9 | ... |
| 15E, etc. | Lake View and Star, Ltd. ... ... ... | 75 | ... | 1 | ... | ... | ... | 7 | 8 | 21 | ... | 27 | 17 | ... |
| 281E, etc. | North Kalgurli (1912), Ltd. ... ... ... | 20 | ... | ... | ... | ... | ... | ... | ... | ... | 6 | 3 | 1 | ... |
| 6E, etc. | Oroya Links, Ltd. ... ... ... ... | 55 | ... | 2 | ... | ... | 1 | 4 | 5 | 3 | 13 | 14 | 5 | ... |
| 1208E, etc. | South Kalgurli Consolidated, Ltd. ... ... | 40 | ... | 4 | ... | ... | ... | 2 | ... | 15 | 34 | 11 | 10 | ... |
| *Kalgoorlie.* | | | | | | | | | | | | | | |
| 796E | Bonnie Lass (Raven Battery) ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 4585E | Creswick ... ... ... ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 5 | ... | ... | ... |
| M.A. 64E | Dunstan & Cummings Works ... ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | 12 | ... | 1 | ... |
| 4546E, etc. | Hannan's Reward, Ltd. ... ... ... | 10 | ... | ... | ... | 1 | ... | ... | ... | 1 | 3 | ... | ... | ... |
| L.C. 353E | Lone Hand Works ... ... ... ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | 5 | ... | ... | ... |
| | **Total** ... ... ... | **500** | **1** | **41** | **13** | **3** | **6** | **44** | **33** | **167** | **155** | **165** | **103** | **£1,297,043** |
| | **COOLGARDIE GOLDFIELD.** | | | | | | | | | | | | | |
| | COOLGARDIE DISTRICT. | | | | | | | | | | | | | |
| *Burbanks.* | | | | | | | | | | | | | | |
| (134), etc. | Burbanks Birthday G.Ms., Ltd. ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 9 | ... | ... | ... |
| 2160 | Lady Robinson G.M. Co., N.L. ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Coolgardie.* | | | | | | | | | | | | | | |
| 4567 | Griffith's Gold Mine ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| M.A. 11 | New Bayley's Mines, Ltd. ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | ... | 1 | 4 | ... | ... |
| ⋀ | State Battery, Coolgardie ... ... ... | 10 | ... | ... | ... | ... | ... | 2 | ... | ... | 7 | ... | ... | ... |
| *Eundynie.* | | | | | | | | | | | | | | |
| 4253 | Hidden Secret North ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | ... | 6 | ... | ... | ... |
| *Gibraltar.* | | | | | | | | | | | | | | |
| 4603 | Reform ... ... ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | 3 | ... | ... | ... |
| *Widgiemooltha.* | | | | | | | | | | | | | | |
| M.A. 63 | Highgate Battery ... ... ... ... | 3 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... |
| ⋀7497 | Imperial Battery ... ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| | **Total** ... ... ... | **63** | ... | ... | ... | ... | ... | **2** | ... | **1** | **26** | **4** | ... | **£13,796** |
| | KUNANALLING DISTRICT. | | | | | | | | | | | | | |
| *Carbine.* | | | | | | | | | | | | | | |
| 338 | Carbine ... ... ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... |
| 25-Mile | | | | | | | | | | | | | | |
| 696S | Blue Bell ... ... ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | 7 | ... | ... | ... |
| 871S | Shamrock ... ... ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 645S | Star of Fremantle ... ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | ... | 4 | ... | ... | ... |
| | **Total** ... ... ... | **30** | ... | ... | ... | ... | ... | ... | ... | **2** | **11** | ... | ... | **£7,300** |

TABLE XXVI.—*Milling and Cyaniding Plants erected in the respective Goldfields, Districts, etc.*—continued.

