

An aerial photograph of a mining and industrial facility in a desert landscape. The facility includes several large white buildings, a complex network of pipes and conveyor belts, several large circular tanks, and a rectangular pool. The surrounding terrain is arid and hilly. The year '1955' is printed in large white letters at the top right.

1955

Report of the
*Department
of Mines*
Western Australia

COVER PICTURE

The cover picture shows the Sons of Gwalia Gold Mine at Leonora. In the foreground of the picture are the staff houses and swimming pool. In the centre can be seen the plant, mine buildings and the head-frame, with the open cut in the background.

This is the oldest mine in Western Australia having been worked continuously since 1897. It has produced 6,063,460·53 tons of ore for 2,362,405 fine ozs. of gold.

WESTERN AUSTRALIA - 1957

REPORT

OF THE

Department of Mines

FOR THE

YEAR 1955

PERTH:

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To the Hon. Minister for Mines.

Sir,

I have the honour to submit the Annual Report of the Department of Mines of the State of Western Australia for the year 1955, together with reports from the officers controlling Sub-Departments, and Comparative Tables furnishing statistics relative to the Mining Industry.

I have the honour to be, Sir,

Your obedient servant,

A. H. TELFER,

Under Secretary for Mines.

Perth, April, 1956.

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STATE OF WESTERN AUSTRALIA

Report of the Department of Mines for the Year 1955

DIVISION I

The Honourable Minister for Mines:

I have the honour to submit for your information, a report on the Mining Industry for the year 1955.

The estimated value of the mineral output of the State for the year was £9,336,754 (calculating gold at £4 4s. 11.45 per fine ounce), a decrease of £916,156 in value compared with the preceding 12 months. The estimated value of the exchange premium paid to gold producers by the Mint, amounted to £A9,578,940, added to which, the overseas gold sales premium of £A19,230 received by the Gold Producers' Association Limited from sales of West Australian Gold from May, 1954, to June, 1955, brought the gross value of all minerals to £A18,934,924, a decrease of £A1,018,741 compared to that for the record year of 1954, to which it takes second place.

The estimated value of the gold received at the Perth Branch of the Royal Mint and exported in gold-bearing material was £A13,155,329, but with the additional overseas gold sales premium mentioned above, totalled £A13,174,559 (and equalled 69.57 per cent. of the value of all minerals). (See footnote to Table 1 (a), Part II.)

Other minerals realised; Coal, £3,132,074; asbestos, £502,029; iron-ore (exported), £492,741; manganese, £423,830; pyrites, £397,269; iron-ore (pig), £220,558; cupreous ore (fertiliser), £101,731; lead ores and concentrates, £95,191; tin, £94,912; silver, £92,781; talc, £37,767; beryl, £34,430; clays, £32,693; gypsum, £30,336; tanto/columbite, £25,762; felspar, £16,660; tungsten (scheelite), £7,417; glauconite, £7,407; glass sand, £4,801; red ochre, £3,913; bentonite, £2,591; copper ore, £1,001; graphite, £990; dolomite, £324; corundum, £275; emery, £245; antimony, £230; fergusonite, £226; barytes, £70; spodumene, £57; and fuller's earth, £54.

Dividends paid by mining companies amounted to £2,049,121, an increase of £264,228 when compared with the previous year (see Table 6, Part II).

To the end of 1955, the total amount distributed by the gold mining companies was £53,574,669.

To the same date the progressive value of the mineral production of the State amounted to £298,238,954, of which gold accounted for £243,550,338, based on normal value of £4 4s. 11.45 per fine ounce; but the premium on the sale of gold during the years 1920-1924, increasing exchange premium from 1930, payments under the Gold Bounty Act, 1930, plus additional premiums from overseas sales distributed during 1952-1955, increase the total value of gold and mineral production by £133,069,944, making a gross progressive value of £A431,308,898.

GOLD.

The quantity of gold reported as being received at the Perth Branch of the Royal Mint (837,913.72 fine ounces), together with that contained in gold-bearing material exported for treatment (4,091.51

fine ounces), totalled 842,005.23 fine ounces, and was less than that of the previous year by 8,534.94 fine ounces (vide Table 1 (a) of Part II).

Similarly, the total gold yield for the year reported directly to the Department by the producers was 834,325.61 fine ounces, which constituted a decrease of 27,666.30 fine ounces in comparison with the previous years figure (vide Table 3 of Part II).

The variation between the two annual totals mentioned above is principally due to the fact that the gold reported as being received at the Mint and exported for treatment, is not all necessarily produced during the calendar year under review, a certain quantity being always in the transitory stage from the producer at the end of the year. The former total is accepted as the official production of the State on account of its realised monetary value, whilst the latter is utilised mainly in tracing the gold back to its source, i.e. individual mine production to which its respective ore tonnage can be applied.

The calculated average value of ore treated in the State as a whole, increased from 22.611 shillings per ton in 1954 to 24.752 shillings per ton in 1955, calculating gold at the old rate of £4 4s. 11.45 per fine ounce, but the exchange premium rate of 267.84 per cent. would more than treble this estimate. For East Coolgardie Goldfield (which produced 58.61 per cent. of the State's gold yield), the calculated average value of the ore treated decreased slightly from 22.241 shillings to 21.613 shillings per ton. The estimates for Murchison (Hill 50 G.M.N.L.), Mt. Margaret (Sons of Gwalia Ltd.), Coolgardie (New Coolgardie G.M.'s N.L.), Dundas (Central Norseman Gold Corporation N.L.), and Yilgarn (Great Western Consolidated), were 60.518s. (22.709s.); 21.238s. (22.471s.); 48.012s. (41.486s.); 50.717s. (44.845s.); and 13.240s. (12.760s.), respectively. Figures for 1954 being shown in parenthesis.

The tonnage of ore reported to have been treated in 1955; viz. 2,865,048 tons, was 375,330 tons less than the previous year, and constituted 66.75 per cent. of the State record tonnage established in 1940.

The following tonnage increases were reported from the respective Goldfields—Kimberley 20, Mt. Margaret 7,506, North Coolgardie 4,415, Broad Arrow 1,986, East Coolgardie 65,151, and Dundas 2,377; those fields showing a reduction in tonnage being Pilbara 2,815, Ashburton 49, Peak Hill 46,183, East Murchison 395, Murchison 380,619, North-East Coolgardie 231, Coolgardie 158, and Yilgarn 26,360.

Output of the East Coolgardie Goldfield exceeded that of the previous year by 65,000 tons, mainly due to the 96,800 ton increase established by North Kalgurli (1912) Ltd. through its acquisition of the Croesus Treatment Plant, and by the 6,000 ton improvement of the Great Boulder Pty. Ltd. Apart from the Lake View and Star Ltd. which maintained its average, the remaining Companies slightly receded.

Hill 50 Gold Mine's increase of 11,600 tons was absorbed in the final 380,000 net loss sustained by the Murchison Goldfield owing to the closure of the Big Bell Mine early in January.

The closing of the Anglo-Westralian Mining Pty. Ltd. in October, 1954, accounted for the comparative discrepancy reported from the Peak Hill Goldfield for the year.

Great Western Consolidated were responsible for the 26,000 tons regression in the Yilgarn Goldfield, whilst Lancefield Gold Mine and the Central Norseman Gold Corporation Ltd. were credited with the respective improvements reported from the Mt. Margaret and Dundas Goldfields.

The bare fact that the gold mining industry failed to reach the previous year's figures by 375,000 tons and 27,600 fine ounces, does not reveal the true picture.

Faced with a potential deficit of 400,000 tons and 55,000 ounces by the closing of the Big Bell Mine in mid-January, the remaining producers actually improved on their figures for the previous year by approximately 10,000 tons and 27,000 fine ounces, a feature which was most commendable.

Expanding operational and development programmes are being effected by some Companies, whilst reports from others reveal a lowering of costs by modification and modernisation of plant and machinery etc.; further economic improvement should also result from the merging of several properties on the Golden Mile.

With these material features in mind, the overall picture presented by the industry would appear to be a more evenly balanced one, concealing a much brighter aspect than at first conceived.

West Australian gold included in sales on open dollar markets by the Gold Producers' Association Ltd., between May, 1954 and June, 1955, totalled 841,798.15 fine ounces; the extra premium received therefrom, in excess of the Mint value, amounted to £A19,230, an overall average of 5.482 pence per fine ounce. This amount less expenses, was distributed to the producer members during the year and approximated 4.743 pence per fine ounce.

Subsidy payments made by the Commonwealth Government during the year under the Gold Mining Industry Assistance Act, 1954, totalled £A199,130, of which £A180,816 went to Large Producers and £A18,314 to Small Producers in this State.

Production of minerals has been well maintained and there has been continued activity in the North Western fields.

These fields produced asbestos, iron, antimony, beryl, chrome copper, lead, tin and manganese. From the more southern fields came pyrites, gypsum, clays, felspar, talc, and in addition lead, tin and copper.

Prices have been reasonably good and have been at a level enabling profitable production. In the case of Columbite, however, the decision of the Government of the United States to discontinue the bonus of 100% on production price caused the production of this mineral to cease altogether.

Prospecting for uranium continued in the Kimberly Goldfields, but no satisfactory results have yet been obtained.

An amendment to the Mining Act to provide for temporary reserves of large areas up to 3,000 square miles for the purpose of prospecting for nickel encouraged Southwestern Mining Ltd. to take up an area on the Easter border of the State for that purpose. Preparations for an intensive search are well in hand.

Great interest is also being shown in Ilmenite and Titanium deposits, particularly in the South-West Division of the State and both producers and buyers are actively interested in several deposits in this area.

COAL.

Coal production at Collie showed a small decline on last year's figures, the production for 1955 being 903,792 tons as against 1,018,342 tons for 1954. Of the total output 63.35% was from deep mines and 36.65% from open cuts.

The consumption during the year showed a decrease of 113,665 tons from 1954. Government consumption amounted to 76.96% and private consumers used 23.04%.

During the year the Proprietary Mine was closed down by Amalgamated Collieries Ltd., and the Griffin Coal Mining Company ceased operations at the Griffin Mine.

OIL.

The search for oil has been continued vigorously again this year.

West Australian Petroleum Pty. Ltd. have carried out an extensive programme of Geological, Gravity Meter and Seismograph surveys extending from the Kimberley District to the vicinity of Gingin. Drilling operations have been continued at Exmouth Gulf both at Rough Range and Cape Range, where in Rough Range Bore No. 3A oil was again struck close to the original strike. In the Cape Range No. 2 a strong gas flow was encountered, but when tested over differing periods it showed a disappointing diminution in flow. Drilling operations were carried out at Grant Range and Fraser River in the Kimberleys and in the Salt Marsh area and on Dirk Hartog Island near Carnarvon. No further oil deposits have been discovered, but much valuable data has been accumulated which will assist in further interpretation of the Gavity Meter and Seismic surveys.

Associated Kimberley Oil Fields N.L. carried out a drilling programme at Nerrima and Myroodah but neither hole yielded results.

COMPARATIVE MINERAL STATISTICS.

	1954.	1955.	Variation.
Gold—			
Reported to Department :			
Ore (tons)	3,240,378	2,865,048	— 375,330
Gold (fine ozs.)	861,992	834,326	— 27,666
Average grade (dwts. per ton)	5.320	5.824	+ 0.504
Men Employed	6,128	5,845	— 283
Dividends (£A)	1,784,893	2,049,121	+ 264,228
Mint and Export :			
Gold (fine ozs.)	850,540	842,005	— 8,535
Estimated Value (£A)	13,313,618	13,174,559	— 139,059
Coal—			
Reported to Department :			
Tons	1,018,342	903,792	— 114,550
Value (£A)	3,588,818	3,132,074	— 456,744
Men Employed	1,560	1,386	— 174
Other Minerals—			
Reported to Department :			
Value (£A)	3,051,229	2,628,291	— 422,938
*Men Employed	886	850	— 36
All Minerals—			
Value (£A)	19,953,665	18,934,924	— 1,018,741
*Men Employed	8,574	8,081	— 493

* Excluding Oil Search which engaged an average of 222 men in the field during 1954 and 445 men in the field during 1955

PART II.—MINERALS

TABLE 1.

Quantity and Value of Minerals, other than Gold and Silver, produced during Years 1954 and 1955.

Description of Minerals.	1954.		1955.		Increase or Decrease for year, compared with 1954.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Tons.	£A.	Tons.	£A.	Tons.	£A.
Antimony Ore and Concentrates	45·44	1,410	203·88	230	+ 158·44	— 1,180
Asbestos—						
Chrysotile	303·65	13,474	274·58	15,997	— 29·07	+ 2,523
Crocidolite	3,793·67	542,202	4,487·35	486,032	+ 693·68	— 56,170
Barytes	1,043·74	7,631	10·00	70	— 1,033·74	— 7,561
Bentonite	1,121·60	4,111	646·94	2,591	— 474·66	— 1,520
Beryl Ore	132·15	22,607	198·63	34,430	+ 66·48	+ 11,823
Chromite	4,269·55	48,957	....	....	— 4,269·55	— 48,957
Clays—						
Cement Clay	11,901·00	5,903	34,924·32	25,445	+ 23,023·32	+ 19,542
Fireclays :						
Kaolin Type	1,203·00	1,143	878·00	834	— 325·00	— 309
Kaolin and Other Type	5,535·00	5,535	6,034·00	6,034	+ 499·00	+ 499
White Clays :						
Ball Clay (Ceramic)	4,000·00	16,000	....	....	— 4,000·00	— 16,000
Kaolin (Filler Material)	20·00	100	76·00	380	+ 56·00	+ 280
Coal	1,018,342·53	3,588,818	903,792·22	3,132,074	— 114,550·31	— 456,744
Corundum	....	....	9·15	275	+ 9·15	+ 275
Copper Ore	....	....	12·12	1,001	+ 12·12	+ 1,001
Cupreous Ore (Fertiliser)	4,748·11	50,381	7,730·78	101,731	+ 2,982·67	+ 51,350
Diatomaceous Earth (Calcined)	150·00	1,579	....	....	— 150·00	— 1,579
Dolomite	....	....	81·00	324	+ 81·00	+ 324
Emeralds (Carats—Cut)	8·68	313	....	....	— 8·68	— 313
Emery	....	....	8·15	245	+ 8·15	+ 245
Felspar	3,225·91	14,491	3,565·00	16,660	+ 339·09	+ 2,169
Fergusonite	....	....	13	226	+ 13	+ 226
Fullers Earth	....	....	10·76	54	+ 10·76	+ 54
Glass Sand	7,803·01	5,541	6,758·98	4,801	— 1,044·03	— 740
Glauconite	257·50	9,012	196·50	7,407	— 61·00	— 1,605
Graphite	....	....	110·00	990	+ 110·00	+ 990
Gypsum	41,142·00	31,620	39,946·00	30,336	— 1,196·00	— 1,284
Iron Ore (for Pig)	18,298·29	209,027	17,302·88	220,558	— 995·41	+ 11,531
Iron Ore (Exported)	634,514·00	629,325	496,882·00	492,741	— 137,632·00	— 136,584
Lead	....	....	....	....	....	....
Silver-Lead } Ore and Concentrates	2,166·97	101,183	1,415·96	95,191	— 751·01	— 5,992
Silver-Lead-Zinc }	....	....	....	....	....	....
Magnesite	91·75	258	....	....	— 91·75	— 258
Manganese	40,581·00	608,215	37,490·66	423,830	— 3,090·34	— 184,385
Ochre—						
Red	388·00	3,694	345·19	3,913	— 42·81	+ 219
Yellow	41·45	415	....	....	— 41·45	— 415
Petalite	15·00	69	....	....	— 15·00	— 69
Pyrites	56,150·00	441,466	49,485·00	397,269	— 6,665·00	— 44,197
Spodumene	....	....	3·89	57	+ 3·89	+ 57
Talc	2,920·03	45,851	2,586·81	37,767	— 333·22	— 8,084
Tantalum/Columbite Ore and Concentrates	52·11	76,445	11·99	25,762	— 40·12	— 50,683
Tin	121·32	62,977	179·72	94,912	+ 58·40	+ 31,935
Tungsten—Scheelite (lb.)	8,279·00	3,361	17,365·00	7,417	+ 9,086·00	+ 4,056
Zinc (Metallic)	73·85	(not payable)	....	....	— 73·85	....
Total	....	6,553,114	....	5,667,584	....	— 885,530

TABLE 1 (a).—Quantity and Value of Gold and Silver exported and minted during Years 1954 and 1955.

	Fine ozs.	£A.	Fine ozs.	£A.	Fine ozs.	£A.
Gold (Exported and Minted)	850,540·17	13,313,618	842,005·23	13,174,559	— 8,534·94	— 139,059
Silver (Exported and Minted)	228,377·43	86,933	325,794·73	92,781	+ 7,417·30	+ 5,848
Total	....	13,400,551	....	13,267,340	....	— 133,211
Grand Total, All Minerals	....	19,953,665	....	18,934,924	....	— 1,018,741

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.
	£	£	
1902	9,051,358	7,530,319	83·20
1903	10,324,732	8,727,060	84·53
1904	10,271,489	8,625,676	83·98
1905	9,871,019	7,731,954	78·33
1906	9,832,679	7,570,305	76·99
1907	9,904,860	7,544,992	76·17
1908	9,518,020	7,151,317	75·13
1909	8,860,494	5,906,673	66·66
1910	8,299,781	4,795,654	57·78
1911	10,606,863	7,171,638	67·61
1912	8,941,008	5,462,499	61·09
1913	9,128,607	4,608,188	50·48
1914	8,406,182	3,970,182	47·23
1915	6,291,934	2,969,502	47·19
1916	10,878,153	6,842,621	62·92
1917	9,323,229	5,022,694	53·87
1918	6,931,834	2,102,923	30·34
1919	14,279,240	6,236,585	43·67
1920	15,149,323	3,096,849	20·44
1921	10,331,405	1,373,810	13·30
1922	11,848,025	2,875,402	24·27
1923	11,999,500	3,259,476	27·16
1924	13,808,910	1,424,319	13·24
1925	13,642,852	173,126	1·27
1926	14,668,184	1,597,698	10·89
1927	15,805,120	472,041	2·99
1928	16,911,932	996,099	5·88
1929	16,660,742	1,802,709	10·82
1930	19,016,639	6,370,396	33·49
1931	14,266,650	4,333,421	30·37
1932	16,771,465	5,657,870	33·74
1933	18,098,214	5,328,869	29·44
1934	16,784,705	5,759,324	34·31
1935	17,611,547	5,698,721	32·36
1936	19,564,716	7,130,381	36·45
1937	21,594,942	9,026,313	41·80
1938	24,220,864	10,417,458	43·01
1939	23,244,509	11,969,562	51·49
1940	25,800,562	12,480,721	48·37
1941	24,536,777	12,411,316	50·58
1942	20,681,284	8,476,622	40·99
1943	18,014,340	6,539,295	36·30
1944	19,453,001	(a) 1,282,867	6·59
1945	20,170,624	(b) 205,587	1·02
1946	26,342,125	(b) 211,890	0·80
1947	42,389,125	(c) 4,162,892	9·82
1948	57,779,996	(b) 342,646	0·59
1949	58,197,775	(b) 465,124	0·80
1950	78,804,864	(b) 531,245	0·67
1951	115,880,457	(d) 7,479,601	6·45
1952	101,620,138	(c) 7,952,834	7·82
1953	106,678,014	(e) 13,239,076	12·41
1954	79,955,207	(e) 5,342,462	6·68
1955	113,044,633	17,145,741	15·17
Total since 1902	1,412,070,648	297,004,545	21·03

Exclusive of Arsenic prior to 1935. † Including Ship's Stores. (a) Approximately 25 per cent. of gold production for year exported. (b) No gold bullion exported. (c) Approximately 50 per cent. of gold production for year exported. (d) Approximately 66 per cent. of gold production for year exported. (e) Approximately 86 per cent. of gold production for year exported.

Comparative Statistical Diagrams

showing:

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 1955

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

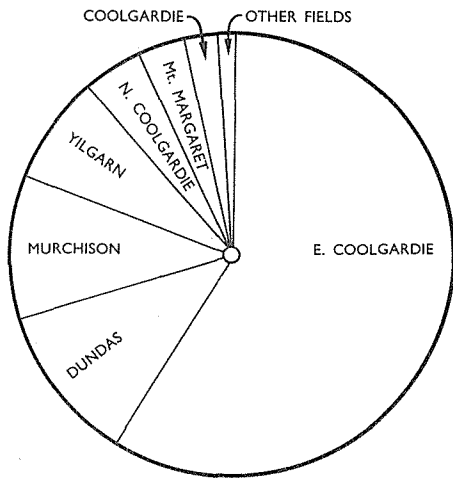


Fig. 2 Gold produced from various Goldfields as given by the Export and Mint Returns

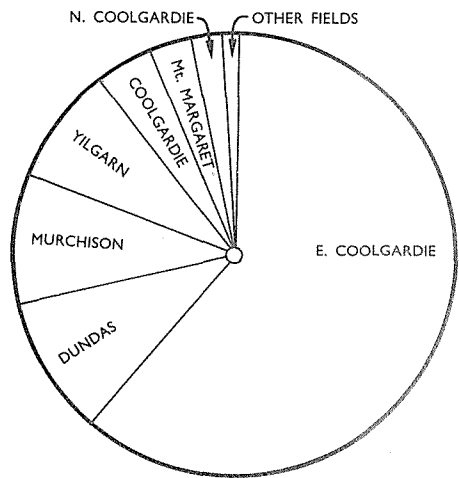


Fig. 3 Value of Gold and other Minerals

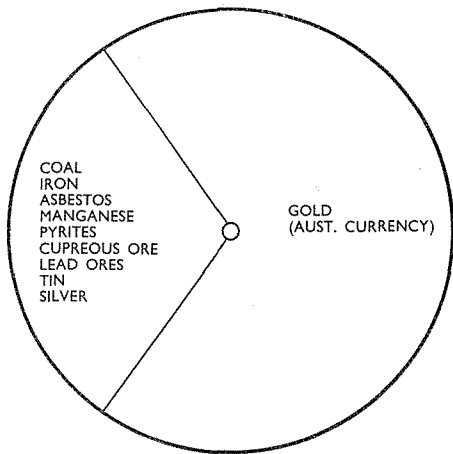


Fig. 4 Value of Minerals other than Gold

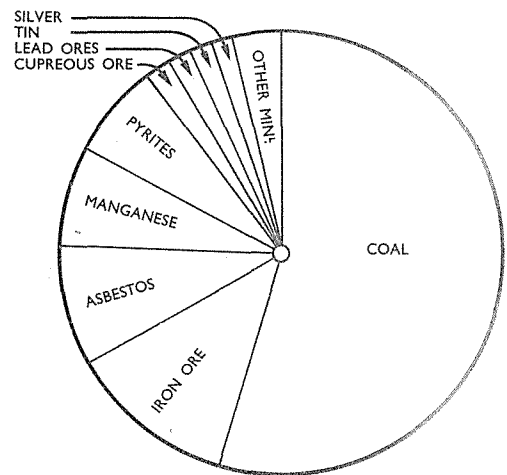


Fig. 5 Areas of land leased for Goldmining on various Goldfields

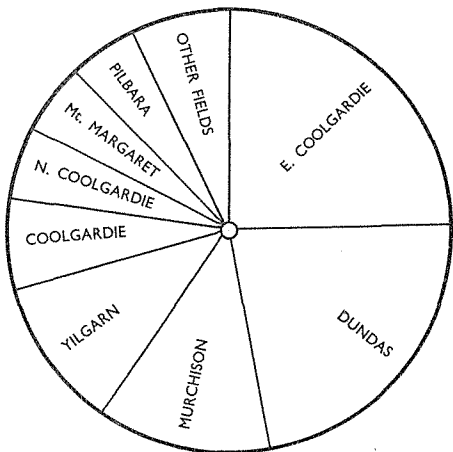


Fig. 6 Output of Gold in the States of Australia and the Dominion of New Zealand

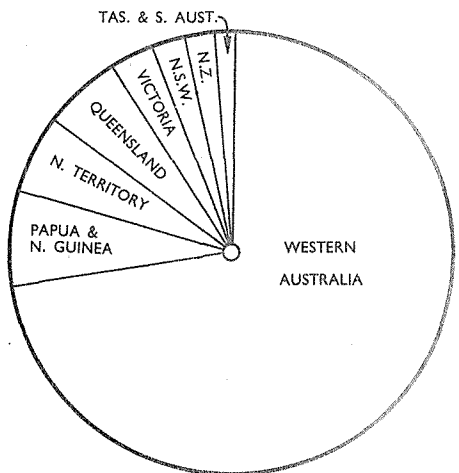


DIAGRAM OF GOLD OUTPUT

Showing Tonnage Treated (as reported to Mines Dept.); the Total Output of Gold Bullion, Concentrates etc., entered for export and received at the Perth Mint, and the Estimated Value thereof, in Australian Currency.

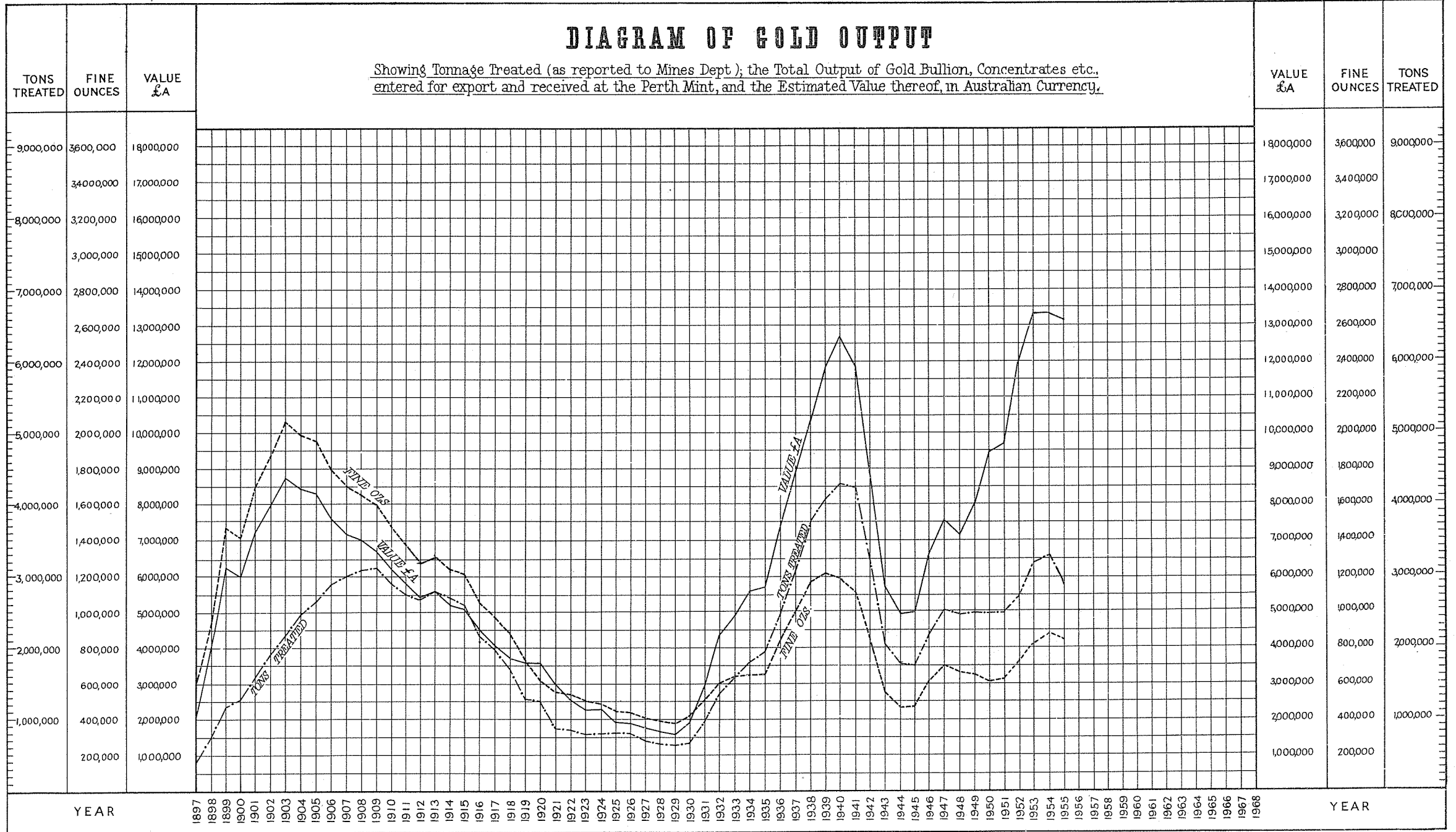


TABLE 3.

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 yield of Gold per ton of ore treated.

Goldfield.	Reported Yield.		Percentage for each Goldfield.		Average Value per ton of Ore Treated, (Gold at £4 4s. 11.45d. per fine oz.).	
	1954.	1955.	1954.	1955.	1954.	1955.
	Fine ozs.	Fine ozs.	%	%	Shillings.	Shillings.
1. Kimberley	83	192	.010	.023	....	....
2. West Kimberley	....	....	....	....	....	....
3. Pilbara	2,800	3,873	.325	.464	29.821	63.764
4. West Pilbara	11	29	.001	.004	....	....
5. Ashburton	89	19	.010	.003	118.086	107.666
6. Gascoyne	21	....	.003	....	....	....
7. Peak Hill	8,683	112	1.007	.014	15.870	32.162
8. East Murchison	348	134	.040	.016	57.535	96.525
9. Murchison	135,214	89,146	15.686	10.680	22.709	60.518
10. Yalgoo	....	12	....	.002	....	....
11. Mt. Margaret	28,413	23,671	3.296	3.436	27.550	21.238
12. North Coolgardie	34,530	35,918	4.006	4.305	48.541	47.079
13. Broad Arrow	2,848	2,735	.330	.328	68.321	42.056
14. North East Coolgardie	213	369	.025	.044	24.054	60.288
15. East Coolgardie	486,040	489,040	56.336	58.610	22.241	21.613
16. Coolgardie	18,743	21,591	2.175	2.588	41.486	48.012
17. Yilgarn	60,341	66,710	7.000	7.996	11.276	13.240
18. Dundas	83,425	95,718	9.678	11.470	44.844	50.717
19. Phillips River	76	3	.009	....	....	....
20. Outside Proclaimed Goldfields	114	54	.013	.007	....	....
Totals and Averages	861,992	834,326	100.000	100.000	22.600	24.752

The total yield of the State is shown in Table 1, being the amount of the gold received at the Royal Mint, the gold exported in bullion and concentrates, and alluvial and other gold not reported to the Mines 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.

Average Quantities of Gold Ore raised and treated, and Gold produced therefrom, per man employed on the several Goldfields of the State, during 1954 and 1955.

Goldfield.	1954.				1955.			
	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	....	....	....	13.77	....	....	....	....
2. West Kimberley	....	....	....	....	....	....	....	....
3. Pilbara	166.20	67.60	58.34	23.73	166.54	68.84	124.93	51.64
4. West Pilbara	....	....	....	10.88	....	....	....	....
5. Ashburton	32.00	21.33	44.48	29.65	....	....	....	....
6. Gascoyne	....	....	....	....	....	....	....	....
7. Peak Hill	5,164.38	1,080.91	964.75	201.92	74.00	26.91	28.00	10.18
8. East Murchison	51.35	16.56	34.78	11.22	23.60	7.87	26.80	8.93
9. Murchison	1,839.37	838.85	491.68	224.23	846.00	350.72	602.34	249.71
10. Yalgoo	....	....	....	....	....	....	....	....
11. Mt. Margaret	599.08	302.93	158.72	80.26	651.95	345.61	162.90	86.36
12. North Coolgardie	434.77	214.30	248.42	122.45	491.27	259.39	272.10	143.67
13. Broad Arrow	72.26	32.19	58.12	25.89	104.30	48.49	51.60	23.99
14. North-East Coolgardie	46.95	20.30	13.29	5.75	65.00	26.00	46.13	18.45
15. East Coolgardie	1,132.55	567.39	296.18	148.54	1,144.53	576.04	291.27	146.59
16. Coolgardie	221.86	119.20	108.34	58.20	269.18	133.18	152.05	75.23
17. Yilgarn	1,902.14	768.58	252.47	115.15	1,413.37	684.11	220.17	106.57
18. Dundas	678.29	390.22	358.05	205.99	706.68	398.06	421.67	237.51
19. Phillips River	....	....	38.29	12.76	....	....	....	....
20. Outside Proclaimed Goldfields	....	....	....	....	....	....	....	....
Total Averages	1,073.32	528.78	285.52	140.66	983.87	490.17	286.51	142.74

TABLE 5.

Output of Gold from the several States of Australia, the Northern Territory, Papua, and Mandated Territory of New Guinea, and the Dominion of New Zealand, during 1955.

State.	Output of Gold.	Value.*	Percentage of Total.	
			Output of Commonwealth.	Output of Australasia.
	Fine ozs.	£	%	%
Western Australia	842,005	3,576,390	74.484	72.781
Victoria	38,035	161,648	3.364	3.288
New South Wales	29,744	126,412	2.631	2.571
Queensland	64,294	273,249	5.687	5.557
Tasmania	16,113	68,480	1.425	1.393
South Australia	50	212	...	...
Territory of Papua and New Guinea	74,853	318,125	6.622	6.470
Northern Territory	65,357	277,767	5.781	5.649
New Zealand	26,443	112,382	...	2.286
	1,156,894	4,914,665	100.000	100.000

* Par Value (£4 4s. 11.45d. per fine ounce.)

TABLE 6.

Dividends, etc., paid by Western Australian Mining Companies during 1955, and the Total to date.

(Mainly compiled from information supplied to the Government Statistician's Office by the Chamber of Mines of Western Australia.)

Goldfield.	Name of Company.	Dividends Paid.	
		1955.	Grand Total to end of 1955.
		£	£
Pilbara	Various Companies	...	26,513
Peak Hill	do. do.	...	199,305
East Murchison	do. do.	...	1,914,053
Murchison	Hill 50 Gold Mine, N.L.	825,000	1,890,626
	Various Companies	...	2,764,945
Mt. Margaret	Sons of Gwalia, Ltd.	...	2,075,050
	Various Companies	...	958,286
North Coolgardie	do. do.	...	712,551
Broad Arrow	do. do.	...	92,500
North-East Coolgardie	do. do.	...	129,493
East Coolgardie	Boulder Perseverance, Ltd.	...	(a) 2,719,884
	Golden Horseshoe (New), Ltd.	5,729	(b) 4,107,399
	Gold Mines of Kalgoorlie, Ltd.	175,267	1,363,136
	Great Boulder Proprietary G.M.'s., Ltd.	156,250	7,903,150
	Kalgoorlie Enterprise Mines, Ltd.	...	287,375
	Lake View and Star, Ltd.	393,750	7,268,250
	North Kalgurli (1912), Ltd.	103,125	1,986,873
	South Kalgurli Consolidated, Ltd.	...	1,234,098
	Various Companies	...	11,128,894
Coolgardie	New Coolgardie G.M., N.L.	...	21,300
	Various Companies	...	388,700
Yilgarn	do. do.	...	(d) 1,205,556
Dundas	Central Norseman Gold Corporation, N.L.	390,000	2,437,500
	Various Companies	...	786,162
	Totals	2,049,121	53,601,599

(a) Also £45,091 in bonuses and profit-sharing notes in years 1935-36. (b) Also £55,000 Capital returned in year 1932 and £42,000 in bonuses and profit-sharing notes in year 1934. (c) Also £75,000 in bonuses and profit-sharing notes and £93,750 Capital returned in years 1932-35. (d) Also £67,725 Capital returned in 1948 by Edna May (W.A.) Amalgamated, N.L.

TABLE 7.

Quantity and Value of Minerals, other than Gold, reported to the Mines Department during 1955.

Goldfield, District or Mineral Field.	1955.		Increase or Decrease as compared with 1954.	
	Quantity.	Value.	Quantity.	Value.
	Tons.	£A.	Tons.	£A.
ANTIMONY ORE AND CONCENTRATES—				
Pilbara	203·88	230	+ 158·44	— 1,180
ASBESTOS (CHRYSTOLE)				
Pilbara	16·45	346	— 108·34	— 2,275
West Pilbara	258·13	15,651	+ 79·27	+ 4,797
ASBESTOS (CROCIDOLITE)				
West Pilbara	4,344·42	486,032	+ 550·75	— 56,170
BARYTES—				
Murchison .....	.....	.....	— 111·74	— 615
Outside proclaimed goldfield.....	10·00	70	— 207·70	— 671
BENTONITE—				
Outside proclaimed goldfield	646·94	2,591	— 474·66	— 1,520
BERYL—				
Pilbara	173·14	29,712	+ 67·54	+ 11,642
Gascoyne	11·08	1,995	— 0·70	— 97
Murchison	0·61	99	+ 0·61	+ 99
Yalgoo	2·33	439	— 1·15	— 108
Coolgardie	11·47	2,185	+ 0·32	+ 313
Ashburton .....	.....	.....	— 0·14	— 25
CHROMITE—				
Peak Hill .....	.....	.....	— 4,269·55	— 48,957
CLAY (CEMENT CLAY)—				
Outside Proclaimed Goldfield	34,924·32	25,445	+ 23,023·32	+ 19,542
FIRECLAYS—				
Outside Proclaimed Goldfield	6,912·00	6,868	+ 174·00	+ 190
WHITE CLAY—				
Outside Proclaimed Goldfield	76·00	380	— 3,944·00	— 15,720
COAL—				
Collie Coalfield	903,792·22	3,132,074	— 114,550·31	— 456,744
CORUNDUM—				
West Kimberley	9·15	275	+ 9·15	+ 275
COPPER ORE AND CONCENTRATES—				
Pilbara	0·53	134	+ 0·53	+ 134
Murchison	11·59	867	+ 11·59	+ 867
CUPREOUS ORE AND CONCENTRATES (For Fertilizer)—				
Pilbara	857·17	23,868	+ 546·59	+ 14,668
West Pilbara	3,327·36	23,981	+ 247·20	+ 6,753
Ashburton	13·95	141	+ 13·20	+ 133
East Murchison	695·58	14,084	+ 142·54	+ 1,412
Peak Hill	1,797·85	30,059	+ 1,469·28	+ 24,144
Murchison	796·39	7,372	+ 510·24	+ 4,719
Mt. Margaret	133·00	599	+ 60·14	— 61
Phillips River	52·50	1,146	— 63·50	— 900
Yalgoo	10·29	102	+ 10·29	+ 102
Broad Arrow	7·05	.....	+ 7·05	.....
Northampton	21·79	186	+ 21·79	+ 186
Outside Proclaimed Goldfield	17·85	193	+ 17·85	+ 193
DIATOMACEOUS EARTH—				
Outside Proclaimed Goldfield	cubic yards	.....	cubic yards	— 1,052·50
DOLOMITE—				
Murchison	81·00	324	+ 81·00	+ 324
EMERY—				
West Kimberley	8·15	245	+ 8·15	+ 245
EMERALD—				
Pilbara	Carats (cut)	.....	Carats (cut)	— 8·68
FELSPAR—				
Coolgardie	3,565·00	16,659	+ 392·00	+ 2,366
Outside Proclaimed Goldfield .....	.....	.....	— 52·91	— 198
FERGUSONITE—				
Pilbara	0·13	227	+ 0·13	+ 227

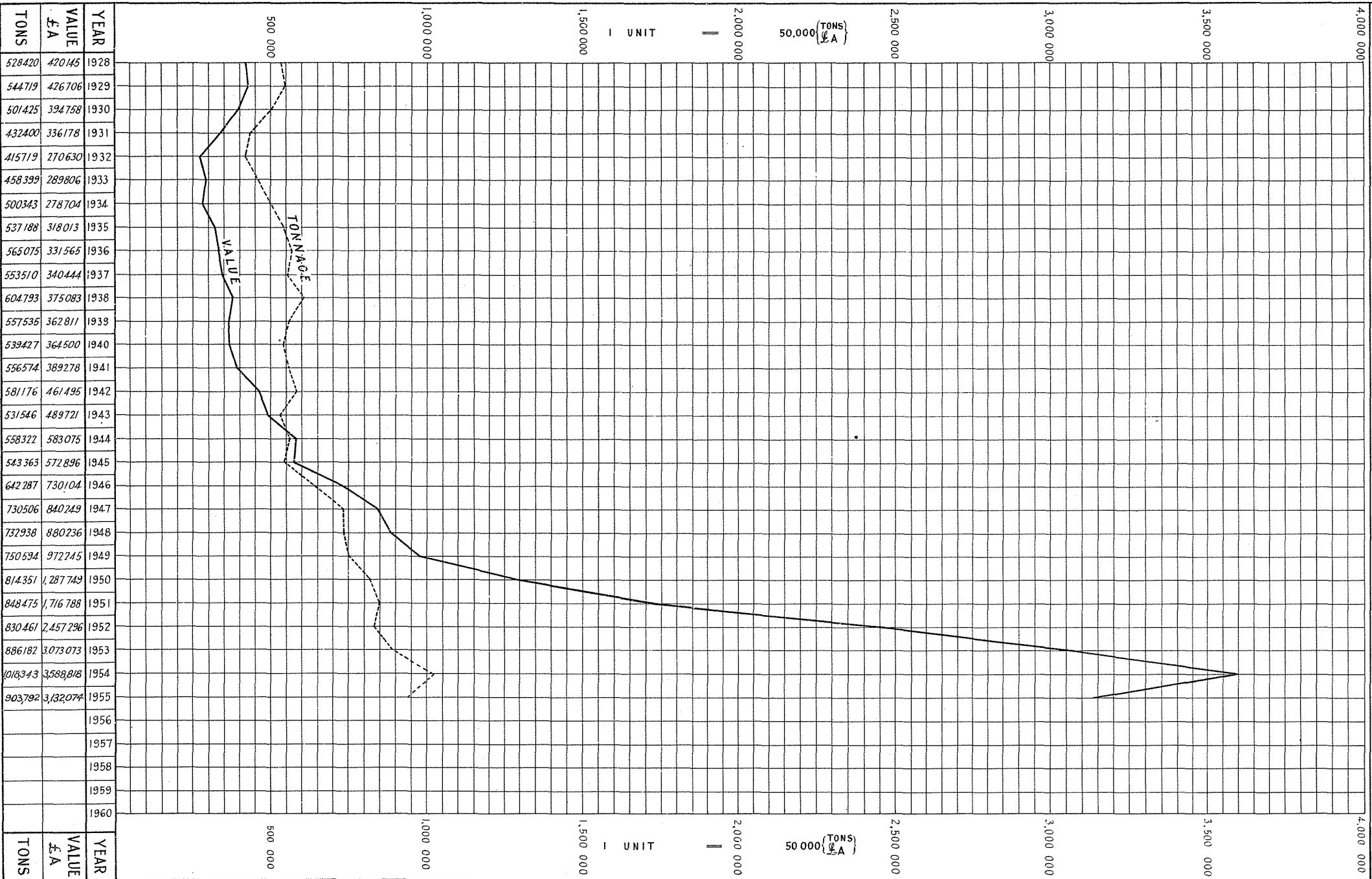
TABLE 7—continued.

Quantity and Value of Minerals, other than Gold, reported to the Mines Department during 1955—continued.

Goldfield, District or Mineral Field.	1955.		Increase or Decrease as compared with 1954.	
	Quantity.	Value.	Quantity.	Value.
FULLERS EARTH—	cubic yards	£A.	cubic yards	£A.
Outside Proclaimed Goldfield	10.76	54	+ 10.76	+ 54
GLASS SAND				
Outside Proclaimed Goldfield	6,758.98	4,801	— 1,044.03	— 740
GLAUCONITE—				
Outside Proclaimed Goldfield	1,179.00	7,407	— 366.00	— 1,605
GRAPHITE—				
Outside Proclaimed Goldfield	110.00	990	+ 110.00	+ 990
GYPSUM—				
Yilgarn	38,807.00	29,411	+ 14,460.00	+ 11,121
Dundas	9.00	5	— 21.00	— 10
Outside Proclaimed Goldfield	1,130.00	920	— 15,635.00	— 12,394
IRON ORE (for Pig Iron)—				
Yilgarn	16,876.82	216,773	+ 211.83	+ 20,776
Outside Proclaimed Goldfield	426.06	3,786	— 1,207.24	— 9,245
IRON ORE (exported)—				
West Kimberley	496,882.00	492,741	— 137,632.00	— 136,584
LEAD ORE AND CONCENTRATES				
Northampton	1,069.04	68,523	— 269.90	— 1,847
SILVER-LEAD ORE AND CONCENTRATES—				
Pilbara	330.60	24,887	+ 175.33	+ 17,208
Ashburton	16.32	992	— 377.18	— 19,541
SILVER-LEAD-ZINC ORE AND CONCENTRATES				
West Kimberley	....	....	— 279.26	— 2,601
MAGNESITE—				
Coolgardie	....	....	— 91.75	— 258
MANGANESE—				
Pilbara	7,594.00	95,146	— 1,388.00	— 68,327
Peak Hill	29,896.66	328,684	— 1,702.34	— 116,058
OCHRE (Red)—				
West Pilbara	41.60	917	+ 41.60	+ 917
Murchison	303.59	2,996	— 84.41	— 698
OCHRE (Yellow)—				
Murchison	....	....	— 41.45	— 415
PETALITE—				
Coolgardie	....	....	— 15.00	— 69
PYRITES-ORE AND CONCENTRATES				
Dundas	49,485.00	397,269	— 6,665.00	— 44,197
SILVER—				
by product of Gold, Lead, Silver-Lead and Copper mining	Fine ozs. 235,794.73	92,781	+ 7,417.30	+ 5,848
SPODUMENE—				
Phillips River	3.89	57	+ 3.89	+ 57
TALC—				
East Coolgardie	26.83	120	— 10.17	— 47
Outside Proclaimed Goldfield	2,559.98	37,647	— 323.05	— 8,038
TANTO/COLUMBITE ORE AND CONCENTRATES	lb.		lb.	
Greenbushes	2,378.00	2,747	— 8,467.00	— 3,194
Pilbara	23,614.00	21,208	— 81,030.00	— 47,790
Coolgardie	221.00	251	— 1,009.00	— 1,255
Phillips River	635.00	1,557	+ 635.00	+ 1,557
TIN—				
Greenbushes	119.57	61,577	+ 76.72	+ 38,692
Pilbara	60.02	33,256	— 18.45	— 6,836
West Kimberley	0.13	79	+ 0.13	+ 79
TUNGSTEN (Scheelite)—				
Mt. Margaret	1,861.00	582	+ 1,861.00	+ 582
Pilbara	....	....	— 3,782.00	— 1,867
North Coolgardie	12,796.00	6,009	+ 8,299.00	+ 4,515
Coolgardie	2,708.00	826	+ 2,708.00	+ 826
ZINC—				
by product from Silver/Lead/Zinc mining West Kimberley	73.85	....	+ 73.85	....

GRAPH OF COAL OUTPUT

Showing Quantities and Values as reported to Mines Dept.



GRAPH OF TREND IN COAL OUTPUT

Showing Comparison of Annual Tonnages and Percentages
between Deep and Open Cut Mining

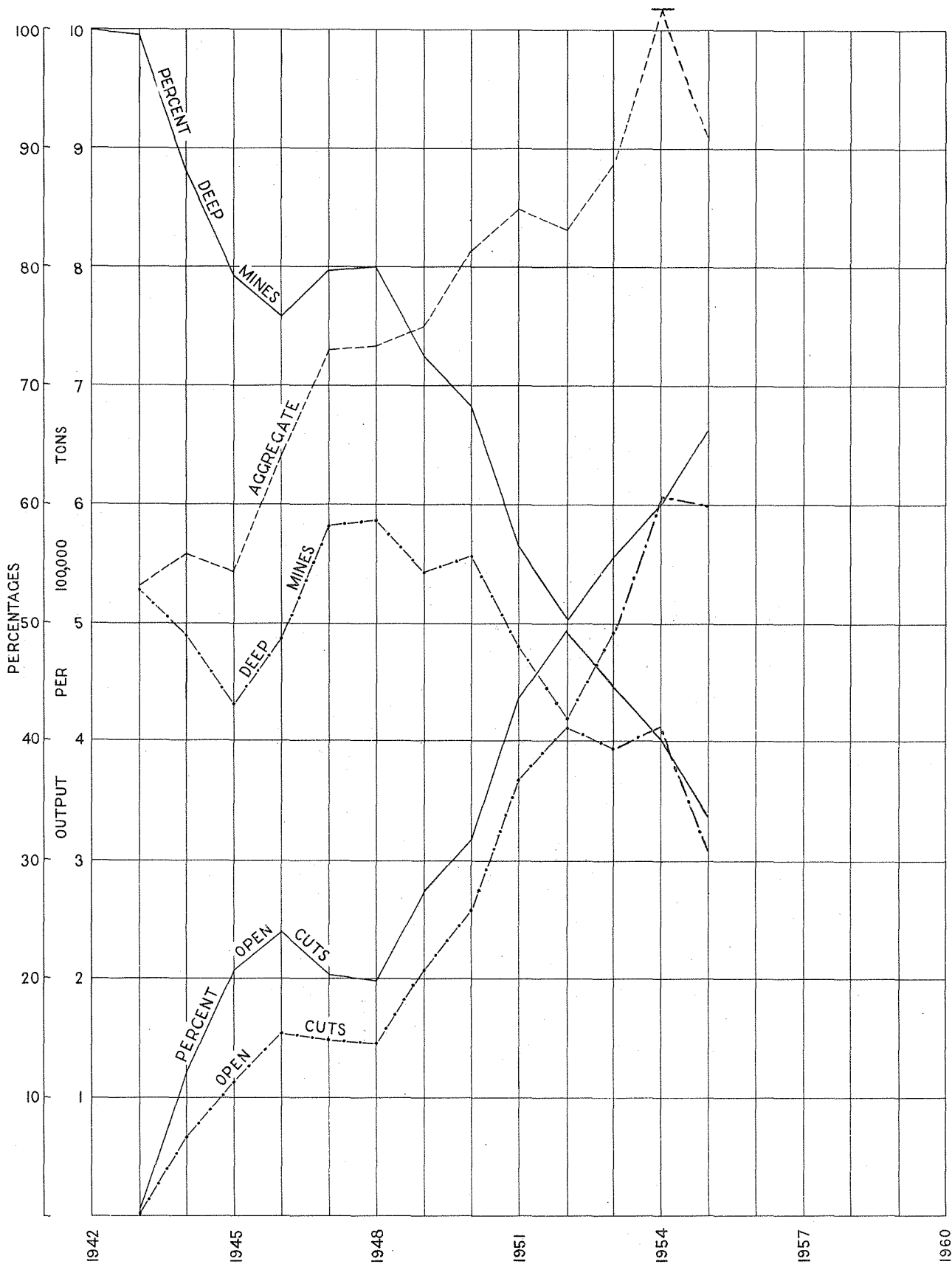


TABLE 8.

Total Coal output from Collie Coalfield during 1954 and 1955, estimated Value thereof, Number of Men employed, and Output per Man as reported Monthly.

Year.	Total Output.	Estimated Value.	Men Employed.			Output per Man Employed.		
			Above ground.	Under ground.	Above and under ground.	Above ground.	Under ground.	Above and under ground.
	Tons.	£A.	No.	No.	No.	Tons.	Tons.	Tons.
Deep Mining—								
1954	607,727	2,141,851	375	852	1,227	1,621	713	495
1955	599,662	2,041,971	365	804	1,169	1,643	746	513
Open Cut Mining—								
1954	400,616	1,446,967	333	....	333	1,233	....	1,233
1955	304,130	1,047,340	217	....	217	1,401	....	1,401
Totals—								
1954	1,018,343	3,588,818	708	852	1,560	1,438	1,195	653
1955	903,792	3,089,311	582	804	1,386	1,553	1,124	652

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

TABLE 9.

Total Number and Acreage of Leases, Mineral Claims, Dredging Claims and Prospecting Areas held for Mining on the 31st December, 1954 and 1955.

Leases and Other Holdings.	1954.		1955.	
	No.	Acreage.	No.	Acreage.
Gold Mining Leases on Crown Lands	1,340	24,821	1,258	23,142
Gold Mining Leases on Private Property	20	462	26	590
Mineral Leases on Crown Lands	281	44,350	253	43,306
Mineral Leases on Private Property	22	2,156	20	2,108
Dredging Claims—Gold	3	58	11	780
Dredging Claims—Mineral	89	7,218	119	7,931
Mineral Claims	452	33,897	469	33,121
Prospecting Areas	*509	12,623	†441	7,508
Totals	2,716	125,585	2,597	118,486

* Includes 61 Prospecting Areas for Minerals of a total of 4,817 acres.

† Includes 75 Prospecting Areas for Minerals of a total of 1,551 acres.

PART IV.—MEN EMPLOYED.

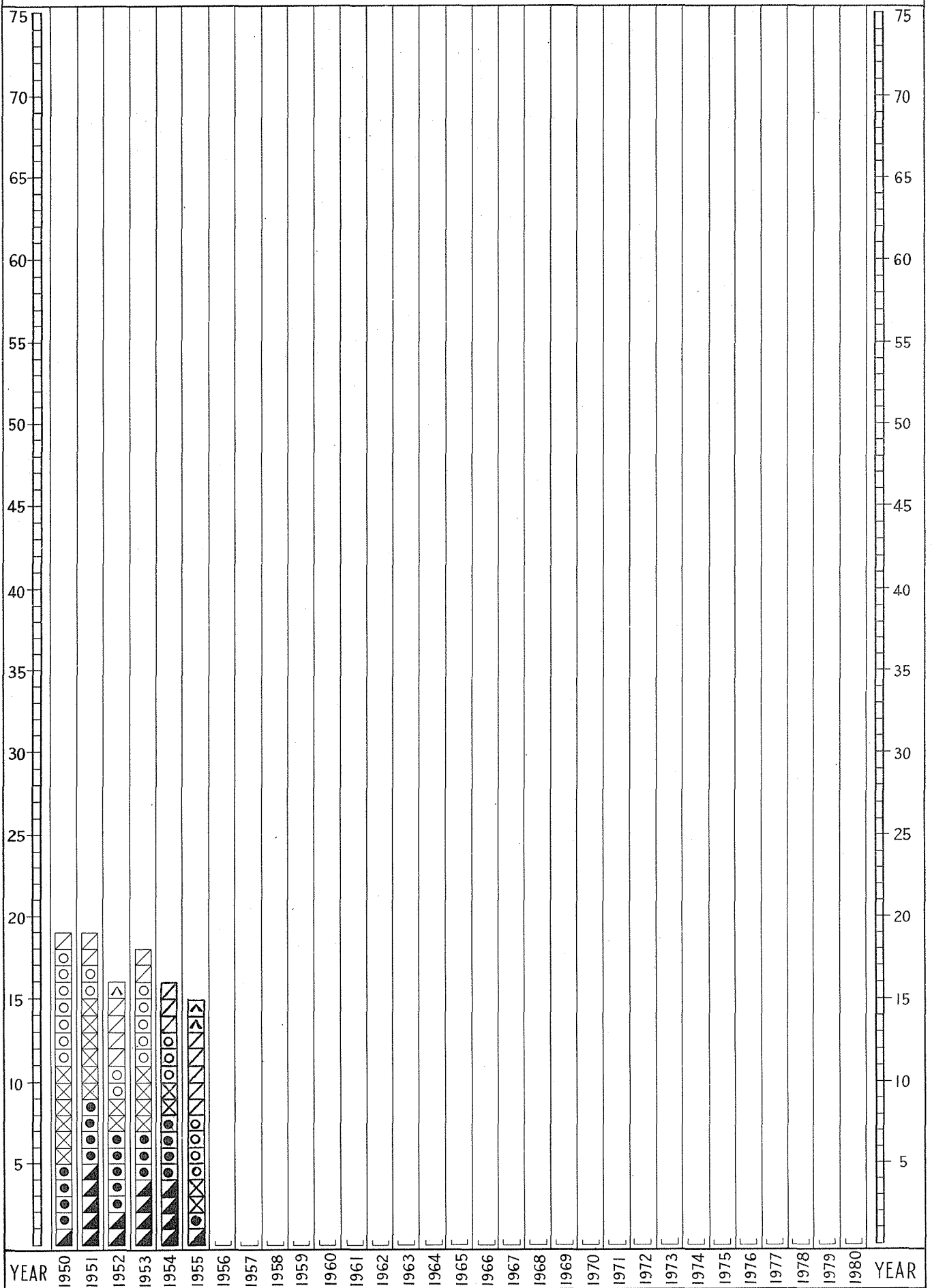
TABLE 10.

Average number of Men reported as engaged in Mining during 1954 and 1955.

Goldfield.	District.	Total.	
		1954.	1955.
Kimberley .....	.....	6	3
West Kimberley .....	.....	.....	.....
Pilbara	Marble Bar	46	33
West Pilbara	Nullagine	72	42
Ashburton .....	.....	1	.....
Gascoyne .....	.....	3	2
Peak Hill .....	.....	.....	.....
East Murchison	Lawlers	43	11
.....	Wiluna	9	7
.....	Black Range	12	5
.....	Cue	10	3
.....	Meekatharra	380	100
Murchison	Day Dawn	31	30
.....	Mt. Magnet	16	14
Yalgoo .....	.....	176	213
.....	.....	11	10
Mt. Margaret	Mt. Morgans	15	15
.....	Mt. Malcolm	260	266
.....	Mt. Margaret	79	51
.....	Menzies	141	129
North Coolgardie	Ularring	83	77
.....	Niagara	15	7
.....	Yerilla	43	37
Broad Arrow .....	.....	110	114
North-East Coolgardie	Kanowna	34	19
.....	Kurnalpi	3	1
East Coolgardie	East Coolgardie	3,261	3,327
.....	Bulong	11	9
Coolgardie	Coolgardie	301	274
.....	Kunanalling	21	13
Yilgarn .....	.....	524	626
Dundas .....	.....	405	403
Phillips River .....	.....	6	2
State Generally .....	.....	.....	2
Total, Gold Mining .....	.....	6,128	5,845
Minerals Other than Gold—			
Asbestos .....	.....	246	221
Barytes .....	.....	3	1
Bentonite .....	.....	2	2
Beryl .....	.....	53	40
Clays .....	.....	10	10
Chromite .....	.....	4	.....
Coal .....	.....	1,560	1,386
Cupreous Ore .....	.....	41	65
Dolomite .....	.....	.....	1
Felspar .....	.....	13	12
Glass Sand .....	.....	4	4
Glauconite .....	.....	2	2
Gypsum .....	.....	24	17
Iron Ore .....	.....	134	115
Lead Ores and Concentrates .....	.....	51	108
Magnesite .....	.....	1	.....
Manganese .....	.....	35	13
Ochre .....	.....	3	2
Pyrites .....	.....	173	128
Talc .....	.....	5	5
Tanto-Columbite .....	.....	23	19
Tin .....	.....	59	85
Total, Other Minerals .....	.....	2,446	2,236

DIAGRAM OF ACCIDENTS

Showing the number of deaths arranged in six classes in the Mines and Quarries of Western Australia



Explosions
 Falls of Ground
 In Shafts
 Misc. Underground
 On Surface
 Fumes

PART V.—ACCIDENTS.

TABLE 11.
MEN EMPLOYED IN MINES KILLED AND INJURED IN MINING ACCIDENTS
DURING 1954 AND 1955.

A.—According to Locality of Accident.

Goldfield.	Killed.		Injured.		Total Killed and Injured.	
	1954.	1955.	1954.	1955.	1954.	1955.
1. Kimberley						
2. West Kimberley			3	5	3	5
3. Pilbara			9	1	9	1
4. West Pilbara			18	17	18	17
5. Ashburton						
6. Gascoyne						
7. Peak Hill			2		2	
8. East Murchison						
9. Murchison			32	15	32	15
10. Yalgoo						
11. Mount Margaret		1	27	25	27	26
12. North Coolgardie		1	12	16	12	17
13. North-East Coolgardie			1		1	
14. Broad Arrow						
15. East Coolgardie	8	6	301	359	309	365
16. Coolgardie			19	15	19	15
17. Yilgarn	2	1	34	34	36	35
18. Dundas	3	2	48	35	51	37
19. Phillips River				1		1
Mining Districts—						
Northampton		1	5	11	5	12
Greenbushes						
Collie		1	147	152	147	153
South-West	3	2	4	10	7	12
Total	16	15	662	696	678	711

From the above table it will be seen that the number of fatal accidents for the year 1955 was 15 as against 16 in 1954. The number injured showed an increase of 34. These accidents are classified according to their causes in the reports of the State Mining Engineer, Division II., and the Chief Coal Mining Engineer, Division X.

B.—According to Causes of Accidents.

Cause.	1954.		1955.		Comparison with 1954.	
	Fatal.	Serious.	Fatal.	Serious.	Fatal.	Serious.
1. Explosives	4 (a)	3	1 (d)	5 (f)	— 3	+ 2
2. Falls of Ground	4	43	1 (e)	34 (g)	— 3	— 9
3. In Shafts	2	20	2	20		
4. Miscellaneous Underground	3	431	4	451	+ 1	+ 20
5. Surface	3 (b)	165 (c)	5	186 (h)	+ 2	+ 21
6. Fumes			2		+ 2	
Totals	16	662	15	696	— 1	+ 34

(a) Includes 2 fatal accidents in quarries. (b) Includes 1 fatal accident in quarries. (c) Includes 4 serious accidents in quarries. (d) Accident occurred in a quarry. (e) Accident occurred in a quarry. (f) Includes 1 serious accident in a quarry. (g) Includes 3 serious accidents in quarries. (h) Includes 6 serious accidents in quarries.

PART VI.—STATE AID TO MINING.

(a) State Batteries—

The number of State Batteries existing at the end of the year was 16 including Northampton Base Metal Plant. The Menzies State Battery commenced operations early in 1955 and crushed 4,415½ tons during the year.

This year the tonnage of gold ore crushed was an increase over last year's tonnage; 42,207½ tons being treated in 1955 as against 34,599½ tons for 1954. This tonnage was made up of 507 separate parcels, an average of 83.25 tons per parcel. The bullion produced amounted to 17,939 ozs. which is estimated to contain 15,203 ozs. of fine gold, or 7 dwts. 5 grains of gold per ton of ore. The cost of crushing including administration was 53/10 per ton, an increase of 4/4 per ton over the previous year.

Cyaniding—Five plants handled 12,858 tons of crushed ore for a production of 2,419 fine ozs. worth £37,867. The average content of this tonnage was 4 dwts. 23 grains before treatment while the residue contained 1 dwt. 7 grains. The theoretical extraction by cyanidation was therefore 74.1% and the actual extraction 75.2%. The cost of cyanidation was 42s. 2d. per ton, an increase of 6s. 11d. per ton on the previous year.

The working expenditure for all plants was £152,266 and the revenue was £39,110, so that the loss was £113,156, an increase of £32,446 on the previous year and does not include depreciation or interest.

Treatment of Ores other than Gold—1½ tons of Tantalite ore were treated at the Northampton Battery for a recovery of 22lb. of concentrates. 90½ tons of Columbite ore at Coolgardie Battery produced 900 lb. concentrates.

The Northampton Battery crushed during the year 3,648½ tons of lead ore with an estimated average content of 15.75% lead. A total of 516.64 tons of concentrates were produced. The concentrates averaged 72.47 lead, giving an estimated content of 374.42 tons of lead in concentrates.

Prospecting Scheme.—There were 90 prospectors approved for assistance on the Prospecting Scheme throughout the year. Expenditure was £12,909 3s. 2d. and refunds amounted to £2,570 0s. 10d. Assisted prospectors reported crushing 1,999 tons of ore for a return of 1,263 ozs.

