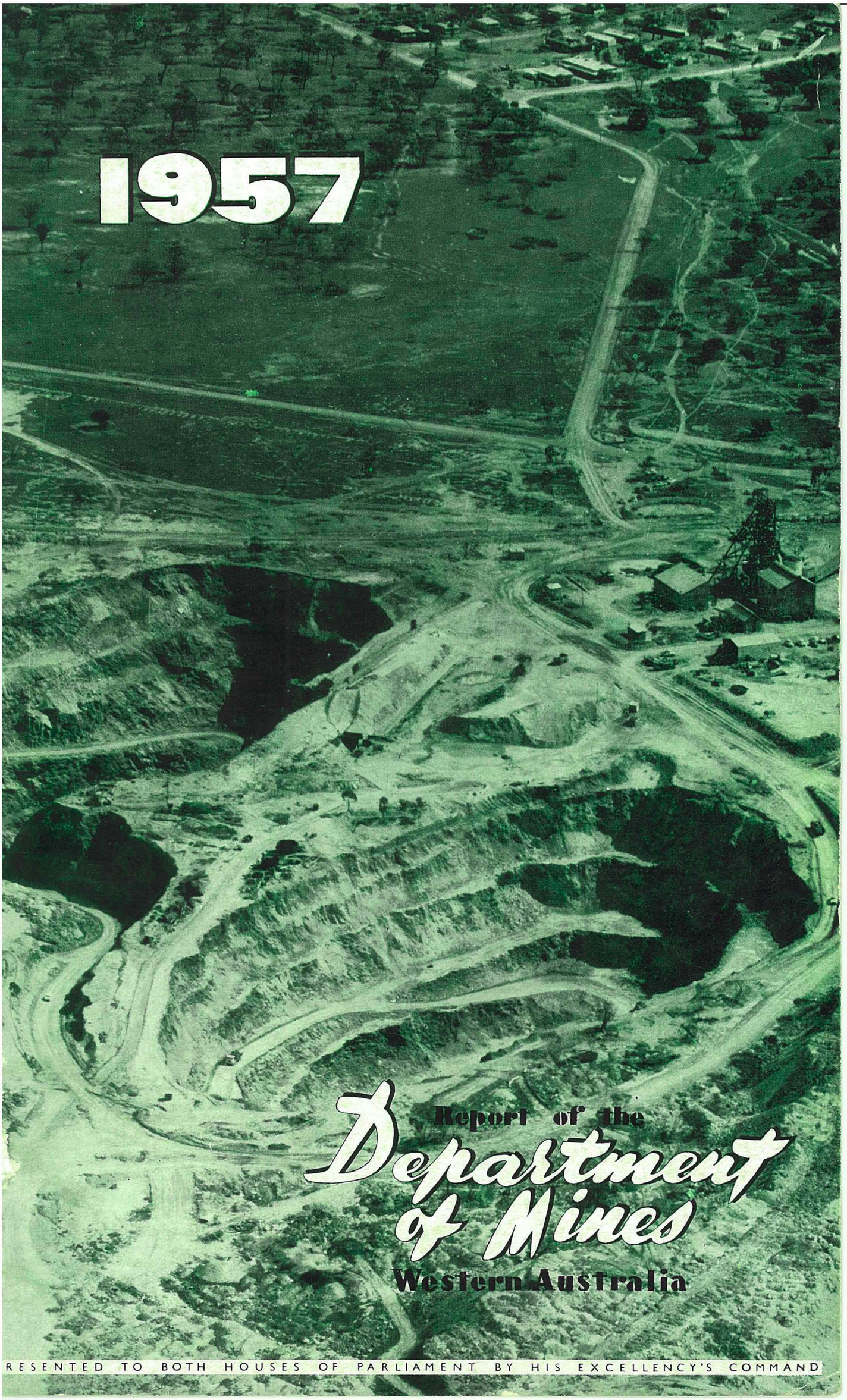


1957

Report of the Department of Mines Western Australia

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

COVER PICTURE

View of "Copperhead Mine," Great Western Consolidated N.L. (Bullfinch, Western Australia).

REPORT OF THE
DEPARTMENT *of* MINES
WESTERN AUSTRALIA
FOR THE YEAR 1957

PERTH:
By Authority: ALEX. B. DAVIES, Government Printer
1958

18619/9/58—595

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 1957, 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, August, 1958.

TABLE OF CONTENTS

STATE OF WESTERN AUSTRALIA

Report of the Department of Mines for the Year 1957

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 1957.

The estimated value of the mineral output of the State for the year was £10,778,079 (calculating gold at £4-4-11.45 per fine ounce), an increase of £2,479,361 in value compared with the preceding twelve months. The estimated value of the exchange premium paid to gold producers by the Mint amounted to £A10,201,771, added to which the overseas gold sales premium of £A27,549, received by the Gold Producers' Association Limited from sales of West Australian Gold from August 1956 to July 1957, brought the gross value of all minerals to £A21,007,399, an increase of £A1,486,364 over the previous year.

The estimated value of the gold received at the Perth Branch of the Royal Mint and exported in gold-bearing material was £A14,010,636. but with the additional gold sales premium mentioned above, totalled £A14,038,185; this being the highest annual value ever recorded in the State for that mineral, although the quantity involved was only 43.42 per cent of the peak year production figure for 1903 when the price was only £4-4-11.45 per fine ounce. The estimated gold value equalled 66.825 per cent of the value of all minerals for 1957. (See footnote to Table (1) (a), Part II).

Other Minerals realised: Coal, £2,552,656; asbestos, £1,237,701; manganese, £929 820; iron ore (exported), £386,440; pyrites, £382,567; iron ore (pig), £324,646; lead ores and concentrates, £314,392; ilmenite, £233,476; tin, £155,079; cupreous ore (fertiliser), £82,127; silver £77,697; beryl £64,234; copper ore, £58,564; talc, £49,906; clays, £34,171; gypsum, £25,967; chromite, £20,997; tanto-columbite, £11,831; phosphatic guano, £5,040; felspar, £4,611; glass sand, £3,914; bentonite, £2,981; barytes, £910; ochre, £272; and dolomite, £240.

The value recorded for coal fell slightly in comparison with the previous year, but minerals other than gold and coal topped last year's record value by a further 9.92 per cent. helping to create another record annual value of all minerals (£A21,007,399), exceeding the last record established in 1954, by 5.01 per cent.

Dividends paid by gold mining companies amounted to £2,401,886, an increase of £202,803 when compared with the previous year (see Table 6, Part II).

To the end of 1957, the total amount distributed by gold mining companies was £58,175,638.

To the same date the progressive value of the Mineral production of the State amounted to £319,166,964, of which gold accounted for £250,809,968, (based on the normal value of £4-4-11.45 per fine ounce); but the premium on the sale of gold during years 1920-1924, increasing exchange premium since 1930, payments under the Gold Bounty Act 1930, plus additional premiums from overseas sales distributed during 1952 to 1957, increase the total value of gold and mineral production by £152,555,080 making a gross progressive value of £471,722,044.

GOLD.

The quantity of gold reported as being received at the Perth Branch of the Royal Mint (894,638.71 fine ounces), together with that contained in gold-bearing material exported for treatment (2,042.27 fine ounces), totalled 896,680.98 fine ounces which was 84,301.20 fine ounces more than the previous year, and the highest figure since 1941 (vide Table 1 (a) of Part II).

Similarly, the total gold yield for the year reported directly to the Department by the producers was 849,750.64 fine ounces, an increase of 36,133.37 fine ounces (vide Table 3 of Part II).

The variation between the two annual totals 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 the ore treated in the State as a whole increased slightly from 24.094 shillings per ton in 1956 to 24.475 shillings per ton in 1957, calculating gold at the old rate of £4 4s. 11.45d. 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 60.11 per cent. of the State's gold yield), the calculated average value of the ore treated rose from 20.850 shillings to 22.081 shillings per ton. The estimates for Murchison (Hill 50 G.M. N.L.), Mt. Margaret (Sons of Gwalia Ltd.), Dundas (Central Norseman Gold Corporation N.L.), and Yilgarn (Great Western Cons. N.L.) were 62.879s. (66.067s.); 19.669s. (21.027s.); 46.295s. (46.996s.); and 14.742s. (15.898s.), respectively. Figures for 1956 being shown in parenthesis.

The tonnage of ore reported to have been treated in 1957 viz. 2,951,011 tons was 82.738 tons in excess of the previous year, and constituted 68.76 per cent. of the State record tonnage established in 1940.

The following tonnage increases were reported from the respective Goldsfields—Pilbara 244, Peak Hill 1,777, Murchison 5,220, Yalgoo 835, Mt. Margaret 20,162, East Coolgarlie 33,270, Coolgardie 5,136, Yilgarn 16,857, and Dundas 7,914; those fields showing a reduction in tonnage being Kimberley 60, East Murchison 341, North Coolgardie 6,884, Broad Arrow 1,264, North East Coolgardie 122, and Phillips River 6.

Output from the East Coolgardie Goldfield exceeded that of the previous year by 33,270 tons; the 31,163 tons increase by Great Boulder Pty. G.M.'s Ltd., together with the 7,800 tons by Lake View & Star Ltd. and 5,700 tons increases by Gold Mines of Kalgoorlie (Aust.) Pty. Ltd., being slightly offset by the 13,500 tons reduction by the North Kalgurlie (1912) Ltd.

It was noticed that while Great Boulder Pty. G.M.'s Ltd. and Lake View & Star Ltd. maintained a practically even grade of ore, the grade treated by the other two companies was slightly higher.

Sons of Gwalia Ltd., Great Western Cons. N.L., and Central Norseman Gold Corporation Ltd., were responsible for the 20,000 tons, 16,900 tons, and 8,000 tons increases shown in the Mt. Margaret, Yilgarn and Dundas Goldfields respectively.

A general strengthening of activity was noticeable in the remaining Goldfields showing improved output for the year, whilst most of those with slightly lower output appeared also to be receiving more attention during that period.

Due to the stagnant price of gold and the constant threat of rising costs, the gold mining industry has been forced to strenuously respond with mechanisation, merger, and greater efficiency in order to preserve its life line of ore reserves, and has accomplished another successful year of production.

West Australian gold included in sales on open dollar markets by the Gold Producers' Association Ltd. between August 1956 and July 1957, totalled 828,784.85 fine ounces; the extra premium received therefrom in excess of Mint Value, amounted to £A27,549 an overall average of 7.977 pence per fine ounce. This amount less expenses, was distributed to the producer members during the year and approximated 7.214 pence per fine ounce.

Subsidy payments made by the Commonwealth Government during the year under the Gold Mining Industry Assistance Act 1954, totalled £A496,785, of which £A478,701 went to Large Producers and £A18,084, to Small Producers in this State.

PART II.—MINERALS.

The value of the production of minerals other than gold and coal, continued the upward trend of 1956, and the 1957 figure became the highest annual total recorded.

Major increases in asbestos, manganese and ilmenite more than offset substantial reduction in the values of lead, tanto-columbite, chromite and tin produced during the year.

The search for manganese in the Pilbara and West Pilbra fields mainly, was continued successfully, and many new deposits have been discovered, considerably increasing our reserves of this mineral.

Mineral beach sands plants at Bunbury and Capel operated through the year and a further two plants are to be erected at Wonnerup and Yoganup. A falling-off of the market is however, causing concern in this industry.

The search for minerals in the State was stimulated by an amendment to the Mining Act which removed restrictions on the size of temporary reserves for the purpose of prospecting for all minerals other than gold. Since the amendment was made at the end of 1957, several substantial companies have commenced large scale prospecting and a number of others are showing great interest in the State's mineral potentialities.

COAL.

Coal production at Collie amounted to 838,660 tons—an increase of 8,655 tons on last year's output.

Consumption during the year totalled 838,653 tons of which 88.32 per cent was used by Government instrumentalities and 11.68 per cent by private consumers.

A significant event during the year for Collie was the finalisation of firm contracts for the supply of coal to Government users for a period of three years.

This is the first time that such contracts have been made, and they will no doubt have considerable affect on the stability of Collie.

OIL.

Throughout the year West Australian Petroleum Pty. Ltd. continued its very active search for oil and carried out further extensive exploration and drilling on its titles.

Exploration holes were drilled on Dirk Hartog Island and at Rough Range, Yanrey and Learmonth during the year, without yielding results.

Associated Kimberley Oil Field N.L. completed its hole at the Sisters at a depth of 9,828 feet, also without success.

WATER.

Towards the end of the year it was decided to form a Hydrological Section within the Geological Survey Branch, for the purpose of underground water exploration.

Two water boring plants were added to our Drilling Section and this number will be increased if possible during the forthcoming year.

Boring on private properties will be carried out at the request of farmers, at sites selected by our geologists who will precede the drills to carry out the necessary preliminary investigations.

The work of this new Section should prove of great value to farmers, who will only be required to reimburse the Department the cost of successful bores.

COMPARATIVE MINERAL STATISTICS.

	1956	1957	Variation
Gold—			
Reported to Department :			
Ore (tons)	2,868,273	2,951,011	+ 82,738
Gold (fine oz.)	813,617	849,751	+ 36,133
Average grade (dwt. per ton)	5,688	5·759	+ 0·091
Men Employed	5,628	5,385	— 243
Dividends	2,199,083	2,401,886	+ 202,803
Mint and Export :			
Gold (fine oz.)	812,380	896,681	+ 84,301
Estimated Value (£A) (including Overseas Gold Sales Premium by G.P.A.)	12,705,581	*14,038,185	+ 1,332,604
Coal—			
Reported to Department :			
Tons	830,007	838,660	+ 8,653
Value (£A)	2,723,981	†2,552,656	— 171,325
Men Employed	1,219	1,136	— 83
Other Minerals—			
Reported to Department :			
Value (£A)	4,017,948	4,416,558	+ 398,610
Men Employed	920	1,108	+ 188
Total All Minerals—			
Value (£A)	19,447,510	*21,007,399	+ 1,559,889
‡Men Employed	7,767	7,629	— 138

* Highest Annual Value ever recorded in the State. † Subject to adjustment. ‡ Excluding Oil Search which engaged an average of 353 men in the field during 1956, and 192 men in the field during 1957.

TABLE 1.

Quantity and Value of Minerals, other than Gold and Silver, produced during Years 1956 *and* 1957.

Western Australia

Description of Minerals.	1956.		1957.		Increase or Decrease for year compared with 1956.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Tons	£A	Tons	£A	Tons	£A
Antimony Concentrates	78·44	742	—	—	— 78·44	— 742
Asbestos—						
Chrysotile	761·10	25,366	**1,389·31**	**42,067**	+ 628·21	+ 16,701
Crocidolite	7,285·97	800,710	**11,104·87**	**1,195,634**	+ 3,818·90	+ 394,924
Barytes	927·10	5,187	**140·00**	**910**	— 787·10	— 4,277
Bentonite	1,403·54	5,658	**741·79**	**2,981**	— 661·75	— 2,677
Beryl	310·19	57,113	**350·37**	**64,234**	+ 40·18	+ 7,121
Chromite	6,096·20	97,526	**1,312·30**	**20,997**	— 4,783·90	— 76,529
Clays—						
Cement Clay	18,314·00	15,208	**11,551·00**	**12,340**	— 6,763·00	— 2,868
Fireclay	9,437·00	9,939	**17,646·70**	**20,816**	+ 8,209·70	+ 10,877
White Clay	2,090·00	8,360	**203·00**	**1,015**	— 1,887·00	— 7,345
Coal	830,006·65	*2,723,981	**838,660·53**	†**2,552,656**	+ 8,653·88	— 171,325
Copper Ore and Concentrates	212·23	12,742	**1,803·97**	**58,564**	+ 1,591·74	+ 45,822
Cupreous Ore and Concentrates (Fertiliser)	7,713·31	113,443	**4,638·69**	**82,127**	— 3,074·62	— 31,316
Dolomite	171·00	690	**60·00**	**240**	— 111·00	— 450
Felspar	2,781·00	17,719	**995·00**	**4,611**	— 1,786·00	— 13,108
Fuller's Earth	40·13	201	....	....	— 40·13	— 201
Glass Sand	7,343·17	5,154	**5,692·86**	**3,914**	— 1,650·31	— 1,240
Glauconite	85·00	3,360	**126·00**	**5,040**	+ 41·00	+ 1,680
Graphite	5·10	37	....	....	— 5·10	— 37
Gypsum	27,121·00	20,928	**33,352·90**	**25,967**	+ 6,231·90	+ 5,039
Iron Ore (for Pig)	19,853·60	278,846	**21,838·50**	**324,646**	+ 1,984·90	+ 45,800
Iron Ore (for Export)	327,815·00	323,923	**389,686·00**	**386,440**	+ 61,871·00	+ 62,517
Lead and Silver/Lead Ore and Concentrates	7,612·89	643,253	**4,179·19**	**314,392**	— 3,433·70	— 328,861
Magnesite	803·55	1,978	....	....	— 803·55	— 1,978
Manganese : Metallurgical and Battery	57,323·14	648,956	**63,937·06**	**929,820**	+ 6,613·92	+ 280,864
Mineral Beach Sand (Ilmenite)	3,293·40	15,150	**40,931·99**	**233,476**	+ 37,638·59	+ 218,326
Ochre—						
Red	368·93	3,595	**10·00**	**100**	— 358·93	— 3,495
Yellow	75·45	755	**17·30**	**173**	— 58·15	— 582
Phosphatic Guano	....	....	**586·89**	**8,974**	+ 586·89	+ 8,974
Pyrites Ore and Concentrates	60,968·98	420,052	**57,917·72**	**382,567**	— 3,051·26	— 37,485
Talc	4,455·57	54,438	**3,653·65**	**49,906**	— 801·92	— 4,532
Tanto/Columbite Concentrates	71·27	127,664	**22·49**	**11,831**	— 48·78	— 115,833
Tin Concentrates	358·35	208,273	**270·25**	**155,079**	— 88·10	— 53,194
Vermiculite	1·04	9	....	....	— 1·04	— 9
Total	....	*6,650,956	....	**6,891,517**	....	+ 240,561

TABLE 1 (a).—*Quantity and Value of Gold and Silver exported and minted during Years* 1956 *and* 1957.

	Fine oz.	£A	Fine oz.	£A	Fine oz.	£A
Gold (Mint and Export)	812,379·78	‡12,705,581	**896,680·98**	‡**14,038,185**	+ 84,301·20	+ 1,332,604
Silver	217,247·01	90,973	**197,128·75**	**77,697**	— 20,118·26	— 13,276
Total	....	12,796,554	....	**14,115,882**	....	+ 1,319,328
Grand Total, All Minerals	....	*19,447,510	....	**21,007,399**	....	+ 1,559,889

* Adjusted. † Subject to Adjustment. ‡ Including Overseas Gold Sales Premium.

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	205,587	1·02
1946	26,342,125	211,890	0·80
1947	42,389,125	4,162,892	9.82
1948	57,779,996	342,646	0·59
1949	58,197,775	465,124	0·80
1950	78,804,864	531,245	0·67
1951	115,880,457	7,479,601	6·45
1952	101,620,138	7,952,834	7·82
1953	106,678,014	13,239,076	12·41
1954	79,955,207	5,342,462	6·68
1955	113,044,633	17,145,741	15·17
1956	142,852,512	9,531,471	6·67
1957	148,128,361	12,483,343	8·43
Total since 1902	1,703,051,521	319,019,359	18·73

† Including Ships' Stores. (*a*) Full value of gold movement by Commonwealth Treasury from 1944 not available.

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 1957

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

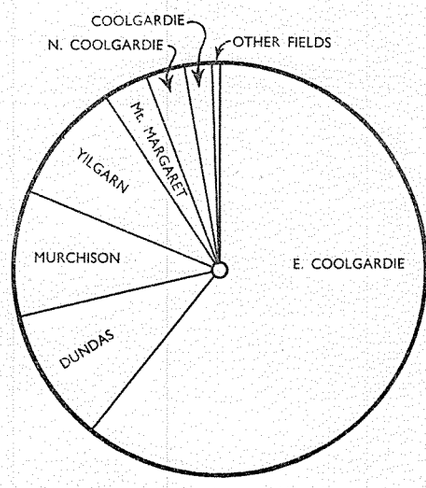


Fig. 2 Gold produced from various Goldfields as given by the Export and Mint Returns

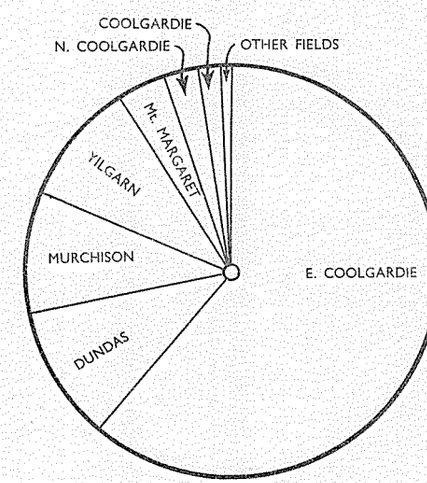


Fig. 3 Value of Gold and other Minerals

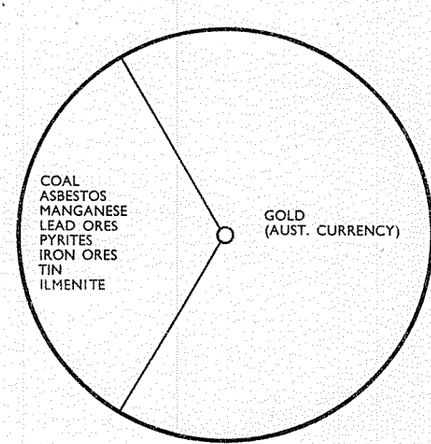


Fig. 4 Value of Minerals other than Gold

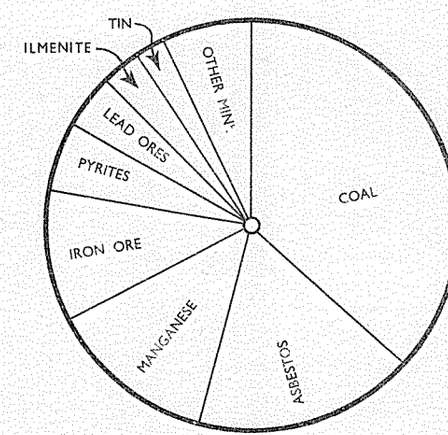


Fig. 5 Areas of land leased for Goldmining on various Goldfields

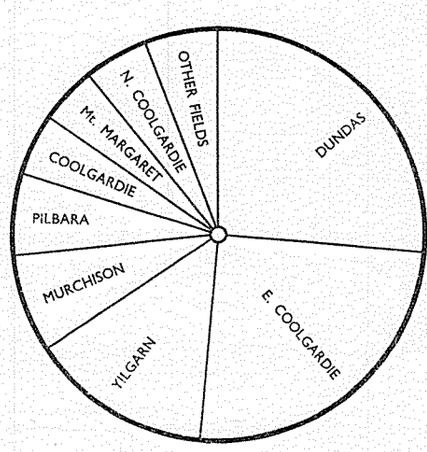


Fig. 6 Output of Gold in the States of Australia and the Dominion of New Zealand

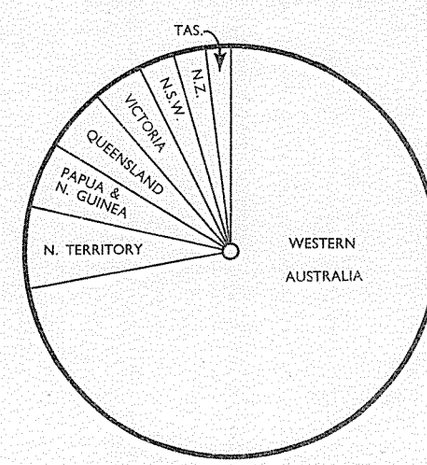
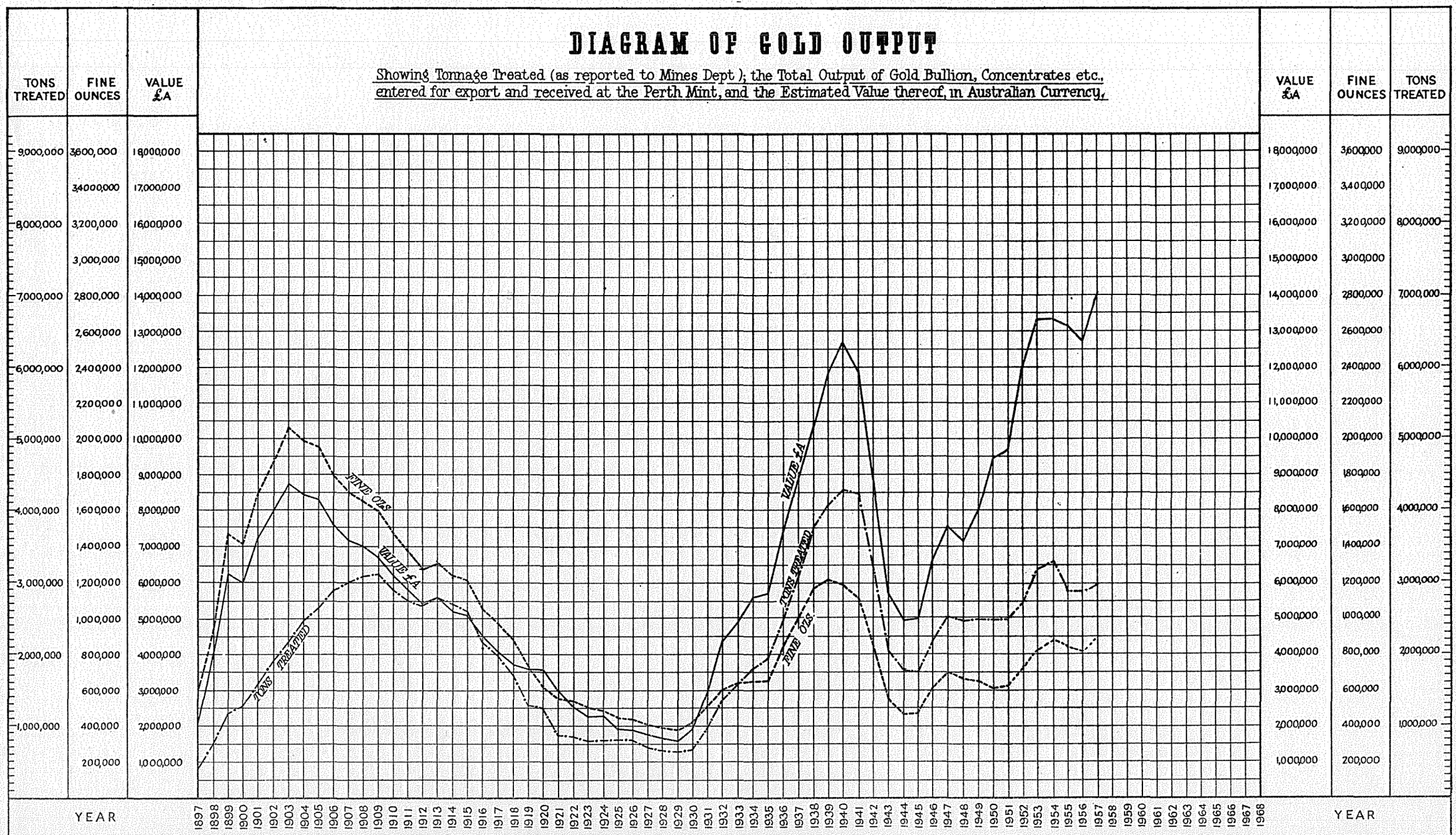


DIAGRAM OF GOLD OUTPUT

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.



TONS TREATED	FINE OUNCES	VALUE £A
9,000,000	3,600,000	18,000,000
	3,400,000	17,000,000
8,000,000	3,200,000	16,000,000
	3,000,000	15,000,000
7,000,000	2,800,000	14,000,000
	2,600,000	13,000,000
6,000,000	2,400,000	12,000,000
	2,200,000	11,000,000
5,000,000	2,000,000	10,000,000
	1,800,000	9,000,000
4,000,000	1,600,000	8,000,000
	1,400,000	7,000,000
3,000,000	1,200,000	6,000,000
	1,000,000	5,000,000
2,000,000	800,000	4,000,000
	600,000	3,000,000
1,000,000	400,000	2,000,000
	200,000	1,000,000

YEAR

1897 1898 1899 1900 1901 1902 1903 1904 1905 1906 1907 1908 1909 1910 1911 1912 1913 1914 1915 1916 1917 1918 1919 1920 1921 1922 1923 1924 1925 1926 1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941 1942 1943 1944 1945 1946 1947 1948 1949 1950 1951 1952 1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968

VALUE £A	FINE OUNCES	TONS TREATED
18,000,000	3,600,000	9,000,000
17,000,000	3,400,000	
16,000,000	3,200,000	8,000,000
15,000,000	3,000,000	
14,000,000	2,800,000	7,000,000
13,000,000	2,600,000	
12,000,000	2,400,000	6,000,000
11,000,000	2,200,000	
10,000,000	2,000,000	5,000,000
9,000,000	1,800,000	
8,000,000	1,600,000	4,000,000
7,000,000	1,400,000	
6,000,000	1,200,000	3,000,000
5,000,000	1,000,000	
4,000,000	800,000	2,000,000
3,000,000	600,000	
2,000,000	400,000	1,000,000
1,000,000	200,000	

YEAR

TABLE 3.

Showing for every Goldfield the amount of Gold reported to the Mines Department as required by the Regulations, also the percentage for the several Goldfields of the reported total, 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.).	
	1956.	1957.	1956.	1957.	1956.	1957.
	Fine oz.	Fine oz.	%	%	Shillings	Shillings
1. Kimberley	179	68	·022	·008	253·725	....
2. West Kimberley	....	....	....	....	....	....
3. Pilbara	2,074	785	·255	·092	102·981	33·262
4. West Pilbara	1	57	....	·007	....	....
5. Ashburton	1	1	....	....	....	....
6. Gascoyne	....	....	....	....	....	....
7. Peak Hill	16	260	·002	·031	30·581	12·136
8. East Murchison	272	205	·033	·024	48·518	55·624
9. Murchison	85,914	85,627	10·560	10·077	66·067	62·879
10. Yalgoo	....	112	....	·013	....	11·401
11. Mt. Margaret	29,775	32,519	3·660	3·827	21·027	19·669
12. North Coolgardie	27,646	23,525	3·398	2·769	46·420	49·085
13. Broad Arrow	1,957	2,928	·240	·345	23·871	43·617
14. North East Coolgardie	105	115	·013	·014	16·837	23·783
15. East Coolgardie	474,683	510,830	58·343	60·115	20·850	22·081
16. Coolgardie	17,705	19,267	2·176	2·267	42·393	40·300
17. Yilgarn	84,187	80,995	10·347	9·532	15·898	14·742
18. Dundas	89,089	92,071	10·950	10·835	46·996	46·295
19. Phillips River	1	359	....	·042	6·842	....
20. Outside Proclaimed Goldfields	12	16	·001	·002	....	....
Totals and Averages	813,617	849,740	100·000	100·000	24·094	24·475

The total yield of the State is shown in Table I, 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 Mines 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 1956 *and* 1957.

Goldfield.	1956.				1957.			
	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 underground.	Per man employed above and underground.	Per man employed underground.	Per man employed above and underground.	Per man employed underground.	Per man employed above and underground.	Per man employed underground.	Per man employed above and underground.
	Tons	Tons	Fine oz.	Fine oz.	Tons	Tons	Fine oz.	Fine oz.
1. Kimberley	....	15·00	....	44·75	....	....	....	....
2. West Kimberley	....	....	....	....	....	....	....	....
3. Pilbara	76·61	30·38	90·17	35·76	125·37	28·25	49·06	11·05
4. West Pilbara	....	....	....	....	....	....	....	....
5. Ashburton	....	....	....	....	....	....	....	....
6. Gascoyne	....	....	....	....	....	....	....	....
7. Peak Hill	14·67	5·50	5·33	2·00	364·20	165·45	52·00	23·64
8. East Murchison	68·11	23·84	38·36	13·60	11·33	5·91	17·08	8·93
9. Murchison	713·10	326·05	554·28	253·43	803·82	367·46	594·63	271·83
10. Yalgoo	....	....	....	....	417·50	104·47	56·00	14·00
11. Mt. Margaret	640·26	356·12	158·38	88·09	826·65	476·37	191·29	110·23
12. North Coolgardie	512·07	250·64	297·27	145·51	565·80	245·41	326·74	141·72
13. Broad Arrow	204·99	84·99	57·56	23·86	203·78	81·54	104·57	41·83
14. North-East Coolgardie	133·19	48·43	26·25	9·55	137·00	45·67	38·33	12·78
15. East Coolgardie	1,130·34	593·78	277·27	145·65	1,157·39	623·07	300·66	161·86
16. Coolgardie	286·29	159·91	142·78	79·75	347·32	189·01	164·67	89·61
17. Yilgarn	1,253·83	644·88	234·50	120·61	1,556·61	747·17	269·98	129·59
18. Dundas	756·48	420·71	418·26	232·61	716·29	409·31	390·13	222·93
19. Phillips River	....	3·23	....	0·50	....	....	....	....
20. Outside Proclaimed Goldfields	....	....	....	....	....	....	....	....
Total Averages	983·64	510·00	278·82	144·56	1,052·43	548·01	303·05	157·78

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 1957.

State.	Output of Gold.	Value.*	Percentage of Total.	
			Output of Commonwealth.	Output of Australasia.
	Fine oz.	£	%	%
Western Australia	896,681	3,808,865	74·429	72·609
Victoria	48,205	204,871	4·001	3·903
New South Wales	31,043	131,933	2·577	2·514
Queensland	64,834	275,544	5·381	5·250
Tasmania	19,442	82,628	1·615	1·574
South Australia	35	149	....	....
Territory of Papua and New Guinea	69,029	293,373	5·731	5·591
Northern Territory	75,476	320,773	6·266	6·113
New Zealand	30,195	128,329	....	2·446
	1,234,940	5,246,465	100·000	100·000

* Par Value (£4 4s. 11·45d. per fine ounce.)

TABLE 6.

Dividends, etc., paid by Western Australian Mining Companies during 1957, *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.	
		1957.	Grand Total to end of 1957.
		£	£
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.	1,050,000	3,840,626
	Various Companies	....	2,764,945
Mt. Margaret	Sons of Gwalia Ltd.	....	2,075,050
	Various Companies	....	958,286
North Coolgardie	Moonlight Wiluna G.M's. Ltd.	....	15,000
	Various Companies	....	712,551
Broad Arrow	do. do.	....	92,500
North-East Coolgardie	do. do.	....	129,493
East Coolgardie	Gold Mines of Kalgoorlie (Aust.) Ltd.	150,949	1,815,981
	Great Boulder Proprietary G.M's. Ltd.	218,750	8,278,150
	Lake View and Star Ltd.	437,500	(*b*) 8,055,750
	North Kalgurli (1912) Ltd.	154,687	2,227,497
	Various Companies	....	(*a*) 19,477,650
Coolgardie	do. do.	....	410,000
Yilgarn	do. do.	....	(*c*) 1,205,556
Dundas	Central Norseman Gold Corporation, N.L.	390,000	3,217,500
	Various Companies	....	786,162
	Totals	£2,401,886	£58,202,568

(*a*) Excluding £45,091 in bonuses and profit-sharing notes in years 1935–1936 by Boulder Perseverance Ltd., and £55,000 Capital returned in year 1932 and £42,000 in bonuses and profit-sharing notes in year 1934 by Golden Horseshoe (New) Ltd.

(*b*) Excluding £75,000 in bonuses and profit-sharing notes and £93,750 Capital returned in 1932–1935.

(*c*) Excluding £67,725 Capital returned in 1948 by Edna May (W.A.) Amalgamated, N.L.

TABLE 7.

Quantity and Value of Minerals, other than Gold and Silver, reported to the Mines Department during 1957.

Goldfield, District or Mineral Field.	1957.		Increase or Decrease as compared with 1956.	
	Quantity.	Value.	Quantity.	Value.
	Tons	£A	Tons	£A
ANTIMONY ORE AND CONCENTRATES—				
Pilbara	....	....	— 78·44	— 742
ASBESTOS (CHRYSOTILE)—				
West Pilbara	1,028·79	34,036	+ 534·94	+ 14,282
Pilbara	360·52	8,031	+ 93·27	+ 2,419
ASBESTOS (CROCIDOLITE)—				
West Pilbara	11,104·87	1,195,634	+ 3,818·90	+ 394,924
BARYTES—				
Murchison	....	....	— 426·10	— 2,031
Outside Proclaimed Goldfields	140·00	910	— 361·00	— 2,246
BENTONITE—				
Outside Proclaimed Goldfields	741·79	2,981	— 661·75	— 2,677
BERYL—				
Pilbara	284·05	52,129	+ 44·78	+ 8,376
Gascoyne	22·73	4,399	— 27·38	— 5,204
Coolgardie	42·40	7,470	+ 21·59	+ 3,713
Yalgoo	0·58	109	+ 0·58	+ 109
Outside Proclaimed Goldfields	0·61	127	+ 0·61	+ 127
CHROMITE—				
Peak Hill	1,312·30	20,997	— 4,783·90	— 76,529
CLAYS (CEMENT CLAY, FIRECLAY, BALL CLAYS)—				
Outside Proclaimed Goldfields	29,400·70	34,171	— 440·30	+ 664
COAL—				
Collie	838,660·53	2,552,656	+ 8,653·88	— *171,325
COPPER ORE AND CONCENTRATES—				
Peak Hill	96·16	7,365	+ 17·08	— 1,078
East Murchison	264·83	6,906	+ 164·24	+ 4,775
Pilbara	459·10	21,013	+ 436·39	+ 19,955
Phillips River	558·83	13,189	+ 552·37	+ 12,419
Ashburton	4·59	326	+ 4·59	+ 326
West Pilbara	381·75	8,967	+ 381·75	+ 8,967
Yalgoo	9·35	193	+ 9·35	+ 193
Mt. Margaret	19·92	404	+ 19·92	+ 404
Northampton	9·44	201	+ 9·44	+ 201
Outside Proclaimed Goldfields	....	....	— 3·39	— 340
CUPREOUS ORE AND CONCENTRATES—				
Pilbara	1,859·93	41,814	+ 6·81	— 1,158
West Pilbara	629·86	5,380	— 1,701·37	— 13,037
East Murchison	575·54	10,504	+ 164·11	+ 3,243
Peak Hill	1,464·37	20,352	— 978·75	— 17,487
Murchison	....	....	— 524·93	— 4,589
Mt. Margaret	9·60	163	— 72·07	— 644
Broad Arrow	....	....	— 5·54	— 11
Yilgarn	....	....	— 26·60	— 212
Phillips River	99·39	3,913	+ 66·91	+ 2,654
Ashburton	....	....	— 2·00	— 53
Outside Proclaimed Goldfields	....	....	— 1·19	— 22
DOLOMITE—				
Murchison	60·00	240	— 111·00	— 450
FELSPAR—				
Coolgardie	995·00	4,611	— 1,778·00	— 13,076
Outside Proclaimed Goldfields	....	....	— 8·00	— 32
FULLER'S EARTH—				
Outside Proclaimed Goldfields	....	....	— 40·13	— 201
GLASS SAND—				
Outside Proclaimed Goldfields	5,692·86	3,914	— 1,650·31	— 1,240
GLAUCONITE—				
Outside Proclaimed Goldfields	126·00	5,040	+ 41·00	+ 1,680
GYPSUM—				
Yilgarn	27,842·50	21,234	+ 6,453·50	+ 5,070
Outside Proclaimed Goldfields	5,510·40	4,733	— 221·60	— 31
IRON ORE (for Pig)—				
Yilgarn	21,838·50	324,646	+ 1,984·90	+ 45,800

TABLE 7—*continued.*

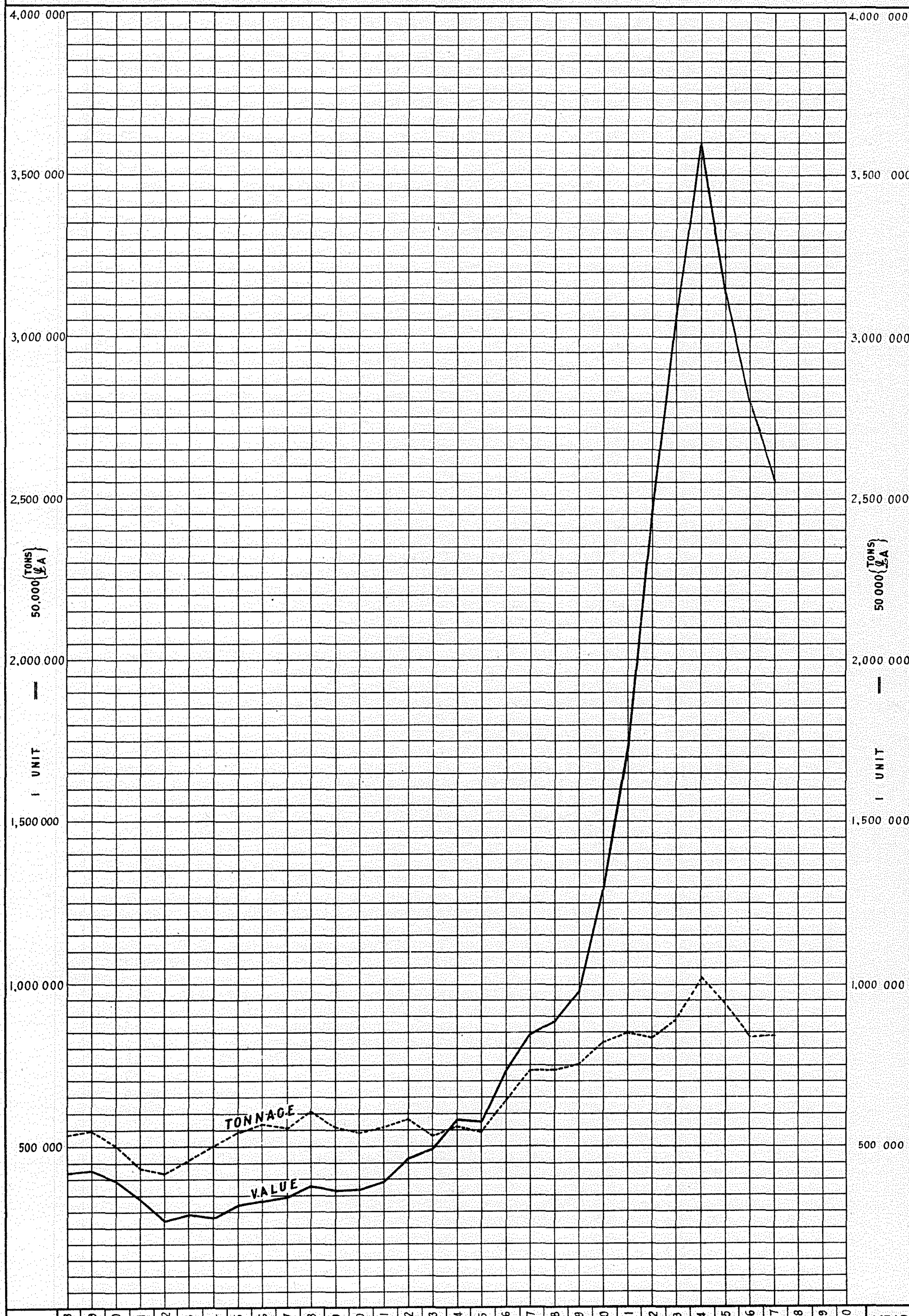
Quantity and Value of Minerals, other than Gold and Silver, reported to the Mines Department during 1957–*continued.*

Goldfield, District or Mineral Field.	1957.		Increase or Decrease as compared with 1956.	
	Quantity.	Value.	Quantity.	Value.
	Tons	£A	Tons	£A
IRON ORE (for Export)—				
West Kimberley	389,686·00	386,440	+ 61,871·00	+ 62,517
LEAD ORE AND CONCENTRATES—				
Northampton	3,322·51	255,971	— 3,008·24	— 296,351
SILVER/LEAD ORES AND CONCENTRATES—				
Ashburton	197·43	15,362	+ 40·83	+ 3,611
Gascoyne	....	....	— 7·60	— 631
Pilbara	657·62	42,938	— 460·32	— 35,611
West Pilbara	1·63	121	+ 1·63	+ 121
MANGANESE—				
Pilbara	13,496·14	227,329	+ 5,970·89	+ 125,170
Peak Hill	50,440·92	702,491	+ 643·03	+ 155,694
MAGNESITE—				
East Coolgardie	....	....	— 358·35	— 810
Coolgardie	....	....	— 445·20	— 1,168
MINERAL BEACH SANDS (ILMENITE)—				
Outside Proclaimed Goldfields	40,931·99	233,476	+ 37,638·59	+ 218,326
OCHRE (Red)—				
Murchison	10·00	100	— 358·93	— 3,495
OCHRE (Yellow)—				
Murchison	17·30	173	— 58·15	— 582
PHOSPHATIC GUANO—				
Outside Proclaimed Goldfields	586·89	8,974	+ 586·89	+ 8,974
PYRITES ORE AND CONCENTRATES—				
Dundas	45,342·00	327,761	— 3,084·00	— 35,188
East Coolgardie	12,575·72	54,806	+ 32·74	— 2,297
TALC—				
East Coolgardie	175·45	877	+ 98·33	+ 489
Outside Proclaimed Goldfields	3,478·20	49,029	— 900·25	— 5,021
TANTO/COLUMBITE ORE AND CONCENTRATES—	lb.		lb.	
Coolgardie	....	....	— 3,306·00	— 4,390
Phillips River	517·00	622	— 255·00	— 851
Pilbara	12,457·00	4,662	— 75,468·00	— 83,472
Greenbushes	37,064·00	6,547	— 30,588·00	— 27,120
TIN—	Tons		Tons	
Pilbara	221·16	125,330	— 5·96	— 11,635
Greenbushes	49·09	29,749	— 82·08	— 41,524
Murchison	....	....	— 0·06	— 35
VERMICULITE—				
East Coolgardie	....	....	— 1·04	— 9

* Adjusted Coal value for 1956.

GRAPH OF COAL OUTPUT

Showing Quantities and Values as reported to Mines Dept.



YEAR	VALUE £A	TONS
1928	420145	528420
1929	426706	544719
1930	394758	501425
1931	336178	432400
1932	270630	415719
1933	289806	458399
1934	278704	500343
1935	318013	537188
1936	331565	565075
1937	340444	553510
1938	375083	604793
1939	362811	557535
1940	364500	539427
1941	389278	556574
1942	461495	581176
1943	489721	531546
1944	583075	558322
1945	572896	543363
1946	730104	642287
1947	840249	730506
1948	880236	732938
1949	972245	750594
1950	1,287749	814351
1951	1,716788	848475
1952	2,457296	830461
1953	3,073073	886182
1954	3,588,818	1018343
1955	3,132074	903,792
1956	2,797,506	830,006
1957	2,552,655	838,660
1958		
1959		
1960		

GRAPH OF TREND IN COAL OUTPUT

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

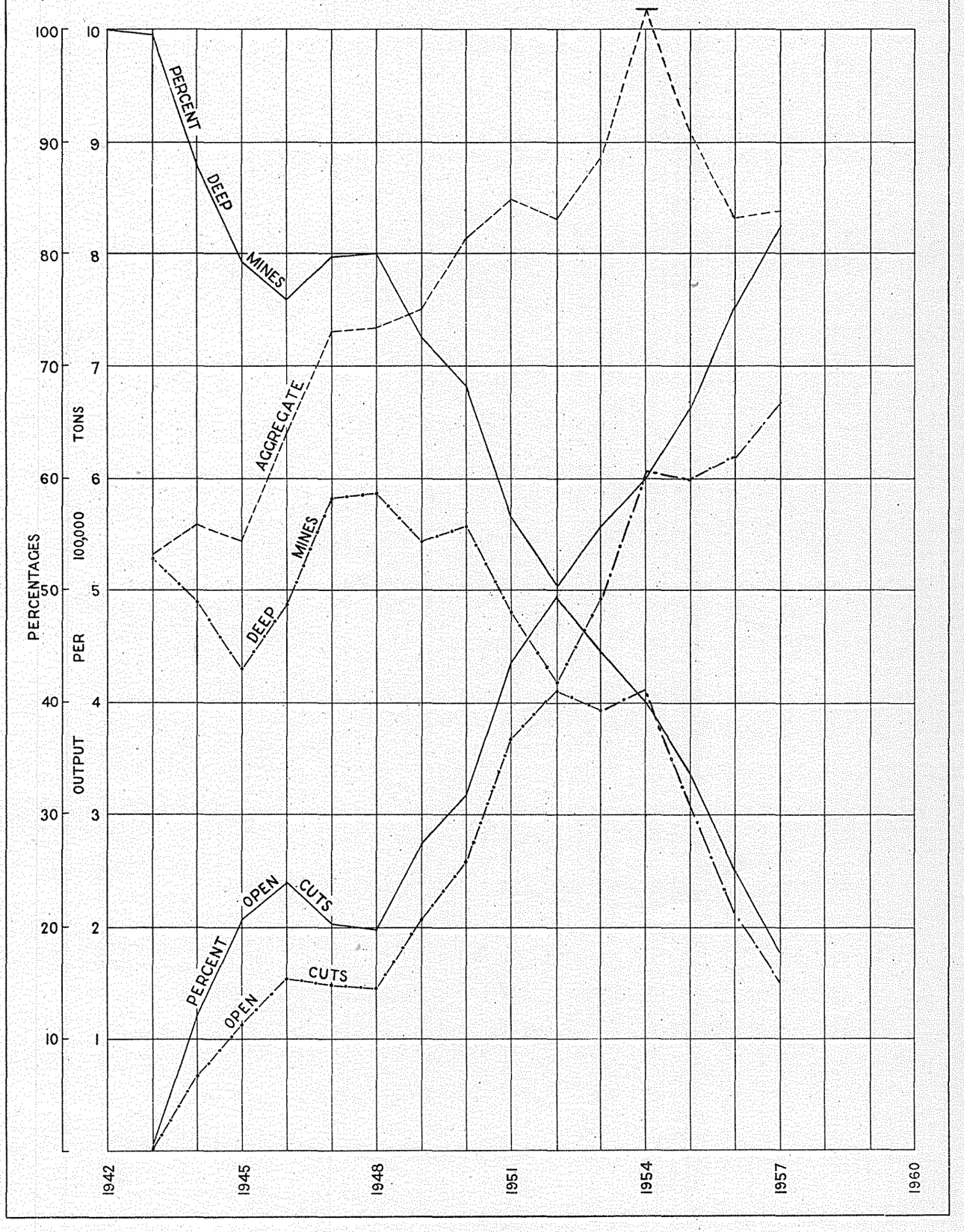


TABLE 8.