| Mining Centre and Lease or Area. | Name of Mine, Company, or Works. | Milling. | | | | | | | | | Cyaniding. | | | Value of all Mining Machinery. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Batteries. | Other Mills. | | | | | | | | | | | |
| | | Number of Heads of Stampers. | Prospecting Mills. | Ball Mills. | Griffin Mills. | Huntington Mills. | Puddlers. | Other Crushers. | Flint Mills. | Grinding Pans. | Leaching Vats. | Agitating Vats. | Vacuum Filters and Presses. | |
| | YILGARN GOLDFIELD. | | | | | | | | | | | | | |
| *Bullfinch.* 914, etc. | Bullfinch Proprietary (W.A.), Ltd. ... ... | 20 | ... | ... | ... | ... | ... | ... | 2 | 2 | ... | 4 | 3 | ... |
| *Corinthian.* 896 | Corinthian North G.Ms., Ltd. ... ... | 10 | ... | ... | ... | ... | 1 | ... | ... | 2 | ... | 4 | 2 | ... |
| *Golden Valley.* 2272 | Glide Away ... ... ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | 1 | 3 | ... | ... | ... |
| *Greenmount.* 550 | Sunbeam ... ... ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | 1 | 5 | ... | ... | ... |
| 536 | Transvaal ... ... ... ... ... | 20 | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... |
| *Kennyville.* 911 | Edna May Battler G.M. Co., N.L. ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... |
| 570 | Great Leviathan ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Marvel Loch.* M.A. 23 | Donovan's Find Battery ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | 3 | ... | ... | ... |
| 719, etc. | Great Victoria ... ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | 2 | 10 | ... | ... | ... |
| M.A., 18 | Never Never Battery ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... |
| *Mt. Jackson* (1933) | Butcher Bird, No. 1 ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Parker's Range.* (508) | Australia ... ... ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | 5 | ... | ... | ... |
| 2801 | Scots Greys ... ... ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 724 | Spring Hill G.M. Co., N.L. ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | ... | 4 | ... | ... | ... |
| *Mt. Rankin.* M.A. 20 | Mt. Rankin G.Ms., N.L. ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... |
| *Westonia.* 2291, etc. | Edna May Central G.Ms., N.L. ... ... | 10 | ... | ... | ... | ... | ... | 1 | ... | 2 | 8 | ... | ... | ... |
| 2570, etc. | Edna May Consolidated G.M. Co., N.L. ... | 10 | ... | ... | ... | ... | ... | ... | ... | 2 | ... | ... | ... | ... |
| 2168, etc. | Edna May Deep Levels G.M. Co., N.L. ... | 10 | ... | ... | ... | ... | ... | ... | ... | ... | 6 | ... | ... | ... |
| 2180, etc. | Edna May G.M. Co., N.L. ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | 3 | ... | ... | ... | ... |
| P.A. 1160 | Recovery ... ... ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | 1 | ... | ... | ... | ... |
| | **Total** ... ... ... | **180** | ... | ... | ... | ... | **1** | **2** | **2** | **20** | **46** | **8** | **5** | **£102,056** |
| | DUNDAS GOLDFIELD. | | | | | | | | | | | | | |
| *Norseman.* (938), etc. | Hampton Uruguay, Ltd. ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | 4 | 12 | 4 | 1 | ... |
| M.A. 31 | Mararoa G.M. Co., N.L. ... ... ... | 20 | ... | ... | ... | ... | ... | ... | ... | 5 | 9 | 4 | 1 | ... |
| M.A. 18 | Rawlings, Bullen, & Rumble ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | 3 | 4 | ... | ... | ... |
| 990 | Viking No. 1 ... ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | ... | 6 | ... | ... | ... |
| ⋀ | State Battery, Norseman ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | 1 | 6 | ... | ... | ... |
| | **Total** ... ... ... | **55** | ... | ... | ... | ... | ... | ... | ... | **13** | **37** | **8** | **2** | **£31,317** |
| | PHILLIPS RIVER GOLDFIELD. | | | | | | | | | | | | | |
| *Kundip.* ⋀194H | Flag ... ... ... ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 184 | Gem ... ... ... ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | 4 | ... | ... |
| 151, etc. | Gem Consolidated ... ... ... ... | 5 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| M.L. 52 | Harbour View Gold and Copper Co., Ltd. ... | 10 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 74 | Two Boys ... ... ... ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| *Ravensthorpe.* (153) | Maori Queen ... ... ... ... ... | ... | 1 | ... | ... | ... | ... | 1 | ... | ... | ... | ... | ... | ... |
| M.A. 4 | Ravensthorpe Battery Co., Ltd. ... ... | 10 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| | **Total** ... ... ... | **45** | **1** | ... | ... | ... | ... | **1** | ... | ... | ... | **4** | ... | **£10,850** |
| | State Generally ... ... ... | ... | ... | **1** | ... | ... | ... | **1** | ... | ... | ... | ... | ... | ... |
| | **Total** ... ... ... | ... | ... | **1** | ... | ... | ... | **1** | ... | ... | ... | ... | ... | **£30,000** |