Drilling Programme.—The Department now has six diamond drills operating:—one at Collie, two in the Yilgarn, two in the Murchison and one in the Pilbara. As a result of the Department's drilling programme a large tonnage of new coal has been discovered at Collie in a part of the field distant from the original mines. At Koolyanobing the iron and sulphide deposits have been proved. Drilling at Day Dawn on the Great Fingall is hoped to prove the reef at depth. The other three drills operating in the Yilgarn, Murchison and Pilbara Goldfields are being used to endeavour to discover further payable gold deposits in the vicinity of old or established mines.

(b) Geological Survey of Western Australia.

The principal work of the Geological Survey Branch for the year 1955 is covered by the following reports previously, but not now, published in Division IV of this Report.

The Search for Oil in Western Australia. (With Plan.)

Report on the Ground Water Prospects on Farming Properties, Kalannie District, S.W. Land Division.

Geraldton Water Supply—Report on the possibility of obtaining additional supplies from the Wicherina Basin. (With Plan.)

Report on a Hydro-Geological Reconnaissance in the Mullewa District.

Report on Ground Water Prospects in the Dalwallinu District.

Report on the Underground Water Prospects of the country in the Vicinity of Borden, South-West Land Division, W.A.

Report on Munghlinup River Graphite Deposits, Eucla Division, W.A. (With Plan.)

Report on Kimberley Radioactive Deposits.

Reports on Government "Failing" Drilling in the Southern Part of the North-Eastern Basin, Collie Mineral Field. (With Plans.)

Report on Uranium Deposit on Location 11084, Nukarni, S.W. Division, W.A.

Report on P.A. 6748 (Late G.M.L. 3388 "les Trios" G.M.), Westonia, Yilgarn G.F.

Report on Options held by Central Radio Mines, N.L. (With Plan.)

Report on Uranium Occurrence on Location 4176, Kalguddering, S.W. Division, W.A.

Progress Report on Diamond Drilling for Gold in the Pilbara G.F.:

(a) The Warrawoona Area. (With Plan.)

(b) The Bamboo Creek Area. (With Plan.)

Reports:

D.D.H. No. 1, Site W1—Warrawoona, Late G.M.L. 1037 "Klondyke Queen." (With Plan.)

D.D.H. No. 2, Site W2—Warrawoona, Late G.M.L. 604, "Klondyke Boulder." (With Plan.)

D.D.H. No. 3, Site W3—Warrawoona, Late G.M.L. 505, "Bow Bells." (With Plan.)

D.D.H. No. 4, Site B1—Bamboo Creek, G.M.L. 817, "Prince Charlie." (With Plan.)

D.D.H. No. 5, Site B6—Bamboo Creek, G.M.L. 817, "Prince Charlie." (With Plan.)

D.D.H. No. 6, Site B2—Bamboo Creek, G.M.L. 1096, "Mt. Prophecy." (With Plan.)

D.D.H. No. 7, Site B3—Bamboo Creek, G.M.L. 1120, "Bamboo Queen." (With Plan.)

Summary Report on Exploratory Drilling of Abandoned Gold Shows, Yilgarn G.F..

Reports:

D.D.H. No. Y7, Site F1—Jackson, Yilgarn G.F., "Hazel Merle." (With Plan.)

D.D.H. No. Y8, Site F2—Jackson, Yilgarn G.F., "Hazel Merle." (With Plan.)

D.D.H. No. Y9, Site F3—Jackson, Yilgarn G.F., "Hazel Merle." (With Plan.)

D.D.H. No. Y10, Site F4—Jackson, Yilgarn G.F., "Hazel Merle." (With Plan.)

D.D.H. No. Y11, Site F5—Jackson, Yilgarn G.F., "Hazel Merle." (With Plan.)

D.D.H. No. Y12, Site G1—Marie's Find, Yilgarn G.F., "Great Bingin." (With Plan.)

D.D.H. No. Y13, Site G2—Marie's Find, Yilgarn G.F., "Great Bingin." (With Plan.)

D.D.H. No. Y14, Site G3—Marie's Find, Yilgarn G.F., "Great Bingin." (With Plan.)

D.D.H. No. Y15, Site H1—Yilgarn G.F., Manxman Shear North End. (With Plan.)

Report on Exploratory Drilling of "Sunshine Reward Amalgamated" G.M., Edwards' Find, Yilgarn G.F., D.D.H. No. EF1—Site A.

Report on Exploratory Diamond Drilling of Abandoned Gold Shows: D.D.H. No. M1, Site A1—"Princess Royal" G.M., G.M.L. 222, Cue, Murchison G.F. (With Plan.)

Report on Exploratory Diamond Drilling of Abandoned Gold Shows: D.D.H. No. M2, Site A2—"Princess Royal" G.M., G.M.L. 222, Cue, Murchison G.F. (With Plan.)

During the year the following publications were issued:

Bulletin No. 108: The Geology of the Irwin River and Eradu Coal Basins, by W. Johnson, B.Sc. (Hons.), J. S. Gleeson, B.Sc. and L. E. de la Hunty, B.Sc.

Annual Progress Report of the Geological Survey of Western Australia for 1952.

The following publications are still in the press:
Annual Progress Reports of the Geological Survey of Western Australia for 1953 and 1954.

The following reports have been compiled and await publication:

Bulletin No. 110: The Geology of the Phillips River Goldfield, W.A., by J. Sofoulis, B.Sc.

Mineral Resources of Western Australia Bulletin No. 6: Gypsum, by L. E. de la Hunty, B.Sc., and G. H. Low, B.Sc.

Mineral Resources of Western Australia Bulletin No. 7: Silver, Lead and Zinc, by W. Johnson, B.Sc. (Hons.).

Mineral Resources of Western Australia Bulletin No. 8: Vermiculite, Talc and Soapstone, Fuller's Earth, Bentonite and Diatomite, by W. Johnson, B.Sc. (Hons.).

Officers of the Survey have rendered varied types of practical assistance to individuals, syndicates and companies, as well as other Government Departments who have been concerned with the exploration of mineral and water resources in all parts of the State.

PART VII.—INSPECTION OF MACHINERY.

The number of useful boilers registered at the end of the year totalled 7,234 against 7,087 total for the preceding year, showing an increase of 147 boilers after all adjustments.

Of the total 7,234 useful boilers, 3,357 were out of use at the end of the year; 3,243 thorough and 654 working inspections were made and 3,497 certificates were issued.

Permanent condemnations totalled 302 and temporary condemnations 6, 13 boilers were transferred beyond the jurisdiction of the Act.

The total number of machinery groups registered was 36,677 against 35,212 for the previous year, showing an increase of 1,465.

Inspections made total 27,900 and 6,318 certificates were granted.

The total miles travelled for the year were 90,232 against 78,112 miles for the previous year, showing increase of 12,120. The average miles travelled per inspection were 2.84 as against 2.6 miles per inspection for the previous year.

360 applications for engine driver's and boiler attendant's certificates were received and dealt with, and 309 certificates all classes were granted as follows:—

Winding Competency (including certificates issued under Regulation 40 and Section 60)	9
First Class Competency (including certificates issued under Regulations 40 and 45, and Sections 60 and 63)	20
Second Class Competency (including Certificates issued under Regulation 40 and Section 60)	26
Third class Competency (including certificates issued under Regulations 40 and 45 and Sections 60 and 63 of the Act)	23
Locomotive Competency (including certificates issued under Regulation 40 and Section 60)	10
Internal Combustion Competency (including certificates issued under Regulation 40 and Section 60)	47
Crane and Hoist Competency (including certificates issued under Regulations 40 and Section 60)	89

Boiler Attendant's Competency (including certificates issued under Regulation 40 and Section 60)	79
Copies	6
Total	309

The total revenue from all sources during the year was £14,628 4s. as against £13,837 2s. previous year, showing an increase of £791 2s.

The total expenditure for the year was £29,079 19s. 2d. against £25,381 10s. 5d. for the previous year, showing an increase of £3,698 8s. 9d.

PART VIII.—GOVERNMENT CHEMICAL LABORATORIES.

The total number of samples registered for analysis, chemical and mineral examinations, industrial and general investigation was 19,534.

This figure is appreciably higher than last years total of 15,876 and being achieved with a somewhat depleted staff reflects credit on the capabilities and zeal of all members of the Laboratories.

The samples covered a great variety of materials and included analyses, examinations and reports for the following Departments:—Mines, Agriculture, Metropolitan Water Supply, Sewerage and Drainage, Public Health, Police, Government Stores and Tender Board, Industrial Development, Public Works, Factories, War Service Land Settlement, Forestry, Fisheries and Royal Mint.

Fees were collected on work undertaken for revenue producing departments, boards and hospitals and various Commonwealth Government Departments, Local Government Bodies, University of Western Australia and the general public. A considerable number of free examinations were made including mineral identifications and assays, and aids to industry. Departmental investigations were instituted with a view to the development of the natural resources of the State.

The number of analyses, examinations and investigations carried out by the five main divisions were:—

Foods, Drugs, Toxicology and Industrial Hygiene	13,341
Mineralogy and Mineral Chemistry	1,156
Agriculture, Forestry, Water Supplies	4,549
Fuel Technology	480
Industrial Chemistry	8
Total	19,534

A considerable number of the samples shown in the work of the Foods, Drugs, Toxicology and Industrial Hygiene Division are again due to field tests carried out as part of a systematic survey of factors and conditions resulting in corrosion of concrete sewers, weekly routine samples taken in connection with chemical control of various treatment works. Systematic surveys have also been carried out of the Swan River, Leschenault Inlet, Bunbury and Ocean beaches to determine sources and degree of pollution.

The largest number of samples under Foods were legal and investigational samples of milk many of which were below standard. In others, definite indications of added water resulted in legal proceedings. Reports were made on the quality of foodstuffs submitted for Government tender whilst surveys were carried out on chemical criteria of ripeness of oranges and on the composition of West Australian honeys.

Toxicological examinations carried out on behalf of the Police Department have increased in number, both in criminal cases and in real and suspected poisoning cases. A large number of post mortem blood and urine exhibits were submitted for alcoholic content. This strong supporting evidence of the sobriety of deceased persons involved in fatal accidents has been increasingly accepted as evidence in Coroners Courts.

Widespread spraying of toxic pesticides has resulted in a number of animal exhibits being submitted to ascertain if death has resulted from the ingestion of toxic concentrations. Formulations of pesticides which were being used for a variety of purposes have been examined for compliance with specifications in respect to chemical composition and physical stability.

Miscellaneous samples received covered a very comprehensive range of industrial and natural products.

The Mineral Division received 1,156 samples and specimens most of which were submitted by the Government Geologist, State Batteries, Department of Industrial Development, other Government Departments and the general public.

The samples and specimens from official sources were concerned chiefly with the development of mineral resources of the State. Ores of potential economic value were examined and assays made of gold tailings and gold umpire samples.

An increasing number of samples were tested for radio-activity both departmentally and for the general public. In the latter cases the examinations were free and were carried out expeditiously to assist in the search for radio active minerals within the State. Public interest has been maintained in oxidised copper ores used as a source of supply for correcting copper deficiencies in agriculture.

Thirty seven samples of heavy sands were submitted for assay as the result of an increasing demand for titanium in whatever form it occurs.

A number of miscellaneous products such as phosphate rock, glass sands, building materials, cement pipes and linings, flue dusts, slagwool and French chalk were examined for composition or suitability for specific purposes.

The major activities of the Agricultural Division continues to be the chemical work required by the Department of Agriculture and the examination of water samples from the Metropolitan Water Supply, Goldfields Water Supply, Country Water Supplies and for primary producers.

The total number of samples examined by the division during the year was 4,549, of which 3,004 were for the various branches of the Department of Agriculture.

Examination of soils from a cultural experiment showed that fallowing reduced the nitrogen content of the soil. Other analyses of soils to which fertilisers had been applied showed the major portion to remain in the top 6in. whilst very little penetrated to the 12in.-18in. layer.

The variability with which agricultural scientists have to contend was shown by comprehensive analyses of soils where extreme variations of compositions were evident in a uniformity sampling of a site for an experiment.

A number of fertilisers and feeding stuffs were analysed for compliance with their respective controlling acts and the investigation of moisture content of superphosphate was continued in connection with the figure for maximum moisture content prescribed under a Fertiliser Act amendment.

Plant material analyses were made to determine the effect of fertiliser treatment on plant composition, diagnosis of unhealthy plants and the effect of various treatments in correcting unthriftness in plants. The result of this work enabled some far-reaching and valuable conclusions to be deduced.

The major portion (approximately 80 per cent.) of the water samples examined were from primary producers for determination of suitability for domestic, stock and irrigation purposes. With each report information contained in a leaflet is also enclosed. The routine examination of existing water supplies to cities and towns was continued and samples were analysed from Canning, Churchmans Brook and Victoria Reservoirs, the Wungong pipe-head dam and Mt. Eliza reservoir also Munding Weir, Kalgoorlie Water Supply and Wellington Dam. Existing or prospective water supplies were examined for 36 communities ranging from the Kimberleys in the extreme north of the State to Augusta in the extreme south.

Experimental treatment with copper sulphate was carried out on the Goldfields Water Supply for the control of sponge growths. The effectiveness of the treatment cannot be ascertained until an inspection of the affected section of the pipeline is possible.

The long term experiment on the bacterial decomposition of sewage sludge in saline water has been continued. Evidence to date is that the safe upper limit of salinity of water for a septic tank is between 700 and 1200 grains per gallon.

The Industrial Chemistry Division has occupied the newly constructed buildings housing the Unit Process Plant but which owing to frustrating delays has not been completely fitted out.

This has limited the scope of activities to smaller items of equipment and only to projects of short duration although the laboratory section has functioned throughout the year.

Working tests have been made on the major items of equipment and trial runs have been successful after overcoming initial difficulties.

Some corrective treatment is still necessary to make the Denver flotation plant fully and correctly operative.

The services of the division have been sought in a consultative capacity on many problems associated with industry. Short term investigations have been made on the bleaching of lanolin, the separation of stibnite from antimonial pyrites, hardener for urca-formaldehyde glues, plastic foils for contour mapping, chemical and physical tests on plastic floor tiles.

Research work on the toxic principle of a species of poison plant has made good progress and the possibilities of the utilisation of the gum of *Zamia palm* as a substitute for gum tragacanth have progressed to partial success.

The number of samples from all sources handled by the Fuel Technology Division amounted to 480.

The work of the division in relation to developments in the Collie Coalfield has been the continuation of analyses of coals and assessment of their combustion characteristics, gasification and coking properties. Research on the production of coked briquettes from Collie coal as a metallurgical coke substitute has been extended and in the progress of the research, 88 samples of coal, char, tar, gas, bitumen and briquettes were examined. In this work close liaison has been maintained with the Department of Industrial Development in their Welshpool briquette pilot plant.

The services of the division were also engaged on the analyses of Tasmanian and Newcastle coal.

In connection with the drilling programme being undertaken at Collie, 30 core samples of coal in all were examined for the Government Geologist and the Chief Coal Mining Engineer.

The deterioration of Collie coal by weathering and storage was the subject of long term experiments in collaboration with railway authorities. Analyses in connection with railway loco trials were carried out.

Continuation of investigations associated with the development of sawdust as a boiler fuel has shown considerable success in achieving boiler economy and in the suppression of smuts.

Miscellaneous analyses or investigations were carried out on charcoal, fly ash, shale, gypsum, refractory clay and dust.

PART IX.—SCHOOL OF MINES.

(a) Kalgoorlie.

The total number of enrolments during 1955 was 347, a decrease of 34 by comparison with the previous year.

During the year 371 samples were received from prospectors for assay and for mineral examination, the total for the previous year being 444.

The Kalgoorlie Metallurgical Laboratory continued to report on samples submitted for metallurgical investigation, and also to make assays and

analyses of selected samples. Eighteen reports and 54 certificates were issued. Also as part of the scheme for assisting prospectors, 199 assays or analyses were made. The work for prospectors is done without charge.

(b) *Norseman.*

The total number of enrolments was 60, a decrease of 7 by comparison with the previous year.

Extensions, alterations and renovations to the buildings have almost been completed and will result in very much improved conditions for 1956.

(c) *Bullfinch.*

The enrolments for the year totalled 55, an increase of 13 over the previous year's figure.

The Bullfinch Country Club Prize was divided between I. Maclean and B. J. D. Van der Hoek. No award of this prize was made in the previous year.

PART X.—EXPLOSIVES.

The total amount of explosives imported into the State was 109,340 cases. This was a decrease of 10,861 cases compared with 1954. Although importations were on a reduced scale, stocks carried from 1954 were such that consumption for 1955 showed no appreciable fall.

Tests were made of all shipments received at Woodman's Point Explosive Reserve before they were permitted to be distributed.

There was increased importation of special types of explosives used in connection with geoseismic survey work.

Larger amounts of fireworks were imported than in 1954 and all lines were found to be satisfactory. No local manufacture of small fireworks has commenced so far.

Fourteen new magazines were licensed during the year and there was a large increase in licensed fireworks dealers.

At the Woodman's Point Explosives Reserve boundary and beach extension fences were completed, paved areas constructed, magazines repaired and several blast mounds reconstructed.

PART XI.—MINER'S PHTHISIS ACT AND MINE WORKERS RELIEF ACT.

During the year all Goldfields were visited with the exception of Kimberley, West Kimberley, Pilbara, West Pilbara, Ashburton and Phillips River, which are remote or in which there are few mine workers.

The number of examinations made was 5,043 as compared with 5,630 for the previous year, a decrease of 587.

PART XII.—CHIEF COAL MINING ENGINEER'S BRANCH.

Operations on the Collie Coalfield during 1955 continued without interruption and an output of 903,791 tons was sold, as compared with 1,017,456 tons for the previous year.

The reduction of output was due to a lesser demand which will continue into 1956.

The output comprised 599,667 tons or 66.35 per cent. of deep mined coal and 304,124 tons or 33.65 per cent. of open cut coal.

The estimated value of coal sold was £3,132,074 or an average of 69s. 4d. per ton.

The average number of men employed during the year was 1,386 as compared with 1,560 during 1954. Of the total number of men employed 1,169 were employed in the deep mines and 217 in the open cut, as compared with 1,227 and 333 respectively for the previous year.

One new deep mine was commenced during the year, that is the Hebe Mine on the Muja leases.

STAFF.

Once again I would like to take this opportunity of publicly thanking all members of the staff for the loyal and efficient way in which they have carried out their duties.

During the year, four valued and senior officers of the Department retired. They were the Director of the Government Chemical Laboratories, Mr. H. P. Rowledge; the Assistant Under Secretary, Mr. E. G. Flanagan; the Principal Registrar, Mr. J. Thomas and the Secretary of the Board of Examiners for Engine Drivers, Mr. J. W. Smith. Each of these officers had been with the Department for over 35 years and each had a vast Departmental knowledge. Mr. Rowledge was a mineralogist of high repute and an authority on Western Australian minerals. Mr. Flanagan and Mr. Thomas had both spent many years in the goldfields before coming to Head Office and were very widely and favourably known to the mining public, while Mr. Smith was the senior clerical official in the Inspection of Machinery Branch. The experience and knowledge of all these officers has already been greatly missed.

In this summary of the various activities, I have commented only on the principal items. Divisions II to XII of this publication contain the detailed reports of the responsible officers.

(Sgd.) A. H. TELFER,
Under Secretary for Mines.

Department of Mines,
Perth, 31st March, 1956.

DIVISION II

Report of the State Mining Engineer for the Year 1955

Under Secretary for Mines:

I have the honour to submit for the information of the Hon. the Minister for Mines the Annual Report of this branch, which was prepared by the Assistant State Mining Engineer.

The impact of higher costs on the gold mining industry is reflected in the increased grade of ore treated. The average grade for the State was 5.82 dwts. per ton, the highest figure since 1938.

There have been developments particularly in primary milling of ore that have increased treatment efficiency and the position generally appears to be improving.

Among the minerals other than gold a very considerable improvement in the outlook for crocidolite asbestos is reported. There is still very considerable interest in tin and in copper for fertilizer.

Although the results of oil exploration have produced no outstanding success, the continued interest of the oil companies must be taken as an encouraging sign.

The work done by our own drilling section has been very satisfactory and some useful results have been obtained.

The present staff is not adequate for the work in hand. In the coming year it is proposed to shift the depot to the metropolitan area and some additional staff will be needed.

(Sgd.) E. E. BRISBANE,
State Mining Engineer.

STATE MINING ENGINEER.

The details of mining activities in the State have been compiled from information supplied by the Statistician and Inspectors of Mines. The section on drilling written by the Assistant State Mining Engineer and the report of the Board of Examiners appear as appendices to this report.

STAFF.

Mr. J. F. Haddow, District Inspector of Mines, stationed at Kalgoorlie, was transferred to the Perth office on the 24/1/55 to supervise drilling operations being undertaken by the Department.

TABLE A.
SERIOUS ACCIDENTS FOR 1955.

Class of Accident.	West Kimberley.	Pilbara.	West Pilbara.	Murchison.	Northampton.	Mt. Margaret.	North Coolgardie.	East Coolgardie.	Coolgardie.	Yilgarn.	Dundas.	Phillips River.	South-West.	TOTAL.
Major Injuries—Exclusive of Fatal—														
Fractures—														
Head						1		1				1	1	4
Shoulder			1					1						2
Arm						3		4			1			8
Hand								1						1
Spine						1		1						2
Rib			1	1			1			2	1			6
Pelvis						1								1
Thigh														
Leg						1		1	1				1	4
Ankle								2						2
Foot			1			1	1	4		1	1		1	10
Amputations—														
Arm														
Hand														
Finger			1		1	1	1	5		2				11
Leg														
Foot								1						1
Toe													1	1
Loss of Eye					1						1			2
Serious Internal			3	1										4
Hernia								8	1	1	2			12
Dislocations					1									1
Other Major			1			1	1	2		2			1	8
Total Major			8	2	3	10	4	31	2	8	6	1	5	80
Minor Injuries—														
Fractures—														
Finger	2	1	2	1		1		8		3			1	19
Toe				1				3		2	1		1	8
Head	1							14						15
Eyes								12	1	2	1			16
Shoulder					1			10	1		1			13
Arm							1	24		1	3			30
Hand			1	1	4	4	4	82	4	8	7		1	116
Back				6	1	1	3	44		2	7		1	65
Rib	2							7						10
Leg			4	2		3	4	74	5	1	7		1	101
Foot			1	2	1	4		39	2	3	2			54
Other Minor			1		1			11		4				17
Total Minor	5	1	9	13	8	15	12	328	13	26	29		5	464
Grand Total	5	1	17	15	11	25	16	359	15	34	35	1	10	544

There were no accidents during the year under review in the following Goldfields:—

Ashburton.	East Murchison.	Greenbushes	North East Coolgardie	Yalgoo.
Broad Arrow.	Gascoyne.	Kimberley.	Peak Hill	

The vacancy at Kalgoorlie was filled on the 27th June by the appointment of Mr. E. G. Timoney to the position of District Inspector.

Messrs. M. Simmons and E. Shenton were appointed Assistant Inspectors of Mines (Ventilation) on the 28th February and 5th December, 1955, respectively.

Mr. B. L. Berry, Assistant Inspector, resigned as from the 19th July, 1955, and has left the mining industry.

ACCIDENTS.

Fatal and serious accidents in metal mines and quarries reported to the Department are shown below. The corresponding figures for 1954 are shown in brackets.

There were 14 (16) fatal and 544 (515) serious accidents.

In gold mines there were 11 (11) fatal and 492 (465) serious accidents. The number of men employed in such mines was 5,846 (6,128). The accident rate per 1,000 men was thus 1.88 (1.79) for fatal accidents and 84.16 (75.88) for serious accidents.

Two men were killed in quarry accidents during the year and one on a lead mine.

A classification of serious accidents showing the nature of the injuries is given in Table "A".

Table B shows the fatal, serious and minor accidents reported, and the number of men employed classified according to mineral mined.

TABLE B.
(Minerals other than Coal and Oil.)

Mineral.	Men Employed.	Accidents.		
		Fatal.	Injured.	
			Serious.	Minor.
Asbestos	221	....	17	69
Copper	....	....	....	....
Gold	5,846	11	492	1,742
Iron Ore (for Pig)	9	....	....	....
Iron Ore (for Export)	106	....	5	1
Lead, Silver, Zinc	108	1	11	14
Pyrite	128	....	8	25
Tin, Wolfram, Tantalum	104	....	....	....
Other Minerals	174	....	1	....
Quarries	Not available	2	10	3
Total	6,696	14	544	1,854

TABLE C.
Fatal and Serious Accidents showing Causes and Districts.
(Minerals other than Coal and Oil.)

District	Explosives.		Falls of Ground.		In Shafts.		Fumes.		Miscellaneous Underground.		Surface.		Total.	
	Fatal.	Serious.	Fatal.	Serious.	Fatal.	Serious.	Fatal.	Serious.	Fatal.	Serious.	Fatal.	Serious.	Fatal.	Serious.
Kimberley
West Kimberley	5	....	5
Pilbara	1	....	1
West Pilbara	8	....	....	9	....	17
Ashburton
Peak Hill
Gascoyne
Murchison	1	....	....	....	....	....	....	....	....	....	....
East Murchison	9	....	....	5	....	15
Yalgoo
Northampton	6	....	1	5	1	11
Mt. Margaret	2	1	1	....	....	16	....	....	6	1	25
North Coolgardie	1	....	2	....	....	....	....	10	....	....	3	1	16
Broad Arrow
North-East Coolgardie
East Coolgardie	2	....	17	....	14	1	....	3	240	2	86	6	359
Coolgardie	12	....	3	....	15
Yilgarn	4	....	....	1	19	....	11	1	34
Dundas	1	....	5	1	1	....	....	....	22	1	6	2	35
Phillips River	1	....	1
Greenbushes
South-West	1	1	1	3	....	....	....	....	....	....	....	6	2	10
Totals for 1955	1	5	1	30	2	20	2	....	4	342	4	147	14	544
Totals for 1954	4	3	4	38	2	20	....	....	3	326	3	128	16	515

Oil well drilling companies employing 445 men in the field reported 1 fatal, 44 serious, and 48 minor accidents during the year.

The man killed was Victor Alcedos Goettelman, a driller, who was driving a station wagon which collided with a Mack truck near Learmonth on the 17th August, 1955.

FATAL ACCIDENTS

A brief description of fatal accidents reported during the year is given below.

Name and Occupation.	Date.	Mine.	Details and Remarks.
Massimini, Amedeo Giovanni (Quarry Worker)	Injured 11-3-55 Died 15-3-55	Australian Blue Metal Quarry Bunbury	Massimini was struck on the back by a piece of fly rock whilst sheltering 250 yards from blasting operations. It appears that the rock ricocheted off a tree before striking him.
Hitchcock, John Edward (Machine Miner)	3-5-55	Main Shaft, Great Boulder Gold Mine, Fimiston	Received head and chest injuries in the 900 ft. level New lode shrink stope, when broken ore on which he was standing shrank and buried him. His body was recovered 16 days later
Vlaisavljevich, Dane (Skipman)	4-5-55	Sons of Gwalia, Gwalia	Death was due to multiple injuries received when he was crushed between the skip and shaft timber at the No. 31 level of the internal inclined shaft. He was not correctly seated in the skip
Rowe, William Roy (Hoist Driver)	17-5-55	Regent Shaft, Central Norseman Gold Corporation	Death was due to severe concussion, fractured thigh and severe shock received when he was thrown from a mancar in a derailment near the No. 34 level.
Papoutsakis, Dimitrios (Locomotive Driver)	27-6-55	Copperhead Mine Great Western Consolidated Bullfinch	Papoutsakis died from a fractured skull received when he fell from the electric locomotive he was driving on the No. 10 level.
Crncevich, Lui (Machine Miner)	27-6-55	Perseverance Mine, G.M.K. (Aust.) Ltd. Fimiston	A blow over the heart inflicted by a rock drill contributed to his death from a diseased heart.
New, Edward Jack Guy (Mill Attendant)	12-7-55	Central Norseman Gold Corporation, Norseman	Death was due to coronary occlusion due to advanced coronary atheroma and arterio-sclerosis. Death was hastened by unusually strenuous exertion in the course of his shift, just completed.
Pitcher, John Henry (Change-room Attendant)	Injured 16-8-55 Died 18-8-55	Hamilton Shaft, Great Boulder Pty. G.M. Ltd. Fimiston	Suffered head injuries when he tripped on a hose and fell near the boiler house.
Guanella, Emilio (Miner)	13-10-55	Callion Mine, New Coolgardie Gold Mines N.L.	Overcome by fumes at the bottom of a winze below the No. 6 level. Available ventilation equipment was not correctly installed prior to accident.
Steel, William Jamieson (Mill Shift Boss)	Injured 24-8-55 Died 22-10-55	Great Boulder Pty. G.M. Ltd. Fimiston	Died from a secondary haemorrhage of a previously ruptured spleen, which was received when he fell from the platform of a calcine agitator. The handrail that he grasped after tripping over some rope or an agitator support, gave way and he fell 18 ft. onto a stack of timber.
Moore, Thomas Barry (Sampler)	4-11-55	Horseshoe No. 2, Lake View & Star Ltd., Fimiston	Death due to asphyxia from compression of chest received when he was buried by a run of ore in the 1100 ft. level No. 1 lode shrink stope.
Agostinelli, Franco (Quarry Worker)	10-11-55	York Street, Quarry Beaconsfield, owned by Wesco Lime & Stone Co.	Asphyxiated when buried under a fall of limestone. The face had been made unsafe by excessive undercutting.
Pummell, Samuel George (Winch Driver)	9-12-55	Surprise Lead Mine, Galena	Death was due to a compound fracture of the skull received when he became entangled in the vee belts driving the hoist.
Loan, Charles Alfred (Trucker)	29-12-55	North Kalgurli (1912) Ltd., Fimiston	Poisoned when he inhaled carbon monoxide gas in a rise off the No. 8 level 2S2 East lode. He entered the unventilated rise before drives off the rise had been blown free of fumes after firing.

WINDING MACHINERY ACCIDENTS.

Thirty seven accidents involving winding machinery were reported during the year and are briefly as follows:—

Fatal (3).—These accidents have been included under the heading of fatal accidents.

Overwinds (13).—Errors of judgment accounted for eight overwinds.

An overwind of a cage containing 11 men occurred at the Chaffers Shaft on the 10/2/55. The cage was ascending to the surface and the driver's attention was distracted, with the result that the cage went through to the thimble where the rope was released and the cage suspended by the detaching hook. Luckily no one was seriously injured.

Two overwinds occurred when the drivers forgot to reverse the engines, and another when the engine failed to reverse although the reversing lever was in its correct position.

The rope was released and the cage suspended by the safety hook at the Enterprise shaft when the driver attempted to land the opposite cage at the No. 26 level when the cages were geared into the No. 23 level.

Cages Hung Up (6).—When the cage on its test run at the Ivanhoe was being lowered through the shaft in single gear, the grippers engaged the skids

at approximately 2,100 feet. The grippers held till 900 feet of rope was lowered onto it, and then the cage fell freely till the slack was taken up. When the weight came on the rope again, the rope pulled through the shoe and the cage dropped to the 3,300 penthouse. It is thought that the grippers partially operated when the cage bounced following a sudden application of the brakes.

An empty skip being lowered in the Lake View shaft was hung up when the grippers engaged the skids near the No. 5 level. This accident was caused through too great an acceleration of the winder.

Cages were held up in the New North Boulder and Bayley's shafts when insecurely fastened materials being raised, fouled the shaft timbers.

A sudden application of the brakes following their adjustment was the cause of a cage being hung up in the Hainault shaft.

Low steam pressure and grippers set too finely was reported to be the cause of a cage being hung up in the Hamilton shaft on the 29th December.

Cage Out of Control (1).—On the 27th January the north cage at the Paringa South Shaft dropped to the bottom when the driver applied the wrong brake when the unclutched drum started to move.

Derailments (8).—These accidents were reported by the Sons of Gwalia, the causes being, skip rear wheel hitting corner of rail at joint, obstructions on the line, spread rails, tyre breakage, loose bearings, and tight gauge at a joint. Some damage was done to shaft timbers and rails in most cases, but no one was injured in the one derailment when men were being lowered.

As previously reported, William Roy Rowe was killed in the Regent shaft on the 17th May when he was thrown from a derailed mancar. Spillage on the line was thought to have been the cause of the accident. The mancar has since been roofed and an electronic signalling device installed in the skip.

Mechanical Failures (6).—A winding rope, used for bailing purposes at the Croesus shaft, broke and the bailing tank dropped to the bottom. The break was caused through corrosion.

The copper rivet of the safety detaching hook sheared and released the rope at the Haoma Gold mine on the 11th March.

On the 18th March the spindle on the south head sheave broke at the hub at the South Kalgurli main shaft. This was a fatigue failure.

The top connecting link between the two brake-posts of the right hand brake snapped as the driver was applying the brake on the Iron Duke shaft winder. The motion was then stopped with the left hand brake.

When a loaded skip was ascending in the Copperhead shaft at Bullfinch the top edge of the skip fouled the No. 16 loading chute and the link, coupling the draw bar of the skip to the safety hook shackle, broke and released the skip which fell 120 feet onto the shaft spillage. The effective operation of the grippers was nullified because of fouling of the teeth with timber spoil. The cause of the mishap was due to fine spillage that had accumulated on the skip frame thus preventing the skip from returning to its vertical position after tipping.

At the Perseverance shaft, following repairs to the winder, the right hand cage took charge as it was being lowered in single gear, and despite efforts to stop it, it continued to the shaft bottom. The cage was slightly damaged. The partial operation of the brake was brought about by oil on the brake path which apparently was spilt on it during the repairs.

PROSECUTIONS.

It was found necessary to prosecute four persons during the year. All were successfully conducted by departmental officers.

A bogger was prosecuted for blasting rocks other than at the permitted times. The action was taken in an attempt to deter men from firing indiscriminately.

A mine manager was prosecuted on two occasions, firstly for employing men on a Sunday contrary to Section 42 of the Mines Regulation Act, and secondly for allowing an uncertificated man to drive a mine locomotive. The prosecutions were only instigated after several warnings had been ignored.

Two managers were prosecuted for employing an uncertificated electrician. The unauthorised electricians concerned were prosecuted under the Electricity Act.

SUNDAY LABOUR PERMITS.

Eleven permits to employ Sunday labour were granted during the year.

Norseman Gold Mines were permitted to employ 5 men on one Sunday for the purpose of stripping the bottom section of an ore pass.

A permit was granted for one Sunday for preparatory work in connection with the lowering of a pump in the main shaft of the Haoma gold mine.

Hill 50 Consolidated N.L. was granted a permit for 6 men to work one Sunday cleaning out an old shaft in which there was an excessive inflow of water.

Eight permits were granted for Sunday labour on the Copperhead mine at Bullfinch for essential work in connection with the completion of a new access road into the Southern series quarry, the removal of a large tonnage of waste weakened by rain, and repairs to the ore pass system.

AUTHORISED MINE SURVEYORS.

The Survey Board issued four certificates during the year.

CERTIFICATES OF EXEMPTION (SECTION 46).

Six certificates were issued as compared with thirteen in 1954.

PERMITS TO FIRE OUTSIDE PRESCRIBED TIMES (Regulation 51).

Permission was granted to the Lake View and Star whilst winze sinking operations were in progress from the surface. The permit was granted to accelerate improvement of ventilation.

ADMINISTRATIVE.

Mines Regulation Act.—The notice published in the Government Gazette of the 4th April, 1949, suspending Sections 36, 37 and 39 was rescinded on the 21st July, 1955. These Sections deal with hours of employment in the industry.

The South-West Mining District was proclaimed on the 16th August, 1955. This district covers the South-West Land Division excluding areas previously proclaimed, as goldfields, mineral fields or mining districts, within its boundaries.

Mines for the purpose of quarrying rock or limestone were exempted from the provisions of Part XIV of the Mines Regulation Act Regulations.

Regulation 14 was amended to provide for an increase in remuneration paid to Workmen's Inspectors of Mines.

Mining Act.—Clays suitable for brickmaking purposes and mounding sands were brought under Part VII of the Act.

The boundaries of the Kimberley and West Kimberley Goldfields were amended by proclamation dated the 14th September, 1955.

Regulation 156 has been corrected.

Mine Workers' Relief Act.—Scale I, relating to benefits paid to prohibited and notified mine workers and their dependants was amended on the 10th November, 1955.

VENTILATION.

All major metalliferous mines throughout the State were inspected, and dust counts and temperatures recorded at the underground working places. Treatment plants were also inspected and dust counts recorded in the crushing sections. The majority of mines have continued to be satisfactorily ventilated, but isolated instances of poor ventilation were encountered. On some of the smaller mines, where no full-time ventilation officer was available, assistance was given in the making of air surveys etc.

Results of dust counts taken during the year are tabulated below.

Dust Samples from	No. of Samples.	Samples giving over 1,000 ppec.	Average Count.
Development	394	7	198
Stoping	675	11	190
Levels	159	11	269
Surface	75	6	280
Totals	1,303	35	207

Overall results were slightly better than in previous years. Particular attention was paid to tipping points at ore passes and improvements made to lessen the dust from this source.

During the year a mining equipment Company introduced a new piece of equipment to these fields, which involved dry boring and the collection through the steel into a container of the dust so created. During the demonstration dust samples were taken and results indicate that at the demonstration the dust collection was quite efficient.

The more important of the improvements made to main ventilation systems are listed below.

A winze from the surface was sunk into the James Lode stope above the 327ft. level in the Hannans Star workings of the Lake View and Star. Also on this mine on the 187ft. level a north drive holed through to the old Hannans Star main shaft which is downcast. A connection was made on the 2,000ft. level between the No. 2 lode East Branch and an old east crosscut from the Ivanhoe South Extended shaft. A flow of 45,000 c.f.m. is now drawn directly from this lode to the main up-cast shaft with a reported improvement to the ventilation of all workings on this ore body between the No. 16 and 26 levels.

A 5½ C.L. fan has been installed on the 2050ft. level of the Enterprise mine to exhaust 20,000 cumins from the workings and send the air to the surface via old Lake View lode workings. At the 2,600ft. level a 6½ C.L. fan has been installed to downcast the shaft and exhaust to the mine workings and the fan on the 2,050ft. level.

On the Gold Mines of Kalgoorlie group, exhaust systems have been constructed at most of the ore pass grizzlies to remove the dust created by the tipping of ore. The exhausted air is filtered or directed into old workings. Standard equipment on most grizzlies of this group is the air water blast for minimizing the dust.

Aluminium Therapy.—With the cessation of mining activities of Big Bell Mines Ltd. the number of changerooms in which aluminium powder is dispersed has dropped to 26. Powder concentration in the changerooms is measured by the ventilation officer on the mines and also periodically by our own officers.

A census taken early in the year indicates that 86% of the miners avail themselves of some prophylactic treatment and that 29% receive the full treatment advised by the McIntyre Research Foundation.

GOLD MINING.

The ore treated during the year amounted to 2,865,048 tons as compared with 3,240,378 tons in the previous year. The drop in tonnage was brought about by the closure of Big Bell Mines Ltd.

The gold recovered was 834,326 fine ounces as compared with 861,992 fine ounces in the previous year.

Grade of ore mined was generally higher giving a return of 5.82 dwts. per ton as against 5.32 dwts. per ton for the previous year.

The calculated value of the gold produced was £13,055,574 which includes £16,638 distributed by the Gold Producers' Association from the sale of 841,798 fine ounces of gold at an average premium of 4.74d. per fine ounce. The mint value for gold throughout the year was £15 12s. 6d. per fine ounce.

There was a reduction in the labour force in the industry from 6,128 in 1954 to 5,846 in 1955. Average production of ore per man for the year was 490.09 tons valued at 91.13 shillings per ton as compared with 528.78 tons per man valued at 83.27 shillings per ton for 1954. Gold recovery per man amounted to 142.72 fine ounces as compared with 140.66 fine ounces in the previous year.

Statistics relating to the gold mining industry are tabulated as follows:—

Table "D"—Gold Production Statistics.

Table "E"—Classification of Gold Output for 1955 by Goldfields.

Table "F"—Classification of Gold Output 1951-1955.

Table "G"—Mines that have produced 5,000 ounces and upwards during the last five years.

Table "H"—Development Footages.

TABLE D.
Gold Production Statistics.

Year.	Tons Treated. (2,240 lb.)	Total Gold Yield.	Estimated Value of Yield.	Value of Yield per ton.	Number of Men Employed.	Average Value of Gold per oz.	Average Yield per ton of ore.
	tons.	fine ozs.	£A.	shillings A.		shillings A.	dwts.
1929	628,400	372,064	1,580,426	50.30	4,108	84.96	11.84
1930	645,344	419,767	1,874,484	58.09	4,284	89.33	13.01
1931	982,163	518,045	3,042,019	61.94	5,961	117.44	10.55
1932	1,327,021	599,421	4,358,989	65.70	8,695	145.44	9.03
1933	1,588,979	636,928	4,884,112	61.48	9,900	153.36	8.01
1934	1,772,931	639,871	5,461,004	61.60	12,523	170.69	7.22
1935	1,909,832	646,150	5,676,679	59.45	14,708	175.71	6.77
1936	2,492,034	852,422	7,427,687	59.61	15,698	174.27	6.84
1937	3,039,608	1,007,289	8,797,662	57.99	16,174	174.68	6.64
1938	3,759,720	1,172,950	10,409,928	53.38	15,374	177.50	6.24
1939	4,095,257	1,188,286	11,594,221	56.62	15,216	195.14	5.80
1940	4,291,709	1,154,843	12,306,816	57.35	14,594	213.15	5.38
1941	4,210,774	1,105,477	11,811,989	56.10	13,105	213.70	5.25
1942	3,225,704	845,772	8,840,642	54.81	8,123	209.04	5.24
1943	2,051,011	531,747	5,556,736	54.185	5,079	209.00	5.185
1944	1,777,128	472,588	5,966,451	55.89	4,614	210.18	5.32
1945	1,736,952	469,906	5,025,039	57.86	4,818	213.87	5.41
1946	2,194,477	618,607	6,657,762	60.70	6,961	215.25	5.64
1947	2,507,306	701,752	7,552,611	60.25	7,649	215.25	5.59
1948	2,447,545	662,714	7,132,748	58.28	7,178	215.25	5.42
1949	2,468,297	649,572	7,977,200	64.64	6,800	245.62	5.26
1950	2,468,423	608,633	9,428,745	76.55	7,080	309.83	4.94
1951	2,471,679	648,245	10,042,392	81.26	6,766	309.83	5.25
1952	2,626,612	727,468	11,809,047	89.92	6,394	324.66	5.54
1953	3,169,875	823,331	13,290,100	83.85	6,359	322.837	5.20
1954	3,240,378	861,992	13,492,209	83.27	6,128	313.04	5.32
1955	2,865,048	834,326	13,055,574	91.13	5,845	312.96	5.82

TABLE E.
Classification of Gold Output for 1955 by Goldfields.

Goldfield.	Un-classified Sundry Claims, Alluvial, etc.	Under 100 ozs.		100-500 ozs.		500-1,000 ozs.		1,000-5,000 ozs.		5,000-10,000 ozs.		10,000-20,000 ozs.		20,000-50,000 ozs.		50,000-100,000 ozs.		Over 100,000 ozs.		Total Fine Ozs.
		No. of Producers.	Gold.	No. of Producers.	Gold.	No. of Producers.	Gold.	No. of Producers.	Gold.	No. of Producers.	Gold.	No. of Producers.	Gold.	No. of Producers.	Gold.	No. of Producers.	Gold.	No. of Producers.	Gold.	
Kimberley	Fine ozs. 146	1	Fine ozs. 46	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	192
West Kimberley	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pilbara	239	9	264	2	382	1	537	1	2,451	...	...	...	...	...	...	...	...	...	...	3,873
West Pilbara	29	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	29
Ashburton	19	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	19
Peak Hill	...	5	112	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	112
Gascoyne	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Murchison	340	20	613	3	717	...	...	...	...	1	5,675	...	...	...	...	1	81,801	...	...	89,146
East Murchison	17	3	117	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	134
Yalgoo	1	1	11	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	12
Mt. Margaret	608	6	134	2	260	4	2,935	1	1,508	...	...	...	...	1	23,226	...	...	...	...	28,671
North Coolgardie	454	12	465	11	2,774	1	506	1	1,568	...	...	2	30,151	...	...	...	...	...	...	35,918
Broad Arrow	553	13	379	7	1,803	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2,735
North-East Coolgardie	8	3	159	1	202	...	...	...	...	...	...	...	...	...	...	...	...	...	...	369
East Coolgardie	252	19	491	4	825	...	...	3	6,197	1	6,607	1	19,627	2	45,374	2	128,789	2	280,878	489,040
Coolgardie	319	12	221	5	1,157	1	714	...	...	...	...	1	19,180	...	...	...	...	...	...	21,591
Yilgarn	878	15	396	4	999	1	887	1	1,414	...	...	...	...	...	...	1	62,136	...	...	66,710
Dundas	12	2	6	...	...	...	...	...	...	...	...	...	...	...	...	1	95,700	...	...	95,718
Phillips River	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3
State Generally	54	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	54
Totals	3,932	121	3,414	39	9,119	8	5,579	7	13,138	2	12,282	4	68,958	3	68,600	5	368,426	2	280,878	834,326

TABLE F.
Classification of Gold Output, 1951-1955.

Range of Output.	1955.			1954.			1953.			1952.			1951.		
	No. of Producers.	Pro-duction.	Percentage of Total.	No. of Producers.	Pro-duction.	Percentage of Total.	No. of Producers.	Pro-duction.	Percentage of Total.	No. of Producers.	Pro-duction.	Percentage of Total.	No. of Producers.	Pro-duction.	Percentage of Total.
Fine ozs.		Fine ozs.			Fine ozs.			Fine ozs.			Fine ozs.			Fine ozs.	
Over 100,000	2	280,878	33.6	2	275,139	31.9	2	272,467	33.2	1	146,256	20.1	1	155,044	23.9
50,000-100,000	5	368,426	44.1	6	387,840	45.1	5	296,444	36.0	4	293,217	40.3	2	146,381	22.6
40,000- 50,000 ....	....	....	....	....	....	....	1	41,799	5.1	1	47,286	6.5	3	140,437	21.7
30,000- 40,000 ....	....	....	....	1	31,150	3.6	1	33,677	4.1	1	30,578	4.2	1	33,126	5.1
20,000- 30,000	3	68,600	8.2	4	69,964	8.1	2	49,699	6.0	1	23,616	3.3	2	45,340	7.0
10,000- 20,000	4	68,958	8.3	3	44,664	5.2	4	64,358	7.8	6	104,197	14.3	3	47,485	7.3
5,000- 10,000	2	12,282	1.5	3	22,798	2.6	2	18,142	2.2	4	29,537	4.1	2	14,116	2.2
4,000- 5,000 ....	....	....	....	....	....	....	1	4,636	0.6	....	....	....	1	4,283	0.7
3,000- 4,000	1	3,454	0.4	....	....	....	1	3,795	0.5	2	7,290	1.1	1	3,327	0.5
2,000- 3,000	1	2,451	0.3	....	....	....	1	2,703	0.3	3	6,735	0.9	5	12,522	1.9
1,000- 2,000	5	7,233	0.9	5	7,641	0.9	6	7,685	0.9	5	6,869	0.9	6	8,517	1.3
500- 1,000	8	5,579	0.7	14	9,666	1.1	12	7,894	0.9	14	9,704	1.3	15	10,222	1.6
100- 500	39	9,119	1.1	22	4,611	0.5	54	12,378	1.5	56	13,293	1.8	71	16,208	2.5
Under 100	121	3,414	0.4	149	4,280	0.5	184	3,988	0.5	177	5,081	0.7	175	5,277	0.8
Sundry Claims, etc. ....	....	3,932	0.5	....	4,239	0.5	....	3,666	0.4	....	3,808	0.5	....	5,960	0.9
Totals	191	834,326	100.0	209	861,992	100.0	276	823,331	100.0	275	727,467	100.0	288	648,245	100.0

TABLE G.

Mines that have Produced 5,000 ounces and upwards during the last Five Years.

Mine.	1955.			1954.			1953.			1952.			1951.		
	Tons Treated.	Fine ozs.	Dwt. per ton.	Tons Treated.	Fine ozs.	Dwt. per ton.	Tons Treated.	Fine ozs.	Dwt. per ton.	Tons Treated.	Fine ozs.	Dwt. per ton.	Tons Treated.	Fine ozs.	Dwt. per ton.
Big Bell Mines, Ltd.	14,691	5,675	7.73	405,684	59,985	2.96	402,906	54,142	2.69	400,563	53,610	2.68	369,412	49,726	2.69
Blue Spec Mining Co., N.L.	3,388	2,451	14.47	8,614	1,006	3.05	2,297	3,795	33.04	8,819	6,494	19.05	...	...	...
Boulder Perseverance, Ltd.	126,251	25,046	3.97	133,800	31,150	4.66	136,257	33,677	4.94	131,840	30,578	4.64	135,474	33,126	4.89
Callion (Worserman Mining Corporation Ltd.)	26,922	13,037	9.69	30,974	15,385	9.93	29,926	16,023	10.71	25,214	14,697	11.66	...	...	...
Central Norseman Gold Corporation, N.L.	169,224	95,700	11.95	157,377	83,396	10.56	155,451	73,869	9.50	158,447	78,241	9.88	151,322	43,868	5.80
Gold Mines of Kalgoorlie (Aust.), Ltd.	195,732	52,552	5.37	209,311	60,370	5.77	191,292	57,184	5.98	171,659	47,286	5.51	167,889	46,843	5.53
Great Boulder Pty. Gold Mines, Ltd.	423,379	114,560	5.41	417,374	107,670	5.15	409,314	106,775	5.21	376,564	96,111	5.10	325,924	96,985	5.34
Great Western Consolidated, N.L.	423,012	62,136	2.94	445,864	55,330	2.48	392,508	50,192	2.56	30,143	2,134	1.42	...	...	...
Haoma Gold Mine	3,565	3,454	19.38	4,600	5,437	23.81	3,827	4,636	24.23	3,198	3,655	22.86	2,836	2,023	14.27
Hill 50 Gold Mines, N.L.	104,010	81,801	15.72	92,411	71,813	15.50	83,865	41,799	9.97	53,803	15,839	5.89	28,352	7,557	5.33
Horseshoe (Anglo Westralian Mining Pty., Ltd.)	74,429	19,627	5.27	69,789	21,599	6.19	54,923	8,896	3.24	35,602	5,428	3.05	...	...	...
Kalgoorlie Enterprise, Ltd.	656,099	157,527	4.80	657,197	157,667	4.80	657,621	156,589	4.76	610,111	146,256	4.79	614,051	145,681	4.75
Lake View & Star, Ltd.	33,296	19,180	11.52	33,534	15,761	9.40	39,570	17,176	8.68	37,436	19,387	10.36	41,756	20,914	10.02
New Coolgardie Gold Mines, N.L.	348,829	76,237	4.37	251,988	56,945	4.52	253,967	61,057	4.81	256,040	65,255	5.10	255,315	59,395	4.65
North Kalgurli (1912), Ltd.	84,928	20,328	4.79	97,711	22,197	4.54	102,449	23,673	4.62	95,992	23,616	5.03	98,594	24,426	4.96
South Kalgurli Consolidated, Ltd.	42,207	15,203	7.20	34,600	11,848	6.84	40,218	15,003	7.47	42,270	17,386	8.23	48,959	19,578	8.00
State Batteries	102,742	23,226	4.52	103,237	26,168	5.07	100,525	26,026	5.18	85,263	23,768	5.58	73,825	19,186	5.20
The Sons of Gwalia	30,056	17,114	11.39	24,290	13,518	11.13	23,105	13,039	11.29	23,410	11,680	9.98	23,976	11,402	9.51
Timonl (Moonlight Wiluna G.M., Ltd.) ....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	2,854,260	804,854	5.64	3,222,711	825,819	5.12	3,145,741	781,670	4.97	2,605,243	680,247	5.22	2,393,735	597,607	4.95
Other Sources (excluding large Retreatment Plants)	10,788	11,655	21.61	17,667	15,282	17.30	24,134	19,020	15.76	21,369	22,894	21.43	77,944	27,184	6.98
Total (excluding large Retreatment Plants)	2,865,048	816,509	5.70	3,240,378	841,101	5.19	3,169,875	800,690	5.05	2,626,612	703,141	5.35	2,471,679	624,791	5.06
Golden Horseshoe Sands Retreatment ....	...	6,607	...	...	8,787	...	...	9,246	...	...	9,767	...	...	6,559	...
Lake View & Star Retreatment ....	...	8,791	...	...	8,802	...	...	9,102	...	...	7,848	...	...	9,384	...
State Batteries Tailing Treatment ....	...	2,419	...	...	3,302	...	...	4,293	...	...	6,712	...	...	7,511	...
GRAND TOTAL	2,865,048	834,326	5.82	3,240,378	861,992	5.32	3,169,875	823,331	5.20	2,626,612	727,468	5.54	2,471,679	648,245	5.25

TABLE H.
Development Footages Reported by the Principal Mines.

Gold or Mineral Field.	Mine.	Shaft Sinking.	Driving.	Cross Cutting.	Rising and Winzing.	Diamond Drilling.	Total.
		Feet.	Feet.	Feet.	Feet.	Feet.	Feet.
Gold—							
Murchison	Vivian Gold, N.L.	140	...	130	...	...	270
	Mount Magnet Development, N.L.	...	...	...	...	3,796	3,796
	Hill 50 Eclipse	59	136	...	...	...	195
	Hill 50 Consolidated, N.L.	221	351	448	65	...	1,085
	Hill 50 Gold Mines, N.L.	56	1,134	619	486	4,617	6,912
	Hill 50 Central, N.L.	110	240	60	...	...	410
	Hill 50 Extended, N.L.	...	...	...	...	2,076	2,078
Mount Margaret	Sons of Gwalia	...	1,177	382	198	3,831	5,586
North Coolgardie	Timoni	...	927	295	496	3,031	4,749
	Yilgangee Queen	...	347	...	...	...	347
	Callion	...	1,746	6	612	1,558	3,922
East Coolgardie	Lake View and Star, Ltd.	...	17,833	2,528	7,841	8,752	36,954
	Great Boulder Pty. Gold Mines, Ltd.	263	10,332	2,459	3,596	5,987	22,637
	North Kalgurli (1912), Ltd.	...	8,975	2,690	2,807	10,330	24,802
	Gold Mines of Kalgoorlie	23	14,555	2,349	4,555	56,849	78,331
	Haoma Gold Mine	...	356	59	73	...	488
	Daisy Gold Mine	...	227	92	...	...	319
Coolgardie	Gold Mines of Kalgoorlie	...	3,241	117	...	23,783	27,141
Yilgarn	Great Western Consolidated	13	9,417	1,717	1,584	48,317	61,048
	Sunshine Reward	...	150	...	80	1,000	1,230
	Marjorie Glen	...	180	25	...	395	600
	Radio	113	15	...	...	...	128
	Frances Furness	30	...	...	...	...	30
Dundas	Central Norseman Gold Corporation, N.L.	632	10,665	1,067	1,270	37,611	51,245
	Totals in Gold Mines	1,660	82,004	15,043	23,663	211,933	334,303
Pyrite—							
Dundas	Norseman Gold Mines, N.L.	...	521	9	...	301	831
Asbestos—							
West Pilbara	Australian Blue Asbestos	...	1,095	766	174	...	2,035
	Nunyerri	...	40	40	120	...	200
	Totals in Asbestos Mines	...	1,135	806	294	...	2,235
Copper—							
Phillips River	Western Uranium Mines, N.L.	...	...	...	...	9,011	9,011
Pilbara	Copper Hills	...	240	...	110	...	350
West Pilbara	Yannery Hills	...	120	82	45	...	247
	Totals in Copper Mines	...	360	82	155	9,011	9,608
Lead—							
Northampton	Surprise	...	281	72	...	...	353
	Protheroe Lead Mine	136	738	64	435	4,073	5,446
	Gurkha Lead Mine	20	383	48	303	...	754
	Totals in Lead Mines	156	1,402	184	738	4,073	6,553
Iron Ore—							
West Kimberley	Australian Iron and Steel	...	...	...	...	2,160	2,160
	Totals in All Mines	1,816	85,422	16,124	24,850	227,478	355,690

OPERATIONS OF THE PRINCIPAL MINES.
EAST COOLGARDIE GOLDFIELD.

The total ore treated in this goldfield amounted to 1,921,668 tons and the gold yield of 489,040 fine ounces was an average of 5.09 dwts. per ton. This is equal to 58.6 per cent. of the gold production for the State. In the previous year 1,856,517 tons of ore averaging 5.24 dwts. were treated for a recovery of 486,040 fine ounces of gold.

There was very little activity in the *Bulong District*, only 76 ounces won from the treatment of 378 tons. In the *East Coolgardie District* 488,964 fine ounces were recovered from 1,921,290 tons of ore, the principal producers being:—

Lake View and Star Ltd. with a production of 656,099 tons of ore for a return of 157,527 fine ounces of gold at an average of 4.80 dwts. per ton was the State's leading producer. Retreatment of tailings yielded an additional 8,791 ounces.

The previous year's production was 157,667 ounces from the treatment of 657,197 tons plus 8,802 ounces from tailings retreatment. In comparison with last year's figures mill extraction has risen from 90.25 to 91.28 per cent. and tailings decreased from 0.46 to 0.41 dwts. per ton. Mining costs have decreased from 52s. 4d. to 51s. 11d. per ton.

Development footages amounted to 28,202 feet being 484 feet more than in the previous year.

Plant additions comprised the installation of an electrical substation with necessary transformers and switch gear. An electric winder has replaced the old steam winder at Lake View shaft, whilst the steel head frame purchased at Big Bell is to be re-erected at Ivanhoe Shaft.

Output classifies the Company as the premier gold mining Company in Australia, whilst reserves, set at the end of the financial year, amounting to 3,714,000 short tons of 4.76 dwt. grade insure both the future and the status of the mine.

Great Boulder Pty. Gold Mines Ltd. treated 423,879 tons averaging 5.41 dwts. for a return of 114,560 fine ounces of gold. During the previous year 417,874 tons yielded 107,670 fine ounces at an average of 5.15 dwts. per ton. Over the last four years mill throughput has been gradually increased from approximately 27 to 35 thousand tons per month, an increase of nearly 30 per cent. Ore reserves stated are 2,068,400 short tons at 5.42 dwts. per ton.

Hamilton shaft is in the process of sinking. Work has been completed to the 2,246 horizon and a new ore hoisting pocket is in operation at the 2,111 horizon. Method of sinking is by pilot winzing and then stripping the winze to shaft dimensions.

Mine ventilation continues a major problem.

Underground mechanisation is a priority of policy and three battery locomotives, two mechanical loaders and four double drum 5 h.p. scrapers were installed. Surface installations are in keeping with the general progressive policy of the management and additions include, 800 ton coarse ore bin at Edward's shaft, Main shaft winder converted from steam to electricity and an Edwards roaster installed at treatment plant.

North Kalgurli (1912) Ltd. treated 348,829 tons of ore for a recovery of 76,237 fine ounces at an average of 4.37 dwts./ton. This represents an increase of 96,841 tons and 19,292 fine ounces of gold over the previous year's operations.

The expansion was occasioned by extra milling facilities provided when the Company acquired full shares in Croesus Pty. Treatment Coy. At this plant construction is in progress to increase capacity from 15,000 to 27,000 tons monthly.

This expanded programme was also possible because of previous foresight in sinking a modern new shaft capable of handling expanding operations. Development was confined to accelerating normal development of known ore structures.

Ore reserves are stated as 2,269,049 tons at 5.57 dwts. per ton.

Gold Mines of Kalgoorlie (Aust.) Ltd. The group of mines under the control of this Company produced 97,926 fine ounces of gold from 406,911 tons of ore averaging 4.81 dwts. per ton. Production from the *Boulder Perseverance* was 126,251 tons for a recovery of 25,046 ounces at 3.97 dwts. per ton. *South Kalgurli* production was 84,928 tons for a recovery of 20,328 ounces or 4.79 dwts. per ton. The parent Company produced 52,552 ounces from 195,732 tons at an average value of 5.37 dwts. per ton.

For administration purposes, operations are divided into two groups—the Eastern group comprising Oroya, New North Boulder, Iron Duke and Paringa; and the Western group comprising *Perseverance*, *South Kalgurli* and *Kalgoorlie Enterprise*. On the operating side no new policies have as yet evolved. Development follows the same pattern as when the various mines were independent Companies.

All ore is now being treated at the Oroya mill which has had its capacity increased to handle 40,000 tons per month.

Ore reserves, for all the mines under G.M.K., are stated as 1,557,919 tons at 5.8 dwts. per ton.

At Mount Monger good returns were obtained from mining operations. *Haoma Gold Mines N.L.* reported the recovery of 3,454 fine ounces of gold from 3,565 tons. Output from the *Daisy* mine was 1,109 ounces from the treatment of 1,016 tons of ore. On the No. 1 level of this mine, a cross cut East intercepted the rich leader worked in the *Rosemary*. Interconnection of the *Daisy* and *Rosemary* workings has resulted in a vast improvement of the ventilation of both mines. *Rosemary* production was 1,634 fine ounces from the treatment of 262 tons.

DUNDAS GOLDFIELD.

The production of 95,718 fine ounces of gold from the treatment of 160,418 tons of ore is equivalent to 11½ per cent. of the State's total production. In the previous year 158,042 tons were mined for a recovery of 83,425 fine ounces.

Practically all of the production was from *Central Norseman Gold Corporation's* holdings at Norseman where 95,700 ounces of gold were recovered from 160,224 tons of ore averaging 11.95 dwts. per ton. These figures compare favourably with the previous year's production of 83,396 ounces from 157,877 tons averaging 10.56 dwts. per ton.

Nearly 14,000 feet of development was carried out during the year plus 37,000 feet of exploratory drilling which was mostly confined to drilling the Crown reef.

Ore reserves stated are 495,300 tons at 9.3 dwts. per ton.

Shaft sinking was in progress at both the Regent and Princess Royal shafts at the close of the year. The Regent shaft is now below the No. 40 level with skips operating from the No. 38 bin. Plats and ore passes have been completed in the Princess Royal shaft to the No. 10 level with sinking in progress below the No. 12.

The use of wall bolts continued with great success during the year, the bolts being interconnected by 3in. x ¾in. flat mild steel which follows the contours of the walls.

Tests were carried out in Regent shaft, with an electronic bell system operated from the mancar, that is a transmitter attached to the mancar and a receiver in the winder room. Another innovation introduced was the remote control of electric scrapers.

Towards the end of the year sinking operations had commenced on the Crown shaft.

MURCHISON GOLDFIELD.

125,208 tons of ore were treated in this goldfield for a return of 89,146 fine ounces of gold, the average return being 14.24 dwts. per ton. The gold production was equal to 10.7 per cent. of the State's total.

In the previous year 135,214 fine ounces were obtained from the treatment of 505,827 tons of ore averaging 5.34 dwts. per ton.

The sudden fall in ore mined and the increase in average grade was brought about by the closure of *Big Bell Mines Ltd.* in January 1955.

This mine was opened up in 1913 and operated till 1924 during which period 64,448 tons of ore was mined from an open cut, yielding 10,966 fine ounces of gold.

The Premier Gold Mining Coy. became interested in this large low grade deposit and exploration and testing was commenced in December, 1932. Towards the end of 1935 the Company was in position to equip the mine with a modern power and treatment plant capable of treating at least 30,000 tons per month provided the Government was prepared to construct a spur railway from Cue some 18 miles to the East. Subsequently the line was laid and mine production started in 1937. Operations were continuous except for the period February, 1943-June, 1946, during which period the mine was inoperative because of the acute manpower shortage.