Total Coal output from Collie Coalfield during 1956 *and* 1957, *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—								
1956	621,465	2,029,712	300	776	1,076	2,071	801	577
1957	689,881	2,104,236	269	759	1,028	2,564	908	671
Open Cut Mining—								
1956	208,542	694,269	143	....	143	1,458	....	1,458
1957	148,779	448,420	108	....	108	1,377	....	1,377
Totals—								
1956	830,007	2,723,981	443	776	1,219	1,873	1,069	681
1957	838,660	2,552,656	377	759	1,136	2,224	1,104	738

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 31*st December,* 1956 *and* 1957.

Leases and Other Holdings.	1956.		1957.	
	No.	Acreage.	No.	Acreage.
Gold Mining Leases on Crown Lands	1,150	20,831	1,140	20,645
Gold Mining Leases on Private Property	40	908	28	620
Mineral Leases on Crown Lands	248	42,330	252	43,259
Mineral Leases on Private Property	21	2,135	24	2,203
Dredging Claims—				
Gold	1	20	....	....
Mineral	105	7,722	125	10,832
Mineral Claims	443	32,018	535	38,120
Prospecting Areas	*479	8,243	†494	8,356
Totals	2,487	114,207	2,598	124,035

* Includes 63 Prospecting Areas for minerals for a total acreage of 1,236 acres.

† Includes 53 Prospecting Areas for minerals for a total acreage of 1,082 acres.

PART IV.—MEN EMPLOYED.

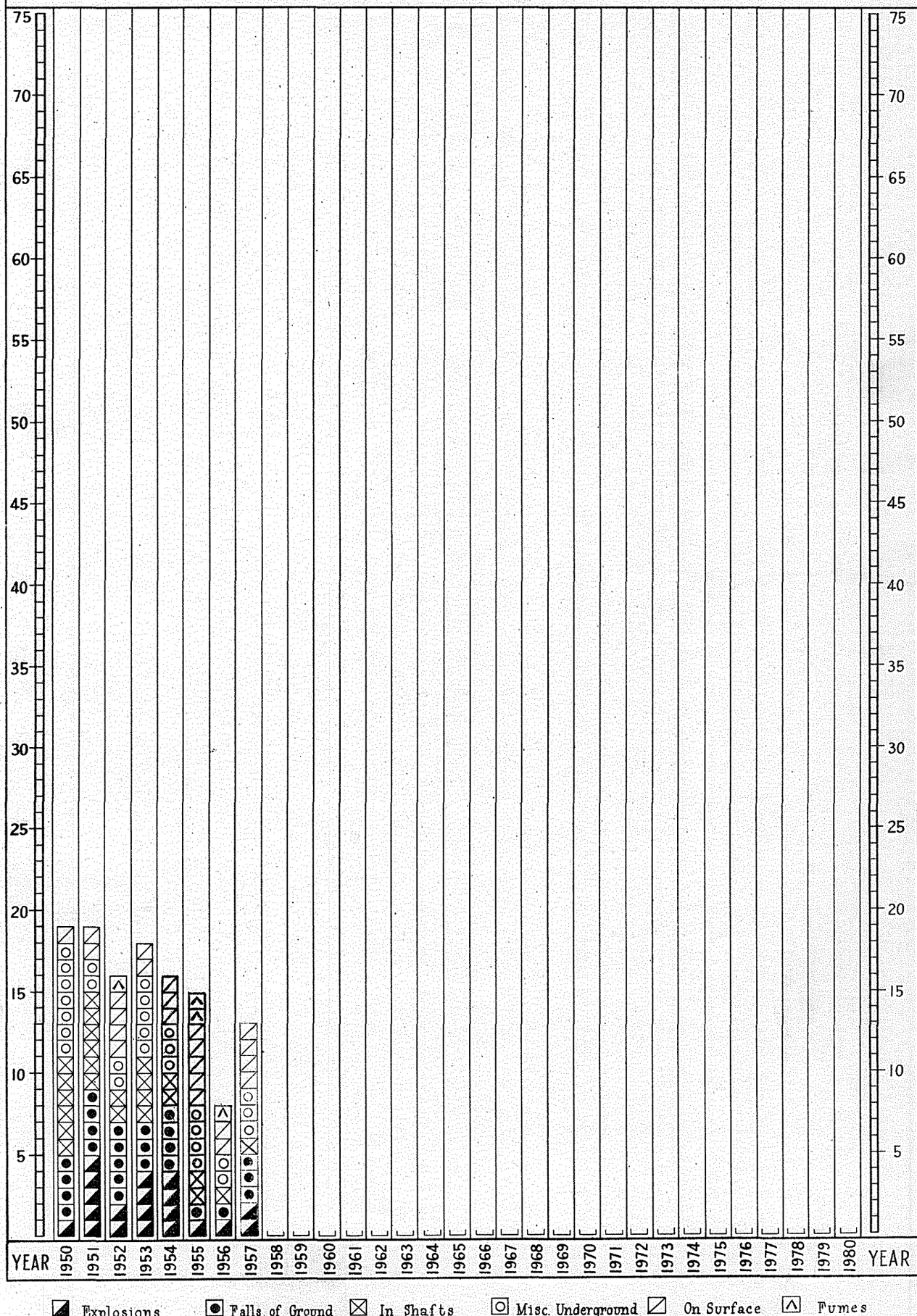
TABLE 10.

Average number of Men reported as engaged in Mining during 1956 *and* 1957.

Goldfield.	District.	Total. 1956.	Total. 1957.
Kimberley		4	4
West Kimberley		....	....
Pilbara	Marble Bar	35	44
	Nullagine	23	27
West Pilbara		....	....
Ashburton		....	....
Gascoyne		....	....
Peak Hill		8	11
East Murchison	Lawlers	8	8
	Wiluna	4	3
	Black Range	8	12
Murchison	Cue	51	50
	Meekatharra	24	20
	Day Dawn	14	14
	Mt. Magnet	250	231
Yalgoo		12	8
Mt. Margaret	Mt. Morgans	14	10
	Mt. Malcolm	279	266
	Mt. Margaret	45	19
North Coolgardie	Ularring	43	35
	Niagara	7	6
	Yerilla	29	22
	Menzies	111	103
Broad Arrow		82	70
North-East Coolgardie	Kanowna	10	8
	Kurnalpi	1	1
East Coolgardie	East Coolgardie	3,253	3,151
	Bulong	6	5
Coolgardie	Coolgardie	203	197
	Kunanalling	19	18
Yilgarn		698	626
Dundas		383	413
Phillips River		2	2
State Generally		2	2
Total, Gold Mining		5,628	5,385
Minerals Other than Gold—			
Asbestos		236	311
Barytes		2	2
Bentonite		2	2
Beryl		27	44
Chromite		5	3
Clays		10	9
Coal		1,219	1,136
Copper		2	69
Cupreous Ore (Fertiliser)		89	60
Dolomite		....	....
Felspar		12	4
Glass Sand		4	4
Glauconite		4	2
Gypsum		14	12
Iron Ore		120	139
Lead		161	137
Manganese		24	66
Ochre		2	2
Pyrites		125	121
Talc		5	5
Tanto-Columbite		6	2
Tin		64	46
Titanium (Ilmenite)		6	59
Total, Other Minerals		2,139	2,244

DIAGRAM OF ACCIDENTS

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



PART V.–ACCIDENTS.

TABLE 11.

MEN EMPLOYED IN MINES KILLED AND INJURED IN MINING ACCIDENTS DURING 1956 AND 1957

A.—*According to Locality of Accident*

Goldfield	Killed		Injured		Total Killed and Injured	
	1956	1957	1956	1957	1956	1957
1. Kimberley	....	....	....	....	....	....
2. West Kimberley	....	....	5	1	5	1
3. Pilbara	1	....	....	3	1	3
4. West Pilbara	....	....	24	22	24	22
5. Ashburton	....	....	....	....	....	....
6. Gascoyne	....	....	....	....	....	....
7. Peak Hill	1	....	1	4	2	4
8. East Murchison	....	....	....	....	....	....
9. Murchison	....	1	13	11	13	12
10. Yalgoo	....	....	....	....	....	....
11. Mount Margaret	2	1	31	27	33	28
12. North Coolgardie	1	....	11	6	12	6
13. North-East Coolgardie	....	....	....	....	....	....
14. Broad Arrow	....	....	....	....	....	....
15. East Coolgardie	2	5	330	272	332	277
16. Coolgardie	....	....	7	7	7	7
17. Yilgarn	1	....	37	42	38	42
18. Dundas	....	3	25	26	25	29
19. Phillips River	....	....	....	9	....	9
Mining Districts—						
Northampton	....	....	11	6	11	6
Greenbushes	....	1	....	....	....	1
Collie	1	....	150	109	151	109
South-West	....	1	12	10	12	11
Total	9	12	657	555	666	567

From the above table it will be seen that the number of fatal accidents for the year 1957 was 12 as against nine in 1956. The number injured showed a decrease of 102. 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	1956		1957		Comparison with 1956	
	Fatal	Serious	Fatal	Serious	Fatal	Serious
1. Explosives	1	5 (*a*)	2	9 (*c*)	+ 1	+ 4
2. Falls of Ground	1	48	3	46 (*d*)	+ 2	— 2
3. In Shafts	1	15	1	17	....	+ 2
4. Miscellaneous Underground	2	429	3	373	+ 1	— 56
5. Surface	3	160 (*b*)	3 (*e*)	110 (*f*)	....	— 50
6. Fumes	1	....	....	....	— 1	....
Total	9	657	12	555	+ 3	— 102

(*a*) Includes one serious accident in a quarry. (*b*) Includes 11 serious accidents in a quarry. (*c*) Includes one serious accident in a quarry. (*d*) Includes three serious accidents in quarries. (*e*) Includes one fatal accident in a quarry. (*f*) Includes six serious accidents in quarries.

PART VI.–STATE AID TO MINING.

(a) State Batteries.

At the end of the year there were 21 State Batteries, including the Northampton Base Metal Plant. Also, the Leonora Battery, although owned by the Prospectors' Association, is operated by the State Batteries Branch.

From inception to the end of 1957, gold, tin, tungsten, lead, copper and columbite ores to the value of £16,762,256 have been treated at the State Batteries. Included in the above amount is gold premium of £5,887,342, and premium paid by sales of gold by the Gold Producers' Association Ltd., of £39,905. £16,477,781 came from 3,164,544 tons of gold ore, £94,577 from 81,818 tons of tin ore, £18,850 from 3,960 tons of tungsten ore, £168,400 from 14,990.75 tons of lead ore and £2,648 from 130 tons of copper ore.

During the year 42,837.5 tons of gold ores were crushed for 18,658 ozs. bullion, estimated to contain 15,813 ozs. fine gold, equal to 7 dwts. 9 grs. per ton. The average value of sands after amalgamation was 2 dwts. 18 grs. per ton, making the average head value 10 dwts. 3 grs. per ton. Cyanide plants produced 3,506 ozs. fine gold, giving a total estimated production for the year of 19,319 ozs. fine gold valued at £302,489.

The working expenditure for the year for all plants was £166,348 and the revenue was £50,827, giving a working loss of £115,521, which does not include depreciation or interest.

(b) Prospecting Scheme.

There were 53 prospectors receiving assistance under the Prospecting Scheme at the end of the year. Expenditure for the year was £12,579 9s. 4d. and refunds amounted to £2,681 9s. 10d.

Assisted prospectors reported crushing 3,243.50 tons of ore for a total of 944 ozs. 13 dwts.

(c) Drilling Programme.

The Department's diamond drilling programme was continued during the year, the drills operating in the Pilbara, Murchison, East Murchison, Coolgardie, North-East Coolgardie and Mt. Margaret Goldfields.

At Bamboo Creek, Burnakura and at Agnew, promising results were obtained in consequence of which active work has been undertaken on the leases drilled at those centres.

Deep diamond drilling on the Great Fingall lode at Day Dawn continued throughout the year and the ore-body was intersected at 3,844 feet and 3,895 feet by a diversion hole from the original drill-hole, again with favourable results.

The rig was then moved to a new site and drilling is in progress to test the possible south-east extension of the downward continuation of the ore-body, 700 feet south-east of the first intersection, at the same vertical depth of 3,200 feet.

(d) Geological Survey of Western Australia.

The reports of the Geological Survey Branch, listed under the Annual Report of that Branch, represent some of the contributions made by this Branch to the mining industry during the year. A considerable portion of these activities is concerned with the exploratory diamond drilling of gold prospects, for which no charge for professional services is made, and only a portion of the operating costs is recoverable from the recipients of the very considerable help given by this Branch.

The collection and collation of geological information pertaining to the mineral resources of the State has proceeded during the year, but its distribution in the published form has been seriously delayed by the very slow rate of publication.

Information pertaining to the publications prepared by this Branch will be found in the Annual Report of the Geological Survey.

A steady demand has been made on the professional and clerical members of the staff for services and information in connection with a very wide range of geological matters during the year.

PART VII.–SCHOOL OF MINES.

(a) Kalgoorlie.

The total number of enrolments during the year was 387—an increase of 22 by comparison with 1956—and the number of examination passes was maintained at over 80 per cent. of those who sat.

In addition to teaching, the School continued to provide services to the public such as metallurgical investigations and free assays and mineral determinations for prospectors, a total of 398 samples being received from all sources for assay and for determination.

(b) Norseman.

Enrolments totalled 60, a decrease of two as compared with the previous year, but maintaining the average number in recent years.

Reg. Dowson Scholarships were awarded to W. K. Hedley and N. E. Wilson, the former also winning a Robert Falconer Prize.

Installation of L.P. Gas to all laboratories was completed during the year.

(c) Bullfinch.

An increase of 16 over the previous year brought enrolments up to a total of 57, the highest since the School has opened in 1953 when 69 students were enrolled.

As no suitable application was received, the position of Officer-in-Charge of the School remained vacant, but endeavours are still being made to fill this position.

It is greatly to the credit of the part-time Registrar and Instructors that, in the absence of an Officer-in-Charge, the School continued to operate so well.

The assistance and co-operation of School Advisory Committees, mining Companies at each centre, and the Chamber of Mines are also again greatly appreciated. Their aid has considerably contributed to the successful running of the Schools.

PART VIII.–INSPECTION OF MACHINERY.

The number of useful boilers registered at the end of the year totalled 6,734 against 7,476 for the preceding year, showing a decrease of 742 boilers after all adjustments.

Of the 6,734 useful boilers, 2,264 were out of use at the end of the year; 3,785 thorough and 685 working inspections were made and 3,869 certificates were issued.

Permanent condemnations total 1,040 and temporary condemnations 10; 46 boilers were transferred beyond the jurisdiction of the Act. This large number of permanent condemnations was due to the administrative action of transferring from the "potentially useful" list, vessels which were abandoned in the goldfields many years ago, and left lying in isolated places.

The total number of machinery groups registered was 38,516 against 37,592 for the previous year, showing an increase of 924.

Inspections made total 33,864 and 7,494 certificates were granted.

The total miles travelled for the year were 87,361 against 90,925 miles for the previous year, showing a decrease of 3,564. The average miles travelled per inspection were 2.30 as against 2.61 miles per inspection for the previous year.

430 applications were received and dealt with for Engine Drivers' and Boiler Attendants' certificates, and 358 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)	29

Second Class Competency (including certificates issued under Regulation 40 and Section 60 of the Act)	36
Third Class Competency (including certificates issued under Regulations 40 and 45 and Sections 60 and 63)	29
Locomotive and Traction Competency (including Certificates issued under Regulation 40 and Section 60)	5
Diesel Locomotive "A" Class Certificates of Competency (including certificates issued under Regulation 40 and Section 53 and 56)	3
Diesel Locomotive "A" Class Certificate of Service (including Certificates issued under Regulation 40 and Section 55)	19
Diesel Locomotive "B" Class Certificate of Service (including certificates issued under Regulation 40 and Section 55)	9
Internal Combustion Competency (including Certificates issued under Regulation 40 and Section 60)	38
Crane and Hoist Competency (including Certificates issued under Regulation 40 and Section 60)	97
Boiler Attendant Competency (including Certificates issued under Regulation 40 and Section 60)	84
Copies	6
	364

The total Revenue from all sources during the year was £16,176 10s. 5d. as against £16,094 6s. 10d. previous year, showing an increase of £82 3s. 7d.

The total Expenditure for the year was £31,334 11s. 9d. against £32,553 15s. 1d. for the previous year, showing a decrease of £1,219 3s. 4d.

PART IX.—GOVERNMENT CHEMICAL LABORATORIES.

The total number of samples registered for analysis, chemical and mineral examination, industrial and general investigation during the year was 19,950. These were allocated to the various Divisions according to the specialised nature of the work undertaken by each Division:—

The major activities of the Agriculture, Forestry and Water Supply Division continued to be chemical analyses for the Department of Agriculture, and examination of water samples from the Metropolitan, Town and Country Water Supplies and from primary producers.

This year 5,593 samples were received in this Division as against 6,502 last year. The decrease of 909 was due to substantially less samples of tobacco leaf being submitted.

Of the total number analysed there were 1,518 Cereal, 107 Fertilisers and Manures, 693 Horticulture, 71 Miscellaneous, 698 Pasture and Fodder, 242 Soil and 2,264 Water samples.

The routine examination of existing water supplies to cities and towns was continued and the Goldfields Water Supply pipeline was again treated with copper sulphate solution in an endeavour to control the growth of a sponge in the pipe-line. An inspection in October revealed that the copper treatment had been successful and further treatment would not be required for some time.

The Food, Drugs, Toxicology and Industrial Hygiene Division examined a total of 12,345 samples during the year, an increase of 598 over the number for the previous year.

The total consisted of 590 Food, 132 Industrial Hygiene, 715 Miscellaneous, 522 Pollution Survey, 9,981 Sewage and 405 Toxicology (359 human, 46 animals) samples.

As in previous years this Division undertook a wide variety of work, the major part being for the Metropolitan Water Supply, Sewerage and Drainage, Agricultural, Public Works, Public Health and Police Departments and the Milk Board of W.A.

The Fuel Technology Division carried out analyses or more prolonged investigational work on a total of 456 samples during the year, a decrease of 230 as compared with 1956.

This decrease was due to a greatly reduced number of samples in connection with the coked briquettes pilot plant which was substantially completed at the beginning of the year.

Regular coal sampling in the Collie mines and open-cuts was continued by that Division which also carried out further work on sawdust fired boilers, domestic heating and incineration.

Test work on a rotary drying kiln operating on damp ilmenite sand resulted in a much improved kiln performance, and the Division also gave advice regarding the possible use of flash drying of these sands. The latter method is less costly and is more convenient for the handling of the sand in and out of the drier.

In the Industrial Chemistry Division, where 64 samples were dealt with as compared with 47 in the previous year, the work has again been mainly (a) consultative (b) short term investigations, with no less than 2,172 enquiries being received.

This large number clearly indicates that manufacturers and the public generally are becoming increasingly aware of the Division as a source of valuable information and advice on technical matters.

The queries and problems put to the Division covered a wide range and many again concerned plastics and the protective coatings field.

It is interesting to note that some classes of epoxy and polyester resins were introduced to this State during the year and also that the Division formulated a plastic which can be used to produce inverted models of human organs for medical demonstration purposes.

The Mineralogy, Mineral Technology and Geochemistry Division received 1,632 samples during the year, an increase of just over 600 as compared with 1956.

The general public again made good use of the Division's services, sending in 1,155 samples of which 681 were examined free of charge in accordance with our policy of encouragement to prospectors.

As in previous years, samples covered a considerable variety of minerals and ores, and came in from all parts of the State.

Ilmenite ores and products showed the most significant increase, rising from 37 in 1955, and 107 in 1956 to 323 samples in the year under review.

PART X.—EXPLOSIVES.

Nine shipments brought into the State a total of 113,814 cases of explosives during the year as compared with 125,694 in 1956.

The decrease was due to a carry-over of stocks from the previous year, actual consumption in 1957 being much the same as last year.

The gold mining industry continued to be the largest consumer of explosives, accounting for more than half of the total used.

Increased quarrying activity caused a 50 per cent. rise in the quantity of explosives used, and making that industry the second largest consumer in place of the coal industry which has hitherto occupied that position.

The Branch continued to carry out analyses and tests of explosives, fuse and fireworks and inspected all shipments for condition and packing.

The fifth Conference of Australian and New Zealand Explosives Department was held in Perth early in the year and was attended by delegates from New Zealand and all Australian States excepting Queensland. These Conferences, which were inaugurated in 1948, are proving of great value in the interchanging of ideas and the bringing about of greater uniformity between the States regarding the control of explosives.

PART XI.—MINERS' PHTHISIS ACT AND MINE WORKERS' RELIEF ACT.

The periodical examination of miners was continued throughout the year at Kalgoorlie and also by the Mobile X-ray Unit which operated in the North Coolgardie, Mt. Margaret, East Murchison, Murchison, Pilbara and Northampton Fields.

Examinations under the Mine Workers' Relief Act totalled 4,406—a decrease of 661 as compared with the previous year—and there were also 1,160 examinations under the Mines Regulation Act—123 less than in 1956.

These decreases are considered due to the fact that the Mobile Unit did not visit the Yilgarn and Dundas Goldfields, where large numbers of miners are employed.

Compensation paid under the Miners' Phthisis Act decreased to £15,947 11s. 10d., and at the end of the year only 12 ex-miners and 135 widows were receiving these benefits.

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

The total output of coal for the year was 838,660 tons as compared with 830,007 tons in 1956—an increase of 8,653 tons.

Of the total, 689,881 tons or 82.26 per cent. was deep mined and 148,779 tons or 17.74 per cent. came from open-cuts.

The 1956 figures were 621,464 or 74.87 per cent. deep mined and 208,541 tons or 25.13 per cent. of open cut coal.

The total value of coal sold amounted to £2,552,656 at an average cost of 68s. 9d. per ton as compared with 67s. 5d. for the previous year.

The largest consumer, the State Electricity Commission, used 470,987 tons (56.15 per cent. of total production)—an increase of 37,060 tons over the previous year, but consumption by the W.A Government Railways dropped 28,564 tons to a total for the year of 269,712 tons—its lowest annual consumption since 1947.

With one exception, the deep mines are now almost completely mechanised and Collie thus remains the most highly mechanised coalfield in Australia.

It is pleasing to note that there were no fatal accidents during the year and that the accident rate was the lowest on record.

CHIEF DRAFTSMAN'S BRANCH.

Work was continued on the compilation of the Department's plans on the Transverse Mercator Projection within the National Mapping Grid, 26 sheets of original compilation plans being drawn.

The three surveyors attached to the Branch completed 147 surveys during the year and also carried out traversing and triangulation work to fix the location of various points.

The main work of the branch of maintaining all Departmental public plans, and plotting the positions of all mining tenements applied for was increased during the year as a result of widespread activity in the search for minerals.

STAFF.

Once again I would like to take the opportunity of publicly thanking all members of the Staff, both at Head Office and at Outstations, for the loyal and efficient manner in which they have carried out their duties.

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

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

Department of Mines,
Perth.

DIVISION II

Report of the State Mining Engineer for the Year 1957

Under Secretary for Mines:

The Annual Report of this branch for the year 1957 compiled by the Assistant State Mining Engineer from information supplied by District Inspectors of Mines and the Statistical Branch is submitted.

Workmen's Inspector Hunter who has been stationed at Marble Bar for many years retired and his place has been taken by Mr. J. L. Hunt who will be stationed at Port Hedland.

Fatal accidents are higher than for the previous year but that year was the lowest for many years.

Gold Mining is in a stable condition. There have been no new developments of major importance but the existing mines have maintained their position and there have been promising disclosures of ore particularly in the Great Boulder and North Kalgurli mines. The lower levels of the Sons of Gwalia have been disappointing and unless some new ore body is discovered this mine must close within the next few years. The Timoni mine is also nearing the end of its reserves.

The Eclipse mine at Mount Magnet has continued with plant construction and should be in production in the new year.

Development at Bamboo Creek has been hampered by an unusually dry season.

Minerals other than gold have received severe setbacks owing to market depression. The exception to this rule is Crocidolite. The blue asbestos industry at Wittenoom Gorge is expanding rapidly and the new mill is now in operation. A new road to Port Hedland has been constructed which will permit shipments from that port.

Ravensthorpe Copper is in regular production and will be in a much stronger position when it becomes possible to treat its concentrates in Australia.

Pyrites from the Iron King mine is likely to have difficulty in competing with imported sulphur and with concentrates from Kalgoorlie.

Interest has been maintained in Manganese ore and considerable tonnages have been developed.

The beach sands industry in the south west has settled down to steady production. The demand for Ilmenite has weakened and Western Titanium have turned to the production of the other minerals, stockpiled in the earlier production of Ilmenite.

Although the value of minerals exported shows only a moderate increase the position has improved a good deal in the last few years. Good supplies of the various minerals have been developed and mines have been equipped with plant. The major problems are now exploitation and marketing.

E. E. BRISBANE.
STATE MINING ENGINEER.

STATE MINING ENGINEER.

Mining activities for the year 1957 are described in this report, which is based on information supplied by the Statistician and Inspectors of Mines. The section on drilling written by Inspector Haddow and the report of the Board of Examiners for Mine Managers' and Underground Supervisors' Certificates, appear as appendices to this report.

STAFF.

Workmen's Inspector L. Cross commenced duties on the 8th January following the retirement of J. Gillespie from the Cue Inspectorate.

In August Inspector S. Hunter of Marble Bar retired after 12 years service as Workmen's Inspector. The vacancy was filled by Mr. J. L. Hunt who commenced duties as Workmen's Inspector of Mines on the 30th September.

ACCIDENTS.

Fatal and serious accidents in metal mines and quarries reported to the Department are shown below. The corresponding figures for 1956 are shown in brackets.

There were 12 (8) fatal and 446 (507) serious accidents.

In gold mines there were 10 (5) fatal and 388 (453) serious accidents. The number of men employed in such mines was 5,385 (5,628). The accident rate per 1,000 men was thus 1.86 (0.89) for fatal accidents and 72.05 (80.49) for serious accidents.

One man was killed in a limestone quarry accident and another in an open cut in the Greenbushes tin field.

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

Oil well drilling companies employing 192 men in the field reported one fatal, eight serious and nine minor accidents during the year.

The man killed was James Laing, an employee of Geophysical Service International at Yannery who was electrocuted when he touched a washing machine that was electrically alive through a developed fault in a flexile cord attached to the machine.

TABLE A.

SERIOUS ACCIDENTS FOR 1957.

Class of Accident	West Kimberley	Pilbara	West Pilbara	Peak Hill	Murchison	Northampton	Mount Margaret	North Coolgardie	East Coolgardie	Coolgardie	Yilgarn	Dundas	Phillips River	Greenbushes	South-West	Total
Major Injuries—Exclusive of Fatal—																
Fractures—																
Head	....	....	....	....	....	1	....	....	3	....	....	....	....	....	1	5
Shoulder	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1
Arm	....	....	....	....	....	....	....	....	1	....	1	....	2	....	....	4
Hand	....	....	....	....	....	....	1	....	2	....	....	....	....	....	....	3
Spine	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	1
Rib	....	....	....	....	....	....	3	....	1	....	3	....	....	....	....	7
Pelvis	....	....	1	....	....	....	....	....	2	....	....	....	....	....	....	3
Thigh	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	1
Leg	....	....	....	....	....	....	....	....	3	....	....	....	....	....	....	3
Ankle	....	....	....	....	....	....	1	....	4	....	....	....	....	....	....	5
Foot	....	....	1	....	....	....	....	....	2	....	4	1	....	....	....	8
Amputations—																
Arm	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	1
Hand	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Finger	....	....	....	1	....	....	2	....	1	....	....	....	....	....	....	4
Leg	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	1
Foot	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Toe	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Loss of Eye	....	....	1	....	....	....	....	....	....	....	....	....	....	....	1	2
Serious Internal	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Hernia	....	....	....	....	....	....	2	....	10	....	2	....	....	....	....	14
Dislocations	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	2
Other Major	....	....	1	....	....	....	4	....	12	....	3	2	1	....	1	24
Total Major	....	....	4	1	....	1	13	....	46	....	13	4	3	....	4	89
Minor Injuries—																
Fractures—																
Finger	....	....	3	....	2	....	3	....	5	....	2	1	....	....	....	16
Toe	....	....	2	....	....	....	2	....	5	....	3	....	....	....	....	12
Head	....	....	....	....	1	1	....	....	7	....	....	....	....	....	....	9
Eyes	....	....	1	....	....	....	2	....	4	....	3	1	....	....	....	11
Shoulder	....	....	....	....	1	....	2	....	3	....	1	1	1	....	....	9
Arm	....	1	....	....	1	....	....	3	11	1	1	....	....	....	....	18
Hand	....	....	5	....	....	1	2	1	73	4	13	5	4	....	1	109
Back	....	....	....	1	....	1	1	....	48	....	3	5	1	....	2	62
Rib	....	....	....	....	....	....	....	....	5	....	1	....	....	....	1	7
Leg	....	....	3	....	4	1	1	2	34	....	2	7	....	....	1	55
Foot	....	....	1	....	1	....	....	....	17	2	....	1	....	....	1	23
Other Minor	....	3	3	2	1	1	1	....	14	....	....	1	....	....	....	26
Total Minor	....	1	3	18	3	11	5	14	6	226	7	29	22	6	....	6	357
Grand Total	....	1	3	22	4	11	6	27	6	272	7	42	26	9	....	10	446

There were no accidents in the year under review in the following Goldfields :—
Kimberley. East Murchison. North-East Coolgardie. Ashburton.
Yalgoo. Gascoyne Broad Arrow.

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	311	....	22	134
Copper	129	....	9	21
Gold	5,385	10	388	1,792
Ilmenite	69	....	....	....
Iron Ore (for Pig)	6	....	....	....
Iron Ore (for Export)	133	....	1	12
Lead, Silver, Zinc	137	....	9	40
Manganese	66	....	4	10
Pyrite	121	....	3	23
Tin, Wolfram, Tantalum	48	1	....	....
Other Minerals	88	....	....	....
Rock Quarries	Not available	1	10	25
Total	....	12	446	2,057

Accidents classified according to causes for the various districts are shown in Table "C".

TABLE C.

Fatal and Serious Accidents showing Causes and Districts.

District	Explosives		Falls of Ground		Shafts		Fumes		Miscellaneous Underground		Surface		Total	
	Fatal	Serious	Fatal	Serious	Fatal	Serious	Fatal	Serious	Fatal	Serious	Fatal	Serious	Fatal	Serious
Kimberley	....	....	....	....	....	....	....	....	....	....	....	....	....	....
West Kimberley	....	....	....	....	....	....	....	....	....	....	....	1	....	1
Pilbara	....	....	....	....	....	....	....	....	....	....	....	3	....	3
West Pilbara	....	1	....	....	....	....	....	....	....	10	....	11	....	22
Ashburton	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Peak Hill	....	2	....	....	....	....	....	....	....	....	....	2	....	4
Gascoyne	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Murchison	....	....	....	2	....	....	....	....	1	2	....	7	1	11
East Murchison	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Yalgoo	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Northampton	....	....	....	1	....	1	....	....	....	3	....	1	....	6
Mount Margaret	....	....	....	4	....	3	....	....	1	11	....	9	1	27
North Coolgardie	....	....	....	1	....	1	....	....	....	4	....	....	....	6
Broad Arrow	....	....	....	....	....	....	....	....	....	....	....	....	....	....
North-East Coolgardie	....	....	....	....	....	....	....	....	....	....	....	....	....	....
East Coolgardie	2	5	2	21	....	5	....	....	....	197	1	44	5	272
Coolgardie	....	....	....	2	....	....	....	....	....	5	....	....	....	7
Yilgarn	....	....	....	4	....	4	....	....	....	27	....	7	....	42
Dundas	....	....	1	1	1	1	....	....	1	20	....	4	3	26
Phillips River	....	....	....	1	....	2	....	....	....	2	....	4	....	9
Greenbushes	....	....	....	....	....	....	....	....	....	....	1	....	1	....
South-West	....	1	....	3	....	....	....	....	....	....	1	6	1	10
Total for 1957	2	9	3	40	1	17	....	....	3	281	3	99	12	446
Total for 1956	1	5	1	39	1	15	1	....	2	306	2	142	8	507

FATAL ACCIDENTS.

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

Name and Occupation	Date	Mine	Details and Remarks
Sulkava, Aimo Manuel (Machine Miner)	4/2/57	North Royal Shaft, Central Norseman Gold Corporation, Norseman	Suffered severe head injuries when struck by a fall of earth on the No. 7 level, 269 stope.
Matthews, Frederick Charles Thomas (Brush Hand)	Accident 4/2/57 Died 9/2/57	Great Boulder G.M., Fimiston	Died from pulmonary embolism and fatty heart following a fall in the plant which ruptured his spleen.
Marzinotto, Francesco Pietro (Mullocker)	20/3/57	Sons of Gwalia, Gwalia	Asphyxiated when buried by a run of mullock in a pass below the No. 26 level.
Vollrath, Wolfgang Georg Wolhelm (Trucker)	Injured 29/3/57 Died 30/3/57	North Kalgurli (1912) Ltd., Fimiston	Death was due to shock and medullary failure which followed severe leg injuries received when he was struck by stone falling down a manway in the 1,100 Dower Lode stope.
Scott, John Francis (Quarry Worker)	8/4/57	Carati's Quarry, Spearwood. Operated by Swift Civil Engineering Contractors	Crushed by the loaded scoop of an overloader which fell on him following the accidental release of the brake.
Perry, Bernard Henry Charles (Hydraulic Gun Operator)	16/5/57	South-West Tin Pty. Ltd., Greenbushes	Suffered head injuries when he slipped or was knocked over by the gun and fell onto the pressure pipe line.
Dalsanto, Gelindo (Winch Driver)	23/7/57	Regent Shaft, Central Norseman Gold Corporation, Norseman	Collapsed and died on the 2,200 level. Death was due to coronary occlusion which may have been accelerated by over-exertion during the course of his employment.
Wickins, Frederick Robert (Machine Miner)	16/9/57	Ivanhoe Shaft, Lake View & Star Ltd., Fimiston	Died from shock following multiple injuries received from an explosion, which resulted from boring into an old hole containing fracteur. He was boring short holes for timber hitches in the No. 16 intermediate level, New Lode stope, when the explosion occurred.
Petruskevicius, Jonas (Miner)	11/10/57	Crown Shaft, Central Norseman Gold Corporation N.L., Norseman	Received head injuries when he was thrown out of a loading box which was momentarily hung up about 50 feet above the No. 9 level of the inclined shaft.
McNair, Jim (Machine Miner)	Injured 23/10/57 Died 24/10/57	Hill 50 Gold Mine, Mt. Magnet	Died from head injuries received when he slipped and fell from a stope bench below the 900 ft. sub-level onto broken ore about 45 feet below. It would appear that he slipped on stepping off the chain ladder leading into the stope.
Grey, Ronald Hopetoun (Tool Sharpener)	29/10/57	Perseverance Lease, Gold Mines of Kalgoorlie (Aust.) Ltd., Fimiston	Grey was struck by flying fragments of a blocked drill steel which exploded whilst being warmed on top of a furnace frame. It is thought that a short section of the water hole was blocked with undetonated explosive.
Milne, George Henry (Machine Miner)	14/11/57	Main Shaft, Great Boulder Mines Ltd., Fimiston	Suffered injuries to pelvis and chest when he was crushed by a fall of rock in the 1,400 ft. level 10 lode stope. It would appear that he was barring down at the time of the accident.

WINDING MACHINERY ACCIDENTS.

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

Fatal (1).—This accident, in the Crown Shaft, Norseman, has been included under the heading of fatal accidents.

Overwinds (7).—An overwind occurred at the Chaffers Shaft on the 4th October. At the time of the mishap six men were being brought to the surface in the right hand cage. Approaching the surface the driver shut the throttle but did not reverse the engine. The unbalanced left hand skip thus was raising the cage against compression. The driver wishing to reduce speed and thinking that the engine was reversed, opened the throttle. The application of the brakes was not sufficient to stop the cage at the brace and it went to the skip tipping tracks before it was stopped. No damage was done.

On the 13th July, the driver overwound the skip at the Sons of Gwalia mine whilst hoisting ore. It was alleged that he was under the influence of alcohol. An inquiry was held and the Board found that the driver was guilty of negligence and his certificate was suspended for a period of two calendar months.

At the Lake View shaft on the 2nd May, a learner driver allowed the right hand skip to overshoot the tipping point. Whilst attempting to pull the full left hand skip the regular driver accidentally allowed the right hand detaching gear to enter the thimble thus freeing the rope.

Errors of judgment accounted for two overwinds.

On two occasions skips were overwound when the drivers failed to reverse the engines after tipping the skips of ore.

Cages Hung Up (5).—Timber had been lowered to No. 12 level, in the main Shaft of the Great Boulder Gold Mines, and when being taken out it jammed and momentarily took the weight of the cage allowing the grippers to operate. When the platman freed the timber he rang the cage to lower and walked away. The driver lowered about 200 feet of rope when a shift boss on the 1100 level saw the rope piling up and stopped the driver. The rope was not damaged.

A cage hung up in the Copperhead shaft during greasing operations on 8th March. The rigger signalled for the speed to be decreased and when the brakes were applied the empty skips rebounded and the grippers held on the descending skip. About 800 feet of rope was lowered on to the stationary cage and a large amount of it was damaged.

Following an overwind on the previous day, 15th April, the platman at the 1300 level signalled to change cages and for the left hand cage to be lowered to him. This was to check the indicator mark for the level. The cage did not arrive although the rope was lowered to the mark on the engine. It was later discovered to be hung up about 40 feet above the 1300 level. The platman again rang for the cage and the driver lowered the right hand cage to him. He rang this cage to the surface and as it was hoisted it fouled slack rope which had come through from the other compartment. The driver notice the heavy load indicated by his ammeter reading and stopped the cage. The cage was then lowered on the brake to the 1200 level. Some damage was done to the cage in the left hand compartment, to the ropes and to the shaft timbers.

A cage hung up in Lane Shaft—Great Boulder Mine on 18th December while a relief driver was receiving instructions. It is thought that the cage bounced sufficiently to engage the grippers. No damage was done.

On 20th December a split skid caused a skip to hang up in the Oroya Shaft of the Gold Mines of Kalgoorlie. The rope was found to be knotted near the capel and 20 feet was cut off.

Cage Out Of Control (1).—On 16th September the skip and man car were being run through the North Royal shaft—Central Norseman Gold Corportion prior to lowering the men on shift. When the driver applied the brakes at about 1200 feet the skip and car ran on and hit the penthouse at 1300 feet. Approximately 150 feet of rope ran out but was not damaged. Slight damage was done to the shaft skip and man-car. When the brakes were checked no defect was found.

Derailments (11).—A skip derailment caused nine legs to be knocked out in the North Royal Shaft—Central Norseman Gold Corporation on 24th March.

On the 27th March the north skip in the Regent shaft was hauling men to the surface. The south skip was descending empty when the driver noticed the rope was slack and stopped the engine. Twelve legs were knocked out. The two skips were 100 feet apart when brought to rest.

In the same shaft on 11th April the skipman noticed a badly bent axle on a skip. Subsequent inspection showed that three centre legs and one end leg had been knocked out below No. 36 level.

A descending skip was derailed in the North Royal shaft on 16th May. Ore had been pulled at No. 7 bin. The south skip descending in single gear was derailed by a stone just below No. 8 bin. No damage was done.

A descending empty skip was derailed near 27 level in the Regent Shaft on 29th May. No damage resulted.

A derailment occurred in the North Royal Shaft on 13th June. The North skip descending, empty, was derailed at about No. 11 level and knocked out 6 centre legs before it could be stopped.

On 3rd August the south skip at the Sons of Gwalia mine was derailed when a rail broke below the No. 25 plat. Several shaft legs were displaced and numerous fishplate bolts were sheared.

The north skip descending empty in the Regent shaft Central Norseman Gold Corporation was derailed at No. 34 plat on 15th October. Normal hoisting was in progress. Five centre legs were knocked out.

The north skip at the Sons of Gwalia was derailed on 7th December while hoisting ore from No. 29 bin. The back wheel left the rails at No. 14 bin and ran on the runner for some distance. Two legs were knocked out. The shaft alarm operated and the driver stopped the skip between 11 and 12 levels. A split runner apparently caused the mishap.

On the 11th December the north skip at the Sons of Gwalia left the rails as it was coming out of the tip and some slack rope was paid out. No damage resulted.

A skip was derailed by spillage as it was pulled away from No. 16 level bin in the Regent Shaft—Central Norseman Gold Corporation on 23rd December. The skipman stopped it within a few feet but one centre was knocked out.

Mechanical Failures (4).—A crack developed in the bed-plate of the winder at Edwards Shaft—Great Boulder Mine on 1st May. Repairs were made on the mine.

On 30th August a section of the cheek plate on the left hand drum of the winder at Hamilton Shaft—Great Boulder Mine broke as the left-hand skip was nearing the surface. The driver stopped the engine at once and no other damage was done.

A rope on the Croesus Shaft of the North Kalgurli mine broke on 14th October while ore was being hoisted. The cause of the failure was internal corrosion. The ropes had been cut two days previously and the cut ends were in good condition.

On 13th December the rope used to haul the loading boxes used in sinking the Internal shaft on the Copperhead mine fouled a fish plate and was broken by the hoist. Steps have been taken to prevent a recurrence.

Miscellaneous (1).—While ore was being hoisted at the Lake View shaft on 2nd August the overload control operated and the brakes were automatically applied. The rope was just crossing from one layer to the next. One turn of the rope came off the drum.

PROSECUTIONS.

There were no prosecutions during the year.

SUNDAY LABOUR PERMITS.

Four permits were issued during the year. Great Boulder Gold Mines Ltd. were permitted to employ seven men to pull ore from underground bins on one day. This followed repairs to the winder.

Great Western Consolidated were granted permission to employ six men to clean broken rock from No. 18 level ventilation chamber and to replace pipes rails and ventilation dust.

Permission was also given for the employment of six men for one Sunday to lay rails in the Internal Shaft.

On another occasion seven men were permitted to work one Sunday placing steel frame sets and bracing in the Internal shaft.

AUTHORISED MINE SURVEYORS.

The Survey Board issued six certificates during the year.

CERTIFICATES OF EXEMPTION (Section 46).

Eleven certificates were issued as compared with thirteen in 1956.

PERMITS TO FIRE OUTSIDE PRESCRIBED TIMES (Regulation 51).

Central Norseman Gold Corporation was issued with a permit for No. 34 level Regent Shaft which is in an isolated position.

ADMINISTRATIVE.

Mines Regulation Act.—Regulations 16 and 21 which refer to the conduct of elections for Workmen's Inspectors of Mines were amended and Regulation 22 was revoked. Notice appeared in the *Government Gazette* of 1st May, 1957.

The Kimberley Goldfield was proclaimed a Mining District by notice published in the *Government Gazette* of 20th September, 1957.

Regulation 14 was amended by notice in the *Government Gazette* of 30th September, 1957. This regulation deals with the salaries of Workmen's Inspectors of Mines.

Regulations 43 and 44 were amended to improve the sense of the wording by notice in the *Government Gazette* of 30th September, 1957.

Mining Act.—Regulation 1 was amended, Regulation 2 was revoked and Regulation 206 was amended by notice in the *Government Gazette* of 5th November, 1957.

Building stones were brought under the provision of Part VII of the Act by proclamation in the *Government Gazette* of 29th November, 1957.

Regulation 55 was also amended to include building stones by notice in the *Government Gazette* of 4th December, 1957.

VENTILATION.

All major mines have been regularly inspected and temperature readings and dust counts have been recorded.

Results of dust counting are tabulated below:—

Dust Samples from	No. of Samples	Samples giving over 1,000 p.p.c.c.	Average Count
Development	548	9	174
Stoping	951	7	169
Levels	129	2	294
Surface	195	3	197
Totals	1,823	21	175

The average remains about the same as usual and the number of places where bad conditions have been reported is also similar except that there is some increase in the development ends where high counts were obtained.

Major changes in ventilation systems occurred in the Great Boulder where the sinking of Hamilton Shaft to the No. 31 level has been completed and a fan installed.

The connection of No. 22 level Kalgurli Shaft to No. 18 level Main Shaft is continuing at the North Kalgurli (1912).

A new fan is planned for the Enterprise mine and should be installed early in the new year.

Central Norseman Gold Corporation have completed the sinking of the Crown Shaft and the connection to No. 14 level Regent Shaft. No. 15 and No. 16 levels have been connected by a rise.

At the Copperhead mine two rises have been put up from No. 18 to No. 16 level and the fan has been shifted from No. 12 to No. 18 level.

Some trouble has been experienced at Hill 50 because of the big flow of air necessary to clear the smoke of firing from the open stopes. A larger fan is contemplated.

At Wittenoom Gorge operations are now concentrated in the Colonial mine and the ventilation in this mine under the influence of a 60-inch axial flow fan is good.

Improvements in dust collection at hard rock quarries have been noted.

A Board of Reference on dust control in the plant at Wittenoom Gorge was attended and evidence was placed before the board.

ALUMINIUM THERAPY.

Aluminium powder has been distributed regularly at all licensed change rooms. Frasers Mine has been added to the list of those using the treatment.

FUMING ACCIDENTS.

Eleven minor fuming accidents were reported. Fortunately there was no serious or fatal accident from this cause.

Following on fatal accidents from fumes in 1956 an investigation into the fumes produced by explosives was conducted. The results indicate that the amount of carbon monoxide gas produced by explosives is very much higher than that produced under the same conditions in 1938. Some further investigations are being made by the explosives manufacturers.

GOLD MINING.

The ore treated during the year amounted to 2,951,011 tons as compared with 2,870,273 tons in the previous year while the gold recovered was 849,741 fine ounces as compared with 813,617 fine ounces.

The recovered grade which averages 5.76 dwts. per ton is little above the figure of 5.67 dwts. per ton recorded in the previous year.

The calculated value of the gold won is £A13,304,752 which figure includes £A27,544 received during the year from premium sales.

The Mint value of gold throughout the year was £15 12s. 6d. per fine ounce.

A reduction in the labour force from 5,612 in 1956 to 5,385 in 1957 is recorded.

Average production of ore per man for the year was 548.01 tons valued at 90.17 shillings per ton as compared with 511.45 tons of ore valued at 88.66 shillings in the previous year.

Gold recovery per man averaged 157.80 fine ounces as compared with 144.98 fine ounces in the previous year.

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

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	61·54	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	2,463,423	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
1956	2,870,273	813,617	12,724,923	88·67	5,612	312·80	5·67
1957	2,951,011	849,741	13,304,752	90·17	5,385	313·15	5·76

TABLE E.

CLASSIFICATION OF GOLD OUTPUT FOR 1957 BY GOLDFIELDS.

Goldfield	Unclassified 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
		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	
	Fine ozs.		Fine ozs.		Fine ozs.		Fine ozs.		Fine ozs.		Fine ozs.		Fine ozs.		Fine ozs.		Fine ozs.		Fine ozs.	Fine ozs.
Kimberley	67·85	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	67·85
West Kimberley	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Pilbara	169·74	8	145·00	3	470·74	....	....	....	....	....	....	....	....	....	....	....	....	....	....	785·48
West Pilbara	....	1	56·95	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	56·95
Ashburton	0·69	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0·69
Peak Hill	44·57	4	54·74	1	160·27	....	....	....	....	....	....	....	....	....	....	....	....	....	....	259·58
Gascoyne	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Murchison	942·63	27	798·76	4	693·37	....	....	....	....	....	....	....	....	....	....	1	83,192·69	....	....	85,627·45
East Murchison	95·45	....	....	1	109·89	....	....	....	....	....	....	....	....	....	....	....	....	....	....	205·34
Yalgoo	73·76	3	38·49	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	112·25
Mount Margaret	1,176·66	6	299·23	....	....	....	....	....	....	....	....	....	....	1	31,043·09	....	....	....	....	32,518·98
North Coolgardie	1,479·88	14	339·07	8	1,417·13	2	1,422·72	1	3,085·55	....	....	1	15,780·98	....	....	....	....	....	....	23,525·33
Broad Arrow	1,232·14	8	197·18	3	605·27	2	893·14	....	....	....	....	....	....	....	....	....	....	....	....	2,927·73
North-East Coolgardie	32·04	1	83·46	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	115·50
East Coolgardie	1,281·51	19	741·41	3	984·52	1	928·83	1	3,232·76	....	....	....	....	....	....	1	75,326·86	3	428,334·08	510,829·97
Coolgardie	884·94	12	193·97	2	508·29	....	....	....	....	1	7,372·36	1	10,306·96	....	....	....	....	....	....	19,266·52
Yilgarn	537·07	12	332·86	4	1,181·04	1	960·44	3	7,025·50	1	6,127·43	1	12,842·30	....	....	1	51,988·15	....	....	80,994·79
Dundas	47·61	1	1·02	1	108·55	....	....	....	....	....	....	....	....	....	....	1	91,913·49	....	....	92,070·67
Phillips River	....	1	2·51	1	356·74	....	....	....	....	....	....	....	....	....	....	....	....	....	....	359·25
State Generally	16·34	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	16·34
Totals	8,082·88	117	3,284·65	31	6,595·81	6	4,205·13	5	13,343·81	2	13,499·79	3	38,930·24	1	31,043·09	4	302,421·19	3	428,334·08	849,740·67

TABLE F.