TABLE XXVI.—*Milling and Cyaniding Plants erected in the respective Goldfields, Districts, etc.*—continued.

| GOLDFIELD. | DISTRICT. | MILLING. Batteries. Number of Heads of Stampers. | MILLING. Other Mills. Prospecting Mills. | Ball Mills. | Griffin Mills. | Huntington Mills. | Puddlers. | Other Crushers. | Flint Mills. | Grinding Pans. | CYANIDING. Leaching Vats. | Agitating Vats. | Vacuum Filters and Presses. | Total Value of all Mining Machinery. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | GOLD MINING. | | | | | | | | | | | | | £ |
| KIMBERLEY ... ... ... | ... ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| PILBARA ... ... ... | Marble Bar ... ... ... | 38 | ... | ... | ... | ... | ... | ... | ... | 2 | 8 | ... | ... | 11,134 |
| | Nullagine ... ... ... | 25 | ... | ... | ... | ... | ... | ... | ... | 2 | 16 | ... | ... | 4,237 |
| WEST PILBARA ... ... ... | ... ... ... ... ... | 20 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2,100 |
| ASHBURTON ... ... ... | ... ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| GASCOYNE ... ... ... | ... ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| PEAK HILL ... ... ... | ... ... ... ... ... | 20 | ... | ... | ... | ... | ... | ... | ... | 3 | 13 | ... | ... | 8,762 |
| EAST MURCHISON ... | Lawlers ... ... ... | 45 | ... | ... | ... | ... | ... | ... | ... | 1 | 26 | ... | ... | 13,631 |
| | Wiluna ... ... ... | 80 | ... | ... | ... | ... | ... | ... | 1 | 9 | 8 | 9 | 5 | 36,830 |
| | Black Range ... ... | 70 | ... | 1 | ... | ... | ... | 1 | 1 | 5 | 22 | 3 | 2 | 97,229 |
| MURCHISON ... ... | Cue ... ... ... ... | 68 | ... | ... | ... | ... | ... | 2 | ... | 4 | 37 | ... | ... | 36,361 |
| | Meekatharra ... ... ... | 97 | ... | ... | ... | ... | ... | 2 | ... | 13 | 17 | 10 | 4 | 76,730 |
| | Day Dawn ... ... ... | 50 | ... | ... | ... | ... | ... | 3 | ... | 6 | 14 | 8 | ... | 6,200 |
| | Mt. Magnet ... ... ... | 30 | ... | 1 | ... | ... | ... | ... | ... | 1 | 17 | ... | ... | 18,243 |
| YALGOO ... ... ... | ... ... ... ... ... | 48 | ... | ... | ... | ... | ... | ... | ... | 6 | 7 | 6 | ... | 27,393 |
| MT. MARGARET ... | Mt. Morgans ... ... ... | 45 | ... | ... | ... | ... | ... | ... | ... | 5 | 20 | 2 | 1 | 13,102 |
| | Mt. Malcolm ... ... ... | 127 | ... | ... | ... | ... | ... | 2 | 4 | 9 | 1 | 4 | 2 | 234,704 |
| | Mt. Margaret ... ... | 50 | ... | 6 | ... | ... | ... | 2 | ... | 15 | 18 | 7 | 3 | 47,229 |
| | Menzies ... ... ... | 65 | ... | ... | ... | ... | ... | ... | ... | 13 | 49 | 4 | 2 | 33,760 |
| NORTH COOLGARDIE ... | Ularring ... ... ... | 20 | ... | ... | ... | ... | ... | 1 | 1 | 5 | 5 | 4 | ... | 27,953 |
| | Niagara ... ... ... | 25 | ... | 1 | ... | ... | ... | ... | ... | 3 | 13 | ... | 8 | 5,286 |
| | Yerilla ... ... ... | 20 | ... | ... | ... | ... | ... | ... | ... | 1 | 9 | ... | ... | 3,740 |
| BROAD ARROW ... ... ... | ... ... ... ... ... | 45 | ... | 1 | ... | 2 | 3 | 2 | ... | 10 | 17 | ... | 2 | 64,260 |
| N.E. COOLGARDIE ... | Kanowna ... ... ... | 55 | ... | ... | ... | 2 | ... | ... | ... | 1 | 8 | ... | ... | 9,048 |
| | Kurnalpi ... ... ... | 5 | 1 | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 250 |