During the period 1937-1955, 5,538,877 tons of ore were treated to yield 729,867 fine ounces of gold, the average recovery being 2.64 dwts. per ton.

The cessation of mining operations at *Big Bell* was brought about by mounting costs and the average low grade of the deposit which could not be worked economically even with financial aid given by the State.

Cue District produced 6,343 fine ounces of gold from the treatment of 16,291 tons of ore, average recovery being 7.79 dwts. per ton. Big Bell Mines Ltd. was responsible for the bulk of the production, this company having produced 5,675 ounces from the treatment of 14,691 tons of ore.

Two departmental diamond drills were used during the latter half of the year in the district in an endeavour to locate deposits of economic importance. One of the drills was solely engaged in deep drilling at the Great Fingall, Day Dawn.

Meekatharra District produced 563 ounces from the treatment of 3,606 tons of ore averaging 3.12 dwts. per ton. In the previous year 1,788 fine ounces of gold were obtained from the treatment of 4,043 tons of ore at an average of 8.84 dwts. per ton.

The principal producers were Rinaldi and Young with a return of 115 ounces from the treatment of 1,732 tons and *Vivian Gold N.L.* with a production of 132 ounces from 858 tons.

Day Dawn District.—Mining in this area was at a low ebb production mostly coming from part time prospectors. 183 tons of ore were treated for a return of 98 ounces of gold.

Mount Magnet District with 82,142 ounces from the treatment of 105,127 tons of ore averaging 15.63 dwts. per ton was again above the previous year's production of 71,992 fine ounces of gold from 92,607 tons of ore averaging 15.54 dwts. This advance is due solely to increased tonnages and grade from *Hill 50 Gold Mines N.L.* which produced 81,801 fine ounces of gold for the year from the treatment of 104,010 tons of ore averaging 15.72 dwts. per ton. In the previous year 92,411 tons were treated to yield 71,813 fine ounces at the rate of 15.5 dwts. per ton.

During the year the company was actively engaged in exploring the lower grade Mars ore body. Further sinking of the main shaft was also in progress during the latter part of the year.

Additional plant was obtained from the sale at Big Bell and Hill 50 Gold Mines now have a reserve of power and some duplication of treatment plant.

Seventy-seven fine ounces of gold were obtained from the treatment of 293 tons of ore mined at the *Morning Star* lease by Mount Magnet Development N.L. This company cleaned out and reconditioned the old main shaft with the view of developing an ore body located by diamond drilling. The costs involved in reconditioning this shaft were much greater than was anticipated, and although the more recent work has progressed satisfactorily, it is possible that the company may not have sufficient funds to complete the original programme of development.

The *Eclipse* mine produced 70 ounces of fine gold from the treatment of 182 tons of ore averaging 7.69 dwts. per ton.

YALGOO GOLDFIELD.

There was very little activity in this goldfield, production being 12 ounces of fine gold from the treatment of 11 tons of ore.

YILGARN GOLDFIELD.

Production for the year was 66,710 fine ounces from 428,253 tons averaging 3.12 dwts. per ton as compared with 60,341 fine ounces from 454,613 tons of ore in the previous year. This goldfield was responsible for 8 per cent. of the State's production.

Great Western Consolidated milled 423,012 tons for a recovery of 62,136 fine ounces of gold, the average recovery being 2.94 dwts. which is quite an improvement on 2.48 dwts. the average grade for the previous year when 55,330 fine ounces of gold were recovered from 445,864 tons.

At the Copperhead mine, Bullfinch, shaft sinking has been completed to 1,870 feet, the ore pass system extended from the loading pocket below the No. 8 level to 100 feet below the No. 16 level and the underground crushing station transferred to the 1,670 ft. level.

Development work was mainly confined to the Nos. 10, 12, 14 and 16 levels. Extensive diamond drilling was carried out along the drives to delineate the extent of the ore body which is very irregular in shape.

At Fraser's mine, Southern Cross, a winder was installed on the No. 1 shaft and the existing head-frame repaired. No. 3 shaft was stripped and retimbered and further sinking was in progress at the end of the year. The stripping and retimbering of the Golden Pig shaft, also in this area was commenced.

The *Radio Gold Mine* produced 363 fine ounces from the treatment of 220 tons of ore. The underlay shaft was sunk a further 113 feet to 450 feet. Ore reserves are stated as 2,770 tons and increased production is envisaged for the coming year.

Edward's Reward treated 2,390 tons for a return of 1,414 fine ounces of gold. Surface diamond drilling, undertaken by this Department has proved the downward continuation of the ore body below the No. 3 level.

The *Francis Furness*, a small but steady producer at Marvel Loch, crushed 432 tons for a return of 377 fine ounces of gold. Operations are now being carried out below water level and approximately 80,000 gallons per day are pumped to keep the mine unwatered.

Messrs. Bell and Robinson recovered 887 fine ounces of gold from 557 tons of ore broken from the *Marjorie Glen Reward Mine* at Mount Rankin. This small rich mine is now down to the 250ft. level.

NORTH COOLGARDIE GOLDFIELD.

Sixty four thousand eight hundred and forty-eight tons of ore were treated in this goldfield for a return of 35,918 fine ounces of gold, the average return being 11.08 dwts. per ton. There was a small increase in tonnage but the grade declined as compared with the previous year which was 34,530 ounces recovered from 60,434 tons averaging 11.42 dwts. Production for 1955 was 4.3% of the State's total.

In the *Menzies District* 18,393 ounces were recovered from the treatment of 33,055 tons of ore, production coming mostly from the *Timoni* mine at Mount Ida which treated 30,056 tons for a recovery of 17,114 fine ounces of gold. In the previous year 24,290 tons were treated for a recovery of 13,518 fine ounces. The increased tonnage treated was made possible by the completion of extensions to the plant late in 1954.

Disappointing results were obtained from development of the No. 8 level, which results were offset somewhat by encouraging values obtained in developments on the upper levels of the mine.

Production in the *Ularring District* declined to 29,407 tons of ore returning 15,402 fine ounces of gold as compared with the previous years output of 17,367 fine ounces recovered from 32,752 tons. This decline is accounted for by the reduced output of the *Callion* mine which produced 13,037 fine ounces from 26,922 tons of ore averaging 9.7 dwts. per ton. During 1954, 30,974 tons yielded 15,385 fine ounces at an average recovery of 9.93 dwts. per ton.

Among the smaller mines the best returns were from the *Mabel Gertrude* at Morley's with 415 fine ounces from 128 tons, *Ajax West* at Mulline with 475 fine ounces from 721 tons and *Oakley* at Mulwarrie with 506 fine ounces from 300 tons.

Niagara District reported 423 fine ounces from the treatment of 377 tons. The *Altona* was responsible for most of this production with a recovery of 241 fine ounces from the treatment of 281 tons.

Yerilla District.—There was very little activity in this area, the reported production being 1,700 fine ounces recovered from the treatment of 2,009 tons of ore. The only producer of note was the *Yilgangie Queen* with 1,568 ounces from 1,468 tons.

MOUNT MARGARET GOLDFIELD.

The total ore treated in this goldfield amounted to 114,744 tons and the gold yield of 28,671 fine ounces was an average of 5 dwts. per ton. This is equal to 3.4% of the gold production for the State. In the previous year 107,238 tons, averaging 5.3 dwts. were treated for a recovery of 28,413 fine ounces of gold.

Mount Morgans District produced 842 fine ounces from the treatment of 1,903 tons averaging 8.35 dwts. per ton, as compared with 209 fine ounces from 408 tons for the previous year. The principal producer was the *Queen of the May* at Yundamindra with 776 fine ounces of gold from 1,845 tons. All available ore in this mine has been stoped to the 200 ft. level and the tributaries are now engaged in developing the 242 ft. level.

Mount Malcolm District produced 25,437 fine ounces of gold from the treatment of 104,245 tons of ore at an average recovery of 4.9 dwts. per ton. During the previous year 103,663 tons were treated for a recovery of 26,603 fine ounces. The only contributor of note was the *Sons of Gwalia*, which produced 23,226 fine ounces from the treatment of 102,742 tons, average recovery being 4.52 dwts. per ton. Production was less than in 1954 when 26,168 fine ounces were recovered from 103,237 tons of ore averaging 5.07 dwts. per ton. This loss of production may be accounted for by the collapse of the shaft at the No. 3 bin and mining operations were suspended for several weeks till the shaft was cleaned out and retimbered in the collapsed area.

This mine has benefited from assistance given by the Commonwealth Government, without which it would have been difficult to meet working costs. Re organisation of the company has been effected and its venue transferred from London to Perth. With loan monies from the State Government, quarters and a mess house have been erected to attract a suitable labour force.

Electric locomotives are in the process of replacing horses for ore and "fill" haulage. Additions to mill include a 60 ft. thickener and two 28 ft. agitators.

Mount Margaret District produced 2,391 fine ounces from the treatment of 8,596 tons of ore averaging 5.56 dwts. per ton as compared with 1,599 fine ounces recovered from 3,167 tons of ore in the previous year.

The mild boom, created by the successful stock exchange flotation of the Lancefield N.L. company to develop and put in production leases held by D. Cable, did not survive 1955. The leases have since reverted to Mr. Cable. The production for this mine amounted to 584 ounces from the treatment of 8,141 tons or 1.43 dwts. per ton.

Several small mines were active in the district the most important being the *Boomerang* with 623 ounces from 150 tons and *Nil Desperandum* with 114 ounces from 57 tons.

COOLGARDIE GOLDFIELD.

This Goldfield produced 21,591 fine ounces of gold from the treatment of 38,224 tons of ore averaging 11.30 dwts. per ton recovery, which was an increase in grade on the previous year's production of 18,743 fine ounces from 38,381 tons of ore averaging 9.76 dwts. per ton. The production for 1955 was equal to 2.6% of the State's total.

Coolgardie District produced 21,493 fine ounces of gold from the treatment of 38,006 tons at an average recovery of 11.3 dwts. per ton. In the previous year 38,158 tons of ore yielded 18,664 fine ounces at the rate of 9.4 dwts. per ton.

New Coolgardie Gold Mines N.L. reported the production of 19,180 fine ounces from the treatment of 33,296 tons of ore averaging 11.5 dwts. per ton. Production for 1954 was 15,761 fine ounces from 33,534 tons. This Company was taken over by Gold Mines of Kalgoorlie (Aust.) Ltd. during the year and towards the end of the year all the ore was transported to Kalgoorlie for treatment.

At the *Barbara* mine development was confined to testing of the North Lode shear on No. 5, 6 and 7 levels. At *Bayleys* a programme of reconditioning old workings and development has been undertaken. The shaft has been unwatered to below the No. 12 level. A new ore body, the North Spur Reef was found and partly exposed between the No. 6 and 8 levels.

Small producers on the field include the *Jackpot* with a return of 714 ounces from 2,197 tons and *MacPherson's Reward* with 305 ounces from 262 tons.

98 fine ounces of gold recovered from the treatment of 218 tons of ore was reported from the *Kunanalling District*.

PILBARA GOLDFIELD.

In this goldfield 3,873 fine ounces were recovered from the treatment of 5,163 tons of ore averaging 15 dwts. per ton as compared with 2,800 fine ozs. from 7,978 tons for the previous year. Output from this field should increase within the next year following good results obtained by departmental diamond drilling in the Bamboo Creek area.

Marble Bar District produced 942 fine ounces of gold from the treatment of 1,434 tons of ore averaging 13.14 dwts. per ton. *Halley's Comet* reported the treatment of 690 tons of ore for a return of 537 fine ounces of gold. The owner of this mine has planned for a diamond drilling programme for the coming year.

Nullagine District reported 2,931 fine ounces from the treatment of 3,729 tons, the main producer being the *Blue Spec* with 2,451 fine ounces from the treatment of 3,388 tons of ore. This mine ceased operations in May. A departmental drilling programme is envisaged for this mine in the coming year and if results are promising there may be a chance that this mine will be revived.

The *Alice* mine produced 264 ounces from 235 tons and the *Barton* 117 ounces from 246 tons of ore. There were several other small producers with 99 ounces between them.

BROAD ARROW GOLDFIELD.

A number of small mines in this goldfield produced a total of 2,735 fine ounces of gold from the treatment of 5,528 tons of ore averaging 9.9 dwts. per ton. In the previous year 2,848 fine ounces were recovered from the treatment of 3,541 tons averaging 16.08 dwts. per ton.

An average of 119 men were active in this goldfield. Several new small shows have appeared, but in many instances prospecting proved nothing of value or a small pocket was extracted and the prospector moved on.

Tributers on the *Ora Banda Amalgamated* obtained 206 fine ounces from the treatment of 309 tons of ore. The *New Mexico* produced 147 ounces from 51 tons and the *New Mexico South* 343 ounces from 113 tons. Two other small producers were the *Gimlet Leases* with 254 fine ounces from 1,579 tons and the *King of Kings* at Smithfield with 168 fine ounces from 1,470 tons.

Production from the other Goldfields in the State amounted to 778 fine ounces.

MINERALS OTHER THAN GOLD AND COAL.

The production of minerals, other than Gold and Coal, for 1954 and 1955 is shown in the table below.

Brief notes on mineral production are given below.

Antimony.

204 tons of auriferous antimonial concentrate assaying 29% Antimony was exported overseas from the Blue Spec mine at Nullagine. No payments were made for the greater part of the antimony which returned £230 to the producer. Full scale production from the mine may recommence in 1957 if diamond drilling, to be undertaken by the Mines Department, is successful in discovering extensions of the ore body.

Asbestos.

Production of blue asbestos rose 18% to 4,487 tons during the year. Overseas orders were obtained and Australian Blue Asbestos has an assured market for some years. Commonwealth assistance to the industry has further brightened the outlook for Wittenoom.

Chrysotile asbestos was mined at Nunyerry and Lionel in much the same quantity as in previous years.

Barytes.

A 10 ton parcel was mined at Cranbrook. This sudden fall in production was brought about by the drop in demand by the oil industry which obtained considerable stocks during the previous year.

Bentonite.

Bentonite production from Marchagee fell to 647 tons as compared with 1,122 tons for the previous year. This decline is also attributed to the falling off of orders for bentonite for use in drilling muds.

Beryl.

Production for the year amounted to 198.63 tons containing 2,348 units of Beryllium Oxide and valued at £34,430. Main producing areas were:—Cooglegong, Mount Francisco, Pippingarra, Wal-larieny and Wodgina in the Pilbara, Yinnietharra in the Gascoyne, and Spargoville in the Coolgardie Goldfield.

PRINCIPAL MINERALS OTHER THAN GOLD AND COAL.

Mineral.	1954.		1955.	
	Tons.	Value. £A.	Tons.	Value. £A.
Antimony Ore and Concentrates	45.44	1,410	203.88	230
Asbestos—				
Chrysotile	303.65	13,474	274.58	15,997
Crocidolite	3,793.67	542,202	4,487.35	486,032
Barytes	1,043.74	7,631	10.00	70
Bentonite	1,121.60	4,111	646.94	2,591
Beryl Ore	132.15	22,607	198.63	34,430
Chromite	4,269.55	48,957	....	....
Clays—				
Cement Clay	11,901.00	5,903	34,924.32	25,445
Fire Clays—				
Kaolin Type	1,203.00	1,143	878.00	834
Kaolin and Other Types	5,535.00	5,535	6,034.00	6,034
White Clays—				
Ball Clay (Ceramic)	4,000.00	16,000	....	....
Kaolin (Filler Material)	20.00	100	76.00	380
Corundum	....	....	9.15	275
Copper Ore	....	....	12.12	1,001
Cupreous Ore (Fertiliser)	4,748.11	50,381	7,730.78	101,731
Diatomaceous Earth (Calcined)	150.00	1,579	....	....
Dolomite	....	....	81.00	324
Emeralds (carats—cut)	8.68	313	....	....
Emery	....	....	8.15	245
Felspar	3,225.91	14,491	3,565.00	16,660
Fergusonite	....	....	0.13	226
Fullers Earth	....	....	10.76	54
Glass Sand	7,803.01	5,541	6,758.98	4,801
Glauconite	257.50	9,012	196.50	7,407
Graphite	....	....	110.00	990
Gypsum	41,142.00	31,620	39,946.00	30,336
Iron Ore (for Pig)	18,293.29	209,027	17,302.88	220,558
Iron Ore (Exported)	634,514.00	629,325	496,882.00	492,741
Lead—Ore and Concentrates	2,166.97	101,183	1,415.96	95,191
Magnesite	91.75	258	....	....
Manganese	40,581.00	608,215	37,490.66	423,830
Ochre—				
Red	388.00	3,694	345.19	3,913
Yellow	41.45	415	....	....
Petalite	15.00	69	....	....
Pyrites	5,6150.00	441,466	49,485.00	397,269
Silver (Fine ozs.)	228,377.43	86,933	235,794.73	92,781
Spodumene	....	....	3.89	57
Talc	2,920.03	45,851	2,586.81	37,767
Tantalo-Columbite Ore and Concentrates	52.11	76,445	11.99	25,762
Tin	121.32	62,977	179.72	94,912
Tungsten—Scheelite (lb.)	8,279.00	3,361	17,365.00	7,417
Zinc (Metallic)*	73.85	(Not Pay- able)	....	....
Total	.....	3,051,229	....	2,628,291

* By product from Silver-Lead-Zinc Mining.

Chromite.

No mining was attempted at the Chromite deposit at Coobina during 1955. Resumption of work is expected in 1956.

Clays.

Clays, from Maida Vale, Gosnells, Glen Forrest, Clackline and Mount Kokeby, totalled 41,912 tons valued at £32,693.

Corundum.

A small parcel of 9.15 tons was obtained by Clackline Refractories Ltd. from Mount Broome in the West Kimberley Goldfield. Eight tons of Emery, reported from the same source, was produced in the previous year.

Copper

Copper ore production followed the increased demand for it by fertilizer works. 7,731 tons averaging 8.65% copper were absorbed by this industry during the year. Producing centres ranged from Ravensthorpe to Marble Bar. The comparatively high average price of £13 3s. per ton paid to the producer has encouraged prospectors to seek copper deposits and temporarily abandon gold mining.

Only 12 tons of concentrate was shipped to smelters.

Dolomite.

81 tons were mined from the Mount Magnet deposit by Atkinson and Giles.

Felspar.

Australian Glass Manufacturers Pty. Ltd. obtained 3,565 tons from their quarry at Londonderry. Annual production from this quarry has doubled over the last four years.

Fergusonite.

A small parcel (0.13 tons) from Cooglegong realised £226.

Fullers Earth.

10.76 tons were obtained from the Marchagee deposit by D. J. and T. I. Read.

Glass Sand.

6,759 tons of glass sand for local use were obtained from Lake Gngangara.

Glaucanite.

Production from the Gingin deposit amounted to 1,179 tons of greensand from which 196.5 tons of glaucanite were recovered.

Graphite.

110 tons assaying 20% carbon were obtained from the Munglinup deposits. Test work carried out at the School of Mines, Kalgoorlie, has shown that the ore can be satisfactorily beneficiated to over 80% C. by fine grinding and flotation.

Gypsum.

Local plaster manufacturers obtained a total of 39,946 tons from Lakes Seabrook and Brown, and in the Hines Hill district. Included in the above total is 9 tons from Norseman.

Iron Ore.

Production at Cockatoo Island proceeded at a steady rate, 496,882 tons being mined and exported. Australian Iron and Steel Ltd. have commenced a diamond drilling programme for the purpose of proving the structural geology and possible mining of the deposit below high water level. Further investigations were carried out in examining the ore deposit at Koolan Island.

17,303 tons of ore for local pig iron production were obtained from Koolyanobbing by Bell Bros. contractors for the Wundowie Charcoal Iron works.

Lead.

Lead mining declined during the year, there being 1,416 tons of concentrate marketed yielding 1,007 tons of lead as compared with the previous year when 2,167 tons yielded 1,496 tons of lead. The principal producing field was Northampton with 1,069 tons concentrate followed by the Pilbara with 331 tons and 16 tons from the Ashburton. Silver recovered from lead concentrates was valued at £1,119.

Magnesite.

No Magnesite was produced during the year.

Manganese.

The Horseshoe deposit in the Peak Hill Goldfield was worked consistently throughout the year. 29,897 tons averaging 44.28 per cent. Mn. was obtained from this source. The brightest aspect of these operations has been the opening up of more Manganese beneath what was originally thought to be the base of the deposit.

From Ragged Hills in the Pilbara 7,594 tons averaging 50.74 per cent. Mn. was carted to Port Hedland for export.

Ochre.

A total of 345 tons of red ochre were obtained from deposits at Weld Range in the Murchison Goldfield and Ophthalmia Range in the West Pilbara.

Oil.

Two companies were actively engaged in exploratory drilling in the northern part of the State.

Associated Freney drilled two holes, one at Nerrima to 9,072 feet and another at Myroodah to 6,001 feet. The only indication of oil was between 2,675 and 2,680 feet in the Nerrima bore.

West Australian Petroleum continued drilling in the Rough Range, Cape Range, Giralia, Warroora and Grant Range areas. Stratigraphic drilling at Grierson, Cape Cuvier and Dirk Hartog Island was also undertaken.

At Rough Range Site No. 1A oil was obtained at an average rate of 850 gallons per hour from the Birdrong sand. As a result of the testing between 3,597 and 3,610 feet it appeared that the mean efficient rate of production of the test well was approximately 385 barrels (35 gallons per barrel) of oil and 33 barrels of water per day, on a $\frac{1}{4}$ inch choke at a productivity index of 6.4.

Pyrites.

Norseman Gold Mines railed 49,485 tons, with a sulphur content of 22,004 tons, to superphosphate works in the metropolitan area. It is disappointing to note the diminishing market for pyrite, owing to the importation of increasing amounts of brimstone. The Iron King mine is producing at one quarter its rated capacity. The installation of a heavy media beneficiation plant was completed and in use at the end of the year.

Silver.

Silver as a by-product of Gold, Lead and Copper mining amounted to 235,795 fine ounces.

Spodumene.

3.89 tons of concentrate, containing 26.55 units of lithium oxide, were obtained from the Ravensthorpe district.

Talc.

Production for the year was 2,587 tons, output coming mostly from the Three Springs district. 27 tons were obtained from the Mount Monger deposit.

Tantalo-Columbite Ores.

The sudden fall in production from 52 tons of concentrate in 1954 to 12 tons in 1955 was brought about by the removal of the bonus paid by the United States Government.

A little over a ton was obtained from tin mining at Greenbushes, $\frac{1}{2}$ ton from Spargoville and Ravens-thorpe, and the rest from the Pilbara. Two of the larger producers at Wodgina have turned their attention to alluvial tin in the Cooglegong and Shaw River areas.

Tin.

Tin and Strategic Minerals at Greenbushes increased their output to a total of 102 tons of concentrate. Western Queen in the same area produced 17 tons early in the year and then ceased operations. The ground was subsequently taken up by Tin and Strategic. 61 tons were obtained from the Pilbara to make the total production for the State, 180 tons valued at £94,912.

Tungsten.

Renewed interest was shown in this metal, there being 8 tons of concentrate marketed as compared with 4 tons for the previous year. Most of the production was from Davyhurst with small amounts from the Mount Margaret and Coolgardie Goldfields.

(Sgd.) J. K. N. LLOYD,
Assistant State Mining Engineer.

Appendix No. 1.

EXPLORATORY DRILLING.

State Mining Engineer: With the purchase of two new Mindrill A2000's this Department now has six drills actively engaged in exploratory drilling. Three machines were operating for the full year, two for six months and one for four months. A total of 25,416 feet were drilled in widely scattered areas from Collie to Bamboo Creek. Four of the drills were let on contract and two were operated by departmental employees.

Contract Drilling: The drilling of the iron and pyritic deposit at Koolyanobbing was successfully concluded in August. A good grade pyritic lode was explored and proved at Dowd's Hill and a smaller but still economic ore body was discovered some two miles south east. On completion of this programme the drill, an A3000 was shifted to Edward's Find and drilling started on the Sunshine Reward. Four holes totalling 3,700 feet were drilled to prove the downward continuation of the auriferous ore body, below the 300 ft. level. During the period November, 1952-July, 1956, contractor A. Horsham has drilled a total of 13,200 feet with the A3000. Footage for 1955 was 3,633 feet.

Contractor L. C. Honey, operating an A2000, drilled 6,110 feet in the Yilgarn Goldfield without much success, as no ore bodies of economic importance were cut in any of the holes which were drilled at Mount Jackson, Marie's Find and the Manxman Group. This drill is now operating in the Mount Magnet district.

A diesel powered A2000 was added to the operational strength during June and a contract let to K. McCallum for drilling in the Pilbara Goldfield. Three holes drilled at Warrawoona failed to cut any ore body of economic importance. At the end of September the plant was shifted to Bamboo Creek. Drilling in this area was more successful and values up to 17 dwts. gold per long ton over 7 feet were encountered below any previous workings. Results obtained from this drilling will be reported by Geological Surveys on completion of the programme. To the end of the year a total of 4,052 feet had been drilled in the Pilbara, 1,421 feet at Warrawoona and 2,631 feet at Bamboo Creek.

During August a second diesel powered A2000 was let on contract to J. F. Grill and drilling started at the "Princess Royal," Cue. Two holes, 815 and 602 feet deep, were drilled without success and the machine then moved to drill the "Rising Sun Reef." The first hole at this site had reached 773 feet at the close of the year.

The Great Fingall Project.—During 1950 the Great Fingall Exploration Coy. Ltd. put down two vertical holes in an attempt to cut the Fingall lode at depth. The first hole was abandoned at 1,130 feet because of mechanical difficulties brought about by loose wedges in the hole. In all, 18 wedges were set in the hole in an attempt to keep it vertical. The second hole was sited to allow for some creep but eight wedges were set in it before drilling was suspended at 1,708 ft. following on financial difficulties experienced by the Company. Attempts to obtain additional finance for the venture were unsuccessful and no further work was attempted till early in 1955 when arrangements were made for this Department to drill the Great Fingall, the operating costs to be borne jointly by Day Dawn Gold Pty. Ltd. and the Mines Department.

A site was selected by the Government Geologist so that with an initial dip of 80° and a deflection of 1½ degrees per 100 ft., the hole would cut the expected repetition in depth of the Great Fingall ore body at approximately 3,200 feet vertically.

The B.B.S.4 drill, previously operating in the Collie Coalfields, was overhauled and with a 50 ft. drilling headframe, fabricated from 8 inch bore casing by the State Engineering Works, was transported and erected on the site. Drilling commenced on June 18th, 1955, on a two shift basis five days per week.

Progress of the "BX" size hole was at a rate of 21.4 feet per machine shift to a depth of 1,326 feet where drilling operations were stopped due to excessive deflection of the hole which was 3½ degrees per 100 feet over the final 300 feet. The overall average deflection in this hole was 1.77 degrees per 100 feet and it was considered that the target area would not be reached using normal drilling techniques and standard "BX" equipment.

Subsequently a deflection reducing core barrel was made in Perth to a pattern adopted by the Western Mining Corporation in their drilling of the Southern Series of the Golden Mile. (With this barrel, deflection is controlled by having a built up section in every four feet so that rod vibration is damped out before reaching the bit and the barrel itself is virtually central in the hole for its entire length). Exit was made from the original hole at 254 feet by drilling with BX casing. From this point to 900 feet the 30 ft. single tube deflection reducing core barrel was used with satisfactory results except that binding of the barrel in the hole was evident. To alleviate this problem the number of fluted built up sections were reduced by placing one every 10 feet instead of three feet as originally. This arrangement was used till the quartz reef was encountered at 3,786 feet and then a single tube core barrel was used to the final depth of 4,137 feet. Average hole deflections are listed below:—

0-1,000 feet average deflection	0.8 degrees per 100 feet.
1,000-2,000 feet average deflection	1.2 degrees per 100 feet.
2,000-3,000 feet average deflection	1.0 degrees per 100 feet.
3,000-4,000 feet average deflection	0.5 degrees per 100 feet.

Average deflection over the total length was 0.83 degrees per 100 feet.

The course of the hole gradually progressed to the East from the initial magnetic bearing of S45°E to S60°E at 2,000 ft. From this point to final depth the course of the hole remained fairly constant at S60°E, that is a true bearing of S56°E. All surveys were made with a BX-NX Tro-Pari instrument at 50 ft. intervals to 2,000 ft. and at 100 ft. intervals thereafter. No trouble was experienced with the operation of the instrument, which was checked on a testing block before each survey and overhauled and cleaned every six months.

A brief description, of equipment and average drilling conditions, is given below.

Drilling Machine.—Boyles Bros. B.B.S.4 powered by a 6-cylinder G.M.C. petrol motor developing 88 h.p. at 2,400 r.p.m. For most of the drilling, rotation of the hydraulic head was kept within 100-150 r.p.m. so that rod vibration would be at a minimum. Rate of advance whilst drilling was 3-4 feet per hour with a weight of 1,800 lbs. on the BX bit. Average rate of advance over the whole operation was 9.7 feet per machine shift.

Pumping Equipment.—Mindrill 1,000-3,000 single cylinder double acting pump driven by a Perkins P.3 diesel. Standby unit was a duplex 750-1,200 G.P.H. unit powered by a 4-cylinder air cooled Wisconsin petrol engine. Pump pressures were kept below 500 lbs. per square inch throughout the hole, water being pumped at an average rate of approximately 1,000 gallons per hour. Velocity of the return water in the hole was approximately 3,000 feet per minute.

Drilling Headframe.—50 ft. "A" type fabricated from 8 inch bore casing and 3 inch water pipe. All drilling loads carried by the two front legs which are pivoted so that they can be set at same angle as the hole.

Rods and Core Barrels.—BX equipment was standard throughout the hole. B rods, handled in 49 feet sections, were purchased in 20 ft. lengths, the entrances to couplings being tapered to reduce resistance to flow and coupling threads non standard at 3 T.P.I. Core barrels used were sectional double and single tube and a sectional deflection reducing core barrel. The last named barrel was fabricated from seamless tubing having O.D. 2½ in. and I.D. 1¾ in. Between each 10 ft. plain section was placed an 8 in. piece on which was welded 6 strips of stellite 6 in. x ½ in. These strips were ground to give a final O.D. of 2.352 inches (cutting size of B.X. reamer 2.360 inches).

Bits and Reamers.—Diamond bits used were standard "BX" mintung bevel wall core bits set with approximately 13 carats of 15-20 diamonds per carat. There were four waterways per bit. Average life of a bit was 49.6 feet with a loss of 0.094 carats per foot or 4.68 carats per bit. Standard "BX" double tube reamer shells were used for 3,000 ft. and then a change was made to hand set reamers. The change was made because of the excessive wear on one side of the reamers used in conjunction with the deflection reducing core barrel. This wear was brought about by the diamond strips not being set concentric with the axis of rotation of the assembly. This trouble was not experienced with the hand set reamers nor was the eccentricity noticed with the standard strip set reamers when double or single tube core barrels were used.

On the completion of this hole at 4,137 ft. on the 6/7/56 arrangements were in hand to import a Thompson Retrieval Wedge from Canada so that a diversion from the parent hole could be made at 2,600 ft. Drilling costs for the 12 months' operations amounted to £5 8s. 8d. per foot with virtually 100 per cent. core recovery.

Results of core assays over a 21 ft. interval between 3,786 ft. and 3,807 ft. average 4.69 dwts. per long ton with a 7ft. section assaying 8.16 dwts./ton. This intersection was made approximately 1,000 ft. below the deepest workings of the mine.

Failing M-1 Drill Operations.—This machine operated in the Collie, Bunbury and Perth districts during 1955 on exploratory drilling for coal, water, and bridge foundations. Average cost per foot drilled was £2 9s. 8d. for the 6,763 feet drilled during the year. Total footage was below that drilled in previous years due to a two months'

stoppage for a complete overhaul of the machine and the slow rate of progress in mudstone in hole 28 at Collie which reached a record depth of 2,890 feet.

The drilling programme at Collie was completed on the 24/7/56 with the Failing, drilling 41 holes for a total of 32,848ft. at an average operating cost of £1 19s. per foot. This programme started in November 1952 was continuous 3 shifts per day 5 days a week for the whole period except for annual three weeks' leave and broken periods totalling 27 weeks whilst the machine was away from the district.

Operational costs for the Collie programme are listed below:—

COLLIE COALFIELDS DRILLING.

	Segregation of Operational Costs.			Per foot.		
	£	s.	d.	£	s.	d.
Supervision	5,909	10	5	3	7	
Wages	30,574	15	6	18	8	
Bits	6,744	2	9	4	1	
Fuel	1,965	16	5	1	2	
Bentonite	1,164	18	6			9
Repairs and Replacements	14,156	8	7	8	7	
Transport	3,576	13	0	2	2	
Total cost	64,092	5	2	1	19	0

Feet Drilled—32,848 equivalent to 912 feet per month in holes varying between 184 and 2,890 feet, in depth.

During the period 11th May, 3rd June, 1955, the Failing rig was engaged in drilling for water for the State Electricity Commission's power station at Bunbury. Three holes were drilled, about a quarter of a mile from the power house, for a total of 412 feet and at an average cost of £3 12s. 3d. per foot. The high cost of these holes can be attributed to their shallowness (86, 202 and 124 feet), and roller and diamond bit cost of nearly 16s. per foot. The holes were drilled 6 inches diameter with Reed rock bits till penetration was retarded by the basalt formation. From this point to final depth the holes were drilled 3 13/16 inches diameter using diamond tools. Six inch casing was seated on solid rock after reaming to 7½ inches the decomposed section of the basalt. Each of the bores flowed freely at a rate of approximately 1,200 gallons per hour.

An interesting assignment was the drilling of the area to be traversed by the "Narrows" bridge at Perth. Thirteen holes totalling 2,544 feet were drilled for the Main Roads Department during the period 10th December, 1955, 7th February, 1956. for a cost of £1 11s. 9d. per foot. Seven were drilled on the banks of the river and six from a floating platform on the river itself. These holes were put down to obtain core samples of the strata on which the bridge foundations will be supported. Solid limestone was encountered in all the holes at depths varying between 118 and 152 feet. Sands, muds, and a little gravel were cut above the limestone.

Normal rotary drilling practice was followed for the drilling of the land based holes and no difficulty was experienced in the drilling of them. However, some time was lost in shifting to the several sites as bogging of the equipment was frequent on the loose fill in the areas traversed.

For the drilling on the river the Failing rig was towed onto an all steel barge by the Department's Leyland Hippo service truck, and the truck, drill and barge towed to the drill sites by tug. The barge, used as the drilling platform, was 120ft. x 24ft. x 6ft. divided into three watertight compartments each 40 feet in length. The drill was set up with the rotary and hoisting gear overhanging one end of the barge. This load was balanced by having the truck at the other end and the compartment beneath it partially filled with water. Stability at each site was gained by using six anchors set radially from the ends of the barge. Anchor cables were attached to crab winches welded to the deck. With this arrangement the barge could at all times be positioned so that the rotary gear was immediately above the hole being drilled. At each site a 30 foot length of 8 inch casing was set in the river bed and the casing supported by three anchor lines. These lines were adjustable so that the casing could be kept vertical. Depth of water at the sites varied between 10 and 20 feet. Fluid return from the hole was carried by a launder to a 400 gallon square tank supported at water level by two pontoons. This assembly was secured to the barge. The launder was pivoted at the top of the casing to counteract the 2 foot rise and fall of the tide.

The first 80 feet of each hole was drilled using six inch roller bits and river water for the drilling fluid. Three foot samples were taken as required by the bridge engineer. Below 80 feet the strata was cored using stationary inner tube core barrels fitted with bottom discharge diamond core bits cutting a 2½ inch diameter core from a 3 13/16 inch hole. Mud fluid was used throughout this phase of the work. At no time was trouble experienced in keeping the drill directly over the top of the casing. As an added precaution drill pipe was added every 10 feet so that the "Kelly" would not have more than half its length inside the casing, so lessening its chance of bending should the barge move.

The above operation was successfully completed on the 7th February, 1956, after two months drilling at an average rate of 1,272 feet per month.

Previous reports on drilling generally, and drilling techniques used in the operation of the Failing M-1 drill appear as appendices to the State Mining Engineer's reports for 1953 and 1954.

(Sgd.) J. K. N. LLOYD,
Assistant State Mining Engineer.

Appendix No. 2.

REPORT ON ACTIVITIES OF EXAMINERS FOR UNDERGROUND SUPERVISORS' AND MINE MANAGERS CERTIFICATES FOR 1955.

School of Mines,
Kalgoorlie,
6th December, 1955.

The Chairman, Board of Examiners for Mine Managers' and Underground Supervisors' Certificates, Mines Department, Perth, W.A.

I submit herewith the Annual Report on the work of the Board of Examiners for Mine Managers' and Underground Supervisors' Certificates for the year 1955.

Examination in Mining Law.—An examination in Mining Law, which is a requirement for the Mine Manager's Certificate of Competency was held on April 15th, 1955, results being as follows:—

Number entered	....	....	....	....	10
Number passed	....	....	....	....	4
Number failed	....	....	....	....	5
Did not sit	....	....	....	....	1

Following are the names of the successful candidates:—

B. L. Berry.
G. K. McLellan.
D. Seaton.
J. P. Shanahan.

Underground Supervisors' Examination.—An examination for Underground Supervisors' Certificates of Competency was held on September 26th, 1955. The examination paper for the Mining section was prepared by Mr. Boyland, and the paper for the Mining Law section was prepared by Mr. Hobson.

Forty three candidates sat for the examination which is the largest number since the inception of the Board in 1949. Entries were received from the following centres:—

Kalgoorlie district	....	....	....	....	23
Coolgardie	....	....	....	....	2
Norseman	....	....	....	....	2
Bullfinch	....	....	....	....	4
Southern Cross	....	....	....	....	1
Marvel Loch	....	....	....	....	1
Three Springs	....	....	....	....	1
Protheroe	....	....	....	....	1
Mt. Magnet	....	....	....	....	2
Leonora	....	....	....	....	2
Laverton	....	....	....	....	2
Nullagine	....	....	....	....	1
Onslow	....	....	....	....	1

The results of the examination were as follows:—

Number entered	....	....	....	....	43
Number passed	....	....	....	....	33
Number deferred	....	....	....	....	1
Number failed	....	....	....	....	9

The names of the successful candidates are as follows:—

K. G. Anderson.	E. W. Jacobson.
D. E. Brackenridge.	J. A. Lamotte.
J. F. Burston.	H. G. McMahon.
C. R. Bird.	J. M. O'Connor.
M. G. Barr.	L. Perry.
W. J. Cruickshank.	E. Ryan.
J. Clancy.	L. J. Roberts.
W. Claus.	J. W. Stodart.
G. A. Crunkhorn.	C. A. G. Smart.
J. J. Cappa.	T. Smith.
S. G. Camp.	C. M. Smith.
F. C. Evans.	D. Seaton.
R. J. Graham.	H. W. Stonehouse.
A. Harrison.	R. J. Tagliaferri.
J. S. Henderson.	C. B. G. Thornton.
K. V. Jacob.	E. Wilson.
	J. J. Zuvich.

The following was deferred (to take the Mining Law section and oral examination again next year):—

A. Sofoulis.

The following applicant, deferred from last year was granted a pass, having completed the required experience:—

G. Newman.

Mine Managers' Certificates of Competency.—Seven applications for Mine Managers' Certificates were received during the year. Five were approved and two deferred, pending completion of the required underground experience.

The names of the successful applicants are as follows:—

J. A. Cedro.
E. T. Coles.
W. B. Edlington.
G. Newman.
D. Seaton.

(Sgd.) G. M. LUMB,
Secretary,

Board of Examiners for Mine Managers'
and Under-ground Supervisors' Certificates.

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DIVISION III

Report of the Superintendent of State Batteries

UNDER SECRETARY FOR MINES.

For the information of the Hon. Minister I submit my report on the operation of State Batteries for the year ending 31st December, 1955.

Crushing Gold Ores.

One 15 head, five 10 head, and nine five head mills crushed 42,207½ tons of ore made up of 507 separate parcels an average of 83.25 tons per parcel. The bullion produced amounted to 17,939 ozs. which is estimated to contain 15,203 ozs. of fine gold, or 7 dwts. 5 grs. of gold per ton of ore.

The cost of crushing including administration was 53s. 10d. per ton as against 49s. 6d. for the previous year, a rise of 4s. 4d. per ton. Laverton had the best cost figure at 35s. 8d. per ton.

The average assay value of all the ore after amalgamation but before cyanidation was 3 dwts. 12 grs. Thus the total head value of the ore was 10 dwts. 17 grains which is 22 grains more than the previous year's figure.

Values in this ore before cyanidation can be segregated as follows:—

	Tons.	%
Over 2 dwts. 8 grs. per ton	20,664½	49
1 dwt. 18 grs. to 2 dwts. 8 grs. per ton	2,963½	7
Under 1 dwt. 18 grs. per ton	17,142½	40.6
Refractory	1,437½	3.4
	<u>42,207½</u>	<u>100</u>

Cyaniding.

Five plants handled 12,858 tons of crushed ore for a production of 2,419 fine ozs. worth £37,867. The average content of this tonnage was 4 dwts. 23 grains before treatment while the residue contained 1 dwt. 7 grains. The theoretical extraction by cyanidation was therefore 74.1% and the actual extraction 75.2%.

The cost of cyanidation was 42s. 2d. per ton, an increase of 6s. 11d. per ton on the previous year. Laverton and Ora Banda showed the best figures with 28s 6d. and 36s. 6d. respectively.

ESTIMATED OVERALL RECOVERY.

Figures for estimated recovery are:—

	Content Fine oz.	Per ton crushed		%
		dwt.	Gr.	
Head Value	22,632	10	17	100
Amalgamation recovery	15,203	7	5	67.31
Cyanidation recovery	2,419	1	4	10.89
Total recovery	<u>17,622</u>	<u>8</u>	<u>9</u>	<u>78.20</u>

Value of Production.

The estimated value of production since inception excluding the value of gold tax paid to the Commonwealth:—

	GOLD.	
	1955 £	Grand Total £
Par production:		
Crushing	64,605	8,333,334
Cyanidation	10,322	2,066,968
Gold Premium:		
Crushing	173,039	4,222,801
Cyanidation	27,545	1,262,288
Open Market Premium:		
Crushing	262	28,832
Cyanidation	64	9,939
Total Gold Production	<u>275,837</u>	<u>15,924,162</u>

OTHER ORES REALISED.

	£	£
Tin:		
Ore	—	94,005
Residues	—	572
Tungsten:		
Concentrates	819	18,712
Agricultural Copper Ore	2,648	2,648
Lead (Produced 1954 and Part 1955) Concentrates	62,920	62,920
Total other ores	<u>66,387</u>	<u>178,857</u>
Grand Total	<u>342,224</u>	<u>16,103,019</u>

Financial.

	Tons.	Expendi- ture.	Re- ceipts.	Profit.	Loss.
Crushing	42,207½	£ 125,151	£ 25,307	£	£ 99,844
Cyaniding	12,858	27,115	13,803	.....	13,312
		152,266	39,110	.....	113,156

The loss of £113,156 is an increase of £32,446 on the previous year and does not include depreciation or interest. Capital expenditure was incurred as below:—

	General Loan Fund.	Consolidated Revenue Fund.
	£ s. d.	£ s. d.
Kalgoorlie Scraper	764 0 0	.....
Installation Diesel Engine Yarri	800 0 0	.....
Erection of Menzies Battery	2,278 3 0	.....
Conversion of Ora Banda Engine to Oil	116 5 10	.....
Alteration Bins and Jaw Crusher Kalgoorlie	1,442 3 0	.....
New Steel Vats Kalgoorlie	928 7 1	.....
Manager's Residence Laverton	600 0 0	.....
	<u>£ 6,928 18 11</u>	<u>Nil</u>

Cartage Subsidies.

	Tons.	Cost.
On ore carted to State Plants	8,739	£ 4,150
On ore carted to private plants	238	136
	8,977	4,286

Comparative figures for the last three years are:—

—	State Plants.				Private Plants.		
	Tons Crushed	Tons Subsidi-d.	Per-cent. Subsidi-d.	Cost.	Tons Crushed	Cost.	Total Cost.
1953	40,218	11,645	29.0	£ 5,553	371	£ 228	£ 5,781
1954	34,600	7,682	22.2	2,759	49	31	2,790
1955	42,207	8,739	20.7	4,150	238	136	4,286

Treatment of Ores other than Gold.

1½ tons of Tantalite ore were treated at the Northampton Battery for a recovery of 22lb. of concentrates. 90½ tons Columbite ore at Coolgardie Battery produced 900lb. concentrates.

Lead Ores.

The Northampton State Battery crushed during the year 3,648½ tons of lead ore, with an estimated average content of 15.75% lead. There were 26 separate parcels, giving an average of 140.33 tons of ore per parcel.

A total of 516.64 tons of concentrates were produced. The concentrates averaged 72.47 lead, giving an estimated content of 374.42 tons of lead in concentrates.

3,131.96 tons of tailings were discarded. The tailings had an estimated average content of 1.85% lead, giving a total of 58 tons of lead discarded in tailings.

The recovery of lead in concentrates was 89.91% of the lead in the ore delivered to the Battery.

The cost of operating amounted to £12,164 4s., the cost per ton being 75s. 8d. Revenue received was £4,981 18s. 1d., being 31s. per ton. Operating loss was £7,182 5s. 11d. or 44s. 8d. per ton. The expenditure includes Administration costs, but not Interest, Sinking Fund, Depreciation and Superannuation charges.

Sales of lead concentrates to date amount to £62,920. There are still several month's production not sold.

STAFF.

During the year some changes of staff occurred. Manager Sanfead is now at Laverton, in place of Manager Casserly, now at Yarri.

Prospecting activity in the Cue-Meekatharra-Peak Hill portion of the Murchison is now very low, and Managers were not needed at both the Cue and Meekatharra Batteries. Manager Ball was transferred from Meekatharra to Kalgoorlie, where he is Assistant Manager and can be called on at short notice to relieve at any State Battery. Manager Sturman is in charge of the Cue, Meekatharra and Peak Hill Batteries.

Leading Hand Steele who has been Acting Manager at Lake Darlot was promoted to Assistant Manager.

I wish to thank the Staff at Head Office and in the field for their efficient and willing service during the year.

ADMINISTRATION.

Expenditure amounted to £14,843 11s. 5d. as against £15,019 9s. 3d. for 1954, and was equivalent to 5s. 5d. per ton of ore crushed and cyanided as against 5s. 6d.

	1954			1955		
	£	s.	d.	£	s.	d.
Salaries	8,647	11	0	8,920	19	5
Pay Roll Tax	1,941	4	4	2,296	19	10
Workers Compensation	2,353	15	9	2,244	17	9
Travelling and Inspection	1,920	4	5	1,261	1	5
Sundries	156	13	9	119	13	0
	£15,019	9	3	£14,843	11	5

GENERAL REMARKS.

The quantity of gold ore crushed in 1955 was 42,207½ tons showing an increase of 7,608 tons over the 34,599½ tons crushed in 1954. The new Battery at Menzies which commenced operating early in 1955, crushed 4,415½ tons, and contributed considerably to this increase. Considerably higher tonnages were crushed at Boogardie, Coolgardie, Lake Darlot, Laverton and Meekatharra, but Kalgoorlie showed a reduction from 14,718 tons in 1954 to 9,774 tons in 1955.

Crushing costs showed an increase from 49s. 6d. to 53s. 10d. per ton. Wages and salary rises were responsible for some of the increase, but most of the high cost was caused by high maintenance expenditure. Extensive repairs were necessary at the Boogardie, Coolgardie, Laverton, Marvel Loch and Ora Banda Batteries.

During 1955 only 12,858 tons of sands were cyanided, compared with 19,907 tons in 1954. The low tonnage was mainly caused by the present lack of cyaniding equipment at Kalgoorlie and Menzies. A new type of plant, consisting of large steel vats to be filled and emptied by a scraper, is being constructed at Kalgoorlie. If this system is successful, a similar plant will be installed at Menzies.

During the year a new ore feeder, a larger trommel, and equipment for handling drums of concentrates, were installed at the Northampton Battery. These alterations, together with the increased experience of the staff, resulted in increased efficiency as shown by comparing the 1955 results with those of 1954, the first year of operation.

	1954	1955
Tons crushed	3,879½	3,648½
Ore grade—per cent. lead	15.90	15.75
Concentrate grade—per cent. lead	71.88	72.47
Tailings—per cent. lead	3.03	1.85
Recovery of Lead in concentrates—%	83.52	89.91

This plant is now capable of efficiently treating 1,000 tons per month of normal lead ore. If reasonable quantities of ore are available the crushing costs should now show a marked reduction.

(Sgd.) K. M. PATERSON,
Superintendent of State Batteries.

SCHEDULE 1.

Number of Parcels Treated, Tons Crushed and Head Value for the Year ended 31st December, 1955.

No. of Parcels Treated	Battery.	Tons Crushed.	Yield by	Yield by	Tailings Gross @ 100%	Total	Average per Ton (Fine Gold).	Gross Value per Ton fine gold at £4 4s. 11½d. per Ounce.
			Amalgamation. (Bullion).	Amalgamation. (Fine Gold).		Contents of Ore. (Fine Gold).		
10	Bamboo Creek	451½	Ozs. Dwts. 137 3	Ozs. Dwts. 116 5	Ozs. Dwts. 122 7	Ozs. Dwts. 238 12	Dwts. Grs. 10 13	£ s. d. 2 4 9
25	Boogardie	1,142	423 7	358 16	275 7	634 3	11 2	2 7 1
57	Coolgardie	4,739½	1,850 18	1,568 13	512 5	2,080 18	8 19	1 17 4
33	Cue	2,086½	629 16	533 15	318 13	852 8	5 17	1 4 3
127	Kalgoorlie	9,774	4,152 11	3,519 6	1,081 0	4,600 6	9 10	2 0 0
22	Lake Darlot	1,503	514 11	436 2	265 5	701 7	9 8	1 19 8
41	Laverton	8,662½	1,759 17	1,491 9	2,468 14	3,960 3	9 3	1 18 9
23	Marvel Loch	1,190	1,053 6	892 13	297 8	1,190 1	20 0	4 4 11
24	Meekatharra	3,427½	575 10	487 15	203 11	691 6	4 1	1 17 2
65	Menzies	4,415½	2,577 10	2,184 9	935 13	3,120 2	14 3	3 0 0
7	Norseman	194½	24 13	20 18	25 11	46 9	4 19	1 0 4
10	Nullagine	341	246 10	208 18	86 7	295 5	17 11	3 14 2
38	Ora Banda	1,974½	1,877 0	1,590 15	572 12	2,163 7	21 21	4 12 11
7	Peak Hill	296	104 7	88 9	31 14	120 3	8 3	1 14 6
18	Yarri	2,009	2,011 15	1,704 19	232 12	1,937 11	19 7	4 1 11
507		42,207½	17,938 14	15,203 2	7,428 19	22,632 1	10 17	2 5 6

Average Tons per Parcel 83.25.
 Average Yield by Amalgamation per ton (fine gold).... 7 dwts. 4.89 grains.
 Average Value by Amalgamation per ton (fine gold).... £1 10s. 7d. Australian £5 12s. 6d.
 Average Head Value of Tailings per ton (fine gold).... 3 dwts. 12 grains.
 Average Value of Tailings per ton (fine gold) 14/11 Australian £2 14s. 10d.

SCHEDULE 2

Details of Extraction—Tailings Treatment, 1955.

Battery.	Tons Treated.	Head Value.	Contents.	Tail Value.	Contents.	Re- covery.	Call.	Recovery.	Shortage.	Surplus.
		Dwts. Grs.	Dwts.	Dwts. Grs.	Dwts.	%	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Bamboo Creek	670	7 7	4,880	1 20	1,220	75	777 13 5	782 16 5	.....	5 3 0
Coolgardie	2,866	3 16	10,500	21	2,500	76	1,701 14 11	1,693 13 2	8 1 9	.....
Kalgoorlie	1,590	3 10	5,440	17	1,160	79	912 5 2	1,091 3 9	.....	178 18 7
Laverton	6,016	5 0	30,160	1 11	8,720	71	4,556 19 2	4,544 5 3	12 13 11	.....
Ora Banda	1,716	7 12	12,840	1 17	2,900	77	2,111 15 6	2,096 2 11	15 12 7	.....
	12,858	4 23	63,820	1 7	16,500	74.1	10,060 8 2	10,208 1 6	36 8 3	184 1 7

Net Surplus : £147 13s. 4d.

Head Value 4 dwts. 23 grains.
 Tail Value 1 dwt. 7 grains.
 Theoretical Recovery 74.1%.
 Actual Recovery 75.2%.

SCHEDULE No. 3.

Cyanide Yield, 1955.

Battery.	Tons.	Fine ozs.	Value.	Premium.	Total.
			£	£	£
Bamboo Creek	670	183.79	787.874	2,096.357	2,884.231
Coolgardie	2,866	417.93	1,776.372	4,757.651	6,534.023
Kalgoorlie	1,590	256.89	1,091.186	2,922.678	4,013.864
Laverton	6,016	1,067.05	4,565.528	12,141.950	16,707.478
Ora Banda	1,716	493.55	2,100.934	5,627.065	7,727.999
	12,858	2,419.21	10,321.894	27,545.701	37,867.595

SCHEDULE 4.

Statement of Receipts and Expenditure for Year ended 31st December, 1955

MILLING.

Batteries.	Tonnage Crushed.	Expenditure.										Receipts.		Profit.	Loss.
		Management.	Wages.	Stores.	Total Working Expenditure.	Cost per Ton.	Repairs and Renewals.	Sundries.	Gross Expenditure.	Cost per Ton.	Receipts.	per Ton.			
Bamboo Creek	431.5	£ 209 2 4	s. d. 1,103 0 9	£ 333 18 6	s. d. 1,646 1 7	78 3-5	£ 447 9 8	s. d. 222 16 6	£ 2,316 7 9	s. d. 107 4-4	£ 365 16 8	s. d. 16 11-5	£	s. d. 1 950 11 1	
Boogardie	1,141	857 0 11	1,716 1 7	1,586 3 10	4,159 6 4	72 10-9	1,879 16 7	538 18 10	6,578 1 9	115 3-6	744 13 3	13 0-6	.....	5,832 8 6
Coolgardie	4,609.75	650 18 0	3,226 3 7	2,443 0 7	6,320 2 2	27 5-1	2,272 6 2	1,546 19 5	10,139 7 9	43 11-9	1,985 7 10	8 7-4	.....	8,153 19 11
Cue	2,141.5	551 15 3	1,743 6 1	1,962 17 9	4,257 19 1	39 9-2	1,525 14 0	1,195 14 7	6,979 7 8	65 2-2	976 3 8	9 1-4	.....	6,003 4 0
Kalgoorlie	9,656	1,423 9 1	6,236 8 11	5,270 5 4	12,930 3 4	26 9-4	2,480 2 4	3,521 7 6	18,931 13 2	39 2-5	4,129 16 1	8 6-6	.....	14,801 17 1
Lake Darlot	1,503	1,008 6 0	2,823 19 1	1,035 17 10	4,883 2 11	64 11-7	377 19 8	902 4 9	6,163 7 4	82 0-1	797 8 6	10 7-3	.....	5,365 18 10
Laverton	8,550.5	629 6 1	6,331 13 5	3,766 12 8	10,727 12 2	25 1-1	1,484 7 8	3,036 18 7	15,248 18 5	35 8-0	4,506 15 4	10 6-5	.....	10,742 3 1
Linden	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11 1 2	.....	11 1 2	.....
Marble Bar	.....	27 4 5	535 17 9	110 19 2	674 1 4	.....	397 10 11	284 11 8	1 856 3 11	.....	81 5 0	.....	.....	1,774 18 11
Marvel Loch	1,190	.....	2,228 14 5	1,534 12 11	3,763 7 4	63 3	1,577 13 10	662 18 11	6 004 0 1	100 10-9	631 13 3	10 7-4	.....	5,372 6 10
Meekatharra	3,427.5	730 15 0	3,609 0 9	1,754 6 0	6,094 1 9	35 6-7	808 19 9	1,256 7 6	8,159 9 0	47 7-3	1,609 0 11	9 4-6	.....	6,550 8 1
Menzies	4,415.5	1,353 0 4	3,415 9 6	3,399 10 3	8,163 0 1	37 0	993 17 11	1,666 11 10	10,828 9 10	49 0-6	2,057 15 0	9 3-9	.....	8,770 14 10
Norseman	194.5	.....	416 7 7	27 0 8	443 8 3	45 7-2	26 1 5	111 11 7	581 1 3	59 8-9	103 4 9	10 7-2	.....	477 16 6
Nullagine	341	189 11 2	666 14 4	213 2 19	1,069 8 4	62 8-7	749 14 3	92 11 8	1,911 14 3	112 1-5	191 7 5	11 2-7	.....	1,720 6 10
Ora Banda	1,955.75	859 0 7	2,504 9 0	1,648 2 8	5,011 12 3	51 3	2,593 0 7	1,035 10 6	8,640 3 4	88 4-3	976 3 11	9 11-8	.....	7,663 19 5
Paynes Find	.....	.....	69 0 0	.....	69 0 0	.....	.....	0 7 0	69 7 0	.....	21 7 6	.....	.....	47 19 6
Peak Hill	296	150 6 9	890 15 11	204 14 0	1,245 16 8	84 2-1	387 0 11	149 15 7	1,782 13 2	120 5-4	150 14 0	10 2-2	.....	1,631 19 2
Yarri	2,077	876 8 10	2,375 8 2	1,024 6 2	4,275 18 2	41 2-9	1,661 16 7	858 13 10	6,796 8 7	65 5-3	985 2 3	9 5-9	.....	5,811 6 4
Head Office	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0 12 5	.....	0 12 5	.....
	41,930.5	9,516 4 9	39,907 5 10	26,315 11 2	75,739 1 9	36 1-5	20,163 12 3	17,084 0 3	112,986 14 3	53 10-7	20,325 8 11	9 8-3	11 13 7	92,672 18 11	
Northampton	3,214.25	1,344 13 3	4,377 14 0	2,064 0 1	7,786 7 4	48 5-4	3,274 18 2	1,102 18 6	12,164 4 0	75 8-3	4,981 19 1	30 11-9	.....	7,182 5 11
	45,144.75	10,860 18 0	44,284 19 10	28,379 11 3	83,525 9 1	37 0	23,438 10 5	18,186 18 9	125,150 18 3	55 5-3	25,307 7 0	11 2-5	11 13 7	99,855 4 10	
Net Loss	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	99,843 11 3

SCHEDULE No. 5.

Statement of Receipts and Expenditure for Year ended 31st December, 1955.

CYANIDING.

Batteries.	Tons Treated.	Expenditure.									Receipts.		Profit.	Loss.
		Management.	Wages.	Stores.	Total Working Expenditure.	Cost per Ton.	Repairs and Renewals.	Sundries.	Gross Expenditure.	Cost per Ton.	Receipts.	per Ton.		
		£ 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	670	217 5 7	288 9 7	403 17 1	909 12 3	27 1-8	228 13 3	211 10 6	1,349 16 0	40 3-5	456 10 4	13 7-5	....	893 5 8
Coolgardie	2,866	650 8 0	2,982 8 11	981 11 2	4,614 8 1	32 2-4	881 15 1	1,142 18 2	6,639 1 4	46 4	3,713 3 4	25 10-9	....	2,925 18 0
Cue .....	....	97 4 5	91 11 6	56 14 2	245 10 1	....	32 16 5	61 14 9	340 1 3	....	....	....	....	340 1 3
Kalgoorlie	1,590	1,290 3 0	1,847 13 10	1,513 0 7	4,650 17 5	58 6	279 19 1	928 2 8	5,858 19 2	73 8-4	2,825 13 9	35 6-5	....	3,033 5 5
Laverton	6,016	598 6 6	3,721 7 1	2,192 12 2	6,512 5 9	21 7-8	271 7 8	1,795 10 4	8,579 3 9	28 6-2	5,835 15 9	19 4-8	....	2,743 8 0
Marble Bar .....	....	211 12 4	210 3 2	189 16 6	611 12 0	....	69 2 3	217 8 6	898 2 9	....	....	....	....	898 2 9
Meekatharra.....	....	44 7 2	31 2 0	186 5 5	261 14 7	....	12 9	....	262 7 4	....	....	....	....	262 7 4
Menzies .....	....	....	....	26 0 7	26 0 7	....	....	1 5 0	27 5 7	....	....	....	....	27 5 7
Mount Ida .....	....	....	....	....	....	....	....	....	....	....	24 17 0	....	24 17 0	....
Ora Banda	1,716	349 17 1	1,426 8 9	764 10 5	2,540 16 3	29 7-4	45 0 2	545 15 5	3,131 11 10	36 6	2,867 6 7	33 5	....	264 5 3
Peak Hill .....	....	....	2 18 2	....	2 18 2	....	....	1 2 0	4 0 2	....	....	....	....	4 0 2
Yarri .....	....	....	....	....	....	....	....	25 3 4	25 3 4	....	....	....	....	25 3 4
	12,858	3,459 4 1	10,602 3 0	6,314 8 1	20,375 15 2	31 8-3	1,809 6 8	4,930 10 8	27,115 12 6	42 2-1	15,723 6 9	24 5-4	24 17 0	11,417 2 9
Interest Paid to Treasury.....	....	....	....	....	....	....	....	....	....	....	1,920 0 0	....	....	1,920 0 0
											13,803 6 9	....	24 17 0	13,337 2 9
														24 17 0
Net Loss .....	....	....	....	....	....	....	....	....	....	....	....	....	....	13,312 5 9

DIVISION IV

Annual Progress Report of the Geological Survey Branch of the Mines Department for the Year 1955

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Geological Reports:

- The Search for Oil in Western Australia. (With Plan.)
- Report on the Ground Water Prospects on Farming Properties, Kalannie District, S.W. Division.
- Geraldton Water Supply—Report on the possibility of obtaining additional supplies from the Wicherina Basin. (With Plan.)
- Report on a Hydro-Geological Reconnaissance in the Mullewa District.
- Report on Ground Water Prospects in the Dalwallinu District.
- Report on the Underground Water Prospects of the Country in the Vicinity of Borden, South-West Land Division, W.A.
- Report on Munglinup River Graphite Deposits, Eucla Division, W.A. (With Plan.)
- Report on Kimberley Radioactive Deposits.
- Report on Government "Failing" Drilling in the Southern Part of the North-Eastern Basin, Collie Mineral Field. (With Plans.)
- Report on Uranium Deposit on Location 11084, Nukarni, S.W. Division, W.A.
- Report on P.A.6748 (Late G.M.L. 3388 "les Trios" G.M.), Westonia, Yilgarn G.F.
- Report on Options held by Central Radio Mines, N.L. (With Plan.)
- Report on Uranium Occurrence on Location 4176, Kalguddering, S.W. Division, W.A.
- Progress Report on Diamond Drilling for Gold in the Pilbara G.F.:
 - (a) The Warrawoona Area. (With Plan.)
 - (b) The Bamboo Creek Area. (With Plan.)

Reports:

- D.D.H. No. 1, Site W1—Warrawoona, Late G.M.L. 1037, "Klondyke Queen." (With Plan.)
- D.D.H. No. 2, Site W2—Warrawoona, Late G.M.L. 604, "Klondyke Boulder." (With Plan.)
- D.D.H. No. 3, Site W3—Warrawoona, Late G.M.L. 505, "Bow Bells." (With Plan.)
- D.D.H. No. 4, Site B1—Bamboo Creek, G.M.L. 817, "Prince Charlie." (With Plan.)
- D.D.H. No. 5, Site B6—Bamboo Creek, G.M.L. 817, "Prince Charlie." (With Plan.)
- D.D.H. No. 6, Site B2—Bamboo Creek, G.M.L. 1096, "Mt. Prophecy." (With Plan.)
- D.D.H. No. 7, Site B3—Bamboo Creek, G.M.L. 1120, "Bamboo Queen." (With Plan.)