Classification of Gold Output, 1953–1957.

Range of Output.	1957.			1956.			1955.			1954.			1953.		
	No. of Producers.	Production.	Percentage of Total.	No. of Producers.	Production.	Percentage of Total.	No. of Producers.	Production.	Percentage of Total.	No. of Producers.	Production.	Percentage of Total.	No. of Producers.	Production.	Percentage of Total.
Fine ozs.		Fine ozs.			Fine ozs.			Fine ozs.			Fine ozs.			Fine ozs.	
Over 100,000	3	428,334·08	50·5	2	289,315	35·5	2	280,878	33·6	2	275,139	31·9	2	272,467	33·2
50,000–100,000	4	302,421·19	35·6	5	377,203	46·3	5	368,426	44·1	6	387,840	45·1	5	296,444	36·0
40,000– 50,000	....	....	....	....	....	....	....	....	....	....	....	....	1	41,799	5·1
30,000– 40,000	1	31,043·09	3·6	....	...	....	....	....	....	1	31,150	3·6	1	33,677	4·1
20,000– 30,000	....	....	....	1	27,376	3·4	3	68,600	8·2	4	69,964	8·1	2	49,699	6·0
10,000– 20,000	3	38,930·24	4·6	4	63,742	7·8	4	68,958	8·3	3	44,664	5·2	4	64,358	7·8
5,000– 10,000	2	13,499·79	1·6	3	21,112	2·6	2	12,282	1·5	3	22,798	2·6	2	18,142	2·2
4,000– 5,000	....	....	....	1	4,045	0·5	....	....	....	....	....	....	1	4,636	0·6
3,000– 4,000	2	6,318·31	0·7	1	3,906	0·5	1	3,454	0·4	....	....	....	1	3,795	0·5
2,000– 3,000	2	5,160·59	0·6	2	5,376	0·7	1	2,451	0·3	....	....	....	1	2,703	0·3
1,000– 2,000	1	1,864·91	0·2	3	4,074	0·5	5	7,233	0·9	5	7,641	0·9	6	7,685	0·9
500– 1,000	6	4,205·13	0·5	5	3,798	0·5	8	5,579	0·7	14	9,666	1·1	12	7,894	0·9
100– 500	31	6,595·81	0·8	33	7,817	0·9	39	9,119	1·1	22	4,611	0·5	54	12,378	1·5
Under 100	117	3,284·65	0·4	112	2,893	0·4	121	3,414	0·4	149	4,280	0·5	184	3,988	0·5
Sundry Claims, etc.	....	8,082·88	0·9	....	2,960	0·4	....	3,932	0·5	....	4,239	0·5	....	3,666	0·4
Totals	172	849,740·67	100·0	172	813,617	100·0	191	834,326	100·0	209	861,992	100·0	276	823,331	100·0

TABLE G.

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

Mine.	1957.			1956.			1955.			1954.			1953.		
	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.	....	137	....	....	481	....	14,691	5,675	7·73	405,684	59,985	2·96	402,906	54,142	2·69
Boulder Perseverance, Ltd.	Now incl. in G.M.K. (Aust.) Ltd.			122,397	18,354	3·00	126,251	25,046	3·97	133,800	31,150	4·66	136,257	33,677	4·94
Callion (New Coolgardie G.M. N.L.)	....	....	....	8,305	4,045	9·74	26,922	13,037	9·69	30,974	15,385	9·93	29,926	16,023	10·71
Central Norseman Gold Corporation, N.L.	168,846	91,913	10·89	160,961	89,039	11·06	160,224	95,700	11·95	157,877	83,396	10·56	155,451	73,869	9·50
Gold Mines of Kalgoorlie (Aust.), Ltd.	523,617	147,341	5·63	222,456	61,217	5·50	195,732	52,552	5·37	209,311	60,370	5·77	191,292	57,184	5·98
Great Boulder Pty. Gold Mines, Ltd.	459,734	128,928	5·61	428,571	122,313	5·71	423,879	114,560	5·41	417,874	107,670	5·15	409,814	106,775	5·21
Great Western Consolidated, N.L.	462,799	73,367	3·17	444,185	76,279	3·43	423,012	62,136	2·94	445,864	55,330	2·48	392,508	50,192	2·56
Haoma Gold Mine	4,043	3,233	15·99	3,731	2,725	14·61	3,565	3,454	19·38	4,609	5,487	23·81	3,827	4,636	24·23
Hill 50 Gold Mines, N.L.	107,128	83,193	15·53	106,479	83,720	15·72	104,010	81,801	15·72	92,411	71,813	15·50	83,865	41,799	9·97
Horseshoe (Anglo Westralian Mining Pty., Ltd.)	1,339	160	2·39	....	....	....	....	....	....	45,347	8,524	3·76	54,923	8,896	3·24
Kalgoorlie Enterprise Mines Ltd.	Now incl. in G.M.K. (Aust.) Ltd.			66,744	12,839	3·85	74,429	19,627	5·27	69,789	21,599	6·19	65,220	18,119	5·56
Lake View & Star, Ltd.	664,895	159,811	4·81	657,105	158,487	4·82	656,099	157,527	4·80	657,197	157,667	4·80	657,621	156,589	4·76
New Coolgardie Gold Mines, N.L.	Now incl. in G.M.K. (Aust.) Ltd.			32,560	16,109	9·90	33,296	19,180	11·52	33,534	15,761	9·40	39,570	17,176	8·68
North Kalgurli (1912), Ltd.	337,888	75,327	4·46	351,374	66,948	3·81	348,829	76,237	4·37	251,988	56,945	4·52	253,967	61,057	4·81
South Kalgurli Consolidated, Ltd.	Now incl. in G.M.K. (Aust.) Ltd.			70,631	15,375	4·35	84,928	20,328	4·79	97,711	22,197	4·54	102,449	23,673	4·62
State Batteries	42,837	15,813	7·38	35,740	13,218	7·40	42,207	15,203	7·20	34,600	11,848	6·84	40,218	15,003	7·47
The Sons of Gwalia, Ltd.	137,934	31,043	4·50	113,598	27,376	4·82	102,742	23,226	4·52	103,237	26,168	5·07	100,525	26,026	5·18
Timoni (Moonlight Wiluna G.M., Ltd.)	31,445	15,781	10·04	30,754	17,174	11·17	30,056	17,114	11·39	24,290	13,518	11·13	23,105	13,039	11·29
Total	2,942,505	826,047	5·62	2,855,591	785,699	5·50	2,850,872	802,403	5·63	3,216,097	824,813	5·13	3,143,444	777,875	4·95
Other Sources (excluding large Retreatment Plants)	8,506	6,542	15·38	14,682	11,578	15·80	14,176	14,106	19·90	24,281	16,288	13·42	26,431	22,815	17·26
Total (excluding large Retreatment Plants)	2,951,011	832,589	5·64	2,870,273	797,277	5·56	2,865,048	816,509	5·70	3,240,378	841,101	5·19	3,169,875	800,690	5·05
Golden Horseshoe Sands Retreatment	....	....	....	....	5,003	....	....	6,607	....	....	8,787	....	....	9,246	....
Great Western Consolidated N.L. Sands Retreatment	....	3,712	....	....	....	....	....	....	....	....	....	....	....	....	....
Lake View & Star Retreatment	....	9,934	....	....	8,515	....	....	8,791	....	....	8,802	....	....	9,102	....
State Batteries Tailing Treatment	....	3,506	....	....	2,822	....	....	2,419	....	....	3,302	....	....	4,293	....
GRAND TOTAL	2,951,011	849,741	5·76	2,870,273	813,617	5·67	2,865,048	834,326	5·82	3,240,378	861,992	5·32	3,169,875	823,331	5·20

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	Hill 50 G.M. N.L.	....	1,572	1,695	1,049	7,457	11,773
	Gold Mining Lease 1463M	125	....	....	....	....	125
	Margueritta	40	....	55	45	....	140
Mount Margaret	Sons of Gwalia	....	928	485	1,456	6,704	9,573
North Coolgardie	Timoni	....	108	....	154	....	262
	Altona	....	120	....	150	....	270
East Coolgardie	Lake View and Star Ltd.	....	16,095	2,038	5,883	10,230	34,246
	Great Boulder	437	9,495	2,563	5,072	6,074	23,641
	North Kalgurli (1912) Ltd.	176	11,387	1,865	2,846	16,664	32,938
	Gold Mines of Kalgoorlie (Aust.)	....	14,274	5,414	5,632	34,374	59,694
	Kalgoorlie Southern Gold Mines N.L.	....	....	....	....	2,855	2,855
	Daisy Gold Mine	....	205	20	53	1,234	1,512
	Haoma Gold Mine	....	187	92	128	2,151	2,558
Coolgardie	New Coolgardie G.M.	....	2,996	287	657	4,956	8,896
Yilgarn	Great Western Consolidated—						
	Copperhead	115	4,662	854	3,021	8,792	17,444
	Fraser's	28	2,924	1,108	1,588	11,538	17,186
	Corinthian	....	123	21	95	45	284
	Golden Peg	....	....	....	....	934	934
	Nevoria	122	919	211	250	1,652	3,154
	Marjorie Glen	....	50	....	50	....	100
	Radio	....	270	90	105	....	465
Dundas	Central Norseman Gold Corporation N.L.						
	Phoenix	....	2,064	....	1,602	2,671	6,337
	North Royal	122	985	31	647	18,783	20,568
	Crown	361	7,404	538	1,032	17,597	26,932
Pilbara	Prince Charlie Gold Mine	....	35	....	....	....	35
	The Trump G.M.	50	....	....	....	....	50
	Homeward Bound G.M.	....	....	....	....	260	260
	Total in Gold Mines	1,576	76,803	17,367	31,515	154,971	282,232
Pyrites—							
Dundas	Norseman Gold Mines	....	1,453	66	806	5,036	7,361
Asbestos—							
Pilbara	Fibre Queen	120	....	20	....	....	140
West Pilbara	Australian Blue Asbestos	....	2,674	646	435	....	3,755
Copper—							
Peak Hill	Kumarina	....	85	....	....	....	85
Pilbara	Copper Hills	100	100	30	100	1,860	2,190
West Pilbara	Yannery	53	137	60	122	....	372
Lead—							
Pilbara	Ragged Hills	....	180	....	100	....	280
	Coronation	80	....	15	....	....	95
Ashburton	June Audrey	....	40	....	10	....	50
	Gift	61	100	....	10	....	171
	Dingo	....	30	....	....	....	30
	Bilrose	....	50	....	....	....	50
Northampton	Mary Springs	60	20	....	....	....	80
	Surprise	....	92	50	203	....	345
	Springvale	....	292	56	268	....	616
	McGuires	313	485	84	136	2,917	2,935
	Protheroe	....	711	71	336	3,253	4,371
	A.G.M. Syndicate	79	100	....	16	....	195
	Wheal Fortune	....	71	....	51	....	122
	Ghurka	....	740	25	358	....	1,123
	TOTAL IN ALL MINES	2,442	84,163	18,490	34,466	168,037	307,598

OPERATIONS OF THE PRINCIPAL MINES.

EAST COOLGARDIE GOLDFIELD.

The total ore treated was 1,966,413 tons and the gold yield of 510,830 fine ounces was an average of 5.29 dwts. per ton.

In the previous year 1,935,413 tons of ore yielded 474,683 fine ounces at an average of 4.91 dwts. per ton.

The number of men employed was 3,156 as com- with 3,253 in the previous year.

The gold won amounts to 60.12 per cent. of the state's production.

There was very little activity in the *Bulong District* the total production being 110 fine ounces from the treatment of 579 tons of ore.

In the *East Coolgardie District* 510,655 fine ounces was recovered from the treatment of 1,965,833 tons of ore. The activities of the principal producers are described below.

Lake View and Star Limited, with a production of 664,895 tons remains the state's largest producer. The gold recovered from underground ore was 159,811 fine ounces and this was supplemented by 9,934 fine ounces from re-treatment of old sands giving a total production of 169,745 fine ounces.

An electric winder on the Ivanhoe shaft was completed and came into operation towards the end of the year.

Gold Mines of Kalgoorlie (Aust.) Limited treated 487,930 tons of ore for a recovery of 129,662 fine ounces of gold at an average of 5.32 dwts. per ton.

This places them second on the list of the State's producers.

The programme in progess provides for the installation of an ore pass system and mine bins and for skip haulage at the Perserverance Shaft. A haulage level connecting the South Kalgurli mine will be driven on the 1400 and 2300 levels.

Favourable developments have been made on the Paringa and Hainault leases.

Pyritic concentrates are now railed to North Fremantle where the sulphur is utilised for the manufacture of sulphuric acid.

Great Boulder Gold Mines Limited treated 459,734 tons for a return of 128,928 fine ounces, the average return being 5.61 dwts per ton.

Hamilton Shaft has been deepened to 3,236 feet and a hoisting station established at 3186 horizon. Light alloy skips are in use in this shaft.

An internal shaft below 2950 has been commenced in a position adjacent to the Main Shaft.

The mine is responding well to development in depth and it is interesting to note that both tonnage and grade have shown consistent increases over the last three years.

North Kalgurli (1912) Ltd. treated 337,888 tons for a return of 75,327 fine ounces at an average of 4.46 dwts. per ton. Kalgurli Shaft has been sunk to No. 22 level and connected at that level to No. 18 level North Kalgurli Shaft.

Pilot winzes to assist in sinking North Kalgurli shaft to No. 19 level have been sunk.

The Croesus mine has been placed in production and encouraging developments have been made. Preparations are in hand for a change over to filling with wet tailings.

Kalgoorlie Southern Mines continued No. 10 hole to a depth of 5,440 feet. Driling has been suspended pending the arrival of a drill of greater capacity.

The *Champagne Syndicate* crushed 2,504 tons from the dumps at Mt. Charlotte for a return of 299 fine ounces.

Two small mines the *Golden Key* and *Lesanben* crushed 239 tons for 199 fine ounces and 137 tons for 42 fine ounces respectively.

At *Mount Monger* the *Haoma* mine which produced 3,233 fine ounces from the treatment of 4,043 tons was nearing the end of its reserve and its early closure is anticipated. The *Daisy* obtained 929 fine ounces from the treatment of 1,012 tons of ore and *Rosemary* obtained 466 fine ounces from the treatment 1,148 tons of ore.

DUNDAS GOLDFIELD.

In this goldfield 92,071 fine ounces of gold representing 10.84 per cent. of the state's production was obtained from the treatment of 169,045 tons of ore. The average grade being 10.90 dwts. per ton. In the previous year production from 161,131 tons amounted to 89,089 fine ounces. The number of men employed was 413 as compared with 383 in the previous year.

Practically all of production was from *Central Norseman Gold Corporation* which treated 168,846 tons for a return of 91,913 fine ounces of gold. Vigorous development including 27,781 feet of diamond drilling has disclosed additional tonnages of good grade ore.

The Crown Shaft has been sunk to No. 15 level and plats and loading stations have been completed at 11, 14, and 15 horizons. An electric hoist and skips have been installed.

Norseman Gold Mines did some drilling to test gold bearing ore bodies but mining was confined to pyrites production at the Iron King Mine.

MURCHISON GOLDFIELD.

In the *Murchison Goldfield* 85,627 fine ounces of gold was obtained from the treatment of 115,751 tons of ore at an average of 14.80 dwts. per ton. This production represents 10.08 per cent. of the State's output.

In the previous year 85,914 fine ounces was obtained from the treatment of 110,531 tons of ore at an average of 15.55 dwts. per ton.

The number of men employed was 315 as compared with 239 in the previous year.

Cue District produced 666 fine ounces from 1,087 tons. This includes 363 fine ounces from the clean up at Big Bell and sands re-treatment. The most successful of the small mines was the *Orange Bell* which treated 373 tons for a return of 84 fine ounces. This mine is close to the Big Bell.

Meekatharra District produced 889 fine ounces from the treatment of 4,660 tons. The most successful mines being the *Lady Central* with 319 fine ounces from 1,620 tons, and the *Bluebird* with 116 fine ounces from 397 tons. Some development work was undertaken with departmental assistance on the *Margueritta*.

Day Dawn District produced 75 fine ounces from the treatment of 1,015 tons of ore. Drilling for the continuation of the Great Fingall lode continued throughout the year.

Mt. Magnet District produced 83,979 fine ounces from the treatment of 108,988 tons of ore. The principal producer was *Hill 50* with 83,193 fine ounces from 107,128 tons at an average of 15.53 dwts. per ton. The tonnage treated remains substantially the same but there has been a slight recession from the grade of 15.72 dwts. per ton reported in the previous year.

A new headframe and winding gear have been brought into operation and shaft sinking with a target 200 feet below the bottom of the existing shaft has been commenced.

The construction of a treatment plant on the *Eclipse* mine was commenced during the year, and should be in operation during 1958.

YILGARN GOLDFIELD.

Yilgarn Goldfield produced 80,995 fine ounces, equal to 10.84 per cent. of the State's production from the treatment of 466,984 tons at an average of 3.47 dwts. per ton. In the previous year 84,187 fine ounces of gold was obtained from the treatment of 450,126 tons at an average of 3.74 dwts. per ton. Gold production includes 4,583 fine ounces from the treatment of residues.

The labour force was 625 employed as compared with 698 in the previous year.

The principal producer was *Great Western Consolidated N.L.* at Bullfinch, which reported the following treatment: From the Copperhead Group, 380,144 tons averaging 3.00 dwts. per ton for 51,988 fine ounces; from the Frasers Group, 37,000 tons averaging 6.94 dwts. per ton for 12,842 fine ounces; from the Nevoria Group, 14,802 tons averaging 3.25 dwts. per ton for 2,409 fine ounces, and from the Corinthian Group, 30,853 tons averaging 3.97 dwts. per ton for 6,127 fine ounces or a total of 462,799 tons averaging 3.17 dwts. per ton treated for a recovery of 73,367 fine ounces. A further 3,712 fine ounces were obtained from the re-treatment of sands.

An inclined shaft from a position on No. 14 level is in course of sinking. Ore from the northerly sections of the mine below this level will be delivered to a transfer pass feeding the crusher below No. 16 level.

Satisfactory developments are reported from *Frasers*, the *Corinthian* and *Nevoria*.

A small mine at *Eenuin* called the *Birthday* obtained 156 fine ounces from 130 tons of ore.

The consistent *Radio* at *Golden Valley* crushed 1,482 tons for a return of 1,865 fine ounces.

The *Francess Furness* at *Marvel Loch* obtained 179 ounces from 438 tons.

The *Marjorie Glen* at *Mount Rankin* obtained 385 fine ounces from 296 tons of ore.

The *Sunshine Reward* at Edwards Find which has been under option for some time has now been taken over by Hill 50 Central.

MOUNT MARGARET GOLDFIELD.

Mount Margaret Goldfield was responsible for 3.83 per cent. of the State's production. The yield from 140,530 tons was 32,519 fine ounces, the average being 4.62 dwts. per ton. In the previous year 120,368 tons yielded 29,776 fine ounces at an average of 4.96 dwts. per ton. There is thus a slight drop in grade which has been more than balanced by increased production.

The men employed numbered 295 as compared with 338 in the previous year.

Mount Morgans District produced 262 fine ounces from 565 tons of ore, the only producers of note being *Morgans Gold Mines Ltd.* with 62 fine ounces from 350 tons, and *Queen of the May* at *Yundamindera* with 76 fine ounces from 205 tons.

In the *Mount Malcolm District* there were only two producers. *Sons of Gwalia* treated 137,934 tons for a return of 31,043 fine ounces at an average of 4.50 dwts. per ton. In the previous year 113,598 tons was treated for 27,736 fine ounces at an average of 4.82 dwts. per ton.

The use of horses underground has been discontinued and the increased tonnage reflects the mechanisation of underground operations.

The fall in grade has been evident for some time past and supplies of payable ore are limited.

The only other producer was the *Jessie Alma* with 77 fine ounces from 83 tons of ore.

Production from sundry claims brought the total for the district to 31,401 fine ounces from 138,647 tons of ore.

Mount Margaret District reported 856 fine ounces from the treatment of 1,318 tons of ore. The Lancefield contributed 42 ounces from 1,009 tons of ore and the *Laverton State Battery* obtained 707 fine ounces from the treatment of sands.

NORTH COOLGARDIE GOLDFIELD.

North Coolgardie Goldfield reported the treatment of 40,738 tons of ore averaging 11.55 dwts. per ton for a recovery of 23,525 fine ounces equal to 2.77 per cent. of the state's production. In the previous year the treatment of 47,622 tons of ore averaging 11.40 dwts per ton yielded 27,646 fine ounces of gold.

There were 168 men employed as compared with 190 in the previous year.

In the *Menzies District* which returned 16,492 fine ounces from the treatment of 32,445 tons of ore the principal producer was *Moonlight Wiluna Gold Mines Ltd.* who obtained 15,781 fine ounces from 31,445 tons of ore at an average of 10.04 dwts. per ton from their *Timoni* mine at *Mount Ida.* In the previous year they treated 30,754 tons for a return of 17,174 fine ounces at an average of 11.17 dwts. per ton. There has thus been a slight decline in grade. The extraction of ore is now approaching the limits of the ore bodies and development has been suspended.

The *First Hit* at *Menzies* obtained 193 fine ounces from 215 tons.

In the *Ularring District* 2,710 fine ounces was obtained from the treatment of 2,592 tons of ore. At *Morley's Find* the *Emerald* reported 125 fine ounces from 483 tons; the *First Hit* 145 fine ounces from 202 tons of ore and the *Paramount* 259 fine ounces from 220 tons.

At *Mulline* the *Ajax West* crushed 966 tons for 525 fine ounces and the *Golden Wonder* crushed 42 tons for 209 fine ounces.

Sundry claims contributed 548 fine ounces the principal contributor being the rich PA 1291U.

In the *Niagara District* the *Altona* with 898 fine ounces from 2,097 tons, the *Cosmopolitan South* with 109 fine ounces from 100 tons and *New Gladstone* with 123 fine ounces from 217 tons supplemented by 13 fine ounces from sundry claims produced 1,142 fine ounces from 2,445 tons.

The *Yerilla District* reported, 3,181 fine ounces from the treatment of 3,256 tons of ore the principal producer being *Yilgangie Queen,* with 3,986 fine ounces from the treatment of 2,848 tons.

COOLGARDIE GOLDFIELD.

Coolgardie Goldfield reported the production of 19,267 fine ounces of gold from the treatment of 40,637 tons of ore averaging 9.48 dwts. per ton. In the previous year production was 17,705 fine ounces from 35,500 tons averaging 9.97 dwts. per ton.

The men employed numbered 215 as compared with 222 in the previous year.

Although tonnage treated shows an increase on the previous year it will be noted that the labour force is a little smaller.

Development has ceased on *Bayleys South* and *New Coolgardie.*

The *Rayjax* at *Bonnievale* obtained 115 fine ounces from the treatment of 55 tons and the *Jackpot* at Coolgardie crushed 1,141 tons for 393 fine ounces.

The total from the *Coolgardie District* was 19,210 fine ounces from the treatment of 40,396 tons.

There was little activity in the *Kunanalling District.* The total production from 241 tons of ore being 56 fine ounces.

PILBARA GOLDFIELD.

The *Pilbara Goldfield* produced 785 fine ounces the principal producers being *Prince Charlie* with 259 fine ounces from 310 tons and *Normay* with 105 fine ounces from 110 tons in the *Marble Bar District* and the *Barton* with 109 fine ounces from 89 tons in the *Nullagine* district.

Some increase in employment is recorded the figure for this year being 71 as compared with 58 in the previous year. This reflects the work being done at Bamboo Creek following a successsful diamond drilling programme.

PHILLIPS RIVER GOLDFIELD.

In the *Phillips River Goldfield* almost the whole of the reported production of 359 fine ounces was recovered as a by-product from the operations of Ravensthorpe Copper.

PEAK HILL GOLDFIELD.

In the *Peak Hill Goldfield* a production of 160 fine ounces from 1,339 tons was reported by *Anglo Westralian Mines Pty. Ltd.* in a total of 260 fine ounces from 1,821 tons.

Gold Mining in other fields was confined to minor prospecting. *Kimberley Goldfield* recorded 68 fine ounces; *West Pilbara* 57 fine ounces, *Yalgoo* 112 fine ounces, *North-East Coolgardie* 116 fine ounces, and miscellaneous sources produced 16 fine ounces.

MINERALS OTHER THAN GOLD AND COAL.

The production of minerals, other than gold and coal, for 1956 and 1957 is shown in the table below.

PRINCIPAL MINERALS OTHER THAN GOLD AND COAL.

Mineral	1956		1957	
	Tons	Value £A	Tons	Value £A
Antimony (Concentrates)	78·44	742	....	....
Asbestos—				
Chrysotile	761·10	25,366	1,389·31	42,067
Crocidolite	7,285·97	800,710	11,104·87	1,195,634
Barytes	927·10	5,187	140·00	910
Bentonite	1,403·54	5,658	741·79	2,981
Beryl	310·19	57,113	350·37	64,234
Chromite	6,096·20	97,526	1,312·30	20,997
Clays—				
Cement Clay	18,314·00	15,208	11,551·00	12,340
Fireclay	9,437·00	9,939	17,646·70	20,816
White Clay	2,090·00	8,360	203·00	1,015
Copper—				
Ore and Concentrates	212·23	12,742	1,803·97	58,564
Fertiliser Grade	7,713·31	113,443	4,638·69	82,127
Dolomite	171·00	690	60·00	240
Felspar	2,781·00	17,719	995·00	4,611
Fullers Earth	40·13	201	....	....
Glass Sand	7,343·17	5,154	5,692·86	3,914
Glauconite	85·00	3,360	126·00	5,040
Graphite	5·10	37	....	....
Gypsum	27,121·00	20,928	33,352·90	25,967
Ilmenite	3,293·40	15,150	40,931·99	233,476
Iron Ore—				
For Pig	19,853·60	278,846	21,838·50	324,646
Exported	327,815·00	323,923	389,686·00	386,440
Lead ore and Concentrates	7,612·89	643,253	4,179·19	314,392
Magnesite	803·55	1,978	....	....
Manganese	57,323·14	648,956	63,937·06	929,820
Ochre—				
Red	368·93	3,595	10·00	100
Yellow	75·45	755	17·30	173
Phosphatic Guano	....	....	586·89	8,974
Pyrites	60,968·98	420,052	57,917·72	382,567
Silver (fine ounces)	217,247·01	90,973	197,128·75	77,697
Talc	4,455·57	54,438	3,653·65	49,906
Tantalo-Columbite	71·27	127,664	22·49	11,831
Tin	358·35	208,273	270·25	155,079
Vermiculite	1·04	9	....	....
Totals	....	4,017,948	....	4,416,558

Brief notes on mineral production are given below.

Asbestos.

Production of crocidolite and chrysotile increased to 12,494 tons valued at £1,237,701. Output has nearly trebled in the last two years following on increased demand from local and overseas buyers.

Australian Blue Asbestos obtained all their output from the Colonial mine. A new mill is being constructed at this mine and when completed and operating satisfactorily all production will pass through it.

The target for 1958 is a 25 per cent. increase on this year's output of 11,105 tons valued at £1,195,634.

Production of chrysotile from Hancock's leases, at Lionel and Nunyerry, rose to nearly 1,400 tons for the year.

Barytes.

The 140 tons produced were obtained from the Cranbrook deposit in the south-west.

Bentonite.

Marchagee was the producing centre for the 742 tons produced.

Beryl.

The demand for this mineral was maintained and the price remained constant at £16 8s. 9d. per unit BeO, f.o.b. Australian ports with the minimum grade of 10 per cent. BeO. Main producing centres were the Pilbara, Coolgardie and Gascoyne Goldfields.

Chromite.

One thousand three hundred and 12 tons, valued at £20,997, were obtained by the Broken Hill Pty. Co. Ltd. from the Coobina deposit.

Clays.

Clay production from the metropolitan area, Glen Forrest, Clackline and Mt. Kokeby, totalled 29,401 tons valued at £34,171.

Copper.

Towards the end of the year increased demand, for fertilizer grades, assisted the industry to regain some of its former importance. Of the 6,443 tons produced 72 per cent. was absorbed by superphosphate works.

The Copper Hills mine at Spinaway Well in the Pilbara operated throughout the year and production amount to 2,244 tons valued at £61,185. Some diamond drilling was undertaken during the year.

Production from the Thaduna Hill deposit on the Peak Hill goldfield amounted to 1,445 tons assaying 8.3 per cent. Cu and valued at £16,589.

In the Phillips River goldfield, Ravensthorpe Copper Mines N.L. produced 530 tons of concentrate valued at £11,155. Most of the ore came from old dumps and development work on the Nos. 1 and 2 levels of the Elverdton shaft.

Other major producing centres were Roebourne, Kathleen Valley, Kumarina, and Barrambie.

Dolomite.

Sixty tons valued at £240 were obtained, by Westralian Ores Pty. Ltd., from the Mt. Magnet deposit.

Felspar.

Operations at the Londonderry quarry were restricted following falling off of demand through stockpiling of the product. 995 tons valued at £4,611 were railed to Perth during the year.

Fullers Earth.

No production was recorded for the year under review.

Glass Sand.

Production from the Lake Gnangara deposit amounted to 5,693 tons valued at £3,914.

Glauconite.

The Gingin deposit yielded 630 tons of greensand from which 126 tons of glauconite were recovered. The value of production was £5,040.

Gypsum.

Gypsum production rose approximately six thousand tons to 33,353 tons as compared with the previous year. Major sources of supply were Yellowdine, Lake Brown, Baandee and Nukarni.

Ilmenite.

Beach sand mining reached a new high in 1957 when 40,932 tons of ilmenite valued at £233,476 were shipped from Bunbury.

Western Titanium at Capel recovered 26,730 tons assaying 54.59 per cent. TiO_2. Plant extensions have been made to enable recovery of associated minerals, mainly monazite.

Cable (1956) Ltd. at Bunbury produced 14,202 tons assaying 54.4 per cent. TiO_2 and valued at £75,010.

Westralian Oil Ltd's. pilot plant at Yoganup will be in operation during the coming year. At Wonnerup near Busselton, Ilmenite Pty. Ltd. is erecting a small plant which should be producing in the near future.

Iron Ore.

At Cockatoo Island, Australian Iron and Steel Ltd. shipped 389,686 tons of ore, assaying 63 per cent. Fe, to the Eastern States. At no time was the crushing plant working to capacity.

The Charcoal Iron and Steel Industry at Wundowie obtained 21,838 tons of 62.9 per cent. Fe ore from the Koolyanobbing deposit. A start has been made to form another quarry face in high grade ore on the eastern end of the deposit.

Lead.

The downward trend in lead prices had a marked effect on local production, which was about half that of the previous year. The State's output for 1957 was 4,179 tons of concentrate containing 3,087 tons of lead valued at £314,392. Northampton was the principal producing field with 3,323 tons of concentrate followed by the Pilbara with 658 tons, and Ashburton with 197 tons.

Silver recovered from the concentrates was valued at £1,974.

Anglo Westralian operating at Protheroe was the leading producer with 1,738 tons of concentrate valued at £138,637. The closing down of this mine early in the new year is expected as all ore above the No. 4 level in the Protheroe lode has been extracted and exploratory diamond drilling has failed to disclose ore of economic importance.

The Gurkha Lead Mine Pty. Ltd., also in the Northampton field, completed another successful year with 1,092 tons of concentrates valued at £83,732. This mine appears to be capable of producing high grade ore for some time provided the demand warrants such production.

In the Pilbara the "Ragged Hills" lead mine produced 658 tons of lead silver concentrate worth £44,161. Operations at this mine were curtailed in December because of the market failure.

Magnesite.

No production was recorded for the year.

Manganese.

This mineral received considerable attention throughout the year and many new deposits were discovered and pegged in entirely new localities. The remoteness of many of the deposits has involved the interested parties in a considerable amount of road building.

The year's production was 63,937 tons valued at £929,820 coming mostly from the Horseshoe and Mt. Sydney centres.

Westralian Ores Pty. Ltd. operating at Horseshoe and Peak Hill obtained 50,441 tons assaying 45.50 per cent Mn and valued at £702,492. Included in the above production was 222 tons of battery grade ore assaying 84 per cent. Mn.

The Northern Minerals Syndicate obtained 13,496 tons of manganese assaying 49.50 per cent. Mn from the Mt. Sydney and Bee Hill deposits.

The above figures refer only to results of shipments finalised during the year.

Ochre.

From the Weld Range 10 tons of red and 17 tons of yellow ochre were obtained. The total value of production was £273 f.o.r. Cue.

Oil.

West Australian Petroleum Pty. Ltd., the only operating company actively engaged in oil search in this State, was unsuccessful in its quest during the year. The company since commencement of drilling in September, 1953, has drilled 25 exploratory holes plus 31 shallower structural tests for a total of almost 200,000 feet of hole.

In the coming year exploratory holes will be drilled at Samphire Marsh and Meda.

Phosphatic Guano.

From Jurien Bay 587 tons valued at £8,974 were obtained.

Pyrites.

Norseman Gold Mines railed 45,342 tons, containing 20,570 tons sulphur to superphosphate works in the metropolitan area. This mine has not worked to capacity since the completion of the main shaft in 1953. Ore reserves are in a healthy position at nearly 3.75 million tons. Development for the year was confined to the Nos. 6 and 7 levels.

Gold Mines of Kalgoorlie (Aust.) Ltd. forwarded to works at Fremantle 12,576 tons of auriferous pyritic concentrate containing 4,385 tons of sulphur valued at £54,806.

Silver.

Silver as a by-product of gold, lead and copper mining amounted to 197,129 fine ounces valued at £77,697.

Talc.

Production of 3,478 tons from Three Springs accounted for most of the State's output. The remaining 176 tons were obtained from the Mt. Monger deposit.

Tantalo-Columbite.

Very little activity was directed towards the production of these minerals. Columbite is still relatively unwanted but a demand for tantalite at £2,500 per ton may result in renewed activity in the Pilbara goldfield.

The 22.50 tons of concentrate produced came from Mt. Francisco, Pippingarra, Pilgangora, Tabba Tabba, Wodgina, Greenbushes, and Ravensthorpe.

Tin.

Mining at Greenbushes has ceased with the year's production standing at 49 tons of concentrates valued at £29,749.

The production of tin in the Pilbara was maintained throughout the year, although shortage of water hampered operations on occasions. Production was 221 tons of concentrates valued at £125,330.

Three plants operated in the Cooglegong-Shaw River areas and two new plants are about to enter the field at Moolyella. The Eley's tinfield is expected to be brought back into production during 1958.

J. K. N. LLOYD,
Assistant State Mining Engineer.

APPENDIX No. I
EXPLORATORY DRILLING.

State Mining Engineer.

In the annual report for 1955 the Assistant State Mining Engineer has traced the course of our drilling at the Great Fingall to the successful completion at 4,137 feet of the hole set out. Following this, the BBS4 was completely overhauled and a series of deflections made with the object of obtaining further intersections of the ore body cut by the hole to 4,137 feet. For the purpose of record, I list hereunder the footages bored from our first rig on the project.

		Feet.
1.	Surface to 1,326 ft.	1,326
2.	254 ft. to 4,137 ft.	3,883
3.	2,581 ft. to 2,987 ft.	406
4.	2,466 ft. to 3,566 ft.	1,100
5.	3,522 ft. to 3,587 ft.	65
6.	3,566 ft. to 3,567 ft.	1
7.	3,502 ft. to 4,021 ft.	519
8.	3,179 ft. to 3,230 ft.	51
	Total	7,351

Hole 1 was commenced from the surface on June 16th 1955 on a bearing of S 45 degrees E and a dip of 80 degrees. It was advanced to 1,326 feet on 5th August, 1955 where surveys with a Tropari instrument showed the bearing to be S 57 degrees E and dip 56.50 degrees. This was considered to be too flat for an effective intersection and the hole was stopped. Efforts to fill this hole with core preparatory to cementing a Hall Row Wedge at 725 feet were started. The core became jammed in the hole before reaching bottom and this method was abandoned. By reaming the hole with a line of BX casing, a straighter hole was cut and a thin section of core was recovered from 216 feet to 254 feet when full core was cut.

Hole 2 was commenced from 254 feet on 23rd September, 1955 and bored to 4,137 feet on 4th July, 1956 where the last survey, at a depth of 4,100 feet, showed the azimuth to be S 60 degrees E Dip 45.50 degrees.

The Fingall reef was intersected between 3,786 and 3,807 feet and averaged 4.69 dwts over a core length of 21 feet. The quartz proved exceptionally hard drilling and a change was made to an improved type of BX bits with small pin head size face diamonds and gauge stones on the periphery of about 15-20 stones per carat to maintain hole size.

Hole 3.—After a major overhaul of the plant a Thompson Retrievable Wedge was imported from Canada and set in Hole 2 with the wedge top at 2,581 feet depth. The azimuth and dip at this depth would be around S 60 degrees E dip 53 degrees. On 24th August, 1956, drilling off the wedge commenced using the Thompson Wedge reaming assembly followed by Double Tube core barrel to 2,975 feet. Surveys at 2,950 feet were S 60 degrees E Dip 48.50 degrees. That is no change in azimuth and a flattening of 4.50 degrees in approximately 400 feet. The Thompson arc cutter was then used in an endeavour to further flatten the hole. After boring to 2,987 feet the wedge seated at 2,581 feet was dislodged and had to be retrieved early in October, 1956.

Hole 4.—The retrieved wedge was repaired and set in Hole 2 at a depth of 2,466 feet on 6th October, 1956. The azimuth and dip at this depth would be about S 60 degrees E Dip 54 degrees. The arc cutter assembly was used after passing the wedge to a depth of 2,644 feet. Surveys at 2,600 feet show bearing S 64 degrees E Dip 47 degrees. That is a change of four degrees in azimuth and seven degrees in dip for an approximate distance of 130 feet. A Double Tube barrel was then used to 3,010 feet. Surveys at 3,000 feet were S 66 degree E Dip 44.50 degrees. From 3,010 to 3,076 feet the Thompson Arc cutter assembly was used. At 3,050 feet the bearing was S 63 degrees E Dip 42 degrees. A change of three degrees in bearing and two and a half degrees in dip for 50 feet. At 3,100 feet surveys showed azimuth S 62.50 degrees E Dip 37 degrees, a change of half a degree in bearing and five degrees in dip for 50 feet.

The arc cutter was used again in this hole from 3,473 to its final depth of 3,566 feet. Surveys at 3,450 feet were S 60 degrees E Dip 36 degrees which at 3,500 feet had changed to S 70 degrees E Dip 36.50 degrees. A change of 10 degrees in azimuth in 100 feet. With this disastrous swing to the north the hole could not go near its projected target area and the hole was stopped at 3,566 feet on March 15th 1957.

Hole 5.—A consideration of the Surveys of Hole 4 makes it obvious that a fairly sharp bend exists in the hole at about 3,473 feet where the arc cutter was introduced and a 10 degrees difference in azimuths was recorded. At this point a rigid single tube barrel 20 feet long was used and rotated whilst slowly lowered into the hole, relying on the principle that the rigid barrel would not deflect around the bend but cut into the wall. At 3,522 feet a new hole was started with a single tube barrel and advanced to 3,587 feet by the 8th April, 1957.

Surveys at 3,550 feet gave an azimuth of S 69.50 degrees E Dip 36.50 degrees. This bearing was so close to the bearing at 3,550 feet in Hole 4 that some doubt as to being in the correct hole was evident. This doubt was further exaggerated by the failure of the drill runner to record the last run of Hole 4 from which it appeared that this hole finished at 3,558 feet.

Hole 6.—To clarify this doubtful position the rods were again pulled above 3,522 feet and lowered whilst rotating extremely fast. By this means the bit entered Hole 4 again to a depth of 3,566 feet. As further evidence an advance of one foot was made to 3,566 feet 9 inches.

Hole 7.—As it was considered that Hole 5 could not be brought back onto the projected course, the same technique as adopted in the run off of Hole 5 was again attempted. By using a rigid single tube barrel a further hole was started at 3,502 feet. The bearing at this point was S 62 degrees E Dip 35 degrees and the hole was completed at a depth of 4,021 feet, on 28th May, 1957. The bearing at 4,000 feet being S 67 degrees E Dip 35 degrees. So that for a 500 foot advance the hole only swung five degrees in azimuth using mostly single tube barrels.

The ore body was intersected and gave some spectacular results of four ounces per ton over 18 inches at 3,844 feet and 5.50 ounces over 12 inches, at 3,895 feet.

Hole 8.—An attempt was made to intersect the quartz reef again. A Thompson Retrievable Wedge was set at 3,180 feet, in Hole 4 on the 29th May, 1957. An arc cutter assembly was used after passing the wedge to the completed depth of 3,230 feet. Surveys of Hole 4 at 3,150 feet was S 61.50 degrees E Dip 36.50 degrees and at 3,220 feet was S 61.50 degrees E Dip 28.50 degrees a flattening of eight degrees in 70 feet. On trying to recover the wedge set at 3,180 feet some mischance caused the Retrieving tool to secure the repaired wedge set at 2,466 feet in Hole 4 and it was found impossible then to return to the bottom. Operations at this site were concluded on 10th June, 1957, and a start made on lowering the tower.

The total operating cost of this hole was £46,760 11s. 3d., giving an average price per foot of hole drilled of £6 7s. 3d.

This price does not include interest, amortisation or depreciation on the capital cost of the drilling plant and rods together with other ancillary plant of a total value of close to £16,000.

1,148.75 carats of diamonds were lost in drilling 7,351 feet and the average cost per foot for bits was 15s. 11d. and the average diamond loss per foot was .156 carats or .93s. per foot diamond loss. Total loss of only five units was made in drilling this hole three core bits being lost when boring over loose core and a bull nose bit and reamer were left in the hole when they broke from the core barrel after passing the wedge set at 2,581 feet in Hole 3.

BBS4—Great Fingall: On the completion of operations at Site 1, the drill crew were engaged dismantling the rig pouring foundations and erecting the drill at Site 2 from June 15th to August 28th when drilling recommenced.

The hole was drilled to 13 feet with a 6 inch roller bit followed by "NX" size to 61 feet which was cased. BX drilling then commenced. The hole was set out on an initial dip of 80 degrees, and a magnetic bearing of S. 55 degrees E. To the end of the year the hole had been advanced to 1,392 feet.

Contract Drilling: During most of the period under review the four Mindrill A. 2000's hired under contract arrangements from the Department were engaged and a total of 17,201 feet were bored.

Mr. L. Honey bored two holes at Kanowna totalling 2,372 feet, nothing of economic importance was disclosed at this centre. At Bonnievale one hole 1,834 feet was bored almost entirely in granite no values were struck. A start was made at Morgans and 490.50 feet completed to the end of the year, three minor intersections of low value were shown to this depth.

Mr. J. Grill bored 3,334 feet in a programme on the Blue Spec mine at Nullagine with somewhat disappointing results. At Agnew 2,085 feet were bored in four holes on the Waroonga leases; several intersections of fair value were made. He next shifted to Burnakura centre in the Murchison and drilled three holes 401 feet, 228 feet and 479 feet deep respectively. In the first hole two significant intersections were 18 dwts. over three feet and seven dwts. over three feet. In the 2nd hole 6.77 dwts over 3.50 feet was intersected.

Mr. McCallum was drilling for the whole year at Bamboo Creek where five holes were bored totalling 3,764 feet. Several good intersections were made in two of the holes.

Mr. Horsham drilled three holes totalling 3,309 feet for the year. Two holes 1,399 feet and 1,393 feet were completed on the Oroya Black Range at Sandstone and showed nothing of value. One hole on the Eaglehawk leases out of Cue was drilled to 517 feet with no values disclosed.

At the close of the year only one drill, that leased by Contractor Honey, was still in operation. All the others had been closed down and were placed in our store at Collie or were in transit to this centre.

Failing M1 Drill: During 1957 the Failing drill was not utilised but some minor replacements were made to the pump parts.

J. F. HADDOW,
District Inspector of Mines.

Appendix No. 2.

REPORT ON ACTIVITIES OF BOARD OF EXAMINERS FOR UNDERGROUND SUPERVISORS' AND MINE MANAGERS' CERTIFICATES FOR 1957.

School of Mines,
Kalgoorlie, 20th March, 1958.

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

I submit herewith the Annual Report of the work of the Board of Examiners for Mine Managers' and Underground Supervisors' Certificates for the year 1957.

Examination in Mining Law.—An examination in Mining Law was held on April 12th, 1957. The results being as follows:—

Number entered	10
Number passed	6
Number failed	4

The successful candidates were:—

K. J. Carter—Kalgoorlie.
R. D. Inman—Bullfinch.
R. F. Marshall—Wittenoom.
A. H. Parbo—Bullfinch.
D. Ross—Kalgoorlie.
M. R. Simmons—Kalgoorlie.

A copy of the examination paper is attached.

Underground Supervisors' Examination.—An examination for Underground Supervisors' Certificates of Competency was held on 2nd September, 1957.

Twenty-two candidates sat for the examination.

Entries were received from the following centres:—

Kalgoorlie District	15
Norseman	1
Bullfinch	1
Southern Cross	1
Geraldton	2
Wittenoom	2
	22

All applicants sat for the examination, the results of which are as follows:—

Number passed	12
Number failed	6
Number deferred	4
	22

The names of the successful candidates are as follows:—

K. A. Allen.
F. E. Byrnes.
K. J. Carter.
J. E. Langlands.
M. D. Maher.
P. J. Osmond.
E. J. Richards.
F. R. Smith.
L. F. Truman.
J. E. Smith.
J. T. Wylie.
J. R. Young.

A copy of the examination paper is attached.

Mine Managers' Certificates of Competency.—Seven applications for Mine Managers' Certificates of Competency were received during the year and were considered with three that had been deferred in 1956. Nine were approved and one refused.

The names of the successful applicants are as follows:—

W. D. Steel.
R. F. Marshall.
R. D. Inman.
J. P. Shanahan.
P. C. Dunn.
E. O. Myers.
J. C. Lissiman.
R. S. Boylen.
D. Ross.

During the year, Mr. G. Lumb retired as secretary of the board and Mr. L. J. Carroll took over that position.

(Sgd.) R. GETHING,

Acting Secretary, Board of Examiners Mine Managers' and Underground Supervisors' Certificates of Competency.

MINES REGULATION ACT, 1946.

Examination for Mine Manager's Certificate of Competency.

MINING LAW.

April, 1957.

Time allowed—Three hours.

Attempt twelve (12) questions from Section A. Attempt eight (8) questions from Section B. Candidates should note:—

(a) The Mining Act and Regulations may be used at the examination, but not the Mines Regulation Act.

(b) In answering questions in Section B reference to the appropriate Sections of the Act or to the Regulations alone will not be sufficient. Candidates must summarise the requirements of the Act and/or Regulations, and also should make reference to the relevant section or regulation (s).

(c) Candidates are required to pass in both sections of the paper.

SECTION A.

(Mines Regulation Act.)

Attempt twelve (12) questions from this section. Do not attempt more than twelve (12) questions from this section.

Marks allowed are five (5) per question.

What does the Mines Regulation Act and/or Regulations require in respect to any twelve (12) of the following:—

1. When must the following be employed:—
   (a) a registered manager;
   (b) an underground manager?
2. (a) What is a "serious injury";
   (b) What must a manager do following an accident resulting in serious injuries or apparently serious injuries?
3. May a locomotive battery be used for electric firing?
4. Safety provisions for locomotives.
5. When can the underground compressed air supply be shut off?
6. Use of the English language in and about a mine.
7. Obligation of manager regarding abandonment of Mining operations.
8. Gates to cages and cover overhead.
9. Ventilation officers.
10. Compass surveys.
11. (a) Tests regarding safety fuse;
    (b) Who may fire electrically?
12. Machine miners working alone.
13. Safety belts.
14. Firing in winzes.
15. Hours of employment below ground.
16. (a) Maximum gradient for locomotive.
    (b) Inspection of locomotive roads.

SECTION B.

(Mining Act.)

Attempt eight (8) questions from this section. Do not attempt more than eight (8) questions from this section.

Marks allowed are five (5) per question.

17. What action is necessary by a lessee if gold is found on a Mineral Lease, and under what conditions can the gold be mined? Is a similar action necessary if a mineral other than gold is found on a Gold Mining Lease?
18. Who grants a water right and when?
19. How is an application for a lease made and what rights does this application immediately confer on the applicant?
20. What is a Consolidated Miner's Right, and what fee is payable for such a Right?
21. When is a mining tenement on which labour conditions are prescribed considered to be efficiently worked?
22. Under what circumstances may a dredging claim be granted?
23. If the owner of pumping machinery considers that his machinery is draining or assisting to drain water from adjacent mines what action can be taken to recover some of the pumping costs?
24. (a) What area may a miner mark off as a prospecting area for copper?
    (b) What are the limitations governing a prospecting area for gold regarding tenancy?
25. If a lease is surrendered what action must the lessee take to protect any tailings which are on the lease at the time of surrender?
26. A holder of a Gold Mining Lease puts down some exploratory bore holes—What does the Act or regulations require him to do?
27. What area of land may be held as a Miner's Homestead Lease? Can this land be also held as a mining tenement or a mining lease?
28. A holder of a pastoral lease sinks a well on his property. How is he protected from miners?

Western Australia.