| EAST COOLGARDIE ... | East Coolgardie ... ... | 500 | 1 | 41 | 13 | 3 | 6 | 44 | 33 | 167 | 155 | 165 | 103 | 1,297,043 |
| | Bulong ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| COOLGARDIE ... ... | Coolgardie ... ... ... | 63 | ... | ... | ... | ... | ... | 2 | ... | 1 | 26 | 4 | ... | 13,796 |
| | Kunanalling ... ... ... | 30 | ... | ... | ... | ... | ... | ... | ... | 2 | 11 | ... | ... | 7,300 |
| YILGARN ... ... ... | ... ... ... ... ... | 180 | ... | ... | ... | ... | 1 | 2 | 2 | 20 | 46 | 8 | 5 | 102,056 |
| DUNDAS ... ... ... | ... ... ... ... ... | 55 | ... | ... | ... | ... | ... | ... | ... | 13 | 37 | 8 | 2 | 31,317 |
| PHILLIPS RIVER ... ... | ... ... ... ... ... | 45 | 1 | ... | ... | ... | ... | 1 | ... | ... | ... | 4 | ... | 10,850 |
| STATE GENERALLY ... ... | ... ... ... ... ... | ... | ... | 1 | ... | ... | ... | 1 | ... | ... | ... | ... | ... | 30,000 |
| | **Total, Gold Mining Machinery ...** | **1,921** | **4** | **52** | **13** | **7** | **10** | **65** | **42** | **317** | **600** | **246** | **139** | **£2,270,544** |
| | LEAD MINING. | | | | | | | | | | | | | |
| NORTHAMPTON, M.F. ... ... | ... ... ... ... ... | ... | ... | ... | ... | ... | ... | 6 | ... | ... | ... | ... | ... | 28,500 |
| | **Total, Lead Mining Machinery ...** | ... | ... | ... | ... | ... | ... | **6** | ... | ... | ... | ... | ... | **£28,500** |
| | TIN MINING. | | | | | | | | | | | | | |
| PILBARA ... ... ... ... | Marble Bar ... ... ... | ... | ... | ... | ... | 1 | ... | 2 | ... | ... | ... | ... | ... | 25,300 |
| GREENBUSHES TINFIELD ... | ... ... ... ... ... | ... | ... | ... | ... | 4 | ... | 4 | ... | ... | ... | ... | ... | 39,793 |
| | **Total, Tin Mining Machinery ...** | ... | ... | ... | ... | **5** | ... | **6** | ... | ... | ... | ... | ... | **£65,093** |
| | COPPER MINING. | | | | | | | | | | | | | |
| PHILLIPS RIVER ... ... | ... ... ... ... ... | ... | ... | ... | ... | ... | ... | 9 | 2 | 2 | ... | ... | ... | 74,251 |
| WEST PILBARA ... ... ... | ... ... ... ... ... | ... | ... | ... | ... | ... | ... | 5 | 2 | 1 | ... | ... | ... | 73,500 |
| MT. MARGARET ... ... | Mt. Morgans ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 3,000 |
| | **Total, Copper Mining Machinery ...** | ... | ... | ... | ... | ... | ... | **14** | **4** | **3** | ... | ... | ... | **£150,751** |
| | COAL MINING. | | | | | | | | | | | | | |
| COLLIE RIVER COALFIELD ... | ... ... ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 116,560 |
| | **Total, Coal Mining Machinery ...** | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | **£116,560** |
| | ASBESTOS MINING. | | | | | | | | | | | | | |
| PILBARA ... ... ... ... | Nullagine ... ... ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | 2,750 |
| | **Total, Asbestos Mining Machinery ...** | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | **£2,750** |
| **Total Machinery other than Gold Mining ... ... ...** | | ... | ... | ... | ... | **5** | ... | **26** | **4** | **3** | ... | ... | ... | **£363,654** |
| **Total, all Mining Machinery ... ... ... ...** | | **1,921** | **4** | **52** | **13** | **12** | **10** | **91** | **46** | **320** | **600** | **246** | **139** | **£2,634,198** |