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Summary Report on Exploratory Drilling of Abandoned Gold Shows, Yilgarn G.F.:

Reports:

- D.D.H. No. Y7, Site F1—Jackson, Yilgarn G.F., "Hazel Merle." (With Plan.)
- D.D.H. No. Y8, Site F2—Jackson, Yilgarn G.F., "Hazel Merle." (With Plan.)
- D.D.H. No. Y9, Site F3—Jackson, Yilgarn G.F., "Hazel Merle." (With Plan.)
- D.D.H. No. 10, Site F4—Jackson, Yilgarn G.F., "Hazel Merle." (With Plan.)
- D.D.H. No. Y11, Site F5—Jackson, Yilgarn G.F., "Hazel Merle." (With Plan.)
- D.D.H. No. Y12, Site G1—Marie's Find, Yilgarn G.F., "Great Bingin." (With Plan.)
- D.D.H. No. Y13, Site G2—Marie's Find, Yilgarn G.F., "Great Bingin." (With Plan.)
- D.D.H. No. Y14, Site G3—Marie's Find, Yilgarn G.F., "Great Bingin." (With Plan.)
- D.D.H. No. Y15, Site H1—Yilgarn G.F., Manxman Shear North End. (With Plan.)

Report on Exploratory Drilling of "Sunshine Reward Amalgamated" G.M., Edward's Find, Yilgarn G.F. D.D.H. No. EF1, Site A.

Report on Exploratory Diamond Drilling of Abandoned Gold Shows: D.D.H. No. M1, Site A1, "Princes Royal" G.M., G.M.L. 222, Cue, Murchison G.F. (With Plan.)

Report on Exploratory Diamond Drilling of Abandoned Gold Shows: D.D.H. No. M2, Site A2, "Princess Royal" G.M., G.M.L. 222, Cue, Murchison G.F. (With Plan.)

NOTE.—Owing to a change in the Mines Department's publication policy, the reports listed above do not appear with this Annual Report. The arrangement is that they will appear as a Geological Survey bulletin under the title of "Miscellaneous Bulletin."

DIVISION IV

Annual Progress Report of the Geological Survey of Western Australia for the year ended 31st December, 1955

The Under Secretary for Mines,

I have the honour to submit, for the information of the Honourable the Minister for Mines, my report on the operations and progress of the Geological Survey for the year ended 31st December, 1955.

(Sgd.) H. A. ELLIS,
Government Geologist.

STAFF.

Strength as at 31st December:—

Professional.

Ellis, H. A., B.Sc., Government Geologist A.O.S.M.			
Berliat, K., D.Sc. Senior Geologist		} 6
Sofoulis, J., B.Sc. Geologist, Grade 1	....	
de la Hunty, L. E., B.Sc. Geologist, Grade 1	....	
Low, G. H., B.Sc. Geologist, Grade 1	....	
Noldart, A. J., B.Sc. Geologist, Grade 1	....	

Attached.

Connolly, R. R. Trainee Geologist		1
--	------	--	---

Clerical.

Martin, T. J. Clerk		} 3
Clift, J. N. Junior Clerk	....	
White, S. V. G. Typiste	....	

Laboratory.

Fimmell, L. H. Laboratory Technician		1
---	------	--	---

Promotions, Resignations, Appointments.

On 5th January Mr. R. R. Connolly commenced a two year training period to enable him, if found satisfactory at the completion of that time, to be appointed to the Professional Staff.

Mr. T. J. Martin of the Forests Department was transferred to the position of Clerk to the Survey and commenced duties on 5th January.

There were no other staff changes during the year.

Professional Staff.

The approved establishment for professional officers as at 31st December is as follows:—

Government Geologist	....	H. A. Ellis.
Senior Geologist	....	K. Berliat.
Geologist, Grade 1	....	J. Sofoulis.
Do.	....	L. E. de la Hunty.
Do.	....	G. H. Low.
Do.	....	A. J. Noldart.
Geologist, Grade 2	....	Vacant.
Do.	....	Vacant.
Do.	....	Vacant.
Do.	....	Vacant.

This year again saw no resignations of professional officers despite the number of attractive positions offered by outside organisations. However, efforts to fill the existing vacancies were still unsuccessful, and for this reason it was decided to train a suitable officer to eventually undertake professional assignments.

The following tabulated statement shows the relation between the area of the State and the availability of geologists during the year:—

Period.	No. of Geologists available including Government Geologist.	Area of State (sq. miles).	Square Miles per Geologist.	Population of State.
Jan.-Dec., 1955	6	975,920	162,650	658,538

Activities of Professional Officers.

H. A. Ellis, Government Geologist—

In addition to head-office duties, the following field work was undertaken:—

Places Visited.	Purpose of Visit or Matters Investigated.	Period.
Koolyanobbing	Diamond Drilling—Pyrite	Jan.
Koolyanobbing	Diamond Drilling—Pyrite	Feb.
Corrigin and Boyup Brook	Underground Water Supply	Feb.
Koolyanobbing	Diamond Drilling—Pyrite	Mar.
Frankland River	Manganese	Mar.
Carnarvon	Water Supply	Apr.
Koolyanobbing (2)	Diamond Drilling—Pyrite	May
Widgiemooltha	Uranium prospects	June
Norseman		
Ravensthorpe	Diamond Drilling—Gold	July
Warrawoona		
Pippingarra	Columbite	July
Exmouth Gulf	Oil Exploration	July
Carnarvon	Water Supply	July
Koolyanobbing (2)	Diamond Drilling—Pyrite	August
Edwards' Find (2)	Diamond Drilling—Gold	Sept.
Day Dawn	Diamond Drilling—Gold	Oct.
Carnarvon	Water Supply	Nov.
Edwards' Find (2)	Diamond Drilling—Gold	Dec.

K. Berliat, Senior Geologist—

January—Investigation of groundwater prospects, Kalannie District. Office work in connection with Mt. Magnet survey.

February—On sick leave.

March—Office work in connection with Mt. Magnet survey.

April—Water supply investigations for Geraldton town supply.

May—Investigation of groundwater conditions, Mullewa Road Board District.

June—Investigation of groundwater conditions, Dalwallinu Road Board district.

July-Sept.—Preparatory work in connection with iron ore survey of the State, and compilation of known deposits.

Oct.-Dec.—Examination and sampling of iron ore deposits in the Yilgarn, Murchison and Yalgoo Goldfields. Selection of bore sites at Wicherina for Geraldton water supply.

Examination of diamond drill cores, Mt. Magnet district.

J. Sofoulis, Geologist Grade 1—

Jan.-Feb.—Examination of Munglinup River Graphite Deposits and Water Investigations Ongerup and Borden Areas.

Feb.-July—Report writing.

Aug.-Oct.—Drilling supervision—Pilbara Goldfield.

Oct.-Dec.—Report writing.

L. E. de la Hunty, Geologist Grade 1—

Jan.-May: Report writing.

June-Aug.—Drilling supervision—Pilbara Goldfield.

Sept.—Inspection of Uranium claims—Kimberley Goldfield.

Oct.-Dec.—Drilling Supervision—Pilbara Goldfield.

G. H. Low, Geologist Grade 1—

Jan.-Dec.—Supervision diamond drilling operations on the Collie Mineral Field.

Preparation of Part 2 of Bulletin 105 on the Coal Reserves of the Collie Mineral Field. Compilation of data from Oil Search in W.A.

A. J. Noldart, Geologist Grade 1—

Jan.-Dec.—Goldfields diamond drilling supervision. Miscellaneous Gold Mine investigations. Miscellaneous Radioactivity investigations.

FIELD WORK.

Major Field Work Completed During the Year and in Progress as at December 31st.

(1) Supervision of Government exploratory drilling on the Collie Coal Field continued throughout the year.

(2) A drilling programme to test abandoned gold shows in the Yilgarn Goldfield was completed during the year without the discovery of payable ore at any of the prospects drilled.

(3) Drilling programmes to test abandoned gold shows in the Murchison and Pilbara Goldfields were commenced and continued throughout the year. No payable ore has yet been discovered as a result of these operations.

(4) Diamond drilling of the Koolyanobbing iron ore and pyrite deposits was completed during the year.

(5) A State-wide assessment of iron ore grades and quantities was commenced.

(6) Diamond drilling of the "Great Fingall" G.M. to determine the possibility of payable gold ore at depth was commenced.

No regional survey was undertaken during the year due to the continued staff shortage and the demands made on the existing staff for supervision of unsuccessful gold drilling programmes.

Field Work for 1956.

(1) Completion of Collie Coal Field exploratory drilling.

(2) Continuation of diamond drilling programmes to test abandoned gold shows in the Pilbara and Murchison Goldfields.

(3) Continuation of the deep drilling of the "Great Fingall" G.M.

(4) Continuation of the Iron Ore survey.

(5) A regional survey of an area around Nullagine and Marble Bar, Pilbara Goldfield.

(6) Revision and examination of some geological boundaries appearing on the Geological Sketch Map of Western Australia (1950).

(7) State-wide survey of copper resources.

(8) State-wide survey of manganese and chromite.

TRANSPORT.

Tabulated details of transport at present in use by the Geological Survey are as follows:—

Vehicle W.A.G.	Make & Type	Load cwt.	Mileage as at 31/12/55	Mileage for 1954	Date Vehicle Purchased	Remarks
1194	Ford Utility	15	91,015	9,693	1946 (new)	
1413	Chevrolet Utility	15	83,700	3,210	1947 (new)	Disposed of 29-8-55
1421	do.	15	67,435	1,915	1947 (new)	Disposed of 23-6-55
2044	Dodge Utility	18	51,213	5,852	1950 (new)	
2393	International Utility	14	58,205	12,982	1950 (new)	
2412	do.	14	72,493	10,414	1950 (new)	
2608	do.	14	48,428	10,296	1951 (new)	
909	Willy's Jeep	5	26,666	14,034	1953 (new)	
3135	Fargo Utility	15	27,910	19,145	1954 (new)	
3535	Land Rover Utility	10	5,958	5,958	1955 (new)	Purchased 23-6-55
3678	Dodge Utility	15	5,583	5,583	1955 (new)	Purchased 29-8-55

Total miles, 99,082.

SERVICE TO THE GENERAL PUBLIC, MINING INTERESTS AND GOVERNMENT DEPARTMENTS.

Much information, both written and oral, was given to a variety of applicants during the year, and our publications were frequently sought. This year, as the technical reports show, assistance to private interests and other Government departments in the search for water and minerals in the State, was restricted due to heavy drilling supervision commitments made on the small staff. Wherever possible however, the more urgent requests for assistance were dealt with.

ACTIVITIES OF THE COMMONWEALTH BUREAU OF MINERAL RESOURCES.

During the year geological and geophysical parties from the Commonwealth Bureau of Mineral Resources continued their very valuable field

work in the far North, North-West and South-Western coastal areas of the State in furtherance of the search for oil. The data compiled by these surveys is made readily available to the technical staff of the energetic West Australian Petroleum Pty. Company who are conducting a vigorous search for oil by geological and geophysical surveying, formation drilling, and deep test wells.

The part played by the Bureau of Mineral Resources in its work over the past eight years on the potential oil-bearing sedimentary areas of the State, has contributed vital geological information to geological research programme which must be extensive before the geological history can be unravelled, and hence the oil prospects evaluated and subsequently tested.

PUBLICATIONS.

Issued during 1955.

Annual Progress Report of the Geological Survey of Western Australia for 1952.

Bulletin No. 108: The Geology of the Irwin River and Eradu Coal Basins, by W. Johnson, B.Sc. (Hons.), J. S. Gleeson, B.Sc., and L. E. de la Hunty, B.Sc.

In the Press.

Annual Progress Reports of the Geological Survey of Western Australia for 1953 and 1954.

Compiled Awaiting Authority to Print.

Mineral Resources of Western Australia Bulletin No. 6: Gypsum, by L. E. de la Hunty, B.Sc., and G. H. Low, B.Sc.

Bulletin No. 110: The Geology of the Phillips River Goldfield W.A., by J. Sofoulis, B.Sc.

(Sgd.) H. A. ELLIS,
Government Geologist.

DIVISION V

School of Mines, Western Australia

The Under Secretary for Mines.

I have the honour to submit for the information of the Honourable the Minister for Mines my report for the year 1955.

KALGOORLIE.

Enrolments.

The total number of enrolments received during 1955 was 347—a decrease of 34 by comparison with the previous year. Table I gives the individual and class enrolments for 1953, 1954, and 1955, and Table II gives the enrolments in the various subjects in 1955. Table III sets out the number of students enrolled for the various courses.

TABLE I
Enrolments—1953, 1954, 1955.

Year.	First Term.		Second Term.		Third Term.	
	Individual.	Class.	Individual.	Class.	Individual.	Class.
1953	365	787	341	699	294	606
1954	355	837	307	691	284	593
1955	324	764	322	629	294	543

TABLE II.
Class Enrolments, 1955.

Subject.	First Term.	Second Term.	Third Term.
Preparatory Chemistry	20	18	16
Chemistry IA	22	18	17
Chemistry IB	10	9	9
Chemistry II	1	1	1
Analytical Chemistry I	5	5	5
Analytical Chemistry II	—	—	—
Chemical Metallurgy I	2	2	2
Chemical Metallurgy II	1	1	1
Mineral Dressing I	16	15	14
Mineral Dressing II	2	2	2
Mineral Dressing III	1	1	1
Physical Metallurgy II	6	—	—
Assaying	11	11	11
Trade Metallurgy	7	5	4
Preparatory Mathematics	32	25	21
Mathematics I	26	21	15
Mathematics IIA	27	23	21
Mathematics IIB	6	3	2
Mathematics IIC	5	4	4
Applied Mathematics I	25	18	16
Applied Mathematics II	2	2	2
Preparatory Physics	9	6	6
Physics I	21	17	15
Physics IIA	12	11	11
Physics IIB	3	3	3
Trade Mathematics I	30	20	11
Trade Mathematics II	2	2	2

Preparatory Drawing	53	42	28
Engineering Drawing I	27	23	17
Engineering Drawing and Design IIA	13	7	4
Engineering Drawing and Design IIB	5	4	4
Engineering Drawing and Design IIC	6	5	5
Engineering Drawing and Design IID	2	2	1
Surveying Drawing II	8	7	7
Mechanical Engineering I	10	7	7
Mechanical Engineering II	2	2	2
Practical Electricity	13	7	6
Electrical Engineering I	10	9	9
Internal Combustion Engines	19	10	9
Workshop Practice I	24	26	19
Workshop Practice II	4	4	4
Workshop Practice IIIA	6	6	6
Workshop Practice IIIB	2	—	—
Engineering Workshop Practice	9	7	6
Welding I	32	27	22
Welding II	14	12	10
Steam Engine Driving	8	6	4
Structural Engineering I	5	5	4
Structural Engineering II	5	5	5
Machine Design	5	4	3
Materials of Construction	14	13	12
Hydraulics	10	10	10
Preparatory Geology	10	8	8
Geology IA	12	11	10
Geology IB	17	17	17
Geology IIA	8	7	6
Geology IIB	10	9	8
Geology IIC	5	4	3
Geology IIIB	5	4	3
Geology IIIC	6	5	5
Mining I	15	14	14
Mining II	4	4	4
Mining IIA	4	—	—
Mining IIC	—	—	—
Mining III	—	—	—
Mining IIIA	7	5	—
Mine Ventilation	8	8	8
Surveying I	15	15	16
Surveying II	9	9	9
Surveying IIA	—	—	—
Preparatory English	6	4	4
English I	6	5	5
English IA	7	7	7
Total	764	629	543
Total, 1954	837	691	593

TABLE III.
NUMBER OF STUDENTS ENROLLED FOR
VARIOUS COURSES.

Course.	Number Enrolled, 1955.
<i>Associateship Courses—</i>	
Mining	33
Metallurgy	20
Engineering	43
Mining Geology	11
Total	107
<i>Certificate Courses—</i>	
Assayer's	3
Surveyor's	14
Mine Manager's	4
Engineering Draughtsman's	9
Electrical Engineer's	5
Mechanical Engineer's	1
Total	36
<i>Technicians' Courses—</i>	
Engine Operation and Maintenance	3
Workshop Foreman's	5
Welding	9
Total	17
<i>No Set Course—</i>	
Preparatory Subjects }	187
Others }	
— 347	

Revenue.

Fees received from students, including those nominated by the Repatriation Department, lecture note fees, and fees from the sale of official publications amounted to £634 3s. 8d.—an increase of £27 by comparison with 1954. Fees received for work done in the Kalgoorlie Metallurgical Laboratory and paid into a Trust Fund amounted to £463 3s. 4d.—an increase of £7 by comparison with 1954. About one-third of the students enrolled pay class fees, and the remainder pay either a small registration fee or are exempt from fees. Details are as follows:—

	Full-time	Part-time	Total
1. Students paying class fees (age 21 or over)	3	116	119
2. Students nominated by Repatriation Department (C.R.T.S. and others)	0	3	3
3. Students paying a Registration fee or students who pay no fees (under 21 years of age)	6	152	158
4. Students who are returned servicemen and exempt from fees (General Regulation 5)	0	67	67
			347

Staff.

The following staff changes occurred during the year:—

Name, Position, Date, Notes.
Baldwin, W. J.; Cadet; 14/2/55; Appointed.
Collins, S. J.; Lecturer, Gr. II; 31/3/55; Resigned.
Field, R. V.; Lecturer, Gr. II; 14/2/55; Appointed.
Genge, A. B.; Fitter and Turner; 12/9/55; Appointed.
Higgs, K. E.; Laboratory Assistant; 21/2/55; Appointed.
Hooper, K.; Lecturer, Grade I; 7/2/55; Appointed.
Kemsley, D. S.; Lecturer, Grade I; 6/5/55; Resigned.
Kozak, P.; Cadet; 14/2/55; Appointed.
Moir, G. A.; Lecturer, Grade II; 18/4/55; Appointed.
Thomas, A. V.; Lecturer, Grade I; 1/1/55; Transfer from Norseman.
Thompson, B. M.; Fitter and Turner; 5/8/55; Resigned.

Courses of Study.

One new course—Welding Course—was commenced. This increased the number of Technicians' Courses from two to three. The subjects included in this Course were all previously available at the School. Details of the Course were not included in the 1955 Prospectus, which had gone to the printer before the Course was approved, but were posted at the School, and the Course was available at the start of the year.

In the Mine Surveyor's Certificate Course Physics I was substituted for Engineering Drawing and Design IIA. This change did not appear in the 1955 prospectus, but did become effective at the start of the year.

Small changes were made in the Associateship Courses and in the engineering Certificate Courses following a re-organisation of Applied Mathematics, Physics IIA, and Physics IIB as indicated below:—

		Hours Per Week.
1954	Applied Mathematics	3
	Physics IIA	2
	Physics IIB	2
Total		7
		Hours Per Week.
1955	Applied Mathematics I	2
	Applied Mathematics II	2
	Physics IIA	2
	Physics IIB	1
Total		7

Details of the changes are given in the Prospectus.

Annual and Supplementary Examinations.

The results of the Annual and Supplementary Examinations are summarized in Tables IV and V. Table IV is based on class enrolments and Table V on individual enrolments. Table IV shows that the percentage of entries for individual subjects was 4 per cent. greater than in the previous year. Otherwise the results were the same as in 1954, and very similar to those of earlier years. Table V shows that, as might be expected, the biggest wastage during the year is among students not enrolled for any set course.

The results for individual subjects are given in Appendix I.

TABLE IV.

Results of Annual and of Supplementary Examinations Based on Class Enrolments, 1951-1955.

	1951	1952	1953	1954	1955
Class enrolments = A	833	856	837	901	802
Number of entries for Annual Examinations = B	434	458	546	521	495
B/A per cent.	51	54	65	58	62
Number of passes at Annual Examinations, as a per cent. of A	41	43	54	47	51
Number of passes at Annual Examinations, as a per cent. of B	79	80	83	82	82
Number of passes at Annual and Supplementary Examinations, as a per cent. of A	44	44	56	49	52
Number of passes at Annual and Supplementary Examinations, as a per cent. of B	84	82	85	85	85

TABLE V.

Students Sitting for Annual Examinations, 1955.

	Number Enrolled.	Number Sitting.	Percentage ^o Sitting.
Associateship Courses	107	87	81
Certificate Courses	36	28	78
Technician's Courses	17	13	76
No set course	187	81	42
	347	209	60

Scholarships and Prizes.

No students held Mines Department Scholarships during 1955.

Six students who had been awarded Chamber of Mines Scholarships attended the School—two part-time and four full-time. With the exception of one student, who was very seriously handicapped by a previous illness, all completed a good year's work. Scholarships to commence in 1955 were awarded to J. W. Brien and J. S. Garrigan.

The usual scholarships and prizes were awarded as a result of the year's work.

Diplomas and Certificates.

The number of Diplomas and Certificates issued during 1955 is given in Table VI. Figures for the four previous years have been added for comparison. The figures include any Diplomas or Certificates gained by students at Branch Schools.

	1951	1952	1953	1954	1955
<i>Associate Courses—</i>					
Mining	2	5	3	7	1
Metallurgy	2	2	1	6	2
Engineering	4	4	4	3	2
Mechanical and Electrical Engineering (pre 1947 course)	3	2	1	1	...
Mining Geology	3	...	1	2	...
	11	13	9	19	5
<i>Certificate Courses—</i>					
Assayer's	3	1	3	4	3
Industrial Chemist's (pre 1947 course)	...	1	1	1	...
Mine Surveyor's	9	14	7	9	8
Mine Manager's	...	2	4	2	4
Geologist's (pre 1947)	1	...	...	...	...
Engineering Draughtsman's	2	3	3	3	1
Electrical Engineer's	...	...	1	2	...
Mechanical Engineer's	...	...	1	...	1
	15	21	20	18	17
<i>Technician's Courses—</i>					
Engine Operation and Maintenance	...	...	5	3	3
Workshop Foreman's	...	...	...	...	...
Welding	...	...	...	...	...
	...	...	5	3	3

Students Nominated by Repatriation Department.

Only three returned servicemen at the School are now being assisted by the Repatriation Department, and all are part-time students. Details are as follows:

	1953	1954	1955
Full-time	—	—	—
Part-time	24	14	2

	1953	1954	1955
Full-time	1	1	—
Part-time	—	—	1

Services to the Public—

As in previous years the School provided a number of services to the public other than its teaching activities.

The Kalgoorlie Metallurgical Laboratory continued to report on samples submitted for metallurgical investigation, and also to make assays and analyses of selected samples. More details of the work done in the Laboratory are given later in this report.

During the year 371 samples were received from prospectors for assay and/or mineral examination. This is a decrease by comparison with 1954 when 444 samples were received. As in previous years all assays were made in the Kalgoorlie Metallurgical Laboratory and all mineral examinations by Mr. Cleverly, Head of the Department of Geology at the School. Details of the work done on samples are as follows:

	1953	1954	1955
Assay—gold	276	191	90
Assay—gold and other constituents	8	6	21
Assay—metals other than gold	13	27	23
Assay plus mineral determination	14	—	4
Mineral examination	288	218	225
Rejected or transferred to Met. Lab. pay	8	2	8
	607	444	371

As in previous years the Junior and Leaving Examinations were held at the School, and various professional bodies continued to meet at the School. In August the Annual Conference of the Australasian Institute of Mining and Metallurgy was held in Kalgoorlie, and the technical sessions were held at the School.

Buildings—

No new buildings were added during 1955. Those buildings not recently painted externally were painted, and generally buildings are in good condition. Some additional internal painting is desirable.

Requirements of the School—

These remain as set down in last year's report, and it is disappointing to find that not one of the three major requirements has been satisfied.

Advisory Committee—

It is with regret that we record Mr. Maloney's serious illness towards the end of 1955 and his death in February, 1956. It is also with regret that we record Mr. Manners' resignation submitted in December, 1955 because of his impending departure from Kalgoorlie. Mr. Maloney and Mr. Manners were foundation members of the Committee, and both have attended meetings regularly since the first meeting of the Committee in May, 1941. Both were very interested in the School, and both endeavoured at all times to improve the work being done by the School.

During the year the Committee met seven times, and attendances were as follows:—

Mr. M. Harwood	5
Mr. J. E. Manners	7
Mr. C. H. Warman	6
Mr. J. A. Maloney	5
Mr. F. Collard	3
Mr. R. A. Hobson	7

Further contributions of £1,000 each were received from the Chamber of Mines and from the Mines Department to the Apparatus and Equipment Trust Fund, and at the end of the year the estimated balance in the Fund was £3,280.

Kalgoorlie Metallurgical Laboratory.

Table VII summarises the work done in the Metallurgical Laboratory during the year. Not so many requests for work were received during the year, and by the end of the year almost all outstanding work was completed. Of the 18 reports issued six had reference to gold ores, two to gold-copper ores, one to a gold-tungsten ore, two to the ores of other metals, and seven to non-metallics. In addition 54 certificates giving the results of assays, analyses, and similar work were issued. Also as part of the scheme for assisting prospectors 199 assays or analyses were made. The work for prospectors is done without charge.

TABLE VII.
KALGOORLIE METALLURGICAL LABORATORY
SUMMARY OF WORK.

	1955	1954	1953
Investigations outstanding (1st January)	6	12	11
Investigations asked for (659-675, inclusive)	17	20	63
	23	32	74
Investigations completed	18	23	61
Investigations outstanding (31st December)	5	6	12
Investigations cancelled ....	....	3	1
	23	32	74
Certificates issued (assays, analyses, etc.)	54	50	....

More information about the work of the Laboratory is given in Appendix I, which has been prepared by the Senior Research Metallurgist.

The Laboratory is now reasonably well equipped, but the buildings are very unsatisfactory and improvements particularly in the chemical section are urgently required. Detailed plans have been prepared, but no funds have been available.

The C.S.I.R.O. continued to assist the Laboratory, and for the 1955-56 financial year provided £2,700 for salaries and equipment.

Students' Association.

During the year the Students' Association held two very successful functions, the Annual Ball on August 19th and a Dinner on November, 25th. The Association also provided the usual Scholarship.

NORSEMAN.

Enrolments.

The total number of enrolments received was 60—a decrease of seven by comparison with 1954. Table VIII gives the individual and class enrolments for the year and for the two previous years, and Table IX the enrolments in individual classes. Table X sets out the number of students enrolled for the various courses.

TABLE VIII.
Enrolments—1953, 1954 and 1955.

Year.	First Term.		Second Term.		Third Term.	
	Individual.	Class.	Individual.	Class.	Individual.	Class.
1953	54	141	53	124	45	107
1954	63	150	58	137	56	129
1955	60	160	55	141	53	127

Revenue.

The revenue received was £40 15s.

Staff.

The following changes in full-time staff occurred during the year:—

Name, Position, Date, Notes.

Baker, S. R.; Cadet; 9/12/55; Resigned.

Hennessey, R. M.; Cadet; 13/2/56; Appointed.

Moore, G. H.; Lecturer, Grade I (in-charge, Norseman); 23/2/55; Appointed.

TABLE IX.
Class Enrolments, Norseman, 1955.

Subject	1st Term	2nd Term	3rd Term
Preparatory Chemistry	5	4	3
Preparatory Mathematics	8	7	6
Mathematics I	5	3	3
Applied Mathematics I	2	1	1
Preparatory Physics	5	5	5
Trade Mathematics I	14	13	11
Trade Mathematics II	7	6	6
Preparatory Drawing	24	22	15
Engineering Drawing I	13	8	11
Engineering Drawing IIA	6	6	5
Surveying Drawing II	2	3	3
Practical Electricity	11	11	9
Workshop Practice II	8	8	8
Welding I	18	16	14
Welding II	5	5	5
Steam Engine Driving	11	10	8
Geology IA	3	3	3
Geology IB	9	7	7
Mining I	1	1	1
Mining II	3	2	3
Totals	160	141	127
Totals, 1954	150	137	129

TABLE X

Number of Students Enrolled for Various Courses.

Course	Number Enrolled, 1955.
Associateship Courses:	
Mining	1
Metallurgy	—
Engineering	1
Mining Geology	2
Total	4
Certificate Courses:	
Assayer's	—
Mine Surveyor's	7
Mine Manager's	—
Engineering Draughtsman's	—
Electrical Engineer's	—
Mechanical Engineer's	—
Total	7
Technicians' Courses:	
Engine Operation and Maintenance	27
Workshop Foreman's	—
Welding	—
Total	27
No Set Course:	
Preparatory subjects	} 22
Others	
	60

No suitable applications were received for the second full-time instructor at Norseman, and this position remains unfilled.

During the year 10 part-time instructors were employed. In May Mr. R. Atkinson left Norseman, and was replaced by Mr. R. N. Kerr. Mr. Atkinson had been part-time instructor in Practical Electricity since 1952, and during this time had shown himself to be a keen and a competent instructor. During the year some re-arrangement of duties was necessary because of the absence of certain part-time instructors from Norseman as part of their normal full-time employment, but it was always possible to obtain temporary replacements, and instruction in all classes was continuous.

Subjects.

Twenty subjects were taught at Norseman during 1955—one more than in the previous year. As in previous years classes in Workshop Practice, in Welding, and in Practical Electricity were held in the workshops of Central Norseman Gold Corporation.

Examinations.

The results of the Annual and the Supplementary Examinations are summarized in Table XI and XII. Table XI is based on class enrolments and Table XII on individual enrolments. Table XI shows that the number of entries for individual subjects was lower than in the previous year, but of those who sat a greater proportion passed. Table XII shows that a greater proportion of students at Norseman sat for the Examinations than at Kalgoorlie. These figures suggest that students at Norseman are tending to enrol for more subjects than they can cope with. Table XIII makes a comparison of examination results for Norseman and Kalgoorlie based on class enrolments.

Scholarships and Prizes.

Of the two boys awarded Reg Dowson Scholarships at the end of 1954, C. H. Basset completed a fair year's work in 1955 and K. G. Green a satisfactory year's work. The Scholarships for 1955 were awarded to R. M. Hennessy and A. E. Avery.

TABLE XI.
Results of Annual and of Supplementary Examinations based on Class Enrolments, 1951-1955.

	1951	1952	1953	1954	1955
Class enrolments = A	112	149	144	157	167
Number of entries for Annual Examinations = B	68	108	84	100	90
B/A per cent.	61	72	58	64	54
Number of passes at Annual Examinations, as a per cent. of A	53	54	46	48	43
Number of passes at Annual Examinations, as a per cent. of B	88	75	80	76	79
Number of passes at Annual and Supplementary Examinations, as a per cent. of A	54	58	48	49	43
Number of passes at Annual and Supplementary Examinations, as a per cent. of B	89	80	83	77	80

TABLE XII.
Students Sitting for Annual Examinations, Norseman, 1955.

Course	Number enrolled	Number sitting	% sitting
Associateship Courses	4	2	50
Certificate Courses	7	6	86
Technicians' Courses	27	21	78
No set Course	22	14	64
Totals	60	43	72
Kalgoorlie for comparison:			
Totals	347	209	60

TABLE XIII.

Examination Results, Norseman and Kalgoorlie.

Note:—The letters A and B have the same meaning as in Table XI.

	Norseman.			Kalgoorlie.		
	1953.	1954.	1955.	1953.	1954.	1955.
B/A per cent.	58	64	54	65	58	62
Total passes as a per cent. of A	48	49	43	56	49	52
Total passes as a per cent. of B	82	77	80	85	85	85

Buildings.

The extensions, alterations, and renovations referred to in last year's Annual Report were almost completed by the end of 1955, and will result in very much improved conditions for 1956. The new section of the building provides for the following:—

Office for Officer-in-charge.

Staff Room—for additional full-time staff and also for part-time staff.

Store Room.

Lecture Room.

Geology Lecture Room and Laboratory.

In addition the older section of the building has been greatly improved.

Advisory Committee.

Mr. Dutton continued as Chairman of the Advisory Committee and the thanks of the Department are due to all members of this Committee who gave of their time and who took a lively interest in the affairs of the School.

BULLFINCH.

Enrolments.

The total number of enrolments received during 1955 was 56—an increase of 13 by comparison with the previous year. Table XIV gives the individual and class enrolments for 1955 and for the two previous years, and Table XV the enrolments in the subjects taught at Bullfinch. Table XVI shows the numbers of students enrolled in the various courses.

TABLE XIV.
Enrolments—1953, 1954 and 1955.

Year.	First Term.		Second Term.		Third Term.	
	Individual.	Class.	Individual.	Class.	Individual.	Class.
1953	69	108	42	71	42	71
1954	43	72	36	71	32	62
1955	55	111	36	65	30	46

TABLE XV.
Class Enrolments, Bullfinch, 1955.

Subject	1st Term	2nd Term	3rd Term
Preparatory Chemistry	7	3	2
Preparatory Physics	11	4	3
Preparatory Geology	8	6	3
Preparatory Drawing	23	13	7
Engineering Drawing I	7	2	2
Engineering Drawing & Design IIA	1	1	1
Trade Mathematics I	10	7	5
Mathematics I	9	6	4
Mathematics IIA	4	3	2
Mining I	10	4	4
Surveying I	5	5	4
Welding I	9	7	5
Welding II	7	4	4
Totals, 1955	111	65	46
Totals, 1954	77	71	62

Revenue.

The revenue received was £56 2s. 9d. Over half the students were under 21 years of age, and they together with returned servicemen do not pay class fees.

Staff.

Mr. V. J. Tie commenced duty on 7th February, 1955, as Lecturer Grade I (in-charge Bullfinch). Mr. Browne continued as part-time Registrar, and during the year seven part-time instructors were employed.

Subjects Taught.

Thirteen subjects were taught at Bullfinch—two less than in 1954.

TABLE XVI.

Number of Students Enrolled for Various Courses.

Course	Number enrolled, 1955.
Associateship Courses:	
Mining	—
Metallurgy	—
Engineering	—
Mining Geology	1
Total	1
Certificate Courses:	
Assayer's	2
Mine Surveyor's	6
Mine Manager's	2
Engineering Draughtsman's	2
Electrical Engineer's	2
Mechanical Engineer's	—
Total	14
Technicians' Courses:	
Engine Operation and Maintenance	3
Workshop Foreman's	1
Welding	5
Total	9
No Set Course:	
Preparatory subjects	32
Others	
	56
	—

Examinations.

The results of the Annual Examinations are summarized in Table XVII, XVIII, and XIX. Tables XVII and XVIII show that there is still a large wastage at Bullfinch during the year, but that of those who sat this year a much larger proportion passed than in previous years. Table XIX compares the results for the three Schools, and is based on entries for individual subjects.

TABLE XVII.

Results of Annual and of Supplementary Examinations based on Class Enrolments, 1953-1955.

	BULLFINCH.		
	1953	1954	1955
Class enrolments = A	107	79	113
Number of entries for Annual Examinations = B	68	48	30
B/A per cent.	64	61	27
Number of passes at Annual Examinations as a per cent. of A	35	37	17
Number of passes at Annual Examinations as a per cent. of B	54	47	63
Number of passes at Annual and Supplementary Examinations as a per cent. of A	36	37	19
Number of passes at Annual and Supplementary Examinations as a per cent. of B	57	47	70

TABLE XVIII.

Students Sitting for Annual Examinations, 1955.

Bullfinch.		Number enrolled	Number sitting	% sitting
Course				
Associateship Courses	....	1	1	100
Certificate Courses	....	14	8	57
Technicians' Courses	....	9	4	44
No set Course	....	32	9	26
Totals	....	56	22	39
Norseman for Comparison:				
Totals	....	60	43	72
Kalgoorlie for Comparison:				
Totals	....	347	209	60

TABLE XIX.

Examination Results.

BULLFINCH, NORSEMAN and KALGOORLIE.

Note:—The letters A and B have the same meaning as in Table XVII.

	1953	1954	1955
B/A per cent.—			
Bullfinch	64	61	27
Norseman	58	64	54
Kalgoorlie	65	58	62
Total passes as a per cent of A—			
Bullfinch	36	37	19
Norseman	48	49	43
Kalgoorlie	56	49	52
Total passes as a per cent. of B—			
Bullfinch	57	47	70
Norseman	82	77	80
Kalgoorlie	85	85	85

Scholarships and Prizes.

The Bullfinch Country Club Prize was divided between I. Maclean and B. J. D. Van der Hoek. No award of this prize was made in the previous year.

Buildings.

The laboratory benches referred to in last year's report were installed, and enabled laboratory work in physics, chemistry, and in geology to be done. The laboratories are equipped at present for the preparatory grade of these subjects, but with additional equipment would provide reasonable accommodation for one grade higher in each subject. During the year a lawn, trees, and shrubs were planted and the grounds generally were improved.

Advisory Committee.

This Committee continued to meet with Mr. L. C. Brodie-Hall as chairman, and the thanks of the Department are due to members for their interest in and assistance to the School.

ACKNOWLEDGMENTS.

Much of the information in this report has been compiled by others—the Registrar and Senior Research Metallurgist in Kalgoorlie, and the Officers-in-charge and Registrars at Norseman and Bullfinch. My thanks are due to these officers. All members of the Staff—both full-time and part-time—have carried out their duties efficiently and have assisted students and others coming to the School at all times. Quite a lot of enquiries are received from members of the public and are efficiently handled by various members of the Staff. Thanks are also due to members of the three Advisory Committees for their assistance and co-operation during the year. Mining Companies at Norseman and at Bullfinch have made their workshops available for practical classes, and have also assisted the Branch Schools in other ways. Certain classes could not be held at the Branch Schools without this assistance.

(Sgd.) R. A. HOBSON,
Director, School of Mines.

APPENDIX I.

KALGOORLIE METALLURGICAL LABORATORY.

By C. H. S. Meharry, A.W.A.S.M. (Min. & Met.),
M.Aust. I.M.M., Senior Research Metallurgist.

INTRODUCTION.

Eighteen reports and fifty-four certificates were issued during the year. A brief description of the more comprehensive investigations is included in this report. The complete list of reports, issued, senders, localities of samples, ore types, and scope of the investigations is contained in the table with this report.

For further information regarding these reports apply to

The Secretary,
Industrial and Physical Sciences,
C.S. and I.R.O.,
314 Albert Street,
EAST MELBOURNE, VIC.

from whom copies of reports can be obtained, usually six months after date of issue.

A considerable proportion of the certificates issued covered gold assays of diamond drill core samples for the Government Geologist.

In addition to the reports issued four other investigations (Nos. 667, 671, 674 and 675) were substantially complete at the end of the year.

From the table it can be seen that the back-log of test work has been eliminated, and work can commence almost immediately on samples as they are received.

During the year a request was received from the Metallurgical Sub-committee of the Western Australian Chamber of Mines for the Laboratory to carry out investigations of a fundamental nature on Golden Mile ores. A comprehensive programme of test work was submitted to the committee for their consideration.

GOLD ORES AND PRODUCTS.

Reports Nos. 659 and 668.

Two reports were issued dealing with test work on accumulated flotation tailings from the Blue Spec Mine, Nullagine, W.A.

Report 659.—This work was carried out for the State Mining Engineer to determine the gold recovery, the scheelite recovery, and any metallurgical difficulties associated with the treatment process. The sample supplied assayed 2.6 dwt. gold per short ton and 0.08 per cent. tungstic oxide (WO_3). Agitation cyanidation gave a recovery of 1.76 dwt. gold per short ton with no fouling of the solution. However thickening and filtration tests indicated that a satisfactory recovery of pregnant solution from the cyanidation pulp would be difficult. A further sample was requested (see Report 668). The scheelite recovery tests showed that gravity concentration followed by a complex magnetic roasting and separation technique of the concentrate gave a recovery of about 60 per cent. of the tungsten in a concentrate assaying 70 per cent. tungstic oxide.

Report 668.

This investigation was carried out for the mine management on a fresh sample of tailings. The head values in gold and tungstic oxide and recovery of gold by cyanidation were much the same as for the sample supplied for Report 659. The filtering and thickening characteristics of this new sample were much poorer than the Report 659 sample.

Charcoal precipitation of the gold followed by flotation of the charcoal gave only about a 50 per cent. recovery of the cyanide soluble gold.

Reports 663, 669.

Two reports were issued on tests carried out on the difficult gold-copper-pyritic ore from the Northern Hercules mine, Pine Creek, N.T.

Report 663.

A flow sheet had been prepared and a plant in course of erection based upon results of Kalgoorlie Metallurgical Laboratory Report No. 126, November 1937. The object of the test work in Report 663 was to determine whether the ore as represented by the sample supplied was amenable to treatment by the plant concerned.

The head value of the sample was 11.5 dwt. gold per short ton, 0.36 per cent. copper, and 28.8 per cent. sulphur. The chalcopyrite occurred as fine veinlets in the massive pyrite. No coarse free gold was detected in this sample and the ground ore was not straked prior to flotation. Fine grinding and flotation using pyrite depressants yielded a low grade copper concentrate. The recovery of gold by flotation was 1.6 dwt. per ton. Cyanidation of the flotation tailing yielded residues assaying 1 dwt. per ton. The cyanide consumption was high at 9-10 lb. per ton but the lime requirement was relatively low.

Report 669.

Two samples were received assaying 9.7 and 12.7 dwt. of gold per ton respectively and with roughly the same copper and sulphur content as the sample supplied for Report 663. However both these samples contained coarse free gold and the ground ore was straked before flotation. The recovery of gold by straking and amalgamation was 3.5 and 6.7 dwt. per ton respectively.

The strake tailings were concentrated by flotation and the flotation tailings were cyanided with similar results to those obtained in Report 663.

Report 672.

Several series of tests using a 15 millimetre hydrocyclone were carried out on unclarified pregnant solution from the Lake View and Star mine, Kalgoorlie. The object of the tests was to enable a study of the economics of installing micro-cyclones in the plant ahead of the leaf clarifiers. Conditions were varied widely and the best results with a single pass gave a lowering of solids content from 280 parts per million to 130-150 p.p.m. Three passes in series produced a minimum result of 100 p.p.m. However only the coarser particles were recovered and the filterability of the extremely fine solids still left in suspension in solution may have an important bearing on the economics of the use of the cyclones.

FLUID BED CALCINATION.

Report 651.

A 4 inch diameter stainless steel fluid bed reactor equipped with a constant rate feeder, liquid fuel pump, and cyclone was constructed, and tests were carried out at temperatures from 850°-950°C on the fluid bed calcination of lime sands. Some siliceous material (sponge spicules) was present in the lime sands and at temperatures above 850°C this became sticky and tended to agglomerate. The siliceous agglomerates had a tendency to concentrate in the bed and at temperatures approaching 900°C formed sinter.

The carbon dioxide elimination was above 94 per cent. at temperatures as low as 850°C and the amount of material reporting as cyclone product at 850°C was 18-19 per cent.

Provided the temperature was kept below 900°C, sinter formation was not serious and the lime sands are therefore amenable to fluid bed calcination.

BENEFICATION OF PHOSPHATE ROCK.

Report 655.

Comprehensive testwork was carried out to develop a simple inexpensive method to reduce the iron and aluminium content of the phosphate rock overburden on Christmas Island to acceptable limits.

The method finally developed was to crush the rock to about $\frac{3}{4}$ inch maximum size, dry and dry grind at a temperature of about 90°C. The iron and aluminium compounds occur as a film on the surface of nodules, and the grinding has to be controlled to grind the film off the particles. A "wet" method was also developed which was more effective than the all dry method but would be more costly to operate. Recommendations were made for a pilot plant installation.

FURTHER TESTS ON MARCHAGEE BENTONITE.

Report 664.

Report 548 issued July 1953 was the original report on this bentonite, and some further work was requested by the State Mining Engineer. The bentonite was thoroughly tested with various reagent combinations according to the American Petroleum Institute Code for field testing of drilling muds. The results of Report 548 were confirmed, and it was found that the addition of 2 per cent. soda ash by weight plus a little tannic acid was the most suitable reagent combination for this bentonite.

INVESTIGATION OF PYRITE AND MAGNETITE ORES.

Report 658.

Core samples from the diamond drilling of the pyrite and magnetite orebodies at Koolyanobbing were investigated to develop methods of treatment to produce marketable concentrates.

The magnetite was extremely fine grained and after a preliminary sink-float separation at 1 inch had to be ground to minus 100 mesh before effective magnetic separation could be applied. The hanging wall section (higher grade) yielded concentrate assaying 61 per cent. iron for a recovery of 78 per cent. of the iron. The lower grade foot-wall section gave a concentrate assaying 56 per cent. iron and a recovery of only 47 per cent.

The pyrite was likewise fine grained and after a preliminary sink float separation to remove relatively barren greenstone bands had to be finely ground to give a satisfactory recovery of pyrite. After grinding to minus 100 mesh and flotation, a concentrate assaying 47 per cent. sulphur representing a recovery of 92 per cent. of the sulphur in the feed was obtained. Higher grade concentrates would only be obtained at the expense of recovery.

INCOMPLETE REPORTS.

Report 667.

Recovery of gold from Wiluna calcine residues.

A detailed series of tests were carried out applying chlorination at various temperatures, salt roasting, volatilisation, and various cyanidation conditions to develop a method of recovering the refractory gold in the residues.

Report 671.

Check tests on recovery of graphite from Munglinup ore by flotation.

Some check tests were made on a fresh sample of Munglinup graphite ore to check earlier testwork, in particular, Kalgoorlie Metallurgical Report 617.

The tests confirmed the earlier work and a flotation concentrate assaying 81 per cent. graphitic carbon was produced.

Report 674.

Investigation of a new type of rabbling mechanism for Edwards roasters.

A model roaster (36in. x 6in.) incorporating some novel ideas was built at the Croesus Proprietary Treatment Plant under direction of Mr. T. D. Field, Mill Superintendent, and equipped with auxiliary apparatus at this Laboratory. Several test runs were made, up to 10 hours' duration, and the results were so encouraging that the building of a 12ft. x 4ft. wide experimental roaster was authorised by the management. This is in course of erection at the treatment plant.

CERTIFICATES.

The 54 certificates issued covered the usual wide range of measurements. The system of issuing certificates is proving quite satisfactory and the laboratory is able to give a speedy service to industry.

GENERAL.

During the year the services of a temporary fitter-mechanic were obtained and the re-organisation of the sampling section and the installation of the pilot plant were completed. The pilot plant was given several successful trial runs. The equipment installed in the laboratory is now first class, but the building housing the equipment leaves much to be desired. In particular the provision of adequate laboratory space for chemical analyses, and the partitioning of the unlined portion to separate the sampling section from the remainder is urgently required.

KALGOORLIE METALLURGICAL LABORATORY.
SUMMARY OF YEAR'S WORK (1955).

Report No.	Owner.	State.	Locality.	Ore Type.	Type of Investigation.	Confidential Until.	Number of Metallurgical Tests.	Number of Assays.	
								Gold.	Others.
644	O. J. Parker, Kalgoorlie	W.A.	Kalgoorlie	Gold	Cyanidation of products of testwork	11-2-56	10	74	42
651	Department of Industrial Development, Perth	W.A.	Perth	Limesands	Fluid bed calcination	12-4-56	7	....	104
655	The British Phosphate Commissioners, Melbourne	....	Christmas Island	Phosphate rock	Beneficiation of phosphatic rock	1-6-56	41	....	474
656	Westralian Ores Pty., Ltd., Perth	W.A.	Mt. Marion, Coolgardie	Lithium	Sink-Float tests for recovery of spodumene	17-9-55	2	....	18
657	Warman Equipment Co., Kalgoorlie	N.S.W.	Moss Vale	Limestone	Comparison of grinding techniques	12-1-56	11	....	190
658	Government Geologist, Perth	W.A.	Koolyanobbing	Iron-sulphur	Beneficiation of magnetite and pyrite	18-7-56	42	2	266
659	State Mining Engineer, Perth	W.A.	Nullagine	Gold - tungsten	Recovery of gold and scheelite from flotation tailing	25-1-56	40	85	46
660	Wiona Syndicate, Mt. Magnet	W.A.	Mt. Magnet	Gold	Recovery of gold with and without fine grinding	12-1-56	6	21	1
661	G. Napier, Widgiemooltha	W.A.	Widgiemooltha	Gold	Recovery of gold by amalgamation and cyanidation	12-1-56	2	9	8
662	C. H. Warman, Kalgoorlie	W.A.	Wonnerup	Titanium	Recovery of ilmenite from beach sands	18-4-56	3	....	26

Report No.	Owner.	State.	Locality.	Ore Type.	Type of Investigation.	Confidential Until.	Number of Metallurgical Tests.	Number of Assays.	
								Gold.	Others.
663	Northern Hercules G.M., Pine Creek	N.T.	Pine Creek	Gold-copper	Plant design tests	8-6-56	44	136	113
664	State Mining Engineer, Perth	W.A.	Marchagee	Bentonite	Beneficiation tests	1-1-56	31	....	....
665	Department of Industrial Development, Perth	W.A.	Perth	....	Determination of settling rates of fly ash	25-1-56	5	....	....
666	Warman Equipment Co., Kalgoorlie	N.S.W.	Moss Vale	Limestone	Determination of thickening characteristics of ground limestone	15-2-56	12	....	8
668	Blue Spec G.M., Nullagine	W.A.	Nullagine	Gold	Gold recovery tests on flotation tailing	8-6-56	12	34	1
669	Northern Hercules G.M., Pine Creek	N.T.	Pine Creek	Gold-copper	Treatment tests	21-4-56	17	38	32
670	Inca Gold Alluvials, Perth	W.A.	Pilbara	Gold	Determination of amount of free gold in gravel	7-5-56	2	10	4
672	Lake View & Star, Ltd., Kalgoorlie	W.A.	Kalgoorlie	Gold	Use of microcyclones to separate solids from mill solution	23-6-56	21	....	51
Totals							308	409	1,384
Certificates, Nos. 51-104							....	390	54
Free Assays							....	115	35
School of Mines							....	16	33
Totals							308	930	1,506

THE FOLLOWING INVESTIGATIONS WERE INCOMPLETE OR PENDING AT 31st DECEMBER, 1955.

667	J. J. Carroll, Perth	W.A.	Wiluna	Gold	Recovery of gold from calcine residues	....	41	58	26
671	G. Halbert, Esperance	W.A.	Munglinup	Graphite	Flotation tests on graphite ore	....	13	....	16
673	J. A. Mazza, Perth	W.A.	Napier Range, Derby	Lead-zinc	Method of treatment of lead-zinc ore	....	....	....	....
674	North Kalgoorlie (1912), Ltd., Kalgoorlie	W.A.	Kalgoorlie	Gold	Determination of characteristics of small scale modified Edwards roaster	....	3	....	....
675	B. E. Hewitt, Perth	W.A.	....	Gypsum	Washing tests to remove impurities	....	1	....	6
Totals for 1955							366	988	1,554

DIVISION VI

Annual Report of the Inspection of Machinery Branch of the Mines Department for the Year 1955

Operations under the Inspection of Machinery Act, 1921-1951

Annual Report of the Chief Inspector of Machinery and Chairman of the Board of Examiners for Engine-Drivers for the Year ended 31st December, 1955, with statistics

The Under Secretary for Mines:

For the information of the Hon. Minister for Mines, I submit the report of the Deputy Chief Inspector of Machinery in the administration of the Inspection of Machinery Act, 1921-1951, for the year ended 1955.

(Sgd.) E. E. BRISBANE,
Chief Inspector of Machinery.

Section 1.

INSPECTION OF BOILERS, MAINTENANCE, ETC.

(See Returns Nos. 1, 2, 3.)

Under the Act "Boiler" means and includes—

- (a) Any boiler or vessel in which steam is generated above atmospheric pressure for working any kind of machinery, or for any manufacturing or other like purposes;
- (b) any vessel used as a receiver for compressed air or gas, the pressure of which exceeds 30 lbs. to the square inch, and having a capacity exceeding five cubic feet; but does not include containers used for transport;
- (c) any vessel used under steam pressure as a digester, and
- (d) any steam jacketed vessel used under steam pressure for boiling, heating, or disinfection purposes.

It also includes the setting, smoke stack, and all fittings and mountings, steam and other pipes, feed pumps and injectors, and other equipments necessary to maintain the safety of the boiler.

Return No. 1.

Registrations of new boilers totalled 465; this represents an increase of 166 compared to the number of new registrations during 1954.

Return No. 2.

Tabulated in this return are the numbers of useful boilers of various types on the register at the close of the year. At the end of the return is recorded the total number on the register and also the total of those boilers which were not in commission. Comparisons with the previous year are also shown.

It will be observed that notwithstanding 465 new boilers being registered, as indicated in Return No. 1, the increase of useful boilers on the register as at 31st December, 1955, does not exceed 140. This is explained by 17 pressure vessels built here being exported to the Eastern States during the year and 308 very old ones being permanently condemned and removed from the register of potentially useful boilers.

(5)—3974

Return No. 3.

Therein are shown the operations of the Inspection of Machinery Branch relative to boilers during the year.

RETURN No. 1.—SHOWING THE NUMBER OF BOILERS OF EACH TYPE, AND COUNTRY OF ORIGIN OF NEW REGISTRATIONS FOR THE YEAR ENDED 31ST DECEMBER, 1955.

Type.	Country of Origin.						Total
	Germany	United Kingdom	U.S.A.	Eastern States	Western Australia	Unknown Sources	
Lancashire	1				1		2
Cornish					6		6
Vert. Stationary	1						1
Vert. Portable	1						1
Return Multi Stat. Under-fired				1	3		4
Ret. Multi Stat. Int. Fired				1	3		4
Water Tube	3			9	38		50
Saddle Back				3			3
Cylindrical					1		1
Sectional				2			2
Caustic Settling Tank					2		2
Digester				2	7		9
Vulcanizer				56	3		59
Steam Jacketed Vessel	1			9	20		30
Sterilizer	2	1		9	8		20
Air Receiver	18	2	2	57	45	6	128
Gas Receiver	34	40	18	40			132
Steam Receiver		10		1			11
Totals	2	60	52	168	177	6	465

RETURN No. 2.—SHOWING CLASSIFICATION OF VARIOUS TYPES OF USEFUL BOILERS IN PROCLAIMED DISTRICTS ON 31ST DECEMBER, 1955

Types of Boilers.	Districts Worked from PERTH.	Districts Worked from KALGOORLIE.	Totals.	
			1955.	1954.
Lancashire	47	50	97	95
Cornish	158	444	602	607
Semi Cornish	11	36	47	48
Vert. Stationary	418	341	759	792
Vert. Portable	64	17	81	83
Vert. Multi Stat.	45	25	70	78
Vert. Multi Port.	15	3	18	19
Vert. Pat. Tubular	47		47	47
Loco. Rect. F/box Stat.	76	61	137	147
Loco Rect. F/box Port.	227	64	291	319
Loco Circ. F/box Port.	104	8	112	146
Locomotive	76	33	109	121
Water Tube	471	107	578	545
Ret. Multi U/Fired Stat.	249	58	307	316
Ret. Multi U/Fired Port.	1	8	9	9
Ret. Multi Int. fired Stat.	43	12	55	58
Ret. Multi Int. fired Port.	2		2	2
Egg ended and other types not elsewhere specified	522	36	558	543
Digesters	297	10	307	308
Air Receivers	1,352	559	1,911	1,821
Gas Receivers	184		184	44
Vulcanizers	406	10	416	417
Steam Jacketed Vessels	517	13	530	521
Total Registration Useful Boilers	5,332	1,906	7,227	7,087
Total Boilers out of use 31st December, 1955	1,838	1,503	3,341	3,643

RETURN No. 3.—SHOWING OPERATION IN PROCLAIMED DISTRICTS DURING YEAR ENDED 31st DECEMBER, 1955.

Types of Boilers.	Districts Worked from PERTH.	Districts Worked from KALGOORLIE.	Totals.	
			1955.	1954.
Total number of useful boilers registered	5,332	1,906	7,238	7,08
New boilers registered during year	456	9	465	299
Boilers Converted	1	....	1	3
Boilers inspected—thorough	2,843	400	3,243	2,907
Vessels exempt under Act constructed for export—thorough	74	....	74	311
Boilers inspected—working	651	3	654	996
Boilers condemned during year temporarily	6	....	6	10
Boilers condemned during year permanently	289	13	302	44
Boilers sent to other States during the year	17	....	17	3
Boilers sent from other States during the year ....	....	....	....	3
Transferred to other Departments ....	....	....	....	2
Transferred from other Departments ....	....	....	....	2
Number of notices of repairs issued during year	415	1	416	700
Number of Certificates issued, including those issued under Section 30 during year	3,007	400	3,407	3,281

MAINTENANCE, ETC.

The percentage of boiler users who place the necessity of good care and maintenance of boilers low in importance on the scale of their industrial interests has reduced considerably; eventually experience in some respects can be a costly task-master and tutor.

There have been, however, some isolated cases in which small water tube boilers have suffered tube damage caused by defects developing in the automatic control systems and shortage of water resulting. In most instances the ultimate damage could have been obviated had the operators adopted routines of regular and frequent checking of the performances of components of the automatic control systems.

Unfortunately some users of small boilers equipped with such appliances appear to take the mistaken view that boiler automatic gear is something that requires no further attention when once placed in service, and that thereafter it can take all care of itself.

A short comment on the use of compounds for treatment of boiler waters is considered not to be out of place under the heading of maintenance.

There have been instances of users of small vessels anxious to apply treatment of boiler waters who, having obtained one or other of the various compounds, have failed to carry out the suppliers' instructions. The occasion has also arisen in which a salesman who took an order left the buyer without any useful directions regarding the use of the product.

In such instances much if not all of the useful purposes of the compounds were lost.

There has been a gradual increase in the trend toward the use of sawdust as a boiler fuel, particularly at sawmills in the South-West portion of the State. Seven water tube boilers and two of the return multitubular underfired type which originally were of Cornish design have now been added to the list of vessels fired with sawdust.

SECTION 2.

EXPLOSIONS AND INTERESTING DEFECTS.

There were no explosions during the year to report but occurrences worthy of mention are recorded hereunder for information.

Case A:

In this instance the dog of a front header externally fitted cap of a B. & W. water tube boiler failed whilst steam was being raised after boiler cleaning and inspection, resulting in a man receiving injuries to his foot when jumping down from a staging.

From a statement received it would appear that when the steam pressure had risen to 80 P.S.I. it was discovered that leakage at the cap joint surface had developed and an unsuccessful attempt was made by the Company's boilermaker to stop the leak by hardening up the nut. Anticipating that a replacement would then be effected the attendant then took action to ease all pressure but when this had been reduced to approximately 40 P.S.I. a further attempt to overcome the leak by tightening on the nut was carried out by another person.

Using a B. & W. standard cap nut ring spanner another quarter turn on the nut was gained but at this stage, although the leakage appeared to be reduced slightly, the bolt pulled through the dog and the cap blew off the header. Fortunately the man working on the cap was not scalded by the escaping hot water or struck by the cap as, naturally, he was standing aside during his activities with the spanner. His foot injury was caused by his vision of surroundings being obscured by steam when he jumped to the ground.

This incident demonstrates the danger attached to tightening up a bolt of a header cap of this nature without first relieving a boiler of all steam pressure.

Case B:

This has reference to two air receivers in a bank of five large horizontally seated egg-ended receivers in series which became affected by the passage of oil from the air compressors. For clarity the two receivers are referred to as (a) and (b) in order of sequence in the bank. Receiver (a) is the vessel receiving the initial delivery from the compressor.

Piping of 10 in. diameter for inlet of air to and outlet from each receiver in succession throughout the bank is introduced through the centres of the ends. In the crown of the shell of receiver (a) is also fitted a delivery pipe from a small additional compressor.

This plant had been in continuous service for very many years without any unusual condition coming to notice until an occasion one mid-afternoon smoke was observed issuing from the surfaces of receivers (a) and (b) in the vicinity of the adjacent ends. The compressors were immediately stopped, all pressure released from the bank of receivers and arrangements made to blow steam into the vessels through the drain cocks.

At this stage the exterior paint work in patches at the outlet end of receiver (a) and in one patch at the inlet end of (b) had burnt off and the whole surface of (a) was far too hot to touch.

When the vessels had cooled, internal inspections revealed that the ends, sides and top of receiver (a) were clean and free from any deposit but along the bottom over an area of approximately 15 in. wide an appreciably heavy deposit of oil about $\frac{3}{4}$ in. depth at extreme bottom remained, and this had baked to brittleness except in places where in contact with the shell plating the deposit was still soft and oily.

Whilst the plating of this vessel had been hot enough to burn the paint it had no appearance of having suffered structurally.

The collection of oil residue remaining in vessel (a) suggests that subsequent to the previous internal inspection five months earlier too infrequent drainings had been carried out.

Climatic conditions during summer months under which the compressor plant is worked and the factor of the receivers being fully exposed to the direct influence of the sun result in the temperature inside the vessel being severe. In such circumstances the collective effect of two large compressors and a smaller one, were oil sealing rings defective, would be such as to cause a concentration of vapour of some magnitude in the first receiver.

Although there was no report of severe overheating in the delivery line in close proximity to any of the compressors, it seems probable that this may have occurred with sufficient intensity for any carbon deposit to burn.

Under such conditions burning particles could become dislodged and in such event the released carbon deposits could have ignited the vapour concentrated in receiver (a).

That an explosion resulting in rupture of this vessel did not occur is attributable in my opinion to the successive receivers in the bank, each of which is of cubic capacity equal to (a), acting as expansion tanks.

It is of interest that only at the end of (a) opposite the inlet and in which is located the outlet to (b) did the paint burn off the plates and only at the inlet end of (b) was a small patch of paintwork similarly affected.

With regard to receiver (a) this is explained of course by consideration of the fact that air from the compressors is introduced concentrically with the axis of the vessel. Under the influence of the shaft of incoming air the heaviest concentration of oil vapour would naturally tend to take place at the far end and there be ignited. That the remainder of the plates of the receiver were too hot to touch but heating was insufficient to burn the paint on those parts makes it evident that away from the outlet end the oil vapour contained in those parts was appreciably less dense and that only slow burning consequently occurred there.

The intensity of the vapour fire issuing through the connecting pipe to receiver (b) would account for the slight burning of paint at the inlet end of this vessel. Obviously any oil vapour that had previously passed into (b) was of insufficient quantity to be ignited from (a).

Section 3.

INSPECTION OF MACHINERY.

See Returns Nos. 4, 5 and 6.

There were 36,677 groups of machinery on the register at the close of the year, an increase of 1,465 above the number in 1954.

It is worthy of note that 44 lifts were installed during 1955; this constitutes a record for one year.

RETURN No. 4.—SHOWING CLASSIFICATION ACCORDING TO MOTIVE POWER OF GROUPS OF MACHINERY IN USE OR LIKELY TO BE USED BY PROCLAIMED DISTRICTS AND WHICH WERE ON THE REGISTER DURING THE YEAR ENDED 31ST DECEMBER, 1955.

Classification.	Districts Worked from PERTH.	Districts Worked from KALGOORLIE.	Totals.	
			1955.	1954.
No. of Groups driven by steam engines	255	387	642	683
No. of Groups driven by oil engines	2,107	1,089	3,196	3,543
No. of Groups driven by gas engines	31	158	189	210
No. of Groups driven by Compressed air	2	61	63	62
No. of Groups driven by Electric motors	28,463	4,124	32,587	30,714
No. of Groups driven by hydraulic pressure	....	....	....	....
Totals	30,858	5,819	36,677	35,212

RETURN No. 5.—SHOWING OPERATIONS IN PROCLAIMED DISTRICTS DURING YEAR ENDED 31ST DECEMBER, 1955.
(Machinery Only.)