MINES REGULATION ACT, 1946.

Examination for Certificate of Competency as Underground Supervisor.

MINING.

September, 1957.

Time allowed: Three hours. Answer six questions.

Note.—Read the Examination Paper Carefully.

Answers must be Written in Ink.

Candidates should Illustrate with Sketches where possible.

(1) A dead end drive has exposed a new isolated ore body on the 2000 feet level, in a position averaging 800 feet from a good through air current. The ore at this level is 180 feet long, 8 feet wide and vertical; it averages 6 dwt. gold per ton.

It is anticipated that the ore body will be stoped to a height of 120 feet before upper level development reaches the ore.

A leading stope has already been taken out to a height of 20 feet above the drive level and all the broken ore and equipment removed.

It is essential that ore extraction now be commenced.

Explain how you would stope this ore body.

A diagram of the stope showing all details is essential.

(2) Consider the ore body in question 1 to be of regular size and the walls clean and of great strength so that no dilution occurs.

(a) How many "fathoms" will your party break by the time the stope is completed to 120 feet above the drive level?

(b) How many ounces of gold will be expected in the ore so broken?

(c) What will be the value of this gold? This gold is valued at £15 10s. per ounce.

(3) You are a Shift Boss and have thirty (30) men under you in your section of the mine. The mine operates day and afternoon shift. Work being carried out on your round consists of: Driving to connect to a winze, rising, winzing, stoping, timbering a leading stope in weak ground.

Write a complete report such as you would write in your Shift Boss's report book at the end of afternoon shift on Thursday.

(4) Write a brief summary on each of the following:—

(a) The use of wall bolts as compared with stope timber.

(b) Safe storing and handling of explosives.

(5) You are an Underground Shift Boss. In the course of your duties you should examine all practices and appliances, relative to the section of the mine under your supervision. What do you look for when you:

(a) Meet up with an ore train,

(b) Examine a drive face,

(c) Examine an air door,

(d) Examine an underground dam,

(e) Examine the top surroundings of a winze being sunk under an air hoist?

(6) Describe fully the precautions you would take for safe working in—

(a) Pass repairing.

(b) Shaft repairs.

(c) Firing a chute.

(7) (a) Describe in detail two methods of shaft timbering in common use;

or

(b) How would you replace a broken cap in an underlay shaft?

(8) Compare the various methods of taking water out of a mine and state the conditions under which you consider each method suitable.

Western Australia.

MINES REGULATION ACT, 1946.

Examination for Certificate of Competency as Underground Supervisor.

MINING LAW.

September, 1957.

Time allowed—Two hours.

Note.—Read the Examination Paper Carefully.

Answers must be Written in Ink.

What is required by the Mines Regulation Act or the Regulations made under that Act regarding any Fifteen (15) of the following:—

1. Safety provisions for locomotives.
2. Gates to cages and cover overhead.
3. Machine miners working alone.
4. Safety belts.
5. Firing in winzes.
6. Inspection of locomotive roads.
7. Time of blasting.
8. Method of firing charges when electric blasting is not in use.
9. Clearing passes and chutes.
10. Ladders in shafts and winzes.
11. The age requirements (if any) for the following:—
    (a) Use of explosives.
    (b) Hoist driver.
    (c) Braceman.
    (d) Shift-boss.
12. Safety fuse.
13. Rises in mines.
14. (a) Signalling in winzes.
    (b) Raising and lowering tools in winzes.
15. Testing of safety cages or safety skips.
16. Precautions necessary when repairing shafts.
17. Method of obtaining a hoist driver's certificate.
18. (a) Ventilation of development ends.
    (b) Use of cyanide tailings for filling underground.
19. (a) Stagnant water underground.
    (b) Crib places.

Index to State Mining Engineer's Annual Report for 1957

LIST OF TABLES

(3a)—18619

DIVISION III

Report of the Superintendent of State Batteries

Under Secretary for Mines:

For the information of the Hon. Minister for Mines, I have the honour to submit my report on the operations of the State Batteries for the year ended 31st December, 1957.

Crushing Gold Ores:

One 15 head, six 10 head, and twelve 5 head mills crushed 42,837.50 tons of ore made up of 650 separate parcels, an average of 65.9 tons per parcel. The bullion produced amounted to 18,658 ozs. which is estimated to contain 15,813 ozs. of fine gold, equal to 7 dwts. 9 grs. of gold per ton of ore.

The cost of crushing, including administration, was 56s. 8d. per ton, a fall of 6s. 1d. per ton compared with the previous year when 35,740.50 tons were crushed at a cost of 62s. 9d. per ton.

The average value of the ore after amalgamation, but before cyanidation was 2 dwts. 18 grs. Thus the average head value of the ore was 10 dwts. 3 grs., which is 21 grs. less than the previous year's average.

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

	Tons.	Per cent.
Over 2 dwts. 8 grs. per ton	16,471·25	38·5
1 dwt. 18 grs. to 2 dwts. 8 grs. per ton	4,812·25	11·2
Under 1 dwt. 18 grs. per ton	19,257·25	44·9
Refractory	2,296·75	5·4
	42,837·5	100·0

Cyaniding:

Six plants treated 18,553 tons of tailings from amalgamation for a production of 3,506 fine ozs. of gold worth £54,848. The average content was 5 dwts. 4 grs. before cyanidation, while the residue after treatment averaged one dwt. six grs. The theoretical extraction was therefore 75 per cent. The actual extraction was 74 per cent.

The cost of cyaniding was 35s. 8d. per ton, a decrease of 8s. 8d. per ton on the previous year, when 17,011 tons were treated at a cost of 44s. 4d. per ton.

Estimated Overall Recovery:

Figures for estimated recovery are:—

	Content.	Per ton crushed.		Per cent.
	Fine oz.	dwts.	grs.	
Head Value	21,730	10	3	100·0
Amalgamation Recovery	15,813	7	9	72·8
Cyanidation Recovery	3,506	1	15	16·0
Total Recovery	19,319	9	0	88·8

Treatment of Ores other than Gold.

Lead Ores:

During the year the Northampton State Battery crushed 4,911 tons of lead ore with an estimated average content of 13.34 per cent. lead. There were 30 separate parcels, giving an average of 163.7 tons of ore per parcel.

A total of 776.56 tons of concentrates were produced. The concentrates averaged 74.0 per cent. lead giving an estimated content of 573.68 tons of lead in concentrates.

4,134.4 tons of tailings were discarded. These had an average contents of 1.97 per cent. lead, giving a total of 81.52 tons of lead discarded in tailings.

The recovery of lead in the concentrates was 87.6 per cent. of the lead in the ore delivered to the plant.

The cost of operating the Northampton State Battery, including administration, was £11,218 14s. 4d., being 45s. 6d. per ton of ore crushed. Revenue received was £8,368 15s., 34s. 0d. per ton. The corresponding figures for 1956, when 3,731.75 tons of ore was crushed, were operating cost £9,520 17s. 4d., 51s. 3d. per ton, and revenue £5,893 4s., 31s. 8d. per ton.

Sales of lead concentrates from the Northampton State Battery for the year were valued at £51,252.

Value of Production.

The estimated value of production from the State Batteries since their inception, excluding the value of gold tax paid to the Commonwealth, is:—

GOLD.

	1957.	Grand Total.
	£	£
Par production—		
Crushing	67,148	8,456,632
Cyanidation	14,946	2,093,902
Gold Premium—		
Crushing	179,850	4,553,045
Cyanidation	39,902	1,334,297
Open Market Premium—		
Crushing	526	29,763
Cyanidation	117	10,142
Total Gold Production	£302,489	£16,477,781

OTHER ORES REALISED.

Tin—	£	£
Ores	*Nil*	94,005
Residues	*Nil*	572
Tungsten Concentrates	138	18,850
Agricultural Copper Ore	*Nil*	2,648
Lead Concentrates	51,252	168,400
Total Other Ores	£51,390	£284,475
Grand Total	£353,879	£16,762,256

FINANCIAL.

	Tons	Expenditure	Receipts	Loss
Crushing—		£	£	£
Gold Mills	42,837·50	121,816	20,514	101,302
Northampton	4,911	11,219	8,369	2,850
Cyaniding	18,553	33,313	21,944	11,369
		£166,348	£50,827	£115,521

The loss of £115,521 is a decrease of £1,486 on the previous year. It does not include depreciation and interest on capital.

Capital Expenditure, all from General Loan Fund, was incurred as below:—

	£	s.	d.
Bamboo Creek—			
Foreman and Men's Quarters, Portable Elevator, Pipes for Water Supply	4,601	1	3
Kalgoorlie—			
Cyanide Plant	935	10	11
Marble Bar—			
Southern Cross engine	253	9	10
Assay Office and equipment and Oil Store	908	16	5
Menzies—			
Cyanide Plant	8,772	18	2
Nullagine—			
Sand pump and pipes	114	1	2
Wheel Weighers, 3 only	695	0	0
Clean up Machines	473	3	2
Truck for North-West, 1 only 4-5 ton tip type	1,752	19	6
	£18,507	0	5

Cartage Subsidies.

	Tons.	Cost.
Ore carted to State Plants	16,032	£8,098

Comparative figures for the last three years are:—

Year	State Plants.				Private Plants.		
	Tons Crushed	Tons Subsidised.	Per cent. Subsidised.	Cost.	Tons Subsidised.	Cost.	Total Cost.
				£		£	£
1955	42,207	8,739	20·7	4,150	238	136	4,286
1956	35,740	12,679	35·5	4,847	70	44	4,891
1957	42,837	16,032	37·4	8,098	*Nil*	*Nil*	8,098

Administrative

Expenditure amounted to £18,730 2s. 9d., equivalent to 6s. 1d. per ton of ore crushed and cyanided, compared with an expenditure of £16 668 12s. 3d., 5s. 11d. per ton, for 1956.

	1956			1957		
	£	s.	d.	£	s.	d.
Salaries	10,079	17	0	9,682	6	10
Pay Roll Tax	2,417	14	9	2,708	1	2
Workers' Compensation	1,907	5	10	3,855	8	4
Travelling and Inspection	1,841	7	8	2,082	8	8
Sundries	422	7	0	401	17	9
	£16,668	12	3	£18,730	2	9

Staff.

I have to report with regret the death during the year of Manager Clemesha. The late Mr. E. J. Clemesha had been a State Battery Manager since 1946, and had well served the Department at many plants, particularly at Marble Bar.

Due to ill-health, F. A. Casserly had to retire from the position of Manager. After a long illness, during which he had to have a leg amputated, he made a good recovery and he has been re-employed as an assayer.

A. Clayden has been appointed Assistant Manager in charge of the Ora Banda Battery.

A. Thompson has been appointed Assistant Manager at the Yarri Battery.

I wish to thank the Staff at Head Office and at the Batteries for their capable and willing service during the year.

General Remarks.

The 42,837.50 tons of gold ore crushed was an increase of 7,097 tons on the 35,740.50 tons crushed in 1956. There was an increase at all Batteries except Bamboo Creek, Laverton, Ora Banda and Sandstone. The decreases at Ora Banda and Sandstone were small, but there was a big increase at Laverton due to the cessation of operations at the Lancefield Mine. Water shortage caused the reduction at Bamboo Creek.

A Battery at Leonora started operating during the year. Although purchased and repaired by the Prospectors' Association it was operated as a State Battery. It crushed 759.50 tons of ore.

The gross expenditure on gold milling increased from £112,124 in 1956 to £121,816 in 1957, but the cost per ton decreased from 62s. 9d. to 56s. 8d. per ton. The increased tonnage crushed was mainly responsible for the reduction in the cost per ton crushed, but the availability of better workers and a reduction in maintenance expenses also assisted.

Cyanide treatment, with an increased tonnage treated and a reduction of gross expenditure showed a reduction of 8s. 8d. per ton treated. The scraper system of handling tailings has been operating throughout the year at Kalgoorlie. Alterations are being made to increase the output and decrease costs. A similar plant was constructed at Menzes and started operating near the end of the year.

The Northampton lead plant crushed 4,911 tons of ore for the year, almost 1,000 tons more than any of the previous three years that it has been operating. The operating cost of 45s. 6d. per ton crushed was a reduction of 5s. 9d. on the figure for 1956. Near the end of the year the price of lead dropped very considerably. To assist the small mines to continue operating the crushing charge was reduced from 30s. 0d. per ton to 20s. 0d. per ton. The lead price has continued falling and it appears likely that there will be a big reduction in the amount of ore to be crushed at Northampton during 1958.

With increased tonnages treated and a slightly decreased operating loss, the State Batteries showed a considerable improvement on the 1956 operations.

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

SCHEDULE 1

Return showing tons crushed, Gold yield by Amalgamation, average per ton in Shillings, and Total value without Premium for the Year ended 31st December, 1957.

Battery.	Tons Crushed.	Gold Yield Bullion oz.	Value per ton in shillings.	Total Value without premium.
				£ s. d.
Bamboo Creek	100	27·10	19·51	97 11 2
Boogardie	1,943	494·45	18·32	1,780 0 1
Coolgardie	4,740·75	1,329·05	20·16	4,784 11 7
Cue	2,582·50	1,201·95	33·52	4,327 0 0
Kalgoorlie	9,722	2,295·95	17·00	8,264 8 5
Lake Darlot	233	167·95	51·90	604 12 5
Laverton	1,678	394·24	16·89	1,417 3 3
Leonora	759·50	376·80	35·72	1,356 9 8
Marble Bar	1,029·25	441·79	30·54	1,572 8 10
Marvel Loch	2,124·50	1,077·40	36·52	3,879 0 0
Meekatharra	4,326	1,152·39	19·18	4,148 12 0
Menzies	3,978·50	3,016·22	54·94	10,858 7 7
Norseman	287	128·05	32·12	460 19 8
Nullagine	756·50	250·50	23·84	901 16 0
Ora Banda	2,846·75	1,936·00	48·96	6,969 12 0
Paynes Find	835·50	240·65	20·75	866 6 10
Peak Hill	1,533	247·85	11·65	892 5 3
Sandstone	105·75	80·48	54·79	289 14 7
Yarri	3,256	3,799·07	84·03	13,676 13 0
	42,837·50	18,657·89	31·34	67,147 12 4

SCHEDULE No. 2.

Number of Parcels Treated, Tons Crushed and Head Value for the Year ended 31st December, 1957.

No. of Parcels Treated	Battery.	Tons Crushed.	Yield by Amalgamation (Bullion).	Yield by Amalgamation (Fine Gold).	Tailings Gross at 100 per cent	Total Contents of Ore (Fine Gold).	Average per Ton (Fine Gold).	Gross Value per Ton fine gold at £4 4s. 11½d. per Ounce.
			Oz. Dwt.	Oz. Dwt.	Oz. Dwt.	Oz. Dwt.	Dwt. Grs.	£ s. d.
1	Bamboo Creek	100	27 2	22 19	20 17	43 16	8 8	1 15 5
43	Boogardie	1,943	494 9	418 18	231 1	649 19	6 17	1 8 6
95	Coolgardie	4,740·75	1,329 1	1,126 7	601 19	1,728 6	7 7	1 10 11
45	Cue	2,582·50	1,201 19	1,018 13	278 15	1,297 8	10 1	2 2 8
121	Kalgoorlie	9,722	2,295 19	1,945 16	999 14	2,945 10	6 1	1 5 8
7	Lake Darlot	233	167 19	142 6	79 4	221 10	19 0	4 0 8
21	Laverton	1,678	394 5	334 2	399 4	733 6	8 17	1 17 0
31	Leonora	759·50	376 16	310 6	93 1	412 7	10 21	2 6 2
12	Marble Bar	1,029·25	441 16	374 8	232 14	607 2	11 19	2 10 1
49	Marvel Loch	2,124·50	1,077 8	913 2	229 11	1,142 13	10 18	2 5 8
34	Meekatharra	4,326	1,152 8	976 13	610 19	1,587 12	7 8	1 11 2
61	Menzies	3,978·50	3,016 4	2,556 5	779 5	3,335 10	16 18	3 11 2
13	Norseman	287	128 1	108 11	54 15	163 6	11 9	2 8 4
11	Nullagine	756·50	250 10	212 6	111 8	323 14	8 13	1 16 3
50	Ora Banda	2,846·75	1,936 0	1,640 15	741 8	2,382 3	16 19	3 11 4
14	Paynes Find	835·50	240 13	203 19	61 7	265 6	6 8	1 6 11
14	Peak Hill	1,533	247 17	210 11	79 12	290 2	3 19	16 1
2	Sandstone	105·75	80 9	68 4	15 13	83 17	16 6	3 9 1
26	Yarri	3,256	3,799 2	3,219 13	297 9	3,517 2	21 14	4 11 8
650		42,837·50	18,657 18	15,812 14	5,917 16	21,730 9	10 3	2 3 0

Average Tons per Parcel	65·9
Average Yield by Amalgamation per ton (fine gold)	7 Dwts. 9·17 Grs.
Average Value by Amalgamation per ton (fine gold)	£1 11s. 4d.
Average Head Value of Tailings per ton (fine gold)	2 dwt. 18 grs.
Average Value of Tailings per ton (fine gold)	11s. 6d.

SCHEDULE No. 3.

Segregation of Tailings Produced according to Value for the Year ended 31st December, 1957.

Battery.	Payable.		2 dwts. 8 grains to 1 dwt. 18 grains.		1 dwt. 18 grains and under.		Refractory.		Total.	
	Tons	Oz. Dwt.	Tons	Oz. Dwt.	Tons	Oz. Dwt.	Tons	Oz. Dwt.	Tons	Oz. Dwt.
Bamboo Creek	100	20 17	....	....	....	....	....	....	100	20 17
Boogardie	885·75	162 11	384·75	43 13	483	24 17	189·50	....	1,943	231 1
Coolgardie	1,752·50	412 19	136·75	40 9	2,850	148 11	1·50	....	4,740·75	601 19
Cue	718·50	186 6	249·75	25 3	1,324	67 6	290·25	....	2,582·50	278 15
Kalgoorlie	2,370·50	597 9	445	46 7	6,906·50	355 18	....	....	9,722	999 14
Lake Darlot	171	74 13	38	3 5	24	1 6	....	....	233	79 4
Laverton	1,390·50	377 14	154	15 14	133·50	5 16	....	....	1,678	399 4
Leonora	273	59 18	145	14 16	341·50	18 7	....	....	759·50	93 1
Marble Bar	516·75	208 15	....	....	457·50	23 19	55	....	1,029·25	232 14
Marvel Loch	437	99 10	200	22 5	1,395·50	81 15	92	26 1	2,124·50	229 11
Meekatharra	2,210	379 4	894·50	92 11	970·75	63 12	250·75	75 12	4,326	610 19
Menzies	2,717·25	713 14	434·50	45 11	759	20 0	67·75	....	3,978·50	779 5
Norseman	137	43 1	86	8 16	64	2 18	....	....	287	54 15
Nullagine	209·50	51 8	510	57 2	37	2 18	....	....	756·50	111 8
Ora Banda	1,704·50	647 13	....	....	1,142·25	93 15	....	....	2,846·75	741 8
Paynes Find	58	9 8	353·50	36 19	306	15 0	118	....	835·50	61 7
Peak Hill	267·50	31 15	23·50	2 5	10	0 10	1,232	45 2	1,533	79 12
Sandstone	69	13 1	....	....	36·75	2 12	....	....	105·75	15 13
Yarri	483	79 6	757	80 4	2,016	137 19	....	....	3,256	297 9
	16,471·25	4,169 2	4,812·25	535 0	19,257·25	1,066 19	2,296·75	146 15	42,837·50	5,917 16

SCHEDULE No. 4.

Details of Extraction—Tailings Treatment, 1957.

Battery.	Tons Treated.	Head Value.	Contents.	Tail Value.	Contents.	Recovery.	Call.	Recovery.	Shortage.	Surplus.
		Dwt. Grs.	Dwt.	Dwt. Grs.	Dwt.	%	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Boogardie	3,239	4 18	15,440	1 10	4,585	70	2,302 3 6	1,922 9 3	379 14 3	....
Kalgoorlie	4,608	5 18	26,540	1 7	6,013	77	4,348 5 5	4,374 13 11	....	26 8 6
Laverton....	3,272	4 12	14,780	1 5	3,865	73	2,320 16 5	2,452 15 1	....	131 18 8
Marvel Loch	2,034	3 23	8,080	20	1,703	79	1,352 5 4	1,350 2 9	2 2 7	....
Menzies	840	4 18	3,986	2 1	1,708	57	483 18 2	340 16 10	143 1 4	....
Ora Banda	4,560	5 22	26,976	1 6	5,081	79	4,522 15 4	4,505 5 8	17 9 8	....
	18,553	5 4	95,802	1 6	23,555	75	15,330 4 2	14,946 3 6	542 7 10	158 7 2

Net Shortage : £384 0s. 8d.

Head Value .... 5 dwt. 4 grains.
Tail Value .... 1 dwt. 6 grains.
Theoretical Recovery .... 75%.
Actual Recovery .... 74%.

SCHEDULE No. 5.

Direct Purchase of Tailings, Year ended 31*st December,* 1957.

Battery.	Tons of Tailings Purchased.	Amount Paid at £4 4s. 11½d. per oz.	Amount Paid Account of Premium.
		£ s. d.	£ s. d.
Bamboo Creek	385·50	303 5 0	696 3 4
Boogardie	652·50	261 11 10	1,004 11 3
Coolgardie	1,708·25	747 17 7	1,733 2 3
Cue	622·75	278 2 11	638 10 6
Kalgoorlie	2,080·00	1,096 13 3	3,241 4 8
Lake Darlot	82·75	138 10 5	317 19 11
Laverton	2,142·00	1,029 3 11	3,018 16 7
Leonora	119·00	83 8 2	191 9 7
Marble Bar	229·25	189 17 10	435 18 8
Marvel Loch	1,051·50	306 6 2	1,108 4 9
Meekatharra	1,890·50	334 8 6	767 14 7
Menzies	2,789·00	1,455 6 9	3,378 6 7
Norseman	114·25	65 5 11	149 18 1
Nullagine	177·75	82 13 2	189 15 2
Ora Banda	1,406·50	1,440 9 5	4,150 11 2
Paynes Find	9·00	1 9 10	3 8 5
Peak Hill	240·75	24 8 10	56 2 2
Sandstone	63·25	27 8 1	62 18 3
Yarri	557·25	79 17 7	183 7 6
	16,321·75	7,946 5 2	21,328 3 5

SCHEDULE No. 6.

Cyanide Yield, 1957.

Battery.	Tons.	Fine ozs.	Value.	Premium.	Total.
			£	£	£
Boogardie	3,239	452·01	1,922·456	5,142·888	7,065·344
Kalgoorlie	4,608	1,028·57	4,374·694	11,702·258	16,076·952
Laverton	3,272	568·93	2,452·753	6,472·644	8,925·397
Marvel Loch	2,034	317·69	1,350·136	3,614·445	4,964·581
Menzies	840	80·13	340·840	911·616	1,252·456
Ora Banda	4,560	1,058·21	4,505·280	12,058·407	16,563·687
	18,553	3,505·54	14,946·159	39,902·258	54,848·417

SCHEDULE No. 7.

Statement of Receipts and Expenditure for Year ended 31st December, 1957.

Milling.

Battery	Tons Crushed	Expenditure								Receipts		Profit	Loss
		Management and Supervision	Wages	Stores	Total Working Expenditure	Cost per Ton	Repairs and Renewals	Sundries	Gross Expenditure	Cost per Ton	Receipts	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	100	67 4 0	707 6 9	788 7 5	1,562 18 2	312 7	731 13 9	501 9 8	2,796 1 7	559 2	112 19 0	24 6	....	2,683 2 7
Boogardie	1,943	1,251 17 4	2,290 12 6	938 14 6	4,481 4 4	46 2	645 1 2	1,158 3 1	6,284 8 7	64 6	954 10 10	9 8	....	5,329 17 9
Coolgardie	4,740·75	2,159 15 11	3,043 18 5	2,095 12 2	7,299 6 6	30 10	2,101 13 4	1,903 1 2	11,304 1 0	48 0	2,059 1 1	8 6	....	9,244 19 11
Cue	2,582·50	1,619 3 11	2,749 5 3	1,647 2 2	6,015 11 4	46 7	1,432 8 3	1,182 14 7	8,630 14 2	66 8	1,541 7 7	12 0	....	7,089 6 7
Kalgoorlie	9,722	2,390 5 5	5,308 18 3	4,362 17 5	12,062 1 1	24 10	2,145 10 11	3,349 7 0	17,556 19 0	36 2	3,786 15 7	7 8	....	13,770 3 5
Lake Darlot	233	124 3 7	542 9 10	124 0 7	790 14 0	67 8	63 6 6	91 12 0	945 12 6	82 0	120 6 9	10 4	....	825 5 9
Laverton	1,678	1,436 10 8	1,780 12 2	1,083 4 10	4,300 7 8	51 2	1,147 2 0	828 16 6	6,276 6 2	7 4	1,037 19 4	12 4	....	5,238 6 10
Leonora	759·50	632 17 11	1,198 16 9	587 16 5	2,419 11 1	63 8	308 12 10	388 17 2	3,117 1 1	82 0	422 14 8	11 2	....	2,694 6 5
Linden	....	....	....	....	....	....	....	....	....	....	9 10 11	....	9 10 11	....
Marble Bar	1,029·25	1,942 6 5	1,842 17 3	1,333 8 10	5,118 12 6	99 5	1,786 12 6	1,746 16 0	8,652 1 0	168 2	581 11 7	11 4	....	8,070 9 5
Marvel Loch	2,124·50	1,429 9 11	3,364 13 3	949 15 2	5,743 18 4	54 0	296 9 9	819 0 0	6,059 8 1	64 6	1,123 19 8	10 6	....	5,735 8 5
Meekatharra	4,326	1,203 4 1	3,806 11 7	1,555 2 6	6,564 18 2	30 4	537 17 7	1,330 5 8	8,433 1 5	39 6	1,529 3 7	7 0	....	6,903 17 10
Menzies	3,978·50	1,435 16 3	3,863 9 3	1,756 4 9	7,055 10 3	35 4	518 7 5	1,748 2 2	9,321 19 10	46 8	1,992 19 10	10 0	....	7,329 0 0
Norseman	287	300 8 6	477 4 5	282 19 5	1,060 12 4	74 0	193 9 0	148 7 2	1,402 8 6	97 8	142 8 0	9 8	....	1,260 0 6
Nullagine	756·50	297 5 4	1,498 7 0	964 12 2	2,760 4 6	73 0	245 10 7	281 13 6	3,287 8 7	87 0	335 4 4	8 8	....	2,952 4 3
Ora Banda	2,846·75	728 13 6	2,818 11 11	1,790 13 5	5,337 18 10	37 2	1,233 7 2	1,037 8 6	7,608 14 6	53 4	1,567 5 0	11 0	....	6,041 9 6
Paynes Find	835·50	475 13 0	1,808 13 9	711 3 9	2,995 10 6	71 6	577 0 4	467 17 4	4,040 8 2	96 8	520 15 8	12 4	....	3,519 12 6
Peak Hill	1,533	516 17 7	1,871 7 10	469 7 3	2,857 12 8	37 2	542 3 8	690 13 0	4,090 9 4	53 4	719 8 3	9 4	....	3,371 1 1
Sandstone	105·75	172 17 5	409 17 11	133 8 11	716 4 3	135 6	70 4 8	79 6 2	865 15 1	163 8	128 1 2	24 2	....	737 13 11
Wiluna	....	....	....	....	....	....	....	....	....	....	9 4 11	....	9 4 11	....
Yarri	3,256	1,855 8 6	4,506 3 1	1,475 15 4	7,837 6 11	48 2	1,228 9 2	1,277 15 3	10,343 11 4	63 6	1,816 2 6	11 0	....	8,527 8 10
Head Office	....	....	....	....	....	....	....	....	....	....	2 13 2	....	2 13 2	....
	42,837·50	20,039 19 3	43,889 17 2	23,050 7 0	86,980 3 5	40 6	15,805 0 7	19,031 5 11	121,816 9 11	56 8	20,514 3 5	9 6	21 9 0	101,323 15 6
Northampton (Lead)	4,911	2,190 5 6	3,867 7 3	1,728 0 8	7,785 13 5	31 2	1,647 4 4	1,785 16 7	11,218 14 4	45 6	8,368 15 0	34 0	....	2,849 19 4
Totals	47,748·50	22,230 4 9	47,757 4 5	24,778 7 8	94,765 16 10	39 6	17,452 4 11	20,817 2 6	133,035 4 3	55 8	28,882 18 5	12 0	21 9 0	104,173 14 10
Net loss	....	....	....	....	....	....	....	....	....	....	....	....	....	104,152 5 10

SCHEDULE No. 8.

Statement of Receipts and Expenditure for Year ended 31st December, 1957.

Cyaniding.

Battery	Tons Treated	Expenditure								Cost per Ton	Receipts		Profit	Loss
		Management and Supervision	Wages	Stores	Total Working Expenditure	Cost per Ton	Repairs and Renewals	Sundries	Gross Expenditure		Receipts	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	....	....	51 7 1	....	51 7 1	....	294 4 11	25 15 0	371 7 0	....	....	....	....	371 7 0
Boogardie	3,239	1,007 5 2	1,839 0 9	979 8 10	3,825 14 9	23 6	463 3 7	900 16 0	5,189 14 4	32 0	2,188 16 10	13 6	....	3,000 17 6
Coolgardie	....	56 3 4	188 14 10	37 11 9	282 9 11	....	45 2 2	134 5 6	461 17 7	....	....	....	....	461 17 7
Cue	....	56 18 8	....	24 6 3	81 4 11	....	29 13 7	124 16 6	235 15 0	....	....	....	....	235 15 0
Kalgoorlie	4,608	1,388 3 2	2,784 16 2	2,037 12 4	6,210 11 8	27 0	508 2 6	2,519 5 3	9,237 19 5	40 0	7,935 12 11	34 4	....	1,302 6 6
Laverton	3,272	503 3 9	2,834 9 9	759 7 10	4,097 1 4	25 0	100 8 3	892 2 6	5,089 12 1	31 2	5,378 4 2	32 8	288 12 1	....
Marble Bar	....	....	....	48 13 5	48 13 5	....	....	1 11 8	50 5 1	....	....	....	....	50 5 1
Marvel Loch	2,034	291 19 2	1,312 9 3	511 17 2	2,116 5 7	20 8	71 4 3	841 2 11	3,028 12 9	30 0	2,601 15 10	25 6	....	426 16 11
Meekatharra	....	....	....	9 13 4	9 13 4	....	....	94 3 5	103 16 9	....	....	....	....	103 16 9
Menzies	840	201 17 7	598 8 8	326 10 3	1,126 16 6	26 8	43 18 0	243 18 0	1,414 12 6	33 6	153 14 5	3 6	....	1,260 18 1
Ora Banda	4,560	773 19 9	3,703 14 4	1,807 4 7	6,284 18 8	27 6	521 3 1	1,322 16 11	8,128 18 8	35 6	5,845 16 7	25 6	....	2,283 2 1
	18,553	4,279 10 7	13,313 0 10	6,542 5 9	24,134 17 2	26 4	2,077 0 4	7,100 13 8	33,312 11 2	35 8	24,104 0 9	26 0	288 12 1	9,497 2 6
Interest paid to Treasury	....	....	....	....	....	....	....	....	....	....	2,160 0 0	....	....	2,160 0 0
	....	....	....	....	....	....	....	....	....	....	21,944 0 9	....	....	11,657 2 6
Less Profit	....	....	....	....	....	....	....	....	....	....	....	....	....	288 12 1
Net Loss	....	....	....	....	....	....	....	....	....	....	....	....	....	11,368 10 5

STATE BATTERIES.

Trading and Profit and Loss Account for the Year ended 31st December, 1957.

1956		1957	
£		£	£
80,470	Trading Costs— Wages	87,580	
28,439	Stores	31,321	
23,604	Repairs, Renewals and Battery Spares	19,529	
26,828	General Expenses and Administration	27,917	
159,341			166,347
	Earnings—		
42,334	Milling and Cyaniding Charges		50,827
117,007	Operating Loss for the Year		115,520
	Other Charges—		
20,855	Interest on Capital	22,915	
12,803	Depreciation	13,283	
1,980	Superannuation—Employers Share	1,887	
35,638			38,085
£152,645	Total Loss for the Year		£153,605

STATE BATTERIES.

Balance Sheet as at 31st December, 1957.

31st December, 1956	Funds Employed.	31st December, 1957	
£	Capital—	£	£
538,705	Provided from General Loan Fund	557,213	
137,495	Provided from Consolidated Revenue Fund	137,398	
676,200			694,611
	Reserves—		
28,622	Commonwealth Grant—Assistance to Goldmining Industry	28,622	
13,786	Commonwealth Grant—Assistance to Metaliferous Mining	13,786	
42,408			42,408
	Liability to Treasurer—		
879,353	Interest on Capital		902,268
	Other Funds—		
794,605	Provided from Consolidated Revenue Fund (Excess of payments over collections)		915,857
2,392,566			2,555,144
	Deduct—		
	Profit and Loss :		
2,061,585	Loss at commencement of year	2,214,230	
152,645	Loss for year	153,605	
2,214,230	Total Loss from Inception		2,367,835
£178,336			£187,309
	Employment of Funds.		
	Fixed Assets—		
670,609	Plant, Buildings and Equipment	689,020	
564,586	*Less* Depreciation	577,869	
106,023			111,151
	Current Assets—		
4,578	Debtors	3,783	
44,721	Stores	46,710	
1,332	Battery Spares	1,008	
	Purchase of Tailings—		
3,669	Treasury Trust Account	1,941	
47,786	Tailings not Treated	47,391	
7,310	Estimated Gold Premium	7,039	
109,396			107,872
215,419	Total Assets		219,023
	Deduct—		
	Current Liabilities :		
8,506	Creditors	3,644	
17,812	Liability to Treasurer (Superannuation—Employer's Share)	19,699	
	Purchase of Tailings—		
3,455	Creditors	1,332	
7,310	Estimated Premiums Due	7,039	
37,083			31,714
£178,336			£187,309

DIVISION IV

Annual Progress Report of the Geological Survey Branch of the Mines Department for the Year 1957

CONTENTS

REPORTS

The following reports were prepared during the year for ultimate publication as one of a Miscellaneous Bulletin Series:—

Water Potentialities in the Yoganup District (South-West Division).

Report on Water Supply, Bamboo Creek Mining Centre, Pilbara Goldfield, W.A.

Report on a Geological Reconnaissance of a Greenstone Belt extending from Jackson in the Yilgarn Goldfield to Ryan's Find in the Coolgardie Goldfield.

The Seach for Oil in Western Australia in 1957.

Report on the Industrial Rocks and Minerals of the Esperance Area.

Summary Report on some Manganese Deposits in the Pilbara and West Pilbara Goldfields.

Report on Radioactivity at Mt. Mulgine, Yalgoo Goldfield.

Report on Beach Sand Heavy Mineral Deposit on P.A.'s 1013H, 1016H, and 1017H, Mosman Beach.

Summary Report on the Principal Beach Sand Heavy Mineral Deposits, South-West Division, Western Australia.

Report on Iron Deposit 9.5 miles North-North-East of Collie, W.A.

Some Notes on Underground Water in the Sand Patch Area, Albany.

Report on a Gold Find on P.A.389PP, Lake Grace.

Report on an Examination of an Alleged Copper Deposit, 3 miles South-South-East of Yornup, South-West Division.

Notes on the Occurrence of the "Toodyay Building Stone," Toodyay District, South-West Division.

Summary Progress Report on Reconnaissance Survey of Portion of the Pilbara Goldfield.

Notes on the Geology of the Copper Hills Area, Pilbara Goldfield, W.A.

Report on Heavy Mineral Concentrations on D.C.66H, Wilson's Inlet, South-West Division.

Report on the Occurrence of Prase, M.C.29, 4 miles South of Spargoville, Coolgardie Goldfield.

Report on Groundwater Conditions of the Country to the North and East of Lake Allanooka, South-West Division, W.A.

Notes on the Occurrence of Iron Ore at Tallering Peak, Yalgoo Goldfield.

Notes on the Occurrence of a Phosphatic Limestone on Location 1996 near Ruabon Siding, South-West Land Division, W.A.

CONTENTS—*continued*

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 Branch of the Mines Department for the year 1957

Under Secretary for Mines,

I submit herewith, for the information of the Honourable the Minister for Mines, my report on the activities of the Geological Survey for the year ended 31st Decmeber, 1957.

STAFF

Staff members as at 31st December, 1957 were as follows:—

Professional.

Ellis, H. A., B.Sc., A.O.S.M. (N.Z.)	Government Geologist	10
Berliat, K., D.Sc. (Switzerland)	Senior Geologist	
Sofoulis, J., B.Sc. (W.A.)	Geologist, Grade 1	
de la Hunty, L. E., B.Sc. (W.A.)	Do.	
Low, G. H., B.Sc. (W.A.)	Do.	
Noldart, A. J., B.Sc. (Syd.)	Do.	
Duggan, J. W., B.Sc. (W.A.)	Geologist, Grade 2	
Wyatt, J. D., B.A. (W.A.)	Do.	
Connolly, R. R.	Do.	
Bartram, G. D., B.Sc. (W.A.)	Do.	

Clerical.

White, S. V. G.	Typist	3
Rasmussen, R. F.	Clerk	
Potts, H. G.	Junior Clerk	

Laboratory.

Fimmell, L. H.	Laboratory Technician	1

Promotions, Resignations, Appointments

Mr. R. R. Connolly was promoted to the Professional Staff as Geologist Grade 2 on 5th January, 1957 following the completion of a two year training period.

Mr. E. J. Samuel was successful in his application for a transfer to head office, and ceased duty with this branch on 7th June, 1957.

Mr. T. J. Martin, clerk to the Survey for several years, died on 23rd July, 1957.

Mr. G. D. Bartram joined the Professional Staff as Geologist Grade 2 on 14th January, 1957.

Mr. R. F. Rasmussen was appointed to the position of clerk on 22nd November, 1957 on transfer from the Mining Registrar's office, Marble Bar.

Mr. H. G. Potts commenced duties as a junior clerk on 4th June, replacing Mr. Samuel.

PROFESSIONAL STAFF

The approved establishment for professional officers as at 31st December, 1957, is as follows:—

Position.	Occupant.
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	J. W. Duggan.
Do.	J. D. Wyatt.
Do.	R. R. Connolly.
Do.	G. D. Bartram.
Do.	Vacant.
Do.	Vacant.

The two vacant Grade 2 positions were created late in the year to supply the needs of a newly organised Hydrological Section of the Geological Survey, but despite Australia-wide advertisement for applicants no suitable persons applied.

The widely scattered nature of the localities in which our professional services were required during the year necessitated a vast amount of travelling, and the year's work was hard on both vehicles and personnel

For the greater part of the year, and for the first time in many years, the authorised establishment was up to full strength.

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., 1957	10	975,920	97,592	691,882

Activities of Professional Officers

H. A. Ellis, Government Geologist.

In addition to head-office duties, resumed April 1st after three months long service leave, I attended a Conference of State and Commonwealth Government Geologists in Sydney towards the end of May. In July a visit was made to the Field Party operating in the Marble Bar District, and a reconnaissance carried out in the sedimentary basin between Port Hedland and Broome.

K. Berliat, Senior Geologist.

January-March.—Acting Government Geologist.
April.—Office duties, Iron Ore Survey of the State.
May.—Drilling Supervision, Sandstone.
June.—Office duties, Iron Ore Survey of the State.
July.—Bungalbin Iron Ore Investigation.
August-October.—Iron Ore Investigations, Peak Hill, Pilbara, West Pilbara, Ashburton, Gascoyne and Murchison Goldfields.
November-December.—Water Supply South-West Division and Menzies District. Office work relative to formation of Hydrological Section. Annual Leave.

J. Sofoulis, Geologist, Grade 1.

January-February.—Long service leave and report writing.
March-May.—Drilling supervision Bamboo Creek and Copper Investigations, Pilbara and West Pilbara Goldfields.
June-July.—Report writing.
July-September.—Iron Reconnaissance, North-West Districts, in conjunction with Dr. Berliat.
October-December.—Drilling supervision Burnakura; Iron Ore Reconnaissance Jackson-Bungalbin-Ryan's Find areas.

L. E. de la Hunty, Geologist, Grade 1.

January-March.—Long Service Leave.
April.—Report writing.

May.—Reconnaissance survey in Esperance area. Core-logging at Day Dawn.
June.—Laying out drill sites at Agnew.
July.—Core-logging at Kanowna. Drill supervision at Agnew.
August.—Drill supervision at Agnew. Inspections of gold, water and manganese.
September.—Inspection of Mineral Claims for Manganese in Pilbara, West Pilbara, and Peak Hill Goldfields.
October.—Annual Leave and report writing.
November.—Report writing.
December.—Investigation of radioactivity at Mt. Mulgine.

G. H. Low, Geologist, Grade 1.

January.—Beach Sands Survey, South-West and South Coasts. Reports on Oil Search in W.A.
February.—Completion of Abba River Drilling Reports, and Drafting Work Part 2, Bulletin 105.
March.—Mosman Beach Sand Investigation.
April-December.—Supervision of Diamond Drilling at Bamboo Creek. Preliminary work on Tectonic Map of W.A.
July.—Investigation of Iron Ore at Collie, and Water Supply at Albany.
August-December.—Supervision of Diamond Drilling at Burnakura.
September.—Investigation of gold find at Lake Grace, and copper at Yornup.
October.—Kalgoorlie visit associated with gold ore investigation. Report on Toodyay building stone.

A. J. Noldart, Geologist, Grade 1.

January-February.—Annual Progress Report Pilbara Goldfield Regional Survey. (Stage I, Marble Bar 4 mile to 1 inch sheet.).
February-April.—Compilation of structure maps and preparations Stage 2. Pilbara Goldfield Regional Survey (Nullagine 4 mile to 1 inch sheet).
May-September.—Field work Pilbara Goldfield Regional Survey.
October-December.—Compilation and correlation of field maps and preparation of Bulletin data.

J. W. Duggan, Geologist, Grade 2.

January-December.—Diamond Drilling supervision at Day Dawn, Bonnievale, Sandstone, Peak Hill, Kanowna, and Mount Morgans. Annual leave in September.

J. D. Wyatt, Geologist, Grade 2.

January.—Office duties.
February.—Clay survey, Maylands Aerodrome.
March.—Beach Sand Investigations, Mosman Park.
April.—Office duties.
May-October.—Regional Survey, Marble Bar Area.
November.—Office duties.
December.—Lime Sands, Northcliffe Area.

R. R. Connolly, Geologist, Grade 2.

January-June.—Miscellaneous mineral investigations and inspections.
July-November.—Temporarily transferred to clerk's position pending replacement for Mr. Martin (deceased).
November-December.—Miscellaneous investigations.

G. D. Bartram, Geologist, Grade 2.

January.—Appointed. Office duties.
February-April.—Office duties and miscellaneous field work including clay drilling Maylands, copper shows Northampton, gold drilling Peak Hill.
May-October.—Pilbara Regional Survey field work.
October-December.—Office duties and miscellaneous field work, including Capel water supply, Leonora water supply.

FIELD WORK.

Major Field Work Completed During the Year and in Progress as at 31st December, 1957.

(1) Pilbara Goldfield Regional Survey completed.
(2) Completion of deep diamond drilling at Kanowna, Sandstone and Coolgardie.
(3) Completion of extensive Exploratory Diamond Drilling at "Blue Spec"—Nullagine District.
(4) Completion of Underground Exploratory Drilling on the "Comet" Gold Mine, Marble Bar.
(5) Continuation of Exploratory Diamond Drilling at Bamboo Creek Centre, Pilbara Goldfield.
(6) Continuation of Exploratory Diamond Drilling of abandoned gold mines at Agnew, Burnakura and Mt. Morgans.
(7) Continuation of Iron Ore Survey of the State.
(8) Continuation of Copper Reserves Survey of the State.
(9) Continuation of Manganese-Chromite Survey of the State.
(10) Continuation of the Deep Diamond Drilling Programme on the "Great Fingall" reef at Day Dawn.
(11) Diamond Drilling at Peak Hill, Peak Hill Goldfield.

Field Work Planned for 1958.

(1) Supervision of Diamond Drilling at Bamboo Creek, Day Dawn, Mt. Morgans and any other operations arising out of the £ for £ subsidised Diamond Drilling Scheme.
(2) Commencement of geological work and supervision of water-boring in connection with the just established Water Drilling Section of the Mines Department and the Hydrological Section of the Geological Survey.
(3) Continuation of Iron Ore Survey, Manganese and Chromite and Copper Surveys.

TRANSPORT.

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

Vehicle W.A.G.	Make and Type	Load cwt.	Mileage as at 31/12/57	Mileage for 1957	Date Vehicle Purchased	Remarks
909	Willys Jeep	5	42,665	6,025	1953 (new)	
1194	Ford Utility	15	104,929	1,361	1946 (new)	Disposed of 3/4/57.
2044	Dodge Utility	18	70,210	9,189	1950 (new)	
2392	International Utility	14	97,957	21,437	1950 (new)	
2412	do. do.	14	93,852	11,018	1950 (new)	
2608	do. do.	14	73,775	11,562	1951 (new)	Damaged. Disposed of 13/11/57.
3135	Fargo Utility	15	45,140	8,402	1954 (new)	
3535	Land Rover Utility	10	37,280	14,197	1955 (new)	
3678	Dodge Utility	15	24,028	7,554	1955 (new)	
3876	Land Rover Utility	10	20,944	11,544	1956 (new)	
4475	do. do.	10	6,515	6,515	1957 (new)	Purchased 28/6/57.
4559	do. do.	10	3,497	3,497	1957 (new)	Purchased 12/9/57.
4691	International Utility	20	388	350	1957 (new)	Purchased 17/12/57.

Total miles, 112,751.

Heavy toll was taken of our vehicles in travelling the long distances involved in the supervision of diamond drilling, and in negotiating the rugged country in the Pilbara Goldfield regional survey. Maintenance costs for the year were very high.

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

This Branch continues to render an extensive service under this heading in the form of consultations, written reports, making publications available and field examinations. The lag in publication of our reports is frequently a serious handicap to our efficiency in this respect.

Hydrological Section.

Ministerial approval was given towards the end of the year for the formation within the Geological Survey Branch of a special section whose work would be confined to underground water exploration. Two Ruston-Bucyrus water boring percussion plants were added to the equipment of the Mines Department's Drilling Section, and early in 1958 exploratory boring will take place in the Hill River Area on partially developed agricultural lands, privately owned. It is anticipated that the activities of this section will gradually expand until underground water is recognised as being of high priority in the economy of the State. Suitable additional staff have not been available, and the additional work will be carried by existing staff.

ACTIVITIES OF THE COMMONWEALTH BUREAU OF MINERAL RESOURCES.

The principal activity of the Bureau during 1957 was the continuation of the Canning Basin Regional Geological Survey commenced several years ago and in which a helicopter was used for the first time in Western Australia on geological work. Airborne magnetometer and scintillometer traverses were made in the Carnarvon and Eastern Goldfields localities, and in conjunction with an officer from the Geological Survey of Western Australia, an examination was made of current manganese reserves in the Pilbara and other northern districts.

PUBLICATIONS.

Issued during 1957.

Annual Progress Report of the Geological Survey of Western Australia for the year 1954—Administrative Section only.

In the Press.

Geological Sketch Map of Western Australia—1956. Scale 1 inch = 40 miles—one sheet.

Bulletin 109—Miscellaneous Bulletin—contains reports for 1954.

Bulletin 110—The Geology of the Phillips River Goldfield, W.A., by J. Sofoulis, B.Sc.

Bulletin 111—The Exploratory Diamond Drilling of the Koolyanobbing Iron Ore Deposits for Pyrite, by H. A. Ellis, B.Sc., A.O.S.M.

Bulletin 105—The Collie Mineral Field, Part 2, by G. H. Low, B.Sc.

Mineral Resources Series—Bulletin No. 6—Gypsum in W.A., by L. E. de la Hunty, B.Sc., and G. H. Low, B.Sc.

Compiled and Awaiting Authority to Print.

Reports for 1955, 1956 and 1957—previously published with this Annual Report up to 1953 inclusive.

H. A. ELLIS,
Government Geologist.

DIVISION V

School of Mines, Western Australia

ANNUAL REPORT, 1957.

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 1957. The activities of the main School at Kalgoorlie, and the Branch Schools at Norseman and at Bullfinch are covered.

KALGOORLIE.

Enrolments.

The total number of enrolments received during 1957 was 387—an increase of 22 by comparison with 1956. Table I gives the individual and class enrolments for 1955, 1956, and 1957, and Table II the enrolments in various subjects during 1957. Table III sets out the number of students enrolled for the various courses. Although the number of students enrolled has increased over the last three years, the number enrolled for Associateship and Certificate Courses has decreased slightly.

TABLE I.

Enrolments—1955, 1956, 1957.

Year.	First Term.		Second Term.		Third Term.	
	Individual.	Class.	Individual.	Class.	Individual.	Class.
1955	324	764	322	629	294	545
1956	365	839	331	734	288	613
1957	363	940	315	767	264	653

Revenue.

Students fees and fees from the sale of official publications amounted to £635 3s. 8d.—a decrease of £48 2s. 4d. by comparison with the previous year. Details of fees received from students are given in Table IV.

Fees received for work done in the Kalgoorlie Metallurgical Laboratory amounted to £270 9s.—an increase of £36 3s. 4d. by comparison with the previous year.

TABLE II.

Class Enrolments, 1957.