# APPENDIX.

## ROYAL MINT, PERTH BRANCH.

Subject to the Regulations, any person may deposit gold at the Mint in his own name. Those who cannot attend personally for the purpose may send the gold by an agent, under Police escort, or by Post.

A circular can be obtained from the Deputy Master of the Mint giving all necessary information for intending depositors, conditions of the Escort Service, Coining Regulations, etc., etc.

An Escort Service is provided by the Police Department for parcels of all sizes. The consignor pays for the carriage by coach or train, but the escort charges may be collected by the Mint.

Forms for use in connection with gold sent to the Mint by post or under Police escort can be obtained at the Mint.

*Charges for Assaying, Refining, and Coinage.*

| Gross Weight of Deposit in ounces. | Mint Charge. | Gross Weight of Deposit in ounces. | Mint Charge. | Gross Weight of Deposit in ounces. | Mint Charge. |
|---|---|---|---|---|---|
| Up to and including— | £ s. d. | Up to and including— | £ s. d. | Up to and including— | £ s. d. |
| 24 | 0 5 0 | 400 | 4 3 4 | 1,300 | 10 4 2 |
| 30 | 0 6 3 | 410 | 4 5 5 | 1,400 | 10 16 8 |
| 40 | 0 8 4 | 420 | 4 7 6 | 1,500 | 11 9 2 |
| 50 | 0 10 5 | 430 | 4 9 7 | 1,600 | 12 1 8 |
| 60 | 0 12 6 | 440 | 4 11 8 | 1,700 | 12 14 2 |
| 70 | 0 14 7 | 450 | 4 13 9 | 1,800 | 13 6 8 |
| 80 | 0 16 8 | 460 | 4 15 10 | 1,900 | 13 19 2 |
| 90 | 0 18 9 | 470 | 4 17 11 | 2,000 | 14 11 8 |
| 100 | 1 0 10 | 480 | 5 0 0 | 2,100 | 15 4 2 |
| 110 | 1 2 11 | 490 | 5 2 1 | 2,200 | 15 16 8 |
| 120 | 1 5 0 | 500 | 5 4 2 | 2,300 | 16 9 2 |
| 130 | 1 7 1 | 520 | 5 6 8 | 2,400 | 17 1 8 |
| 140 | 1 9 2 | 540 | 5 9 2 | 2,500 | 17 14 2 |
| 150 | 1 11 3 | 560 | 5 11 8 | 2,600 | 18 6 8 |
| 160 | 1 13 4 | 580 | 5 14 2 | 2,700 | 18 19 2 |
| 170 | 1 15 5 | 600 | 5 16 8 | 2,800 | 19 11 8 |
| 180 | 1 17 6 | 620 | 5 19 2 | 2,900 | 20 4 2 |
| 190 | 1 19 7 | 640 | 6 1 8 | 3,000 | 20 16 8 |
| 200 | 2 1 8 | 660 | 6 4 2 | 3,100 | 21 9 2 |
| 210 | 2 3 9 | 680 | 6 6 8 | 3,200 | 22 1 8 |
| 220 | 2 5 10 | 700 | 6 9 2 | 3,300 | 22 14 2 |
| 230 | 2 7 11 | 720 | 6 11 8 | 3,400 | 23 6 8 |
| 240 | 2 10 0 | 740 | 6 14 2 | 3,500 | 23 19 2 |
| 250 | 2 12 1 | 760 | 6 16 8 | 3,600 | 24 11 8 |
| 260 | 2 14 2 | 780 | 6 19 2 | 3,700 | 25 4 2 |
| 270 | 2 16 3 | 800 | 7 1 8 | 3,800 | 25 16 8 |
| 280 | 2 18 4 | 820 | 7 4 2 | 3,900 | 26 9 2 |
| 290 | 3 0 5 | 840 | 7 6 8 | 4,000 | 27 1 8 |
| 300 | 3 2 6 | 860 | 7 9 2 | 4,100 | 27 14 2 |
| 310 | 3 4 7 | 880 | 7 11 8 | 4,200 | 28 6 8 |
| 320 | 3 6 8 | 900 | 7 14 2 | 4,300 | 28 19 2 |
| 330 | 3 8 9 | 920 | 7 16 8 | 4,400 | 29 11 8 |
| 340 | 3 10 10 | 940 | 7 19 2 | 4,500 | 30 4 2 |
| 350 | 3 12 11 | 960 | 8 1 8 | 4,600 | 30 16 8 |
| 360 | 3 15 0 | 980 | 8 4 2 | 4,700 | 31 9 2 |
| 370 | 3 17 1 | 1,000 | 8 6 8 | 4,800 | 32 1 8 |
| 380 | 3 19 2 | 1,100 | 8 19 2 | 4,900 | 32 14 2 |
| 390 | 4 1 3 | 1,200 | 9 11 8 | 5,000 | 33 6 8 |