Classification.	Districts Worked from PERTH.	Districts Worked from KALGOORLIE.	Totals.	
			1955.	1954.
Total registrations useful machinery	30,858	5,819	36,677	35,212
Total inspections made	24,410	3,449	27,859	27,051
Certificates (bearing fees)	5,809	468	6,277	6,378
Certificates (steam without fees)	41	....	41	28
No. of extension certificates issued under Sec. 42 of Act	....	....	....	....
Notices issued (Mach. dangerous)	357	3	360	591

RETURN No. 6.—SHOWING CLASSIFICATION OF LIFTS ON 31ST DECEMBER, 1955.

Types.	How Driven.	Totals.	
		1955.	1954.
Passenger	Electrically driven	212	201
	Hydraulically driven ....	....	1
Goods	Electrically driven	114	107
	Hydraulically driven	2	3
Service	Belt driven	4	4
	Electrically driven	62	46
Escalators	Hydraulically driven	1	....
	Electrically driven	11	....
		406	362

ACCIDENTS TO MACHINERY.

Case A.

GOODS LIFT.

This refers to an automatic goods lift installation which suffered damage in which a train of events was involved. Fortunately, no person was injured.

The basement floor enclosure door became dislodged from its guides and held up the descending car. The machine is of drum type and located over the lift shaft.

A slack rope switch is fitted on the machine but the weight of the car ropes down the shaft kept the ropes taut and this switch failed to operate. As the basement floor levelling switch is situated at that floor and operated by the car the machine continued in motion.

As a consequence the counterweight was hauled to the top extremity of the shaft breaking timber supports, bending the diverter sheave spindle and fracturing the machine sole plate before the person operating the lift stopped the machine.

A slack rope switch has subsequently been fitted to the bridle ropes on the car.

Section 4.

PROSECUTIONS FOR BREACHES OF THE ACT.

There were no prosecutions during the year for breaches of the Act.

Section 5.

ACCIDENTS TO PERSONS.

During the year 104 accidents were reported to the Department and investigated. Of these, there were three fatalities and injuries in 25 instances were classed as being of minor nature. Returns Nos. 7 and 7A show the industries and descriptions of machinery to which the accidents were related and the number of persons injured under each group.

Hereunder are reports of the circumstances surrounding the fatalities:—

Case A.
CRANE.

A steam jib crane whilst being used on a jetty for placing a load in position overside without being blocked lost stability and fell into the water. The crane driver was unable to escape and was killed by being crushed between the crane and jetty combing.

The weight being handled was within the authorised loading of the crane when blocked, but not unblocked.

Following the accident it was thought that the driver desired to retain freedom to travel the crane in order to exactly position the material being handled and therefore did not request the attendant to block the bogie girders. As the driver was a well experienced man it is quite probable that he was not aware of the weight of the load or had underestimated this.

Case B.
CRANE.

The failure of two mast guys associated with a mast and derrick erected in connection with earthworks and not registered with this Department resulted in an attendant being killed when he was struck by a part of the falling structure. During investigation of the fatality it was understood that the appliance had been designed for a capacity of five tons.

One guy that failed was in two parts and these were joined together simply by laying the ends side by side and securing with three rope clamps of a type in general use. The guy was then anchored by looping it to a tree.

The second and adjacent guy that failed was looped through the top plate of the mast and secured with two clamps.

It was stated that at the time of the accident a load of 2½ to 3 tons was suspended from the derrick and that prior to this the mast and derrick had been tested with similar loading by reason of the whole structure having been moved from another site on the construction work in hand.

It was also said that the test load had been allowed to run and then braked for an impact test. This test was reported as being satisfactory, but it is understood that it was conducted at only one position in the arc of derrick slew and this was 180 degrees from the position where the accident occurred.

The accident was caused by the failure of the connection of the two parts of the one guy, and the tail of the bight in the other pulling through its clamps. Which guy failed first is not known but it appeared evident that neither were securely clamped and that creep must have occurred.

Following this most unfortunate mishap tests were conducted in order to ascertain the holding power of wire rope clamps. For the tests 9/16 in. rope of 6/19 construction and breaking strain approximately ten tons was used.

With lap connection and two clamps creep was set up at 2½ to 3 tons; with three clamps creep commenced at four tons pull. Using a thimble joint and rope laid back on itself with two clamps creep began at nine tons.

Case C.
DRIVING BELT.

In this case a hoist driver employed on a winch at a small mine shaft was killed by being in some way caught up in the Vee belt drive between the motor and the winch.

As there were no witnesses of the accident it is not known in what manner he became entangled.

GENERAL.

Woodworking and metalworking industries continue in the main to be responsible for personal injuries. It is acknowledged of course that the amount of machinery associated with each of these industries together with the variety of purposes regarding fashioning of materials for which it is utilised far exceeds that which is associated with any other industry in this State.

Buzzers and circular saws in that order still claim the greater toll in the accident rate regarding woodworking machines whilst sheet metal presses and wire drawing machines have been the sources of the larger proportion of accidents in the metalworking industry during the year.

Section 6.

EXAMINATION OF ENGINE DRIVERS, CRANE DRIVERS AND BOILER ATTENDANTS.

During the year the Board of Examiners granted 135 engine drivers', 89 crane and hoist drivers' and 79 boiler attendants' certificates.

Compared with the previous year these figures represent increase 26, increase 10, decrease 22 respectively.

Section 7.

AMENDMENT TO ACT.

No amendment to the Act was introduced during the year.

RETURN No. 7.—SHOWING NUMBER OF SERIOUS ACCIDENTS BOTH FATAL AND NON-FATAL WHICH OCCURRED
IN PROCLAIMED DISTRICTS DURING THE YEAR ENDED 31st DECEMBER, 1955.

"F" denotes "Fatal."

Industry.	Circular Saw.	Band Saw.	Buzzer.	Combination Woodworker.	Spindle Moulder (Shaper).	Borer.	Chain Mortiser.	Four Sider.	Belts and Shafting.	Gearing and Chain Drives.	Press (Metal).	Abrasive Wheels.	Punch and Shears.	Drilling Machine.	Hydraulic Riveter.	Wiredrawing and Wireworking Machines.	Bottle Making Machines.	Bottling Machine.	Mining Machine.	Printing Press.	Conveyor (Belt, Chain, Screw).	Rolls.	Lift.	Friction Hoist.	Guyed Derrick.	Guillotine.	Stoneware Pipe Machine.	Shaker Hopper.	Boiler.	Steam Crane.	Water Hammer.	Totals per Industry.
Woodworking and Furniture	6	1	11	1	3	1	1	1	1		4	2	1	1	1	3						1	1									27
Metalworking and Engineering									1													1										14
Leather Processing																																1
Printing and Allied Industries																					1											3
Fertiliser Manufacturing	2								1																							3
Mining	1		1						1												1											3
Food and Drink Processing	1								1																							1
Building Materials and Building	1		1						1																							3
Glassmaking																																1
Other										1													1									4
Totals per Type of Machine	11	1	13	1	3	1	1	1	6	5	4	3	1	1	1	3	1	1	4	1	4	3	1	1	1F	1	1	1	1	1F	1	79

RETURN No. 7A.—SHOWING NUMBER OF ACCIDENTS NOT CLASSED AS SERIOUS UNDER THE ACT AND NOT INCLUDED
IN RETURN No. 7 BUT WERE REPORTED AND INVESTIGATED DURING THE YEAR ENDED 31st DECEMBER, 1955.

Industry.	Circular Saw.	Band Saw.	Buzzer.	Belts and Shafting.	Wad Press.	Abrasive Wheels.	Shaper (Metal).	Milling Machine.	Sewing Machine.	Printing Press.	Corrugated Cardboard Machine.	Conveyor.	Rolls.	Lift.	Guillotine.	Creaming Machine.	Dough Break.	Totals per Industry.
Woodworking and Furniture	3	1	2			2	1	1										6
Metalworking and Engineering				1		2	1	1					1					6
Printing and Allied Industries										1								1
Fertiliser Manufacturing				1			1		1			1						4
Food and Drink Processing	1														1	1	1	4
Building Materials and Building												1						1
Glassmaking					1						1							2
Other														1				1
Totals per Type of Machine	4	1	2	2	1	2	2	1	1	1	1	2	1	1	1	1	1	25

Section 8.

STAFF.

Due to the progressive expansion of industrial activities over recent years and a consequent increase of boilers and machinery, the volume of work had risen to such a degree that it became necessary to appoint one additional Inspector, Mr. R. Cameron.

An Oil Refinery installed at Kwinana was placed in commission in the early part of the year and, due to the very large amount of pressure vessels and machinery used in productivity there, this is one source of much additional work which has developed in the Inspection of Machinery Branch.

Designs of proposed construction of all boilers and unfired pressure vessels, also lifts and cranes must be examined and stresses calculated before

certificates are granted, and these duties together with a number of visits to a workshop or erection site to inspect a single unit during construction absorbs a considerable amount of an Inspector's time. In addition to such duties it is expected of him that he maintains routine inspections of other boiler and machinery plants already in service.

Industrial growth involving a relative increase of boiler and machinery registrations reflects itself in the demands made on all clerical members of the staff also, and each has given ready response throughout the year.

The efforts of all technical and clerical officers on all occasions have been of high order and are unreservedly appreciated.

(Sgd.) J. F. WINZAR,
Deputy Chief Inspector of Machinery.

DIVISION VII

Annual Report of the Government Chemical Laboratories

The Under Secretary for Mines,

I have the honour to present to the Honourable the Minister for Mines my Annual Report on the operations of the Government Chemical Laboratories for the year ending 31st December, 1955.

The total number of samples registered for analysis, chemical and mineral examinations, industrial and general investigation was 19,534.

This figure is appreciably higher than last year's total of 15,876 and being achieved with a somewhat depleted staff reflects credit on the capabilities and zeal of all members of the Laboratories.

The samples covered a great variety of materials and included analyses, examinations and reports for the following Departments:—Mines, Agriculture, Metropolitan Water Supply, Sewerage and Drainage, Public Health, Police, Government Stores and Tender Board, Industrial Development, Public Works, Factories, War Service Land Settlement, Forestry, Fisheries and Royal Mint.

Fees were collected on work undertaken for revenue producing departments, boards and hospitals and various Commonwealth Government Departments, Local Government Bodies, University of Western Australia and the general public. A considerable number of free examinations were made including mineral indentifications and assays and aids to industry. Departmental investigations were instituted with a view to the development of the natural resources of the State.

The number of analyses, examinations and investigations carried out by the five main divisions were:—

Foods, Drugs, Toxicology and Industrial Hygiene	13,341
Mineralogy and Mineral Chemistry	1,156
Agriculture, Forestry, Water Supplies	4,549
Fuel Technology	480
Industrial Chemistry	8
	<hr/>
	19,534

A considerable number of the samples shown in the work of the Foods, Drugs, Toxicology and Industrial Hygiene Division are again due to field tests carried out as part of a systematic survey of factors and conditions resulting in corrosion of concrete sewers, weekly routine samples taken in connection with chemical control of various treatment works. Systematic surveys have also been carried out of the Swan River, Leschenault Inlet, Bunbury and Ocean beaches to determine sources and degree of pollution.

The largest number of samples under Foods were legal and investigational samples of milk many of which were below standard. In others, definite indications of added water resulted in legal proceedings. Reports were made on the quality of

foodstuffs submitted for Government tender whilst surveys were carried out on chemical criteria of ripeness of oranges and on the composition of West Australian honeys.

Toxicological examinations carried out on behalf of the Police Department have increased in number, both in criminal cases and in real and suspected poisoning cases. A large number of post mortem blood and urine exhibits were submitted for alcoholic content. This strong supporting evidence of the sobriety of deceased persons involved in fatal accidents has been increasingly accepted as evidence in Coroners' Courts.

Widespread spraying of toxic pesticides has resulted in a number of animal exhibits being submitted to ascertain if death has resulted from the ingestion of toxic concentrations. Formulations of pesticides which were being used for a variety of purposes have been examined for compliance with specifications in respect to chemical composition and physical stability.

Miscellaneous samples received covered a very comprehensive range of industrial and natural products.

The Mineral Division received 1,156 samples and specimens most of which were submitted by the Government Geologist, State Batteries, Department of Industrial Development, other Government Departments and the general public.

The samples and specimens from official sources were concerned chiefly with the development of the mineral resources of the State. Ores of potential economic value were examined and assays made of gold tailings and gold umpire samples.

An increasing number of samples were tested for radio-activity both departmentally and for the general public. In the latter cases the examinations were free and were carried out expeditiously to assist in the search for radio-active minerals within the State. Public interest has been maintained in oxidised copper ores used as a source of supply for correcting copper deficiencies in agriculture.

Thirty-seven samples of heavy sands were submitted for assay as the result of an increasing demand for titanium in whatever form it occurs.

A number of miscellaneous products such as phosphate rock, glass sands, building materials, cement pipes and linings, flue dusts, slagwool and French chalk were examined for composition or suitability for specific purposes.

The major activities of the Agricultural Division continues to be the chemical work required by the Department of Agriculture and the examination of water samples from the Metropolitan Water Supply, Goldfields Water Supply, Country Water Supplies and for primary producers.

The total number of samples examined by the division during the year was 4,549 of which 3,004 were for the various branches of the Department of Agriculture.

Examination of soils from a cultural experiment showed that fallowing reduced the nitrogen content of the soil. Other analyses of soils to which fertilisers had been applied showed the major portion to remain in the top 6 in. whilst very little penetrated to the 12-18 in. layer.

The variability with which agricultural scientists have to contend was shown by comprehensive analyses of soils where extreme variations of compositions were evident in a uniformity sampling of a site for an experiment.

A number of fertilisers and feeding stuffs were analysed for compliance with their respective controlling acts and the investigation of moisture content of superphosphate was continued in connection with the figure for maximum moisture content prescribed under a Fertiliser Act amendment.

Plant material analyses were made to determine the effect of fertiliser treatment on plant composition, diagnosis of unhealthy plants and the effect of various treatments in correcting unthriftness in plants. The result of this work enabled some far-reaching and valuable conclusions to be deduced.

The major portion (approximately 80 per cent.) of the water samples examined were from primary producers for determination of suitability for domestic, stock and irrigation purposes. With each report information contained in a leaflet is also enclosed. The routine examination of existing water supplies to cities and towns was continued and samples were analysed from Canning, Churchmans Brook and Victoria Reservoirs, the Wungong pipe-head dam and Mt. Eliza Reservoir also Munding Weir, Kalgoorlie Water Supply and Wellington Dam. Existing or prospective water supplies were examined for 36 communities ranging from the Kimberleys in the extreme north of the State to Augusta in the extreme south.

Experimental treatment with copper sulphate was carried out on the Goldfields Water Supply for the control of sponge growths. The effectiveness of the treatment cannot be ascertained until an inspection of the affected section of the pipeline is possible.

The long term experiment on the bacterial decomposition of sewage sludge in saline water has been continued. Evidence to date is that the safe upper limit of salinity of water for a septic tank is between 700 and 1,200 grains per gallon.

The Industrial Chemistry Division has occupied the newly constructed buildings housing the Unit Process Plant but which owing to frustrating delays has not been completely fitted out.

This has limited the scope of activities to smaller items of equipment and only to projects of short duration although the laboratory section has functioned throughout the year.

Working tests have been made on the major items of equipment and trial runs have been successful after overcoming initial difficulties.

Some corrective treatment is still necessary to make the Denver flotation plant fully and correctly operative.

The services of the division have been sought in a consultative capacity on many problems associated with industry. Short term investigations have been made on the bleaching of lanolin, the separation of stibnite from antimonial pyrites, hardener for urea-formaldehyde glues, plastic foils for contour mapping, chemical and physical tests on plastic floor tiles.

Research work on the toxic principle of a species of poison plant has made good progress and the possibilities of the utilisation of the gum of *Zamia palm* as a substitute for gum tragacanth have progressed to partial success.

The number of samples from all sources handled by the Fuel Technology Division amounted to 480.

The work of the division in relation to developments in the Collie Coalfield has been the continuation of analyses of coals and assessment of their combustion characteristics, gasification and coking properties. Research on the production of coked briquettes from Collie coal as a metallurgical coke substitute has been extended and in the progress of the research, 88 samples of coal, char, tar, gas, bitumen and briquettes were examined. In this work close liaison has been maintained with the Department of Industrial Development in their Welshpool briquette pilot plant.

The services of the division were also engaged on the analyses of Tasmanian and Newcastle coal.

In connection with the drilling programme being undertaken at Collie 30 core samples of coal in all were examined for the Government Geologist and the Chief Coal Mining Engineer.

The deterioration of Collie coal by weathering and storage was the subject of long term experiment in collaboration with railway authorities. Analyses in connection with railway loco trials were carried out.

Continuation of investigations associated with the development of sawdust as a boiler fuel has shown considerable success in achieving boiler economy and in the suppression of smuts.

Miscellaneous analyses or investigations were carried out on charcoal, fly ash, gypsum, refractory clay and dust.

(Sgd.) J. C. HOOD,
Director.

DIVISION VIII

Annual Report of the Chief Inspector of Explosives for the Year 1955

The Under Secretary for Mines:

For information of the Hon. Minister for Mines, I have the honour to report as under on the functioning of the Explosives Branch in 1955.

Importation of Explosives.

Because of reduced output consequent upon a disaster at the Australian explosives factory, a 16,000 case consignment was imported from South Africa last March. When Messrs. Nobel resumed full production, the usual vessels were supplemented by two interstate freighters bringing 17,000 cases. These three shipments necessitated a return to the former practice of lightering from roadstead to jetty, with the difference that transference was effected at Owen's Anchorage in place of Gage Roads. Shorter towage to Woodman's Point, coupled with enhanced protection from storms, seemed promising, but severe winter conditions delayed operations almost to the extent expected at the more exposed position. The shallow-draft m.v. Taranui, as for several years past, brought major supplies direct to the Explosives Reserve Jetty. Explosives for mining hematite at Cockatoo Island came by the northerly route from N.S.W. on iron-ore vessels. The State's remaining requirements were fulfilled by several railages, and one road movement from Brisbane of special American explosives used in the oil drilling industry.

Types of Explosives.

Elimination of certain explosives differing from widely-used ones in minor degree reduced the varieties imported to about fifteen. Even of these, some such as A2 and A3 Monobel are identical except for the metallic chlorides added as flame suppressants, and South African Ammon Gelignite is a close counterpart of Australian-manufactured A.N. Gelignite 60. In the following summary, no distinction is drawn between polar and non-polar grades because they have the same properties other than freezing-point.

TABLE No. 1.

Importations in 1955.
(Cases of 50 lb. net weight.)

Explosives—		
A.N. Gelatin Dynamite	....	4,206
Ammon Gelignite	....	16,000
A.N. Gelignite 60	....	46,940
Plastergel	....	305
Quarigel	....	1,466
Ajax	....	1,170
Roxite	....	100
A3 Monobel	....	398
Semigel	....	26,355
Quarry Monobel	....	3,505
Monograin	....	3,082
Blasting Powder	....	488
Geophex	....	5,304
Shaped Charges	....	1,843 lb.*
Gunpowder	....	21
Whaling Powder	....	132
* Packaged differently from Australian explosives.		
Fuse—		
Safety	....	6,417,600 yds.
Detonating	....	95,000 yds.
Detonators (Number)—		
Plain No. 6	....	2,200,000
Electric No. 6	....	114,000
Electric delay No. 6	....	120,400
Submarine No. 8	....	20,000

Recent Importations—

The second table shows quantities imported over the last five-year period—

TABLE No. 2.

	1951.	1952.	1953.	1954.	1955.
Explosives (cases)	90,264	121,017	114,916	120,201	109,340
Detonators (number)	2,222,376	3,931,943	4,447,870	3,745,850	2,454,400
Fuse (yards)	5,820,000	5,368,000	6,438,400	7,363,200	6,512,600

Use of Explosives—

Although importations were on a reduced scale, stocks carried from 1954 were such that consumption during the year under review showed no appreciable fall. As in the past, goldmines and collieries continued to be the principal users. It is interesting to note that geoseismic survey work accounted for 5,293 cases of Geophex, an explosive almost unknown here prior to the intensive search for petroleum. A summary of the main purposes to which explosives were put appears below:—

TABLE No. 3.
Main Consumers in 1955.
(Cases of 50lb.)

Mining—		
Gold	74,084	
Coal	9,785	
Asbestos	2,780	
Lead	691	
Tin	111	
Iron	1,125	
Quarrying	6,709	
Construction—		
Main Roads	5	
Railway	10	
Geoseismic Surveying	5,293	
Brickworks	544	
Public Works	1,517	
Timber	75	
Whaling	132	

Testing, Analysis and Investigation.

Except for analyses conducted by the Government Chemical Laboratories, all the undermentioned work was done at the Explosives Reserve. Actual inspection of explosives for physical condition, involving examination of many thousand samples per year, is not included in these figures—

TABLE No. 4.

	Determinations.
Explosives—	
Heat Testing, Sensitivity, Analysis, etc.	2,300
Fuse—	
Burning rate, freedom from lateral sparking	610
Fireworks—	
Percussion and Firing Tests	500
Chemical Analysis	10
General—	
Examination of case liners, packing materials, etc.	250 approx.

Licensed Storage of Explosives.

Efforts to account for explosives despatched to non-licensees revealed that apart from storage prescribed by Mines Regulations Act, quantities were held governmentally and privately under conditions sometimes at variance with this Branch's requirements. Most breaches were of an unwitting character; when the transgressors were apprised of their obligations under the Act, fourteen applications for magazine or store licenses were received. Several concerns in the Coogee-Spearwood district magazined their bulk at the Explosives Reserve, withdrawing supplies as necessary. A few storekeepers, mainly in decadent mining districts, cancelled their licenses, but a small net gain came about through expanding business elsewhere. Occasional requests from vendors for a double license in respect to the one premises were granted only where sufficient isolation of the explosives receptacles from protected works could be attained. The pyrotechnical trade, as indicated by a sharply increased number of resellers and heavy storage in the magazines at Woodman's Point, surpassed

its previous dimensions. Police vigilance in country districts beyond economical departmental inspection, plus co-operation by wholesalers, materially assisted a drive against unauthorised storage and sale of fireworks. The following list shows the kind and number of licenses operative:—

TABLE No. 5.

Licenses issued under the Explosives Act.	
Magazines on Government Reserves	60
Magazines on Government Lands not reserves	36
Magazines, privately owned on non-governmental land	124
Stores Mode A	76
Stores Mode B	1
Fireworks—storage and sale	538
Fireworks—manufacture	2
Explosives—importation	2

The Quality of Explosives.

A section of the Act enjoins that every explosive in Class 3 (which includes practically all except blasting and gun powder) and every component thereof "shall be so thoroughly purified as to satisfy a test known as the Heat Test . . .". Although this determination alone tells little or nothing of an explosive's firing characteristics, normal results indicate expected stability, or resistance to decomposition. The converse is not necessarily true, but the test is nevertheless applied in England and by all Australasian Explosives Departments. In 1955 about 800 manhours were spent on the preparation and heat testing of each size and type of nitroglycerin explosive imported into W.A. No sub-standard values were recorded. Neither was any seepage, or exudation, found during inspections of explosives on arrival, and in a chemical sense the entire quota for the year could be pronounced as satisfactory. Physical deformation of cartridges, or out-of-roundness, reached fairly serious dimensions among the South African explosives, but no instances of difficulty in charging shotholes were reported.

Colour of Explosives.

A colour range from pale pink to deep red commonly occurring nowadays is an incidental property conferred by inclusion of acid magenta as an anti-agglomerant. Without such protection, ammonium nitrate which enters into the composition of most explosives may recrystallise to form a mass too hard for insertion of the detonator. Much confused thought arises among users of explosives, some of whom are obsessed with the notion that colour is fundamental. Uniformity or preferably a reversion to the natural buff shade is therefore desirable. Promise that this may be attained is held by the researches of oversea chemists who have recently prepared colourless anti-setting compounds suitable for incorporation with explosives.

Shipping and Unloading.

Three occasions where explosives were landed by lighter took up much time because these craft were neither self-propelling nor equipped with winches. Unloading was accomplished by a single electric crane on the jetty. Vessels able to berth alongside, however, worked as described last year, were cleared rapidly at no sacrifice of safety. Indeed, the danger element must be regarded as lessened now that a heavy concentration of explosives may be dispersed within two working days. To maintain or better this rate, however, modern rail trucks for transit from ship to magazine will be required. Apart from inadequate capacity, the existing rolling stock is so old that the possibility of fatigue fracture in structural members or perhaps wheel axles cannot be ignored.

Inspections—

Acting in the capacity of inspector under Fremantle Harbour Trust regulations, the writer personally attended at North Wharf during the munitioning of war vessels. These operations, at approximately monthly intervals, involved expenditure of time ranging from a couple of hours

to two days. Supervision over transfer of civilian explosives at a powder anchorage was in the hands of a Fremantle Harbour Trust nominee, following Sub Inspector T. K. Wood's retirement. As before, continued vigilance was exercised at Woodman's Point Reserve from start to finish of all explosives movements. These duties, combined with those at head office, again made heavy inroads on time available for country inspections, some of which may involve a fortnight's absence.

Results of Inspections—

The primary purpose of ensuring that no sub-standard explosive reached consumers was attained as far as it was possible to pass judgment on a consignment by examination of samples regarded as representative. Inspections of vehicles intended for explosives transport, ships' gear and stowage in holds also received attention, with results which in the latter instance served to show how and where wetting of explosives in transit occurred. Another finding, which unchecked could have portended danger, was that of a case of gelignite into which the ends of a pipe clip had gouged. Only the hesheen liner prevented actual contact between the explosive and ferrous metal.

New Explosives—

A small consignment of Roxite, a gelignite-like composition with a good record of performance in tunnelling for the Snowy Mountains Hydroelectric project, arrived in December. Local trials have not been completed. From U.S.A. came a ton of Schlumberger Shaped Charges, used in oil-drilling technology for perforating bore casings. The active component is mainly cyclonite, a powerful explosive known chemically as cyclotrimethylene trinitramine. The Roxite and Charges are under examination prerequisite to authorisation.

Detonators—

A rare instance of open-circuited electric detonators from New Coolgardie G.M., when referred to the manufacturers, could not be explained other than by the suggestion that a few factory rejects had inadvertently been included. Another interesting experience was that of ten detonators retrieved from the river bed at Canning Bridge. Examined at police request, these were found dulled by immersion and contaminated with adherent marine growth. One specimen, reasonably dry since recovery three days beforehand, unexpectedly fired when crimped to fuse. Such an occurrence, coupled with results of work done elsewhere on the slow desensitization of detonators by deliberate wetting, shows the folly in disposing of these articles except by exploding under powerful stimulus.

Destruction of Explosives—

A police and army campaign for surrender of war souvenirs achieved the additional purpose of bringing to hand many oddments of commercial explosives. These with the usual miscellany of samples from inspections and those after heat testing were burnt on Woodman's Point Reserve beach. As for years past, absorption of moisture proved to be the main deteriorating factor which justified destruction.

Explosion During Destruction—

On October 24th, 250 lb. of material exploded shortly after ignition, causing considerable havoc despite a long sandy ridge screening the burning-ground. As all displacement occurred toward the blast, the suction effect, or wave of secondary rarefaction, seemed responsible. About 400ft. of boundary fence suffered in extent varying from loosened springheads to obtusely bent iron, with a few broken rails, and props wrenched from their

ground anchorage. Several windows and glass louvre slats were smashed in buildings more than 600ft. from the explosion. No cause could be assigned to the unexpected mishap, which was only about the third of its kind in the Reserve's history. The observed effects of this explosion align with the modern view that a mound or traverse may function to better purpose by protecting property within than in guarding external structures against blast and rarefaction.

Woodman's Point Explosives Reserve.

Reconditioning of the boundary fence, together with a steel post barb-wired extension into water at the N.W. corner, was finished in June. The enhanced security was reflected in less unauthorised entry to the magazine area and shore. Two large paved areas to facilitate vehicular movements were constructed by the Branch's resident staff. Many magazines underwent repairs, and a start was made on rebuilding anti-blast mounds whose timbering was ravaged by termites before systematic extermination became general practice. Several mounds were constructed in or faced with non-reinforced concrete containing only eight or ten per cent. cement. This composition, long used in other countries, will pulverise under explosive violence rather than cause a projectile menace.

The Explosives Act, 1895.

Though soundly based on English legislation originally, the Act and many contingent regulations seem inadequate for present day application. We have, as it were, gone a long way since gunpowder in barrels was man-handled over a vessel's side into horse-drawn vans. Technical considerations apart, there have been several instances of where shortcomings thwarted a projected line of action. According to legal opinion, even such simple purpose as the compulsory recording of sales by explosives vendors could not be attained without an amending clause, and fees must remain static until the Schedule is altered. For lack of an appropriate section, a fully-justified intended prosecution had to be dropped during the year. These and similar instances all indicate the necessity for a new Act—maybe a short one akin to the Commonwealth Explosives Act, 1953, but with ample power for control by Regulations.

Fireworks.

About 140 tons gross, comprising 2,793 packages, were imported in 1955. Mostly the products of old-established English, Chinese and Australian manufacturers, well aware of local requirements, all lines proved acceptable for transport, storage and use within the State. Several minor accidents were attributable to indiscretion rather than faulty or over-sensitive composition. Neither of the two locally-licensed pyrotechnicians, both of whose wares have been in demand for public displays, has yet realised his intention to exploit the shop-goods or toy fireworks field.

Inflammable Substances Control.

A report dealing with practices elsewhere and particularly embodying results of investigations in New South Wales was compiled through the year. That the necessity for control exists is undisputed, but even with ample precedent it is difficult to prepare a draft covering the whole subject. However, several Acts studied provide that the Minister shall require bodies such as port, railway and public works authorities to formulate their own codes, not inconsistent with the main regulations, for incorporation therewith. Hence it seems that if

an Act were proclaimed its full application would be a gradual development. The Commissioner of Public Health has pointed out that a start could well be made by the Explosives Branch in administering regulations promulgated under Section 199 of the Health Act. Such a plan is to be commended as affording immediate experience, admittedly in a narrow field, but of undoubted value in the preparation and ultimate implementation of comprehensive control.

Staff.

Mr. E. J. Rouse was appointed Assistant Magazine Keeper to fill a vacancy last January. At Head Office, Mr. W. Smith capably discharged the clerical duties of the Branch during Mr. Calneggia's absence on long service leave.

Acknowledgments.

To the above officers and the staff generally, gratitude is expressed for satisfactorily performed work during a heavy year. Appreciation is also recorded of help and co-operation from members of the Department generally, be they superiors, equals or juniors, and of the relationships existing with the outside public.

F. F. ALLSOP,

Chief Inspector of Explosives.

DIVISION IX

Report of Chairman, Miner's Phthisis Board and Superintendent Mine Workers' Relief Act

Under Secretary for Mines:

I have the honour to submit for the information of The Honourable Minister for Mines, my report on this Branch of the Mines Department for the year, 1955.

Under arrangements commenced with the State Public Health Department on the 12th November, 1954, that Department continued the periodical examination of mine workers, the work being carried on continuously by the Kalgoorlie District Hospital and by a mobile X-ray unit which visits the mining centres in various Goldfields. The Goldfields not visited during the year were the West Kimberley, Kimberley, Pilbara, West Pilbara, Ashburton and Phillips River, which are remote or in which there are few mine workers.

Mine Workers' Relief Act.

The examinations under the Mine Workers' Relief Act during the year totalled 5,043 as compared with 5,630 for the previous year, a decrease of 587. The results of the examinations for 1955 together with figures for previous years are shown in the Tables annexed hereto. A graph is also attached illustrating the trend of the examinations since their inception in 1925. In explanation of these figures I desire to make the following comments.

Normal, etc.: These numbered 4559, or 90.40 per cent. of the men examined, and include men having first class lives, or suffering from pneumoconiosis only, the figures for the previous year being 5,142 or 91.33 per cent.

Early Silicosis: These numbered 449, of which 63 were new cases and 386 had been previously reported, the figures for 1954 being 154 and 275 respectively. Early Silicotics represent 8.90 per cent. of the men examined, the percentage for the previous year being 7.62 per cent.

Advanced Silicosis: Of the 31 cases reported, nine were men who advanced from early silicosis during the year, the other 22 having been reported previously. Advanced silicotics represent 0.62 per cent. of the men examined, the percentage for the previous year being 0.76 per cent.

Silicosis plus Tuberculosis: Three cases were reported compared with nine in 1954.

Tuberculosis only: One case was reported compared with seven in the previous year.

MINES REGULATION ACT.

Examinations under the Mines Regulation Act, totalled 1,644. These were in addition to the 5,043 examinations under the Mine Workers' Relief Act. There was a decrease of 25 examinations under the Mines Regulation Act in 1955 as compared with those in 1954. Of the total of 1,644 men examined, 1180 were new applicants and 464 re-examinees for the Initial Certificate.

Particulars of the examinations are as follows:—
New Applicants:

Normal	....	....	....	....	1,154
Pneumoconiosis	....	....	....	....	11
Silicosis Early	....	....	....	....	2
Silicosis Advanced	....	....	....	....	—
Query Tuberculosis	....	....	....	....	3
Tuberculosis	....	....	....	....	—
Other Conditions	....	....	....	....	10
					1,180

Of the above applicants for admission into the industry, 1,154 received the Initial Certificates (Form 2), four received Temporary Rejection Certificates (Form 3), 21 received Rejection Certificates (Form 4) and one received a Re-admission Certificate (Form 5). Thus of 1,180 applicants, 1,154 or 97.80 per cent., were eligible for employment anywhere on a mine.

Re-Examinations:

Normal	....	....	....	....	354
Pneumoconiosis	....	....	....	....	71
Silicosis early	....	....	....	....	15
Silicosis advanced	....	....	....	....	—
Query Tuberculosis	....	....	....	....	3
Tuberculosis	....	....	....	....	1
Pneumoconiosis plus Query Tuberculosis	....	....	....	....	1
Silicosis early plus Query Tuberculosis	....	....	....	....	2
Other conditions	....	....	....	....	17
					464

These men had previously been examined and some were engaged in the industry prior to this examination. 354 received the Initial Certificate (Form 2), six received Rejection Certificate (Form 4), 54 received Re-Admission Certificate (Form 5), 48 received Special Certificates (Form 9) and no certificate was issued in two cases. Thus of 464 men re-examined, 408 were eligible for employment anywhere on a mine, 48 were eligible for surface work only and eight were not eligible to work on a mine.

Grouping the two sets of figures discloses that the following Certificates were issued under the Mines Regulation Act:—

Initial Certificates (Form 2)	1,508
Temporary Rejection Certificate (Form 3)	4
Rejection Certificate (Form 4)	27
Re-admission Certificate (Form 5)	55
Special Certificate (Form 9)	48
No Certificate	2
Total ...	<u>1,644</u>

The percentage of men of normal health to the number examined was 91.73, compared with 90 per cent. in 1954.

THE MINER'S PHTHISIS ACT.

The amount of compensation paid during the year totalled £18,828 15s. compared with £19,897 18s 9d. for the previous year, a decrease of £1,069 3s. 9d. which can be attributable to the death of some of the beneficiaries and the attainment of the age of sixteen years by some of the dependent children.

The number of beneficiaries under the Act on the 31st December, 1955, was 173, being 16 ex-miners and 157 widows.

(Sgd.) W. Y. R. GANNON,
Chairman Miners' Phthisis Board,
and Superintendent Mine Workers' Relief Act.

TABLE SHOWING RESULTS OF PERIODICAL EXAMINATION OF MINE WORKERS FROM INCEPTION OF EXAMINATIONS (1925).

Year of Examination.	Normal, etc.				Silicosis Early.				Silicosis Advanced.				Silicosis Plus Tuberculosis.				Tuberculosis Only.				Total Number of Men Examined.						
	Previously reported as Normal, etc.	New Cases.	Total.	Per cent.	Previously reported as Normal, etc.	Previously reported as Silicosis Early.	New Cases.	Total.	Per cent.	Previously reported as Normal, etc.	Previously reported as Silicosis Early.	Previously reported as Silicosis Advanced.	New Cases.	Total.	Per cent.	Previously reported as Normal, etc.	Previously reported as Silicosis Early.	Previously reported as Silicosis Advanced.	Previously reported as Silicosis plus Tuberculosis.	New Cases.		Total.	Per cent.	Previously reported as Normal, etc.	New Cases.	Total.	Per cent.
1925 } 1926 }	...	...	3,239	80.5	...	...	...	459	11.4	...	...	...	...	183	4.5	...	...	...	...	...	131	3.3	...	...	11	0.3	4,023
1927	2,290	826	3,116	83.6	...	348	33	381	10.2	...	...	85	8	93	2.5	13	27	62	...	26	128	3.4	...	...	10	0.3	3,728
1928	2,738	239	2,977	85.5	47	303	12	362	10.4	1	16	79	2	98	2.8	10	14	10	...	8	42	1.2	3	1	4	0.1	3,483
1929	2,099	21	2,120	81.9	100	224	2	326	12.6	...	34	60	...	94	3.6	8	14	19	...	...	41	1.6	7	...	7	0.3	2,588
1930	2,751	34	2,785	81.9	133	247	3	383	11.3	...	22	43	2	67	2.0	6	60	46	...	2	114	3.3	47	3	50	1.5	3,399
1931	2,530	...	2,530	84.0	94	252	...	346	11.5	...	18	35	...	53	1.8	4	35	19	...	...	58	1.9	25	...	25	0.8	3,012
1932	3,835	...	3,835	89.5	35	338	...	373	8.7	...	6	47	...	53	1.2	3	9	4	...	...	16	0.4	8	...	8	0.2	4,285
1933	2,920	...	2,920	86.5	57	322	...	379	11.2	1	15	44	...	60	1.8	2	9	4	...	...	15	0.4	3	...	3	0.1	3,377
1934	5,140	...	5,140	92.4	54	315	...	369	6.6	1	24	12	...	37	0.7	6	6	...	...	...	12	0.2	5	...	5	0.1	5,563
1935	4,437	...	4,437	92.3	35	303	...	338	7.0	...	24	2	...	26	0.6	...	5	...	...	...	5	0.1	2	...	2	0.0	4,808
1936	6,972	...	6,972	94.7	29	323	...	352	4.8	1	15	4	...	20	0.3	3	8	...	...	...	11	0.1	8	...	8	0.1	7,363
1937	7,487	...	7,487	95.4	15	319	...	334	4.3	...	14	4	...	18	0.2	1	10	...	...	...	11	0.1	2	...	2	0.0	7,852
1938	6,833	...	6,833	95.7	13	266	...	279	3.9	...	15	2	...	17	0.2	1	8	...	...	...	9	0.1	3	...	3	0.0	7,141
1939	6,670	...	6,670	95.6	18	264	...	282	4.0	...	7	3	...	10	0.1	1	9	1	...	...	11	0.2	2	...	2	0.0	6,975
1940	7,023	...	7,023	96.2	12	245	...	257	3.5	...	10	1	...	11	0.2	...	4	...	...	...	4	0.0	4	...	4	0.0	7,299
1941	6,840	...	6,840	95.8	32	248	...	280	3.9	...	11	3	...	14	0.2	...	...	...	...	...	...	...	7	...	7	0.1	7,141
1942	5,469	...	5,469	93.9	61	264	...	325	5.6	...	20	5	...	25	0.4	...	...	...	...	...	...	0.0	3	...	3	0.1	5,824
1943	3,932	...	3,932	91.5	63	262	...	325	7.6	...	25	7	...	32	0.7	...	5	...	...	...	5	0.1	4	...	4	0.1	4,298
1944	4,079	...	4,079	91.5	70	270	...	340	7.5	...	21	14	...	35	0.8	1	7	...	...	...	8	0.2	6	...	6	0.1	4,468
1945	3,071	...	3,071	92.1	54	166	...	220	6.6	...	26	10	...	36	1.1	3	2	...	...	...	5	0.2	2	...	2	0.1	3,334
1946	5,294	...	5,294	94.4	89	172	...	261	4.7	1	36	2	...	39	0.7	3	1	2	...	...	6	0.1	6	...	6	0.1	5,606
1947	6,021	...	6,021	93.3	101	237	...	338	5.2	...	49	9	...	58	1.0	13	11	1	...	...	25	0.3	8	...	8	0.1	6,450
1948	4,827	...	4,827	94.0	24	239	...	263	5.1	...	18	17	...	35	0.7	1	3	...	...	...	4	0.1	5	...	5	0.1	5,134
1949	5,162	...	5,162	94.0	24	239	...	263	4.8	...	20	31	...	51	1.0	3	2	...	1	...	6	0.1	7	...	7	0.1	5,489
1950	5,077	...	5,077	93.6	14	269	...	283	5.2	...	14	41	...	55	1.0	...	1	...	2	...	3	0.1	8	...	8	0.2	5,426
1951	4,642	...	4,642	93.9	13	248	...	261	5.3	...	9	20	...	29	0.6	...	4	1	1	...	6	0.1	4	...	4	0.1	4,942
1952	5,073	...	5,073	94.6	8	234	...	242	4.5	...	4	31	...	35	0.6	...	2	...	...	...	2	0.1	7	...	7	0.1	5,359
1953	4,474	...	4,474	93.03	74	225	...	299	6.22	...	8	24	...	32	0.6	...	2	...	...	...	2	0.1	2	...	2	0.1	4,809
1954	5,142	...	5,142	91.33	154	275	...	429	7.62	...	22	21	...	43	0.76	1	6	2	...	...	9	0.1	7	...	7	0.1	5,630
1955	4,559	...	4,559	90.40	63	386	...	449	8.90	...	9	22	...	31	.62	1	1	1	...	...	3	.06	1	...	1	.02	5,043

DIVISION X

Report of the Chief Coal Mining Engineer for the Year 1955

Under Secretary for Mines:

I have the honour to submit the Annual Report on the operations of the Collie Coalfield for the year ended 31st December, 1955.

The aggregate amount of coal sold for the year was 903,791 tons as compared with 1,017,456 tons for the previous year. This represents a decrease of no less than 113,665 tons.

The output comprised 599,667 tons of deep mined coal or 66.35 per cent. of the total and 304,124 tons or 33.65 per cent. of open cut coal.

Due to the lesser demand the deep mines produced 7,110 tons less and the open cuts 106,555 tons less, thus making the total reduction of 113,665 tons.

The estimated total value of the coal sold was £3,132,074 or an average of approximately 69s. 4d. per ton as compared with 70s. 6d. per ton for the previous year.

Details of the outputs of the individual mines are shown on Table "A" together with a comparison of the equivalent statistics for the previous year.

Only two mines exceeded the 100,000 tons per annum mark, namely, the Co-operative and Neath Mines. These two mines produced an aggregate of 229,042 tons or 25.34 per cent of the total output, including the open cuts. This output, as a percentage of deep mined output, is no less than 38.2 per cent from two deep mines only. The other ten deep mines produced the remainder, or 61.8 per cent. of the total, an average contribution of only 6.18 per cent. for each remaining deep mine.

Apportionment of Output.

The State Electricity Commission were again the largest consumers of coal, consuming 353,802 tons in the metropolitan area. This represents 39.15 per cent. of the total coal sold. The Collie Power Station consumed 51,777 tons or 5.73 per cent. of the total. The S.E.C. therefore consumed a total of 405,579 tons or 44.98 per cent. of the total, an increase of only 4,342 tons, or approximately 1 per cent, on the consumption of the previous year.

The next largest consumers were the Railways Commission with a consumption of 318,986 tons or 35.29 per cent of the total. This represents a reduction of 56,162 tons or approximately 15 per cent. on the consumption for the previous year.

Consumption by private companies was 36,588 tons of large coal and 38,835 tons of small coal, a total of 75,423 tons or 8.35 per cent. of the total consumed. In the previous year private consumption was 116,989 tons, making a reduction of 41,566 tons or 35.5 per cent. on the consumption for 1954.

The total reduction in consumption by the Railways Commission and private consumers is no less than 97,728 tons or 19.6 per cent. on the consumption for the previous year. This is a most formidable decrease and is due to the increasing use of alternative fuels.

This reduction will be increased by the amount consumed by the cement works, which for the year under review was 65,826 tons.

The estimated reduction for 1956 therefore will be approximately 160,000 tons, thus making the requirements approximately 700,000 to 750,000 tons.

DEVELOPMENTS.

Co-operative Mine.

The output from this mine increased from 123,386 tons during 1954 to 126,746 tons in 1955, an increase of only 3,360 tons. However it must be recalled that this mine increased its output by over 100 per cent. during 1954. This rate of increase cannot be expected each year.

However, during the year the re-making of the main East Tunnel was completed to the fault on the southern end of the lease. It is hoped to drive through the fault during 1956 and commence developments on the south side of the fault.

The future of this mine lies on the south side of the fault and it is essential to develop same as soon as is possible.

This mine produced during the year 14.02 per cent. of the total output, including the open cuts, as compared with 12.13 per cent. during the previous year.

The total deep mined coal was 599,667 tons of which the Co-operative produced 126,746 tons or 21 per cent. of the total. When developments commence on the south side of the fault this mine will have enormous potentialities.

Neath.

This mine increased its output from 69,105 tons during 1954 to 102,296 tons in 1955, an increase of 33,191 tons, or approximately 50 per cent. on the previous year's output.

The mine is still in the development stage and will continue so until the main dips have reached the southern boundary. It is intended to bring this mine into production on the retreating system.

In spite of the fact that the Neath is still developing it produced 11.32 per cent. of the total output, including open cuts. For the deep mines alone it produced approximately 17 per cent. of the deep mine output.

Ewington.

This mine still continues to develop and produced an output of 11,172 tons as compared with 10,455 tons the previous year.

It is not intended to bring this mine into full production until the developments are well ahead of production faces. Two seams of coal are available on the lease and both will be developed and brought into production from the same tunnel.

Westralia and Black Diamond.

Both these mines are in the development stage and will continue so for some time. Ultimately both will be coupled into one mine and all the output concentrated into the Westralia tunnel.

Unfortunately the Westralia seam contains a band of dirt up to 2 ft.—3 ft. thick. At present this dirt is loaded out of the mine separately. The Company would be well advised to dispose of the dirt band on the side of the working places rather than send same out of the mine. Some of this dirt finds its way into the coal contaminating same. If this seam develops into a large producer then some means will have to be adopted to clean same, otherwise history may repeat itself.

During the year these two mines jointly produced 51,229 tons as compared with 35,761 tons the previous year, an increase of 15,468 tons or 43.25 per cent.

Stockton: This mine is the only hand-getting mine at Collie. It produced an output of 70,073 tons as compared with 66,216 tons the previous year.

The future of this mine has been the subject of much controversy since early 1950. It was realised at the time that the mine had no long future unless some form or re-organisation took place.

The haulage system to the No. 2 Seam Stone Drive Section has a limited capacity and can serve adequately only eight pairs of miners, producing approximately 150 tons per shift. The capacity of this haulage system could be considerably increased by the driving of a drift to the surface from the Stone Drive. This drift would reduce the distance traversed by the haulage from 1500 yards to 550 yards, thus considerably increasing its capacity.

One cannot understand the reluctance of the management to carry out the suggested re-organisation as the potentialities existing justify same.

Western No. 1: This mine produced 66,624 tons during the year as compared with 62,661 tons the previous year.

As stated in the Annual Report for 1954 this mine appears to have reached its potential output unless the two lower seams are developed. The abovementioned tonnages seem to confirm the view expressed twelve months ago.

It has been suggested to the management on many occasions to develop the lower seam and drain the two upper seams. The most difficult natural cause of roof control at Collie is that due to water. Such cause can so easily be removed by efficient drainage of the property as was clearly established at the Neath Mine.

The management would be well advised to give serious consideration to the above suggestion.

Western No. 2: As mentioned previously the short career of this mine is one of misfortune caused by adverse geological difficulties in the form of wash-outs or vugs. The main dips still remain inundated with slurry and until they can be recovered no permanent development can take place.

In view of the considerable geological difficulties encountered and the uncertainty of the continuity of the main dips, the long future of this mine is obscure.

Wyvern: As stated in many previous reports this mine cannot, for geological reasons, play an important part in the long future of the Collie coal-field.

The geological circumstances pertaining to this mine are well known to everybody and a repetition of same in this report would be superfluous.

The mine has a very limited life and the management would be well advised to develop elsewhere so as to absorb the employees involved at the Wyvern.

The mine produced 53,655 tons during the year as compared with 56,213 tons during the previous year.

Phoenix: This mine produced 33,463 tons during the year as compared with 31,832 tons during the previous year.

The results from a production point of view are satisfactory but unfortunately the seam contains a band of carbonaceous shale approximately 15 in. thick on the floor of the seam. This shale contaminates the coal and consequently it does not commercially enjoy a good reputation.

Centaur: This mine continues to operate under Section 17 of the Act and only the dip headings are in production. However, in July, 1955, the management informed the Mines Department that they would cease further developments of the dip headings for purposes of economy. The output for the year was 26,012 tons as compared with 24,262 tons the previous year. The future of this mine is therefore obscure as without developments to the dip it must be the beginning of the end of the mine.

Hebe: This mine is still in the development stage and should continue so until the dip headings are well down. The seam worked is the Hebe and is 42 ft. 0 in. thick. The workings are approximately in the middle of the seam and in the absence of a good parting in the roof or floor, it will be difficult to keep in this horizon. The output for the year was 35,547 tons.

General: During the year the developments, at some of the mines, were retarded in order to economise in costs and in anticipation of some mines ceasing production due to the much lesser demand for coal.

Late during the year the Government called for tenders for the supply of coal to Government instrumentalities but no finality was reached, hence the Companies were loath to undertake any new development programmes. Much development work is needed at many of the deep mines in order to prove reserve coal as well as to provide reserve production faces to meet contingencies that occur in mining.

I would once more stress the need for the study of roof control and would reiterate my previous comments and state that the essence of good and efficient mining is good roof control. A study of the subject would, in my opinion, pay handsome dividends and eliminate much anxiety at many of the Collie mines.

The Proprietary Mine ceased production in March due to the fact that the consumers were not prepared to pay the high price for coal which was due to the high costs of developments.

Accidents: The total number of serious accidents for the year was 149 as compared with 139 for the previous year.

The number of miscellaneous accidents was 351 as compared with 381 in 1954, thus making the total number of all accidents 500 for the year as compared with 520 the previous year.

It is regrettable to record a fatal accident which occurred to a shunter at the surface sidings of the Centaur Mine. The shunter fell on the rails and was run over by five trucks.

(Sgd.) G. MORGAN,
Chief Coal Mining Engineer.

TABLE "A."

TABULATED DATA SHOWING ESTIMATED TONNAGE AND VALUE OF COAL SOLD IN 1955 FROM INDIVIDUAL MINES AS COMPARED WITH 1954.

Mines.	1954.		1955.		Increase on 1954.	Decrease on 1954.	Estimated Value, 1954.	Estimated Value, 1955.
	Output.	Percentage of Total.	Output.	Percentage of Total.				
Deep. Mines—							£.	£.
Co-operative	123,386	12·13	126,746	14·02	3,360	....	439,508	419,339
Proprietary	55,439	5·45	3,118	·35	....	52,321	197,333	11,007
Cardiff-Neath	69,105	6·79	102,296	11·32	33,191	....	247,930	353,308
Stockton	66,216	6·51	70,073	7·75	3,857	....	235,893	232,086
Black Diamond Tunnel	14,491	1·42	21,359	2·36	6,868	....	51,570	69,961
Westralia	21,270	2·09	29,870	3·31	8,600	....	75,929	99,381
Ewington	10,455	1·03	11,172	1·24	717	....	37,094	37,424
Griffin	40,695	4·00	116	·01	....	40,579	142,299	416
Wyvern	56,213	5·53	53,655	5·94	....	2,558	192,406	193,333
Phoenix	31,832	3·13	33,463	3·70	1,631	....	109,052	120,564
Centaur	24,262	2·38	26,012	2·88	1,750	....	82,976	93,686
Hebe	903	·09	35,547	3·93	34,644	....	3,252	128,162
Western No. 1	62,661	6·16	66,264	7·33	3,603	....	221,591	239,247
Western No. 2	29,849	2·93	19,976	2·21	....	9,873	105,018	71,916
Total	606,777	59·64	599,667	66·35	....	7,110	2,141,851	2,069,900
Open Cuts—								
Stockton	113,143	11·12	53,465	5·96	....	59,678	403,353	181,328
Ewington	141,930	13·95	98,453	10·89	....	43,477	505,547	332,697
Muja	95,311	9·37	84,762	9·34	....	10,549	325,720	305,334
Western No. 3	60,295	5·92	67,444	7·46	7,149	....	212,347	242,815
Total	410,679	40·36	304,124	33·65	....	106,555	1,446,967	1,062,174
Deep Mines	606,777	59·64	599,667	66·35	....	7,110	2,141,851	2,069,900
Open Cuts	410,679	40·36	304,124	33·65	....	106,555	1,446,967	1,062,174
Grand Total	1,017,456	100·00	903,791	100·00	....	113,665	3,588,818	3,132,074

TABLE "B."

Comparison of Overall Production Losses for 1954 and 1955 showing where Losses Occurred.

Year.	Pit Top Meetings.	Railway Wagon Shortage.	Strikes.	Other Causes.	Total.
1954....	3,505	15,745	....	5,515	24,765
1955....	2,485	15,160	5,190	6,560	29,395
Increase on 1954....	....	....	5,190	1,045	4,630
Decrease on 1954....	1,020	585	....	....	....

TABLE C.

Tabulation showing Estimated Apportionment of Coal Sold during 1955.

Colliery.	Locos.	%	Trams (Power)	%	Private Large.	%	Private Small.	%	Cement Works.	%	Kal- goorlie Electric Power and Lighting Corp. Ltd.	%	Collie Power House.	%	Total
Co-operative	73,425	41·55	40,695	23·03	5,141	2·91	....	....	5,508	3·12	924	·52	51,006	28·87	176,699
Black Diamond															
Westralia	32,502	28·51	29,025 (a)	25·46	9,574	8·40	1,475	1·29	3,747	3·28	....	....	64	·06	114,004
Proprietary															
Ewington Open Cut															
Ewington															
Neath	17,353	16·96	31,644	30·94	54	·05	2	....	53,190	52·00	....	....	53	·05	102,296
Stockton															
Stockton Open Cut	86,597	70·98	32,800	26·55	121	·10	....	....	3,381	2·73	....	....	654	·53	123,553
Griffin															
Wyvern	57	·11	20,235	37·71	4,831	9·00	14,309	26·67	....	....	14,223	20·51	....	....	116
Phoenix	104	·31	21,917	65·50	2,241	6·70	8,736	26·10	....	....	465	1·39	....	....	53,655
Centaur	10,553	40·57	11,735	45·11	87	·34	3,177	12·21	....	....	460	1·77	....	....	33,403
Hebe	11,076	31·16	21,106	59·37	378	1·06	945	2·66	....	....	2,042	5·75	....	....	26,012
Muja Open Cut	30,817	36·36	25,268	29·81	3,954	4·66	10,191	12·02	....	....	14,532	17·15	....	....	35,547
Western No. 1	9,005	13·58	42,158	63·56	9,830	14·82	....	....	....	....	5,331	8·04	....	....	84,762
Western No. 2	47,497	54·37	39,524	45·24	339	·39	....	....	....	....	....	....	....	....	66,324
Western No. 3															
Total	318,986	35·29	353,802 (b)	39·15	36,588	4·05	38,835	4·30	65,826	7·28	37,977	4·20	51,777	5·73	903,791

(a) For S.E.C. Gas.

(b) Includes 29,025 for S.E.C. Gas.

TABLE D.

Tabulation showing Estimated Apportionment of Collie Coal Sold during the Five Years 1951-1955.

Year.	Rail- ways.	%	S.E.C.	%	Collie Power Station.	%	Cement Works.	%	Kal- goorlie Electric Power and Lighting Corp. Ltd.	%	Private Con- sumers.	%	Total.
1951	373,366	44·07	299,156	35·26	27,536	3·25	49,082	5·79	....	....	98,657	11·63	848,347
1952	298,587	35·94	338,913	40·79	33,247	4·00	53,826	6·48	....	....	101,284	12·19	830,857
1953	370,382	41·83	269,744	30·46	44,689	5·05	66,846	7·55	25,294	2·86	108,493	12·25	885,448
1954	373,148	36·87	349,634	34·37	51,803	5·07	81,617	8·02	42,374	4·17	117,080	11·50	1,017,450
1955	318,986	35·30	353,802 (a)	39·15	51,777	5·73	65,826	7·28	37,977	4·20	75,423	8·34	903,791
Increase or Decrease since 1951	-54,880	....	+54,646	....	+23,101	....	+16,744	....	+37,977	....	-23,234	....	+55,444
Per cent. Increase since 1951	-14·67	....	+18·26	....	+84·06	....	+34·11	....	....	....	-23·55	....	+6·53

(a) Includes 29,025 tons for S.E.C. G

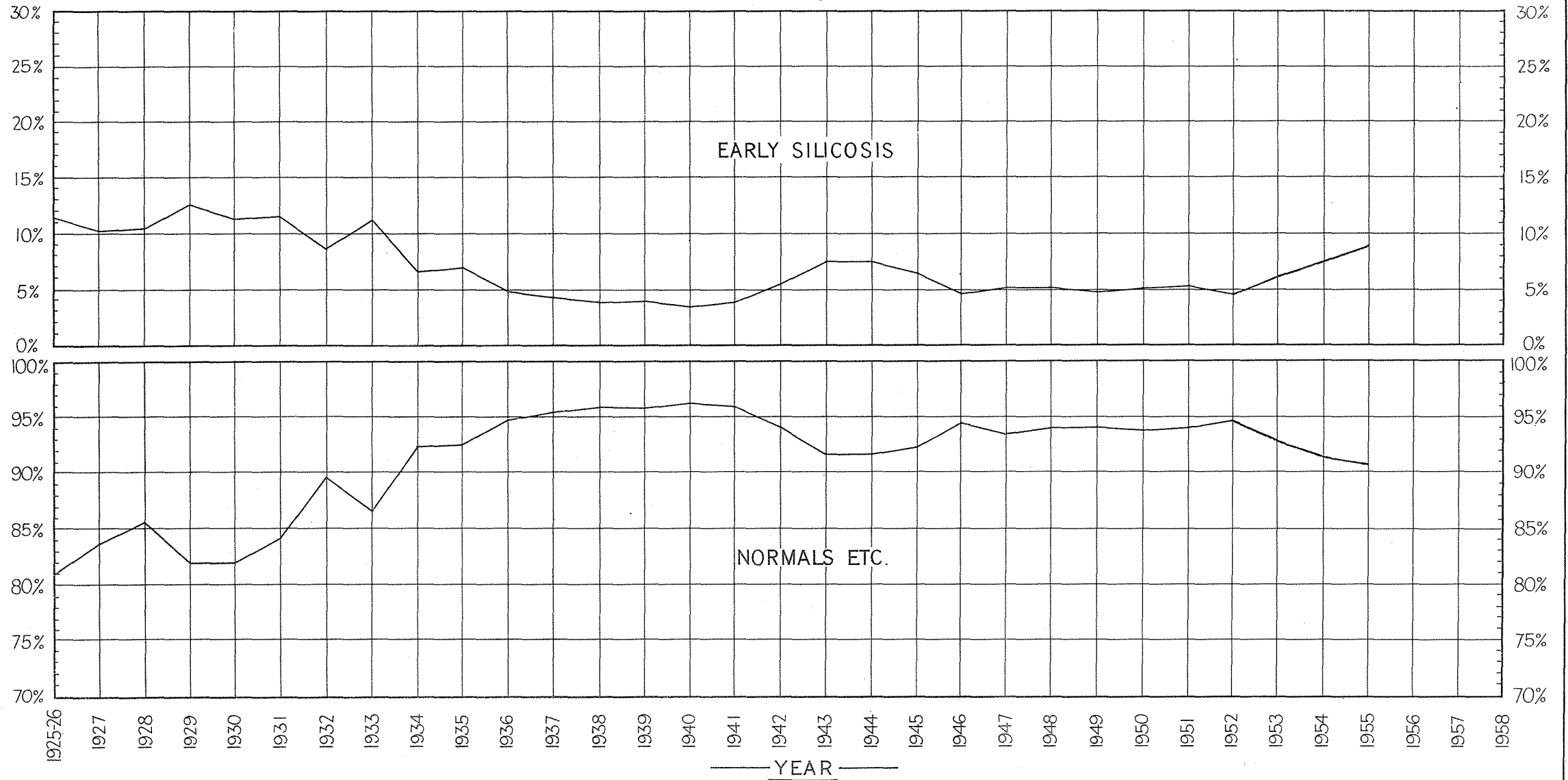
TABLE E.

Collie Coal Produced 1946-1955 (as officially reported to the Mines Department by the Producers).

	1946.	1947.	1948.	1949.	1950.	1951.	1952.	1953.	1954.	1955.
Open Cuts	154,392	148,345	145,948	206,650	258,310	368,330	411,344	393,147	410,616	304,130
Deep Mines	487,895	582,161	586,990	543,944	556,042	480,145	419,117	493,035	607,727	599,662
Aggregate All Mines	642,287	730,509	732,938	750,594	814,352	848,475	830,461	886,182	1,018,343	903,792
Percentage Open Cuts to Aggre- gate	24·04	20·31	19·91	27·53	31·72	43·41	49·53	44·36	40·32	33·65
Percentage Deep Mines to Aggre- gate	75·96	79·69	80·09	72·47	68·28	56·59	50·47	55·64	59·68	63·35
Persons Employed	955	1,032	1,064	1,044	1,099	1,125	1,281	1,463	1,560	1,386

PERIODICAL EXAMINATION OF MINE WORKERS GRAPH No 1

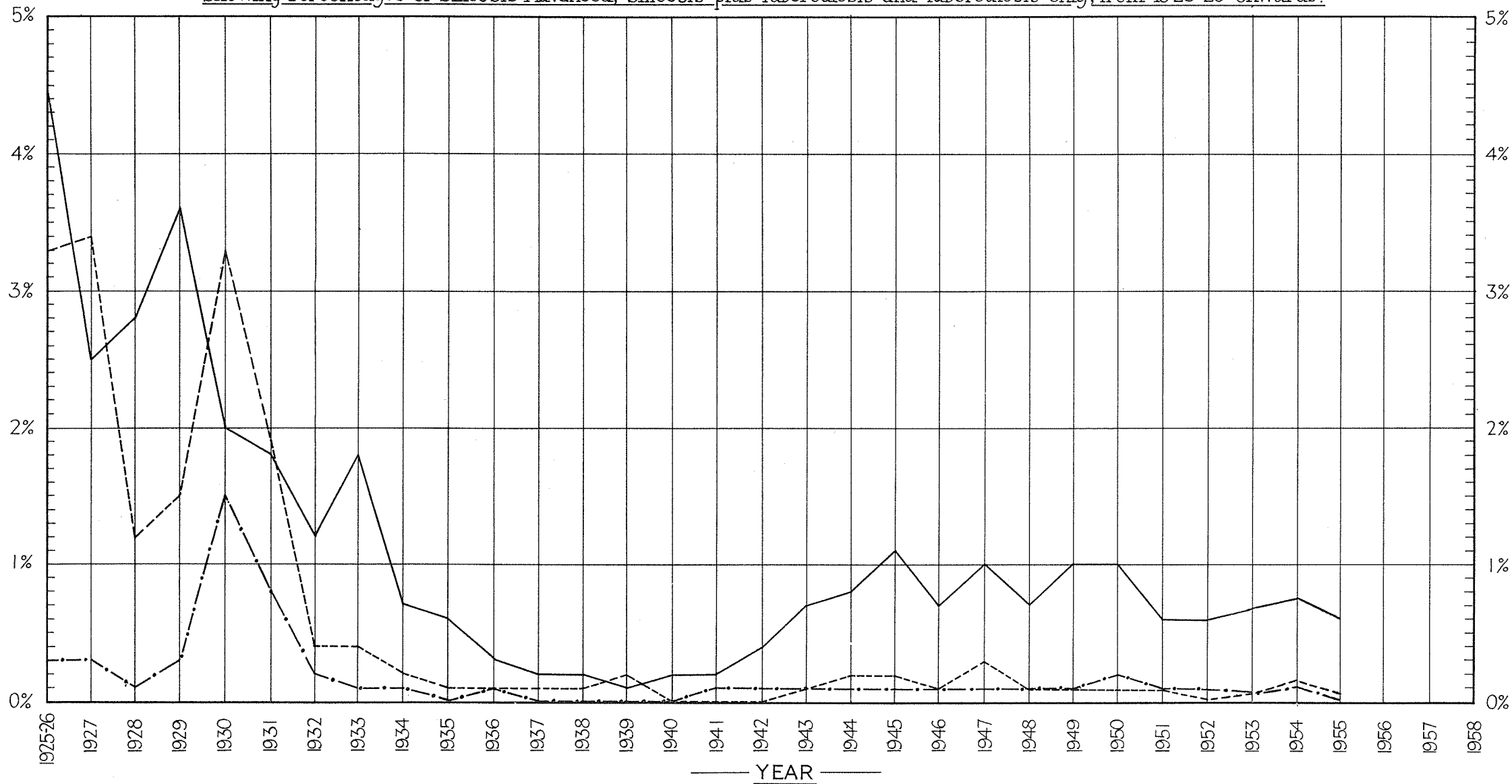
Showing Percentages of Normals and Early Silicotics from 1925-26 onwards



PERIODICAL EXAMINATION OF MINE WORKERS

GRAPH NO 2

Showing Percentages of Silicosis Advanced, Silicosis plus Tuberculosis and Tuberculosis only, from 1925-26 onwards.