Subject	First Term	Second Term	Third Term
Preparatory Chemistry	35	26	19
Chemistry IA	40	36	27
Chemistry IB	4	4	4
Chemistry II	4	5	5
Analytical Chemistry I	6	6	6
Analytical Chemistry II	4	4	4
Chemical Metallurgy I	6	6	5
Chemical Metallurgy II	3	3	3
Mineral Dressing I	8	8	8
Mineral Dressing II	3	4	4
Mineral Dressing III	3	3	3
Physical Metallurgy I	6	7	7
Assaying	7	6	6
Preparatory Mathematics	47	27	23
Mathematics I	42	26	23
Mathematics IIA	23	24	20
Mathematics IIB	12	9	8
Mathematics IIM	6	6	4
Applied Mathematics I	24	22	19
Preparatory Physics	26	20	17
Physics I	39	38	38
Physics IIA	17	18	16
Physics IIB	8	8	8
Trade Mathematics I	41	26	24
Preparatory Engineering Drawing	51	37	20
Engineering Drawing I	49	32	20
Engineering Drawing and Design IIA	18	10	8
Engineering Drawing and Design IIB	9	4	3
Engineering Drawing and Design IIC	4	3	2
Engineering Drawing and Design IID	2	2	2
Surveying Drawing II	15	10	10
Mechanical Engineering I	11	12	11
Practical Electricity	6	5	4
Electrical Engineering I	16	14	13
Electrical Engineering II	2	4	4
Internal Combustion Engine	17	13	10
Workshop Practice I	37	26	22
Workshop Practice II	13	10	9
Workshop Practice IIIA	4	4	2
Workshop Practice IIIB	5	2	1
Engineering Workshop Practice	6	7	6
Welding I	33	29	22
Welding II	19	15	12
Steam Engine Driving	5	6	2
Structural Engineering I	9	10	10
Structural Engineering II	3	2	3
Machine Design	6	6	6
Materials of Construction	9	8	7
Hydraulics	4	4	4
Preparatory Geology	24	19	19
Geology IA	13	11	11
Geology IB	15	15	15
Geology IIA	8	8	8
Geology IIB	9	8	8
Geology IIC	3	3	3
Geology IIIA	6	4	3
Mining I	19	14	11
Mining II	10	9	7
Mining IIA	1	....	....
Mining III	5	1	1
Mining IIIA	....	3	3
Mining IIIB	1	1	1
Mine Ventilation	2	2	2
Surveying I	14	13	13
Surveying II	12	10	9
Preparatory English	9	7	5
English IA	22	22	20
Totals	940	767	653
Totals, 1956	839	734	613

TABLE III.

Number of Students Enrolled for Various Courses.

Course	Number Enrolled		
	1955	1956	1957
Associateship Courses—			
Mining	33	30	27
Metallurgy	20	23	26
Engineering	43	40	37
Mining Geology	11	9	10
Total	107	102	100
Certificate Courses—			
Assayer's	3	2	2
Surveyor's	14	15	10
Mine Manager's	4	2	1
Engineering Draftsman's	9	11	8
Electrical Engineer's	5	5	2
Mechanical Engineer's	1	1	3
Total	36	36	26
Technicians' Courses—			
Engine Operation and Maintenance	3	2	3
Workshop Foreman's	5	9	8
Welding	9	13	16
Total	17	24	27
No Set Course—			
Preparatory Subjects	*	54	50
Others	*	149	184
Grand Total	187	203	234
Total for Year	347	365	387

* Information not available.

TABLE IV.

Numbers of Students Paying Fees.

Group No.	Description	Full Time	Part Time	Ext.	Totals
1	Students who pay class fees—				
	Age 21 and over	3	116	6	
	Under age 21	....	3	....	
		3	119	6	128
2	Students nominated by Repatriation Department. Class fees paid (C.R.T.S. and others)	....	1	....	1
3	Students under 21, who pay registration fees	7	108	....	115
4	Students under 21, who do not pay registration fees	9	66	....	75
5	Students aged 21 and over who do not pay class fees—				
	Returned Servicemen	....	57	....	
	Staff	....	9	....	
	Scholarship holders (Y.F.S.)	....	2	....	
		....	68	....	68
	Total	....	....	....	387

Staff.

The following changes of staff occurred during the year:—

Name	Position	Date	Notes
Bialecki, G.	Laboratory Assistant	8/2/57	Resigned
Bourne, R. W.	Cadet	13/9/57	Appointed
		28/11/57	Resigned
Carroll, L. J.	Registrar	29/5/57	Appointed
Hooper, K.	Lecturer	6/12/57	Resigned
Lumb, G. M.	Registrar	25/5/57	Retired
Neve, H. D.	Laboratory Assistant	27/5/57	Appointed
Travis, G. A.	Cadet	25/2/57	Appointed
van der Hoek, B. J. D.	Cadet	25/2/57	Appointed
Wills, M. F.	Cadet	12/9/57	Resigned

Courses of Study.

These remained as in 1956.

Annual and Supplementary Examinations.

The results of these examinations are summarised in Tables V and VI—Table V is based on class enrolments and Table VI on individual examinations. Table V shows that the proportion of students sitting for and passing the examinations was slightly lower than in the previous year, but the difference is not significant and the figures are higher than some of the previous years. Table VI shows that there has been a small decrease in the numbers of students enrolled for Associateship and for Certificate Courses, and a corresponding increase in the numbers enrolled for Technicians' Courses or for no set course. These changes are not particularly significant, but the tendency will need to be watched. Table VI also indicates that there has been an overall increase in the proportion of students sitting for the examinations.

The results for individual subjects are given in Appendix I.

TABLE V.

Results of Annual and of Supplementary Examinations.

Based on Class Enrolments, 1953-1957.

Kalgoorlie.

	1953	1954	1955	1956	1957
Class enrolments = A	837	901	802	878	951
Number of entries for Annual Examinations = B	546	521	495	557	577
B/A per cent.	65	58	62	63	61
Number of passes at Annual Examinations, as a per cent. of A	54	47	51	53	48
Number of passes at Annual Examinations, as a per cent. of B	83	82	82	83	79
Number of passes at Annual and Supplementary Examinations, as a per cent. of A	56	49	52	55	52
Number of passes at Annual and Supplementary Examinations, as a per cent. of B	85	85	85	86	83

TABLE VI.

Students Sitting for Annual Examinations, 1957.

KALGOORLIE.

	1955		1956		1957	
	Number enrolled	Per cent. sitting	Number enrolled	Per cent. sitting	Number enrolled	Per cent. sitting
Associateship Courses	107	81	102	81	100	89
Certificate Courses	36	78	36	86	26	85
Technicians' Courses	17	76	24	75	27	67
No Set Course	187	42	203	48	234	59
Total	347	60	365	63	387	69

Scholarships and Prizes.

S. T. Hunter was awarded a Mines Department Entrance Scholarship at the end of 1956, and he completed a good year's work in 1957. His scholarship was renewed at the end of 1957.

Seven students held Chamber of Mines Scholarships during 1957, and all students completed a good year's work.

The usual scholarships and prizes were awarded at the end of the year, and a list of awards is given in Appendix 2.

Diplomas and Certificates.

Twenty-four students completed courses in 1957. Details are given in Table VII.

Students Nominated by Repatriation Department.

Only one student was assisted by the Repatriation Department.

Details are as follows:—

	1955	1956	1957
Commonwealth Reconstruction Training Scheme—			
Full-time	....	....	....
Part-time	2	1	....
Disabled Members and Widows' Training Scheme—			
Full-time	....	....	....
Part-time	1	1	1

TABLE VII.

Diplomas and Certificates Awarded, 1953-1957.

	1953	1954	1955	1956	1957
Associateship Courses—					
Mining	3	7	1	6	3
Metallurgy	1	6	2	4	5
Engineering	4	3	2	8	3
Mechanical and Electrical Engineering (pre 1947 course)	....	1	....	....	....
Mining Geology	1	2	....	1	....
Total	9	19	5	19	11
Certificate Courses—					
Assayer's	3	4	3	2	4
Industrial Chemist's (pre 1947 Course)	1	1	....	....	....
Mine Manager's	4	2	4	3	1
Mine Surveyor's	7	9	8	4	2
Engineering Draughtsman's	3	....	1	....	2
Electrical Engineer's	1	2	....	....	....
Mechanical Engineer's	1	....	1	....	....
Total	20	18	17	9	9
Technicians' Courses—					
Engine Operation and Maintenance	5	3	3	....	1
Workshop Foreman's	....	....	....	2	1
Welding	....	....	....	3	2
Total	5	3	3	5	4

Library.

The first stage in the cataloguing of the library is almost completed. At 31st December, 1957, author and shelf list entries had been made for 4,288 items. This number is made up of approximately 200 pamphlets and 4,088 books and bound volumes of periodicals.

There is still a large amount of pamphlet and unbound serial matter to be catalogued. This will take some time, as careful weeding is required.

New books and bound volumes of periodicals added to the library in 1957 totalled 255.

A start has been made on a subject catalogue and on a card system for loans. Loan cards are placed in all new books as received, and in old books as these are taken out. Eventually they will be placed in all lending stock.

A shortage of space is still the biggest obstacle to effective library service. A library cannot function efficiently without some central storage—for at least its basic reference and lending stock. The present distribution of the School's library stock in not less than nineteen different parts of the School, plus the inaccessibility of books which are housed in lecturers' offices and class rooms, does not encourage use of the library by students, and even less so by mining companies and others engaged in the industry.

Services to the Public.

The School continued to provide the same services (in addition to its teaching activities) to the public as in previous years. These have been listed in previous Annual Reports.

During the year 398 samples were received from prospectors and others for assay and/or mineral determination. The work done on these samples is summarised in Table VIII.

TABLE VIII.

Work done on Samples Received from Prospectors and Others.

	1955	1956	1957
Assay—gold	90	147	106
Assay—gold and other constituents	21	23	6
Assay—metals other than gold	23	20	42
Assays plus mineral determination	4	11	11
Mineral examination	225	150	223
Rejected or transferred to Met. Lab. pay	8	42	10
	371	393	398

Visit of Director to Eastern States.

The Director attended the Annual Conference of the Australasian Institute of Mining and Metallurgy held at Newcastle from 2nd to 9th June.

On the way across a short stay was made in Melbourne and in Sydney. In Melbourne the main points of interest were the following: C.S. & I.R.O. Head Office, including the Library; Royal Melbourne Technical College; University of Melbourne, including the C.S. & I.R.O. Ore Dressing Laboratory, the Department of Metallurgy, and the Appointments Board. The writer discussed electrostatic and high tension apparatus for the separation of minerals particularly in beach sands with Mr. Hudson of the Melbourne Laboratory. Additional information was obtained later in Queensland. On the writer's return to Kalgoorlie the matter was discussed with the Senior Research Metallurgist, and orders were placed for equipment for the Kalgoorlie Laboratory. From discussions with the Secretary of the Appointments Board and others it was clear that it would be difficult to obtain an experienced physical metallurgist for Kalgoorlie.

In Sydney the writer visited the Mining Department of the New South Wales University of Technology. Brief calls were made on the Secretary, University of Sydney Appointments Board and on the Secretary, Institution of Engineers (Aust.). It was pleasing to visit the Sydney office of the Warman Equipment Company and to find that the senior staff members were all old students of the School.

Following the Conference the writer visited various beach sand workings in the vicinity of the New South Wales-Queensland border and also on Stradbroke Island in the vicinity of Brisbane. It was pleasing to again meet a number of old students of the School. The writer was accompanied by Mr. Miles of the Kalgoorlie Metallurgical Laboratory Staff. One of the main points of interest was the rehabilitation of areas which had been worked. Rehabilitated areas on the beach, at the Coolangatta Airport, and in settled areas were inspected, and it was evident that rehabilitation, if properly supervised, did not present any problems and that the rehabilitated areas were in better condition after rehabilitation than before they were worked. While in Brisbane the writer visited the Mining Department of the University of Queensland and also the Brisbane Technical College.

On the return journey to Kalgoorlie short stops were made at Adelaide and at Port Pirie. In Adelaide B.Th. Courses were discussed with Mr. E. W. Hughes of the School of Mines and Industries. Except for a few minor problems the scheme, which requires co-operation between the School of Mines and Industries and the University of Adelaide, appears to be working satisfactorily.

The main purpose of stopping at Port Pirie was to visit B.H.A.S. and to see what was being done there by Technical Information Section. Contact was also made with the Education Officer at B.H.A.S., and the Principal of the Port Pirie Technical School.

A report is being prepared on the various places visited and will be submitted to the Department.

Buildings.

No new buildings were added during 1957. The School buildings are in good condition.

Requirements of the School.

These remain as listed in last year's Annual Report. Towards the end of the year approval was given for the erection of a mineral dressing laboratory for student use and also for some improvements in the Metallurgical Laboratory. These buildings should be completed during 1958.

Advisory Committee.

During the year there were some changes in the members of the Committee. Mr. F. J. O'Dea resigned because of his departure from Kalgoorlie. Following Mr. O'Dea's resignation the constitution of the Committee was changed, and provision made for the Institution of Engineers (Aust.) and the Australasian Institute of Mining and Metallurgy to be represented on the Committee. Mr. W. B. Blown and Mr. C. M. Kleeman were appointed by the respective organisations. Mr. Harwood continued as Chairman, but provision was made during the year for Mr. O'Sullivan to be Chairman in Mr. Harwood's absence. Eight meetings were held during the year and attendance was as follows: Mr. M. Harwood, 4; Mr. O'Sullivan, 2; Mr. W. B. Blown, 4 (maximum); Mr. F. Collard, 3; Mr. C. M. Kleeman, 2; (maximum 4), Mr. E. B. Mundle, 7; Mr. F. J. O'Dea, 0; Mr. C. H. Warman, 7; Mr. R. A. Hobson, 3.

Mr. G. M. Lumb retired from the position of Registrar of the School in May and consequently also from the position as Secretary to the Committee. At its May meeting the Board placed on record its appreciation of Mr. Lumb's services as Secretary since 1941. Mr. L. J. Carroll was appointed as Registrar of the School to succeed Mr. Lumb, and also Secretary to the Committee.

During the year the Committee authorised the purchase from the Trust Fund of equipment valued at just over £1,000.

Kalgoorlie Metallurgical Laboratory.

Eleven reports and 70 certificates were issued during the year. Of the 11 reports issued 5 referred to gold ores, one to a gold-copper ore, one to a copper ore, one to a copper-cobalt ore, two to titanium ores, and one to non-metallics. Most of the assays required by the Government Geologist in connection with the drilling programme were made in the Laboratory and results given as certificates. In addition an appreciable number of gold and other assays were made for prospctors and others without cost.

In June Mr. Miles attended the Annual Conference of the Australasian Institute of Mining and Metallurgy at Newcastle and later spent some time inspecting the beach sand industry in the vicinity of the N.S.W.-Queensland border. He also visited C.S. & I.R.O. Head Office in Melbourne, and the Melbourne Ore Dressing Laboratory. On the return journey to Kalgoorlie Mr. Miles visited B.H.A.S. works at Port Pirie.

In August Messrs. Tasker and Miles visited the ilmenite workings at Bunbury and Capel.

From late August to October Messrs. Tasker and Dunstan were at Christmas Island in connection with pilot plant tests on the beneficiation of upper layer phosphate rock. This work followed the pattern set by earlier work in the Kalgoorlie Metallurgical Laboratory. Sufficient information was obtained to show that the procedure could be satisfactory.

More information about the work of the Laboratory is given in Appendix 3.

TABLE IX

KALGOORLIE METALLURGICAL LABORATORY SUMMARY OF WORK

——	1955	1956	1957
Investigations outstanding (1st January)	6	5	8
Investigations asked for (690 to 702 inclusive)	17	14	13
	23	19	21
Investigations completed	18	10	11
Investigations outstanding (31st December)	5	8	7
Investigations cancelled	....	1	3
	23	19	21
Certificates issued (assays, analyses, etc.)	54	71	70

The C.S. & I.R.O. continued to assist the Laboratory and again provided £2,700 in the 1957/58 financial year for salaries and equipment.

Students' Association.

The Students' Association organised two functions during the year—the Annual Ball on 26th July and the Annual Dinner on 29th November. The Association also provided four scholarships each valued at £10.

NORSEMAN.

Enrolments.

The total number of students enrolled was 60—2 less than in 1956. Table X sets out the individual and class enrolments for the year and also for the two previous years, and Table XI, the enrolments in the individual subjects. Table XII gives the students enrolled for the various courses.

TABLE X

ENROLMENTS—1955, 1956, 1957

Year	First Term		Second Term		Third Term	
	Individual	Class	Individual	Class	Individual	Class
1955	60	160	55	141	53	127
1956	60	159	50	156	58	135
1957	58	160	55	144	51	134

TABLE XI

CLASS ENROLMENTS, NORSEMAN, 1957

Subjects	First Term	Second Term	Third Term
Preparatory Mathematics	9	9	8
Trade Mathematics I	8	5	5
Mathematics IIA	6	5	5
Preparatory Chemistry	11	9	8
Preparatory Physics	10	9	8
Preparatory Engineering Drawing	9	6	6
Engineering Drawing I	16	14	13
Engineering Drawing and Design IIA	5	3	3
Surveying Drawing II	2	3	2
Mining III	3	3	3
Mining IIIA	2	1	1
Practical Electricity	8	7	6
Surveying I	7	8	8
Welding I	9	9	8
Welding II	8	8	8
Trade Metallurgy	14	13	12
Mechanical Engineering I	5	4	4
Steam Engine Driving	12	12	11
Workshop Practice II	9	9	9
Geology IA	4	4	3
Geology IIA	3	3	3
Totals	160	144	134
Totals, 1956	159	156	135

TABLE XII

NUMBER OF STUDENTS ENROLLED FOR VARIOUS COURSES

Course	Number Enrolled		
	1955	1956	1957
Associateship Courses—			
Mining	1	6	3
Metallurgy	....	....	....
Engineering	1	....	....
Mining Geology	2	....	....
Total	4	6	3
Certificate Courses—			
Assayer's	....	1	....
Surveyor's	7	5	8
Mine Manager's	....	1	1
Engineering Draughtsman's	....	....	1
Electrical Engineer's	....	....	....
Mechanical Engineer's	....	....	....
Total	7	7	10
Technician's Courses—			
Engine Operation and Maintenance	27	27	22
Workshop Foreman's	....	2	2
Welding	....	1	4
Total	27	30	28
No Set Course—			
Preparatory Subjects	*	5	11
Others	*	12	8
Total	22	17	19
Total for Year	60	60	60

* Information not available.

Revenue.

The revenue received was £71 0s. 0d.

Staff.

At the end of the academic year Mr. G. H. Moore resigned from the position of Officer-in-Charge at Norseman, and Mr. R. V. Field of Kalgoorlie was appointed to this position. At the time of appointment Mr. Field was a member of the teaching staff of the Department of Metallurgy and Chemistry in Kalgoorlie. The position of lecturer was advertised, but no appointment was made. Nine part-time instructors were employed during the year.

Subjects Taught.

Twenty subjects were taught—the same number as in the previous year. As in previous years use was made of various workshops at Central Norseman Gold Corporation for practical instruction.

Examinations.

The results of the Annual Examinations are summarised in Tables XIII and XIV—Table XIII is based on class enrolments and Table XIV on individual enrolments. Table XV makes a comparison with Kalgoorlie results, and is based on class enrolments. The tables show that the results obtained were very similar to those of previous years. There does appear to be a steady improvement in the proportion of students who are sitting for the Annual Examinations (Table XIV).

The results for individual subjects are given in Appendix I.

Scholarships and Prizes.

Reg. Dowson Scholarships based on work done during 1957 were awarded to W. K. Hedley and N. E. Wilson. Each of these students passed in four subjects and completed a good year's work. The two students who were awarded Reg. Dowson Scholarships at the end of 1956 each completed a fair year's work, but neither was successful in all subjects for which he was enrolled.

W. K. Hedley was also awarded a Robert Falconer Prize. Two of these prizes are awarded each year and they are available to students enrolled in Kalgoorlie or at the branch schools.

A list of awards is given in Appendix 2.

Buildings.

An L.P. gas installation was completed during the year, and gas is available in all laboratories. Otherwise only minor improvements were made to the buildings.

TABLE XIII

Results of Annual and of Supplementary Examinations Based on Class Enrolments, 1953-1957.

	1953	1954	1955	1956	1957
Class enrolments = A	144	157	167	163	178
Number of entries for Annual Examinations = B	84	100	90	111	116
B/A per cent.	58	64	54	68	65
Number of passes at Annual Examinations, as a per cent. of A	46	48	43	58	52
Number of passes at Annual Examinations, as a per cent. of B	80	76	79	86	79
Number of passes at Annual and Supplementary Examinations, as a per cent. of A	48	49	43	61	53
Number of passes at Annual and Supplementary Examinations, as a per cent. of B	82	77	80	89	81

TABLE XIV

Students Sitting at Annual Examinations 1955-1957

Courses	1955		1956		1957	
	Number Enrolled	Per cent. sitting	Number Enrolled	Per cent. sitting	Number Enrolled	Per cent. sitting
Associateship Courses	4	50	6	100	3	100
Certificate Courses	7	86	7	86	10	90
Technicians' Courses	27	78	30	83	28	86
No set Course	22	64	17	81	19	84
Totals	60	72	60	83	60	87
Kalgoorlie for comparison	347	60	365	63	387	69

TABLE XV.

Examination Results, Norseman and Kalgoorlie.

Notes: i. Information based on class enrolments.
ii. The letters "A" and "B" have the same meaning as in Table XIII.

	Norseman			Kalgoorlie		
	1955	1956	1957	1955	1956	1957
B/A per cent.	54	68	65	62	63	61
Total passed as a per cent. of A	43	61	53	52	55	52
Total passed as a per cent. of B	80	89	81	85	86	83

Advisory Committee.

The Advisory Committee continued to meet with Mr. W. L. Dutton as Chairman, and to take an active interest in the affairs of the School.

BULLFINCH.

Enrolments.

The total number of enrolments was 57—an increase of 16 by comparison with the previous year. Table XVI gives the individual and class enrolments for 1957 and for the two previous years. The loss of students during the year was slightly greater than in the previous year, but not as great as in 1955. Table XVII gives the number of students enrolled in the subjects taught at Bullfinch, and Table XVIII the number of students enrolled for the various Courses. Only a few students at Bullfinch are so far enrolled for definite Courses.

Revenue.

The revenue received was £56 10s.

Staff.

The position of officer-in-charge was advertised a number of times, but no suitable application was received. Mr. Browne continued as part-time Registrar, and all instructors were members of the staff of Great Western Consolidated. The total number of part-time instructors employed was 13, but at any one time the number did not exceed 11. Some changes were made during the year as members of the part-time staff were moved away from Bullfinch.

Subjects Taught.

Fourteen subjects were taught during 1957—two more than in the previous year. One subject was discontinued at the end of first term.

Examinations.

The results of the Annual Examinations are summarised in Tables XIX to XXI. The figures are slightly lower than in the previous year, but well ahead of 1955. The proportion of students sitting for the Annual Examinations is now only just under the proportion sitting in Kalgoorlie and in Norseman, but the proportion passing is considerably less (Table XXI).

The results for individual subjects are given in Appendix 1.

TABLE XVI.

Enrolments—1955, 1956, and 1957.

Year.	First Term.		Second Term.		Third Term.	
	Individual.	Class.	Individual.	Class.	Individual.	Class.
1955	55	111	36	65	30	46
1956	33	64	33	59	27	54
1957	56	113	41	78	41	77

TABLE XVII.

Class Enrolments, Bullfinch, 1957.

Subjects	First Term	Second Term	Third Term
Preparatory Chemistry	5	5	5
Mineral Dressing I	7	3	3
Trade Mathematics I	12	8	8
Preparatory Mathematics	11	8	8
Mathematics I	6	5	5
Preparatory Engineering Drawing	9	6	5
Engineering Drawing I	8	6	6
Engineering Drawing and Design IIA	3	2	2
Internal Combustion Engines	8	....	....
Workshop Practice I	10	8	8
Welding I	13	11	11
Preparatory Geology	6	5	5
Geology IB	5	5	5
Mining I	10	6	6
Totals	113	78	77
Totals, 1956	64	59	54

Scholarships and Prizes.

B. H. Harris, who was awarded the Country Club Prize in 1956, completed a good year's work by passing in three subjects—one with credit.

A list of awards is given in Appendix 2.

Buildings.

The buildings require painting externally, but otherwise are in good condition and adequate for present requirements.

TABLE XVIII.

Number of Students Enrolled for Various Courses.

Course	Number Enrolled		
	1955	1956	1957
Associateship Courses—			
Mining	....	....	....
Metallurgy	....	....	1
Engineering	....	....	....
Mining Geology	1	2	1
Total	1	2	2
Certificate Courses—			
Assayer's	2	....	....
Surveyor's	6	3	4
Mine Manager's	2	....	....
Engineering Draughtsman's	2	....	....
Electrical Engineer's	2	1	2
Mechanical Engineer's	....	....	....
Total	14	4	6
Technicians' Courses—			
Engine Operation and Maintenance	3	....	....
Workshop Foreman's	1	....	1
Welding	5	....	....
Total	9	0	1
No Set Course—			
Preparatory Subjects	*	10	7
Others	*	17	41
Total	32	27	48
Total for Year	56	33	57

* Information not available

TABLE XIX.

Results of Annual and of Supplementary Examinations based on Class Enrolments, Bullfinch, 1955-1957.

	1955	1956	1957
Class enrolments = A	113	77	114
Number of entries for Annual Examinations = B	30	45	64
B/A per cent.	27	58	56
Number of passes at Annual Examinations as a per cent. of A	17	39	33
Number of passes at Annual Examinations as a per cent. of B	63	67	59
Number of passes at Annual and Supplementary Examinations as a per cent. of A	19	39	35
Number of passes at Annual and Supplementary Examinations as a per cent. of B	70	67	62

TABLE XX.

Students Sitting for Annual Examinations, Bullfinch.

Course	1955		1956		1957	
	Number enrolled	Per cent. sitting	Number enrolled	Per cent. sitting	Number enrolled	Per cent. sitting
Associateship Courses	1	100	2	50	2	100
Certificate Courses	14	57	4	75	6	100
Technicians' Courses	9	44	....	....	1	....
No set Course	32	26	27	59	48	48
Totals	56	39	33	67	57	54
Totals—Kalgoorlie	347	60	365	63	387	69
Norseman	60	72	60	83	60	87

TABLE XXI.

Examination Results—Bullfinch, Norseman, and Kalgoorlie.

Notes: i. Based on Class Enrolments. ii. The letters "A" and "B" have the same meaning as in Table XIX.

	1955	1956	1957
B/A per cent.—			
Bullfinch	27	58	56
Norseman	54	68	65
Kalgoorlie	62	63	61
Total passes as a per cent. of A—			
Bullfinch	19	39	35
Norseman	43	61	53
Kalgoorlie	52	55	52
Total passes as a per cent. of B—			
Bullfinch	70	67	62
Norseman	80	89	81
Kalgoorlie	85	86	83

ACKNOWLEDGEMENTS.

During the year members of the Staff have carried out their various duties in a manner likely to bring credit to the School and to themselves. Members of the part-time Staff have also worked well and particular thanks are due to part-time staff at Norseman and Bullfinch. Without part-time staff the branch schools could not carry on.

Thanks are due to members of the Advisory Committees, who have given of their time to assist the School.

Mining Companies in Norseman and in Bullfinch have made available their workshops for practical classes. Without this assistance these classes could not be held.

Finally, acknowledgement is made of assistance and co-operation from Head Office Staff and from members of other sections of the Department.

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

APPENDIX 1.

School of Mines of Western Australia.
ANNUAL EXAMINATIONS.
1957.

PASS LIST.

Passes are in order of merit.
(E) denotes equal.
(*) denotes year fee scholarship.

Preparatory English.
Credit:
Hunter, S. T. (*)
Pass:
Peden, R. W.
Procter, J. D.
Turner, B. C.
Sullivan, B. S.

English 1A.
Credit:
Buckett, L. N. (*)
Hooker, L. F.
Dowson, J. W.
Pass:
Ross, D.
Smith, A. M.
Garrigan, J. S.
George, T. J. F.
Wolff, D. L.
Allen, T. R.
Willis, J. S.
Oliver, J. B.
Radge, J. A. (E)
Thomas, R. P. (E)
Scott, S. J. (E)
Lennon, B. P.
Boddington, E. H.
Terrell, R. J. H.
Simmons, M. R.

Preparatory Drawing.
Credit:
Douglas, D. C. (*)
Annear, J. F. (Miss)
Ruvidini, A.
Symons, W. S.
Duval, J. D.
Bagworth, B. A.
Pass:
Bower, J. K.
Bourne, R.
Pivac, A. M.
Travis, G. A.
Peden, R. W.
Tie, C. S.
Hurley, B. J.
Kilderry, T. J.
Love, R. J.
Jahn, R. E.
Morocz, G.
Frank, P. H.
Thompson, F.
McGillivray, G. B.
Hall, B. R.
Sullivan, B. S.

Engineering Drawing 1.
Credit:
Mills, W. J. (*)
Leslie, W. E.
Hunter, S. T.
White, R.
Ruvidini, A.
Pass:
Flanagan, K. J.
Bagworth, B. A.
Bell, D. R.
Oliver, B. C.
Keogh, J. T.
Comparolo, T. G.
Templeman, M.
Baker, G. B.
Simms, B. F.

Engineering Drawing & Design IIA.
Credit:
Turner, B. C. (*)
Pass:
Slocomb, J. H.
McNally, R. J.
Brownrigg, N. J.
McIntyre, A. T.
Boyd, J. C.
Procter, J. D.
Loxton, I. W.

Engineering Drawing & Design IIB.
Credit:
Matheson, W. S. (*)
Crocker, R. F.
Rasmussen, G. C. R.
Pass:
Kozak, P.

Engineering Drawing & Design IIC.
Credit:
Willis, J. S. (*)
Pass:
Rasmussen, G. C. R.

Engineering Drawing & Design IID.
Credit:
Sullivan, A. D. (*)
Pass:
Kozak, P.

Surveying Drawing II.
Credit:
Hooker, N. R. (*)
Mistry, S. D.
Pass:
Argus, J. C.
Dodge, G. J.
Suthisorn, V.
Hug, R. L.
Ganthavee, S.
Mahalingham, S.

Practical Electricity.
Pass:
Gleeson, R.
Arndt, G.

Electrical Engineering I
Credit:
Ross. D. (*)
Shenton, E. F.
Dowson, J. W.
Duncan, H. F.
Pass:
Thomas, R. P.
Canning, D. G.
Simmons, M. R.
Timoney, E. G.
Hardy, R. J.
Supp. Exam. Granted.
Cedro, J. A.
Ganthavee, S.
Mistry, S. D.
McDermott, J. C.

Electrical Engineering II.
Credit:
Marsh, F. E. (*)
Pass:
Scott, S. J.
Rasmussen, G. C. R.
Cameron, J. W.

Mechanical Engineering I.
Credit:
Mitchell, P. N. (*)
Simmons, M. R.
Pass:
Rasmussen, G. C. R. (E)
Shenton, E. F. (E)
Boddington, E. H.
Mistry, S. D.
Curnow, G. L.
Oliver, B. C.
Timoney, E.
Hardy, R.

Supp. Exam. Granted.
Elliott, R. J.

Structural Engineering I.
Credit:
Oliver, J. B. (*)
Ross, D.
Elliott, R. J.
Sullivan, A. D.
Pass:
Crocker, R. F.
Duncan, H. F.
Lawson, K. S.
Mullins, H. D.
Wolff, D. L.
Ganthavee, S.

Structural Engineering II.
Credit:
Willis, J. S. (*)
Rasmussen, G. C. R.
Pass:
Currie, E. G.

Materials of Construction.
Credit:
Ruvidini, A. (*)
Bagworth, B. A.
Shearn, A. S.
Sullivan, A. D.
Pass:
Forrest, R. N.
Slocomb, J. H.
Clifton, M. R.

Machine Design.
Credit:
Duncan, H. F. (*)
Lawson, K. S.
Oliver, B. C.
Pass:
Terrell, R.
Curnow, G. L.
Mackay, I. D.

Hydraulics.
Credit:
Rasmussen, G. C. R. (*)
Sullivan, A. D.
Pass:
Willis, J. S.

Internal Combustion Engines.
Credit:
Nelson, R. A. (*)
Rose, B. F. S.
Ward, D. A. H.
Pass:
Lawrence, W. F.
Waldock, R. L.
Wilson, F. L.
Kleyweg, R.

Workshop Practice I.
Credit:
Travis, G. A. (*)
Sutherland, G. W. (E)
Goldner, H. (E)
Baker, A. H.
Clifton, M. R.
Pass:
Duval, J. D.
Ranniko, E.
Simms, B. F.
Hall, B. R.
Chegwidden, P. J.
Maley, R. J.
Honey, J.
Irving, G. H. (E)
Baker, B. G. (E)
Exemption from attendance at practical work granted for 1958:
Pascoe, W. B.
Violi, P. J.

Workshop Practice II.
Credit:
Duncan, A. M. S. (*)
Nelson, R. A.
Pass:
Baker, A. H.
Genge, J. W.
Joyce, M.
Lamont, E. G.
Woods, C. T.
Jenkins, K.
Exemption from attendance at practical work granted for 1958:
Brayshaw, K. V.

Workshop Practice IIIA.
Credit:
Douglas, D. (*)
Bevans, E. T.

Workshop Practice IIIB.
Pass:
Mills, W. J.

Engineering Workshop Practice.
Credit:
Ruvidini, A. (*)
Pass:
Bagworth, B. A.
White, R.
Radge, J. A.
Jasson, K. E.
Mitchell, P. N.
Cameron, J. W.

Welding I.
Credit:
Sutherland, G. W. (*)
Thompson, F.
Evans, V. E.
Vanek, V.
Pass:
Ranniko, E. (E)
Bone, R. W. (E)
Blair, R. E.
Adams, R. A.
Pianto, G. V.
Godenzi, R. J.
Chegwidden, P. J.
Alexander, J. A.
Mason, T. G.
Tie, C. S.
Murray, G. K.
Mackay, A. F.
Exemption from attendance at practical work granted for 1958.
Anderson, E. L.

Welding II.
Credit:
Goldner, H. (*)
Mills, W. J.
Genge, A. B.
Turner, F. L.

Pass:
Moyle, H. R.
Lawrance, W. F. (E)
Wright, C. T. (E)
Gowdie, B. A.
Brooks, R. G.
Smith, R. W.
Rees, E. W.
Hoddy, D. K.

Steam Engine Driving.
Credit:
Kleyweg, R. (*)
Pass:
McDiarmid, H. D.

Preparatory Mathematics.
Credit:
Travis, G. A. (*)
Leslie, W. E.
Pass:
Cooper, W. H.
Bell, D. R. (E)
Keogh, C. E. (E)
Maley, R. J. (E)
Turner, B. C.
Nowland, L. G.
Keogh, J. T.
Attrill, D. M.
Supp. Exam. Granted.
Ballardie, G. F.

Mathematics I
Credit:
Bourne, R. W. (*)
White, R.
Sclanders, R. J.
McGillivray, G. B.
Pass:
Hunter, S. T.
Frank, P. H.
Klose, W. F.
Forrest, R. N.
Veale, I. L.
Cugley, K.
Maguire, D. W.
Supp. Exam. Granted.
Flanagan, K.
Rourke, I. G.
Williams, J. G.
Yates, V.

Mathematics IIA.
Credit:
Dowson, J. W. (*)
Pass:
Ruvidini, A.
Bagworth, B. A. (E)
Smith, A. McD. (E)
Kew, J. A.
Cruickshank, R. A.
Oliver, B. C.
Boyd, J. C.
Supp. Exam. Granted.
Boddington, E. H.
Slocomb, J. H.

Mathematics IIB.
Credit:
Smith, C. L. (*)
Ruvidini, A.
Pass:
Bagworth, B. A.
Crocker, R. F.
Willis, J. S.
Mullins, H. D.
Supp. Exam. Granted.
Slocomb, J. H.
Terrell, R. J. H.

Mathematics IIM.
Credit:
Buckett, L. N. (*)
Garrigan, J. S.
Bracanin, B. F.
Pass:
Symons, W. S.
Neve, H. D. (Completed pass from 1956).

Applied Mathematics I
Credit:
Bourne, R. W. (*)
Bagworth, B. A. (E)
George, T. J. F. (E)
Ruvidini, A. (E)
Pass:
Curnow, G. L.
Hunter, S. T.
Sloan, R. B.
Cedro, J. A. (E)
Kops, J. N. (E)
White, R.
Hug, R. L. (E)
Timoney, E. G. (E)
Lawson, K. S.
Supp. Exam. Granted.
Mitchell, J. A.
Van der Hoek, B. J.

Preparatory Physics.
Credit:
McIntyre, A. T. (*)
Leslie, W. E.
Klose, W. F.
Kilderry, T. J.
Pass:
Loxton, I. W.
Davey, C. R.
Keogh, C. E.
Turner, B. C.
Sullivan, B. S.
Chegwidden, P. J.
Supp. Exam. Granted:
Morocz, G.
Peden, R. W.
Exemption from attendance at practical work granted for 1958:
Morocz, G.
MacGregor, B. R.
Nowland, L. G.
Peden, R. W.
Tie, C. S.

Physics I.
Credit:
Bourne, R. W. (*)
Sclanders, R. J.
Pass:
MacGuire, D. W.
Bartlett, M. S.
Van der Hoek, B. J.
Veale, I. L.
Hunter, S. T.
Forrest, R. N. (E)
Shearn, A. S. (E)
Goddard, R. L.
Radge, J. A.
Wills, M. F.
Mackay, I. D.
Supp. Exam. Granted:
Morel, F. R.
Rourke, I. G.
McGillivray, G. B.
Exemption from practical work granted for 1958:
Morel, F. R.
Rourke, I. G.
McGillivray, G. B.

Physics IIA
Credit:
Mitchell, P. N. (*)
Buckett, L. N.
Bracanin, B. F.
Pass:
Thomas, R. P.
Simmons, M. R.
Hooker, L. F.
Cedro, J. A.
Willis, J. S.
Canning, D. G.
Supp. Exam. Granted.
Bennet, V. G.
Boddington, E. H.
Cruickshank, K.
Terrell, R. J. H.
McDermott, J. C.
Timoney, E. G.

Physics IIB.
Credit:
Mitchell, P. N. (*)
Pass:
Duncan, H. F.
Rasmussen, G. C. R.
Sullivan, A. D.
Jasson, K. E.
Cameron, J. W.
Crocker, R. F.
Mullins, H. D.

Trade Mathematics I.
Credit:
Tonkin, D. (*)
Darroch, D. A.
Duval, J. D.
Colgrove, J. E.
Ridley, R. H. (E)
Smith, R. W. (E)
Pass:
Farrell, R. T.
Simms, B. F.
Adams, R. A.
Russell, C. W.
Thompson, F.
Woods, C. T.
Hicks, D. C.
Morocz, G.
Supp. Exam. Granted.
Hefron, K. J.

Preparatory Chemistry.
Credit:
Travis, G. A. (*)
Tonkin, D.
White, R.
Pass:
Proctor, J. D.
Prest, R. S.
Kilderry, T. J.
Bell, D. R.
Ridley, R. H.
Supp. Exam. Granted.
Flanagan, K. J.
Attrill, D.
Lithgow, J.

Chemistry IA.
Credit:
Laffer, B. G. (*)
Lee, T. L.
Muncaster, I. M.
Marsh, F. E.
Panzich, A. P.
Pass:
Sclanders, R. J.
Van der Hoek, B. J.
McDermott, J. C.
Mistry, S. D.
Timoney, E. G.
Robinson, T. J.
Hunter, S. T.
Vidulich, H. T.
Bennett, V. G.

Chemistry IB.
Pass:
Kops, J. N.
Smith, C. L.
Brien, J. W.

Chemistry II.
Credit:
Buckett, L. N. (*)
Zani, D. A.
Pass:
Bracanin, B. F.
Symons. W. S.

Analytical Chemistry I.
Credit:
Buckett, L. N. (*)
Bracanin, B. F.
Pass:
Dowson, J. W. (E)
Gray, D. J. (E)
Hooker, L. F. (E)
Neve, H. D.

Analytical Chemistry II.
Pass:
Lennon, B. P.
Garrigan, J. S.
Higgs, K. E.
Zani, D. A.

Chemical Metallurgy I.
Pass:
Buckett, L. N.
Bracanin, B. F.
George, T. J. F. (E)
Hooker, L. F. (E)
Supp. Exam. Granted.
Neve, H. D.

Chemical Metallurgy II.
Pass:
Bower, J. K. (E)
Symons, W. S. (E)
Lennon, B. P.

Physical Metallurgy I.
Credit:
Garrigan, J. S. (*)
Buckett, L. N.
Matheson, W. S.
Pass:
Bracanin, B. F. (E)
Zani, D. A. (E)
Smith, A. M.
Dunstan, H. R.

Mineral Dressing I.
Credit:
Bourne, R. W. (*)
Pass:
Parry, K. F.
Bartlett, M. S.
Higgs, K. E.
Ganthavee, S. (E)
Mistry, S. D. (E)
Supp. Exam. Granted.
Chamberlain, H.

Mineral Dressing II.
Credit:
Hooker, L. F. (*)
Pass:
Neve, H. D.
Exemption from attendance at practical work granted for 1958.
Canning, D. G.
Exemption from attendance at lectures granted for 1958.
Bartlett, M. S.

Mineral Dressing III.
Pass:
Bower, J. K.
Symons, W. S.
Lennon, B. P.

Assaying.
Pass:
Oliver, J. B.
Bracanin, B. F.
Wolff, D. L.
Elliott, R. J. (E)
Williams, J. D. (E)
Supp. Exam. Granted.
Poole, R. H.
Exemption from attendance at practical work granted for 1958.
Poole, R. H.

Preparatory Geology.
Credit:
Travis, G. A. (*)
Pass:
Banks, F. R. (E)
Van Der Hoek, B. (E)
Bourne, R. W.
Crew, W. J.
Sullivan, J. P.
Bain, W. B.
Williams, J. G.
Supp. Exam. Granted:
Klose, W. F.
Peate, B. F.

Geology IA.
Pass:
Hooker, N. R. (E)
Simmons, M. R. (E)
Sloan, R. B. (E)
Fraser, P. G.
Dykstra, F. D.
Supp. Exam. Granted:
Hug, R. L.
Mahalingham, S.
Exemption from attendance at practical work granted for 1958:
Hug, R. L.
Mahalingham, S.
Jordan, A. F.
Suthisorn, V.

Geology IB.
Pass:
Buckett, L. N.
Campbell, A. D.
McGushin, P. J.
Frank, P. H.
Gray, D. J.
Van der Hoek, B. J.
Bracanin, B. F.
Fraser, P. G.
Scouler, M. F.
Dykstra, F. D.
Higgs, K. E.
Jordan, A. F.

Geology IIA.
Pass:
Smith, C. L.
Ross, D.
Chamberlain, H. I.
Ganthavee, S. (E)
Parry, K. F. (E)
Supp. Exam. Granted:
Connelly, M. A.
Mistry, S.

Geology IIB.
Credit:
Smith, C. L. (*)
Pass:
Oliver, J. B.
Ross, D.
Antulov, V.
Exemption from attendance at practical work granted for 1958:
Mistry, S. D.
Exemption from attendance at lectures granted for 1958:
Meiklejohn, G.
Supp. Exam. Granted:
Mistry, S. D.

Geology IIC.
Pass:
Neve, H. D.
Bower, J. K.
Supp. Exam. Granted:
Lennon, B. P.

Geology IIIA.
Pass:
McLeod, A.
Henderson, G.
Brien, J.

Mining I.
Pass:
McNally, R. T.
Doran, R. R. H.
Meiklejohn, G.
Henderson, G. A.
Gray, F. E.
Smith, J. E.
Darroch, D. A.
Bain, W. B.
McGushin, P. J.
Peate, B. F.
Supp. exam. granted:
Pivac, A. M.

Mining II.
Credit:
Gray, F. E. (*)
Bird, C. R.
Pass:
Ganthavee, S.
Jordan, A. F.
Mahalingham, S. J.

Mining IIA.
Pass:
Suthisorn, V.

Mining III.
Pass:
Ross, D.

Mining IIIA.
Pass:
Shenton, E. F.
Mistry, S. D.
Parry, K. F.

Mining IIIB.
Pass:
Timoney, E. G.

Mine Ventilation.
Credit:
Ross, D. (*)
Oliver, J. B.

Surveying I.
Credit:
Matheson, W. S. (*)
Ruvidini, A.
Pass:
McGushin, P. J.
Bagworth, B. A.
McNally, R. T.
Scott, S. J.
Rasmussen, G. C. R.
Mullins, H. D.
Bain, W. B.
Exemption from attendance at lectures granted for 1958:
Gray, F. E.
Wilkinson, R. H.
Exemption from attendance at practical work granted for 1958:
Bird, C. R.
Supp. Exam. granted (Paper B):
Bird, C. R.

Surveying II.
Pass:
Argus, J. C.
Morel, F. R.
Jordan, A. F.
Ganthavee, S.
Mahalingham, S. S.
Supp. exam. granted (Paper A):
Dodge, G.
Exemption from attendance at practical work granted for 1958:
Dodge, G.

NORSEMAN.

Preparatory Mathematics.
Credit:
Avery, A. E. (*)
Hedley, W. K.
Pass:
Daly, P. R.
Willoughby, B. G.
Horsham, F. J.
Sainsbury, J. A.
Burgess, R. J.

Mathematics IIA.
Pass:
Hennessy, R. M.
Supp. Exam. Granted:
Basell, C. A.
Lea, R. J.

Trade Mathematics I.
Credit:
Wilson, N. E. (*)
Pass:
Orton, A. A.
Morton, P. W.
Supp. Exam. Granted:
Salmon, L. J.

Preparatory Physics.
Credit:
Hedley, W. K. (*)
Kerr, P. H.
Stewart, D. A.
Pass:
Sainsbury, J. A.
Horsham, F. J.
Denison, J. L.
Exemption from attendance at practical work granted for 1958:
Morton, D. C.

Preparatory Chemistry.
Pass:
Hedley, W. K.
Denison, J. L.
Supp. Exam. Granted:
Roberts, J. L.
Sainsbury, J. A.

Trade Metallurgy.
Pass:
Hide, B.
Kerr, P. H.
Horne, L. C.
Young, C. J.
Oliver, D.
Jones, W. B.
Wilson, K. L.
Newman, E. J.
Supp. Exam. Granted:
Bassett, C. H.

Practical Electricity.
Pass:
Bastow, S. J.
Moir, L. W.
Perkin, R. E.

Mechanical Engineering I.
Credit:
Baker, S. R. (*)
Pass:
Hennessy, R. M.
Reid, A. J.
Lea, E. J.

Workshop Practice II.
Credit:
Avery, A. E. (*)
Young, P. A.
Wilson, N. E.
Pass:
Perkin, R. E.
Moir, L. W.
Hide, B.
Salmon, W. J.
Maitland, R. E.
Jones, W. B.

Welding I.
Pass:
Walker, W. M.
Bassett, C. H.
Wilson, K. L.
Mahony, A. J. (E)
Bingham, B. J. (E)
Newman, E. J.
Shinnick, M. J.

Welding II.
Credit:
Foote, A. S. (*)
Horne, L. C.
Pass:
Baker, R. G. C.
Hide, B.
Wilson, N. E.
Young, P. A.
Semmens, N.
Wood, R.

Steam Engine Driving.
Credit:
Hedley, W. K. (*)
Avery, A. E.
Young, P. A.
Pass:
Salmon, W. J.
Jones, W. B.
Horne, L. C.
Moir, L. W.
Bastow, S. J.
Perkin, R. E.
Mahony, A. J.
Shinnick, M. J.

Preparatory Drawing.
Pass:
Bingham, B. J.

Engineering Drawing I.
Credit:
Bassett, C. H. (*)
Wilson, K. L.
Pass:
Willoughby, B. G.
Young, P. A.
Wilson, N. E.
Morton, D. C.

Surveying Drawing II.
Pass:
Baker, S. R.

Surveying I.
Pass:
Hennessy, R. M.
Basell, C. A.
Moffatt, B.
Burgess, R. J.
Roberts, J. L.
Lea, R. J.
Denison, J. L.
Stewart, D. A.

Mining III.
Credit:
Baker, S. R. (*)
Pass:
Reid, A. J.
Lea, E. J.

Mining IIIA.
Pass:
Silvester, S. W.

Geology IA.
Pass:
Hennessy, R. M.

Geology IIA.
Pass:
Baker, S. R.
Silvester, S. W.
Supp. Exam. Granted:
Lea, E. J.

BULLFINCH.

Preparatory Mathematics.

Credit:
Blackley, T. (*)
Swain, G. B.
Sawyer, M. E.

Pass:
Harken, R. M.

Supp. Exam. Granted.
Maclean, I.

Mathematics I.

Pass:
Stocker, P.
Walker, J. G.
Harris, B. H.
Powell, P.

Supp. Exam. Granted.
Stokes, M. C.

Trade Mathematics I.

Pass:
Ryan, T. E.

Supp. Exam. Granted.
Montgomery, B. J.

Preparatory Chemistry.

Pass:
Walker, J. G.
Harken, R. M.
Swain. G. B.

Workshop Practice I.

Pass:
Montgomery, B. J.
Petersen, B. E.
Cossens, K. C.
Ryan, T. E.

Exemption from attendance at practical work granted for 1958.
Crunkhorn, L. G.
Hooper, F. W.
McMahon, R. K.

Exemption from attendance at lectures granted for 1958.
Powell, W. C.

Welding I.

Credit:
Stewart, E. R. (*)

Pass:
Keogh, J.
Knowler, B. W.

Exemption from attendance at practical work granted for 1958.
Ding, R.
Lippe, P. L.
Rogers, W. M.
Tyler, K. I.

Preparatory Drawing.

Credit:
Harris, B. H. (*)

Pass:
Blackley, T.
Hooper, F.