For every additional 100ozs. the charge is increased by 12s. 6d.

NOTE.—Additional charges (*see* Regulation No. 6) are collected when base metals in a deposit exceed 2 per cent. of its weight.

The following table illustrates the operation of these charges in case of gold of the value of £3 17s. 10½d. an ounce:—

| Weight of Deposit. | Rate of Charge per ounce. | Amount of Charge. | Net Value of Deposit. |
|---|---|---|---|
| ozs. | d. | £ s. d. | £ s. d. |
| 50 | 2.5 | 0 10 5 | 194 3 4 |
| 100 | 2.5 | 1 0 10 | 388 6 8 |
| 600 | 2.3 | 5 16 8 | 2,330 8 4 |
| 1,000 | 2.0 | 8 6 8 | 3,885 8 4 |
| 5,000 | 1.6 | 33 6 8 | 19,435 8 4 |
| 10,000 | 1.55 | 64 11 8 | 38,872 18 4 |

NOTE.—A proportion of silver in deposits of gold is paid for by the Mint as follows:—

In deposits under 1,000ozs. gross: all silver in excess of 8 per cent. of the weight of the deposit after melting.
" from 1,000 " to 5,000 " " 6 " " " " "
" " 5,000 " " 10,000 " " 5 " " " " "
" " 10,000 " upwards " " 4 " " " " "

The rate at which payment for silver is made is liable to fluctuation.

# GOLD ESCORT SERVICE.

## RATES.

Actual Cost, plus 20 per cent.

## RATES FOR CARRIAGE OF GOLD ON GOVERNMENT RAILWAYS.

| | Distance not over— | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 25 miles. | 50 miles. | 100 miles. | 150 miles. | 200 miles. | 250 miles. | 300 miles. | 350 miles. |
| Gold dust and bullion per 100ozs. ... ... ... ... | s. d. 1 0 | s. d. 2 0 | s. d. 3 0 | s. d. 3 9 | s. d. 4 6 | s. d. 5 0 | s. d. 5 6 | s. d. 6 0 |

6d. per 100ozs. for every additional 50 miles, or part thereof.

NOTE.—A special reduction of 25 per cent. is made for all gold dust or bullion consigned to the Perth Mint.

*To find the value per ounce of gold sent from a mine to the Mint.*—Divide the standard gold by the weight before melting, and multiply the result by £3 17s. 10½d. For instance, supposing the Mint return to show:—

| | Ozs. |
|---|---|
| Weight before melting .. .. .. .. .. .. | 47.41 |
| Standard gold .. .. .. .. .. .. .. | 38.19 |

The calculation would be as follows:—

4741)3819.0(.805
3792.8
26200
23705
2495

.805 × £3 17s. 10½d. =
.805 × £3.894
.805
19470
311520
£3.134(670)
20
s. 2.680
12
d. 8.160 = £3 2s. 8d., value per ounce of gold as produced from the mine.

By Authority: FRED. WM. SIMPSON, Government Printer, Perth.