Silicosis Advanced

Silicosis Plus Tuberculosis

Tuberculosis Only

TABLE H.

TABLE SHOWING FATAL ACCIDENT RATE PER 1,000 PERSONS EMPLOYED FOR EACH YEAR AND PROGRESSIVELY SINCE 1929 TO DATE.

Year.	Men Employed.		Fatal Accidents.		Death Rate per 1,000.	
	Current.	Progressive.	Current.	Progressive.	Current.	Progressive.
1929	858	858	4	4	4.66	4.66
1930	896	1,754	....	....	....	2.28
1931	752	2,506	1	5	1.35	2.00
1932	604	3,110	....	5	....	1.61
1933	626	3,736	1	6	1.59	1.60
1934	624	4,360	....	6	....	1.38
1935	689	5,049	2	8	2.90	1.58
1936	768	5,817	....	8	....	1.37
1937	723	6,540	....	8	....	1.22
1938	765	7,305	1	9	1.31	1.23
1939	752	8,057	1	10	1.33	1.24
1940	713	8,770	3	13	4.21	1.48
1941	781	9,551	2	15	2.56	1.57
1942	822	10,373	2	17	2.43	1.64
1943	838	11,211	1	18	1.19	1.60
1944	880	12,091	1	19	1.13	1.57
1945	860	12,951	1	20	1.16	1.54
1946	955	13,906	1	21	1.05	1.51
1947	1,032	14,938	....	21	....	1.40
1948	1,064	16,002	....	21	....	1.31
1949	1,044	17,046	1	22	0.96	1.29
1950	1,099	18,145	1	23	0.91	1.27
1951	1,125	19,270	2	25	1.77	1.29
1952	1,281	20,551	2	27	1.56	1.31
1953	1,463	22,014	2	29	1.37	1.32
1954	1,560	23,574	....	29	....	1.23
1955	1,386	24,060	1	30	0.72	1.20

COAL MINES REGULATION ACT, 1946-51.

ANNUAL REPORT OF THE BOARD OF EXAMINERS FOR MINE MANAGERS, UNDER MANAGERS AND DEPUTIES.

The Under Secretary for Mines:

We submit herewith for the information of the Hon. Minister for Mines, the Annual Report of the Board of Examiners for the year 1955.

April Examinations: There were no applications for First or Second Class Certificates of Competency.

There were three applicants for Third Class Certificates of Competency and this examination was held at Collie on 21st April, 1955. The three candidates were successful in obtaining a pass and at a meeting held after the examination it was decided to issue Certificates to the successful candidates.

The average percentages were as follows:—

Aitken, W.A.—73 per cent.
Graham, A. J.—61 per cent.
Jack, W.—69 per cent.

October Examinations: There were no applicants for First Class Certificates of Competency.

There was one applicant for Second Class Certificate of Competency but he was not successful in obtaining a pass.

There were two applicants for Third Class Certificates of Competency but neither of these were successful in obtaining a pass.

The average percentages were as follows:—

Second Class—Davies, J.—23.1 per cent.
Third Class—Gelmi, J.—18 per cent; Squance, H. A.—35 per cent.

Certificates of Competency were issued to the following on the production of doctors' certificates covering eyesight and hearing and on the payment of the prescribed fee:—

Third Class Certificates of Competency:

Aitken, W.A.—Cert. No. 60.
Graham, A. J.—Cert. No. 61.
Jack, W.—Cert. No. 62.

G. MORGAN,
Chairman,
Chief Coal Mining Engineer.

K. BERLIAT,
Member,
Government Geologist.

C. K. SWEENEY,
Member,
Senior Inspector of Mines.

MINING STATISTICS

to 31st December, 1955

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TABLE I.

PRODUCTION OF GOLD AND SILVER FROM ALL SOURCES, SHOWING IN FINE OUNCES THE OUTPUT AS REPORTED TO THE MINES DEPARTMENT DURING 1955, AND THE TOTAL PRODUCTION TO DATE.

(Note.—Lease numbers in brackets indicate that the holding was voided during the year.)

(Note.—* denotes mainly derived from treatment of tailings. † denotes mainly derived from Silver/Lead Ores and Concentrates. ‡ denotes mainly derived from Copper Ores and Concentrates.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1955.					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 (2,240 lb.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240 lb.).	Fine ozs.	Fine ozs.
Kimberley Goldfield.												
Brockman	....	Voided leases	....	....	....	....	....	....	....	....	....
		Sundry claims	....	....	....	....	....	....	....	....	....
Hall's Creek	....	Voided leases	....	....	....	....	....	....	....	....	....
		Sundry claims	....	....	....	....	....	....	....	....	....
Mary	....	Voided leases	....	....	....	....	....	....	....	....	....
		Sundry claims	....	....	....	....	....	....	....	....	....
Mt. Dockrell	....	Voided leases	....	....	....	....	....	....	....	....	....
		Sundry claims	....	....	....	....	....	....	....	....	....
Panton	....	Voided leases	....	....	....	....	....	....	....	....	....
		Sundry claims	....	6.28	....	....	....	....	....	....	....
Ruby Creek	97	Ruby Queen	....	....	20.00	45.58	....	....	....	....	....
		Voided leases	....	....	....	....	....	....	....	....	....
		Sundry claims	....	....	....	....	....	....	....	....	....
		<i>From Goldfield generally :—</i>	....	....	....	....	....	....	....	....	....
		Sundry claims	....	....	....	....	....	....	....	....	....
		Reported by Banks and Gold Dealers	....	....	....	....	....	....	....	....	....
		Totals	....	....	....	....	....	....	....	....	....

West Kimberley Goldfield.

Napier Range	M.C. 29	Devonian Silver Lead Mine										†13,575.29
<i>From Goldfield generally:—</i>												
	Sundry claims						1.30	34.68	1.00	2.49		
	Totals						1.30	24.68	1.00	2.49		13,575.29

Pilbara Goldfield.

MARBLE BAR DISTRICT.

Bamboo Creek	(1126)	Abbey								15.50	4.76	.45	
	1120	Bamboo Queen	32.50	9.68						57.50	17.20	.34	
	1107	Bulletin								845.50	416.91	2.02	
	850	Federation							8.22	3,026.00	2,203.86	6.35	
	1118	Kitchener	10.00	4.20						81.00	31.89	1.05	
	1095, etc.	Mt. Prophecy Leases	264.00	39.59						2,010.00	901.25	49.63	
	817	Prince Charlie	139.00	45.44						4,187.00	3,708.95	64.43	
	1072	Princess May	24.00	2.91						92.50	24.27		
	924	True Blue	62.00	(a)						2,317.25	85.22		
		Voided leases							13.54	46,222.35	53,500.67	2.17	
		Sundry claims							8.97	307.83	3,022.97	7.21	
Boodalyerrie		Voided leases								292.07	120.25	587.86	
		Sundry claims								7.16			
Braeside		Sundry claims				†2,886.18						†19,370.73	
Lalla Rookh		Voided leases							4.78	3,612.00	4,696.33	574.01	
		Sundry claims								7,943.00	7,675.09		
Marble Bar	930 (956)	Alexander Leases								354.50	120.94	.81	
	1094	Blue Bar								361.00	51.05		
	927, etc.	Halley's Comet	690.00	(b) 536.88	45.43					6,360.00	6,390.33	680.36	
	(912)	Homeward Bound								6,292.25	3,111.75		
	1125	Laura Dawn								28.00	36.80	3.06	
	1121	Little Portree								103.00	66.88	6.93	
	1127	New Atlas							45.98			2.72	
	1089	Repeater								548.20	123.83	6.26	
		Voided leases								199.09	159,638.04	148,525.67	583.57
		Sundry claims							67.08	251.77	20,459.04	12,699.67	9.43
North Pole	1122, etc.	Normay Leases		*53.34	57.54					1,465.00	1,294.43	1,755.28	
		Voided leases								4,339.00	1,930.51	260.08	
		Sundry claims								669.75	298.62	15.82	
North Shaw		Voided leases							7.53	1,072.45	996.29		
		Sundry claims							2.84	579.91	179.75	121.72	

(a) Gold content too fine for plate recovery—Purchased by State Battery.

(b) Gold mainly recovered from Exported Concentrates.

Table I.—Production of Gold and Silver from all sources, etc.—continued.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1955.					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 (2,240 lb.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240 lb.).	Fine ozs.	Fine ozs.					
PILBARA GOLDFIELD—continued.																	
MARBLE BAR DISTRICT—continued.																	
Pilgangoora	....	Voided leases	....	....	....	....	....	16.65	....	2,255.00	403.60	....				
		Sundry claims	....	....	....	....	....	161.08	45.64	481.60	146.39	....				
Sharks	1081, etc.	Table Top Leases	....	....	112.00	40.25	....	....	....	1,071.25	588.30	17.28
		Voided leases	....	....	....	....	....	1.43	....	1,739.50	1,969.65	1.16
		Sundry claims	....	....	....	....	....	163.14	47.93	1,150.75	1,668.11	.97
Talga Talga	....	Voided leases	....	....	....	....	....	....	93.15	1,799.00	1,760.68	....				
		Sundry claims	....	....	....	....	....	76.17	85.18	1,975.09	1,499.86	.70
Tambourah	....	Voided leases	....	....	....	....	....	....	73.90	1,576.50	1,882.29	....				
		Sundry claims	....	....	....	....	....	89.52	294.75	3,742.25	2,689.78	....				
Warrawoona	1013	The Trump	....	....	....	....	....	....	....	4,085.55	631.25	10.36
		Voided leases	....	....	....	....	....	....	16.99	13,049.25	18,958.41	13.34
		Sundry claims	....	....	....	....	....	70.98	623.67	6,632.79	4,247.38	.08
Western Shaw	....	Voided leases	....	....	....	....	....	....	....	1,222.50	957.80	....				
		Sundry claims	....	....	....	....	....	22.34	67.47	71.50	81.49	....				
Wodgina	....	Sundry claims	....	....	....	....	....	....	43.37	.50	....	3.25
Wyman's Well	1084	New Copenhagen	....	....	100.00	61.01	....	....	....	510.00	144.74	1.35
		Voided leases	....	....	....	....	....	....	42.86	2,977.29	1,258.44	....				
		Sundry claims	....	....	....	....	....	4.47	51.52	2,604.46	1,291.29	1.47
Yandicoogina	....	Voided leases	....	....	....	....	....	....	140.76	3,159.20	6,218.83	....				
		Sundry claims	....	....	....	....	....	4.32	239.89	574.50	642.82	40.96
<i>From District generally:—</i>																	
<i>Sundry Parcels treated at:</i>																	
		State Battery, Bamboo Creek	....	....	....	*116.33	....	....	....	40.00	*11,172.12	*190.95
		State Battery, Marble Bar	....	....	....	....	....	....	....	12.00	*11,181.91	1.15
		Various Works	....	....	....	....	....	....	....	237.95	*1,908.24	5.54
		Reported by Banks and Gold Dealers	....	....	....	....	....	26.77	5.88	....	15.41	10.53
		Totals	26.77	5.88	1,433.50	909.63	2,989.15	15,234.56	4,562.28	328,543.92	323,964.51	23,701.80

NULLAGINE DISTRICT.

Eastern Creek	....	Voided Leases	....	....	....	....	....	....	8.94	8.19	5,594.00	9,854.21	14.76
		Sundry claims	....	....	....	....	....	....	....	12.74	1,409.10	1,600.71	16.90
Elsie	....	Voided leases	....	....	....	....	....	....	....	....	586.25	1,675.91	....
		Sundry claims	....	....	....	....	....	....	....	8.28	58.00	188.08	....
McPhees Creek	....	Voided leases	....	....	....	....	....	....	....	....	113.00	137.92	....
		Sundry claims	....	....	....	....	....	....	....	....	134.00	197.09	....
Middle Creek	279L	All Nations	....	....	....	....	....	....	....	....	1,277.50	356.03	.87
	229L	Barton	....	....	....	....	....	....	1.22	....	6,529.00	3,676.39	35.28
	231L, etc.	Blue Spec. Mining, Co., N.L.	....	....	....	....	....	....	....	....	53,391.41	31,016.41	7.09
		Voided leases	....	....	....	....	....	....	....	1.02	17,182.15	11,362.58	7.50
		Sundry claims	....	....	....	....	....	....	....	....	5,573.10	2,335.57	....
Mosquito Creek	....	Voided leases	....	....	....	....	....	....	1.07	30.12	8,392.30	12,839.13	....
		Sundry claims	....	....	....	....	....	....	....	181.64	3,707.44	3,789.21	....
Nullagine	292L	Alice	....	....	....	235.38	9.00	28.75	2.30	3.85	1,053.52	107.10	63.45
	311L	Conglomerate	....	....	....	....	....	....	....	....	84.00	6.43	.43
	294L	Nullagine View	....	....	....	....	....	....	....	....	289.63	41.00	23.69
		Voided leases	....	....	....	....	....	....	....	....	309.96	9,067.75	12.80
		Sundry claims	....	....	....	....	28.00	26.90	....	315.53	678.24	6,256.55	15.22
Spinaway Well	M.Cs. 34L, 35L	Stubbs & Baker	....	....	....	....	....	....	....	....	....	....	‡320.18
Twenty Mile Sandy	....	Voided leases	....	....	....	....	....	....	....	....	16.97	7,243.70	.32
		Sundry claims	....	....	....	....	38.00	10.30	....	33.10	30.50	7,692.85	2.76
		<i>From District Generally :—</i>											
		Sundry parcels treated at :											
		Barton Battery	....	....	....	....	....	....	....	....	....	....	*45.19
		McKinnon W.M., D.Cs. 10, etc.	....	....	....	....	....	....	....	3.89	2.23	....	....
		Various Works	....	....	....	....	....	....	....	....	....	124.50	*8,110.35
		Reported by Banks and Gold Dealers	....	....	....	38.89	14.66	....	....	9,920.93	115.55	....	29.81
		Totals	....	....	....	38.89	250.04	3,729.31	2,642.16	2.30	10,288.55	2,738.59	134,564.70
			....	....	....	....	....	....	....	....	....	....	126,573.43
			....	....	....	....	....	....	....	....	....	....	528.42

West Pilbara Goldfield.

Croydon	....	Voided leases	....	....	....	....	....	....	....	....	8.00	5.44	....
Hong Kong	....	Voided leases	....	....	....	....	....	....	....	....	331.00	442.45	....
		Sundry claims	....	....	....	....	....	....	21.40	.02	9.00	3.15	....
Lower Nicol	....	Voided leases	....	....	....	....	....	....	....	....	1.10	653.20	402.22
		Sundry claims	....	....	....	....	....	....	10.44	2.71	10.00	11.51	....
Mallina	....	Voided leases	....	....	....	....	....	....	....	....	141.60	128.44	....

Table I.—Production of Gold and Silver from all sources—continued.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1955.					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 (2,240 lb.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240 lb.).	Fine ozs.	Fine ozs.	
WEST PILBARA GOLDFIELD—continued.													
Nicol	....	Voided leases	....	....	....	....	....	....	....	....	30.00	11.47	....
Pilbara	D.C. 2	Johnston J. A. & Sons	(a) 9.90	....	....	(a) 19.25	....	....	9.90	....	....	19.25	....
		Voided leases	....	....	....	....	....	....	....	48.12	267.00	413.59	....
		Sundry claims	....	....	....	....	....	....	1.11	86.24	163.00	255.42	....
Roebourne	173, (174)	Corderoy Mines, Ltd.	....	....	....	....	....	....	....	....	1,954.50	471.13	10.79
		Voided leases	....	....	....	....	....	....	....	....	442.36	952.91	374.36
		Sundry claims	....	....	....	....	....	....	15.47	3.29	1,934.85	754.91	114.03
Station Peak	....	Voided leases	....	....	....	....	....	....	177.74	41.37	11,016.00	11,388.18	.08
		Sundry claims	....	....	....	....	....	....	....	....	86.50	77.23	....
Towranna	....	Voided leases	....	....	....	....	....	....	....	2.62	3,965.80	5,187.51	....
		Sundry claims	....	....	....	....	....	....	....	....	22.00	12.35	....
Upper Nicol	....	Sundry claims	....	....	....	....	....	....	....	....	6.50	2.57	....
Weerianna	....	Voided leases	....	....	....	....	....	....	....	....	3,200.15	3,214.45	....
		Sundry claims	....	....	....	....	....	....	....	....	336.00	135.26	1.29
Whim Creek	....	Voided leases	....	....	....	....	....	....	....	....	....	....	‡883.80
		<i>From Goldfield Generally :—</i>											
		Sundry parcels treated at :	....	....	....	....	....	....	....	....	....	....	....
		Various Work	....	....	....	....	....	....	....	....	....	*102.39	4.90
		Sundry claims and leases	....	....	....	....	....	....	....	11.77	....	....	‡491.10
		Reported by Banks and Gold Dealers	....	....	....	....	....	....	6,098.03	177.50	103.50	228.32	.81
		Totals	9.90	.07	....	19.25	....	....	6,334.09	374.74	24,680.96	24,220.15	1,881.19

Ashburton Goldfield.

Belvedere	....	Voided leases	....	....	....	....	....	....	....	9.88	1,560.00	435.86	176.48
Dead Finish	....	Voided leases	....	....	....	....	....	....	....	....	1,699.00	874.60	.03
		Sundry claims	....	....	....	....	....	....	....	11.89	104.25	245.08	....
Linden Station	....	Sundry claims	....	....	15.00	14.03	....	....	....	....	128.35	203.51	....

(a) By-product from Tin Sluicing.

Melrose	....	....	Voided leases	....	....	....	....	....	....	....	2,704.00	840.26	213.11
			Sundry claims	....	....	....	....	....	12.41	21.88	562.00	262.78	6.40
Mt. Edith	....	....	Sundry claims	....	....	....	....	....	....	....	5.00	3.97	....				
Mt. Mortimer	....	....	Sundry claims	....	....	....	....	....	364.63	315.64	44.50	40.25	74.47
Uaroo	....	....	Voided leases	....	....	....	....	....	....	....	....	....	†7,713.22
			<i>From Goldfield Generally :-</i>															
			Sundry claims	†106.51	†31,059.65				
			Reported by Banks and Gold Dealers				
			Totals	2.20	3.06				
			Totals	2.20	3.06	15.00	14.03	106.51	9,264.97	482.46	6,807.10	2,913.43	39,243.36

Gascoyne Goldfield.

Bangemall	....	....	Voided leases	....	....	....	....	....	....	....	6.22	350.70	313.82	....
			Sundry claims	....	....	....	....	....	88.97	33.55	36.30	203.47	....	....
			<i>From Goldfield Generally :-</i>												
			Reported by Banks and Gold Dealers	....	....	....	....	....	....	....	604.47	23.30	....	....
			Totals	693.44	62.97	387.00	517.29

Peak Hill Goldfield.

Bulloo Downs	....	....	Voided leases	....	....	....	....	....	....	....	....	....	....	†50.09
Egerton	....	....	Voided leases	....	....	....	....	....	62.31	224.68	7,292.25	6,604.91	....	....
			Sundry claims	....	....	....	....	....	235.35	23.51	1,501.77	791.34	....	....
Horseshoe	568P, etc.	....	Anglo-Westralian Mining Pty., Ltd.	....	....	....	....	23.17	....	....	135,872.00	22,870.80	1,407.05	....
			Prior to transfer to present holders	....	....	....	....	....	....	....	3,914.00	894.44	....	....
	575P	....	Labourchere Main Lode	....	....	....	....	....	....	....	535.00	60.38	....	....
			Voided leases	....	....	....	....	....	15.57	1,975.37	4,371.38	2,684.27	2.00	....
			Sundry claims	....	....	....	....	....	20.12	829.58	1,939.55	728.57	....	....
Jimblebar	....	....	Voided leases	....	....	....	....	....	....	172.75	7,526.25	2,561.95	....	58
			Sundry claims	....	....	....	....	....	13.79	65.95	1,048.05	574.16	....	....
Mt Fraser	....	....	Voided leases	....	....	....	....	....	....	....	389.50	320.96	....	....
			Sundry claims	....	....	....	....	....	88.28	40.61	400.75	341.14	....	....
Mt. Seabrook	....	....	Voided leases	....	....	....	....	....	....	5.05	620.25	428.26	....	....
			Sundry claims	....	....	....	....	....	....	....	1,089.35	803.12	....	....

Table I.—Production of Gold and Silver from all sources, etc.—continued.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1955.					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 (2,240 lb.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240 lb.).	Fine ozs.	Fine ozs.
PEAK HILL GOLDFIELD—continued.												
Peak Hill	512P	Atlantic						1.69	2.87	4,703.75	589.15	
	511P	Commercial			109.00	22.67				3,745.25	591.05	
	584P	Dazzle Star			86.00	5.13				293.00	75.34	
	567P	Miner Bird			91.00	50.20				1,543.50	725.31	
	553P	Morning Star							4.43	2,804.25	410.09	
	587P	Murray Heath								41.00	6.17	
	506P	No. 1 North			10.00	11.05			86.47	7,139.20	1,652.34	
	492P	North Star						23.20	69.63	13,186.50	2,079.21	
		Voided leases						7.39	920.21	521,841.33	247,054.04	2,285.63
		Sundry claims						61.51	306.63	34,399.85	8,946.16	
Ravelstone		Voided leases							101.64	4,219.85	3,117.68	
		Sundry claims								553.60	283.17	
Wilgeena		Voided leases							23.54	230.50	156.25	
Wilthorpe		Voided leases								47.00	20.93	
		Sundry claims								89.00	25.71	
Yowereena		Voided leases								19.50	36.46	
		Sundry claims								117.25	203.16	
		<i>From Goldfield generally :—</i>										
		Sundry parcels treated at :									*1,686.20	
		Australian Machinery & Investment Co.										
		State Battery, Peak Hill							3.05	15.00	*71.68.89	
		Various Works								30.00	*5,661.37	23.12
		Reported by Banks and Gold Dealers						2,847.65	444.36		12.51	
		Totals			296.00	112.22		3,376.86	5,300.33	761,519.43	320,165.49	3,768.47

East Murchison Goldfield.

LAWLERS DISTRICT.

Kathleen Valley		Voided leases							144.85	80,503.66	49,020.54	
		Sundry claims						14.37	526.03	5,615.75	2,601.75	
Lawlers	1236	Waroonga									*99.40	.50
		Voided leases						25.51	692.45	1,622,917.40	575,150.65	14,803.08
		Sundry claims						400.21	451.61	17,347.48	9,568.69	268.34

Sir Samuel	(1357)	Twins	40.00	2.48	....	
		Voided leases	359.03	275,377.55	141,827.04	10,234.80	
		Sundry claims	53.89	64.96	7,623.00	4,550.24	.02
		<i>From District generally :—</i>					
		Sundry Parcels treated at :					
		State Battery, Sir Samuel	53.50	*2,356.81	....	....
		Vanguard Cyanide Plant	4.00	*1,014.04	3.18	....
		Western Machinery Co. Pty., Ltd., prior to transfer to present holder	5.00	*5,662.58	44.64	....
		Various Works	2.12	2.35	1,711.53	*30,788.76	936.21
		Reported by Banks and Gold Dealers	6,408.20	101.91	.05	10.00
Totals			6,904.30	2,343.19	2,011,198.92	822,652.98	26,290.77

WILUNA DISTRICT.

Coles	(662J)	Black Adder	1,935.00	1,083.55	....				
		Voided leases	830.50	156.85	....				
Corboys		Sundry claims	21.03	3,844.50	1,507.23	....			
		Voided leases	5.24	1.25	14,946.29	11,036.71	5.00			
Gum Creek		Sundry claims	118.00	37.45	21.58	9,082.35	5,210.79	....	
		Voided leases	20.75	....	1,380.00	595.73	....		
Mt. Eureka		Sundry claims	....	....	1.36	407.25	131.08	....	
		Voided leases	....	....	....	142.25	96.36	....	
Mt. Keith		Sundry claims	....	....	....	783.75	548.56	....	
		Voided leases	....	....	....	44.54	20,259.50	13,551.08	....
New England		Sundry claims	....	....	4.81	227.29	3,862.50	2,480.03	....
		Voided leases	5.74	95.70	5,364.25	3,490.87
Wiluna	280J	Lake Violet Consols Deeps	....	30.19	....	....	....	32.04	....
		Lone Hand	1,604.75	127.50
		Voided leases	574.76	8,776,381.90	1,788,772.66	10,044.63
		Sundry claims	105.39	225.82	27,419.40	10,885.40	.33
<i>From District generally :</i>										
Sundry Parcels treated at :										
Woosnam, H. G. (L.T.T. 1302H)	....	....	*49.72	....	....	....	....	*126.62	.04
State Battery, Wiluna	....	....	....	....	....	....	637.00	23,679.00	219.70
Various Works	....	....	....	....	....	....	139.00	5,164.05	12.68
Reported by Banks and Gold Dealers	....	....	.28	....	52.03	56.58	....	58.77	....
Totals			118.00	117.64	224.85	1,254.11	8,873,554.94	1,871,846.85	10,282.38	

Table I.—Production of Gold and Silver from all sources, etc.—continued.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1955					TOTAL PRODUCTION.				
			Alluvial.	Dolled and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dolled and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240 lb.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240 lb.).	Fine ozs.	Fine ozs.
EAST MURCHISON GOLDFIELD—continued.												
BLACK RANGE DISTRICT.												
Barrambie	....	Voided leases	....	....	....	....	....	22.49	18,443.92	17,355.15	125.60
		Sundry claims	....	....	....	....	5.07	170.20	833.55	915.51	....
Bellchambers	....	Voided leases	....	....	....	....	....	111.80	4,349.27	3,130.56	....
		Sundry claims	....	....	....	....	....	....	1,008.30	547.06	....
Birrigrin	....	Voided leases	....	....	....	....	....	820.68	12,042.93	15,086.09	....
		Sundry claims	....	....	....	....	....	179.92	2,487.55	1,238.22	....
Currans	....	Voided leases	....	....	....	....	18.24	222.89	7,252.25	3,116.68	....
		Sundry claims	....	....	....	....	....	29.38	2,158.75	827.18	....
Errolls	....	Voided leases	....	....	....	....	14.17	152.29	14,170.50	9,328.92	....
		Sundry claims	....	....	....	....	6.53	399.11	964.75	595.45	....
Hancocks	(1074B) (1107B)	Apples	....	....	....	....	....	443.79	1,023.75	3,212.98	....
		Comedy King	....	....	....	....	....	....	15.75	10.62	....
		Voided leases	....	....	....	....	....	6,524.37	32,686.50	33,441.16	55.72
		Sundry claims	....	....	....	....	4.21	142.89	8,459.10	3,219.53	....
Maninga Marley	....	Voided leases	....	....	....	....	....	195.20	60,833.48	48,494.40	22.55
		Sundry claims	....	....	....	....	....	158.16	3,079.65	1,768.16	....
Montague	....	Voided leases	....	....	....	....	....	100.17	79,550.60	23,444.82	....
		Sundry claims	....	....	....	....	....	71.09	5,041.35	3,171.19	....
Nunngarra	....	Voided leases	....	....	....	....	25.94	952.34	9,509.00	3,655.49	....
		Sundry claims	....	....	....	....	50.27	1,458.98	7,636.40	2,953.69	....
Sandstone	958B	Lady Mary	....	....	....	....	....	383.35	7,165.75	7,119.35	2.35
		Voided leases	....	....	....	....	4.75	4,363.69	696,431.82	447,563.94	11,754.22
		Sundry claims	....	....	....	....	44.95	1,421.07	15,533.45	6,848.57	....
Youanmi	....	Voided leases	....	....	....	....	.36	126.92	731,497.55	273,884.97	10,474.10
		Sundry claims	....	....	....	....	1.07	18.79	6,258.55	1,814.66	....

<i>From District generally :—</i>												
Sundry Parcels treated at :												
State Battery, Sandstone	....	....	....	....	....	....	....	290.50	*23,572.27	61.02
State Battery, Youanmi	....	....	....	....	....	....	....	40.00	*5,504.08	....	
Sciarsa, P. (L.T.T. 1283H)	....	....	....	....	....	*15.93	....	....	*51.99	....	
Various Works	....	....	....	....	....	....	....	92.50	*11,444.26	....	
Reported by Banks and Gold Dealers	....	....	....	....	....	....	1,491.85	52.23	20.38	....	
Totals	15.93	1,667.41	18,521.80	1,728,857.47	953,337.33	22,495.56

Murchison Goldfield.

CUE DISTRICT.

Big Bell	....	2050, etc.	....	Big Bell Mines, Ltd.	....	....	....	14,691.00	5,675.14	1,821.57	....	....	5,538,877.00	729,868.72	251,707.06
	....	2050	....	Little Bell	....	....	....	....	....	....	....	4.49	579.75	60.95	....
	....		....	Voided leases	....	....	....	....	....	....	....	....	401.00	422.83	....
	....		....	Sundry claims	....	....	....	....	....	....	....	....	382.75	357.46	....
Cuddingwarra	....		....	Voided leases	....	....	....	....	....	10.59	132.46	102,115.91	56,152.11	100.71	....
	....		....	Sundry claims	....	....	....	6.50	18.67	2.26	18.46	384.38	9,906.64	5,652.55	11.26
Cue	....	2262	....	Table Top	....	....	....	209.25	27.28	-.90	....	....	1,269.55	1,058.28	.90
	....	2247	....	Victory	....	....	....	....	....	....	....	....	226.75	125.38	....
	....		....	Voided leases	....	....	....	....	....	....	202.71	911.60	288,796.44	221,102.80	69.11
	....		....	Sundry claims	....	....	....	1,124.45	71.55	2.75	252.92	894.70	46,205.54	20,362.32	2.75
Eelya	....	2241	....	Eaglehawk	....	....	....	....	....	....	....	....	1,408.75	417.30	....
	....		....	Voided leases	....	....	....	....	....	....	....	....	8.78	1,069.00	1,811.26
	....		....	Sundry claims	....	....	....	18.50	15.54	1.31	6.20	143.81	2,309.90	1,099.24	1.31
Mindoolah	....		....	Voided leases	....	....	....	....	....	....	3.07	2.54	9,380.28	5,672.31	42.97
	....		....	Sundry claims	....	....	....	....	....	....	....	29.30	3,299.60	2,345.43	....
Reedy	....	2253	....	Rand No. 3	....	....	....	....	....	....	....	....	4,152.25	1,356.56	....
	....		....	Voided leases	....	....	....	....	....	1.46	216.72	725,487.43	238,924.59	20,467.28	....
	....		....	Sundry claims	....	....	....	12.00	5.79	-.62	170.71	137.16	7,084.00	2,667.35	.62
Tuckabianna	....	2237	....	Gidgee	....	....	218.57	83.25	251.14	33.57	....	297.73	2,765.90	2,095.49	33.57
	....	2244	....	Winston	....	....	....	....	....	....	....	671.45	630.00	257.03	2.30
	....		....	Voided leases	....	....	....	....	....	....	649.70	324.77	13,152.23	7,465.12	....
	....		....	Sundry claims	....	....	1.94	65.25	11.67	-.20	153.32	489.40	4,876.10	2,700.62	-.20
Tuckanarra	....		....	Voided leases	....	....	....	....	....	....	85.37	3,511.10	19,490.00	22,828.99	172.77
	....		....	Sundry claims	....	....	....	....	....	....	115.23	792.07	10,190.80	10,307.86	....
Weld Range	....		....	Voided leases	....	....	....	....	....	....	....	23.64	2,169.75	1,137.11	....
	....		....	Sundry claims	....	....	....	....	....	....	....	3.90	1,438.50	1,136.41	....

Table I.—Production of Gold and Silver from all sources, etc.—continued.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1955.					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 (2,240 lb.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240 lb.).	Fine ozs.	Fine ozs.
MURCHISON GOLDFIELD—continued.												
CUE DISTRICT—continued.												
		<i>From District generally:—</i>										
		Sundry Parcels treated at:										
		State Battery, Cue				*36.20			76.25	*26,066.64	123.99	
		State Battery, Tuckanarra							518.50	*5,535.57		
		Turner, F. W.			81.25	4.35			81.25	4.35		
		Various Works							7,340.27	*29,481.92	1,147.77	
		Reported by Banks and Gold Dealers	2.74	2.27						22.62	.07	
		Totals	4.68	220.84	16,291.45	6,117.33	1,863.18	5,087.41	9,096.19	6,805,682.09	1,398,497.17	
MEEKATHARRA DISTRICT.												
Abbotts		Voided leases							26.45	36,841.35	38,775.28	
		Sundry claims							5.29	3,781.27	2,328.66	
Burnakura	1849N	New Alliance								132.25	114.39	
		Voided leases							3,247.59	39,040.45	30,775.77	
		Sundry claims						17.03	129.24	2,486.55	1,310.84	
Chesterfield	1942N, 1946N	Margueritta Leases								1,990.00	524.17	
		Margueritta								732.00	197.73	
		Margueritta, East								1,420.00	250.09	
		Voided leases						29.02	420.32	6,875.26	7,500.57	
		Sundry claims							42.19	960.55	740.97	
Gabanintha	1948N	Fortuna			51.75	8.69				3,181.75	915.97	
	1943N	Nance								39.50	47.41	
		Voided leases						11.79	38.14	29,692.85	21,216.82	
		Sundry claims						16.78	159.05	5,018.25	2,917.97	
Garden Gully		Voided leases						26.36	74.91	30,272.07	21,864.74	
		Sundry claims							18.74	2,914.69	1,719.14	
Gum Creek		Voided leases						25.27	91.96	3,893.08	3,819.91	
		Sundry claims						4.37	84.86	727.25	636.85	

Table I.—Production of Gold and Silver from all sources, etc.—continued.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1955.					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 (2,240 lb.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240 lb.).	Fine ozs.	Fine ozs.
MURCHISON GOLDFIELD—continued.												
MEEKATHARRA DISTRICT—continued.												
Yaloginda	1853N	Blue Bird	....	....	320.00	33.73	....	....	....	8,117.00	2,530.20	....
		Voided leases	....	....	....	....	....	....	19.03	1,972.23	28,175.54	8.68
		Sundry claims	....	....	93.75	13.57	....	....	61.89	647.51	11,024.67	....
		<i>From District generally:—</i>										
		Sundry Parcels treated at:—										
		D. Rinaldi & J. Young, L.T.T. 1295H	....	....	1,732.50	115.09	....	....	....	1,732.50	115.09	....
		L. V. Rinaldi, L.T.T. 1328H	....	....	....	‡.50	‡49.03	....	....	....	‡.50	‡49.03
		State Battery, Meekatharra	....	....	....	*37.85	....	....	....	130.00	*27,260.49	24.34
		Vivian Gold, No Liability, L.T.T. 1323H	....	....	853.00	132.13	....	....	....	858.00	132.13	....
		Various Works	....	....	....	....	....	....	....	172.75	*13,601.19	342.17
		Reported by Banks and Gold Dealers	....	....	....	....	....	....	3.08	12,185.71	179.70	56.93
		Totals	3.08	41.66	3,606.65	518.62	49.03	14,517.68	18,164.04	2,285,052.41	1,303,732.92	5,119.88
DAY DAWN DISTRICT.												
Day Dawn	573D, etc.	Mountain View Gold, No Liability	....	....	79.00	29.29	4.09	....	....	12,789.35	17,321.92	217.60
	573D	Prior to transfer to present holders	....	....	....	....	....	....	....	94.05	10,060.78	32,623.97
	576D	New Fingall	....	....	....	....	....	6.12	6.84	3,230.00	1,226.01	....
		Voided leases	....	....	....	....	....	160.64	826.65	1,922,088.36	1,225,599.75	169,210.44
		Sundry claims	....	....	84.25	51.65	1.14	96.42	523.56	13,558.26	6,730.74	1.55
Lake Austin	....	Voided leases	....	....	....	....	....	613.00	3,079.62	36,872.20	51,050.49	....
		Sundry claims	....	....	20.25	17.39	2.37	59.07	965.49	3,272.44	1,296.21	2.37
Mainland	....	Voided leases	....	....	....	....	....	41	3,296.77	7,575.62	25,026.07	....
		Sundry claims	....	....	....	....	....	17.85	771.56	1,337.95	701.31	....
Pinnacles	676D	Eclipse Amalgamated North	....	....	....	....	....	....	....	159.00	15.58	....
	670D	Eclipse North	....	....	....	....	....	....	....	141.25	11.18	....
		Voided leases	....	....	....	....	....	4.90	1,213.68	18,280.00	9,915.71	....
		Sundry claims	....	....	....	....	....	62.93	509.50	4,429.17	1,765.50	....
		<i>From District generally:—</i>										
		Sundry Parcels treated at:										
		Various Works	....	....	....	....	....	....	16.61	988.00	1,988.33	....
		Reported by Banks and Gold Dealers	....	....	....	....	....	2,214.87	37.30	....	12.57	.01
		Totals	....	....	183.50	98.33	7.60	3,236.21	11,341.63	2,034,782.38	1,375,285.34	169,431.97

MOUNT MAGNET DISTRICT.

Jumbulyer	1410M	Gold Bug	192.15	28.05				2.20	837.85	243.43		
		Voided leases						13.37	680.10	361.74		
		Sundry claims					20.32	116.27	1,205.70	878.98		
Lennonville		Voided leases						3,226.91	151,502.55	128,568.28	459.62	
		Sundry claims	118.75	43.05		23.30	108.82	14,162.32	5,500.97			
Mt. Magnet	1476M	Cascade							10.50	7.14		
	1527M	Eclipse	181.50	69.81	1.34				181.50	69.81	1.34	
	1255M, etc.	Edward Carson Leases					1.82		18,015.50	12,891.77	7.76	
	1455M	Evening Star	22.00	1.56					404.00	47.64		
	1287M	Havelock						11.05	4,332.50	840.14		
	1282M, etc.	Hill 50 Gold Mine, N.L. (Neptune)	104,010.00	81,801.42	2,167.21			829.41	875,626.90	364,882.02	7,632.58	
	1479M	Hill 50 Consolidated, N.L.	68.00	5.10					8,787.65	4,122.61	.21	
	1361M	Jupiter							68.00	5.10		
	1444M	Late Comer	16.00	13.48				.83	658.05	261.71		
	1447M	Morning Star	293.00	76.79				2.53	469.50	387.57		
	1505M	Perseverance							680.65	209.84		
		Voided leases					29.26	9,811.54	834,262.31	312,761.69	851.39	
		Sundry claims	94.25	58.41		122.27	2,626.24	60,151.90	29,699.61		4.49	
Mt. Magnet, East		Voided leases					63.29	764.53	5,522.28	2,811.75		
		Sundry claims						37.22	418.25	428.29		
Moyagee	1538M	Moyagee		4.49					33.75	34.02		
		Voided leases						23.59	12,439.10	18,299.16	757.77	
		Sundry claims				14.44	176.21	1,516.25	1,746.42			
Paynesville		Voided leases						1,613.34	449.77	1,116.15		
		Sundry claims				3.36	540.21	882.57	1,372.00			
Winjangoo		Voided leases					.99	191.88	72.00	69.98		
		Sundry claims						223.32	237.53	71.58		
<i>From District generally :-</i>												
Sundry Parcels treated at :												
		State Battery, Boogardie	131.00	39.33					256.26	*34,499.94	6.87	
		Various Works							56.06	*18,949.24	10.04	
		Reported by Banks and Gold Dealers			.17		2,286.91	114.28	8.00	113.15	.22	
Totals			.17		105,126.65	82,141.49	2,168.55	2,565.96	20,433.75	1,994,036.55	941,263.13	9,732.29

Yalgoo Goldfield.

Berberatha		Voided leases					1.27	90.94	3,384.50	1,845.05	
		Sundry claims						6.64	3,075.05	1,401.56	
Garlaminda		Voided leases					1.28	3.39	2,056.57	862.42	3.30
		Sundry claims							1,368.50	600.68	

Table I.—Production of Gold and Silver from all sources, etc.—continued.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1955.					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 (2,240 lb.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240 lb.).	Fine ozs.	Fine ozs.
YALGOO GOLDFIELD—continued.												
Field's Find	1113, 1220	Field's Find Central Leases	....	....	....	....	....	10.00	10.13	.49
	1113	Fields Find	....	....	....	....	....	44.00	17.96	.10
	1220	Field's Find Central	....	....	....	....	....	5.00	3.53	....	
	1119	Field's Find Central West	....	....	....	....	....	156.75	39.26	.80
	(1114), 1119	Fields Find Central West Leases	....	....	....	....	....	4,625.00	1,074.53	56.69
	1207	Rose Marie	....	....	....	....	....	418.67	252.10	1.52
		Voided leases	....	....	....	....	....	226.72	45,475.96	32,547.10
		Sundry claims	....	....	....	....	5.77	188.67	5,458.85	1,777.91
Goodingnow	1063	Ark	....	....	....	....	....	12.49	2,270.50	1,927.29
	1025	Carnation	....	....	....	....	....	....	18,926.05	13,993.00
	1145	Oversight	....	10.62	....	....	....	10.62	2,338.35	875.92
		Voided leases	....	....	....	....	....	146.70	288.66	60,077.31
		Sundry claims	....	....	....	....	....	152.96	169.70	10,222.30
Gullewa	....	Voided leases	....	....	....	....	....	19.05	39,913.60	20,966.51
		Sundry claims	....	....	....	....	....	170.45	4,391.25	1,918.24
Kirkalucka	....	Voided leases	....	....	....	....	....	....	61.25	45.10
		Sundry claims	....	....	....	....	....	17.79	257.30	126.29
Messenger's Patch	....	Voided leases	....	....	....	....	....	8.64	349.71	39,836.51
		Sundry claims	....	....	....	....	....	463.12	333.98	1,595.10
Mt. Farmer	....	Voided leases	....	....	....	....	....	....	64.00	40.19
		Sundry claims	....	....	....	....	....	....	462.90	145.06
Mt. Gibson	....	Voided leases	....	....	....	....	....	....	6.44	526.50
		Sundry claims	....	....	....	....	....	1.66	44.72	1,134.60
Ninghan	....	Voided leases	....	....	....	....	....	....	10.00	1.41
		Sundry claims	....	....	....	....	....	....	324.75	123.28
Noongal	1201	Hard to Find	....	....	....	....	....	....	114.00	111.83
	1203	Revival	....	....	....	....	....	....	80.00	132.93
		Voided leases	....	....	....	....	....	7.88	31.96	11,069.75
		Sundry claims	....	....	....	....	....	39.32	310.31	8,499.05
Nyounda	....	Voided leases	....	....	....	....	....	....	217.63	416.00
		Sundry claims	....	....	....	....	....	....	30.88	829.00
Pinyalling	....	Voided leases	....	....	....	....	....	....	313.79	2,318.90
		Sundry claims	....	....	....	....	....	3.13	134.09	1,492.50

Retaliation	....	Voided leases	....	....	....	....	....	....	....	5,089.25	1,872.98	....
		Sundry claims	....	....	....	....	....	....	....	778.25	304.71	....
Rothsay	....	Voided leases	....	....	....	....	....	....	24.06	40,680.75	10,777.98	....
		Sundry claims	....	....	....	....	....	....	.73	7,469.50	2,562.03	....
Wadgingarra	....	Voided leases	....	....	....	....	....	....	....	691.11	650.63	....
		Sundry claims	....	....	....	....	....	....	....	2,131.30	559.83	....
Warda Warra	....	Voided leases	....	....	....	....	....	....	....	10,760.50	5,862.04	....
		Sundry claims	....	....	....	....	....	....	....	933.75	369.87	....
Warriedar	....	Voided leases	....	....	....	....	....	....	....	13,661.50	4,607.88	7.30
		Sundry claims	....	....	....	....	....	....	2.84	8,782.85	1,892.46	....
Yalgoo	....	Voided leases	....	....	....	....	....	....	3.23	6,214.50	9,965.18	....
		Sundry claims	....	....	....	....	....	....	23.56	2,622.75	1,010.02	....
Yuin	....	Voided leases	....	....	....	....	....	....	127.12	68,139.50	27,908.57	130.13
		Sundry claims	....	....	....	....	....	....	4.70	335.50	67.53	....
<i>From Goldfield generally:—</i>												
Sundry parcels treated at:												
		State Battery, Payne's Find	....	....	....	....	....	....	....	38.50	*4,532.78	....
		State Battery, Warriedar	....	....	....	....	....	....	....	....	*6,537.13	.37
		State Battery, Yalgoo	....	....	....	....	....	....	....	....	*1,200.51	....
		Various Works	....	....	....	....	....	9.42	....	664.00	*3,325.00	99.84
		Reported by Banks and Gold Dealers	....	....	....	....	....	946.11	58.32	....	48.90	.20
		Totals	....	....	....	....	....	1,787.26	3,223.19	441,403.83	263,534.74	1,502.56

Mt. Margaret Goldfield.

MOUNT MORGANS DISTRICT.

Australia United	....	Voided leases	....	....	....	....	....	....	....	1,911.63	15,913.69	23,305.67	1.76
		Sundry claims	....	....	....	....	....	....	....	580.98	1,307.50	2,227.65	....
Eucalyptus	....	Voided leases	....	....	....	....	....	....	....	2,878.56	1,603.85	3,251.01	....
		Sundry claims	....	....	....	....	....	....	....	591.62	2,160.30	2,011.78	....
Linden	529F	Second Fortune	....	....	....	....	....	....	....	....	543.00	292.75	....
		Voided leases	....	....	....	....	....	....	7.53	566.97	72,376.81	65,915.60	.68
		Sundry claims	....	....	....	....	....	....	132.11	244.96	19,272.35	13,768.96	....
Mt. Margaret	....	Voided leases	....	....	....	....	....	....	12.13	1.89	8,900.39	5,291.51	12.55
		Sundry claims	....	....	....	....	....	....	25.22	111.18	1,790.10	661.42	....
Mt. Morgans	399F, etc.	Morgans Gold Mines, Ltd.	....	....	....	....	....	....	....	....	4,591.05	13,849.14	....
		Prior to transfer to present holders	....	....	....	....	....	....	....	16.66	779,578.43	354,225.86	5,552.63
		Voided leases	....	....	....	....	....	....	17.95	148.79	61,354.50	34,786.53	77.86
		Sundry claims	....	....	....	....	....	....	36.41	398.78	5,100.57	3,391.18	....

Table I.—Production of Gold and Silver from all sources, etc.—continued.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1955.					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 (2,240 lb.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240 lb.).	Fine ozs.	Fine ozs.

MOUNT MARGARET GOLDFIELD—continued.

MOUNT MORGAN DISTRICT—continued.

Murrin Murrin	....	Voided leases	....	....	....	....	....	....	10.43	231.35	136,940.22	104,029.97	29.60
		Sundry claims	....	....	30.25	18.29	....	....	51.15	557.24	6,485.58	4,460.45	....				
Red Castle	557F	Trixie	....	12.33	....	....	....	....	....	28.43	167.75	50.71	....				
		Voided leases	....	....	....	....	....	4.49	436.54	4,107.20	4,043.41	....	....			
		Sundry claims	....	....	....	....	....	....	113.84	1,183.57	642.45	....	....			
Yundamindera	560F	Queen of the May Clinden (W.A.) Gold, N.L.	....	....	1,845.00	775.66	21.16	....	....	....	3,470.00	1,526.58	30.68
		Voided leases	....	....	....	....	....	....	110.93	78,485.85	49,894.35	5.82	....				
		Sundry claims	....	....	....	....	....	3.01	271.93	6,674.35	4,789.46	....	....			
<i>From District generally :—</i>																		
Sundry Parcels treated at :																		
		C. C. Crocker (Anniversary Battery) (M.A. 14F)	....	....	....	.60	....	....	....	....	10.00	*26.96	....				
		State Battery, Linden	....	....	6.25	3.63	....	....	9.16	299.54	*15,499.36	....	....			
		The United Aborigines Mission (M.A. 12F)	....	....	....	....	....	113.08	18.87	403.00	135.50	....	.09
		Various Works	....	....	....	....	....	....	....	1,257.81	*8,561.39	99.97	....				
		Reported by Banks and Gold Dealers	....	....	....	....	....	3,073.03	141.84	10.30	95.75	....	.68
		Totals	23.59	12.33	1,903.00	806.46	21.16	3,486.54	9,372.15	1,213,987.71	716,735.49	5,812.32

MOUNT MALCOLM DISTRICT.

Cardinia	1795C	Rangoon	....	....	....	....	....	....	....	6.49	330.00	178.07	....
		Voided leases	....	....	....	....	....	....	13.87	1,591.66	5,201.74	4,049.91	....
		Sundry claims	....	....	....	....	....	....	4.25	121.91	1,865.25	575.01	.66
Diorite	....	Voided leases	....	....	....	....	....	....	....	945.65	38,879.03	35,144.28	33.18
		Sundry claims	....	....	....	....	....	....	11.21	332.13	4,626.80	4,467.93	....
Dodger's Well	....	Voided leases	....	....	....	....	....	....	....	57.90	1,373.30	1,936.52	....
		Sundry claims	....	....	....	....	....	....	.95	28.32	1,440.25	904.23	....

Lake Darlot	1834C	Monte Christo	1,139.00	81.93						3,789.00	255.14		
		Voided leases								4,482.18	70,928.46	52,038.63	7.56
		Sundry claims	227.87	332.00	218.61		129.92		906.52	8,572.34	5,697.33	2.60	
Leonora	1837C	Great Gwalia								200.00	45.75		
	1829C	Jessie Alma							454.52	623.50	1,834.51		
	1788C	Little Gwalia								1,576.00	530.53		
	1341C, etc.	Sons of Gwalia, Ltd.	102,742.00	23,225.82	1,916.87					5,949,862.53	2,335,028.79	166,560.88	
		Prior to transfer to present holders									109,081.00	55,989.21	8.66
		Voided leases								1,866.86	174,799.00	90,621.56	94.57
		Sundry claims							37.73	361.86	18,338.25	11,705.51	
Malcolm		Voided leases							11.65	47.07	62,656.53	47,563.43	
		Sundry claims							5.75	33.39	4,572.47	2,711.17	.12
Mertondale		Voided leases									89,024.75	60,935.32	1,497.58
		Sundry claims							5.42	85.74	3,216.41	2,295.52	
Mt. Clifford	1844C	Beau Don	14.00	145.83							14.00	145.83	
		Voided leases								1,623.35	9,556.96	16,492.17	
		Sundry claims	1,508.35						53.98	1,860.00	5,569.70	3,485.47	
Pig Well		Voided leases									13,587.32	14,676.58	63.68
		Sundry claims								34.61	2,896.65	1,225.46	
Randwick		Voided leases								246.76	10,912.65	9,736.57	
		Sundry claims							66.57	164.02	2,488.64	1,307.45	
Webster's Find		Voided leases							30.30		22,167.50	14,377.65	
		Sundry claims							36.84	695.68	2,356.15	1,530.56	
Wilson's Creek		Voided leases									333.50	168.27	
		Sundry claims							.70	4.24	316.00	261.12	
Wilson's Patch		Voided leases								99.38	28,863.35	13,050.19	1.05
		Sundry claims	18.00	9.14					4.68	54.46	1,612.16	1,416.41	
		<i>From District generally :-</i>											
		Sundry parcels treated at:									18.00	*786.34	
		State Battery, Darlot									20.00	*3,125.37	22.38
		Reefer Cyanide Plant									789.50	*22,175.93	135.97
		Various Works	19.86						3,502.62	252.83	21.50	51.57	
		Reported by Banks and Gold Dealers											
		Totals	19.86	1,736.22	104,245.00	23,681.33	1,916.87	3,916.44	16,357.53	6,652,480.19	2,818,521.29	168,428.89	

MOUNT MARGARET DISTRICT.

Burtville	2446T	Boomerang	150.00	622.67						1,833.65	9,144.49	462.30	
	2138T	Nil Desperandum	57.25	113.96						5.30	1,934.97	4,511.01	
		Voided leases							4.89	413.80	70,494.33	108,785.83	485.97
		Sundry claims							2.65	208.27	7,409.66	5,505.29	

Table I.—Production of Gold and Silver from all sources, etc.—continued.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1955.					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 (2,240 lb.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240 lb.).	Fine ozs.	Fine ozs.	
MOUNT MARGARET GOLDFIELD—continued.													
MOUNT MARGARET DISTRICT—continued.													
Duketon		Voided leases							5.35	3,216.10	31,839.42	22,542.63	
		Sundry claims	39.58		4.00	4.70			61.45	528.26	2,406.65	2,169.25	29.76
Eagles Nest		Voided leases								145.34	534.50	1,238.22	
		Sundry claims							24.07	487.05	1,046.35	360.11	
Erlistoun	2500T	Westralia										*122.50	
		Voided leases							10.07	393.41	156,730.90	101,512.60	4,327.81
		Sundry claims			9.50	24.05			1,181.65	165.05	5,675.59	3,343.98	
Euro		Voided leases								65.14	91,821.50	37,678.25	
		Sundry claims							4.87	73.04	1,433.00	821.31	
Laverton	2514T	Gladiator			209.75	31.75					2,551.50	402.86	
	2445T, etc.	Lancefield No Liability			8,141.00	583.95					10,034.50	695.54	6.94
	2245T, etc.	Lancefield leases									30,929.25	3,991.93	15.68
	2245T	Lancefield extended west									881.25	346.77	
	2489T	(Wedge)									222.00	21.19	
	2478T	Lancefield North									2,235.25	438.99	
		Voided leases							28.59	2,028.85	2,075,638.37	813,222.85	56,923.16
		Sundry claims			24.25	16.47			215.58	1,492.90	17,434.50	9,234.07	
Mt. Barnicoat		Voided leases								23.08	2,370.00	2,251.99	
		Sundry claims								.68	1,309.75	1,037.77	
Mt Shenton		Voided leases									15.00	26.65	
		Sundry claims									279.25	209.67	
From District generally :—													
Sundry parcels treated at :													
State Battery, Laverton						*953.78					97.50	*17,198.88	381.00
United Gold Recoveries Pty., Ltd. T.L.S.2T, 5T, etc.											.25	*3,786.44	3,374.06
Various Works											214.75	*19,403.68	.24
Reported by Banks and Gold Dealers									2,531.53	108.08		26.76	
Totals			39.58		8,595.75	2,351.33			4,070.70	9,354.35	2,517,423.64	1,171,086.51	66,006.92

North Coolgardie Goldfield.

MENZIES DISTRICT.

Comet Vale	5766Z	Coonega Extended							16.00	15.34		
	5757Z	King of the Hills							156.75	42.43		
	(5772Z)	Kingfisher G.M.		44.00	10.50	2.94			44.00	10.50	2.94	
		Voided leases						419.74	267,144.22	193,180.54	5,352.39	
		Sundry claims						40.19	1,908.91	998.31		
Goongarrie	5740Z	Gull's Blow	164.75	30.50	89.41			164.75	348.75	221.44		
	(5760Z)	Pretty Easy							9.25	9.71		
		Voided leases					.94	1,385.26	29,838.79	18,035.64		
		Sundry claims		64.25	55.50		46.46	2,088.07	2,759.27	3,160.21		
Menzies	5543Z	Black Swan		80.00	11.17				1,080.63	1,644.69	9.08	
	5736Z	Bodington		27.50	101.50			130.27	100.50	154.47		
	5773Z	Dunlops		146.50	13.58				146.50	13.58		
	5511Z	First Hit		122.50	37.39				3,359.25	6,499.23	21.25	
	5511Z, etc.	First Hit G.M.s (1934), Ltd.							68,473.70	49,060.96	6,676.23	
	5542Z	Good Block Lease		898.25	368.88			7.32	2,487.25	2,892.85		
	4714Z	Lady Harriet, North		60.00	9.13				81.00	13.14		
	5549Z	Lady Harriet							728.00	291.44		
	5520Z	Mignonette		5.00	11.69				543.50	378.92		
	5749Z	Woolgar		426.00	107.44				979.00	494.35		
	5752Z	Woolgar South		60.00	32.97					120.00	58.53	
		Voided leases					45.42	1,125.41	934,445.50	725,962.51	13,586.39	
		Sundry claims		984.75	212.04		49.50	623.61	34,012.69	25,163.17	776.49	
Mt. Ida	5701Z, etc.	Moonlight Wiluna G.M.s, Ltd.		30,056.00	17,114.27			40.77	136,047.86	72,322.19	787.54	
	5701Z, etc.	Prior to transfer to present holders							31,833.25	16,021.98	891.37	
		Voided leases							92.21	68,731.17	72,679.14	
		Sundry claims					48.14	436.08	16,044.16	8,230.02	106.63	
Twin Peaks		Voided leases							582.30	574.93		
		Sundry claims							97.80	86.69		
<i>From District Generally :-</i>												
Sundry Parcels treated at :-												
		Lady Harriet Battery			1.01				279.50	*19,381.31	30.00	
		Mt. Ida State Battery			*38.74				1,866.25	*7,442.79	.05	
		Various Works							2,528.30	*39,363.16	3,032.11	
		Reported by Banks and Gold Dealers	1.29	5.00	50.00	6.67	1,468.93	387.80	85.00	14.69		
Totals			1.29	169.75	33,055.25	18,221.89	2.94	1,659.39	6,941.48	1,606,879.55	1,264,468.86	31,272.59

ULARRING DISTRICT.

Davyhurst	1016U, etc.	New Coolgardie Gold Mines, N.L.		26,922.00	13,037.08	3,399.74			123,893.00	63,679.29	15,808.01	
	1016U, 1085U	(New Callion)							5,293.30	2,002.37	119.67	
		Voided leases						2.93	152.64	166,733.32	126,011.36	5,408.47
		Sundry claims							208.48	13,653.94	5,690.39	

Table I.—Production of Gold and Silver from all sources, etc.—continued.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1955.					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 (2,240 lb.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240 lb.).	Fine ozs.	Fine ozs.		
NORTH COOLGARDIE GOLDFIELD—continued.														
ULARRING DISTRICT—continued.														
Morley's	1101U	Emerald			713.50	157.70			26.24	2,785.50	2,038.48			
	1094U	First Hit			152.50	162.04				2,284.75	4,929.69			
	1081U	Mabel Gertrude			128.00	415.25			17.19	1,539.00	1,894.46			
	1089U	Paramount			266.50	261.74			1.49	3,066.50	2,825.82			
		Voided leases							3,854.94	2,956.50	5,944.69	10.54		
		Sundry claims			135.25	116.10		2.16	932.23	1,720.50	2,518.01			
Mulline	1107U	Ajax West			721.00	475.33			1.37	5,845.25	5,428.32			
	1070U	Riverina								267.00	70.41			
	1070U, etc.	(Riverina Gold Mines Pty., Ltd.)								32,085.50	11,669.45	.07		
		Voided leases							274.09	102,637.22	103,360.32	530.75		
		Sundry claims			60.75	16.58		10.82	198.67	10,738.39	8,763.96	1.10		
Mulwarrie	1153U	Four Mile			8.00	35.08				56.00	276.92			
	1113U	Oakley			300.00	506.02				2,670.00	4,102.75			
		Voided leases							165.29	19,480.68	26,369.21	38.47		
		Sundry claims						.80	282.29	3,106.33	2,722.13			
Ularring		Voided leases							563.34	9,771.60	13,907.76			
		Sundry claims								671.50	309.48			
	From District generally :—													
	Sundry Parcels treated at :—													
		State Battery, Mulline								639.99	*16,459.89			
		State Battery, Mulwarrie								613.18	*6,564.16			
		Riverina South Battery				*218.85					*855.28			
		Various Works							15.82	268.15	*9,639.15	11.15		
		Reported by Banks and Gold Dealers			.13			112.81	64.00	100.00	23.48			
		Totals			.13		29,407.50	15,401.77	3,399.74	129.52	6,758.08	512,927.10	428,057.23	21,928.23
NIAGARA DISTRICT.														
Desdemona		Voided leases								7.12	9,809.00	7,555.81	12.04	
		Sundry claims								10.35	2,225.45	892.48		

Kookynie	928G	Altona	281.00	240.71					3,581.50	4,039.10		
	911G	Cosmopolitan South		*14.23					2,133.00	1,077.67		
	933G	New Gladstone							360.00	124.47		
		Voided leases					3.35	347.30	744,917.21	394,601.81	5,375.97	
		Sundry claims				2.84	59.23	106.60	8,963.80	6,733.95	3.02	
Niagara		Voided leases										
		Sundry claims							104.54	85,876.50	52,365.05	
Tampa		Voided leases						28.10	97.22	14,645.16	8,257.78	
		Sundry claims							41.58	50,477.57	23,287.71	
							32.60	283.40	8,041.33	4,113.02	174.24	
<i>From District Generally :-</i>												
Sundry Parcels treated at :-												
		Various Works							1,220.50	*20,884.22	120.98	
		Reported by Banks and Gold Dealers	.64					1,593.39	823.66		63.53	
		Totals	.64	.42	376.75	422.34	2.84	1,716.67	1,821.77	932,251.02	523,996.60	5,686.25

YERILLA DISTRICT.

Edjudina		Voided leases							18.44	35,523.70	43,374.79	37.79
		Sundry claims							28.52	6,948.58	4,827.25	.69
Patricia		Voided leases								4,158.50	5,396.40	25.40
		Sundry claims								47.00	20.78	
Pingin		Voided leases							48.34	17,463.30	10,742.77	
		Sundry claims							154.86	5,642.59	3,475.75	
Yarri	1320R	Margaret	428.00	94.47						3,644.00	1,125.59	
	1330R	Margaret North								260.00	12.84	
	1327R	Nil Desperandum								319.00	73.68	
	1126R, etc.	Porphyry (1939) G.M., N.L.								66,715.00	9,867.95	261.86
	1126R, etc.	(Edjudina Gold Mining Co. N.L.)								30,220.00	5,409.93	507.51
	1126R	Prior to transfer								124.50	38.89	
		Voided leases					6.30	87.08	44,324.75	21,235.42	2.00	
		Sundry claims	105.00	20.75			.87	5.93	16,840.05	6,054.82	.98	
Yerilla		Voided leases							3,107.25	16,481.43	12,925.74	13.93
		Sundry claims	8.00	12.25			19.30	97.63	2,752.83	1,590.03		
Yilganie	1176R, etc.	Western Mining Corporation	1,468.00	1,567.93	266.11					13,540.75	13,544.22	1,752.02
		Prior to transfer to present holders							.85	1,244.75	1,830.28	
		Voided leases							9.94	2,432.75	1,500.80	
		Sundry claims					121.67	98.20	3,302.30	2,020.38	.63	

Table I.—Production of Gold and Silver from all sources, etc.—continued.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1955.					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 (2,240 lb.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240 lb.).	Fine ozs.	Fine ozs.