Engineering Drawing I.

Credit:
Swain, G. B. (*)

Pass:
Blackley, T.
Leyland, T.

Engineering Drawing II.

Pass:
Tromans, F. W.

Mining I.

Pass:
Leyland, E. C.
Blackley, T.
Gray, K. C.
Harris, B. H.
MacLean, I.

Supp. Exam. Granted.
Sewell, H.

Preparatory Geology.

Pass:
Swain, G. B.
Harken, R. M.

Geology IB.

Pass:
Gray, K. C.
Leyland, E. C.
Stocker, P.
Powell, P.
McLean, I. C.

SUPPLEMENTARY EXAMINATIONS.
February, 1957.

The following students passed in the subjects indicated below:—

KALGOORLIE.

Preparatory Mathematics.
Gowdie, B. A.
Van Mierlo, W. R.

Mathematics I.
Davey, C. R.
Crew, W. J.

Mathematics IIA.
Canning, D. G.
Symons, W. S.

Applied Mathematics I.
Miller, J. J.
Terrell, R.
Botica, G. G.

Physics IIA.
Botica, G. G.

Geology IA.
Mistry, S. D.

Mineral Dressing I.
Connelly, M. A.

Mining I.
Fiegert, J.
Suthisorn, V.

Surveying I—Paper "A."
Suthisorn, V.
Cameron, J. W.

NORSEMAN.

Preparatory Mathematics.
Salmon, W. J.

Mathematics I.
Moffatt, B.

Trade Mathematics I.
Moir, L. W.

Mineral Dressing I.
Silvester, S. W.

APPENDIX 2
SCHOLARSHIPS AND PRIZES.

MINES DEPARTMENT.

Entrance Scholarship: No award made
Senior Scholarship: No award made

CHAMBER OF MINES PRIZES.

Mining: Gray, F. E.
Metallurgy: Kops, J. N. Bartlett, M. S.
Engineering: Mitchell P. N.
Geology: Frank, P. H.

SCHOOL OF MINES STUDENTS' ASSOCIATION SCHOLARSHIPS.

Mining: Oliver, J. B.
Metallurgy: Dowson, J. W.
Engineering: Willis, J. S.
Geology: No award

INSTITUTE OF MINING SURVEYORS' PRIZES.

£10: McGushin, P. J.
£5: Argus, J. C.

SOCIETY OF W. A. SCHOOL OF MINES ASSOCIATES' PRIZE

McNally, R. T.

REG DOWSON SCHOLARSHIPS.

Hedley, W. K.
Wilson, N. E.

ROBERT FALCONER PRIZES.

Travis, G. A.
Hedley, W. K.

C. A. HENDRY PRIZE.

Dowson, J. W.

"INDUSTRIAL AND MINING STANDARD PRIZES."

Leyland, E. C.
Parry, K. F.

WESLEY LADIES' GUILD PRIZE.

Mills, W J.

SOCIETY OF ENGINEERS PRIZES.

Sullivan, A. D.
Willis, J. S.

APPENDIX 3.
KALGOORLIE METALLURGICAL LABORATORY

By E. Tasker, A.W.A.S.M. (Met.), A.M. (Aust.), I.M.M., Senior Research Metallurgist.

INTRODUCTION.

Eleven reports and seventy certificates were issued during the year. A brief description of the 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—

Research Secretary,
Industrial and Physical Sciences,
Commonwealth Scientific and Industrial Research Organisation,
314 Albert Street,
East Melbourne, C.2, Victoria.

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

In addition to the reports issued seven other investigations were approved and test work was in progress.

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

The Senior Research Metallurgist accompanied by an Assayer paid a visit to Christmas Island, Indian Ocean, to carry out pilot testing of a method

for treating high grade phosphate rock containing excessive amounts of iron oxide and alumina. Sufficient information was obtained for recommendations to be made to the British Phosphate Commissioners as to a satisfactory treatment method. The method of treatment to be adopted will largely depend upon company policy as to grade of material considered suitable for superphosphate manufacture, and on tonnages of available phosphate rocks.

GOLD ORES AND PRODUCTS.

Report No. 686.

Amalgamation and cyanidation tests were carried out on a strake concentrate from the Radio G.M., Bullfinch, W.A. Amalgamation and cyanidation of the amalgamation tailing recovered 97 per cent. of the gold in the strake concentrate.

COPPER ORES.

Report No. 688.

Flotation tests were made on a sulphide copper ore from Marble Bar, W.A. High-grade copper concentrates were produced containing 80 per cent. of the copper in a flotation concentrate assaying 40 per cent copper.

COPPER-COBALT ORE.

Report No. 681.

Concentration tests were made on a copper-cobalt ore from Roebourne, W.A. The ore was extensively oxidised and was not amenable to gravity concentration. Marketable flotation concentrates were produced assaying 25 to 30 per cent. copper and 2 to 3 per cent. cobalt. Recovery of copper was low at 50 to 70 per cent.

GOLD-COPPER ORE.

Report No. 690.

Treatment tests were made on a sulphide gold-copper ore from Widgiemooltha, W.A. Straking and amalgamation recovered 50 per cent. of the gold and a further 30 per cent. of the gold was recoverable in a marketable grade flotation concentrate assaying 25 per cent. copper and 10 oz. of gold per ton.

INCOMPLETE INVESTIGATIONS.

Report No. 684.

Treatment tests for plant design purposes were carried out on a gold ore from Hill 50 Eclipse Gold Mine, Mt. Magnet, W.A. The investigation was almost complete.

Report No. 692.

Concentration tests and magnetic separations were made on a heavy mineral sand from near Capel, W.A.

Report No. 694.

Flotation test work on an oxidised copper ore from Marble Bar, W.A. was carried out.

Report No. 700.

Washing tests on low-grade gypsum deposits taken from various W.A. lakes were commenced.

CERTIFICATES.

The seventy certificates issued covered the usual wide range of measurements. Thirty-one of these certificates covered gold assays of diamond drill cores for the Government Geologist.

KALGOORLIE METALLURGICAL LABORATORY.

Summary of Year's Work—1957.

Report No.	Owner.	State.	Locality.	Ore Type.	Type of Investigation.	Confidential Until.	Number of Metallurgical Tests.	Number of Assays.	
								Gold.	Others.
678	G. Lister, Widgiemooltha	W.A.	Widgiemooltha	Gold	Gold recovery tests	21/7/57	15	43	47
681	D. M. Hedley	W.A.	Roebourne	Copper-cobalt	Copper and Cobalt concentration tests	18/3/58	29	10	148
685	Cancelled								
686	Barr Bros., Bullfinch	W.A.	Bullfinch	Gold	Cyanidation tests	17/2/58	14	32	7
687	Deputy Master, Royal Mint, Perth	W.A.	Perth	Gold-silver	Method of treatment	27/11/57	17	193	195
688	S. H. Stubbs, Marble Bar	W.A.	Marble Bar	Copper	Flotation tests on sulphide copper ore	12/8/57	10	2	48
689	Cancelled								
690	Northern Minerals Syndicate, Perth	W.A.	Widgiemooltha	Gold-copper	Gold and copper recovery tests	4/12/57	7	38	48
691	Northern Minerals Syndicate, Perth	W.A.	Ravensthorpe	Spodumene	Beneficiation of spodumene ore	20/2/58	2	....	10
693	S. Millington, Haoma G.M., Kalgoorlie	W.A.	Mt. Monger	Gold	Investigation of Mill tailings	27/11/57	4	20	....
695	N. Allen, Widgiemooltha	W.A.	Widgiemooltha	Gold	Gold recovery tests	16/3/58	14	47	....
696	Western Titanium N.L., Perth	W.A.	Capel	Titanium	Ilmenite recovery tests	7/2/58	5	....	12
697	L. Nichols, Perth	W.A.	Capel	Titanium	Ilmenite recovery tests	16/3/58	6	....	6
	Totals						123	385	521
	Certificates, Nos. 176–245						....	680	317
	Free Assays					....	....	119	78
	School of Mines					....	....	....	9
	Totals					....	123	1,184	925

THE FOLLOWING INVESTIGATIONS WERE INCOMPLETE OR PENDING AT 31ST DECEMBER, 1957.

684	W. T. Phillips, Mt. Magnet	W.A.	Mt. Magnet	Gold	Treatment method	....	27	31	2
692	Warman Equipment Company, Kalgoorlie	W.A.	Capel	Titanium	Ilmenite recovery tests	....	5	....	4
694	S. H. Stubbs, Marble Bar	W.A.	Marble Bar	Copper	Concentration of oxide copper ore	....	13	....	50
698	North Kalgurli (1912) Ltd., Kalgoorlie	W.A.	Kalgoorlie	Gold	Investigation of flotation tailings	....	12	35	16
699	Cancelled								
700	Government Geologist, Perth	W.A.	Various W.A. Lakes	Gypsum	Beneficiation tests	....	....	....	20
701	Hill 50 Eclipse G.M., Mt. Magnet	W.A.	Mt. Magnet	Gold	Treatment method	....	3	4	....
702	Warman Equipment Co., Kalgoorlie	W.A.	Nullagine	Gold	Treatment method	....	6	22	2
	Totals					....	189	1,276	1,019

DIVISION VI

Annual Report of the Inspection of Machinery Branch of the Mines Department for the Year 1957

Operations under the Inspection of Machinery Act, 1921-1954

Annual Report of the Chief Inspector of Machinery and Chairman of the Board of Examiners for Engine-Drivers for the Year ended 31st December, 1957, 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, 1921-1956, for the year ended 31st December, 1957.

E. E. BRISBANE,
Chief Inspector of Machinery.

Section 1.

INSPECTION OF BOILERS, MAINTENANCE, ETC.

(See returns Nos. 1, 2 and 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 lb. 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.

Therein are shown the numbers of new boilers of the various types registered during the year under review; it will be noted these total 344, an increase of 32 boilers when compared with new registrations during the previous year.

Return No. 2.

This shows the number of boilers of each type registered with the Branch as useful at the end of 1957. A sharp decline in the total compared with the year previous will be very obvious.

The decrease results from administrative action taken to transfer from the list of potentially useful to that of permanently condemned boilers a large number of vessels that for several years have been lying abandoned throughout the State and which, due to distances and costs of overhauls, are most unlikely to be recovered for restoration to service as pressure vessels. In this respect it will be noted in Return No. 3 that 1040 were permanently condemned and during the preceding year 60 boilers were similarly dealt with.

By progressive writing off of such units a more realistic conception of the ratio between the number of what may be considered as the totals of serviceable boilers in the State and those that are not in actual service is obtained.

Return No. 3.

This summarises the operations of the Branch relating to boilers throughout 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, 1957.

	Country of Origin					
	United Kingdom	U.S.A.	East. States	West. Aust.	Unknown Sources	Total
Locomotive	....	....	1	....	....	1
Vert. Stationary	....	....	....	2	....	2
Return Multi Stat. Underfired	....	....	2	4	....	6
Ret. Multi Stat. Int. Fired	....	....	....	71	....	71
Water Tube	3	....	5	....	....	8
Saddle Back	....	....	1	....	....	1
Waste Heat (annulus)	4	....	....	....	....	4
Thimble Tube	1	....	....	....	....	1
Digester	....	....	5	....	....	5
Vulcanizer	....	....	25	4	....	29
Steam Jacketed Vessel	....	2	8	36	3	49
Sterilizer	....	....	12	31	....	43
Air Receiver	22	....	23	45	7	97
Gas Receiver	6	....	10	9	....	25
Steam Receiver	....	....	....	1	....	1
Hotplate	....	....	....	1	....	1
Totals	36	2	92	204	10	344

RETURN No. 2.—SHOWING CLASSIFICATION OF VARIOUS TYPES OF USEFUL BOILERS IN PROCLAIMED DISTRICTS ON 31st DECEMBER, 1957.

Types of Boilers	Districts Worked from PERTH	Districts Worked from KALGOORLIE	Totals	
			1957	1956
Lancashire	46	24	70	95
Cornish	155	61	216	597
Semi Cornish	11	1	12	47
Vert. Stationary	410	37	447	755
Vert. Port	61	10	71	79
Vert. Multi. Stat.	45	4	49	70
Vert. Multi. Port.	15	1	16	18
Vert. Pat. Tubular	47	....	47	47
Loco. Rect. F/Box Stat.	73	20	93	135
Loco. Rect. F/Box Port.	226	17	243	291
Loco. Circ. F/Box Port.	104	2	106	112
Locomotive	73	17	90	105
Water Tube	481	81	562	589
Ret.Multi U/Fired Stat.	267	8	275	321
Ret.Multi U/Fired Port.	1	5	6	9
Ret. Multi. Int. Fired Stat.	79	5	84	63
Ret. Multi. Int. Fired Port.	2	....	2	2
Egg Ended and Other types not elsewhere specified	621	24	645	606
Digesters	302	6	308	305
Air Receivers	1,570	566	2,136	2,053
Gas Receivers	224	....	224	201
Vulcanizers	439	8	447	437
Steam Jacketed Vessels	572	13	585	539
Total Registration Useful Boilers	5,824	910	6,734	7,476
Total Boilers out of use 31st December, 1957	1,713	551	2,264	3,140

RETURN No. 3.—SHOWING OPERATIONS IN PROCLAIMED DISTRICTS DURING YEAR ENDED 31ST DECEMBER, 1957.

Types of Boilers.	Districts Worked from PERTH.	Districts Worked from KALGOORLIE.	Totals.	
			1957.	1956.
Total number of useful boilers registered	5,824	910	6,734	7,476
New boilers registered during year	332	12	344	312
Boilers inspected—thorough	3,428	357	3,785	3,597
Vessels exempt under Act constructed for export—thorough	5	....	5	21
Boilers inspected—working	683	2	685	723
Boilers condemned during year temporarily	10	....	10	10
Boilers condemned during year permanently	32	1,008	1,040	60
Boilers sent to other States during the year	44	2	46	3
Boilers sent from other States during the year	2	....	2	....
Transferred to other Departments	2	....	2	2
Number of notices of repairs issued during year	440	30	470	483
Number of Certificates issued, including those issued under Section 30 during year	3,512	357	3,869	3,601

MAINTENANCE AND MISCELLANEOUS.

In the cases of boilers of average and larger dimensions in general industry care of plants is receiving close attention by a greater percentage of owners than hitherto.

Respective of boilers of smaller types however there remains much in the direction of maintenance to be desired of too many users. Among those which are neglected it does not appear to be recognised that in instances of restricted accessibility for manual cleaning it is most imperative that feedwater treatment appropriate to the chemical analysis of the particular water being used should be adopted: many of these users also neglect to remedy leakages of glands, joints, etc., promptly so that deleterious effects with costly repairs may be avoided.

I would here refer to the error into which owners of steam boilers and unfired pressure vessels sometimes fall by proceeding with conversion of some unit or other for another purpose without first approaching the Inspection of Machinery Branch relative to their proposals.

To quote an instance: the occasion arose when the advice of the Branch was sought when a disused Cornish type boiler was being converted into a distilling unit. Part of the furnace was to be used as a heating chamber with ends closed by being blanked with flat plates.

Unfortunately the owner had already gone ahead to some extent with the conversion but the staying of the flat surfaces proved to be inadequate. It was suggested that stay bars then be fitted but he decided to discard his original idea and fit a steam coil instead.

Much effort and disappointment would have been avoided if the owner had contacted us prior to conversion work being undertaken.

There are a number of other cases also where vessels of some description or other not originally intended to withstand any pressure above atmosphere have been purchased from scrap heaps for the purpose of effecting some alterations for utilization as air receivers. In the majority of such cases conversion has been completed before we became informed of what has occurred:

Original construction of most of those particular vessels lacking the fundamentals of design required of pressure vessels render them unacceptable for certification and they consequently are condemned against service as air receivers: the owners would therefore have saved themselves against useless expenditure had they previously submitted their proposals to the Inspection Authority.

Of no small interest is the number of the "package" type multitubular boilers manufactured in this State during 1957: there were 71 of these vessels built compared with eight in the previous year. Of further interest is that 44 boilers were exported to the Eastern States and New Zealand against three during the year previous.

Section 2.

EXPLOSIONS AND INTERESTING DEFECTS.

The one failure of a pressure vessel whilst under pressure to be recorded relates to the inner shell of a cylindrical steam jacketed hash dryer in an abattoir, dimensions of inner shell 3 ft. 11in. length, 2 ft. 8½ in. diameter, ⅜ in. thickness mild steel; authorised working pressure 20 p.s.i. Steam to the jacket was supplied through a reducing valve from a boiler of working pressure 80 p.s.i.

The first indication to operators working in the vicinity that some defect had occurred was the driving belt from a motor to the revolving paddles in the vessel being cast off. On investigation it was found that the paddles could not be moved and further examination revealed that the inner shell had collapsed and had fouled the revolving parts.

It was ascertained by an Inspector immediately after the accident that the reducing valve was faulty and permitted steam at boiler pressure to flow to the low pressure side and that the safety valve on the low pressure line had been temporarily removed for overhaul.

At an inspection some days previously he noted that under hammer blows there appeared to be some thinning of the plate in the lower parts and gave instructions that at the next inspection he required test holes to be drilled in certain places to gauge the thickness of metal remaining.

After the accident, when examining the plate where torn at the end circumferential seam around the bottom in some sections, it was observed that there were areas of up to 50 per cent. reduction in plate thickness. Wastage in the lower regions of such vessels is not unusual of course: the abrasive action of products being stirred by paddles is always more or less severe over a period of time according to the amount of processing carried out.

It is most doubtful however that the degree of metal reduction would have produced sufficient weakness to induce any deformation in the shell had it not been subjected to working pressure much in excess of that authorised. Calculations indicate an ample factor of safety remaining in the shell plate even at the reduction of thickness to 3/16 in. in areas.

There is no question that the failure was caused by the defective reducing valve and lack of a safety valve on the low pressure line.

Another incident of note was a small explosion with localised effect which occurred within the structure of the foundation of a multitubular underfired boiler, the dimensions of the vessel being 16 ft. x 6 ft. 6 in. diameter; it is sawdust fired on to an ordinary set of firebars having ⅜ in. airgap.

The foundation is a concrete table extending slightly more in length and breadth than the boiler setting. One layer of firebricks formed a lining on top of the concrete bed in the combustion chamber behind the bridge but no similar lining

was provided in the ash pit. At the time of the occurrence the boiler was new and very recently installed.

It had only been on line and in commission two to three hours when an eruption and tremor occurred which was heard and felt by those in the vicinity of the boiler.

Investigation revealed that the whole area of that portion of the concrete bed below the grate (nine feet by five feet) had shattered into fragments of varying sizes, the depth of shattering being two to three inches. Undoubtedly intensity of heat acting directly on the concrete was contributory to the explosion.

The air gap between the firebars allows an amount of sawdust to fall through to the floor of the ashpit and this is kept burning by the incoming air, but it is considered that a greater source of the temperature absorbed by the concrete was radiant heat from the burning fuel on the bars which are not more than fifteen inches from the floor of the ashpit.

Two theories have been advanced relative to the basic contributory cause of the incident; either (a) a certain amount of moisture was retained in or later absorbed by the concrete and on being raised to a very high temperature by the intensity of heat transmitted through the concrete was converted to high pressure steam which set up sufficient stress to rupture the concrete or (b) the conductivity to increasing temperature being at a low rate in the concrete the amount of heat being supplied could not be absorbed through its mass with sufficient rapidity to prevent a stress being set up due to unequal expansion and this resulted in the shattering of structure near the surface.

It is probable however that the former theory is more correct as some years ago damage to the foundation of a similar boiler occurred in the same boiler house due to drainage being impaired.

Subsequent to the occurrence now being reviewed the concrete floor of the ashpit has been chipped off to four inches in depth and a block of cement fondu which is a heat resisting alumina cement has been laid.

Section 3.

INSPECTION OF MACHINERY.

(See Returns Nos. 4, 5 and 6.)

At the close of the year there were 38,516 groups of machinery on the register, an increase of 924 compared with the previous year. Of the increase 20 groups were lifts and escalators.

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, 1957.

Classification.	Districts Worked from PERTH.	Districts Worked from KALGOORLIE.	Totals.	
			1957.	1956.
No. of Groups driven by steam engines	220	380	600	615
No. of Groups driven by oil engines	2,838	719	3,557	3,352
No. of Groups driven by gas engines	29	149	178	189
No. of Groups driven by Compressed air	3	61	64	63
No. of Groups driven by Electric motors	31,289	2,804	34,093	33,364
No. of Groups driven by hydraulic pressure	4	....	4	1
No. of Groups driven by Hand	19	1	20	8
Totals	34,402	4,114	38,516	37,592

RETURN No. 5.—SHOWING OPERATIONS IN PROCLAIMED DISTRICTS DURING YEAR ENDED 31ST DECEMBER, 1957.

(*Machinery Only.*)

Classification.	Districts Worked from PERTH.	Districts Worked from KALGOORLIE.	Totals.	
			1957.	1956.
Total registrations useful machinery	34,402	4,114	38,516	37,592
Total inspections made	29,678	4,186	33,864	30,533
Certificates (bearing fees)	6,876	589	7,465	7,019
Certificates (steam without fees)	29	....	29	25
No. of extension certificates issued under Sec. 42 of Act	....	....	....	....
Notices issued (Mach. dangerous)	567	17	584	716

RETURN No. 6.—SHOWING CLASSIFICATION OF LIFTS ON 31ST DECEMBER, 1957.

Types.	How Driven.	Totals.	
		1957.	1956.
Passenger	Electrically driven	242	231
Goods	Electrically driven	117	115
	Hydraulically driven	1	1
	Belt driven	4	4
Service	Electrically driven	72	69
	Hydraulically driven	1	1
Escalators	Electrically driven	19	15
		456	436

ACCIDENTS TO MACHINERY

One accident of note to be recorded relates to the parting of a winding rope in a vertical shaft of a mine in the goldfields; rope 3⅛ in. circ., 36.4 Tone breaking strain, factor of safety 10.5 for ore when new.

Around the time of the mishap dirt was being pulled in skips from the 900 ft. level and the laden right-hand skip had been signalled away from that level when immediately afterwards the driver received rings from the shift boss for a skip to convey him from the 500 ft. level.

The winding engine driver decided to give the shift boss the descending empty left-hand skip. The winding engine was being slowed down to allow rolling for the left-hand skip being brought to rest at the 500 ft. level when the driver felt a slight movement of the machinery and the engine began to gather speed again. Under normal conditions of course the ascending right-hand skip would have been approaching the 400 ft. level when the left-hand skip was nearing the 500 ft. level.

Immediately the driver observed the engine unexpectedly gaining speed he applied the brakes to stop the machinery and then heard the right-hand rope fall through the head frame. The rope was found to have parted approximately 400 ft. from the shoe: the loaded skip was prevented by its safety grippers from falling to the bottom of the shaft.

Examination of the fracture in the rope revealed that although externally there was nothing to arouse suspicion corrosion had been very active internally and wires were wasted to needle points.

It was considered that the corrosion was caused by a combination of dampness and sulphur laden atmosphere from a nearby treatment plant. The moisture resulted from periodical bailing of the shaft that had been conducted with the use of the winding equipment.

Tests of a short length cut from the shoe end of the rope a little more than six months previously showed no evidence of deterioration but it is quite probable that the rope even then was becoming affected along its length toward the point of ultimate failure.

During bailing operations spillage of water from the bailing tanks would wet the rope in the adjacent compartment and the water on that rope

would be conveyed to the winding drum and there lodging in the turns of rope penetrate into the structure of the strands and take some time to evaporate.

It is very likely that had the broken rope been cut at other positions along its length after the accident, corrosion there would also have been located, especially in the turns not usually unwound from the drum.

Subsequent to the accident a new pump has been installed in the mine and bailing discontinued. The new ropes therefore should not be subjected to similar attack.

Section 4.

PROSECUTIONS FOR BREACHES OF THE ACT

There were no prosecutions during the year.

Section 5.

ACCIDENTS TO PERSONS

Accidents reported to the department numbered 83, one of which was a fatality. Of the other 82 accidents, 26 instances were classed as being of minor nature.

Returns Nos. 7 and 7A indicate the number of persons injured in the various industries and the types of machines with which the accidents were caused.

Report of all known circumstances surrounding the accident in which a third year electrical apprentice received fatal injuries when he was working on a lift car is as follows:—

A lift was being installed in a new building and as the installation was nearing completion it became necessary for any debris and dust to be removed from door tracks and door locking mechanisms in readiness for acceptance tests.

Engaged on this cleansing were an electrician and the deceased apprentice who were employees of the installing contractors. This duty was carried out from the top of the car and progressed downwards from the top of the shaft.

The required movements of the lift were controlled from the roof of the car by operating the car levelling switch gear and under these conditions it would travel at 30 feet per minute. It has been stated that deceased was familiar with this method of operation and had performed it on several occasions.

Cleaning of equipment of enclosure doors down to the first floor landing had been completed and the electrician alighted from the car roof at that landing and left the apprentice to clean the top of the car whilst he went to another block on the building site to obtain some oil for the opening mechanism dash pot.

During his brief absence he was informed of an accident and with another lift mechanic returned to find the enclosure door still in an open position but with the car raised to a position where the roof was adjacent to the top of the first floor enclosure doorway, and deceased's body lying crushed between the face of the lift well and the door opening mechanism with its supporting frame.

A very thorough investigation failed to disclose any electrical fault or mechanical defect which could have caused the accident and it could only be surmised that the apprentice accidentally caused the lift to move and became caught by the wall face: any reason he may have had for wishing to move the lift is obscure.

The following reports are of other accidents causing serious injuries and which should be brought to notice.

Case A.

Driving Belt.

This accident resulted in a plant operator on a mining treatment plant having his right arm amputated just below the shoulder after suffering injury when applying belt dressing.

It was stated that he was using a short rod to apply some dressing to the driving pulley of a conveyor belt while in motion and apparently getting too close to the pulley his hand and arm were dragged in between it and the belt.

The overload caused by his obstructing arm operated the cut out switch and stopped the motor. The weight of ore on the belt reversed this and freed his arm.

The operator was wearing gloves at the time and it is conceivable that this factor was contributory with the too short a rod in causing the accident.

Case B.

Shafting.

In this instance a greaser received multiple bruises and abrasions when a dust coat he was wearing became entangled with the driving shaft of a boiler mechanical stoker.

The man was standing on a girder approximately four feet below the three inch shafting which revolves at 57 revs. per min. Apparently he leaned over this in the course of his duties to attend to a grease cup, and a three quarter length dust coat he was wearing became fouled with the shafting and around this he was wound.

He first cried out in Italian and this was unheeded but when he continued shouting out with obvious alarm the attention of the boiler attendant was drawn to his predicament and the machinery was stopped.

It is to be hoped that this injured person has now realised the great danger in wearing a dust coat when employed as a greaser.

Case C.

Daugh Mixer.

In this case a lad aged 16 years was injured by an old type four blade dough mixer which most unfortunately necessitated amputation of his left arm. The machine was being used for mixing flour with minced meat preparatory for canning.

There was no witness of the accident but it was stated that at the time of the mishap a party of visitors was being conducted around the factory and the lad was emptying the machine whilst it was running, and it was thought his attention was momentarily distracted with the result that his arm became entangled with the blades.

The process of emptying the machine consists of turning the mixer on its side and dragging the contents with the hands into a portable container. It was stated that instructions had been issued by the foreman that the machine was not to be left running while being discharged by apparently the lad was emulating some seniors by not stopping it.

GENERAL.

Records of machinery accidents which came to the notice of this Branch and were investigated disclose a 24.5 per cent. reduction on the previous year's figures.

It is also gratifying that there has been a further decrease in the incidence of accidents with woodworking machines: a reduction of 18.5 per cent. on the number of mishaps respective of this class of machinery which occurred in 1956 is noted.

With reference to metal working and engineering industries, usually also sources of somewhat high accident rate, the combined figures for these in 1956 revealed an increase of 30 per cent. but compared with the accidents in that year figures for 1957 reveal 26 per cent. reduction.

RETURN No. 7.—SHOWING NUMBER OF SERIOUS ACCIDENTS BOTH FATAL AND NON-FATAL WHICH OCCURRED IN PROCLAIMED DISTRICTS DURING THE YEAR ENDED 31st DECEMBER, 1957.

"F" denotes "Fatal."

Industry	Circular Saw	Band Saw	Buzzer	Spindle Moulder (Shaper)	Buffing and Wirebrush Machine	Fibre Teaser	Abrasive Wheels or Belts	Press (Metal)	Milling Machine	Wiredrawing and Working	Striking Machine (Leather)	Belts and Shafting	Conveyor (Belt, Screw)	Elevator (Bucket)	Printing Machine	Mixer	Cement Asbestos Pipe Former	Mincer	Rolls	Scotch Crane	Lift	Doughbreak	Brush Making Machines	Scutching Machine	Cooling Fan	Boiler W.G. Glass	Mechanical Stoker	Silent Cutter	Totals per Industry
Woodworking and Furniture	3	1	8	2	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	15
Metalworking and Engineering	....	....	....	....	....	....	2	4	1	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	10
Leather Processing	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Printing and Allied Trades	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	3
Fertiliser Manufacturing	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
Mining	1	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
Food and Drink Processing	1	....	....	....	....	....	....	....	....	....	....	2	....	....	....	2	....	2	1	....	....	1	....	....	....	....	1	1	11
Building Materials and Building	1	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	1	....	....	2	....	....	....	....	....	1	....	....	6
Other	....	....	....	....	1	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	1(F)	....	1	1	2	....	....	....	7(1F)
Totals per type of Machine	6	1	8	2	1	1	2	4	1	3	1	4	2	1	3	2	1	2	1	2	1(F)	1	1	1	2	1	1	1	57(1F)

MINOR ACCIDENTS

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, 1957.

Industry	Circular Saw	Borer (Wood)	Buzzer	Bottle Making Machine	Abrasive Wheels	Press (not for Metal)	Lathe	Wiredrawing and Working	Drilling Machine (Metal)	Edge Trimmer (Leather)	Belts and Shafting	Conveyor (Belt)	Glueing Machine	Mixer	Cask Washer	Brush Making Machine	Totals per Industry
Woodworking and Furniture	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Metalworking and Engineering	....	....	....	....	2	....	....	1	1	....	....	....	....	....	....	....	4
Leather Processing	....	....	....	....	....	1	....	....	....	1	....	....	....	....	....	....	2
Printing and Allied Trades	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	1
Fertiliser Manufacturing	....	....	1	....	....	....	....	....	....	....	....	1	....	....	....	....	2
Food and Drink Processing	1	....	....	....	....	....	1	....	1	....	2	....	....	1	1	....	7
Building Materials and Building	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	1
Glassmaking	....	....	....	4	....	....	....	....	....	....	1	....	....	....	....	....	5
Other	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	3
Totals per type of Machine	2	2	1	4	2	1	1	1	2	1	4	1	1	1	1	1	26

Section 6.

EXAMINATION OF ENGINE DRIVERS, CRANE DRIVERS AND BOILER ATTENDANTS.

The Board of Examiners granted 177 engine drivers', 97 crane drivers' and 84 boiler attendants' certificates.

Compared with the previous year these figures show increase 56, decrease one and decrease 19 respectively in the number of certificates granted.

Section 7.

AMENDMENTS TO ACT.

Section 59 amended to remove the obligation of persons of foreign nationality becoming naturalised or alternatively of having served in an Allied Force during the War 1939-1945 before being accepted for examination for engine drivers', crane drivers' or boiler attendants' certificates.

The amendment further provides that an applicant who has not fulfilled either of the two qualifications referred to in the foregoing may be granted a certificate conditional on it being cancelled at such time he fails to apply for naturalisation when qualified by period of residence in this Country, or if on making application for naturalisation at the expiration of that period his application be rejected, or if he cease to be an Australian citizen.

Section 8.

STAFF.

During mid-year Mr. C. A. S. Hosie, an Inspector on our staff, after eight years service resigned for appointment to the newly created position of Senior Inspector of Machinery, Mines Department, Northern Territory. All of his one time colleagues in this department wish him every success in his new sphere of activity.

At the close of the year another Inspector, Mr. R. W. Frankish, retired after 30 years' service and we all wish him improved health and long years of enjoyable retirement.

In view of the decline in the use of boilers in mining districts it was decided to reduce the staff of two Inspectors stationed at Boulder office to one officer, the second official being returned to Head Office; to implement this change it was necessary to transfer all records incidental to North West Inland district to Perth and to arrange for inspections of that district to be carried out from Headquarters in future, otherwise one Inspector at Boulder could not be expected to cope with all the areas despite the reduction of plant at many places.

Re-allocation of Inspections in this way and the additional officer at Headquarters which has been gained by his transfer makes available another Inspector to assist with increased work in the South West portion of the State at such periods of the year he is not absent for six-eight weeks in the North West districts.

Although, with continuing expansion of industry. the volume of work in this Branch has considerably increased all members of the staff have given a ready response with their efforts on all occasions with an earnestness that is deserving of the utmost appreciation.

During the year under review the Police Department, as in the past, has materially assisted in our activities regarding reports of machinery accidents of which, but for its officers, on many occasions we would not be made aware, and our appreciation is extended to them for their co-operation in such matters which has been received.

On behalf of other members of the staff and myself I wish to express our thanks also to all those officers in other Branches of the Department of Mines who on so many occasions have given courteous assistance whenever required.

(Sgd.) J. F. WINZAR,
Deputy Chief Inspector of Machinery.

DIVISION VII

Annual Report of the Director Government Chemical Laboratories

Under Secretary for Mines:

I have the honour to present to the Honourable the Minister for Mines a summarised Annual Report on the operation of the Government Chemical Laboratories for the year ending 31st December, 1957.

The numerical strength of the Laboratories at 31st December, 1957, was 57, being 40 professional officers, 10 general and 7 clerical. The year was a difficult one for professional staff, a reflection of the Commonwealth wide shortage of chemists and at the time of writing there are a number of staff vacancies. Staff changes during the year were:—

Appointments—Two.
Resignations—Three.
Deaths—Two.

It is with the deepest regret that I have to record the death of our late Director, Mr. J. C. Hood, who died on 20th May, 1957, at the age of 60 years. Born at Oban, Scotland, the late Mr. Hood received some of his early education in London but came to Western Australia with his parents at an early age.

In April, 1914, Mr. Hood was appointed a Temporary Junior Analyst in the Explosives and Analytical Branch of the Mines Department and after a course of study at the Perth Technical College, qualified as an analyst. In May, 1917, he was selected as one of the second group of chemists to go to England for work with the Ministry of Munitions and worked in various factories. For conspicuous service and an act of gallantry during an accident at one of these factories he was awarded the O.B.E.

Returning to Australia in 1919 Mr. Hood resumed duties in these Laboratories as an Assistant Analyst and his record is one of steady progress in his chosen profession. Chemist and Analyst 1920, Chemist 1941, Acting Supervising Chemist and Toxicologist 1943, and confirmed in this appointment in 1945, Deputy Government Analyst in 1946, culminating in the most senior position in his chosen field, Director 1955. He was elected an Associate of the Australian Chemical Institute in 1919 and a Fellow in 1952.

Almost all of Mr. Hood's service was in the Food, Drugs and Toxicology Division of the Laboratories and he was an acknowledged authority in these fields. He was essentially of a practical turn of mind, a skilled constructor of apparatus and manipulator. His broad and detailed knowledge of chemistry, particularly in relation to food, drugs and toxicology were invaluable and was always at the disposal of others. His passing was a sad loss to chemistry in this State and to his colleagues.

ADMINISTRATION.

The Laboratories consist of five Divisions, a Physics Section, a central office and a Library all under the control of the Director (Government Mineralogist, Analyst and Chemist) as follows (at 31st December, 1957):—

Director—L. W. Samuel, B.Sc., Ph.D., F.R.I.C., F.R.A.C.I.

Agriculture, Forestry and Water Supplies—R. C. Gorman, B.Sc., A.R.A.C.I., Deputy Government Agricultural Chemist.

Food, Drugs, Toxicology and Industrial Hygiene—N. R. Houghton, B.Sc., A.R.A.C.I., Deputy Government Analyst.

Fuel Technology—R. P. Donnelly, M.A., B.Sc., M.I. Gas Eng. M. Inst. Fuel, A.M.I., Chem. Eng., Fuel Technologist.

Industrial Chemistry—A. Reid, M.A., B.Sc., A.R.I.C., Chief Industrial Chemist.

Mineralogy, Mineral Technology and Geochemistry—J. N. A. Grace, A.W.A.S.M., A.R.A.C.I., Deputy Government Mineralogist.

Library—Vacant.

Office—Miss D. E. Henderson.

The close association of these Laboratories with other Government Departments and with kindred Associations was maintained during 1957 and members of the staff are members of the following committees:—

Australian Atomic Energy Commission—States Committee.

Corrosion Committee.

Food and Drug Advisory Committee.

Technological Standing Committee on hydrogen sulphide problems in sewage installations.

Insectide Committee.

Tender Board—Oils Committee.

Paints Advisory Committee.

Swan River Pollution Committee.

Veterinary Medicines Committee.

Water Purity Advisory Committee.

GENERAL.

The total number of samples received and registered during 1957 was 19,950.

These were allocated to the various Divisions according to the specialised nature of the work undertaken by each Division and in a few cases work was done on the same sample in more than one Division. Thus in the table below some samples occur more than once.

Agriculture, Forestry and Water Supplies	5,593
Food, Drugs, Toxicology and Industrial Hygiene	12,345
Fuel Technology	456
Industrial Chemistry	64
Mineralogy, Mineral Technology and Geochemistry	1,632
	20,090

Table 1, shows the source of the samples and their allocation to the various Divisions. The majority of the samples received from the Metropolitan Water Supply, Sewerage and Drainage Department were again for sewage control.

Table 1, see page 74.

Fees were collected for work undertaken for revenue producing Departments, Local Governing Bodies, and the general public but a considerable number of free examinations were made, including mineral identifications and assays.

The summarised reports of the individual Divisions which follow indicate the wide field covered by these Laboratories.

L. W. SAMUEL.
DIRECTOR.

TABLE 1

Division	Agriculture	Food and Drug	Fuel Technology	Industrial Chemistry	Mineral	Total
Source						
Agriculture Department	3,060	618	....	....	2	3,680
Government Tender Board	....	58	....	....	....	58
Government Geologist	....	....	....	....	145	145
Industrial Development Department	....	....	82	1	10	93
Metropolitan Water Supply	127	10,154	37	1	13	10,432
Mines Department	....	14	....	1	20	35
Police Department	....	388	....	....	....	388
Public Health Department	13	178	....	1	3	195
Public Works Department	657	452	....	15	15	1,139
State Batteries	....	....	....	....	232	232
Other Government Departments	37	69	162	5	10	283
War Service Land Settlement Scheme	40	....	....	....	....	40
Departmental	27	6	29	24	11	97
Pay—						
Public	1,479	68	137	16	492	2,192
Commonwealth Government Departments	11	15	....	....	....	26
Hospitals	....	51	....	....	....	51
Milk Board of W.A.	....	226	....	....	....	226
Other Government Departments	....	8	9	....	....	17
Western Australian Government Railways	....	26	....	....	....	26
Free-Research—						
University of W.A.	141	1	....	....	....	142
Free—						
Public	1	13	....	....	679	693
	5,593	12,345	456	64	1,632	20,090

AGRICULTURE, FORESTRY AND WATER SUPPLY DIVISION.

As in previous years the majority of the work of this division was chemical analysis for the Department of Agriculture and the examination of water samples from the Metropolitan Water Supply Department, the Public Works Department and from primary producers.

During 1957, 5,593 samples were received in this division, which is a decrease of about 14 per cent. on the total received in 1956. The decrease was mainly due to a much smaller number, 46, samples of tobacco leaf received from the Department of Agriculture compared with 1,671 received in 1956.

The description and origin of samples received in 1957 is shown in the Table 2.

Soils.

Of the soils analysed, 120 from a proposed cultural experiment at Wongan Hills Research Station was the largest group. These were analysed for nitrogen to determine the uniformity of the soil and efficiency of sampling prior to study of the effect of cultural operations on the clover seed population of a light soil type such as is typical at Wongan Hills. The figures varied form 0.034-0.094 per cent. nitrogen. This is a considerable variation and the results of cultural operations would have to be very pronounced to overcome this lack of uniformity in the soils.

Other soils analysed include:

(1) four soils for total and exchangeable manganese for which there was no significant difference in the figures between soils growing (a) manganese deficient oats and clover (b) healthy clover and manganese deficient oats (c) healthy oats and clover or (d) healthy clover on a soil similar to (a),

(2) thirty soils for organic carbon from a cultural experiment at Avondale Research Station,

(3) nine soils from Nungarin Army Camp in connection with their corrosive effects on black iron and galvanised wrought iron piping,

(4) several private samples for total phosphate content to see if they would be suitable for growing pine trees, as judged by Forestry Department standards.

(5) two samples from Esperance Plains Research Station, where the organic carbon and nitrogen in soil from clover land were compared with those in virgin soil and showed the benefit of seven years under sub clover in building up the soil fertility.

Waters.

There was an increase of some 34 per cent. in the number of waters received compared with 1956. The majority of these were from primary producers for determination of suitability for agricultural purposes.

The routine examination of existing water supplies to cities and towns was continued.

Parallel with an investigation into possible variation of dissolved oxygen with depth in stored water, samples were taken monthly at various depths in Canning Dam and Mundaring Weir and analysed to ascertain any variation of salinity with depth. There was no significant variation at either place.

Weekly samples were received from contributory streams to Mundaring Weir as a check on their salinity. The salinity of these streams showed the same general trend as the season progressed, decreasing from the beginning of June to a minimum around August and September and then increasing again from the end of October.

The Goldfields Water Supply pipeline was again treated with copper sulphate solution in a successful attempt to control the growth of a sponge in the pipeline. A feed rate of five parts per million of copper sulphate was employed and 170 samples were taken at seven different places along the pipeline in an attempt to trace the progress of the treated "plug" of water along the pipeline. Owing to the difficulty of predicting the position of the treated water the majority of the samples received were of untreated water. However it was shown that the copper level had dropped from a designed 1.25 parts per million at No. 1 pump to 0.27 parts per million at No. 5 pump, a distance of 170 miles, indicating considerable dilution of the treated water or precipitation of copper in the pipeline. An inspection of the pipeline in October convinced the Goldfield Water Supply Engineers that the copper treatment had satisfactorily controlled the sponge growth and further treatment would be unnecessary for some time.

An unusual water containing 12 parts per million of arsenic was received from the True Blue Gold Mine at Bamboo Creek. This is well above the safe upper limit of 0.05 parts per million of arsenic for drinking water and further information regarding the source of this water is being requested.

Fertiilsers and Manures.

Official inspector's samples under the Fertilisers Act, 1928-55, totalled 37 samples. Of these, 16 complied with the registered analysis supplied by the Department of Agriculture. The others were deficient in either nitrogen, water soluble potash, acid soluble phosphoric acid, water soluble phosphoric acid, copper or zinc.

Two official samples of blood and bone received contained both water soluble phosphoric acid and water soluble sulphate indicating that superphosphate had been added to them.

Twelve samples of superphosphate and 12 of rock phosphate were analysed for their minor element content, to see if significant amounts of minor elements would be added to the soil when these fertilisers were used in substantial quantities.

Two superphosphate samples were examined in connection with the rotting of super-bags. They were analysed for free acidity and for chloride, the latter being suspected of being the main cause contributing to the deterioration of jute bags in which superphosphate is stored at elevated temperatures, such as occurs under tarpaulins in railway trucks left at sidings in summertime.

Feeding Stuffs and Pastures.

Under the Feeding Stuffs Act, 1928-51, 22 inspectors' samples were received, but only four of these complied with the registered analysis. The others had an excess or deficiency in one or more of the following, protein, fat, fibre, sodium chloride, phosphoric acid, calcium and cobalt.

A wide variety of fodders was analysed for routine feeding stuff analysis, including various hays, tree lucerne, sudan grass, silage, elephant grass, turnip seed meal, couch grass, safflower meal, meatmeal, poultry mash, dairy food, crayfishmeal, bonemeal and feeding cubes.

One hundred and sixty samples were received for protein determination in connection with the Quokka nutrition study being conducted on Rottnest Island by the University Zoology Department.

PLANT NUTRITION.

Clover.—(a) Phosphate Fertiliser Trial.—Analyses for phosphorus and phosphate (Better Crops with Plant Food Vol. 39 No. 10 pp. 6-12) on 84 samples of clover grown in a glass house showed:———

(1) With constant lime treatment of two tons per acre the phosphorus, P, and phosphate, PO_4—, content of the clover increased with increasing amounts of calcium dihydrogen phosphate added.

(2) In the absence of lime no increase was shown.

(3) In the absence of lime increasing amounts of calcium mono-hydrogen phosphate increased the phophorus, P, and phosphate PO_4—, contents.

(4) Increasing amounts of fine ground rock phosphate in the absence of added lime made not difference to the phosphorus P, or phosphate, PO_4—, content.

(b) Some 180 clover samples were analysed for confirmation of field diagnosis of nutrient deficiencies.

Apple Leaves.—(1) A rate of manganese fertiliser trial conducted by the Department of Agriculture showed that increasing the rate of application from four holes at ¼ lb. manganese sulphate per hole to eight holes at ½ lb. manganese sulphate per hole increased the manganese content of the leaves from 10 to 26 parts per million, this being the average of five replicates. Samples taken at a later stage of growth showed considerable variation mainly due to contamination; one control tree yielded leaves containing 1,300 parts per million of manganese.

(2) Zinc experiments at Kalgan River, Albany. The average of replicates showed a slight increase compared with controls, in zinc content of leaves for trees sprayed with zinc spray when dormant.

Tobacco.—(1) A rate of lime trial at the Tobacco Research Station showed that the addition of lime at four levels from 0-4 tons per acre slightly increased the calcium and potassium uptake of the leaves but had not effect on the chloride content.

(2) Two hundred and fourteen samples were analysed for calcium, chloride, nitrogen, phosphorus and potassium from a complex experiment at the Tobacco Research Station involving 36 treatments at differing levels of nitrogen, phosphorus and potassium.

(3) A sample of local tobacco compared with Virginian tobacco was found to be the lower in gums, nicotine and resins.

Miscellaneous Leaves.—Samples of beetroot, tomato, lemon, silver beet, pear and potato leaves were analysed for confirmation of visual symptoms of nutrient deficiencies.

Cereals.—(a) Barley.—Nearly 200 samples were analysed for protein, from Department of Agriculture trials.

(b) Oats.—(1) Manganese Fertiliser Experiment.—Five rates of application of manganese as a spray were tested. All increased the manganese uptake, the most effective being two sprayings of four per cent. manganese sulphate at the rate of one oz. per acre.

(2) Copper and Zinc Fertliser Experiments.—

(a) At Bremer Bay both copper and copper plus zinc fertilisers in the presence of sulphate of ammonia increased the yield.

(b) At Jerramungup copper or zinc fertiliser in the presence or absence of sulphate of ammonia had not effect on yields. Sulphate of ammonia, with or without minor elements, more than doubled the yield.

(c) Wheat.— (1) Protein determinations were made on 1,049 wheat grain samples including:

(a) Over 300 samples from pasture improvement groups, minor element trials, genetical research projects, export cargoes and wheat variety trials.

(b) The 1955-56 Wheat Quality Survey which included:

(i) Two hundred and eighty-two samples from individual sidings throughout the State. These were grouped into four classifications according to their protein content. Only 23 sidings representing about eight per cent. of the total harvest were in the high protein group of over 11 per cent. protein; all except three of these sidings were north-east of the Eastern Goldfields railway and a line drawn from Tammin to Geraldton.

(ii) Samples of every tenth delivery at the selected sidings of Cunderdin, Coorow, Mollerin, Lake Grace and Yearlering. These showed that there were wide ranges of protein values at any one siding even within the same variety. For example at Coorow, Wongoondy varied from 6.9 per cent. to 12.6 per cent. whilst for Gabo variety at Lake Grace the range was 7.8 per cent. to 12.1 per cent.

(2) *Minor Element Trials.*—Similar experiments to those conducted with oats, above, at Jerramungup and Bremer Bay yielded similar results, though at Bremer Bay the addition of zinc oxide to a basal dressing of superphosphate and sulphate of ammonia reduced the yield below that of the control.

The tops of plants treated with zinc fertiliser showed an increase of uptake of zinc and the roots showed a 10 fold increase.