NORTH COOLGARDIE GOLDFIELD—continued.

YERILLA DISTRICT—(continued).

<i>From District generally :</i>												
Sundry parcels treated at :												
		State Battery, Yarri	....	....	....	....	....	....	....	276.50	*9,060.18	11.65
		State Battery, Yerilla	....	....	....	....	....	....	....	....	*43.52	....
		Various Works	....	....	....	....	....	2.17	....	642.25	*6,049.24	....
		Reported by Banks and Gold Dealers	....	....	....	....	4.27	....	1,161.60	160.08	....	27.36
		Totals	....	....	2,009.00	1,699.67	266.11	1,311.91	3,817.12	272,904.53	160,248.61	2,614.46

Broad Arrow Goldfield.

Bardoc	....	Voided leases	....	....	....	....	....	....	2,335.41	85,370.59	55,699.50	203.60
		Sundry claims	....	16.91	4.50	9.57	....	54.95	1,214.83	17,068.03	8,219.09	....
Black Flag	2284W....	Barlock	....	....	54.00	22.88	....	....	....	54.00	22.88	....
	2229W....	Bellevue	....	....	36.50	27.35	....	....	208.36	1,283.25	2,527.66	....
		Voided leases	....	....	....	....	....	27.81	405.90	48,223.79	28,152.20	....
		Sundry claims	....	....	....	....	....	712.92	251.59	8,027.71	4,961.01	....
Broad Arrow	2039W....	Golden Arrow	....	....	....	....	....	....	....	5,674.75	864.41	....
	2254W....	Grace Darling Extended	....	....	30.75	13.59	....	....	....	2,457.50	1,058.51	....
	(2276W)	Johnnie	....	....	17.75	8.97	....	....	1.09	113.00	36.15	....
		Voided leases	....	....	....	....	....	70.32	10,452.72	147,650.69	118,128.97	20.23
		Sundry claims	....	....	76.00	36.24	....	1,007.72	3,046.17	32,385.89	16,662.62	.11
Cane Grass	....	Voided leases	....	....	....	....	....	....	27.77	669.82	460.72	....
		Sundry claims	....	....	....	....	....	....	227.55	717.45	505.06	....
Carnage	....	Voided leases	....	....	....	....	....	176.04	659.31	2,402.00	2,170.67	....
		Sundry claims	....	....	....	....	....	....	6.61	1,840.08	874.56	....

Cashmans	....	Voided leases	....	....	....	....	....	67.51	813.76	8,172.15	7,090.91	....		
		Sundry claims	....	....	....	....	....	....	40.31	1,205.12	361.74	.05
Christmas Reef	2279W....	New Mexico...	....	....	....	51.50	147.19	....	....	51.50	147.19	....		
	2253W....	New Mexico South	....	....	....	112.50	343.00	....	....	621.75	1,559.47	....		
		Voided leases	....	....	....	....	....	....	55.49	1,856.12	3,599.03	....		
		Sundry claims	....	....	....	27.75	239.39	....	441.85	2,942.64	2,909.94	....		
Fenbark	2188W....	Golden Penny	....	....	....	....	....	....	....	2,873.25	630.89	....		
		Voided leases	....	....	....	....	....	....	4.42	3,897.75	2,080.79	....		
		Sundry claims	....	....	....	....	....	....	51.96	2,999.02	997.31	....		
Grant's Patch	2261W....	Bent Tree	....	....	....	220.00	45.76	....	....	961.00	287.21	....		
	2277W, 2278W	Ora Banda Amalgamated Mines N.L.	....	....	....	308.75	206.23	....	....	169,093.54	63,746.56	175.00
		Prior to transfer to present holders	....	....	....	....	....	....	....	12,424.50	9,540.07	....		
	2208W....	Wentworth	....	....	....	325.75	94.15	....	1.30	3,883.25	1,155.01	....		
	2224W....	Whip-Pole	....	....	....	143.25	30.20	....	12.20	1,057.35	422.08	....		
		Voided leases	....	....	....	....	....	....	260.63	16,529.60	5,729.15	....		
		Sundry claims	....	....	....	4.25	3.02	....	356.66	6,148.04	3,067.15	....		
Ora Banda	T.A. 42W, M.A. 41W	Associated Northern Ora Banda N.L.	....	....	....	....	....	....	....	2,786.50	464.53	21.07
		Prior to transfer to present holders	....	....	....	....	....	....	....	315,958.95	123,252.22	1,664.70
	2270W....	Gimlet South Leases	....	....	....	1,579.50	253.61	....	....	3,482.75	759.90	....		
	2280W....	New Victorious	....	....	....	....	....	....	....	18.00	7.48	....		
	(2275W)	Squanderbug	....	....	....	....	....	....	....	41	5.50	....		
		Voided leases	....	....	....	....	....	....	845.72	103,798.7	27,385.59	....		
		Sundry claims	....	....	....	60.74	71.00	30.81	467.17	13,370.75	4,457.14	....		
Paddington	2287W....	Pakeha	....	....	....	103.25	24.78	....	....	103.25	24.78	....		
	(2122W)	Pakeha	....	....	....	99.00	19.79	....	....	5,149.15	1,691.41	13.19
		Voided leases	....	....	....	....	....	....	5,566.30	463.31	189,970.16	84,586.82
		Sundry claims	....	....	....	515.25	71.68	....	1,714.16	291.43	16,916.48	9,197.95
Riche's Find	2285W....	Lady Correll	....	....	....	8.22	31.50	....	....	8.22	31.50	33.89
		Voided leases	....	....	....	....	....	....	....	13.42	7,583.59	6,017.88
		Sundry claims	....	....	....	37.95	290.45	....	....	296.26	1,943.75	2,289.23
Siberia	....	Voided leases	....	....	....	....	....	....	1.07	2,649.28	28,928.97	31,751.34
		Sundry claims	....	....	....	132.00	19.52	....	289.06	1,233.18	21,195.04	12,864.61
Smithfield...	2264W....	King of Kings	....	....	....	1,470.00	168.28	....	....	19.19	5,341.75	732.08
		Voided leases	....	....	....	....	....	....	....	4,700.71	1,174.69	....		
		Sundry claims	....	....	....	57.25	21.09	....	....	124.29	3,255.84	1,275.89
		<i>From Goldfield generally :—</i>													
		Sundry parcels treated at :													
		State Battery, Ora Banda	128.05	*23,727.85	2.50		
		Golden Arrow Battery	17.75	28.58	80.75	*4,327.22	2.30		
		Various Works	2,275.66	1.24	16,967.02	*49,501.99	3,103.45		
		Reported by Banks and Gold Dealers	11.04	1.80	10,002.59	145.62	61.68	90.35		
		Totals	11.04	88.08	5,527.70	2,635.66	21,966.11	27,434.64	1,330,641.09	729,288.41	5,296.65

Table I.—Production of Gold and Silver from all sources, etc.—continued.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1955.					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 (2,240 lb.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240 lb.).	Fine ozs.	Fine ozs.

North-East Coolgardie Goldfield.

KANOWNNA DISTRICT.

Gindalbi	1576X	Kurrajong	.....	.....	14.50	2.84	.....	.....	.....	35.00	6.59	.....
		Voided leases	.....	.....	.....	.....	.....	.....	1,151.99	46,046.78	41,730.91	38.31
		Sundry claims	.....	.....	.....	.....	.....	.....	716.52	5,445.77	3,168.28	.....
Gordon	.....	Voided leases	.....	.....	.....	.....	.....	.....	682.54	53,900.58	20,072.51	517.61
		Sundry claims	.....	.....	.....	.....	.....	.....	177.38	2,155.70	1,194.71	.....
Kalpini	.....	Voided leases	.....	.....	.....	.....	.....	.....	38.73	13,543.50	6,753.78	.07
		Sundry claims	.....	.....	.....	.....	.....	24.70	269.72	1,492.50	1,026.37	.....
Kanownna	1572X	Kanownna Red Hill	.....	.....	305.00	77.99	.....	.....	.....	1,971.25	575.28	.....
		Voided leases	.....	.....	.....	.....	.....	.....	24.94	4,516.76	685,557.10	380,497.36
		Sundry claims	.....	.....	4.62	120.25	72.77	.....	125.32	2,163.30	26,625.27	11,833.33
Mulgarrie	.....	Voided leases	.....	.....	.....	.....	.....	.....	1,216.63	6,902.26	4,197.98	.....
		Sundry calims	.....	.....	8.25	4.91	.....	.....	16.78	1,290.00	646.60	.....
Six Mile	.....	Voided leases	.....	.....	.....	.....	.....	.....	1,603.72	559.00	767.72	.....
		Sundry claims	.....	.....	.....	.....	.....	.....	56.51	764.50	231.13	.....
		<i>From District generally :—</i>										
		<i>Sundry Parcels treated at :—</i>										
		Various Works	.....	.....	.....	.....	.....	.....	330.42	867.52	158,935.05	153,205.89
		Reported by Banks and Gold Dealers	.....	.....	.....	.....	.....	.....	106,016.31	40.42	.50	108.04
		Totals	.....	.....	4.62	3.07	448.00	158.51	106,521.69	13,518.52	1,005,224.76	626,016.48
			.....	.....								3,039.73

KURNALPI DISTRICT.

Jubilee	.....	Voided leases	.....	.....	.....	.....	.....	.....	.....	145.13	2,122.50	1,465.16	.....
		Sundry claims	.....	.....	.....	.....	.....	.....	25.57	13.52	1,234.00	520.15	.....
Kurnalpi	.....	Voided leases	.....	.....	.....	.....	.....	.....	371.18	3,166.80	4,052.51	3,957.71	6.27
		Sundry claims	.....	.....	72.25	202.38	.....	.....	324.12	727.39	4,377.61	2,292.28	.....
Mulgabbie	.....	Voided leases	.....	.....	.....	.....	.....	.....	.....	1,402.66	226.75	7,845.87	4.95
		Sundry claims	.....	.....	.....	.....	.....	.....	8.06	2,772.71	1,327.45	2,241.18	.....

<i>From District generally :—</i>										
Sundry Parcels treated at :—										
Various Works										
Reported by Banks and Gold Dealers										
	42	...	...	...	...	12,105·52	70·70	101·50	*388·63	...
								2·35		1·49
Totals	42	...	72·25	202·38	...	12,834·45	8,298·91	13,442·32	18,713·33	12·71

East Coolgardie Goldfield.

EAST COOLGARDIE DISTRICT.

Binduli	6025E	Belle of Kalgoorlie...	67·00	2·00	...	...	...	799·50	87·92	...
		Voided leases	...	...	...	...	...	803·10	385·19	...
		Sundry claims	26·00	1·79	...	...	13·01	5,145·27	1,677·71	...
Boorara		Voided leases	...	...	...	...	459·07	309,467·82	172,861·95	411·37
		Sundry claims	117·50	21·41	...	49	145·56	3,487·34	1,514·80	...
Boulder	6145E	Boomerang	...	...	...	...	...	77·00	8·00	...
	5690E, etc.	Boulder Perseverance, Ltd. (in Liq.)	126,250·93	25,045·76	2,956·29	...	...	3,108,997·37	1,086,351·04	338,467·16
		Prior to transfer to present holders	...	...	...	...	...	3,306,942·88	1,841,159·00	203,821·43
	5531E	Cassidy's Hill	...	...	...	...	...	75·50	7·77	...
	5964E	Croesus Extended	...	...	...	...	...	192·75	16·57	...
	6320E	Edith Joy	...	...	...	...	...	188·25	23·81	...
	6537E	Golden Key	...	...	...	18·27	24·33	432·25	165·02	...
	5159E, etc.	Gold Mines of Kalgoorlie (Aust.), Ltd.	195,732·00	52,552·40	12,743·19	...	...	2,731,798·30	756,697·02	175,240·78
	5466E	(South Star)	...	...	...	...	...	233·46	4,237·43	1,494·78
	5466E	Prior to transfer to present holders	...	...	...	...	...	5·22	1,835·75	748·78
	5159E, etc.	(Lake View South (G.M.K.), Ltd.)	...	...	...	...	...	...	62,278·38	21,536·66
	5692E, etc.	Prior to transfer to present holders	...	...	...	...	...	545·23	527,790·53	568,643·05
	5853E, etc.	(Paringa Junction North Leases)	...	...	...	...	...	7·82	1,686·79	701·11
	5853E	(Paringa Junction)	...	...	...	...	...	...	123·75	17·77
	5854E	(Paringa Junction North)	...	...	...	...	...	...	60·50	10·64
	5855E	(Paringa Junction South)	...	...	...	...	...	...	1,473·25	228·42
	5696E, etc.	Great Boulder Pty., Gold Mines, Ltd.	423,879·00	114,560·32	68,370·89	...	1·53	11,394,339·97	5,637,170·67	1,303,917·51
	5845E	Happy Returns	58·50	10·87	...	...	...	7,862·75	1,452·88	...
	5345E, etc.	Kalgoorlie Enterprise Mines, Ltd. (in Liq.)	74,429·32	19,626·80	787·02	...	...	1,028,643·80	313,151·58	28,764·25
		Prior to transfer to present holders	...	...	...	...	...	...	15,320·68	8,957·01
	4476E, etc.	Lake View & Star, Ltd.	656,099·00	166,318·83	20,197·60	...	...	12,475,943·30	3,797,069·14	409,162·54
		Prior to transfer to present holders	...	...	...	...	...	...	8·49	15,792,500·38
	6230E	New Look	...	...	...	...	...	...	256·75	22·68
	5431E, etc.	North Kalgurli (1912), Ltd.	348,829·60	76,236·54	3,968·64	...	127·55	3,949,366·44	1,158,244·29	259,513·34
	5405E, etc.	North Kalgurli (1912), Ltd. Croesus, Pty.	...	...	...	...	...	...	...	...
		G.P.	...	...	...	...	...	...	...	...
	5891E	(New Croesus)	...	...	...	...	...	...	90,159·00	19,261·22
	5700E, etc.	Prior to transfer to present holders	...	...	...	...	...	...	193·00	48·74
	5446E, etc.	(North Kalgurli United Mines, Ltd.)	...	...	...	43·99	...	4,018,436·01	2,815,911·21	97,625·03
		Prior to transfer to present holders	...	...	...	...	...	...	4,661·51	928·18
	(6095E)	Raymond	...	...	...	...	...	...	131·74	76·74
	5695E, etc.	South Kalgurli Consol, Ltd. (in Liq.)	84,928·85	20,328·19	100·00	...	...	...	...	271·25
		Prior to transfer to present holders	...	...	...	...	...	...	3,293,226·36	1,175,512·80
	5716E	Two Bs.	...	...	...	...	...	...	1,344,254·70	531,792·77
			...	...	...	...	...	...	464·25	88·66

Table I.—Production of Gold and Silver from all sources, etc.—continued.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1955.					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 (2,240 lb.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240 lb.).	Fine ozs.	Fine ozs.
EAST COOLGARDIE GOLDFIELD—continued.												
EAST COOLGARDIE DISTRICT—continued.												
		Voided leases	....	....	....	....	....	110.97	11,999.04	1,813,479.56	760,206.32	24,046.96
		Sundry claims	....	....	....	....	....	24.58	212.32	11,649.99	4,300.62	....
Cutters' Luck	....	Voided leases	....	....	....	....	....	45.87	133.58	74.50	239.19	....
		Sundry claims	....	....	....	....	....	8.11	501.65	922.90	384.71	....
Feysville	....	Voided leases	....	....	....	....	....	....	110.93	863.30	425.16	....
		Sundry claims	....	....	....	....	....	....	199.00	1,237.10	645.88	....
Hampton Plains	P.P.L. 1, etc.	Consolidated Gold Areas, N.L.	....	....	50.25	8.83	....	....	....	142,565.73	37,249.15	5,835.85
	P.P.L. 86	Golden Hope, N.L.	....	....	....	....	....	....	....	5,964.00	2,006.14	....
	P.P.L. 192	Golden Hope North	....	....	....	....	....	....	....	353.00	201.02	....
	P.P.L. 252	Hampton Properties, Ltd.—Mount Martin	....	....	....	....	....	....	....	....	....	....
	P.P.L. 460	Hampton Xmas Gift	....	....	....	....	....	6.72	37.57	14,953.75	5,574.11	....
	P.P.L. 12	Junction Extended	....	....	....	....	....	....	....	107.00	89.44	....
	P.P.L. 277	New Hope	....	....	....	....	....	....	....	3,581.75	527.74	....
	P.P.L. 227	Pernatty	....	....	1,202.75	131.24	....	....	17.23	61,468.55	11,175.94	....
	P.P.L. 23	Scherini & Rowe	....	....	388.50	25.22	....	....	....	5,732.75	676.18	....
	P.P.L. 175	Jubilee	....	....	24.50	3.96	....	....	....	388.50	25.22	....
		Voided leases	....	....	....	....	....	4,578.52	203.94	6,277.50	871.24	....
		Sundry claims	....	....	....	....	....	2.68	70.85	126,877.34	39,711.84	69.83
			....	....	....	....	....	....	....	46,439.41	8,509.67	....
Kalgoorlie	6048E	Auld Acquaintance	....	....	....	....	....	....	....	7.50	2.36	....
	4547E, etc.	Champagne Syndicate, N.L.	....	....	642.75	37.49	1.33	....	....	7,152.00	788.86	61.18
		Prior to transfer to present holders	....	....	....	....	....	....	5.72	73,435.85	16,819.11	110.15
	6503E	Coronation	....	....	....	....	....	....	....	20.50	2.52	....
	5913E	Devon Consols	....	....	52.00	10.63	....	....	93.19	2,298.46	699.66	....
	5647E	Golden Cross	....	....	....	....	....	....	....	156.25	19.77	....
	5510E	Golden Dream	....	....	....	....	....	....	....	79.00	6.53	....
	5774E	Golden Goose	....	....	65.50	8.95	....	....	....	215.50	53.07	....
	5739E	Golden Star	....	....	194.00	8.56	....	....	....	918.50	85.96	....
	6502E	Hannans North	....	....	215.75	59.21	4.28	....	....	215.75	59.21	4.28
	6504E	Historic	....	....	211.50	14.14	....	....	....	257.00	17.27	....
	5460E	Kalgoorlie Star	....	....	197.50	39.49	....	....	....	238.25	52.76	....
	5878E	Lady May	....	....	....	....	....	....	62.05	4,740.50	1,177.07	....
	6091E	Lesanben	....	....	....	....	....	....	184.20	478.75	297.85	....
	6485E	Maritana Hill	....	....	203.00	32.15	....	....	....	1,887.25	265.24	....
	6535E	Mary A	....	....	971.25	85.55	....	....	....	971.25	85.55	....
	6321E	North End Extended	....	69.28	799.25	209.49	....	....	69.28	966.75	300.48	....
	5852E, etc.	Pedestal Leases	....	....	66.00	11.28	....	....	....	1,726.00	476.47	....
	6024E	(Trident)	....	....	....	....	....	....	....	58.75	36.67	....

	5852E	(Pedestal)								1,608.75	444.93		
	5468E	Phar Lap								2,083.25	750.82	2.50	
	5415E, etc.	Return Leases								3,831.75	656.15		
		Voided leases					242.48	10,572.12	1,457,335.80	578,523.61	45,973.47		
		Sundry claims			53.75	7.23	232.41	1,124.61	60,566.38	23,132.32			
Wombola	6051E	Big Bull								595.50	432.86		
	5688E, etc.	Caledonian Leases								970.00	659.67		
	5688E	Caledonian								4,275.00	3,632.98		
	5967E	North Caledonian						1.27		22.25	8.15		
	5497E, etc.	Daisy Leases			1,016.50	1,109.12				8,843.65	6,694.10	5.92	
	5497E	(Daisy)								6,282.25	5,031.93		
	5500E	Happy Go Lucky								2,075.25	1,675.85		
	6032E	Dry Mount								1,120.50	1,121.40		
	6325E	Great Hope								150.00	64.66		
	5689E, etc.	Haoma Gold Mines, N.L.			1,155.00	1,024.77				1,155.00	1,024.77		
	5689E, etc.	(Haoma Leases)			2,410.00	2,429.75	13.91			27,396.50	25,445.40	79.15	
	5689E	(Haoma)								2,168.00	1,948.36		
	5525E	(Xmas Flat)								330.25	264.74		
	6312E	Inverness			388.75	58.39				1,657.00	301.62		
	6043E	Launa Doone			59.75	11.71				1,638.50	685.47		
	(6043E, etc.)	(Launa Doone Leases)								32.50	42.76		
	6487E	Leslie			44.25	31.74				71.00	68.21		
	5798E	Maranoa						32.17		3,183.50	1,633.27		
	5493E, etc.	New Milano, N.L.						.25		17,390.75	11,622.24	479.00	
	5493E	(Milano)								4,012.75	11,676.72		
	5616E	(Leslie)								602.00	939.10		
	6213E	Pauline								195.00	196.39		
	6533E	Rosemary			261.75	1,633.55				316.25	1,917.28		
		Voided leases					3.80	2,464.78	27,520.59	40,315.95			
		Sundry claims			198.75	103.60		711.10	23,358.43	14,155.16			
	<i>From District generally :-</i>												
	Sundry Parcels treated at :												
		Golden Horseshoe (New), Ltd. (T.Ls. 101, etc.)									*345,025.43	351,684.60	
		State Battery, Kalgoorlie									*32,014.00	46.24	
		Sundry claims						11,014.57	465.61	5,440.46	2,541.10		
		Various Works						384.36	64.70	41,135.02	*270,756.33	14,114.46	
		Reported by Banks and Gold Dealers		9.87				165.53		16,898.98	9,983.97	359.66	
		Totals		9.87	69.28	1,921,290.70	488,884.65	116,116.66	33,616.80	40,949.24	67530800.23	31349868.51	4,656,782.41
Balagundi		Voided leases							2,408.98	1,115.93	1,488.91	12.92	
		Sundry claims						3.51	293.53	806.01	505.93		
Bulong	1311Y	Blue Quartz			25.50	29.87				1,310.50	559.10		
		Voided leases							107.54	8,526.12	108,330.55	85,785.57	
		Sundry claims			352.50	46.11		1,655.86	1,611.58	16,473.98	17,723.31		
Majestic		Voided leases						19.45	63.91	1,317.94	647.62		
		Sundry claims						42.88	154.58	1,926.55	948.06		
Morelands		Sundry claims							.13	308.75	81.84		

Table I.—Production of Gold and Silver from all sources, etc.—continued.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1955.					TOTAL PRODUCTION.					
			Alluvial.	Dolled and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dolled and Specimens.	Ore treated.	Gold therefrom.	Silver.	
			Fine ozs.	Fine ozs.	Tons (2,240 lb.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240 lb.).	Fine ozs.	Fine ozs.	
EAST COOLGARDIE GOLDFIELD—continued.													
BULONG DISTRICT.													
Mount Monger	....	Voided leases	....	....	....	....	....	....	....	....	....
		Sundry claims	....	....	....	....	....	....	....	....	....
									215·60	2,771·39	1,437·85	1,256·10	....
											379·05	308·48	....
Randalls	....	Voided leases	....	....	....	....	....	....	....	60·04	33,180·35	11,100·46	....
		Sundry claims	....	....	....	....	....	....	20·70	8·11	4,814·31	1,211·05	....
Taurus	....	Voided leases	....	....	....	....	....	....	2·06	3·70	1,765·10	909·84	....
		Sundry claims	....	....	....	....	....	....	112·69	51·88	2,656·60	1,049·81	....
Trans Find	P.P.L. 308	Dawn of Hope	....	....	....	....	....	....	....	2·87	1,145·75	330·33	....
		Voided leases	....	....	....	....	....	....	....	....	1,098·42	876·22	....
		Sundry claims	....	....	....	....	....	....	....	5·93	808·25	335·33	....
		<i>From District generally:—</i>											
		Sundry parcels treated at:											
		Various Works	....	....	....	....	....	....	....	....	6,102·15	6,675·38	....
		Reported by Banks and Gold Dealers	....	....	....	....	....	....	35	....	70·15	28·44	....
		Totals	....	....	....	....	....	....	35	....	378·00	75·98	....
									27,405·22	16,032·89	184,978·05	131,821·78	12·92

Coolgardie Goldfield.

COOLGARDIE DISTRICT.

Bonnievale	5622	Lucky Hit	....	....	....	....	....	....	....	3·28	945·60	491·59	....
	4600	Melva Maie	....	....	....	....	....	....	....	....	3,538·90	3,762·18	2·35
		Prior to transfer to present holders	....	....	....	....	....	....	....	....	614·50	1,099·21	11·63
	5977	Mystery	....	....	....	....	....	....	....	....	273·75	132·56	....
	5890	Rayjax	....	....	....	....	....	....	....	....	153·75	339·32	....
		Voided leases	....	....	....	....	....	....	....	212·48	357,741·97	191,231·36	5·88
		Sundry claims	....	....	....	....	....	....	....	163·19	7,809·88	5,246·54	·04
Bulla-Bulling	5955	Greta	....	....	....	....	....	....	....	....	176·50	51·59	....
		Voided leases	....	....	....	....	....	....	....	....	776·81	668·19	....
		Sundry claims	....	....	....	....	....	....	5·21	15·98	1,685·76	666·59	....
Burbanks	5605	Burbanks Deeps	....	....	....	....	....	....	....	....	103·00	53·46	....
	5956	Lord Bob	....	....	....	....	....	....	....	....	34·50	11·98	....
	(5872)	Vice Regal	....	....	....	....	....	....	....	....	2·81	28·97	....
		Voided leases	....	....	....	....	....	....	....	14·90	420,273·46	306,351·90	521·06
		Sundry claims	....	....	....	....	....	....	55·05	489·57	15,923·10	8,913·63	....

Cave Rocks		Voided leases								8,223.16	1,941.42	
		Sundry claims						50.00		4,473.65	1,082.79	
Coolgardie	5679	Ada								1,602.70	153.57	
	5938	Bailey's South (New Coolgardie G.M.s)		5,548.00	2,761.49	670.21				7,213.00	4,617.77	907.43
	5876	Bailey's West (New Coolgardie G.M.s)								6.25	2.22	
	5868	El Dorado						498.20		166.20	1,034.01	
	5878	Ellen Jean								358.00	116.88	.69
	5844	Jackpot		2,196.75	714.16					5,044.00	1,961.69	
	5643	Lloyd George South									10.25	
	5884	Lone Hand		89.50	8.85			19.85		458.75	75.20	
	5881	Macpherson's Reward		262.50	305.31					953.00	586.05	
	5743	Moya Jan								2,233.25	917.10	
	5954	Pat Jan								32.00	9.08	
		Voided leases						1,301.71	4,763.64	1,104,943.29	447,618.41	4,818.90
		Sundry claims		315.30	98.91			205.49	2,712.30	72,192.44	27,122.78	
Eudynie		Voided leases						3.70	16.09	31,772.98	16,531.34	1.75
		Sundry claims							82.28	694.12	468.01	
Gibraltar	5723	Lloyd George		93.00	7.60					763.00	176.78	
		Voided leases							33.97	38,658.63	20,111.22	
		Sundry claims						1.39	50.76	3,270.10	1,390.47	
Gnarlbine		Voided leases							13.95	2,731.75	1,341.60	
		Sundry claims							4.90	1,186.10	504.18	
Hampton Plains	P.P.L. 462	Bobby Dazzler							28.55	31.37	301.45	
	P.P.L. 419	Chatanooga								1,267.75	295.73	1.10
	P.P.L. 335	D. and C. P. Clews		23.00	16.97					78.50	46.63	
	P.P.L. 338	Dry Hill								43.00	58.42	
	P.P.L. 465	G. Dugan Pty.		53.75	17.54					53.75	17.54	
	P.P.L. 454	Golden Dollar								105.50	13.66	
	P.P.L. 319	Lady May								1,742.25	981.39	
	P.P.L. 316, 330	New Coolgardie Gold Mines N.L.		27,748.00	16,418.26	4,085.86				236,260.00	115,384.46	29,746.38
	P.P.L. 316	(Surprise G.M.)								7,189.00	3,425.59	
	P.P.L. 330	(Barbara)								2,157.75	1,655.63	
		Voided leases							451.32	13,950.84	11,118.69	
		Sundry claims		6.00	.86			1.63	132.06	1,948.00	856.51	
Higginsville	5981	Central Higginsville		33.81	44.00	28.53			33.31	44.00	28.53	
	5877	Sons of Erin		26.40					26.40	20.00	8.44	
	5293	Two Boys								360.00	1,260.43	.01
	5293	(Two Boys)								6,888.00	3,193.95	
		Voided leases							373.93	66,417.35	20,562.31	159.52
		Sundry claims							187.25	3,654.76	1,951.40	
Larkinville		Voided leases						22.77	54.44	2,335.16	3,256.49	
		Sundry claims							147.20	448.53	1,029.03	
Logan's	5324, etc	Spargcs Reward Gold Mine (1935), N.L.			3.75					105,397.50	26,324.42	
		Voided leases								1,263.31	607.26	
		Sundry claims						6.88	128.95	1,969.10	907.47	

Table I.—Production of Gold and Silver from all sources, etc.—continued.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1955.					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 (2,240 lb.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240 lb.).	Fine ozs.	Fine ozs.					
COOLGARDIE GOLDFIELD—continued.																	
COOLGARDIE DISTRICT—continued.																	
Londonderry	....	Voided leases	....	....	....	....	....	....	....	95·04	34,155·35	22,238·37	·35
		Sundry claims	....	....	36·25	43·74	....	16·68	38·72	3,632·42	2,563·56	22·42		
Mungari	....	Voided leases	....	....	....	....	....	....	17·71	1,872·50	458·43	....				
		Sundry claims	....	....	....	....	....	1·77	153·24	2,787·94	750·54	....				
Paris	(5311), 5500	Lister's Gold Mine	....	....	....	....	....	·88	....	5,460·00	3,563·29	75·95	
	(5311), 5500	(Lister's Gold Mine)	....	....	....	....	....	....	....	8,582·00	4,423·84	....				
	(5530)	Paris Central	....	....	....	....	....	....	....	113·00	24·16	....				
	5500	Paris West	....	....	....	....	....	....	....	19·00	11·03	....				
	5873	Voided leases	....	....	....	....	....	....	4·30	1,342·00	614·08	3·24	
		Sundry claims	....	....	....	....	....	....	....	2,104·25	518·98	....				
Red Hill	....	Voided leases	....	....	....	....	....	14·87	1,551·81	40,797·40	31,070·65	....				
		Sundry claims	....	....	....	....	....	15·29	90·33	1,403·14	999·97	....				
Ryan's Find	....	Voided leases	....	....	....	....	....	....	....	54·16	151·69	....				
		Sundry claims	....	....	....	....	....	....	·44	116·44	355·83	....				
St. Ives	(5628, etc.)	Ives Reward Leases	....	....	....	2·08	....	....	....	1,617·00	452·55	....				
		Voided leases	....	....	....	....	....	63·34	146·87	37,701·46	15,756·31	....				
		Sundry claims	....	....	....	....	....	211·25	950·23	4,177·56	1,459·39	....				
Wannaway	....	Voided leases	....	....	....	....	....	....	28·61	1,831·95	1,465·70	....				
		Sundry claims	....	....	....	....	....	....	193·79	1,316·37	1,300·33	....				
Widgiemooltha	5663	Bobs	....	....	....	....	....	....	....	16·00	4·94	....				
	5834	Harper's	....	....	....	....	....	....	9·54	40·00	93·06	....				
	5451	Host Group	....	....	....	....	....	....	12·75	1,604·15	565·02	....				
		Voided leases	....	....	....	....	....	17·95	1,252·70	22,727·81	11,965·35	·17	
		Sundry claims	....	13·99	10·60	17·33	....	46·49	470·06	16,167·96	6,839·38	·07			
		<i>From District generally :—</i>															
		Sundry Parcels treated at :															
		State Battery, Coolgardie	....	....	....	*465·25	....	....	....	771·01	*37,956·79	17·00	
		Australian Machinery and Investment Co. Ltd.	....	....	....	....	....	....	....	....	*3,044·44	86·31	
		Cyanide Plant (T.Ls. 63 and 127)	....	....	....	....	....	....	....	....	*367·34	....				
		T. A. James (T.A. 201)	....	....	....	....	....	....	....	361·00	*269·23	....				
		Lister's Cyanide Plant	....	....	....	....	....	....	....	....	*77·64	....				
		Paris Central Cyanide Plant	....	....	....	....	....	....	....	....	*29,433·20	223·06	
		Various Works	....	....	....	....	....	7·75	....	4,014·61	123·65	·65	
		Reported by Banks and Gold Dealers	....	....	....	....	....	20·17	14,928·93	723·86	48·25	....				
		Totals	20·17	74·20	38,006·15	21,398·69	4,756·07	16,943·93	16,811·33	2,745,668·90	1,419,076·06	36,605·96

KUNANALLING DISTRICT.

Carbine	970S 970S, etc.	Carbine (Carbine Leases) Voided leases Sundry claims								687.98	13,820.00 51,991.86 20,116.00 6,165.88	7,047.96 39,862.25 5,470.81 2,227.93		
Chadwin	1047S	Resolute Voided leases Sundry claims	14.00	17.39							14.00 4,781.55 5,972.55	17.39 5,232.25 2,945.14	2.50 .25	
Dunnsville		Voided leases Sundry claims	26.50	2.36						828.58 1,034.08	17,548.85 2,889.21	8,657.45 2,062.60		
Jourdie Hills		Voided leases Sundry claims	47.75	15.78						18.00 49.81	28,009.74 1,827.25	19,401.09 849.28	28.45 1.05	
Kintore	1036S	Newhaven Voided leases Sundry claims								18.70 111.91	1,993.50 54,829.39 4,524.78	465.11 39,579.50 2,503.91	677.88	
Kunanalling		Voided leases Sundry claims	39.60	10.48						86.13 216.53	1,734.92 815.28	130,303.61 9,620.08	40.77	
Kundana		Voided leases Sundry claims									465.00 475.25	68.12 60.38		
<i>From District generally :-</i>														
Sundry Parcels treated at :														
Goldfields Aust. Dev. Cyanide Plant													*548.07	
Various Works										42.23	1,782.26	*5,061.33		
Reported by Banks and Gold Dealers										866.02	17.93	5.85	.49	
Totals										1,514.74	5,634.93	362,265.95	252,499.23	751.39

Yilgarn Goldfield.

Blackbornes		Voided leases Sundry claims									1,282.50 392.50	341.37 81.15	
Bullfinch	3350, etc. 4287	Great Western Consolidated, N.L. Prior to transfer to present holders Volcano Voided leases Sundry claims	419,859.00	61,005.19	18,255.66						64.80 150.00 490,361.07 7,484.75	1,288,374.00 24,644.88 155.89 185,489.03 4,068.00	52,225.11 27,958.41
Corinthian	3398, 3425 3398 3425 4180	Corinthian Leases (Corinthian) (Corinthian North) Dileverance Voided leases Sundry claims									3,081.83 7,383.75 3,951.00 480.00 23.46 2.68	1,770.09 2,543.16 1,934.78 167.55 33,293.21 640.61	

Table 1.—Production of Gold and Silver from all sources, etc.—continued.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1955.					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 (2,240 lb.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240 lb.).	Fine ozs.	Fine ozs.
YILGARN GOLDFIELD—continued.												
Bembin		Voided leases							181.74	10,038.06	10,457.92	.01
		Sundry claims			12.00	2.65		2.50	73.97	2,633.60	1,826.45	
Evanston		Voided leases							79.27	64,533.06	33,191.88	10.14
		Sundry claims						4.98		638.35	159.55	
Forrestonia		Voided leases								1,185.00	298.15	
		Sundry claims								378.00	144.01	
Golden Valley	4173	Inspiration			12.00	23.78				254.00	397.74	
	4369	Inspiration West			12.00	17.64				12.00	17.64	
	4247	Lily of the Valley			86.00	22.54				624.00	150.19	
	4220	Manxman South								19.00	4.42	
	2994, etc.	Radio Leases			220.00	362.57	3.94		2.70	28,720.80	49,232.43	671.80
		Voided leases								36.34	36,545.92	28,509.40
		Sundry claims			10.00	13.57		4.58	237.85	6,641.27	4,922.56	1.02
Greenmount		Voided leases						45.99	21.62	125,127.64	31,585.45	944.50
		Sundry claims						.46	4.27	3,072.58	813.96	
Holleton	37PP	Brittania			100.00	27.00				1,900.00	1,628.91	
		Voided leases							9.33	45,003.25	13,147.88	36.69
		Sundry claims							3.75	3,464.05	923.78	.27
Hope's Hill	3414	Pilot								19,446.12	2,948.68	
		Voided leases							74.78	132,660.55	36,462.02	1.00
		Sundry claims						18.67	44.35	4,600.52	1,417.83	
Kennyville	3875	Victoria								5,244.00	1,148.94	.63
		Voided leases							18.76	55,876.63	21,625.66	.59
		Sundry claims			69.00	27.73			5.06	8,667.50	2,330.50	
Koolyanobbing		Voided leases							.99	1,768.05	972.77	
		Sundry claims						.26	17.33	656.10	329.20	
Marvel Loch	4243	Christmas Gift			32.60	8.02			32.56	75.60	52.95	
	13PP	Cricket								1,671.00	932.04	
	4039	Cromwell								633.00	98.46	
	3942, etc.	Edward's Reward Leases			2,390.00	1,414.22				62,854.50	28,080.18	
	3942	(Edward's Reward)								2,080.00	2,016.32	
	3943	(Sunshine)								3,866.00	2,384.79	
	4034	Firelight							2.68	6,653.75	940.03	
	3724	Frances Furniss			432.00	376.76				13,282.75	6,378.31	

	3718	....	Kurrajong	....	....	....	....	....	....	....	9,221.00	3,271.73	....
	3914	....	May	....	....	....	....	....	....	....	145.00	45.86	....
	4230	....	May Queen	....	....	....	....	....	....	....	286.00	43.42	....
	3970	....	Mountain Queen	....	....	....	....	....	....	....	1,231.00	455.65	....
	4362	....	North Star	....	....	90.00	13.36	....	....	....	104.00	18.60	....
	4035	....	Undaunted	....	....	....	....	....	....	....	865.00	113.59	....
	4251	....	Union Jack	....	....	....	....	....	....	....	2,175.00	182.17	....
			Voided leases	....	....	....	....	....	....	1,504.26	857,859.48	206,677.52	2,474.95
			Sundry claims	....	579.11	288.00	138.27	-.02	11.35	809.31	35,817.61	13,362.82	.04
Mount Jackson			Voided leases	....	....	....	....	....	....	180.85	55,166.78	39,927.52	2,313.77
			Sundry claims	....	....	....	....	....	6.44	52.87	10,935.95	4,879.54	70.74
Mt. Palmer	4250	....	Palmerston	....	....	....	....	....	2.03	....	23.00	17.84	....
	M.L. 4	....	Yellowdine Gold Dev. Pty. Ltd. (in Liq.)	....	....	....	....	....	....	....	93.00	136.46	....
			Voided leases	....	....	....	....	....	....	....	306,408.40	158,486.81	....
			Sundry claims	....	....	....	....	....	1,643.48	18.19	450.25	387.14	....
Mt. Rankin	81PP	....	Golden View	....	....	15.00	2.36	....	....	....	45.00	77.43	....
	88PP	....	Lynette	....	....	354.00	107.50	....	....	....	354.00	107.50	....
	76PP	....	Marjorie Glen Reward	....	143.03	557.00	744.14	....	....	143.03	1,454.00	2,216.63	....
	3555	....	No Trumps	....	....	....	....	....	....	....	5,562.37	853.06	....
			Voided leases	....	....	....	....	....	3.84	5.20	496.00	122.17	....
			Sundry claims	....	1.85	18.00	3.89	....	....	1.85	749.00	952.01	....
Parker's Range	4381	....	Centipede	....	....	124.00	31.56	....	....	....	124.00	31.56	....
	4359	....	Leonard's Find	....	....	40.00	8.85	....	....	....	250.75	39.23	....
	4370	....	Margaret Rose	....	....	23.00	3.99	....	....	....	23.00	3.99	....
			Voided leases	....	....	....	....	....	....	.42	270.48	62,880.35	32,479.50
			Sundry claims	....	....	160.00	66.54	....	6.59	303.93	12,237.30	5,365.85	26.46
Southern Cross	4002, etc.	....	Great Western Consolidated, N.L.	....	....	3,153.00	923.12	246.63	....	....	3,153.00	923.12	246.63
			Prior to transfer to present holders	....	....	....	....	....	....	....	26,184.75	4,628.71	1.26
			Voided leases	....	....	....	....	....	4.89	261.35	454,906.68	215,351.50	364.41
			Sundry claims	....	....	....	....	....	95.90	648.49	8,183.66	2,626.86	....
Westonia	4326	....	Consols	....	....	....	....	....	....	....	718.00	453.47	....
	4374	....	Les Trois	....	....	94.00	42.22	....	....	....	94.00	42.22	....
			Voided leases	....	....	....	....	....	....	4.06	596,024.64	380,874.45	5,104.07
			Sundry claims	....	....	61.00	35.98	....	9.51	64.96	4,310.76	2,823.33	.72
<i>From Goldfield generally :-</i>														
Sundry Parcels treated at :-														
			State Battery, Marvel Loch	....	....	....	....	....	....	....	29.00	*536.33	....
			Great Western Consolidated	....	....	....	....	*207.88	....	....	....	*207.88	....
			J. & F. Heine (L.T.T. 1320H)	....	....	....	....	*151.83	2.58	....	....	*151.83	2.58
			Kurrajong Battery	....	....	....	....	....	....	....	....	*409.57	....
			Pilot Cyanide Plant	....	....	....	....	....	....	....	30.00	*3,753.59	....
			R. R. Robinson (L.T.T. 1315H)	....	....	....	....	*30.89	....	....	....	*30.89	....
			Three Boys Cyanide Plant	....	....	....	....	*94.53	....	....	7.00	*3,707.75	....
			Westonia Cyanide Plant (L.T.T. 1279H)	....	....	....	....	*41.86	....	....	....	*41.86	....
			Various Works	....	....	....	....	....	....	....	341.48	*98,898.37	105.40
			Reported by Banks and Gold Dealers	....	2.88	....	....	....	323.20	71.73	.60	120.60	....
Totals				2.88	723.99	428,252.60	65,983.01	18,508.83	2,193.56	5,326.03	5,130,442.95	1,895,160.54	92,573.10

Table I.—Production of Gold and Silver from all sources, etc.—continued.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1955.					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 (2,240 lb.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240 lb.).	Fine ozs.	Fine ozs.		
Dundas Goldfield.														
Buldanía	....	Voided leases	....	....	....	....	....	....	....	....	3·02	846·05	708·99	....
		Sundry claims	....	....	....	....	....	....	....	....	39·25	1,324·27	861·36	·72
Dundas	1860	Coronation	....	....	60·00	2·86	....	....	....	....	....	106·50	11·55	....
		Voided leases	....	....	....	....	....	1·88	28·02	6,103·48	2,545·38	254·38	155·02	....
		Sundry claims	....	....	28·00	1·05	....	·76	413·85	2,130·75	1,102·82	18·32	....	....
Norseman	1288, etc.	Central Norseman Gold Corp., N.L.	....	....	160,224·00	95,700·60	48,464·19	....	....	2,163,825·20	855,472·31	675,488·78	....	....
		Prior to transfer to present holders	....	....	....	....	....	....	1,663·32	69,819·83	47,892·08	16,508·85	....	....
	1859	Mt. Barker	....	....	16·00	1·57	....	....	....	30·50	4·51	·19	....	....
	1315, etc.	Norseman Gold Mines, N.L.	....	....	....	....	....	....	....	964,099·00	240,900·95	353,206·54	....	....
		Prior to transfer to present holders	....	....	....	....	....	....	....	20,657·00	3,909·60	4,981·00	....	....
		Voided leases	....	....	....	....	....	....	14·27	10,601·15	915,732·17	601,756·74	39,001·04	....
		Sundry claims	....	....	90·50	10·75	....	1,052·09	3,402·99	47,331·20	22,226·14	200·64	....	....
Peninsula	....	Voided leases	....	....	....	....	....	....	....	24·29	9,603·39	6,102·61	12·30	....
		Sundry claims	....	....	....	....	....	....	....	....	217·25	119·32	·97	....
		<i>From Goldfield generally :—</i>												
		Sundry Parcels treated at :	....	....	....	....	....	....	....	....	417·89	*25,351·51	1,051·13	....
		State Battery, Norseman	....	....	....	....	....	....	....	....	760·64	*15,104·14	2,588·35	....
		Various Works	....	....	....	....	....	....	....	54·52	47·50	18·62	....	....
		Reported by Banks and Gold Dealers	....	....	·83	....	....	....	1,181·77	49·59	47·50	18·62	....	....
		Totals	....	....	·83	160,418·50	95,716·83	48,464·19	2,250·77	16,280·00	4,203,052·62	1,824,088·63	1,093,214·45	....

Phillips River Goldfield.

Hatters Hill	....	Voided leases	....	....	....	....	....	....	....	4·38	1,599·55	1,222·72	....	....
		Sundry claims	....	....	....	....	....	....	74·91	24·26	5,225·60	2,720·90	26·09	....
Kundip	263	Hillsborough	....	....	....	....	....	....	....	....	258·00	65·75	19·33	....
		Voided leases	....	....	....	....	....	....	113·28	556·17	84,866·58	60,584·54	4,008·81	....
		Sundry claims	....	....	....	....	....	....	90·27	73·02	6,436·68	1,951·87	54·65	....
Mt. Desmond	....	Voided leases	....	....	....	....	....	....	....	1·40	9·00	3,905·46	6,891·59	....
		Sundry claims	....	....	....	....	....	....	....	....	80·00	41·96	51·01	....
Ravensthorpe	M.L. 411	Wehr Bros.	....	....	....	....	....	....	....	....	11·99	....	....	....
		Voided leases	....	....	....	....	....	....	....	141·80	24,723·55	26,070·94	4,384·07	....
		Sundry claims	....	....	....	....	....	....	163·96	7·68	7,261·57	3,195·67	41·12	....

TABLE II.

Production of Gold and Silver from all Sources, showing in fine ounces the output, as reported to the Mines Department during the year 1955

Goldfield.	District.	District.						Goldfield.					
		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. (2,240 lb.)	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons. (2,240 lb.)	Fine ozs.	Fine ozs.	Fine ozs.
Kimberley	.....	.....	.....	.....	.....	.....	.....	40.73	106.00	20.00	45.58	192.31	.....
West Kimberley	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pilbara	Marble Bar	26.77	5.88	1,433.50	909.63	942.28	2,989.15	} 65.66	255.92	5,162.81	3,551.79	3,873.37	2,991.45
	Nullagine	38.89	250.04	3,729.31	2,642.16	2,931.09	2.30						
West Pilbara	.....	.....	.....	.....	.....	.....	.....	9.90	.07	.....	19.25	29.22	.....
Ashburton	.....	.....	.....	.....	.....	.....	.....	2.20	3.06	15.00	14.03	19.29	106.51
Gascoyne	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Peak Hill	.....	.....	.....	.....	.....	.....	.....	.....	.....	296.00	112.22	112.22	.....
East Murchison	Lawlers	.....	.....	.....	.....	.....	.....	} 7.93	262.50	125,208.25	88,875.77	89,146.20	4,088.36
	Wiluna	.....	.....	118.00	117.64	117.64	.....					
	Black Range	.....	.....	.....	15.93	15.93	.....					
	Cue	4.68	220.84	16,291.45	6,117.33	6,342.85	1,863.18						
Murchison	Meekatharra	3.08	41.66	3,606.65	518.62	563.36	49.03	} 1.17	10.62	.....	.....	11.79	.....
	Day Dawn	.....	.....	183.50	98.33	98.33	7.60						
	Mt. Magnet	.17	.....	105,126.65	82,141.49	82,141.66	2,168.55						
Yalgoo	.....	.....	.....	.....	.....	.....	.....	} 83.03	1,748.55	114,743.75	26,839.12	28,670.70	1,938.03
Mt. Margaret	Mt. Morgans	23.59	12.33	1,903.00	806.46	842.38	21.16						
	Mt. Malcolm	19.86	1,736.22	104,245.00	23,681.33	25,437.41	1,916.87						
	Mt. Margaret	39.58	.....	8,595.75	2,351.33	2,390.91	.....	} 2.06	170.17	64,848.50	35,745.67	35,917.90	3,671.63
North. Coolgardie	Menzies	1.29	169.75	33,055.25	18,221.89	18,392.93	2.94						
	Ularring	.13	.....	29,407.50	15,401.77	15,401.90	3,399.74						
	Niagara	.64	.42	376.75	422.34	423.40	2.84						
	Yerrilla	.....	.....	2,009.00	1,699.67	1,699.67	266.11	} 11.04	88.08	5,527.70	2,635.66	2,734.78	.....
Broad Arrow	.....	.....	.....	.....	.....	.....	.....
N.E. Coolgardie	Kanowna	4.62	3.07	448.00	158.51	166.20	.....	} 5.04	3.07	520.25	360.89	369.00	.....
	Kurnalpi	.42	.....	72.25	202.38	202.80	.....					
East Coolgardie	East Coolgardie	9.87	69.28	1,921,290.70	488,884.65	488,963.80	116,116.66	} 10.22	69.28	1,921,668.70	488,960.63	489,040.13	116,116.66
	Bulong	.35	.....	378.00	75.98	76.33	.....					
Coolgardie	Coolgardie	20.17	74.20	38,006.15	21,398.69	21,493.06	4,756.07	} 20.17	74.20	38,223.75	21,496.21	21,590.58	4,756.07
	Kunanalling	.....	.....	217.60	97.52	97.52	.....					
Yilgarn	.....	.....	.....	.....	.....	.....	.....	2.88	723.99	428,252.60	65,983.01	66,709.88	18,508.83
Dundas	.....	.....	.....	.....	.....	.....	.....	.....	.83	160,418.50	95,716.83	95,717.66	48,464.19
Phillips River	.....	.....	.....	.....	.....	.....	.....	.....	.17	.....	2.86	3.03	.....
Outside Proclaimed Goldfields	.....	.....	.....	.....	.....	.....	.....	.79	9.86	24.50	43.33	53.98	40.90
Total	.....	.....	.....	.....	.....	.....	.....	262.82	3,526.37	2,865,048.31	830,536.42	834,325.61	200,682.63

TABLE III.

Return showing total production reported to the Mines Department, and respective Districts and Goldfields from whence derived, to 31st December, 1955

Goldfield	District.	District.						Goldfield.					
		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. (2,240 lb.)	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons. (2,240 lb.)	Fine ozs.	Fine ozs.	Fine ozs.
Kimberley	.....	.....	.....	.....	.....	.....	.....	8,967.12	2,643.61	22,661.90	17,191.40	28,802.13	128.76
West Kimberley	.....	.....	.....	.....	.....	.....	.....	1.30	24.68	1.00	2.49	28.47	13,575.29
Pilbara	Marble Bar	15,234.56	4,562.28	328,543.92	323,964.51	343,761.35	23,701.80	} 25,523.11	} 7,300.87	} 463,108.62	} 450,537.94	} 483,361.92	} 24,230.22
	Nullagine	10,288.55	2,738.59	134,564.70	126,573.43	139,600.57	528.42						
West Pilbara	.....	.....	.....	.....	.....	.....	.....	6,334.09	374.74	24,680.96	24,220.15	30,928.98	1,881.19
Ashburton	.....	.....	.....	.....	.....	.....	.....	9,264.97	482.46	6,807.10	2,913.43	12,660.86	39,243.36
Gascoyne	.....	.....	.....	.....	.....	.....	.....	693.44	62.97	387.00	517.29	1,273.70	.....
Peak Hill	.....	.....	.....	.....	.....	.....	.....	3,376.86	5,300.33	761,519.43	320,165.49	328,842.68	3,768.47
East Murchison	Lawlers	6,904.30	2,343.19	2,011,198.92	822,652.98	831,900.47	26,290.77	} 8,796.56	} 22,119.10	} 12,613,611.33	} 3,647,837.16	} 3,678,752.82	} 59,068.71
	Wiluna	224.85	1,254.11	8,873,554.94	1,871,846.85	1,873,325.81	10,282.38						
	Black Range	1,667.41	18,521.80	1,728,857.47	953,337.33	973,526.54	22,495.56						
Murchison	Cue	5,087.41	9,096.19	6,805,682.09	1,398,497.17	1,412,680.77	273,884.64	} 25,407.26	} 59,035.61	} 13,119,553.43	} 5,018,778.56	} 5,103,221.43	} 458,168.78
	Meekeatharra	14,517.68	18,164.04	2,285,052.41	1,303,732.92	1,336,414.64	5,119.88						
	Day Dawn	3,236.21	11,341.63	2,034,782.38	1,375,285.34	1,389,863.18	169,431.97						
	Mt. Magnet	2,565.96	20,433.75	1,994,036.55	941,263.13	964,262.84	9,732.29	1,787.26	3,223.19	441,403.83	263,534.74	268,545.19	1,502.56
Yalgoo	.....	.....	.....	.....	.....	.....	.....	} 11,473.68	} 35,084.03	} 10,383,891.54	} 4,706,343.29	} 4,752,901.00	} 240,248.13
Mt. Margaret	Mt. Morgans	3,486.54	9,372.15	1,213,987.71	716,735.49	729,594.18	5,812.32						
	Mt. Malcolm	3,916.44	16,357.53	6,652,480.19	2,818,521.29	2,838,795.26	168,428.89						
	Mt. Margaret	4,070.70	9,354.35	2,517,423.64	1,171,086.51	1,184,511.56	66,006.92	4,817.49	19,338.45	3,324,962.20	2,376,771.30	2,400,927.24	61,501.53
North Coolgardie	Menzies	1,659.39	6,941.48	1,606,879.55	1,264,468.86	1,273,069.73	31,272.59	} 4,817.49	} 19,338.45	} 3,324,962.20	} 2,376,771.30	} 2,400,927.24	} 61,501.53
	Ularring	129.52	6,758.08	512,927.10	428,057.23	434,944.83	21,928.23						
	Niagara	1,716.67	1,821.77	932,251.02	523,996.60	527,535.04	5,686.25						
	Yerrilla	1,311.91	3,817.12	272,904.53	160,248.61	165,377.64	2,614.46	21,966.11	27,434.64	1,330,641.09	729,288.41	778,689.16	5,296.65
Broad Arrow	.....	.....	.....	.....	.....	.....	.....	} 119,356.14	} 21,817.43	} 1,018,667.08	} 644,729.81	} 785,903.38	} 3,052.44
N.E. Coolgardie	Kanowna	106,521.69	13,518.52	1,005,224.76	626,016.48	746,056.69	3,039.73						
	Kurnalpi	12,834.45	8,298.91	13,442.32	18,713.33	39,846.69	12.71	61,022.02	56,982.13	67,715,778.28	31,481,690.29	31,599,694.44	4,656,795.33
East Coolgardie	East Coolgardie	33,616.80	40,949.24	67,530,800.23	31,349,868.51	31,424,434.55	4,656,782.41	} 18,458.67	} 22,446.26	} 3,107,934.85	} 1,671,575.29	} 1,712,480.22	} 37,357.35
	Bulong	27,405.22	16,032.89	184,978.05	131,821.78	175,259.89	12.92						
Coolgardie	Coolgardie	16,943.93	16,811.33	2,745,668.90	1,419,076.06	1,452,831.32	36,605.96	2,193.56	5,326.03	5,130,442.95	1,895,160.54	1,902,680.13	92,573.10
	Kunanalling	1,514.74	5,634.93	362,265.95	252,499.23	259,648.90	751.39	2,250.77	16,280.00	4,203,052.62	1,824,088.63	1,842,619.40	1,093,214.54
Yilgarn	.....	.....	.....	.....	.....	.....	.....	607.11	821.02	130,485.53	104,030.68	105,458.81	16,026.60
Dundas	.....	.....	.....	.....	.....	.....	.....	1,425.95	1,037.61	4,340.33	11,576.14	14,039.70	33,643.91
Phillips River	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Outside Proclaimed Goldfields	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTAL	.....	.....	.....	.....	.....	.....	.....	333,723.47	307,135.16	123,803,931.07	55,190,953.03	55,831,811.66	6,841,276.83

TABLE IV.

Total output of Gold (Bullion and Concentrates entered for Export and Gold received at the Royal Mint, Perth), from 1st January, 1886, to 31st December, 1955; showing in Fine Ounces the quantity credited to the respective Goldfields.

Year.	Export.	Mint.	Total.	Export.	Mint.	Total.
		Kimberley.			Pilbara.	
	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.
Prior to 1952	22,422.06	16,088.94	38,511.00	159,996.27	370,343.03	530,339.30
1952	.....	327.57	327.57	6,790.64	8,291.93	15,082.57
1953	.....	186.46	186.46	4,105.56	4,694.22	8,799.78
1954	.....	71.98	71.98	1,562.98	1,831.48	3,394.46
1955	.....	178.81	178.81	2,335.70	1,937.80	4,273.50
Total	22,422.06	16,853.76	39,275.82	174,791.15	387,098.46	561,889.61
		(a) West Pilbara.			Ashburton.	
Prior to 1952	4,351.11	26,882.45	31,233.56	4,104.96	6,253.46	10,358.42
1952	.....	13.96	13.96	.....	.....	.....
1953	.....	.....	.....	.....	68.85	68.85
1954	.....	9.73	9.73	.....	29.31	29.31
1955	.....	2.29	2.29	.....	13.60	13.60
Total	4,351.11	28,908.43	31,259.54	4,104.96	6,365.22	10,470.18
		(b) Gascoyne.			(c) Peak Hill.	
Prior to 1952	304.55	1,068.17	1,372.72	41,102.76	207,150.63	248,253.39
1952	.....	.....	.....	.....	5,296.37	5,296.37
1953	.....	.....	.....	.....	8,465.73	8,465.73
1954	.....	21.40	21.40	.....	8,104.51	8,104.51
1955	.....	.....	.....	.....	103.50	103.50
Total	304.55	1,089.57	1,394.12	41,102.76	229,120.74	270,223.50
		East Murchison.			Murchison.	
Prior to 1952	259,190.83	3,022,012.07	3,281,202.90	1,576,335.92	3,400,194.82	4,976,530.74
1952	84.50	1,160.39	1,244.89	572.80	83,400.62	83,973.42
1953	83.33	1,162.39	1,245.72	304.86	98,202.21	98,507.07
1954	33.70	200.54	234.24	36.59	121,085.74	121,122.33
1955	63.89	46.68	110.57	93.85	81,903.93	81,997.78
Total	259,456.25	3,024,582.07	3,284,038.32	1,577,344.02	3,784,787.32	5,362,131.34
		(d) Yalgoo.			(e) Mt. Margaret.	
Prior to 1952	13,650.56	196,436.04	210,086.60	694,543.11	3,790,805.47	4,485,348.58
1952	.....	505.95	505.95	101.76	24,620.40	24,722.16
1953	.....	283.12	283.12	.....	25,725.48	25,725.48
1954	.....	8.72	8.72	197.66	24,169.56	24,367.22
1955	.....	1.68	1.68	112.70	26,285.21	26,397.91
Total	13,650.56	197,235.51	210,886.07	694,955.23	3,891,606.12	4,586,561.35
		(f) North Coolgardie.			(g) Broad Arrow.	
Prior to 1952	263,439.24	2,022,806.83	2,287,246.07	122,626.97	436,563.13	559,190.10
1952	50.26	18,510.84	18,561.10	166.14	3,451.59	3,617.73
1953	22.27	18,816.46	18,838.73	6.43	1,734.52	1,740.95
1954	23.84	19,767.03	19,790.87	40.96	2,343.13	2,384.09
1955	117.56	19,410.57	19,528.13	75.50	1,559.24	1,634.74
Total	263,653.17	2,100,311.73	2,363,964.90	122,916.00	446,651.61	568,567.61
		(f) North-East Coolgardie.			(f) East Coolgardie.	
Prior to 1952	235,893.69	458,893.28	694,786.97	7,030,193.63	24,245,907.41	31,276,101.04
1952	.....	453.56	453.56	1,577.43	455,615.32	457,192.75
1953	.....	120.57	120.57	777.13	493,055.30	493,832.43
1954	.....	146.35	146.35	1,108.51	494,893.95	496,002.46
1955	.....	108.96	108.96	1,248.39	512,527.52	513,775.91
Total	235,893.69	459,722.72	695,616.41	7,034,905.09	26,201,999.50	33,236,904.59
		(h) Coolgardie.			Yilgarn.	
Prior to 1952	663,300.14	1,263,470.12	1,926,770.26	220,317.04	1,545,150.98	1,765,468.02
1952	177.31	42,139.84	42,317.15	87.78	7,732.55	7,820.33
1953	49.20	40,262.26	40,311.46	47.52	57,387.44	57,434.96
1954	16.70	35,769.72	35,786.42	68.14	59,334.09	59,402.23
1955	17.11	35,091.85	35,108.96	26.81	70,003.36	70,030.17
Total	663,560.46	1,416,733.79	2,080,294.25	220,547.29	1,739,608.42	1,960,155.71
		(i) Dundas.			(j) Phillips River.	
Prior to 1952	170,787.39	1,429,146.70	1,599,934.09	40,650.82	62,811.42	103,462.24
1952	.....	68,103.96	68,103.96	.....	222.45	222.45
1953	.....	66,780.03	66,780.03	.....	898.98	898.98
1954	.....	78,668.52	78,668.52	.....	437.74	437.74
1955	.....	88,031.33	88,031.33	.....	3.06	3.06
Total	170,787.39	1,730,730.54	1,901,517.93	40,650.82	64,373.65	105,024.47
		¶ Donnybrook.			Outside Proclaimed Goldfields.	
Prior to 1952	282.21	557.53	839.74	22,769.12	40,416.54	63,185.66
1952	.....	.....	.....	.....	519.14	519.14
1953	.....	.....	.....	.....	671.63	671.63
1954	.....	.....	.....	.....	557.59	557.59
1955	.....	.....	.....	.....	704.33	704.33
Total	282.21	557.53	839.74	22,769.12	42,869.23	65,638.35

(a) Prior to 1st May, 1898, included with Pilbara, and from 12th July, 1929, to 16th September, 1949, included in Outside Proclaimed Goldfields.
 (b) Prior to March, 1899, included with Ashburton. (c) From 1st August, 1897. (d) Prior to 1st April, 1897, included with Murchison.
 (e) From 1st August, 1897. (f) Prior to 1st May, 1896, included with Coolgardie. (g) From 1st September, 1897. (h) Declared 5th April, 1894, to which date included with Yilgarn. (i) Prior to 1893, included with Yilgarn. (j) Prior to 1902, included in Outside Proclaimed Goldfields.
 ¶ Abolished 4th March, 1908.

TABLE V.

Total Output of Gold Bullion, Concentrates, etc., entered for Export and Received at the Perth Branch of the Royal Mint from 1st January, 1886.