TABLE 2

AGRICULTURE, FORESTRY AND WATER SUPPLY DIVISION

	Agriculture Department	Public Works Department	Metropolitan Water Supply	Public Health Department	War Service Land Settlement Scheme	Other Government Departments	University	Pay Commonwealth Government Departments	Departmental	Free	Public Pay	Total
Cereals—												
Barley Grain	199	....	....	....	....	....	....	....	....	....	....	199
Barley Plants	10	....	....	....	....	....	....	....	....	....	....	10
Oat Grain	37	....	....	....	....	....	....	....	....	....	....	37
Oat Plants	131	....	....	....	....	....	....	....	....	....	....	131
Wheat Grain	1,049	....	....	....	....	....	....	....	....	....	....	1,049
Wheat Plants	92	....	....	....	....	....	....	....	....	....	....	92
Fertilisers and Manures—												
Aqueous Solution	2	....	....	....	....	....	....	....	....	....	....	2
Fertiliser Act	37	....	....	....	....	....	....	....	....	....	....	37
Limesand and Limestone	8	....	....	....	....	....	....	....	....	....	6	14
Organic	7	....	....	....	....	....	....	....	....	....	10	17
Rhenania Phosphate	1	....	....	....	....	....	....	....	....	....	....	1
Rock Phosphate	14	....	....	....	....	....	....	....	....	....	....	14
Superphosphate	17	....	....	....	....	....	....	....	....	....	4	21
Zinc Sulphate	1	....	....	....	....	....	....	....	....	....	....	1
Horticulture—												
Apple Leaves	197	....	....	....	....	....	....	....	....	....	....	197
Beetroot Leaves	5	....	....	....	....	....	....	....	....	....	....	5
Lemon Leaves	1	....	....	....	....	....	....	....	....	....	....	1
Pear Leaves	6	....	....	....	....	....	....	....	....	....	....	6
Potato Leaves	5	....	....	....	....	....	....	....	....	....	....	5
Silver Beet Leaves	2	....	....	....	....	....	....	....	....	....	....	2
Tobacco Leaves	468	....	....	....	....	....	....	....	....	....	....	468
Tomato Leaves	9	....	....	....	....	....	....	....	....	....	....	9
Miscellaneous—												
Bearing Metal	....	....	....	....	....	....	....	....	....	....	1	1
Brine Sludge	....	....	....	....	....	3	....	....	....	....	....	3
Copper Ore	1	....	....	....	....	....	....	....	....	....	....	1
Corrosion Deposit	....	4	2	3	....	1	....	....	....	....	2	12
Effluent	....	....	....	....	....	1	....	....	....	....	....	1
Eye Muscles	2	....	....	....	....	....	....	....	....	....	....	2
False Flax Seeds	1	....	....	....	....	....	....	....	....	....	....	1
Flour	14	....	....	....	....	....	....	....	5	....	3	22
Flue Dust	....	....	....	....	....	....	....	....	....	....	1	1
Grease	....	....	....	....	....	....	....	....	....	....	4	4
Linseed Oil	....	....	....	....	....	....	....	....	....	....	1	1
Mulga Seeds	....	....	....	1	....	....	....	....	....	....	....	1
Mud	....	1	....	....	....	....	....	....	....	....	....	1
Offal	1	....	....	....	....	....	....	....	....	....	2	3
Oil	....	....	....	....	....	....	....	....	....	....	4	4
Photographic Solution	....	....	....	....	....	2	....	....	....	....	....	2
Plumbing Fittings	....	....	....	....	....	....	....	....	....	....	2	2
Silver Nitrate Solution	....	5	....	....	....	....	....	....	....	....	....	5
Salt	3	....	....	....	....	....	....	....	....	....	....	3
Zinc Oxide	1	....	....	....	....	....	....	....	....	....	....	1
Pastures and Fodders—												
Bonemeal	1	....	....	....	....	....	....	....	....	....	....	1
Clover	260	....	....	....	....	....	....	....	....	....	....	260
Craymeal	....	....	....	....	....	....	....	....	....	....	1	1
Dairy Food	....	....	....	....	....	....	....	....	....	....	1	1
Dried Blood	....	....	....	....	....	....	....	....	....	....	1	1
Elephant Grass	6	....	....	....	....	....	....	....	....	....	....	6
Feeding Cubes	1	....	....	....	....	....	....	....	....	....	....	1
Feeding Stuffs Act	22	....	....	....	....	....	....	....	....	....	....	22
Fodder	49	....	....	....	....	....	120	....	....	....	....	169
Hay	26	....	....	....	....	....	....	....	....	....	....	26
Lucerne	9	....	....	....	....	....	....	....	....	....	....	9
Lupin Seed	4	....	....	....	....	....	....	....	....	....	....	4
Meatmeal	....	....	....	....	....	....	....	....	....	....	8	8
Pasture	125	....	....	....	....	....	....	....	20	....	....	145
Poultry Mash	4	....	....	....	....	....	....	....	....	....	1	5
Roots and Grasses	1	....	....	....	....	....	20	....	....	....	....	21
Silage	13	....	....	....	....	....	....	....	....	....	....	13
Sudan Grass	2	....	....	....	....	....	....	....	....	....	....	2
Tree Lucerne	2	....	....	....	....	....	....	....	....	....	....	2
Turnip Seed	1	....	....	....	....	....	....	....	....	....	....	1
Soils	196	3	....	....	....	....	....	9	....	....	34	242
Water	17	644	125	9	40	30	1	2	2	1	1,393	2,264
	3,060	657	127	13	40	37	141	11	27	1	1,479	5,593

The tops of the plants treated with copper fertiliser showed no difference in the uptake of copper whereas the copper in the roots increased three to six times.

(3) The urease activity was tested for four varieties which when sprayed with urea gave differing responses. The order of activity greatest to least was Gluclub, Javelin 48, Comeback and Eureka II.

Miscellaneous.

Numerous samples too varied to be summarised are included under this heading.

Of the more interesting are the following:—

(1) A sample of zinc oxide spray suspected of causing leaf drop on citrus trees was checked for peroxide activity.

(2) A wide range of samples for qualitative spectrographic analysis was examined including lithium based greases, brass plumbing fittings, corrosion deposits, minerals, sludges, water deposits and a refrigerator piston ring deposit.

(3) A sample of brine from the refrigeration system on the M.V. Koojarra was examined and recommendations made for the addition of a corrosion inhibitor.

(4) A sample of slime in a water from Caversham was identified as the fungus Beggiotoa alba. This fungus was growing in profuse quantities in an acid swamp water. The dried fungus was found to contain 40 per cent. of free sulphur, produced by the fungus from sulphates in the water.

(5) An inspection of "red water" troubles at Woodside and Swan District Hospitals was made and recommendations were made which have now eliminated their "red water" complaints.

Table 2, see page 76.

FOOD, DRUGS, TOXICOLOGY AND INDUSTRIAL HYGIENE DIVISION.

During 1957 the Staff of the Division remained at its previous level of thirteen officers, two being permanently situated at the Annexe Laboratory, Lincoln Street, and the remaining eleven occupying accommodation originally designed for a staff of eight.

The major part of the work of the Division consisted of chemical work undertaken for the Departments of Public Health, Police, Agriculture, Public Works, the Metropolitan Water Supply, Sewerage and Drainage Department, and the Milk Board of W.A., but a wide variety of miscellaneous examinations were performed for other Government departments and the general public.

12,345 samples were examined during the year, being an increase of 598 over the number for 1956.

Foods.

A total of 590 samples of food materials were examined, as compared with 399 in 1956. Of these, 226 were samples of cows' milk submitted by the Milk Board of W.A. and consisted largely of milks which by inspectors' "field tests" were suspected of being under standard or adulterated with water.

It is of interest to note that of these samples only 1.2 per cent. contained less than 3.2 per cent. of milk fat (the legal minimum), whereas 78.5 per cent. of the samples contained less than the legal requirement of solids not fat (8.5 per cent.), and 91.4 per cent. of the samples failed to comply with the standard laid down for the freezing point of milk (0.540 degrees Centigrade below zero). The distribution of the analytical results is indicated in the following tables:—

MILK FAT.

Per cent. in sample.	Per cent. of total samples.
Less than 3.00	0.6
3.00 - 3.19	0.6
3.20 - 3.49	17.7
3.50 - 3.74	12.0
3.75 - 3.99	7.0
More than 3.99	62.1
	100.0

MILK SOLIDS NOT FAT.

Per cent. in sample.	Per cent. of total samples.
Less than 8.00	13.9
8.00 - 8.24	28.5
8.25 - 2.49	36.1
8.50 - 8.74	15.2
8.75 - 8.99	5.0
More than 8.99	1.3
	100.0

FREEZING-POINT.

Degrees C. below zero.	Per cent. of total samples.
Less than 0.500	4.5
0.500 - 0.509	2.3
0.510 - 0.519	9.5
0.520 - 0.529	44.3
0.530 - 0.539	30.8
0.540 - 0.550	8.6
	100.0

In presenting this distribution of the analyses it is emphasised that all, or nearly all, of these samples were submitted because there was prima facie evidence of their failure to comply with legal standards.

40 samples of cheese were analysed for the Dairy Branch of the Department of Agriculture for the purpose of control checks of the composition of the cheese production by factories in this State. Of these, 24 samples or 60 per cent. of those examined, contained more than 50 per cent. of fat calculated on the moisture-free basis.

30 food samples were examined for the Government Tender Board as a check on the quality of foodstuffs tendered for supply to Government institutions. These comprised such varied commodities as meat pastes, jelly crystals, custard powder, powdered milk, tomato sauce, chutney and pickles.

Included in the samples received from the Public Health Department were 23 samples of vinegars of different types. Apart from technical breaches of the labelling provisions of the Food and Drug Regulations, chemical analysis indicated that the labels of some samples were misleading in their description of the type of vinegar offered.

Investigations were continued for the Department of Agriculture in an endeavour to correlate palatability of varieties of grapes with chemical criteria. It was decided to continue the analytical work in 1958.

Work for this department also included the analysis of 114 samples of oranges. Most of these comprised a survey to check maturity of fruit in different areas. Using as a standard the definition of maturity laid down by the Agricultural Products Act Grading Regulations it was found that in the 1957 season oranges grown in the Swan, South Suburban and Foothills areas matured earlier, followed successively by those in the Hills, Chittering and Bindoon areas. In general the later maturing oranges possessed a higher sugar content.

Other samples of oranges were analysed to provide chemical data of fruit from different rootstocks.

29 samples of pears were examined for fungicide residues following spray experiments conducted by the Plant Pathology Branch of the Department of Agriculture. The need for further work on the chemical side, as well as the agricultural, was indicated.

Miscellaneous foods examined during the year included mince meat, rolled oats, fruit cordial, sausage meat, pickling fluid, cream and confectionery, and a complete analysis of some varieties of bananas.

Human Toxicology.

160 toxicological samples from 88 cases were examined in connection with death from poisoning or for other police enquiries.

In 24 cases no poison or drug was detected, while in 64 cases a poisonous material or other active drug was identified on analysis. Details are given in the following table:—

Poison or Drug.	No. of Cases.
Barbiturates	27
Carbon monoxide	11
Chlorpromazine	5
Strychnine	4
Alcohol	4
Arsenic	2
Aspirin	2
Lead	2
Bromural	1
Chloral hydrate	1
Lysol	1
Nicotine	1
Bromide	1
Parathion	1
Chlorinated hydrocarbon	1
Negative	24
	88

Ninety-one specimens of blood and 73 of urine were analysed for alcohol concentration. These were submitted by the Police Department in connection with traffic accidents, violent death from various causes, or for other police enquiries. The distribution of results for blood was:—

BLOOD ALCOHOL ANALYSES

Per Cent. Alcohol.	Number.
Negative	32
Less than 0.1	32
0.11-0.15	14
0.16-0.20	11
0.21-0.25	11
0.26-0.30	3
0.31-0.35	4
More than 0.35	2
	91

Accepting a limiting figure of 0.15 per cent. as provided in recent amendments to the Traffic Act, W.A., 31 of these cases, or 34 per cent. would be presumed to be under the influence of alcohol.

Animal toxicology.

Forty-six specimens from 35 cases of suspected accidental or malicious poisoning of animals were examined during the year. In 16 cases no poison could be detected, and in 19 cases a common poison was identified, as detailed in the following table:—

Poison	No. of Cases.
Arsenic	10
Strychnine	4
Lead	3
Strychnine and lead	1
Dieldrin	1
Negative	16
	35

Industrial Hygiene.

132 samples were examined in connection with problems of industrial hygiene, an increase of 75 per cent. over the number for the previous year. These comprised 81 samples of blood or urine from persons exposed to actual or potential hazards, chiefly of lead, and included 26 samples of urine from workers at the West Australian Government Railways who were subject to a regular routine check. Of the 66 samples of urine examined for lead content, 46 contained 0.08 parts per million or less, 15 samples contained from 0.09 to 0.19 parts per million while 5 samples contained 0.20 parts per million or more of lead. (A concentration in excess of 0.08 parts per million is generally accepted as indicative of lead poisoning if supported by clinical symptoms).

Other samples were examined for mercury, copper, arsenic and thallium.

Many samples of commercial materials, largely those containing volatile solvents, were examined for the Department of Factories and Labour, and advice as to possible hazards in use has been given where necessary.

Sewage Control.

The Annexe Laboratory situated at Lincoln Street, North Perth, continued to undertake chemical sewage control work and other investigations for the Metropolitan Water Supply, Sewerage and Drainage Department and examined 10,210 samples during the year. 3,192 samples represented routine control work in connection with the operation of the treatment plants at Subiaco, Swanbourne and Fremantle. Systematic testing in relation to the generation and content of hydrogen sulphide in sewage was continued during the year when 6,696 samples were examined.

A considerable expansion of work in regard to sewage treatment is anticipated during 1958, when a pilot plant is to be put into operation at Subiaco for treatment of sewage by the "activated sludge" process, and an increase in staff will be necessary.

During the year an investigation was made of the Kalgoorlie Sewerage System to provide information necessary for the design of proposed additions. Tests were carried out and inspections made of the digesters, sedimentation tank, biological filter, methods of effluent disposal and trade waste treatment, and of the general condition of concrete sewers and structures. A detailed report with recommendations was prepared by the Sewage Chemist.

A small number of trade wastes were examined, chiefly to check if they were suitable for discharge into the sewerage system.

Pollution surveys.

Swan River: The collection and analysis of samples in monthly surveys of the Swan River was continued throughout the year when 237 samples were analysed. Work over the past ten years has indicated where the main profits of pollution may be expected and the regular check surveys continue to confirm these observations.

Leschenault Inlet, Bunbury: Three surveys were made during the year and 72 samples examined. No significant change was noted when compared with the pattern of recent surveys, when a distinct improvement was observed in the summer months.

Metropolitan Ocean Beaches: Regular examinations of sea water collected from metropolitan ocean beaches were made every three months and 146 samples were analysed. Again the main points of pollution had been located in past surveys and no significant changes were recorded during 1957.

Brunswick Junction: Following complaints that water being used for factory purposes developed an objectionable flavour when superheated, an investigation was made of the source of supply, and regular examinations involving 64 samples were continued throughout the year. It was found that the flavour did not develop when water was plentiful during the winter and early spring, but was present during the summer, particularly towards the end of the hot weather. Although the caustive factor has not been identified laboratory investigations indicated methods by which the trouble could be controlled.

During the year an investigation was commenced, for the Water Supply Department, of the waters of the Canning Dam and Mundaring Weir at varying depths from the surface to the bottom. Samples were taken periodically at varying depths and examined for dissolved oxygen content. Although an occasional inexplicable result was obtained the overall figures indicated that there is oxygen present in the water of these dams throughout the year and that there is a reasonable degree of uniformity with no stratification occurring with depth.

General analytical.

Investigations by the Animal Health and Nutrition Laboratory into the supplementary feeding of phosphate to stock were continued in 1957 and in this connection 45 samples of bones and teeth were analysed for fluorine content and occasionally for calcium and phosphorus.

40 samples of cattle and sheep dips from the Stock Branch were analysed as a measure of control of the concentration of dipping fluids. Difficulties experienced by stock officers in remote areas in applying a "field test" for the analysis of arsenical dips were investigated in the Laboratory. As a result it was possible to suggest modifications which would overcome these difficulties in the following season.

Detergents and cleansing materials were also examined for the Government Tender Board as in past years. Once again it was found that a considerable expenditure of time was involved in the examination of a small number of samples of complex nature in order to express an opinion on their relative merits.

Although a number of medicinal exhibits were examined for the Criminal Investigation Branch in connection with the illegal use of drugs, there were few general samples received during the year from investigations relating to criminal activity.

On the other hand 61 samples of drugs were examined on behalf of the Public Health and Government Stores Departments. Many of these were analysed variously for identification, for purity, or for conformity to the standards of the British Pharmacopoeia, but one batch of samples was investigated rather exhaustively in an endeavour to determine the therapeutic or other principles which they were alleged to contain. In respect of most of these samples it was ascertained that extremely large quantities of tablets (of the order of thousands) would require to be ingested to obtain a normal medicinal dose of the active ingredient.

Fruit storage experiments were continued by the Department of Agriculture and 16 samples of air containing carbon dioxide or sulphur dioxide were analysed.

Following the construction and use in 1956 of a standard fire test cabinet 14 further samples of building materials were examined for the Public Health Department for resistance to fire.

Complaints of the alleged ineffectiveness of prepared vermin baits led to the examination of 94 strychnine baits selected at random from a large batch. It is of interest to record that approximately ten per cent. of the prepared strychnine baits which were examined contained no poison, but the remainder contained sufficient concentration to be quite suitable for vermin destruction.

Forty-four samples of pesticides were submitted during the year chiefly for examination to ascertain conformity to prepared specifications.

Only 15 samples of liquors and wines were received in 1957, mostly samples submitted by the Liquor Inspection Branch for determination of spirit strength or for false description following adulteration with an inferior article. Of interest was a brand of a so-called "medicinal" wine which was freely available to legal minors but which contained an appreciable concentration of alcohol.

As in previous years a wide variety of miscellaneous samples were examined in the course of the normal work of the Division. These included human milks, suspected oil finds and ambergris, tallow, floor polishes, corrosion problems, disinfectant fluid, lupin seed, explosive materials, oils, fabric, dyes, phenothiazine powders, paint problems, alleged poisoning of food, and other varied samples.

Many enquiries were received during the year, either by telephone or by personal application at the Laboratories. Endeavours were always made to give full assistance by way of information or advice, although the time involved on some occasions was considerable before the enquiry could be answered.

Expert evidence at Coroner's or other Court of Law was tendered as required by Messrs. Houghton, Southern, Sedgman and Wood in connection with their official duties.

As the foregoing report indicates the work performed by this Division is varied in its scope (Table III). It is realised, however, that postwar developments in fields such as drugs and medicines, pesticides, and food technology have been extensive and present many analytical problems. These have had to remain largely untouched because of limitations of time and personnel.

Table 3, see page 80.

FUEL TECHNOLOGY DIVISION.

Analyses or more prolonged investigational work have been done on a total of 456 samples distributed as set out in Table 4 (see page 79).

The variety of samples and subjects in the list indicates that the Fuel Technology Division provides a wide coverage and service for fuel and related industrial work in the State. Nevertheless work does not flow in regularly and this makes organisation of the work of the Division difficult.

Work on the production of coked briquettes from Collie coal is illustrative of irrigularity in flow of work. The investigation originated from a Committee on which the Department of Industrial Development and ourselves were represented. A method of making coked briquettes was formulated and established on pilot plant scale. In 1956 a total of 370 sample analyses and investigations were made by us in connection with this pilot plant work. This year the number has fallen to 80. Miscellaneous and other analyses in the two years have been 316 and 376 indicating steady work in other directions. It should be noted however that the total of laboratory numbers for samples or investigations is not a complete guide to the work done in the Division since investigations per sample occupy very varying periods of time.

Coal.

Regular coal sampling is maintained in the mines and open cuts at Collie. Particular attention has been given to the Co-operative Mine where the new development below the fault no longer contains such numerous veins of mineral inclusions as exist in the so-called "siderite" section above the fault. The tendency to a high ash content persists in this mine. Although the ash fusion point suggests that it will not clinker, the amount of ash present may cause unfavourable comment by users.

Gases.

Sludge digester gases have been analysed regularly and all samples have approximated closely to carbon dioxide, CO_2, 29 per cent. methane, CH_4, 68 per cent. and nitrogen, N_2, 3 per cent.

Production of Coked Briquettes.

Pilot Plant work by the Department of Industrial Development was substantially completed at the beginning of the year. Investigations in connection with this work and assistance in operation was a major part of the work of Fuel Technology over the previous two years and our own work on fluidised carbonisation and processing had been interrupted to provide the necessary assistance. Work on fluidisation could now profitably go forward once more in conjunction with the Department of Industrial Development.

Sawdust Fired Boilers.

This work has gone steadily forward. Work pioneering in this State has secured wide recognition of the merits of spreader stoker firing of sawdust and wood waste. The major interest is now centred on the control of combustion and reduction of smut emission. Work commenced in 1956 is now bearing fruit. Installation of automatic controls has reduced smut to a figure which causes no marked nuisance.

TABLE 3.

FOOD AND DRUG DIVISION.

	Public Health Department	Agriculture Department	Metropolitan Water Supply	Public Works Department	Police Department	Mines Department	Tender Board	Other Govt. Departments	Departmental	University W.A.	Free	Pay—Public	Pay—Milk Board	Pay—Hospitals	Pay—W.A.G.R.	Pay—Other Govt. Departments	Pay—Commonwealth Govt. Departments	Total
Foods—																		
Apples		6																6
Bananas		8																8
Breast Milk	3																	3
Cheese		40																40
Cod Liver Oil										1								1
Cordial	3																	3
Cow Milk	6								3				226				5	240
Grapes		71				1												72
Mince Meat	6								1									7
Oats (Rolled)	1																	1
Oranges		118																118
Pears		29																29
Pickling Solution	4																	4
Salt												1						1
Sausage Meat	2																	2
Tendered Samples							30											30
Vinegar	23																	23
Sweets	1							1										2
Industrial Hygiene—																		
Blood and Urine	18											10		27	26			81
Miscellaneous	27		2					14				8						51
Miscellaneous—																		
Bones and Teeth (Fluorine)		45										1						46
Cattle and Sheep Dip		40																40
Criminal Cases					15													15
Detergents and Cleaners	1	2					26										3	32
Fruit Storage (Exp.)		16																16
Liquor and Wines	1				14													15
Mine Air and Gases						2		8										10
Natural Veg. Products		51									2							53
Oils and Grease				6								6			5			17
Paint and Primer				3			2					6			1		2	14
Pesticides		32	12															44
Tallow												11						11
Vermin Poison		101										1						102
Water (Investigational)			83															83
Water (Toxic Element)	11	1	5	2		1		1				2						23
Drugs and Medicines	31	1			25			30				1		2				90
Building Material	14											4				1		19
Beef Tissue		6																6
Unclassified	22	12				11		5	3		11	9				1	5	79
Pollution Survey—																		
Bunbury (Leschenault Inlet)				72														72
Brunswick Junction				64														64
Ocean Beaches			146															146
Maritime Pollution								3										3
Swan River				231				6										237
Sewage—																		
Weekly Routine			3,192	2														3,194
Investigational			6,696															6,696
Country Sewage				72														72
Trade Waste			18															18
Miscellaneous	1																	1
Toxicology—Human—																		
Exhibits (Toxicology)	1				160									1				162
Exhibits (Alcohol)					164													164
Specimens (Patients)	2				3							7		21				33
Toxicology—Animal—																		
Specimens, re Death		39			6							1						46
	178	618	10,154	452	388	14	58	69	6	1	13	68	226	51	26	8	15	12,345

TABLE 4.

FUEL TECHNOLOGY DIVISION

	Departmental	Industrial Development	Metropolitan Water Supply	Other Government Departments	Pay—Other Government Department	Pay—Public	Total
Briquetting Experiments (Coal, Char, Gas, Tar)	....	80	....	....	....	....	80
Bituminous Concrete and Surfacing Materials	....	....	....	....	1	....	1
Clay Bricks and Refractories	....	....	....	....	....	15	15
Coal—							
Boiler Trials	....	....	....	1	....	82	83
Storage and Weathering	2	....	....	....	....	....	2
Survey	9	....	....	....	....	....	9
Miscellaneous	1	2	....	3	....	1	7
Flash Drying	1	....	....	....	....	24	25
Furnace Atmosphere	....	....	....	....	....	1	1
Gypsum and Plaster	3	....	....	....	....	6	9
Heating Appliances	5	....	....	....	8	....	13
Sawdust and Smuts (Wood Chips, Chimney Gas)	8	....	....	158	....	6	172
Sewage Gas	....	....	37	....	....	....	37
Thermometer Calibration	....	....	....	....	....	2	2
Totals	29	82	37	162	9	137	456

In conjunction with the Chief Inspector of Factories similar controls have been adjusted and tested at another factory where sawdust and hogged plywood waste are used as fuels. It has been shown that smoke and smut emission can be controlled and the boiler operated economically at over 60 per cent. efficiency. But here there are further special problems caused by frequent changes from one type and size of wood waste to another.

In another instance a different policy has been followed. The boiler is run on induced draft without any modulating control and cyclones have been installed before the induced draft fan to take out dust. It is effective in dust removal but the amount of dust caught in the cyclones is small and bears out our view that smut from sawdust fired boilers is not large in amount if the boiler is running correctly.

Clays and Refractories.

Three firms have submitted a number of samples, some for refractoriness under load and two for thermal conductivity. The service is a useful one which could be much more fully utilised by both brickmakers and industrial users. Good refractories are an expensive item in plant construction and experience in their choice and treatment can best be built up by constant reference to laboratory tests comparative to plant performance. Elsewhere refactory testing is a specialist service which is extensively used by industry. As a growing industrial State we need to build up the same service and to this end improved test equipment is required.

Ilmenite Sands.

Advice has been sought on the performance of a rotary drying kiln operating on damp ilmenite sand. Advice given on the basis of test work carried out resulted in a much improved kiln performance.

Advice has also been sought on the possible use of flash drying of ilmenite sand. The method is one in which the damp sand is picked up in a stream of heated air moving at velocities of 100-150 feet per second and is dried while being transported vertically to a cyclone system where the now dry sand is separated. Drying takes place almost instantaneously, with a high efficiency. The cost of plant installation and the power costs of operation are both lower than for a rotary kiln. The arrangement is also more convenient for the handling of the sand in and out of the drier. The method is normally applicable to any finely divided material and is well suited to ilmenite sands despite their high density. So far only rotary kilns have been installed on the new ilmenite sands developments. These have been found rather troublesome and extravagant in power. Through present contact with the industry it is hoped that flash drying will become generally adopted.

Figures illustrative of the advantages of flash drying are set out in Table 5.

TABLE 5.

Comparisons of Rotary Kiln with Flash Drier to Dry 12 tons of Ilmenite Sand Containing Eight per cent. Water.

	Rotary Kiln	Flash Drier
Capacity of Plant, tons/hr.	12·0	12·0
Diameter of Unit, ft.	6·50	1·50
Length of Unit, ft.	32	30
Oil Consumption, galls./hr.	32	25
Probable Inlet Temperature, °C.	400	800
Probable Exit Temperature, °C.	120	120
Probable Back pressure, inclusive of Cyclone, ins. w.g.	5	9
Volume of Exit Gas at 120° C., cfm.	7,000	3,000
Horsepower of i.d. Fan	15	10–12
Horsepower of Ancillaries—		
(1) Kiln Rotation	25	*Nil*
(2) Feed	1	1
(3) Extraction	1	*Nil*
Thermal Efficiency, per cent.	65·0	85·0

Domestic Appliance Testing—Hot Water.

In 1956 space heating by open fires engaged attention and improvements through the use of convective air heating types of open fires were indicated. This year work on water heating has been substantially completed and progress has been made with solid fuel cooking stoves.

At the request of the State Housing Commission the performance and efficiency of two chip bath heaters were evaluated, and one was found to be considerably more efficient than the other. This work directed our attention to the efficiency of bath heaters and further investigation showed that the performance of the less efficient heater could be raised to that of the more efficient one by adding to it a booster or heat exchanger. Patent application has been made for this device.

Attention has also been given to the more general question of providing domestic hot water, by both storage and instantaneous types of heaters,

including the use of coils or back boilers in fuel stoves or in convective air room heaters of the open fire or closed stove type. Results shown in Table 6 give the comparative costs and performances of various domestic hot water supply methods with the exception of solar heaters, which in conjunction with any storage method of water heating should in Western Australia reduce hot water costs by 50-70 per cent.

TABLE 6.

Performance and Costs of Hot Water Appliances.

Basis of Costs—

Wood	60/- per ton (17 per cent. moisture).
Coal	10/- per 120 lb.
Oil	2/- per gallon.
Gas	1·580d./unit.
Electricity	2·65d./unit.
Heat loss from storage heater	12,000B.Th.U./day.

Type of Heater	Rate of Hot Water heated through 60° F.		Estimated Cost of 40 gallons of Water, heated through	
	Galls./ min.	Galls./ hr.	60° F.	100° F.
Storage—			Pence	Pence
Wood Fired	0·5	30·0	2·8	4·6
Coal Fired	0·5	30·0	5·8	9·6
Oil Fired	Not determined		7·3	12·1
Gas Fired	0·5	30·0	24·1	40·1
Electric	0·1	5·7	24·2	40·3
Heated by Fuel Stove or Room Heater	0·16–0·25	10–15	Not calculated	
Instantaneous—				
Wood Fired :				
50 per cent. efficient	0·7	42·0	2·8	4·6
40 per cent. efficient	0·5	30·0	3·5	5·8
Gas Fired	2·3	120–180	18·5	30·8
Electric	1·0	60·0	19·2	32·0

Plaster of Paris.

The flash roasting method of conversion of gypsum to plaster of paris has now been in commercial operation for 18 months. Samples of plaster submitted to us for test from time to time are satisfactory and modelling works using the plaster seem to be satisfied with it. The operators appear to have been successful in ironing out incidental operational problems. Nevertheless before the process can be expanded on to a larger plant operating continuously with ordinary semi-skilled attendants information is required on the temperatures and gas volumes used in the process.

Domestic Incineration.

Advice was sought on conditions for satisfactory operation of domestic rubbish incinerators in blocks of flats. The rubbish is large made up of tin cans, vegetable waste and paper. Tin cans are not destroyed by these incinerators and good access doors and tipping grates are needed for cleaning them out. Disposal of them separate from combustible rubbish would be preferable.

Successful incineration depends on drying out the vegetable waste so that it will burn. To secure this there must be enough waste paper in the rubbish and the air supply must be so limited that the paper only smoulders slowly. If it is allowed to burn quickly its heat is lost before it can penetrate and dry the vegetable waste. As incinerator stacks run the full height of the blocks of flats stack draught can be considerable and it is therefore necessary to make the bottom cleaning doors and other fittings tight and air inlets must be controlled to minimum openings.

The ratio of paper to vegetable waste in any household is probably sufficient for combustion. Nevertheless incineration calls for oversight and attention and is accompanied by the acrid smell of burning rubbish. The disposal of domestic rubbish is a major problem in all communities. It calls for close study and considerable knowledge of methods available and commonly used elsewhere. Unfortunately some of the sources of revenue from rubbish—scrap steel, tin, waste paper and bones cannot be fully exploited here as they are elsewhere.

General.

Miscellaneous inquiries have been made on a variety of subjects relating to use of fuel, gasworks practice, etc. Early in the year a visit was made to the Eastern States primarily to fill an invitation to the opening of the new B.H.P. research laboratories. The opportunity was taken to visit other establishments, notably the new Lurgi Gasification plant at Morwell in Victoria.

PYROMETRY.

Internal laboratory calibration accounted for most of the pyrometric work done at this centre in 1957; a total of four thermocouples and five thermometers were calibrated against laboratory standards.

In addition to this, visits were made to workshops to check the operation of a salt bath temperature controller, and also to a factory to diagnose and correct a fault in the operation of a zinc bath indicator.

Other internal work has included preparing for registration of this laboratory in the field of heat and temperature measurement with the National Association of Testing Authorities. A new furnace block has been obtained, a standard resistance and salt bath are on order, two potentiometers and two strip lamps are being calibrated, and work is proceeding on a temperature uniformity check of the new furnace block and the thermal behaviour of the low temperature thermometry insulated tube.

These items having been completed, preparation will then be complete for registration in the following sections:—

5.01 (a) (i)	0 – 1100°C.	Calibration of rare metal couples.
5.01 (a) (ii)	0 – 1000°C.	Calibration of basic metal couples.
5.01 (b) (i)		Calibration of pyrometric instrument.
5.02 (a)	700 – 2000°C.	Calibration of optical pyrometers.
5.04 (a)	–40 – 550°C.	Calibration of liquid in glass thermometers.
5.05 (b)	–40 – 550°C.	Calibration of industrial thermometers.
5.05	0 – 1700°C.	Installation checking.

INDUSTRIAL CHEMISTRY DIVISION.

GENERAL.

With the laboratories and Unit Process Plant now fully equipped, 1957 was a busy year. All items in the Unit Process Plant with one exception—the Denver Flotation Plant as a whole—have been in use; some parts of the Denver plant have, however, been in service. All items have functioned satisfactorily and would be much more fully used if staff were available.

Six frames (three metal, three wooden) have been constructed for the exposure of samples of painted wood, mainly karri; one is on service and the others will follow shortly.

Interesting uses of the spray drier included work on gums, mashed potatoes and a medicinal extract; in all cases the drier gave satisfaction. The drum drier, after modification, gave promise as being useful for the production of dehydrated mashed potatoes.

Distillation equipment was used for such varied items as methyl benzoate, kerosene, methyl ethyl ketone, and paraldehyde as well as for bulk supplies of distilled water.

As previously the work of the year can be classified under two main headings:—

(a) consultative.

(b) short term investigations.

Long term research was not undertaken for reasons of staff.

CONSULTATIVE WORK.

We have become conscious of an increasing awareness amongst manufacturers and the public generally of the Division as a source of information and advice on technical matters. This is reflected in the number of enquiries—2,172—received during the year. Of these, replies were possible in all but seven cases. The co-operation of experts on various lines of work made it possible to resolve a large number of problems and many enquiries were referred to these gentlemen. As before, Manufacturers' agents and representatives whom it was found necessary to consult were most helpful and co-operative.

Many enquiries were concerned with plastics and with the use of protective coatings in general. Increasing costs of machinery and equipment and the need for greater efficiency have led many Western Australian manufacturers to consider still more carefully materials of construction and their proper protection. More and more use is being made of protective coatings. We have been asked to advise on the best type of coating to use, pre-treatment of surfaces, sources of supply of materials and application methods. In conjunction with technical representatives we have seen and examined a number of interesting paint-failures. The year saw the introduction into Western Australia of some classes of epoxy and polyester resins and wider use of polyvinyls, acrylics and artificial rubbers.

Enquiries have come from several branches of the engineering profession, from architects, draughtsmen, chemical manufacturers. plumbers, painters, even members of the medical profession. Almost all of the enquirise were of a more or less confidential nature and, as a consequence, cannot be further elaborated here.

SHORT-TERM INVESTIGATIONS.

As usual these investigations covered a wide field and are difficult to classify. The results obtained in a number of cases are confidential and only brief reference can be made to them.

As a result of work carried out by a wine company at their vineyards with our advice it was found that epoxy resins can safely be used to line the cement tanks which are filled seasonally with distillation wine. The resins which are expected to have a long life will replace the wax coatings which had heretofore been applied and removed annually, thus reducing costs appreciably. P.V.A. and epoxy resin paints have been applied with success in other parts of the factory.

The epoxy resin paint used for identification of polio needles (vide 1956 report) has continued to give excellent results.

At the request of the Architectural Division of the Public Works Department the resistance to wear, solvents, cleaners, etc. of various decorative finishes was examined. Standard equipment for this type of work is lacking in this laboratory but we have been able to compromise with equipment which it is believed gives the information required. All the type of sheeting examined had some particular weakness (though not necessarily a serious one) but most were expected to have a satisfactory "life".

For the Plumbing Section of the Public Works Department a new type of decorative floor topping for bathroom and lavatories was examined. It was found unsuitable, perhaps because of inexpert preparation by the supplier of the sample, rather than the intrinsic nature of the materials used.

Fading of a cream colour in sand-lime bricks was found to be due to a combination of incomplete mixing of pigment and to the use of a pigment which was of too coarse a texture and with a tendency to clot.

Some work was done for the Electrical Branch Public Works Department on the joining by vulcanisation of the plastic sheath protecting electrical wires. A reel of tape was prepared for the purpose by soaking pyjama cord in a suitable solution and drying thoroughly. This was successfully used at Bunbury.

Investigations on materials used in making damp-proof courses in constructional work was undertaken on behalf of the Public Works Department. Some interesting results have come to light, in particular the fact that some of the materials are by no means damp-proof for as long as seven days after placement, although perfectly satisfactory after, say, 14 days. The work also shows that materials of local manufacture can replace if required, imported proprietary lines.

For a local firm about 300 lb. of beach sands were processed by Wilfley table to give samples of concentrate, middlings and tailings which were later forwarded to C.S.I.R.O. for further research.

Recovery of antimony from antimonial gold-bearing pyrites is now being studied with promising results. This work is being done for the Mines Department.

Experiments on the wearing and other properties of various forms of plastic floor tiles are almost complete. Using our own simple abrasion tester results have been obtained which appear to be of the same order as those found in tests with a standard Taber abrasion tester. Examination has also shown interesting differences in the various makes of tile submitted for examination.

In collaboration with the Department of Agriculture the preparation of pison baits for dingoes, kangaroos, emus and foxes is being investigated. Good progress has been made. Two types of bait are being prepared, one permanent and the other breaking down in the course of a few days. Bacterial and enzymatic decomposition of the latter will be studied.

Some preliminary work on styrene foam for the manufacture of insulation board is under consideration. This type of board is said to have a very promising K factor and weighs about one lb. per cu. ft.

A manufacturer of insecticidal emulsions who was experiencing difficulty in preparation of the emulsions, was found to have an inefficient emulsifier. A suitable type of emulsifier was indicated. Since its installation superior emulsions have been obtained and the amount of emulsifying agent used (which is expensive and imported) has been considerably reduced. Use of the same type of emulsifier has enabled the manufacturer of a water-proofing paint to produce a very much better product.

Assistance was given to a manufacturer of polishes, who reports that he is now obtaining a share of the much over-crowded market in this type of preparation.

Observations on two heat-resisting types of paint indicated that, by and large, the type based on silicones was superior to that based one butyl titanate.

It was found that zinc-rich paints made a very suitable base for epoxy or polyester resin paints. Zinc-rich paint was less successful with coatings based on artificial rubber ("neoprenes").

At the request of Associated Sawmillers and Timber Merchants, work is in progress on the best methods of painting karri timber. The work has not yet progressed far enough to make any very definite statements but it seems reasonable to suppose that there are definite upper and lower limits of moisture content beyond which karri cannot successfully be painted. An interesting point is that material extractable from green karri appears to have a deleterious effect on paints. This work is, unfortunately, much slowed up by staff shortage.

In the course of this research on paints it was discovered that an adhesive type of P.V.A. emulsion could be used with promise as a primer/sealer. Experiments with this material on porous surfaces such as some woods, concrete and bricks have given most interesting results and a commercially produced P.V.A. emulsion is now specified by some architects. The P.V.A. emulsion can

also be used as a primer for old paint surfaces from which only loose flakes of paint need be removed before painting. All types of paint, except perhaps, cellulose-based ones may apparently be used over this type of sealer.

Dehydrated mashed potatoes which were common enough during the last war, have apparently still a market as a supplement to cattle fodder; enquiries have been received from overseas and there is a potential market in the North-West. Details of plant necessary have been obtained and some preliminary work done in the Division on drying. A product of good taste, but rather indifferent appearance, has been produced which would be suitable for the fodder market. Further research might produce a grade suitable for human consumption. In addition production of peeled, waxed potatoes has been studied. Lack of staff has prevented the active prosecution of this research.

At the request of a medical man we have formulated a plastic which can be used to produce inverted models of human organs such as livers, kidneys, etc. The plastic is injected through a large vein or artery which is then sealed off. The organ is placed under high vacuum when the plastic enters even the finest capillaries. After setting, the flesh is removed by enzymatic decomposition. Results so far are most promising. In the final model, some of the "hairs" of plastic representing capillaries are so fine that they break readily. It is now proposed to bed the plastic models in a methacrylate ("perspex") layer which can be cut as required and used for demonstration purposes. It will be necessary to develop a cold-setting methacrylate and this we hope to do when staff conditions permit.

The work in natural products for which the Unit Process Plant was largely designed has not made much progress because of staff considerations. Reasearch on the oil from Darwinia citriodora has continued in the form of analyses of monthly samples but no attempt has been made at fractionation. Oil content varies with locality, temperature, and with plant varieties (of which there seem to be several). A sample was submitted to the Public Health Department for antibiotic studies but report is not yet to hand.

An extract from the roots of Scaevola spinescens, said to have palliative effects in carcinoma, has been prepared regularly for clinical testing. Sufficient work has been done to make it possible to produce at short notice the extract in the large quantities which would be required for systematic clinical testing.

Some very preliminary investigation has been done on an interesting resin from Actinostrobus arenarius and on Codenocarpus centenifolius which yields a mustard-oil. It is regretted that no research on Oxylobium graniticum has been possible.

This has been an interesting and profitable year—somewhat marred by the restrictions imposed by shortage of staff, but one holding out promise for the future.

MINERAL DIVISION.

One thousand six hundred and thirty-two (1,632) samples were received during the year, representing an increase of 609 over the previous year (see Table 7 at page 84).

The main sources of samples were:—

General public (free 681, pay 474)	1,155
State Batteries Branch	246
Geological Survey Branch	145

Alloys and Metals.

A testing programme for the Department of Supply and Inspection was initiated with a solder and two tinned plate samples being tested for conformity to specification. Complete analyses of two white metal samples were carried out for the Tramways Department. An assay was made of a lead ingot recovered from the wreck of S.S. "Pericles," sunk off the Leeuwin in 1910.

A number of specimens sent in as minerals were found to be of synthetic origin, and included speiss, ferromanganese and solders.

Building Materials.

Work classified under this heading included tests on coarse and fine concrete aggregates for the Main Roads Board, and of natural iron pigments for use in sand-lime bricks. Four cements were tested for conformity to A.S. Spec. A2-1953 for the Hydraulics Branch of Public Works Department, and samples of deteriorated cement and granolithic flooring were examined for the Principal Architect, Public Works Department, to ascertain the cause of breakdown. Other items included examination of discoloured sandstone foundation, and of alumina bricks for the Wundowie Charcoal Iron and Steel Industry.

Burnt Lime.

Most of the 101 samples tested during the year were received from producers and consumers for check on the free lime content. A number of more complete analyses were made on behalf of the State Batteries Branch.

Ceramics.

Clays.—Sixteen samples of clay were received. Where justified, these samples were subjected to burning, porosity, plasticity, colour and shrinkage tests to assess their value as ceramic raw materials.

Refractories.—Tests on refractory bricks consisted of both chemical analyses and thermal tests up to temperatures approaching 1600° C.

Corrosion Tests.

Thirteen used pressed asbestos-cement pipes were received from the Metropolitan Water Supply Department for examination for evidence of deterioration in service. They were examined for the degree of leaching of lime and sulphate from the inner surfaces, and for signs of permeability and physical weakness. There was no evidence of the excessive deterioration noted in earlier pipes manufactured by the lamination process.

Other items examined for the same Department included cadmium-plated water fittings. Advice was given against the use of such fittings in any system of water supply for human consumption.

Chromium-plated furniture was tested for Public Works Department by both microscopic and chemical means, the extent of pin-point corrosion and the thickness of metallic coatings being ascertained.

Ores.

Beryllium.—Beryl continues to interest prospectors and a number of good quality specimens were sent in for examination, several assaying between 13 and 14 per cent. BeO.

Copper.—Of the one hundred specimens of copper ore received during the year, twenty were in connection with a boring programme undertaken at Copper Knob (Peak Hill) by the Geological Survey Branch.

In addition to samples registered as copper ores, a large number of copper assays were carried out on barren samples sent in following a reported copper find in the Yornup district. No significant copper figures were obtained.

Gold.—Two hundred and fifty-seven samples were received for gold assay. The majority came from State Batteries, 153 tailings being received from this source for check assay and 41 for umpire assay.

Ilmenite Ores and Products.—The number of samples of potential titanium ores received was the most significant increase of the year. Compared with 37 in 1955 and 107 in 1956, 323 samples were examined during 1957, reflecting the rising interest in titanium and its products.

In most of the black sands received, ilmenite was the predominating heavy mineral, though in exceptional cases garnet or zircon was the major constituent.

Samples were first concentrated by separation of the heavy mineral content and then these heavy minerals were fractionated magnetically for quantitative identification.

In addition to this work on the raw materials, analyses were made of ilmenite concentrates representing overseas shipments from commercial plants already in operation, as well as examinations of various plant-products. This work involved mainly analyses for titanium, iron, chromium

phosphorus, zirconium and rare-earths. A typical complete analysis of what has become an important item of export from this State, ilmenite, is:—

Ilmenite.

Analysis:	Per Cent.
Ferric oxide, Fe_2O_3	18.19
Ferrous oxide, FeO	22.17
Manganous oxide, MNO	1.52
Alumina, Al_2O_3	0.26
Magnesia, MgO	Nil
Lime, CaO	Nil
Rare earth oxides, R_2O_3	Trace
Chromic oxide, Cr_2O_3	0.04
Vanadic oxide, V_2O_5	0.06
Tantalic and Niobic oxides, Ta_2O_5 +Nb_2O_5	Trace
Zirconium oxide, ZrO_2	0.03
Titanium oxide, TiO_2	56.63
Silica, SiO_2	0.76
Water, H_2O	0.27
Phosphoric anhydride, P_2O_5	0.04
Sulphuric anhydride, SO_3	0.10
	100.07

Analyst: D. Burns.

Ninety one samples of products connected with the ilmenite industry were examined. In addition to ilmenite concentrates, these included monazite, zircon and titaniferous slag.

The Laboratories co-operated with the Department of Industrial Development in its investigation of the possibilities of treating ilmenite to give a titanium-rich slag for export. The work involved a complete analysis of the ilmenite concentrate used as the head sample for this work and a number of determinations for manganese, titanium and iron (in both metallic and oxidised forms), as well as carbon and silica, on the slags produced. X-ray work was also carried out.

Preliminary information was supplied to the Atomic Energy Commission on the potentialities of heavy sand deposits in the south-west of the State as sources of monazite; the thorium content of some monazite concentrates was found to vary between 3.3 and 4.3 per cent. ThO_2.

Iron.

Most of the work carried out on iron ores was in connection with the long-range survey of all West Australian iron ore reserves being undertaken by the Geological Survey Branch. Over one hundred samples were received, representing deposits in the Peak Hill, Pilbara, West Pilbara, Ashburton, Murchison, Yilgarn and Coolgardie Goldfields. Individual samples were assayed for iron, and a number of group samples for iron, phosphorus, silica, sulphur, managanese and titanium.

Samples sent in by the public proved to be hand specimens of iron ore of varying grades, some being rich intergrowths of ilmenite with magnetite, hematite or limonite.

Lead.

Eight samples of lead ore were received, while 45 samples of concentrates and tailings, taken from parcels treated by the Northampton State Battery, were check-assayed for lead and zinc.

Lithium.

Some interest was shown in lithium minerals. An analysis of spodumene from Ravensthorpe showed a lithia figure of 5.92 per cent. The only non-silicate lithium mineral received was a specimen of lithiophilite from Strelley, in the North-West Division. An analysis was made of a petalite from Londonderry to assess its suitability for ceramic use.

Manganese.

Though fewer specimens of manganese ore were received than in the previous year, the much wider distribution and the greater number of enquiries reflects a growing interest in this metal.

A speciment from the Marble Bar district contained rhodochrosite in addition to pyrolusite. Another, from an undisclosed locality, showed a nickel content of 1.75 per cent.

Columbite-tantalite Ores.

A waning interest in these ores was evident, only seven samples being received during the year. This is due probably to the lack of demand for the columbite content of the ore, the tantalite content being of most commercial significance.

Radioactive Minerals.

A large number of mineral and rock samples was subjected to routine tests for radioactivity, the big majority showing either no activity or insignificant amounts.

Minerals received showing radioactivity included euxenite, allanite and monazite. A black lustrous mineral from the Pilbara area proved to be a titanate of iron with rare-earths and uranium and was tentatively identified as davidite.

A sample from Mt. Mulgine, forwarded by the Government Geologist, consisted of rock fragments showing a radioactivity concentrated in an efflorescene of blue, green and white hydrated sulphates of copper, aluminium and magnesium. The whole sample assayed 0.03 per cent. U_3O_8.

MINERALS.

Asbestos.

A number of samples of anthophyllite asbestos received from the Yornup district were too weathered to be of commercial value. A specimen of the same mineral, locality unspecified, was composed of brittle fibres up to 12 inches in length. Deposits of chrysotile were reported from the Ashburton Downs area.

Sulphur.

A specimen consisting mainly of crystalline sulphur had been recovered from a small outcrop on Long Island, off Exmouth Gulf. This would be the first recorded finding of this type of occurrence of sulphur, previous small finds being the result of bacterial reduction of sulphur-bearing minerals such of gypsum and pyrite.

Unfortunately, there is insufficient evidence to exclude the possibility of the sample originating as flotsam.

MINERAL DETERMINATIONS.

As in the past, a large percentage of the mineral specimens sent in for identification were examined free in accordance with the policy of encouragement to prospectors.

A number of minerals were received from localities from which the species had not previously been recorded. Among these were:—

Manganese Minerals.—As a result of the marked increase of interest in manganese ores, specimens of these minerals were received from a number of new localities. High grade hand specimens were received from an area 30-40 miles north west of Lorna Glen Homestead in the Wiluna District, and from Carawine Pool and Ant Hill Peak in the North West. Psilomelane was recorded from Mt. Joseph in the Kimberleys, pyrolusite from 14 miles east of Cranbrook, and a specimen of manganese ore consisting of pyrolusite and rhodochrosite in association with quartz, fuchsite and feldspar came from 20 miles north-west of Marble Bar.

Copper Minerals.—Malachite was recorded for the first time from Mt. Rose, Kimberley, while the same mineral, associated with azurite, was reported from 4 miles west of Westonia.

Anglesite.—Recorded from 8 miles south of Mt. Rose, Kimberley.

Fluorite.—A specimen of green fluorite was received from Mt. Joseph, in the Napier District of the Kimberleys together with two samples of massive *scheelite* from the same locality.

Marmatite.—A rock specimen from an Albany district consisted of quartz with marmatite (an iron-bearing zinc sulphide) associated with magnetite and ilmenite.

Rutile.—A specimen of hematite, with some rutile, quartz and pyrolusite was received from 7 miles west of Woodanilling in the south-west.

Andalusite.—A large crystal of andalusite in a green matrix of fuchsite, muscovite, quartz and rutile was the first specimen of this mineral recorded from the area of the old Yuin Reef mine in the Yalgoo G.F.