Year.	Export.	Mint.	Total.	Estimated Value.
	Fine ozs.	Fine ozs.	Fine ozs.	£A.
1886	270.17	....	270.17	1,147
1887	4,359.37	....	4,359.37	18,518
1888	3,124.82	....	3,124.82	13,273
1889	13,859.52	....	13,859.52	58,871
1890	20,402.42	....	20,402.42	86,664
1891	27,116.14	....	27,116.14	115,182
1892	53,271.65	....	53,271.65	226,284
1893	99,202.50	....	99,202.50	421,385
1894	185,298.73	....	185,298.73	787,099
1895	207,110.20	....	207,110.20	879,749
1896	251,618.69	....	251,618.69	1,068,808
1897	603,846.44	....	603,846.44	2,564,977
1898	939,489.49	....	939,489.49	3,990,697
1899	1,283,360.25	187,244.41	1,470,604.66	6,246,732
1900	894,387.27	519,923.59	1,414,310.86	6,007,610
1901	923,698.96	779,729.56	1,703,416.52	7,235,654
1902	707,039.75	1,163,997.60	1,871,037.35	7,947,661
1903	833,685.78	1,231,115.62	2,064,801.40	8,770,719
1904	810,616.04	1,172,614.03	1,983,230.07	8,424,226
1905	655,089.88	1,300,226.00	1,955,315.88	8,305,654
1906	562,250.59	1,232,296.01	1,794,546.60	7,622,749
1907	431,803.14	1,265,750.45	1,697,553.59	7,210,750
1908	356,353.96	1,291,557.17	1,647,911.13	6,999,881
1909	386,370.58	1,208,898.83	1,595,269.41	6,776,274
1910	233,970.34	1,236,661.68	1,470,632.02	6,246,848
1911	160,422.28	1,210,445.24	1,370,867.52	5,823,075
1912	83,577.12	1,199,080.87	1,282,657.99	5,448,385
1913	86,255.13	1,227,788.15	1,314,043.28	5,581,701
1914	51,454.65	1,181,522.17	1,232,976.82	5,237,352
1915	17,340.47	1,192,771.23	1,210,111.70	5,140,228
1916	26,742.17	1,034,655.87	1,061,398.04	4,508,532
1917	9,022.49	961,294.67	970,317.16	4,121,646
1918	15,644.12	860,867.03	876,511.15	3,723,183
1919	6,445.89	727,619.90	734,065.79	3,618,509
1920	5,261.13	612,581.00	617,842.13	3,598,931
1921	7,170.74	546,559.92	553,730.66	2,942,526
1922	5,320.16	532,926.12	538,246.28	2,525,812
1923	5,933.82	498,577.59	504,511.41	2,232,186
1924	2,585.20	482,449.78	485,034.98	2,255,927
1925	3,910.59	437,341.56	441,252.15	1,874,320
1926	3,188.22	434,154.98	437,343.20	1,857,715
1927	3,359.10	404,993.41	408,352.51	1,734,572
1928	3,339.30	390,069.19	393,408.49	1,671,093
1929	3,037.12	374,138.96	377,176.08	1,602,142
1930	1,753.09	415,765.00	417,518.09	1,864,442
1931	1,726.66	508,845.36	510,572.02	2,998,137
1932	3,887.07	601,674.33	605,561.40	4,403,642
1933	2,446.97	634,760.40	637,207.37	4,886,254
1934	3,520.40	647,817.95	661,338.35	5,558,873
1935	9,868.71	639,180.38	649,049.09	5,702,149
1936	55,024.58	791,183.21	846,207.79	7,373,539
1937	71,646.91	928,999.84	1,000,646.75	8,743,755
1938	113,620.06	1,054,171.13	1,167,791.19	10,363,023
1939	98,739.88	1,115,497.76	1,214,237.64	11,842,964
1940	71,680.47	1,119,801.08	1,191,481.55	12,696,503
1941	65,925.94	1,043,391.96	1,109,317.90	11,851,445
1942	15,676.48	832,503.97	848,180.45	8,865,495
1943	6,408.34	540,057.08	546,475.42	5,710,669
1944	1,824.99	464,439.76	466,264.75	4,899,997
1945	5,029.38	463,521.34	468,550.72	5,010,541
1946	6,090.14	610,873.52	616,963.66	6,640,069
1947	5,220.09	698,666.29	703,886.38	7,575,574
1948	4,653.72	660,332.07	664,985.79	7,156,909
1949	4,173.14	644,252.48	648,425.62	7,962,808
1950	4,161.53	606,171.88	610,333.41	9,466,270
1951	5,589.45	622,189.64	627,779.09	9,725,343
1952	9,608.62	720,366.44	729,975.06	11,847,917
1953	5,396.30	818,515.65	823,911.95	13,299,092
1954	3,089.08	847,451.09	850,540.17	13,313,618
1955	4,091.55	837,913.72	842,005.23	13,175,559
Total	11,568,447.93	45,768,205.92	57,336,653.76	376,459,834

	1954.	1955.
	£A.	£A.
Estimated total par value of above production	239,973,948	243,550,338
Overseas Gold Sales Premium distributed by Gold Producers Association, 1920-1924	2,589,602	2,589,602
Overseas Gold Sales Premium distributed by Gold Producers Association from 1952	1,138,527	1,157,757
Exchange Premium paid by Mint above par value, 1930-1955 (approximate)	119,582,198	129,162,137
Estimated Total	£A363,284,275	£A376,459,834
Bonus paid by Commonwealth Government under Commonwealth Bounty Act, 1930	161,448	161,448
Subsidy paid by Commonwealth Government under Gold Mining Industry Assistance Act, 1954	....	199,130
Gross estimated value of gold won	£A363,445,723	£A376,820,412

TABLE VI.—MINERALS OTHER THAN GOLD

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 1955, and previous years.

Period.	Abrasive Silica Stone.		Alunite (Crude Potash).		Arsenic.*		Antimony.†		
	Murchison Goldfield. (Mt. Magnet District.)		Yilgarn Goldfield.		East Murchison Goldfield. (Wiluna District.)		East Murchison Goldfield.		
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Conc.	Metal.	Value.
Prior to 1952	tons.	£	tons.	£	tons.	£	tons.	tons.	£
1952	1.50	9	9,073.05	215,865	138,674.08	747,205	7,883.66	3,870.93	157,298
1953	.....	.....	.....	.....	.....	.....	.....	.....	.....
1954	.....	.....	.....	.....	.....	.....	.....	.....	.....
1955	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	1.50	9	9,073.05	215,865	38,674.08	747,205	7,883.66	3,870.93	157,298

* By-product by Wiluna G.Ms., Ltd. † By-product of Gold Mining. ‡ Includes 1.13 tons Arsenic valued at £24 from Yilgarn Goldfield.

Period	Antimony.*						Asbestos.	
	Pilbara Goldfield.			Total.			Ashburton Goldfield.	
	Conc.	Metal.	Value.	Conc.	Metal.	Value.	Quantity.	Value.
Prior to 1952	tons.	tons.	£	tons.	tons.	£	tons.	£
1952	969.03	396.36	28,507	†8,878.92	4,280.85	186,405	10.10	959
1953	264.58	129.69	43,397	264.58	129.69	43,397	.....	.....
1954	358.43	164.23	10,313	358.43	164.23	10,313	.....	.....
1955	45.44	23.49	1,410	45.44	23.49	1,410	.....	.....
1955	203.88	59.11	230	203.88	59.11	230	.....	.....
Total	1,841.36	772.88	83,857	9,741.25	4,657.37	241,755	10.10	959

* By-product of Gold Mining. † Includes 26.23 tons Conc. containing 13.56 tons metal valued at £600 from West Pilbara.

Period.	Asbestos—continued.							
	Pilbara Goldfield.		West Pilbara Goldfield.		Outside Proclaimed Goldfield.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Prior to 1952	tons.	£	tons.	£	tons.	£	tons.	£
1952	1,336.91	57,874	9,896.02	707,558	501.10	6,732	11,752.38	773,165
1953	192.72	3,084	3,399.72	592,082	.....	.....	3,592.44	595,116
1954	341.69	7,087	4,059.29	700,277	.....	.....	4,400.98	707,364
1955	124.79	2,620	3,972.53	553,056	.....	.....	4,097.32	555,676
1955	16.45	346	4,602.55	501,683	.....	.....	4,619.00	502,028
Total	2,012.56	71,011	67,330.11	3,054,611	501.10	6,732	28,462.12	3,133,359

Period.	Barytes.							
	Murchison Goldfield.		North-East Coolgardie Goldfield.		Outside Proclaimed Goldfield.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Prior to 1952	tons.	£	tons.	£	tons.	£	tons.	£
1952	.....	.....	10.00	50	21.00	74	31.00	124
1953	9.00	50	.....	.....	.....	.....	9.00	50
1954	.....	.....	42.22	380	169.65	1,410	211.87	1,790
1955	111.74	615	.....	.....	932.00	7,016	1,043.74	7,631
1955	.....	.....	.....	.....	10.00	70	10.00	70
Total	120.74	665	52.22	430	1,132.65	8,570	1,305.61	9,665

Period.	Bentonite		Beryl Ore.					
	Outside Proclaimed Goldfield.		Pilbara Goldfield.		Ashburton Goldfield.		Gascoyne Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Prior to 1952	tons.	£	tons.	£	tons.	£	tons.	£
1952	1,835.13	5,088	918.39	34,540	.....	.....	114.96	5,552
1953	586.00	2,036	69.69	11,541	.....	.....	1.57	284
1954	217.70	741	104.49	18,649	.....	.....	2.07	402
1955	1,121.60	4,111	105.60	18,070	0.14	25	11.78	2,092
1955	696.94	2,591	173.14	29,712	.....	.....	11.08	1,995
Total	4,457.37	14,567	1,371.31	112,512	0.14	25	141.46	10,325

Table VI.—Minerals other than Gold—continued.

Period.	Beryl Ore—continued.						Bismuth.	
	Yalgoo Goldfield.		Coolgardie Goldfield.		Total.		Outside Proclaimed Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Prior to 1952	tons.	£	tons.	£	tons.	£	lb.	£
1952	....	....	97·61	5,035	1,168·99	46,444	5,634·31	1,884
1953	....	....	14·03	2,737	85·29	14,562	....	....
1954	8·00	1,390	10·06	1,782	124·62	22,223	....	....
1955	3·48	547	11·15	1,873	132·15	22,607	....	....
1955	2·33	439	11·47	2,185	198·63	34,430	....	....
Total	13·81	2,376	144·32	13,612	*1,709·68	140,266	5,634·31	1,884

* Includes 3·50 tons valued at £297 from West Kimberley Goldfield, 25·14 tons valued at £1,027 from Murchison Goldfield and 10·00 tons valued at £92 from Outside Proclaimed Goldfield.

Period.	Calcite.		Chromite.		Clays (Cement, Fire and White Clays).			
	Mt. Margaret Goldfield.		Peak Hill Goldfield.		Murchison Goldfield.		Outside Proclaimed Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Prior to 1952	tons.	£	tons.	£	tons.	£	tons.	£
1952	5·00	25	773·00	11,100	41·75	207	90,866·23	57,707
1953	....	....	1,968·00	29,717	....	....	25,924·10	19,280
1954	....	....	4,269·55	48,957	....	....	22,915·85	15,881
1955	....	....	....	....	....	....	22,659·00	28,681
1955	....	....	....	....	....	....	41,912·32	32,693
Total	5·00	25	7,010·55	89,774	41·75	207	204,277·50	154,342

Period.	Clays (Cement, etc.)—continued.		Coal.		Copper Ore.			
	Total.		Collie Coalfield.		Pilbara Goldfield.		West Pilbara Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Prior to 1952	tons.	£	tons.	£	tons.	£	tons.	£
1952	*01,917·03	58,545	22264386·76	18,793,882	60·17	943	82,745·45	748,482
1953	25,965·85	19,487	890,461·20	2,457,296	15·51	1,004	....	....
1954	22,915·85	15,881	886,182·20	3,073,073	32·93	2,424	13·32	674
1954	22,659·00	28,681	1,018,342·53	3,588,818	....	....	....	....
1955	41,912·32	32,693	903,792·22	3,132,074	0·53	134	....	....
Total	205,370·05	155,287	25903164·91	31,045,143	109·14	4,595	82,758·77	749,156

* Includes 1,050·80 tons valued at £738 from Collie Mineral Field.

Period.	Copper Ore—continued.							
	Ashburton Goldfield.		Mt. Margaret Goldfield.		Phillips River Goldfield.		Outside Proclaimed Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Prior to 1952	tons.	£	tons.	£	tons.	£	tons.	£
1952	378·07	6,937	47,861·82	231,003	95,924·47	589,373	176·66	1,945
1953	....	....	....	....	....	....	....	....
1954	....	....	....	....	....	....	4·04	101
1955	....	....	....	....	....	....	....	....
Total	378·07	6,937	47,861·82	231,003	95,924·47	589,467	180·70	2,046

* Value of Copper separated from 1·31 tons Copper precipitates.

Period.	Copper Ore—continued.		Corundum.		Cupreous Ore (Fertiliser).			
	Total.		East Murchison Goldfield.		West Pilbara Goldfield.		Pilbara Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Prior to 1952	tons.	£	tons.	£	tons.	£	tons.	£
1952	†253,643·87	1,748,790	....	....	1,853·59	18,475	....	....
1953	15·51	1,188	54·00	380	1,001·90	7,571	....	....
1954	50·29	3,199	....	....	672·22	6,851	....	....
1954	....	....	....	....	3,080·16	17,228	310·58	9,200
1955	12·12	1,001	9·15	275	3,327·36	23,981	857·17	23,868
Total	†253,721·79	1,754,178	63·15	655	9,934·23	74,106	1,167·75	33,068

† Including 109·52 tons valued at £1,709 from West Kimberley Goldfield; 234·31 tons valued at £5,052 from East Murchison Goldfield; 82·35 tons valued at £311 from Yalgoo Goldfield; 6·12 tons valued at £51 from North Coolgardie Goldfield; 50·67 tons valued at £379 from East Coolgardie Goldfield; 16·00 tons valued at £77 from Yilgarn Goldfield; 1,051·54 tons valued at £33,130 from Peak Hill Goldfield; 24,026·25 tons valued at £119,497 from Northampton Mineral Field and 1,053·61 tons valued at £12,157 from Murchison Goldfield.

Table VI.—Minerals other than Gold—continued.

Period.	Cupreous Ore (Fertiliser)—continued.							
	Ashburton Goldfield.		Peak Hill Goldfield.		East Murchison Goldfield.		Murchison Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Prior to 1952	tons. 39.66	£ 494	tons. 1,404.55	£ 12,168	tons. 268.93	£ 3,079	tons.	£
1952	1.75	31	220.04	7,080	340.05	5,496	.....	.....
1953	9.79	114	163.30	1,140	892.10	10,043	25.54	461
1954	0.75	7	328.57	5,915	553.04	12,671	286.15	2,653
1955	13.95	141	1,797.85	30,059	695.58	14,084	796.39	7,372
Total	65.90	787	3,923.31	56,362	2,749.70	44,373	1,108.08	15,486

Period.	Cupreous Ore (Fertiliser)—continued.							
	Yalgoo Goldfield.		Mt. Margaret Goldfield.		Broad Arrow Goldfield.		East Coolgardie Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Prior to 1952	tons. 47.00	£ 288	tons. 21.76	£ 189	tons.	£	tons.	£
1952	.....	.....	6.85	95	.....	.....	.....	.....
1953	.....	.....	9.50	73	22.00	368	29.00	100
1954	.....	.....	72.86	660	.....	.....	.....	.....
1955	10.29	102	133.00	599	7.05	.....	.....	.....
Total	57.29	390	243.97	1,616	29.05	368	29.00	100

Period.	Cupreous Ore (Fertiliser)—continued.							
	Dundas Goldfield.		Phillips River Goldfield.		Outside Proclaimed Goldfield.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Prior to 1952	tons.	£	tons. 82.67	£ 1,241	tons.	£	tons. 3,736.53	£ 36,067
1952	.....	.....	64.00	1,322	.....	.....	1,643.59	21,595
1953	12.69	117	72.00	1,406	39.94	331	1,948.08	21,004
1954	.....	.....	116.00	2,047	.....	.....	4,748.11	50,381
1955	.....	.....	52.50	1,146	17.85	193	7,730.78	101,731
Total	12.69	117	867.17	7,162	57.79	524	*19,807.09	230,778

* Includes 38.37 tons valued at £133 from Yilgarn Goldfield; and 21.79 tons valued at £186 from Northampton Mineral Field.

Period.	Diamonds.		Diatomaceous Earth.		Dolomite.		Emerald.	
	Pilbara Goldfield.		Outside Proclaimed Goldfield.		Murchison Goldfield.		Murchison Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Prior to 1952	Carats.	£ 24	tons. 828.00	£ 4,510	tons. 1,019.65	£ 4,723	Carats (cut and rough). 18,373.00	£ 1,809
1952	555.25	2,432	.....	.....
1953
1954	150.00	1,579	.....	.....	.....	.....
1955	81.00	324	.....	.....
Total	24	978.00	6,089	1,655.90	7,470	18,373.00	1,809

Period.	Emerald—continued.				Emery.		Felspar.	
	Pilbara Goldfield.		Total.		West Kimberley Goldfield.		Coolgardie Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Prior to 1952	Carats (cut and rough).	£	Carats (cut and rough). 18,373.00	£ 1,609	tons. 13.00	£ 130	tons. 41,811.80	£ 111,852
1952	.....	.....	.....	.....	.....	.....	2,503.50	10,452
1953	.....	.....	.....	.....	.....	.....	2,079.50	8,682
1954	8.68	313	8.68	313	.....	.....	3,173.00	14,293
1955	.....	.....	.....	.....	8.15	245	3,565.00	16,660
Total	8.68	313	18,381.68	1,922	21.15	375	53,132.80	161,939

Table VI.—Minerals other than Gold—continued.

Period.	Felspar—continued.				Fergusonite.		Fuller's Earth.	
	Outside Proclaimed Goldfield.		Total.		Pilbara Goldfield.		Outside Proclaimed Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Prior to 1952	tons. 528·00	£ 1,050	tons. 42,339·80	£ 112,902	tons.	£	tons. *30·00	£ 86
1952	.....	.....	2,503·50	10,452	0·17	165	25·00	125
1953	47·50	178	2,127·00	8,860	.....	.....	15·75	79
1954	52·91	198	3,225·91	14,491	.....	.....	.....	.....
1955	.....	.....	3,565·00	16,660	0·13	226	10·76	54
Total	628·41	1,426	53,761·21	163,365	0·30	391	81·51	344

* From Broad Arrow Goldfield.

Period.	Gadolinite.		Glass Sand.		Glauconite.		Graphite.	
	Pilbara Goldfield.		Outside Proclaimed Goldfield.		Outside Proclaimed Goldfield.		Outside Proclaimed Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Prior to 1952	tons. 1·00	£ 112	tons. 14,188·34	£ 11,271	tons. 4,398·50	£ 89,675	tons. 18·10	£ 97
1952	.....	.....	7,669·12	5,629	230·00	7,305	.....	.....
1953	.....	.....	6,905·74	4,690	319·50	11,182	20·00	180
1954	.....	.....	7,803·01	5,541	257·50	9,012	.....	.....
1955	.....	.....	6,753·98	4,801	190·50	7,407	110·00	990
Total	1·00	112	43,325·19	31,932	5,802·00	124,581	148·10	1,267

Period.	Gypsum.							
	Yilgarn Goldfield.		Dundas Goldfield.		Outside Proclaimed Goldfield.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Prior to 1952	tons. 140,433·50	£ 116,991	tons. 2,006·00	£ 1,257	tons. 181,019·85	£ 202,700	tons. 323,459·35	£ 320,948
1952	34,054·00	21,692	21·00	53	16,256·56	11,512	50,331·56	33,257
1953	25,216·00	19,041	12·00	6	15,019·11	11,131	40,247·11	30,178
1954	24,347·00	18,290	30·00	15	16,765·00	13,315	41,142·00	31,620
1955	38,807·00	29,411	9·00	4	1,130·00	920	39,946·00	30,335
Total	262,857·50	205,425	2,078·00	1,335	230,190·52	239,578	495,126·02	446,338

Period.	Ilmenite Sand.		Iron Ore (for Pig Iron).					
	Outside Proclaimed Goldfield.		Yilgarn Goldfield.		Outside Proclaimed Goldfield.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Prior to 1952	tons. 155·95	£ 776	tons. 16,783·41	£ 159,265	tons. 95,044·77	£ 234,062	tons. 111,328·18	£ 393,327
1952	.....	.....	12,994·90	179,405	4,708·55	47,439	17,703·45	226,844
1953	.....	.....	13,175·88	185,670	3,675·89	35,336	16,851·77	221,000
1954	.....	.....	16,664·99	195,997	1,633·30	13,030	18,298·29	209,027
1955	.....	.....	16,876·82	216,772	426·06	3,786	17,302·88	220,558
Total	155·95	776	76,496·00	937,109	105,488·57	333,653	181,984·57	1,270,762

* Includes 450 tons valued at £247 from East Coolgardie and 100 tons valued at £300 from West Pilbara Goldfield.

Period.	Iron Ore (exported.)		Jarosite.		Kyanite.		Lead Ore and Concentrates.	
	West Kimberley Goldfield.		Phillips River Goldfield.		Outside Proclaimed Goldfield.		Northampton Mineral Field.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Prior to 1952	tons. 10,384·00	£ 10,297	tons. 9·54	£ 37	tons. 4,215·69	£ 21,781	tons. 423,744·34	£ 1,690,549
1952	204,945·00	203,238	.....	.....	.....	.....	5,699·39	783,186
1953	687,895·00	682,162	.....	.....	.....	.....	4,776·11	284,524
1954	634,514·00	629,325	.....	.....	.....	.....	1,338·94	70,370
1955	496,882·00	492,741	.....	.....	.....	.....	1,069·04	68,529
Total	2,034,620·00	2,017,761	9·54	37	4,215·69	21,781	436,627·82	2,897,158

Table VI.—Minerals other than Gold—continued.

Period.	Magnesite.							
	East Coolgardie Goldfield.		Coolgardie Goldfield.		Outside Proclaimed Goldfield.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Prior to 1952	tons. 1,052·96	£ 2,413	tons. 1,163·65	£ 3,135	tons. 4,269·82	£ 9,718	tons. 6,886·43	£ 15,266
1952	.....	.....	1,054·67	2,343	.....	.....	1,054·67	2,843
1953	.....	.....	19·60	73	.....	.....	19·60	73
1954	.....	.....	91·75	258	.....	.....	91·75	258
1955	.....	.....	.....	.....	.....	.....	.....	.....
Total	1,452·96	2,413	2,329·67	6,309	4,269·82	9,718	8,052·45	18,440

Period.	Manganese.						Mica.	
	Pilbara Goldfield.		Peak Hill Goldfield.		Total.		Outside Proclaimed Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Prior to 1952	tons.	£	tons. 28,315·21	£ 166,123	tons. *28,359·06	£ 166,415	lb. †32,930·00	£ 3,984
1952	.....	.....	5,044·80	35,634	5,044·80	35,634	.....	.....
1953	.....	.....	16,324·00	150,991	16,324·00	150,991	.....	.....
1954	8,982·00	163,473	31,599·00	444,742	40,581·00	608,215	.....	.....
1955	7,594·00	95,146	29,896·66	328,684	37,490·66	423,830	.....	.....
Total	16,576·00	258,619	111,177·67	1,126,174	127,800·52	1,385,085	32,930·00	3,984

* Includes 20 lb. valued at £180 from Mt. Margaret Goldfield and 24·85 lb. valued at £112 from Outside Proclaimed Goldfield. † Includes 7,868 lb. crude Mica. Also includes 31·25 lb. Mica valued at £5 from West Kimberley Goldfield.

Period.	Ochre.							
	Kimberley Goldfield.		West Pilbara Goldfield.		Murchison Goldfield.		East Coolgardie Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Prior to 1952	tons.	£	tons. 3,758·85	£ 47,014	tons. 2,700·27	£ 27,068	tons. 45·35	£ 163
1952	.....	.....	.....	.....	298·55	3,252	.....	.....
1953	20·61	330	.....	.....	268·06	2,412	20·50	145
1954	.....	.....	.....	.....	429·45	4,109	.....	.....
1955	.....	.....	41·60	917	303·59	2,996	.....	.....
Total	20·61	330	3,790·45	47,931	3,995·92	39,837	65·85	303

Period.	Ochre—continued.		Petalite.		Phosphatic Guano.		Pyrites.	
	Total.		Coolgardie Goldfield.		Outside Proclaimed Goldfield.		Dundas Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Prior to 1952	tons. *6,563·97	£ 74,517	tons. 5·19	£ 52	tons. 10,799·73	£ 59,174	tons. †374,960·56	£ 1,281,007
1952	296·55	3,252	.....	.....	.....	.....	53,577·00	422,029
1953	307·17	2,887	.....	.....	.....	.....	59,248·00	489,985
1954	429·45	4,109	15·00	69	.....	.....	56,150·00	441,466
1955	345·19	3,913	.....	.....	.....	.....	49,485·00	.....
Total	7,942·33	88,678	20·19	121	10,799·73	59,174	593,420·56	3,031,756

* Includes 2·10 tons valued at £15 ton from Pilbara Goldfield, 11 tons valued at £66 from Yalgoo Goldfield, 10·40 tons valued at £83 from North-East Coolgardie Goldfield and 36 tons valued at £108 from Outside Proclaimed Goldfield. † Includes 74,047·56 tons valued at £45,496 from Mt. Margaret Goldfield.

Period.	Sillimanite.		Silver Lead Ore and Concentrates.					
	Outside Proclaimed Goldfield.		Kimberley Goldfield.		Pilbara Goldfield.		West Pilbara Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Prior to 1952	tons. 2·00	£ 13	tons. 6·53	£ 357	tons. 1,193·91	£ 62,938	tons. 144·34	£ 4,408
1952	.....	.....	2·73	291	420·30	36,827	30·79	3,176
1953	.....	.....	.....	.....	393·77	20,975	3·29	28
1954	.....	.....	.....	.....	155·27	7,679	.....	.....
1955	.....	.....	.....	.....	330·60	24,887	.....	.....
Total	2·00	13	9·26	648	2,493·85	153,206	178·42	7,612

Table VI.—Minerals other than Gold—continued.

Period.	Silver Lead Ore and Concentrates.				Silver Lead Zinc Ore and Concentrates.			
	Ashburton Goldfield.		Total.		West Kimberley Goldfield.		Pilbara Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Prior to 1952	tons.	£	tons.	£	tons.	£	tons.	£
1952	4,814.24	164,102	6,164.52	231,000	803.70	17,827	...	...
1953	979.20	96,977	1,433.02	137,271	316.57	14,743	...	...
1954	713.28	40,195	1,110.34	61,198	444.61	7,118	94.42	5,488
1955	393.50	20,533	548.77	28,212	279.26	2,601	...	...
1955	16.32	992	346.92	25,878	...	...	...	...
Total	6,916.54	322,799	9,603.57	484,649	1,844.14	42,289	94.42	5,488

Period.	Silver Lead Zinc Ore and Concentrates.				Soapstone.			
	Northampton Mineral Field.		Total.		Greenbushes Mineral Field.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Prior to 1952	tons.	£	tons.	£	tons.	£	tons.	£
1952	105.36	3,983	909.06	21,810	517.00	1,778	*565.40	1,928
1953	...	...	316.57	14,743	...	...	...	...
1954	...	...	539.03	12,606	...	...	...	...
1955	...	...	279.26	2,601	...	...	...	...
1955	...	...	...	...	...	...	...	...
Total	105.36	3,983	2,043.92	51,760	517.00	1,778	565.40	1,928

* Including 48.40 tons valued at £150 from Outside Proclaimed Goldfields.

Period.	Spodumene.		Talc.					
	Phillips River Goldfield.		East Coolgardie Goldfield.		Outside Proclaimed Goldfield.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Prior to 1952	tons.	£	tons.	£	tons.	£	tons.	£
1952	...	...	895.66	3,713	978.47	12,296	1,873.11	16,009
1953	...	...	68.25	273	1,155.36	14,410	1,223.61	14,683
1954	...	...	108.70	487	2,119.37	30,445	2,228.07	30,932
1955	...	...	37.00	166	2,883.03	45,685	2,920.03	45,851
1955	3.89	57	26.83	120	2,559.98	37,647	2,586.81	37,767
Total	3.89	57	1,136.44	4,759	9,685.21	140,483	10,831.65	145,242

Period.	Tantalite.						Tantalo Columbite Ore and Concentrates.	
	Pilbara Goldfield.		Greenbushes Mineral Field.		Total.		Greenbushes Mineral Field.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Prior to 1952	tons.	£	tons.	£	tons.	£	tons.	£
1952	265.07	130,672	15.29	10,052	*283.17	143,233	7.63	4,745
1953	...	...	...	...	...	...	3.63	6,056
1954	...	...	...	...	...	...	3.09	7,252
1955	...	...	...	...	...	...	4.84	5,941
1955	...	...	...	...	...	...	2.06	2,747
Total	265.07	130,672	15.29	10,052	283.17	143,233	21.25	26,741

* Includes 2.81 tons valued at £2,509 from Coolgardie Goldfield.

Period.	Tantalo Columbite Ore and Concentrates—continued.							
	Pilbara Goldfield.		Gascoyne Goldfield.		Coolgardie Goldfield.		Phillips River Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Prior to 1952	tons.	£	tons.	£	tons.	£	tons.	£
1952	2.82	915	...	...	...	...	...	...
1953	1.37	1,555	...	...	2.02	2,399	...	...
1954	2.89	8,560	0.80	1,038	1.09	2,960	*0.22	390
1955	46.72	68,997	...	...	0.55	1,507	...	...
1955	10.54	21,208	...	...	0.10	251	0.28	1,556
Total	64.34	101,235	0.80	1,038	3.76	7,117	0.50	1,946

* Microlite.

Table VI.—Minerals other than Gold—continued.

Period.	Tantalum Columbite Ore and Concentrates—continued.		Tin.					
	Total.		Greenbushes Mineral Field.		Kimberley Goldfield.		West Kimberley Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Prior to 1952	tons. 10.45	£ 5,660	tons. 11,435.69	£ 1,043,610	tons. 0.77	£ 260	tons. 0.15	£ 115
1952	7.02	10,010	35.88	23,962	0.06	42	0.15	120
1953	8.09	20,200	41.41	23,311	.....	.....	.....	.....
1954	52.11	76,445	42.85	22,885	.....	.....	.....	.....
1955	12.98	25,762	119.57	61,577	.....	.....	0.13	79
Total	90.65	133,077	11,665.40	1,175,345	0.83	302	0.43	314

Period.	Tin—continued.							
	Pilbara Goldfield.		West Pilbara Goldfield.		East Murchison Goldfield.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Prior to 1952	tons. 6,093.71	£ 615,188	tons. 0.03	£ 18	tons. 0.39	£ 103	tons. *17,536.21	£ 1,659,715
1952	59.85	43,305	1.86	1,287	.....	.....	97.80	68,716
1953	70.97	39,386	0.59	310	0.30	122	113.27	63,129
1954	78.47	40,092	.....	.....	.....	.....	121.32	62,977
1955	60.02	33,256	.....	.....	.....	.....	179.72	94,913
Total	6,363.02	771,227	2.48	1,615	0.69	225	18,048.32	1,949,450

* Includes 4.72 tons valued at £360, 0.15 tons valued at £15, and 0.60 tons valued at £46 from Murchison, Coolgardie and Yilgarn Goldfields, respectively.

Period.	Tungsten (Scheelite).							
	Pilbara Goldfield.		East Murchison Goldfield.		Yalgoo Goldfield.		Mt. Margaret Goldfield.	
	Conc.	Value.	Conc.	Value.	Conc.	Value.	Conc.	Value.
Prior to 1952	tons.	£	tons.	£	tons. 2.99	£ 1,050	tons.	£
1952	.....	.....	0.06	52	.....	.....	1.29	2,255
1953	.....	.....	.....	.....	0.03	43	0.78	842
1954	1.69	1,867	.....	.....	.....	.....	.....	.....
1955	.....	.....	.....	.....	.....	.....	0.83	582
Total	1.69	1,867	0.06	52	3.02	1,093	2.94	3,730

Period.	Tungsten (Scheelite)—continued.							
	North Coolgardie Goldfield.		Coolgardie Goldfield.		Yilgarn Goldfield.		Total.	
	Conc.	Value.	Conc.	Value.	Conc.	Value.	Conc.	Value.
Prior to 1952	tons. 6.45	£ 1,030	tons. 21.43	£ 5,392	tons. 106.74	£ 39,087	tons. *138.89	£ 46,873
1952	.....	.....	0.93	1,384	.....	.....	2.28	3,691
1953	1.31	1,571	0.74	867	0.05	38	2.91	3,361
1954	2.01	1,494	.....	.....	.....	.....	3.70	3,361
1955	5.71	6,009	1.21	826	.....	.....	7.75	7,417
Total	15.48	10,104	24.31	8,479	106.79	39,125	155.53	64,703

* Includes 0.16 tons valued at £59 from Murchison Goldfield, 1.01 tons valued at £175 from Broad Arrow Goldfield and 0.08 tons valued at £19 from Dundas Goldfield.

Period.	Tungsten (Wolfram).							
	Pilbara Goldfield.		Murchison Goldfield.		Yalgoo Goldfield.		Total.	
	Ore and Conc.	Value.	Ore and Conc.	Value.	Ore and Conc.	Value.	Ore and Conc.	Value.
Prior to 1952	tons. 3.69	£ 7,392	tons. 239.85	£ 3,341	tons. 0.72	£ 115	tons. *273.05	£ 11,267
1952	20.92	37,686	5.94	7,538	0.57	795	27.43	46,010
1953	.....	.....	3.00	3,861	0.45	612	3.45	4,473
1954	.....	.....	.....	.....	.....	.....	.....	.....
1955	.....	.....	.....	.....	.....	.....	.....	.....
Total	24.61	45,078	248.82	14,740	1.74	1,522	303.93	61,759

* Includes 28.48 tons valued at £331 from West Kimberley Goldfield and 0.28 tons valued at £88 from Broad Arrow Goldfield.

Table VI.—*Minerals other than Gold—continued.*

Period.	Vermiculite.		Zinc Ore (Fertiliser).		Zinc.†					
	Outside Proclaimed Goldfield.		Pilbara Goldfield.		West Kimberley Goldfield.		Pilbara Goldfield.		Total.	
	Quantity.	Value.	Quantity.	Value.	Metallic Content.	Value.	Metallic Content.	Value.	Metallic Content.	Value.
Prior to 1952	tons.	£	tons.	£	tons.	£	tons.	£	tons.	£
1952	*1,740.92	10,730	10.00	50	...	...	...	...	...	...
1953	62.00	744	...	...	46.01	365	...	...	46.01	365
1954	29.00	348	10.00	50	63.77	1,011	4.38	Nil	68.15	1,011
1955	...	...	...	...	73.85	Nil	...	...	73.85	Nil
1955	...	...	...	...	...	...	...	...	...	...
Total	1,831.92	11,822	20.00	100	183.63	1,376	4.38	Nil	188.01	1,376

* Includes 126.12 tons valued at £872 from East Coolgardie Goldfield and 20 tons valued at £60 from Yilgarn Goldfield.

† By-product from Silver-Lead-Zinc Mining. ‡ Unpayable assayed zinc content of Silver-Lead-Zinc Ore and Concentrate.

TABLE VII.

Quantity and Value of Minerals, other than Gold, reported during year 1955.

Number of Lease, Claim, Or Area.	Goldfield or Mineral Field.	Registered Name of Producer.	Quantity.	Metallic Content.	Value.
ANTIMONY (<i>f</i>) (<i>g</i>) (<i>k</i>).					
G.M.L. 231L, etc.	Pilbara	Blue Spec Mining Co., N.L.	tons. 203·88	tons. 59·11	£A. (<i>b</i>) 230·00
ASBESTOS (Chrysotile).					
Temp. Res. 1305H	Pilbara	Hancock, L. G.	16·45	....	345·90
M.C. 48, etc.	West Pilbara	Hancock, L. G.	258·13	....	15,651·04
		Total	274·58	....	(<i>b</i>)15,996·94
ASBESTOS (Crocidolite).					
M.C. 54, etc.	West Pilbara	Australian Blue Asbestos, Ltd.	4,344·42	....	(<i>b</i>)486,031·90
BARYTES.					
M.C. 487H	O.P.G. (Cran- brook)	Ferrari, A.	10·00	....	(<i>a</i>) 70·00
BENTONITE.					
M.L. 437H	O.P.G. (March- agee)	Noonan, E. J.	581·85	....	2,347·40
M.C. 282H, etc.	O.P.G. (March- agee)	Fennell, W. G.	65·09	....	244·08
		Total	646·94	....	(<i>a</i>) 2,591·48
BERYL.					
Crown Lands	Pilbara	Sundry persons	56·64	BeO Units. 661·24	9,583·25
M.C. 350	do.	Ball, J.	5·76	66·40	978·90
M.C. 393	do.	Ball, W.	2·16	26·00	366·65
M.C. 350, etc.	do.	Johnston, J. A.	24·86	284·72	4,165·55
P.A. 2442	do.	Newlands, C.	0·57	6·92	97·50
M.C. 340	do.	Sherlock and Parker	6·17	71·95	1,014·60
M.C. 304	do.	White, A. L.	18·41	212·29	2,993·20
M.C. 385	do.	Perron Bros.	2·08	26·26	393·95
M.C. 297, etc.	do.	Miller & Trembath	3·64	43·91	657·85
M.C. 313, etc.	do.	Richardson Bros.	43·16	520·88	7,794·20
P.A. 2459	do.	Allen, T.	1·18	14·09	211·40
M.C. 283	do.	Glass and Jacoby	0·98	10·83	162·40
M.C. 354	do.	McGregor, D. M.	2·88	33·94	478·55
P.A. 2447	do.	Engstrom, O.	0·33	3·71	54·85
M.C. 360	do.	Hall, Eades and Crawford	0·83	9·72	145·80
M.C. 305, etc.	do.	North-West Tantalum, N.L.	0·64	7·41	104·50
P.A. 2438	do.	J. Walkerden and Party	2·04	23·03	345·50
M.C. 83L, etc.	do.	Dorrington, Howard and Party	0·84	9·71	145·60
Crown Lands	Gascoyne	Sundry persons	11·08	133·37	1,994·80
Crown Lands	Murchison	Sundry persons	0·61	7·02	99·00
P.A. 2515	Yalgoo	Phillips, D. M.	2·33	29·25	438·60
M.C. 9	Coolgardie	D. J. Evans and Party	11·47	145·63	2,184·95
		Total	198·63	2,348·28	(<i>b</i>) 34,429·70
CLAYS (Cement Clay).					
Freehold Land	O.P.G. (Maida Vale)	D. Rhodes Pty., Ltd.	28,328·00	....	16,352·30
Freehold Land	O.P.G. (Gos- nells)	Cockburn Cement Pty., Ltd.	6,596·32	....	9,093·00
		Total	34,924·32	....	(<i>c</i>) 25,445·30

Table VII.—Minerals other than Gold—continued.
Quantity and Value of Minerals, other than Gold, reported during year 1955.

Number of Lease, Claim, or Area.	Goldfield or Mineral Field.	Registered Name of Producer.	Quantity.	Metallic Content.	Value.
CLAYS (Fireclay).					
Loc. 84	O.P.G. (Glen Forrest)	Darling Range Firebrick Co.	tons. 878·00	tons.	£A. 833·75
M.C. 304H, etc.	O.P.G. (Clackline)	Clackline Refractories, Ltd.	6,034·00	....	6,034·00
Total			6,912·00	....	(c) 6,867·75
CLAYS (White Clay).					
M.C. 247H	O.P.G. (Mt. Kokeby)	Linton, J. B.	76·00	....	(c) 330·00
COAL.					
M.L. 250, etc.	Collie	Amalgamated Collieries	516,548·32	....	1,736,600·69
M.L. 314, etc.	do.	Griffin Coal Mining Co.	233,558·70	....	841,495·40
M.L. 418, etc.	do.	Western Collieries, Ltd.	153,685·20	....	553,977·90
Total			903,792·22	....	3,132,073·99 (e) (h)
CORUNDUM (k).					
M.L. 38	West Kimberley	Clackline Refractories, Ltd.	9·15	....	(h) 275·00
CUPREOUS ORE AND CONCENTRATES (Fertilizer) (f) (g).					
Crown Lands	Pilbara	Stubbs, S. H.	0·53	Copper. 0·30	134·00
M.C. 9N	Murchison	Rinaldi, L. V.	11·59	3·07	866·65
Total			12·12	3·37	(b) 1,000·65
CUPREOUS ORE AND CONCENTRATES (Fertilizer).					
M.C. 103L, etc.	Pilbara	Baker, J. C. & M. C.	100·40	Av. Assay Cu. % 18·95	3,756·93
P.A. 746L	do.	Martin, W. M.	2·80	13·17	70·00
P.A. 750L	do.	Stream & Kelly	31·96	19·13	1,401·65
G.M.L. 314L	do.	Stubbs, S. H.	458·58	14·63	12,514·16
P.A. 733L	do.	Tsakalos, M. E.	14·58	21·68	563·98
M.C. 209	do.	Breens Copper Syndicate	190·60	13·02	4,644·95
P.A. 2492	do.	Doughty, R. G.	1·24	14·20	35·15
P.A. 2474	do.	Bullock, W.	31·46	8·38	386·70
P.A. 2774	do.	Johnson, F. C.	24·96	11·11	453·62
Crown Lands	do.	Sundry persons	0·59	36·00	41·06
M.L. 259	West Pilbara	Lee, T.	246·53	9·38	3,660·98
M.C. 86	do.	Neale, J.	28·59	11·68	592·74
M.L. 260	do.	Pianta, A. H.	76·49	8·60	985·65
M.L. 260	do.	Whundo Copper Syndicate	464·04	7·32	4,489·00
Loc. 71	do.	Walters, I.	2,511·71	5·75	14,253·00
Crown Lands	Ashburton	Northern Transport Co.	13·95	7·40	141·25
M.C. 11	East Murchison	Alac, M.	619·36	12·43	13,139·65
P.A. 1478	do.	Coe, C.	17·76	3·57	23·83
P.A. 1476	do.	Grgich, G.	9·22	10·00	140·00
P.A. 1475	do.	Howarth, C. A.	30·13	8·23	535·61
M.C. 5	do.	Poletti, A.	19·11	8·52	244·53
M.C. 64P	Peak Hill	North End. G.M. Syndicate	189·75	9·37	2,975·95
M.C. 43P	do.	Parkinson, T. L.	68·02	24·74	5,025·40
P.A. 852P	do.	Rumble, P. R.	44·88	7·64	477·31
M.L. 68P	do.	Walsh, E.	1,350·07	9·20	19,169·27
P.A. 3518	Murchison	Anderson & McCarthy	7·01	6·80	57·20
P.A. 3519	do.	Canestrini, P.	6·06	5·05	15·30
M.C. 65P	Peak Hill	Walsh, Bettineschi & Ricci	145·13	10·68	2,410·65
P.A. 1055D	Murchison	Goddard, J. M.	4·58	11·25	79·83
P.A. 1064D	do.	Gorman, W. M.	5·20	14·23	148·00
P.A. 3383N	do.	Jeffery, E. G.	8·95	5·16	55·11
P.A. 3351N	do.	Jefferys & Reynolds	20·51	6·64	154·70
G.M.L. 1725N	do.	Lauritsen	5·71	5·10	32·03
L.T.T. 1289H	do.	Motter, G.	238·56	5·74	1,759·80
M.L. 20N	do.	Motter, Z.	153·14	7·15	1,315·60
M.C. 9N	do.	Rinaldi, V.	352·12	7·22	3,754·71
P.A. 2510	Yalgoo	Johansen, J.	2·80	11·30	49·10
M.C. 7	do.	Twin Peaks Copper Ind., Ltd.	7·49	6·50	52·76
M.L. 24F	Mt. Margaret	Le Feurve, G.	133·00	5·10	598·50
P.A. 4920W	Broad Arrow	Trythall, W.	7·05	3·50	Nil
P.A. 799	Phillips River	Andre & Chipperfield	3·00	11·35	91·00
P.A. 785	do.	Wehr, H.	24·00	8·29	487·50
L.T.T. 1229H	do.	Wehr, W.	10·00	8·60	215·00
M.L. 411	do.	Wehr & O'Dea	15·50	9·10	352·87
Crown Lands	do.	Lorne & Andressen	21·79	6·96	185·55
L.T.T. 1309H	O.P.G.	O'Sullivan, J. J.	17·85	7·53	193·20
Total			7,376·23	8·65	101,730·78 (a) (b)

Table VII.—Minerals other than Gold—continued.
Quantity and Value of Minerals, other than Gold, reported during year 1955.

Number of Lease, Claim, or Area.	Goldfield or Mineral Field.	Registered Name of Producer.	Quantity.	Metallic Content.	Value.
DOLOMITE.					
M.L. 9M, etc.	Murchison	Atkinson & Giles	81·00	....	(a) 324·00
EMERY (k).					
M.L. 38	West Kimberley	Clackline Refractories, Ltd.	8·15	....	(b) 245·00
FELSPAR.					
M.L. 80, etc.	Coolgardie	Aust. Glass Manufacturers Pty., Ltd.	3,565·00	....	(a) 16,659·83
FERGUSONITE.					
Crown Lands	Pilbara	Hansen, H.	0·13	....	(b) 226·50
FULLER'S EARTH.					
M.C. 452H.	O.P.G. (March- agee)	Read, D. J. & T. I.	10·76	....	(a) 53·80
GLASS SAND.					
M.C. 417H	O.P.G. (Lake Gnangara)	Aust. Glass Manufacturers Pty., Ltd.	6,278·98	....	4,080·94
M.C. 365H	do.	Leach, R. J.	345·00	....	518·00
M.C. 161H	do.	Leach, W. M.	135·00	....	202·00
		Total	6,758·98	....	(c) 4,800·94
GLAUCONITE.					
Private Property	O.P.G. (Gingin)	Brook, G. E.	1,179·00	Glaucosite Recovered. tons. 196·50	7,407·00 (b) (d)
GRAPHITE.					
M.C. 451H	O.P.G. (Mung- linup)	Drummond, F. R.	110·00	Assay % Carbon. 20·00	(a) 990·00
GYPSUM.					
M.C. 30, etc.	Yilgarn	Ajax Plaster Co. Pty., Ltd.	9,855·00	....	8,129·47
M.C. 9, etc.	do.	Perth Modelling Works	17,263·00	....	12,515·67
M.C. 280H, etc.	O.P.G. (Lake Brown)	H. B. Brady & Co., Ltd.	11,689·00	....	8,765·90
M.C. 402H	O.P.G. (Hines Hill)	Kay, C. J.	1,130·00	....	920·00
M.C. 12	Dundas	McDonald & Whitfield	9·00	....	4·50
		Total	39,946·00	....	30,335·54 (a) (c)
Plaster of Paris reported as manufactured during the year being 26,348·50 tons from 37,128·25 tons of Gypsum by three factories.					
IRON ORE (for Pig Iron).					
Temporary Reserve 1258H Crown Lands	Yilgarn O.P.G. (Wun- dowie)	Charcoal Iron & Steel Industry Charcoal Iron & Steel Industry	16,876·82 426·06	Pig Iron Recovered. tons. 11,391·29 198·93	216,772·58 3,785·90
		Total	17,302·88	11,590·22	220,558·48 (c) (d)
Average Assay Ore Used—Koolyanobbing 62·00% Fe, Wundowie 43·60% Fe.					
IRON ORE (Exported) (g).					
M.L. 10, etc.	Yampi	Australian Iron & Steel, Ltd.	496,882·00	61·57%	492,741·00 (b)

Table VII.—Minerals other than Gold—continued.

Quantity and Value of Minerals, other than Gold, reported during year 1955.

No. of Lease, Claim or Area.	Goldfield or Mineral-field.	Registered Name of Producer.	Ore and Conc. Tons.	Lead.		Silver.	
				Tons.	Value £A.	Fine ozs.	Value £A.
LEAD ORE AND CONCENTRATES (f) (g).							
Vic. Loc. 1146	Northampton	Corderoy Mines, Ltd.	2·11	1·37	120·31	....	....
M.L. 227	do.	Gabalong Asbestos Co. Pty.	7·83	5·74	529·25	....	....
M.L. 256	do.	Ghurka Lead Mine	249·18	192·18	18,401·01	....	....
Vic. Loc. 832	do.	Isseka Mining Pty., Ltd.	14·69	10·68	807·31	....	....
L.T.T. 1281H	do.	James & Camp	1·40	1·00	76·93	....	....
M.L. 234	do.	Mary Springs	16·09	11·32	1,026·62	....	....
P.A. 250	do.	Norman Well Lead Mine	24·40	17·20	2,498·77	14·54	....
Vic. Loc. 436	do.	Paringa Wheel Fortune	565·86	398·18	34,976·12	....	....
Vic. Loc. 470	do.	Saxon Lead Mine	126·17	78·32	7,026·03	15·68	6·35
M.L. 252	do.	Three Sisters North	44·34	35·29	3,523·96	....	....
Vic. Loc. 334	do.	Thring, J.	10·68	7·07	539·48	10·68	....
M.L. 38PP.	do.	"Yiapa"	6·29	3·76	287·68	....	....
Total			1,069·04	762·11	68,522·60	40·90	6·35

Silver—Quantity and Value transferred to Silver Item.

SILVER/LEAD ORE AND CONCENTRATES (f) (g).							
M.L. 118	Ashburton	"Bilrose" Lead Mine	10·06	7·15	656·41	106·51	36·41
M.L. 135	do.	June Audrey Lead Mine	6·26	4·58	335·18	....	....
M.C. 184	Pilbara	Collins, T. V.	3·34	2·47	195·01	19·11	6·69
M.C. 267	do.	Midgley & Baker	9·82	7·22	540·72	55·63	17·13
M.C. 189	do.	Moore, R. O.	303·75	214·69	23,381·99	2,765·66	1,025·71
M.C. 330	do.	Reck, E. J.	8·04	4·78	432·33	45·78	14·60
M.C. 185	do.	Reick, A.	5·65	3·69	336·80	44·99	12·20
Total			346·92	244·58	25,878·44	3,037·68	1,112·74

(Silver—Quantity and Value transferred to Silver Item.)

Number of Lease, Claim, or Area.	Goldfield or Mineral Field.	Registered Name of Producer.	Quantity.	Metallic Content.	Value.
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MANGANESE (f) (g).

			tons.	Av. Assay % Mn.	£A.
M.C.'s. 268, 53L, etc.	Pilbara	Northern Minerals Syndicate	7,594·00	50·74	95,146·00
M.C. 24P, etc.	Peak Hill	Westralian Ores Pty., Ltd.	29,896·66	44·28	328,684·30
Total			37,490·66	45·59	423,830·30 (b)

OCHRE (Red).

M.L. 239	West Pilbara	Smith, R. J.	41·60	....	917·00
M.C. 27	Murchison	Cassidy, J. E.	10·90	....	109·00
M.C. 44	do.	Cassidy, J. E.	18·00	....	180·00
M.C. 26	do.	Murchison Minerals (1951)	274·00	....	2,707·00
Total			345·19	....	(a) 3,913·00

PYRITES ORE AND CONCENTRATES.

				Sulphur recovered tons.	
G.M.L. 1460, etc.	Dundas	Norseman G.M., N.L.	11,143·00	3,978·26	55,528·00
			(i) 38,342·00	18,025·91	341,741·00
Total			49,485·00	22,004·17	397,269·00

Table VII.—*Minerals other than Gold—continued.*
Quantity and Value of Minerals, other than Gold, reported during year 1955.

Number of Lease, Claim, Or Area.	Goldfield or Mineral Field.	Registered Name of Producer.	Quantity.	Metallic Content.	Value.
SILVER.					
	By-product from	Gold Mining	Fine Ozs. 232,667·12	.....	91,641·75
	do.	Lead Mining	40·90	.....	6·35
	do.	Silver/Lead Mining	3,037·68	.....	1,112·74
	do.	Copper Mining	49·03	.....	20·25
		Total	235,794·73	.....	92,781·09
SPODUMENE (g).					
P.A. 780	Phillips River	Pantall, D. H.	Tons. 3·89	Li ₂ O Cont. Units. 26·55	(b) 56·85
TALC.					
P.P. Loc. 839	O.P.G. (Three Springs)	Universal Milling Co., Ltd.	2,559·98	.....	(c) 37,646·65
M.C. 14E	East Coolgardie	Bean, H.	26·83	.....	(a) 120·00
		Total	2,586·81	.....	37,766·65
TANTO/COLUMBITE ORE AND CONCENTRATES (f) (g).					
			lb.	Combined TaNb ₂ O ₅ lb.	
M.C. 70, etc.	Greenbushes (m)	Tin & Strategic Minerals, Ltd.	2,378·00	1,761·00	2,746·00
Crown Lands	Pilbara	Sundry persons	2,935·00	1,831·00	5,105·30
M.C. 174/5	do.	Griffiths, W. E.	6,365·00	2,513·00	6,624·00
M.C. 421, etc.	do.	Pilbara Native Society	3,138·00	1,632·00	1,089·00
M.C. 297	do.	Miller & Trembath	72·00	51·00	90·00
M.C. 313	do.	Richardson, E. A.	2,347·00	1,695·00	3,112·55
M.C. 312	do.	Hall, Eades & Crawford	589·00	414·00	744·00
M.C. 77L	do.	Dunn, W.	437·00	230·00	333·80
P.A. 2438	do.	Walkerden, J. H.	334·00	236·00	397·65
M.C. 260	do.	Northern Mineral Syndicate	4,529·00	2,810·00	4,525·50
M.C. 316, etc.	do.	Northern Development & Mining Co. Pty.	2,868·00	1,631·00	1,932·40
M.C. 14	Coolgardie	Rowe, E. P.	221·00	168·00	251·00
M.C. 23	Phillips River	Pantall, D. H.	635·00	432·00	1,556·50
		Total	26,848·00	15,454·00	(b) 25,762·40
TIN (f) (g).					
			Tons.		
M.C. 70, etc.	Greenbushes	Tin & Strategic Minerals, Ltd.	102·36	67·07	53,279·50
M.C. 56, etc.	do.	Western Queen (1936), N.L.	17·21	10·59	8,297·30
Crown Lands	West Kimberley	Stuart, J. A.	0·13	0·09	79·03
D.C. 58, etc.	Pilbara	Northern Minerals Syndicate	17·04	11·96	9,565·35
D.C. 26, etc.	do.	Shaw River Alluvials, N.L.	22·37	15·79	12,858·98
D.C. 68, etc.	do.	D. Rhodes Pty., Ltd.	13·58	9·04	7,065·94
Crown Lands	do.	Sundry persons	6·70	4·69	3,625·32
M.C. 92L, etc.	do.	Dorrington & Party	0·33	0·19	140·40
		Total	179·72	119·42	(b) 94,911·82
TUNGSTEN (Scheelite) (f) (g).					
			lb.	WO ₃ content. lb.	
M.L. 24T	Mt. Margaret	Esperance Oil Syndicate, Ltd.	1,861·00	1,372·00	582·00
L.T.T. 1252H	North Coolgardie	Linnett & Hawkins	12,796·00	9,017·00	6,008·50
P.P.L. 463	Coolgardie	McRae & Party	1,933·00	1,298·00	581·25
M.L. 106	do.	Kent, W. A.	775·00	499·10	245·00
		Total	17,365·00	12,186·10	(b) 7,416·75

References :—O.P.G. denotes Outside Proclaimed Goldfield. (a) Value F.O.R. (b) Value F.O.B. (c) Value at Works. (d) Value of Mineral recovered. (e) Value at Pit Head. (f) Only results from shipments finalised during period under review. (g) Metallic content calculated on Assay basis. (h) Value subject to revision. (i) Concentrates. (j) By-product from Gold Mining. (k) Late reported for 1953-54. (m) Separated as a by-product from Tin/Tanto/Columbite concentrates.

TABLE VIII.—SHOWING AVERAGE NUMBER OF MEN EMPLOYED ABOVE AND UNDER GROUND IN THE LARGER GOLDMINING COMPANIES OPERATING IN WESTERN AUSTRALIA DURING THE YEARS FROM 1945 to 1954 INCLUSIVE.

COMPANY.	1946.			1947.			1948.			1949.			1950.			1951.			1952.			1953.			1954.			1955.		
	Above.	Under.	Total.	Above.	Under.	Total.	Above.	Under.	Total.	Above.	Under.	Total.	Above.	Under.	Total.	Above.	Under.	Total.	Above.	Under.	Total.	Above.	Under.	Total.	Above.	Under.	Total.	Above.	Under.	Total.
Anglo-Westralian Mng. Pty.	178	148	326	195	159	354	185	148	333	171	135	306	173	138	311	115	119	274	47	4	51	37	5	42	28	6	34	.....	.....	.....
Boulder Perseverance, Ltd.	33	82	115	38	95	133	38	84	122	36	73	109	34	68	102	13	12	25	6	.....	6	4	.....	4	2	.....	.....	.....	.....
Broken Hill Pty. Co., Ltd.	38	17	55	36	24	60	17	12	29	1	.....	1	20	6	26	33	21	54	36	21	57	33	15	48	30	15	45	17	9	26
Blue Spec Gold Mines, Ltd.	171	143	314	186	198	384	188	193	381	197	210	407	219	246	465	230	240	470	203	205	408	200	215	415	179	167	346	44	16	60
Big Bell Mines, Ltd.	18	.....	18	15	4	19	14	4	18	18	4	22	16	4	20	2	.....	2	1	.....	1	.....	1	.....	2	.....	.....	.....	.....
Burbidge Gold Mines, N.L.	2	.....	2	2	.....	2	2	.....	2	1	.....	1	1	.....	1	3	1	4	1	.....	1	1	1	2	1	2	3	.....	.....
Consolidated Gold Area, N.L.	43	32	75	17	7	24	7	10	17	9	13	22	11	12	23	13	11	24	10	8	18	10	6	16	4	2	6	3	.....	3
Comet Gold Mines, Ltd.	103	201	304	111	251	362	117	268	385	133	246	379	163	236	399	148	226	374	151	212	363	155	228	383	158	227	385	166	225	391
Central Norseman Gold Corporation, N.L.	4	13	17	9	22	31	7	17	24	11	15	26	3	9	12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dundas Gold Mines, N.L.	38	40	78	36	35	71	9	6	15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Emu Gold Mines, Ltd.	29	42	71	28	33	61	11	9	20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Edna May Amalgamated, N.L.	23	32	60	37	26	63	2	.....	2	2	.....	2	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Evanston Gold, N.L.	7	.....	7	4	5	9	2	1	3	1	1	2	1	1	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
First Hit Gold Mine	45	.....	45	46	.....	46	45	.....	45	43	.....	43	41	.....	41	39	.....	39	38	.....	38	42	.....	42	42	.....	42	39	.....	39
Golden Horseshoe (New), Ltd.	144	171	315	169	158	327	166	173	339	175	179	354	187	180	367	181	191	372	185	182	367	184	182	366	199	186	385	257	192	449
Gold Mines of Kalgoorlie, Ltd.	310	469	779	325	496	821	316	418	734	312	392	704	327	404	731	311	354	665	344	339	683	349	359	708	342	372	714	350	379	729
Great Boulder Pty., Ltd.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
*Great Western Consolidated	55	48	103	49	55	104	55	67	122	68	78	146	74	66	140	62	41	103	59	48	107	68	63	131	73	63	136	82	73	155
Hill 50 Gold Mine, N.L.	.....	99	99	.....	118	118	1	105	106	7	103	110	7	95	102	8	85	93	8	93	101	8	98	106	8	89	97	7	101	103
Kalgoorlie Enterprise, Ltd.	73	.....	73	69	.....	69	69	.....	69	74	.....	74	74	.....	74	77	.....	77	81	.....	81	77	.....	77	78	.....	78	65	.....	65
Kalgurli Ore Treatment Co., Ltd.	337	422	759	366	468	834	414	465	879	454	441	895	471	476	947	492	517	1,009	486	529	1,015	494	519	1,013	488	498	986	482	487	969
Lake View and Star, Ltd.	13	11	24	13	20	33	13	20	33	18	18	36	33	32	65	42	42	84	42	41	83	39	37	76	42	34	76	39	33	72
Moonlight Wiluna Gold Mines, Ltd. (Timoni)	.....	.....	.....	7	9	16	11	8	19	10	14	24	11	11	22	13	7	20	5	3	8	4	6	10	3	6	9	3	3	4
Mountain View Gold, N.L.	.....	.....	.....	.....	1	3	18	18	36	24	23	52	10	8	18	2	.....	2	2	3	5	3	6	9	3	2	5	.....	.....
Mt. Charlotte (Kalgoorlie) Gold Mines, N.L.	62	173	235	66	213	279	76	265	341	79	304	383	90	316	406	133	348	481	112	293	405	76	207	283	83	193	276	95	236	331
North Kalgurli (1912), Ltd.	.....	1	3	.....	2	4	2	.....	3	1	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New Milano, N.L.	105	79	184	12	19	31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
*Norseman Gold Mines, N.L.	.....	.....	.....	.....	.....	.....	12	9	21	78	64	142	73	125	198	73	120	193	65	109	174	68	108	176	77	95	172	79	95	174
New Coolgardie Gold Mines, N.L. (Barbara Leases)	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6	21	27	6	29	35	7	34	41	9	42	51	8	35	43
New Coolgardie Gold Mines, N.L. (Callion Leases)	11	20	31	23	44	67	5	4	9	3	1	4	2	.....	2	1	.....	1	1	.....	1	3	2	5	1	2	3	.....	2	2
Ora Banda Amalgamated, Ltd.	76	113	189	83	117	200	87	134	221	79	134	213	92	138	230	47	46	93	10	6	16	2	2	4	.....	.....	.....	.....	.....	.....
Paringa Mining and Exploration Co., Ltd.	50	30	80	50	30	80	33	22	55	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Phoenix Gold Mines, Ltd.	.....	.....	.....	2	1	3	18	18	36	24	28	52	10	8	18	6	1	7	1	.....	1	3	3	6	2	2	4	.....	.....	.....
Porphyry (1939) Gold Mines, Ltd.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	3	8	4	4	8	5	5	10	5	5	10	6	6	12
Radio Gold Mines	80	91	171	103	105	208	107	111	218	110	105	215	120	107	227	124	110	234	67	102	169	67	107	174	64	106	170	53	99	152
South Kalgurli Consolidated Sons of Gwalia, Ltd.	122	160	282	108	128	236	98	109	207	92	143	235	104	151	255	121	129	250	121	118	239	102	157	259	102	138	240	102	146	248
Sunshine Reward Amalgamated Leases	5	7	12	8	9	17	9	10	19	9	14	23	10	9	19	10	7	17	9	7	16	8	7	15	8	7	15	7	4	11
Triton Gold Mine	41	66	107	83	178	261	64	95	159	7	.....	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wiluna Gold Mines, Ltd.	168	96	264	117	5	122	69	.....	69	49	.....	49	29	.....	29	20	.....	20	13	.....	13	2	1	3	1	1	2	.....	.....
Yellowdine Gold Development, Ltd.	4	.....	4	.....	2	.....	2	.....	2	.....	2	.....	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
All other Operators	1,004	674	1,678	1,175	993	2,168	1,128	972	2,100	966	825	1791	986	887	1,823	883	604	1,547	851	598	1,449	846	523	1,369	734	495	1,229	634	388	1,022
State Average (incl. Diggers)	3,416	3,545	6,961	3,612	4,037	7,649	3,416	3,762	7,178	3,260	3,540	6,800	3,404	3,676	7,080	3,378	3,388	6,766	3,265	3,129	6,394	3,238	3,121	6,359	3,109	3,019	6,128	2,933	2,912	5,845
*Also additional men engaged exclusively on Pyrites Production	4	53	57	78	56	134

3974/5/57

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* Converted solely to Pyrites production after 1947.

† Including both Copperhead and Frasers Groups for 1955.