Alexandrolite.—The green chromium-bearing halloysite, alexandrolite, was recorded from 7 miles north of Yalgoo.

Oother minerals received from new localities included:—

Bismutite (10 miles south-east of Southern Cross). *Graphite* (Geraldton), *barite* (Mt. Ord, Kimberleys), *corundum* (Byro Station, Murchison), *lithiophilite* (15 miles east of Marble Bar) and a slightly radioactive *mangano-columbite* from 15 miles south-south-east of Nullagine.

MISCELLANEOUS.

Australite.

A small button-type australite was received from Needilup, which is on the southernmost fringe of the area from which these glassy meteorites have been reported.

Complete Rock Analyses.

Work was also commenced on the complete analyses of two rocks of special interest in the geological research being undertaken by the Department of Geology, University of Western Australia.

One is a porphyritic granite representative of a large batholith in the Koorda-Bencubbin area, the other is a granitic charnockite from Dingo Rock near Lake Grace and represents the first acid charnockite of the Madras type recorded from Western Australia.

Health Hazards.

Free and combined silica were determined on two samples of dust from a power station in connection with possible health hazards associated with this dust.

At the request of the Department of Public Health, an examination was made of the material from which a commercial brand of luminous keyhole surround was made. It was found to consist essentially of activated wurtzite (alpha zinc sulphide) in a plastic base, having a high radioactive count due mainly to beta particles.

Petrological Examinations.

A detailed petrological examination of ten rocks from the Pilbara Goldfields was commenced at the request of Government Geologist. The rocks were collected along the strike of the country over a distance of 10 miles, and show a gradual gradation from the granitic to the porphyritic. The object of the examination was to provide the Government Geologist with evidence to enable age relationships to be established.

The work involves the determination of mineral content and relative areal proportions, the order of crystallisation, accessory minerals and their associations, inclusions, weathering products and analyses for silica and alkali contents.

TABLE 7.
MINERAL DIVISION

	Public Pay	Free	State Batteries	Government Geologist	State Brickworks	Department of Native Welfare	Departmental	W.A. Government Tramways	Commonwealth Department of Supply and Inspection	Mines Department	Department of Industrial Development	Public Works Department	State Mining Engineer	M.W.S.S.D. Department	Department of Public Health	W.A. School of Mines	Department of Agriculture	State Housing Commission	Total
Alloys and Metals	5	4	....	....	....	....	....	2	3	....	....	....	....	....	....	....	....	....	14
Building Materials	1	....	....	....	....	....	....	....	....	....	2	16	....	....	....	....	....	....	19
Burnt Lime	87	1	7	....	....	....	....	....	....	....	1	....	....	....	....	....	....	5	101
Ceramics—																			
Clays	3	6	....	....	7	....	....	....	....	....	....	....	....	....	....	....	....	....	16
Refractories	7	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7
Corrosion	....	....	....	....	....	....	....	....	....	....	....	1	....	15	....	....	....	....	16
Mineral Determinations	44	287	....	1	....	3	....	....	....	....	....	1	....	....	....	....	2	....	338
Minerals—																			
Asbestos	1	7	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	8
Baryte	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3
Corundum	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Euxenite	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	2
Flourite	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Garnet	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3
Graphite	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Gypsum	....	7	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7
Heavy Sands	178	144	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	323
Heavy mineral products (ilmenite, etc.)	77	5	....	....	....	....	1	....	....	....	8	....	....	....	....	....	....	....	91
Limestone	....	5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5
Mica	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
Monazite	4	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	5
Ochres	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	2
Opal	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Sulphur	1	2	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	4
Talc	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
Vermiculite	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
Ores—																			
Antimony	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
Aluminium	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Beryllium	1	12	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	13
Bismuth	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Chromium	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3
Copper	11	69	....	20	....	....	....	....	....	....	....	....	....	....	....	....	....	....	100
Gold—ores	13	45	....	4	....	....	....	....	....	....	....	....	1	....	....	....	....	....	63
tailings	....	....	153	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	153
umpires	....	....	41	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	41
Iron	7	38	....	103	....	....	....	....	....	....	....	....	....	....	....	....	....	....	148
Lead	5	3	45	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	53
Lithium	1	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3
Manganese	11	13	....	5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	29
Molybdenum	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Nickel	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3
Tantalum and Niobium	5	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7
Tin	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Tungsten	1	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3
Uranium	2	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4
Zinc	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	1
Radioactive ores	....	6	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	7
Miscellaneous—																			
Ash	....	....	....	....	....	....	3	....	....	....	....	1	....	....	....	....	....	....	4
Australite	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Health Hazards	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	....	....	....	4
Petrological examinations	....	....	....	10	....	....	....	....	....	....	....	....	....	....	....	....	....	....	10
Rock analyses	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	2
Totals	474	681	246	145	7	4	7	2	3	2	13	19	2	15	4	1	2	5	1,632

DIVISION VIII

Annual Report of the Chief Inspector of Explosives for the Year 1957

UNDER SECRETARY FOR MINES:

For information of the Hon. Minister for Mines, I have the honour to report on the work of the Explosives Branch in 1957.

Importation of Explosives.—Nine shipments were discharged at Woodman's Point during the year. A new vessel, A.K. "Wongala," made the first trip in November and replaces the older wooden ship of the same name. The new "Wongala" carries 16,000 cases. Detonators arrived mostly by rail and some shipments of fuse were carried by other vessels.

Quantities and Types of Explosives.—Table 1, below, gives quantities of all types of explosives imported during the year. The figures are slightly lower than for the previous year, but it is known in some instances that this is due to carry-over of stocks. A trial quantity of a new explosive known as D.P. No. 12 was imported during 1956, but none appears in the list for 1957. Trials were suspended for this year but are to be continued again in the near future. The quarry explosive known as Roxite seems to find little favour in this State and none was imported during 1957. The use of blasting powder is declining steadily, and only 54 cases were imported compared with 210 for the previous year. Comparison of total quantities with those for previous years are given in Table 2 and it can be seen that 1957 imports are of a similar order to those of former years, in spite of the large quantities imported in 1956 and the carry-over of certain stocks.

TABLE No. 1.

Importations in 1957.

Explosives—(cases of 50 lb. net weight).	
A. N. Gelignite 60	66,124
Semigel	28,118
Geophex	5,809
A.N. Gelantine Dynamite	4,521
Quarry Monobel	4,311
Monograin	2,950
A3 Monobel	650
Plastergel	530
Ajax	350
Quarigel	249
Grenade Powder	128
Blasting Powder	54
Whaling Charges	20
D.P. 12B	Nil
Roxite	Nil
Detonators (Number)—	
Plain No. 6	2,350,000
Delay No. 6	340,199
Electric No. 6	200,000
Submarine No. 8	10,900
Fuse (Yards)—	
Safety	6,609,600
Detonating	165,000

Use of Explosives.—In Table 3 are grouped the principal industries and works which are consumers of explosives; they are placed in order of importance, with oil prospecting included in the mining group. Gold mining again heads the list by using over 50 per cent. of the total consumption. Quarrying appears to show a 50 per cent. increase over 1956 figures, and there has no doubt been considerably greater activity in this field. The figures, however, are known to include production of limestone for cement-making and also certain related activities such as earth-movement and production of road material. Greater production of both manganese and asbestos during the year is reflected in the larger amounts of exposives used, and the production of copper concentrates at Ravensthorpe accounts for the use of 390 cases. In previous reports, no consumption has appeared for mining of copper. The apparent drop in figures for iron ore calls for some comment, since the 1956 consumption was 897 cases. Both Koolyanobbing and Yampi actually increased production during 1957, and the use of explosives continued as usual. The lower consumption indicated by the table is due to a large carry-over from stocks built up in the previous year.

TABLE No. 3.

Principal Consumers in 1957.—(Cases of 50 lb. net weight.)

Mining.		Works, other than Mining.	
Gold	76,557	Public Works	1,574
Quarrying	12,860	Miscellaneous	1,204
Coal	7,672	Brickworks	465
Asbestos	5,850	Main Roads	296
Oil Exploration	5,692	Timber	203
Manganese	1,160	Whaling	105
Lead	517	Railways	4
Copper	390		
Iron	50		
Tin	20		

Analyses and Tests.—The usual heat-testing was carried out on all imported nitro-compounds and, although results were generally good, the rare occurrence of a poor test shows that the work is not done in vain. Fuse tests were generally satisfactory, but it is always necessary to make careful inspection of any fuse damaged in transit, and no risks are taken with fuse which has been kinked or deformed in any way.

TABLE No. 2.

IMPORTATIONS OVER THE PERIOD 1953-1957

	1953.	1954.	1955.	1956.	1957.
Explosives (cases)	114,916	120,201	109,340	125,694	113,814
Detonators (number)	4,447,870	3,745,850	2,454,400	3,739,220	2,901,099
Fuse (yards)	6,438,400	7,363,200	6,512,600	7,192,200	6,774,600

TABLE No. 4.

Analyses and Tests.

	Tests.
Explosives—	
Heat-testing, sensitivity, analysis	2,300
Fuse—	
Compliance with Mines Regulation Act and requirements	807
Fireworks—	
Percussion, firing tests, analyses	500
General—	
Police exhibits, packing materials, advice given on transport and storage of materials.	

Licensing.—Table 5 shows the various licenses issued during the year. Some variations are due to completion of works and to opening of special storage depots, particularly those in the North, for oil-prospecting. Fireworks licenses again show a substantial increase. Sixteen new licenses were issued for privately owned magazines.

TABLE No. 5.

Licenses Issued under the Explosives Act.

Magazines on Government Reserves	64
Magazines on Government Lands not reserves	55
Magazines privately owned, on nongovernmental land	114
Stores Mode A	75
Stores Mode B	1
Fireworks—Storage and sale	611
Fireworks—Manufacture	2
Explosives—Importation	2

Inspections.—All shipments were inspected during unloading at the Reserve Jetty and attention given to any variation from approved packing and wrapping methods. In two shipments, some of the explosives were affected by water and extensive overhaul of wet cases was necessary. It was found that although cases were badly affected by water, the explosive itself suffered little damage, with the high quality lining material now in use. After drying out the wooden cases, most of the contents were repacked in sound condition and only a few sticks were condemned. In one shipment, about 450 cases of Quarry Monobel explosive appeared to have suffered, mainly through poor sealing of a few sticks in each case. The contents had escaped from the wrapping, with the result that many sticks were filmed in explosive. These were set aside for re-conditioning because, as explained in earlier reports, external composition can be dangerous. Whaling powder packed in cloth bags of 450 g. capacity showed a large proportion of bags affected by spoilage, ranging from slight agglomeration to complete saturation. The fabric bags were readily permeable to water and there was no other lining of hessian, or even paper, in the cases. In such instances, all relevant details are brought under the manufacturer's notice. Inspections are made at the request of the Fremantle Harbour Trust when Naval vessels handle ammunition over the wharf of the inner Harbour. Reports on these operations are sent to the Harbour Trust and satisfactory conditions are maintained. Inspection of licensed magazines was pursued as far as possible, but owing to pressure of other work, it was on a much reduced scale, and no country trips were made during the year. It is becoming increasingly difficult for one officer to cover all necessary inspections and also attend to the various matters of correspondence and other work which is expected of the Branch. Routine inspection has to be fitted in when circumstances permit, and it is hoped to resume this work early in the next year.

Transport.—An enquiry was made into the feasibility of shipping explosives for the oilfields through North-West ports, but it was found that tidal movements and the lack of handling gear on jetties would make unloading extremely difficult, if not impossible. These explosives were therefore transported to the North by road during the summer season.

Fireworks.—After discussion with H.M. Customs Investigation Branch, it was decided that the present system of authorising the release of fireworks after testing was satisfactory, and that it should continue. Samples are examined from each shipment and, in this way, it is possible to detect any irregularity in composition or behaviour of shop-goods fireworks. Certain types, known as "Feather" and "Starlight," were rejected as unsafe during the year, because of the proved possibility of molten globules igniting light paper and cloth. Throw-downs were watched closely after irregularities found in the previous year, but importers were wary of these lines and smaller quantities were imported. There was no overcharging in those examined. The used of benzoate-perchlorate mixtures continues to be regarded with caution, and none have so far been imported to this State. The question will be reviewed periodically, since it is not desired to impede any possible progress in pyrotechnics, but any decision will be reached only after consideration of the opinions of Inspectors in other States.

Accidents with Explosives.—Only a small number of accidents were reported during the year, and one of them was shown to have no connection with commercial explosives.

1. A quarry foreman was injured by the explosion of a package of 100 detonators. The man was known to be careful and experienced and no cause could be found for the mishap, which occurred while he was opening the tin and removing excess of sawdust. Subsequently, information was received which substantiated the theory that, very rarely, a detonator shell may crack during or after manufacture. If some of the composition should enter such a crack, it could cause dangerous sensitivity to handling. Considering that about three million detonators are handled each year in this State alone, the incidence of such sensitivity is indeed very rare.

2. A railway ganger was killed by a flying fragment from the explosion of a Railway fog signal. These articles, secured to railway lines by lead strips, are intended to give audible warning when atmospheric conditions restrict the effectiveness of lights and visual signals. Firing occurs when the device is crushed under wheel pressure. Some investigation was made for the Railway Department, to determine the radius of danger from flying fragments. Fog signals have hitherto been regarded as a relatively harmless device, but it is clear that they can have a missile hazard and that any person within 100 yards of the detonation should take cover.

3. Two men were injured, one seriously, by an explosion which demolished a hut when caught in a bushfire at Coogee. Commercial explosives were at first suspected, but there was little of the shattering expected from such explosives. Several burnt and exploded cans of paint and solvent were found, and it was considered that these materials had caused the explosion.

4. A twelve-year-old boy lost his right hand when a display firework exploded in the back-yard of his home. The firework had been picked up by the boy's brother at Claremont Show Ground after a display of fireworks given by a pyrotechnist and licensed manufacturer. Legal action will be taken to establish responsibility for the accident and to claim damages for the injury.

5. A man was injured after throwing gelignite into a fire. Such an action calls for no further comment or enquiry.

Suspected Explosive Material.—One of the miscellaneous exhibits examined was a bottle of green liquid confiscated by the Police from a Hungarian, who sought to bring to official notice the potent explosive properties of his product. It was at first thought that a crude attempt had been made at nitrating glycerol, perhaps in a copper vessel. The material was therefore treated with some respect until found, by analysis, to be mainly alcohol, kerosine and an organic dye. Later inquiry disclosed that the "inventor" was under observation for mental derangement.

Destruction of Explosives.—As in previous years, explosives were destroyed from time to time on the beach at Woodman's Point Reserve. The materials consisted mainly of samples after examination, but were augmented by various small quantities from private owners and from the Police Department.

Testing of a New Circuit Tester for Blasting.—A new instrument designed and manufactured in Western Australia was examined and found to be satisfactory. After discussions with the manufacturer and very minor alterations to the instrument, it was authorised for use as required under the Mines Regulation Act.

Under-Water Blasting.—Deepening of the Harbour channel alongside the North Mole caused some concern as to the possible effect of explosive charges on plates of ships in the channel or on any divers or persons who might be in the water at the time. It was difficult to obtain precise information, but from investigation of several recorded instances of injury, it was recommended that no diver should be within 1,500 yards of a 50-lb. exploding charge. The Naval Authorities were able to substantiate this figure and offered some further assistance to the engineer in charge of the work.

Woodman's Point Explosive Reserve.—All fences and magazine buildings have been inspected at four-monthly intervals by a local firm and treated, when necessary, to control termite activity. This arrangement has been very successful and a three-year contract was renewed for the work. During the year, a four-inch water-pipe was installed from the main in Cockburn Road to the landing jetty, a distance of 2,150 feet. The cost of this project was shared equally by this Department and the Fremantle Harbour Trust. An adequate high-pressure water service is now available, both in the area and on the jetty, and it is proposed in future to remove some of the old water system, which is beyond repair, and to make connections to the new service. Toward the end of the year, a new watchman's time-clock was purchased, and the system of patrolling the area is now made as efficient as possible with the available staff. This is most necessary, since recent experience has shown that juvenile intruders may occasionally get into the Reserve. Population and settlement of the surrounding district are increasing, and the Reserve is no longer as isolated as it was in former years. Magazine-Keeper Jensen retired during this year after a continous service of thirty years at the Reserve. The appointment of a successor was a matter requiring considerable thought, since it is not easy to find the combination of training, experience and personality which is derirable in a Magazine Keeper. Appointment was finally made of Mr. S. J. Wightman, a former Police officer, who has since carried out all the duties in a very satisfactory manner.

Explosives Agents in W.A.—Nobel (A/asia) Pty. Ltd. are the manufacturers of all the nitro-compound explosives now used in this State, and the firm of Elder, Smith and Co., Limited, have acted as Nobel's agents for over fifty years. A change was made during the latter part of 1957, when Imperial Chemical Industries of Australia and New Zealand Ltd. established their own independent office in Perth and took over the Nobel agency. All licenses and leases formerly held by Elder, Smith and Co., Limited, will be transferred or assigned to the new agents and it is reported with pleasure that relationships between this Branch and the agents, as well as their principals, have been most satisfactory at all times.

Explosives Conference.—The fifth Conference of Australian and New Zealand Exlosives Departments was held in Perth in April. Meetings were held in the Board Room of the State Government Insurance Building, and the Conference was officially opened by the Hon. Minister for Mines, supported by the Under Secretary for Mines. Except for Queensland, all States and New Zealand were represented, in some instances by two delegates. A heavy agenda occupied six working days and discussions were broken only by visits to places of interest, such as the Explosives Reserve, Government Chemical Laboratories and Kwinana Oil Refinery. Although some of the discussions were in extension of those at former meetings, a wide field of new topics was reviewed. A few of the subjects of general interest are listed as follows:—

- Manufacture of ammonium nitrate—fuel oil explosives;
- Desirability of controlling the use of explosives;
- Construction and fittings of explosives magazines;
- Detonators: Experience with new P.E.T.N. composition and hazards of radio-frequency in blasting circuits;
- Safety Distance Tables;
- Railway Fog Signals, hazards of and safe distances;
- Security measures in Explosives Reserves;
- Benzoate-perchlorate mixtures in fireworks;
- Departmental supervision in an explosives factory.

The Conference was again considered a success by all delegates, who were able to share experiences of and exchange views on many subjects of common interest. Since the Conference was first held in 1948, it has been found possible to attain greater unity of outlook in all States toward subjects and problems which confront the various Departments. There has also developed a very friendly exchange of information by correspondence at all times, and Inspectors are thus kept informed of the trend of events in all States.

Flammable Liquids.—Negotiations with the Public Health Department and other bodies resulted in the Explosives Branch being nominated in a consultative capacity in the administration of any by-laws made by that Department. Unfortunately, no such by-laws have been made owing to conflict with other proposed legislation. The position at the end of 1957 is that no progress has been made toward any form of control such as operates in New South Wales, Tasmania or South Australia. The only solution at present seems to be a return to the original plan for a proposed new Act to control explosives, flammable liquids and dangerous goods.

Conference on Transport of Dangerous Goods.—During the year, the Commonwealth Explosives Transport Committee sought West Australian opinions and views on a United Nations Report on Transport of Dangerous Goods. Mr. Allsop explained this matter to all interested parties in Perth and arranged a conference at which all were represented. It was then possible to record all views for the guidance and benefit of further Eastern States meetings on this matter. As far as this State is concerned, it was generally agreed that some international uniformity of labelling and marking packages of dangerous goods would be an advantage to all. The labels suggested in the United Nations Report are generally acceptable.

Staff.—Mr. F. F. Allsop assumed the duties of Chief Inspector of Explosives after the retirement of Mr. T. N. Kirton in 1948 and has given 10 years of continuous service. It became necessary for him to clear a period of accumulated long service leave, and, by arrangement with the Director of the Government Chemical Laboratories, the writer was seconded from that Branch to replace Mr. Allsop during his absence on six months' leave, which commenced on 2nd December, 1957. Mr. L. Calneggia continued to give loyal support at all times with clerical work and issue of licenses.

Acknowledgments.—Sections of this report dealing with the Conference and with pyrotechnics were based entirely on information provided by Mr. Allsop while he was officially on leave. Mr. Allsop also provided notes on various minor features of the year's work and has been most helpful at various times. Due acknowledgment is made for continued assistance and co-operation which has always been freely given by other Branches and particularly by the Director of the Government Chemical Laboratories, who has again arranged for special analytical work to be done.

G. A. GREAVES,
Acting 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, 1957.

The State Public Health Department, under arrangements with this Department, continued the periodical examination of mine workers, the work being carried on throughout the year at the Kalgoorlie District Hospital and a mobile x-ray unit visited the North Coolgardie, Mount Margaret, East Murchison, Murchison and Pilbara Goldfields and the Northampton Mineral Field.

Mine Workers' Relief Act:

The examinations under the Mine Workers' Relief Act during the year totalled 4,406 as compared with 5,067 for the previous year, a decrease of 661 which, no doubt, is due to the omission of the important Yilgarn and Dundas Goldfields in the itinerary of the mobile x-ray unit. The results of the examinations for 1957, 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 3,925 or 89.08 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 4,600 or 90.78 per cent.

Early Silicosis: These numbered 454 of which 30 were new cases and 424 had been previously reported, the figures for 1956 being 25 and 401 respectively. Early silicotics represent 10.30 per cent. of the men examined, the percentage for the previous year being 8.41 per cent.

Advanced Silicosis: Of the 18 cases reported eight were men who advanced from early silicosis during the year, the other 10 having been reported previously. Advanced Silicotics represent 0.41 per cent. of the men examined, the percentage for the previous year being 0.65 per cent.

Silicosis Plus Tuberculosis:—Five cases were reported compared with four in 1956.

Tuberculosis only:—Four cases were reported which is the same number as in 1956.

MINES REGULATION ACT

Examinations under the Mines Regulation Act totalled 1,160. These were in addition to the 4,406 examinations under the Mine Worker's Relief Act. There was a decrease of 123 examinations under this Act in 1957 as compared with those in 1956. Of the total of 1,160 men examined 755 were new applicants and 405 re-examinees for the Initial Certificate.

Particulars of the examinations are as follows:—

New Applicants:	
Normal	732
Pneumoconiosis	2
Silicosis Early	Nil
Silicosis Advanced	Nil
Query Tuberculosis	12
Tuberculosis	Nil
Tuberculosis with Silicosis	Nil
Other conditions	9
Total	755

Of the above applicants for admission into the industry, 732 received the Initial Certificate (Form 2), eight received the Temporary Rejection Certificate (Form 3), 11 received the Rejection Certificate (Form 4), one received the Re-admission Certificate (Form 5) and in three cases no certificate was issued. Thus of the 755 applicants, 732 or 96.95 per cent, were eligible for employment anywhere on the mine.

Re-Examinations:	
Normal	296
Pneumoconiosis	77
Silicosis Early	11
Silicosis Advanced	Nil
Query Tuberculosis	9
Tuberculosis	1
Pneumoconiosis plus Query Tuberculosis	2
Silicosis early plus Query Tuberculosis	2
Other conditions	7
Total:	405

These men had previously been examined and some were engaged in the industry prior to this examination. 296 received the Initial Certificate (Form 2), five received the Temporary Rejection Certificate (Form 3), six received the Rejection Certificate (Form 4), 63 received the Re-admission Certificate (Form 5), 26 received the Special Certificate (Form 9) and in nine cases no certificate was issued. Thus of the 405 men examined, 359 men were eligible for employment anywhere on a mine, 26 were eligible for surface work only and 20 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)	1,028
Temporary Rejection Certificates (Form 3)	13
Rejection Certificates (Form 4)	17
Re-admission Certificates (Form 5)	64
Special Certificates (Form 9)	26
No Certificate	12
Total	1,160

The percentage of normal health (Initial Certificates) to the number examined was 88.62 per cent. compared with 91.89 per cent. in 1956.

THE MINERS' PHTHISIS ACT.

The amount of compensation paid during the year totalled £15,947 11s. 10d., compared with £17,644 0s. 10d. for the previous year, a decrease of £1,696 9s. which can be attributed to the death of some of the beneficiaries.

The number of beneficiaries under the Act on the 31st December, 1957, was 147, being 12 ex-miners and 135 widows.

(Sgd.) W. Y. R. GANNON.
Chairman Miner's Phthisis Board,
and Superintendent Mine Workers' Relief Act.

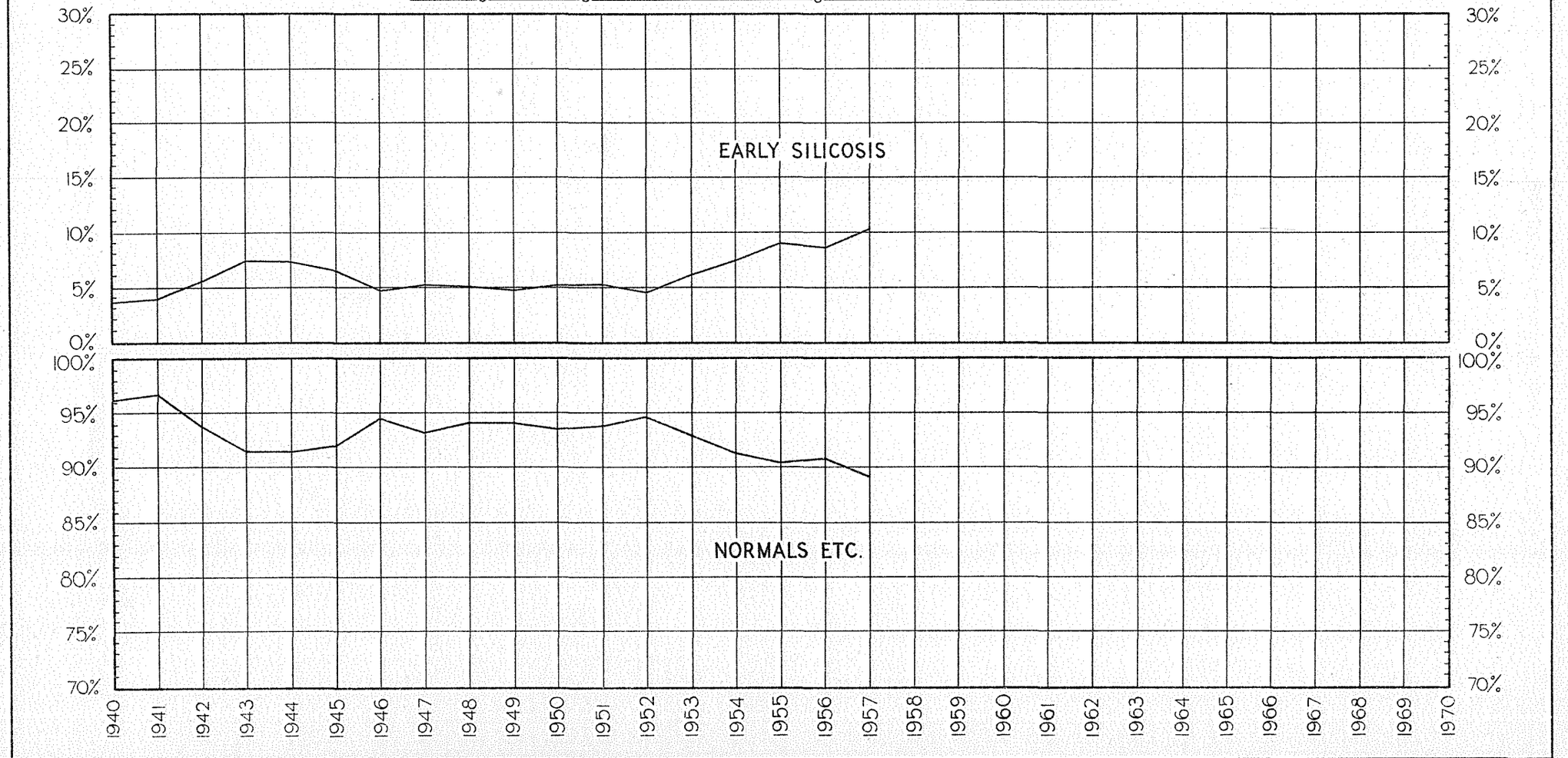
TABLE SHOWING RESULTS OF PERIODICAL EXAMINATION OF MINE WORKERS FROM INCEPTION OF EXAMINATIONS (1925).

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	....	2	....	....	....	2	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
1956	4,600	....	4,600	90·78	25	401	....	426	8·41	....	8	25	....	33	·65	1	3	....	....	....	4	·08	4	....	4	·08	5,067
1957	3,925	....	3,925	89·08	30	424	....	454	10·30	....	8	10	....	18	·41	1	4	....	....	....	5	·12	4	....	4	·09	4,406

PERIODICAL EXAMINATION OF MINE WORKERS

GRAPH No 1

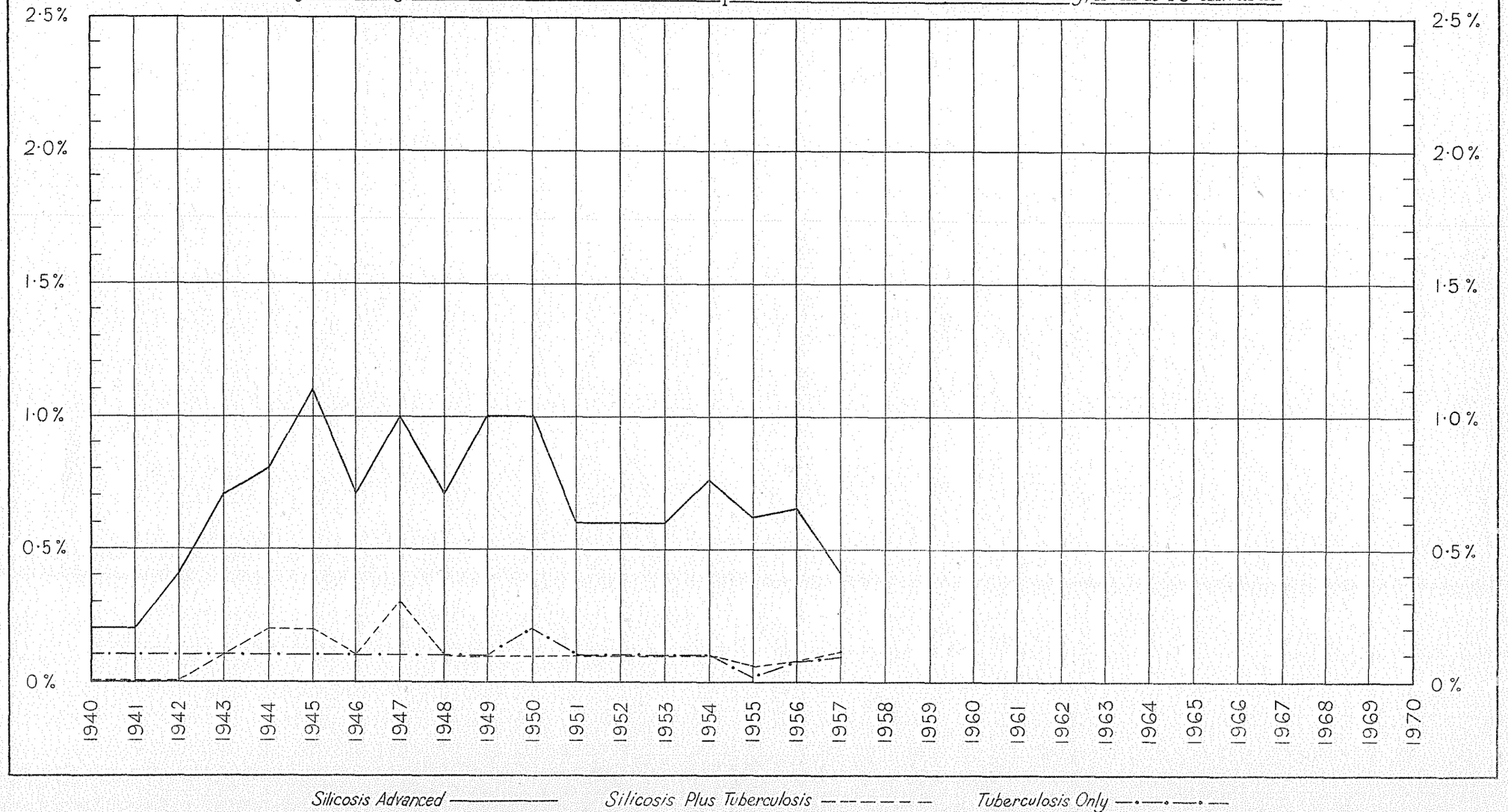
Showing Percentages of Normals and Early Silicotics from 1940 onwards



PERIODICAL EXAMINATION OF MINE WORKERS

GRAPH No 2

Showing Percentages of Silicosis Advanced, Silicosis plus Tuberculosis and Tuberculosis only, from 1940 onwards



DIVISION X

Report of the Chief Coal Mining Engineer for the Year 1957

Under Secretary for Mines:

I have the honour to submit the Annual Report for year ended December, 1957, on the operations of the Collie Coalfield.

The aggregate output for the year was 838,660 tons as compared with 830,005 tons for the previous year. This represents an increase of 8,655 tons.

The output for the year was comprised of 689,881 tons or 82.26 per cent. of deep mined coal and 148,779 or 17.74 per cent. of open cut coal.

The respective outputs of the previous year were 621,464 tons or 74.87 per cent. of deep mined coal and 208,541 tons or 25.13 per cent. of open cut coal.

The deep mined output is again a record for the Coalfield and with a little re-organisation the deep mines could produce all the State's requirements.

The deep mines, with one exception, are now almost completely mechanised and during the year no less than 90 per cent. of the deep mined output was mechanically produced. Collie thus retains its position as the most highly mechanised coalfield in Australia.

The total value of coal sold was £2,552,656 at an average value of 60s. 10d. per ton as compared with 67s. 5d. for the previous year. The reduction of 6s. 7d. per ton is due to a higher efficiency in the deep mines. During the latter part of the year costs in the deep mines were rapidly reducing with a consequent substantial reduction in overall costs.

Details of the outputs of the individual mines together with estimated value are shown on Table "A."

A very significant point to note in these statistics is that out of a total of 689,881 tons from the deep mines no less than 343,584 tons or 49.8 per cent.—almost half—was produced from only two deep mines, namely, the Neath and the Co-operative. These two mines are still developing and will further increase their output during 1958. The remaining output from the deep mines of 346,297 tons was produced from ten mines, each contributing on the average only 5 per cent. of the total deep mined output.

From an economic point of view the policy of concentration is obvious.

Consumption of Coal:

The largest consumption was by the State Electricity Commission which consumed 408,464 tons in the Metropolitan area (this includes 49,007 tons consumed at Bunbury Power Station), and 62,523 tons at Collie Power Station, a total of 470,987 tons or 56.15 per cent. of the total consumption. This is an increase of 37,060 tons or 4.02 per cent. on the previous year.

It is anticipated that this increase will continue especially when the Bunbury Power Station reaches its full capacity.

The W.A. Government Railways consumed 269,712 tons or 32.16 per cent. of the total consumption. This is a reduction of no less than 28,564 tons on the previous year and is the lowest rate of consumption by the Railways since 1947. As a matter of interest the consumtion by the Railways for the last five years is shown in Table "D."

The amount of coal consumed by Private Consumers was 24,790 tons of large coal and 36,503 tons of small coal, a total of 61,293 tons or 7.3 per cent of the total. This compared with 61,585 tons in the previous year.

The Kalgoorlie Electricity and Power Corporation consumed 36,661 tons or 4.37 per cent. of the total as compared with 36,197 tons the previous year.

A summary of consumption during the past five years is shown on Table "D."

DEVELOPMENT.

Co-operative.

This mine produced 171,253 tons as compared with 127,779 tons the previous year, an increase of 43,474 tons or 34.00 per cent.

Output has been increased by approximately 150 per cent. during the last three to four years and at present the production of this mine is approximately 20 per cent. of the total output of all mines at Collie. Developments must therefore be kept well ahead of production faces.

During the year good progress was made with the developments. The main dips advanced satisfactorily and lateral headings were commenced on both sides of the headings. It is essential that the main dips should rapidly advance so as to prove or otherwise the existence of geological disturbances at a distance of approximately 20 chains south of the fault just passed through. In the absence of surface boring it is the only way of proving the area in advance.

It is the intention of the Company to purchase a Continuous Miner for installation in this mine which should considerably increase the output.

Neath.

A further considerable increase in output took place at this mine during the year.

The output increased from 108,529 tons during 1956 to 172,328 tons during 1957. This is an increase of 63,779 tons or 59.00 per cent.

In spite of this increase developments were not relaxed, in fact the contrary is the case. Good progress was made with the main dip headings and during 1958 these headings should reach the extremity of the lease. When this occurs it will then be possible for production to proceed on the full retreating system which will improve the overall efficiency and economy of the mine.

During the year developments were commenced on the West side of the mine and should these prove successful then the life of the mine will be considerably increased. It is therefore of paramount importance that these developments be accelerated as the life on the East side of the mine is comparatively short.

If the developments on the West side are not successful then a new mine will be necessary in the near future to replace the existing one.

Apart from the area left to be worked on the East side there is always the potential danger of a creep closing the area. In view of these facts the Company would be well advised to plan well ahead.

The management has agreed, when the developments on the East side are sufficiently advanced, to transfer the Continuous Miner to the West side.

Stockton.

This mine, although the only hand-getting mine at Collie, was the third largest producer of the deep mines. It produced 72,612 tons or 8.67 per cent. of the total output, or 10.5 per cent. of the total deep mined output. The production for the previous year was 71,398 tons.

Developments have proceeded normally but not as rapidly as the Mines Department would desire. The splitting of the pillars in 4 Left Section has proceeded satisfactorily and there is no reason why the policy should not be extended so as to lengthen the life of the mine.

The future of the mine remains obscure and is a matter of much anxiety to the Mines Department. With the existing haulage arrangements the economy of the mine must inevitably suffer. Many conferences between the Mines Department and the Company have taken place during the year to discuss the future of the Mine and due to lack of surface bores no definite policy can be determined.

There is a distinct possibility that the Ewington and Stockton deep mines can be connected underground, in which case the production from the Stockton could be transported to the surface through the Ewington tunnel, but both mines could still be operated as separate entities.

Another considerable advantage would be that if the above policy could be implemented then the existing workings in the Stockton Stone Drive Section would become retreating workings and a far higher percentage of extraction resorted to. Such a policy would considerably increase the economics of the mine.

It is hoped that sufficient information of the geological conditions of the area between the two mines will become available next year so that the Company can decide on what policy to adopt.

Ewington.

This mine produced 38,349 tons during the year as compared with 27,979 tons the previous year, or an increase of 10,370 tons. The mine has increased its output by no less than 350 per cent. during the last two years, as well as vigorously pursuing its programme of development.

The main dips have progressed very favourably and proved a considerable amount of workable coal.

Arrangements are in hand to prove the upper seam taking advantage of the downthrow fault on the East side of the mine. The fault referred to could easily prove to be the fault on the South-West of the Stockton Mine, in which case both mines could be connected underground. As previously mentioned, in the report on Stockton, if the above policy could be implemented the output from both mines could be transported to the surface through the Ewington tunnel. It is appreciated that the haulage arrangements at the latter mine would have to be re-organised which is not a difficult matter.

Western No. 1.

This mine produced 61,393 tons or 7.34 per cent. of the total output as compared with 53,921 tons or 6.5 per cent. for the previous year.

One can not but reiterate the comments made in previous reports that developments and production should take place from the bottom seam so as to drain the two upper seams.

The graph published in the report for last year (Ref., page 103 Mines Department Annual Report 1956) is a clear illustration of what is taking place at this mine. It is, I think, abundantly clear that until these leases are drained of water higher outputs and efficient results cannot be obtained.

Western No. 2.

At this mine excellent progress was made with developments during the year. The boundary of the lease on the West side was reached and developments for the Retreating System commenced.

In addition to the above, another similar panel was commenced lower down on the slants as well as commencing three new headings advancing East in the direction of the main dips. In a matter of months these headings should be in line with the main dips when two narrow headings will be commenced to recover the main dips. I have no doubt that the main dips can be recovered. The main belt can then be extended and connected to the existing workings. The slants can then be stopped and developments on both the East and West sides of the mine commenced from the main dips.

In the matter of developments more progress was made at this mine during the year than at any other mine at Collie. In spite of the abovementioned progress the output increased from 40,239 tons during the previous year to 53,677 tons during 1957, an increase of 34 per cent.

This is a phenomenal achievement and all concerned are to be warmly congratulated.

When this mine is producing on the full Retreating System it will be the most economical mine at Collie.

Wyvern.

Production at this mine is obtained by taking canches off the pillars left in the first working. This policy will have to continue as no virgin coal remains to be developed in the mine.

It is difficult to assess the life of the mine on the above basis and it is only a matter of a comparatively short time before production ceases altogether. The mine employs an average of 55 men who will, in all probability, be transferred to the Hebe Mine.

During the year the mine produced 40,801 tons as compared with 47,502 tons during the previous year.

Phoenix.

Production at this mine decreased during the year to 20,766 tons as compared with 28,997 tons during the previous year.

Production ceased at the end of the year due to lack of orders.

Centaur.

Developments at this mine ceased in July, 1954, and that was the beginning of the end for this mine.

When the coal contracts were finalised during September it was decided to close the mine at the end of the year. Production ceased at the end of November.

Most of the machinery was removed to the surface and the Company opened negotiations for the sale of the surplus machinery.

Hebe.

Production at this mine reduced during the year due to a reduction in the number of employees.

Developments progressed satisfactorily and the mine now has a potentiality well in excess of its present output. The management intend to continue driving the dip headings to prove as large a body of coal as possible before commencing full scale production.

As stated in the report for last year the successful development of this mine will demand a high standard of management.

General.

The year under review again proved to be difficult for all concerned but in spite of this the deep mined output was again the highest on record and during the latter portion of the year the rate of increase was accelerating, which, if maintained, is a good omen for next year.

The past year will probably prove the most momentous in the history of the coalfield. During September, after long and protracted negotiations between Government Instrumentalities and the Companies, firm contracts for the supply of coal for a period of three years were finalised.

This is the first occasion in the history of Collie that contracts of such a nature were successfully negotiated. It is an indication of the stability and importance of the industry in the State's economy and there is no doubt of the industry's ability to provide all the State's requirements of coal.

There are many matters of a domestic nature, referred to in past Annual Reports, that urgently call for a study by the Mine Managers. There is no useful purpose served in labouring same in this report, other than to state the enormous importance of efficient roof control in the economy of the industry.

During the year there was a tendency to enlarge the mines on a diminishing number of employees and as a consequence at these mines decentralisation took place with the inevitable loss of efficiency. In mechanised mining concentration is essential for good efficiencies and the managements at Collie would be well advised to study the problem and implement same wherever possible.

Much output was lost during the year due to inadequate ventilation necessitating many working places to be out of production. This subject has been discussed on many occasions and again no useful purpose is served in labouring the matter in this report other than to state that the application of a little science in the matter would avoid any stoppages with a consequent improvement in outputs and economy.

As stated earlier in this report the Collie Coalfield is the most highly mechanised in Australia but although this is so the initiative must be retained by further mechanisation in such matters as the elimination of the use of horses and the use of electronics at transfer points, also automatic pumping.

The Mines Department has for some time studied the possibilities of transporting coal by the medium of water and there are distinct possibilities for the system at Collie.

If the above could be successfully achieved then the efficiency and economy of the industry would be completely changed.

There has been no research work done at the Collie Coalfield and unless some work of this nature is commenced then Collie will soon lose its present position as being the most highly mechanised coalfield in Australia. If it is to retain its position then research work on the above mentioned lines should be undertaken.

Accidents.

The total number of serious accidents was 107 as compared with 148 the previous year.

The above number of accidents is comprised of 9 on the surface and 98 underground. This is a very welcome decrease. Considering that the majority of the accidents can be classified as avoidable there is no reason why one should not expect a further decrease.

The rate of accidents per 100 men employed, per 100,000 tons produced and per 10,000 manshifts is a decrease in each category and it is hoped this rate, which is the lowest on record can be improved upon.

It is pleasing to report that no fatal accident occurred during the year.

(Sgd.) G. MORGAN,
Chief Coal Mining Engineer.

TABLE "A."

TABULATED DATA SHOWING ESTIMATED TONNAGE AND VALUE OF COAL SOLD IN 1957 FROM INDIVIDUAL MINES AS COMPARED WITH 1956.

Mines	1956		1957		Increase on 1956	Decrease on 1956	Estimated Value, 1956	Estimated Value, 1957
	Output	Percentage of Total	Output	Percentage of Total				
Deep Mines—								
Co-operative	127,779	15·39	171,245	20·40	43,466	....	424,848	511,796
Neath	108,529	13·08	172,339	20·65	63,810	....	360,342	512,682
Stockton	71,398	8·60	72,612	8·67	1,214	....	238,605	219,898
Black Diamond	29,859	3·60	....	....	....	29,859	99,513	....
Westralia	23,400	2·82	....	....	....	23,400	78,455	....
Ewington	27,979	3·37	38,349	4·57	10,370	....	93,268	114,027
Wyvern	47,502	5·72	40,801	4·87	....	6,701	162,283	127,703
Phoenix	28,997	3·49	20,766	2·47	....	8,231	98,670	69,327
Centaur	21,966	2·65	22,281	2·65	315	....	74,707	72,949
Hebe	39,895	4·80	36,418	4·34	....	3,477	135,964	114,847
Western No. 1	53,921	6·50	61,393	7·34	7,472	....	183,909	194,343
Western No. 2	40,239	4·85	53,677	6·30	13,438	....	137,803	166,664
Total	621,464	74·87	689,881	82·26	68,417	....	2,088,367	2,104,236
Open Cuts—								
Stockton	15,417	1·86	16,776	2·00	1,359	....	52,386	48,008
Ewington	71,253	8·58	31,351	3·73	....	39,902	240,751	91,854
Muja	76,578	9·23	57,437	6·86	....	19,141	260,842	176,498
Western No. 3	45,293	5·46	43,215	5·15	....	2,078	155,159	132,060
Total	208,541	25·13	148,779	17·74	....	59,762	709,138	448,420
Deep Mines	621,464	74·87	689,881	82·26	68,417	....	2,088,367	2,104,236
Open Cuts	208,541	25·13	148,779	17·74	....	59,762	709,138	448,420
GRAND TOTAL	830,005	100·00	838,660	100·00	8,655	....	2,797,505	2,552,656

TABLE B.

COMPARISON OF OVERALL PRODUCTION LOSSES FOR 1956 AND 1957 SHOWING WHERE LOSSES OCCURRED.

Year	Pit Top Meetings	Railway Wagon Shortages	Strikes	Other Causes	Total
1956	2,397	22,720	14,800	1,000	40,917
1957	3,547	5,030	670	4,530	13,777
Increase on 1956	1,150	....	....	3,530	....
Decrease on 1956	....	17,690	14,130	....	27,140

TABLE C.

TABULATION SHOWING ESTIMATED APPORTIONMENT OF COAL SOLD DURING 1957.

Colliery.	Locos.	Per cent.	Trams Power.	Per cent.	Private Large.	Per cent.	Private Small.	Per cent.	Kalgoorlie Electric and Power Corp.	Per cent.	Collie Power House.	Per cent.	Total.
Co-operative	75,162	8·98	33,439*	3·98	3,394	0·41	....	....	....	....	59,798	7·15	171,793
Ewington Open Cut Ewington	18,706	2·23	44,582†	5·32	3,062	0·36	352	0·04	101	0·01	2,357	0·28	69,160
Neath	30,398	3·66	141,613	16·82	75	0·01	....	....	37	....	205	0·02	172,328
Stockton .... Stockton Open Cut	52,241	6·23	29,821‡	3·56	7,284	0·87	....	....	....	....	42	....	89,388
Wyvern	685	·01	7,174	0·85	3,391	0·40	11,556	1·37	17,993	2·15	....	....	40,799
Phoenix	....	....	10,919	1·31	299	0·04	8,681	1·03	868	0·10	....	....	20,767
Centaur .... Hebe .... Muja Open Cut	34,779	4·15	52,416§	6·28	2,070	0·25	15,914	1·90	10,857	1·30	94	0·01	116,130
Western No. 1....	11,468	1·37	38,143	4·56	5,012	0·60	....	....	6,756	0·81	17	....	61,396
Western No. 2.... Western No. 3 Open Cut	46,273	5·53	50,357	6·03	203	0·02	....	....	49	....	10	....	96,892
Total	269,712	32·16	408,464	48·71	24,790	2·96	36,503	4·34	36,661	4·37	62,523	7·46	838,653

* Includes 507 tons for S.E.C. Gas. † Includes 16,695 tons for S.E.C. Gas. ‡ Includes 71 tons for S.E.C. Gas. § Includes 161 tons for S.E.C. Gas. ‖ Includes 17,434 tons for S.E.C. Gas. *Note.*—Co-operative includes 540 tons from Ewington Mine and Open Cut.

TABLE D.

TABULATION SHOWING ESTIMATED APPORTIONMENT OF COLLIE COAL SOLD DURING THE FIVE YEARS 1953–1957.

Year.	Railways.	Per cent.	S.E.C.	Per cent.	Collie Power House.	Per cent.	Cement Works.	Per cent.	Kalgoorlie Electric and Power Corpn.	Per cent.	Private Consumers.	Per cent.	Total.
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	375,148	36·87	349,634	34·37	51,603	5·07	81,617	8·02	42,374	4·17	117,080	11·50	1,017,456
1955	318,986	35·30	353,802	39·15	51,777	5·73	65,826	7·28	37,977	4·20	75,423	8·34	903,791
1956	298,276	35·94	378,185	45·57	55,742	6·72	....	....	36,197	4·36	61,585	7·42	829,985
1957	269,712	32·16	* 408,464	48·70	62,523	7·46	....	....	36,661	4·37	61,293	7·31	838,653
Increase or Decrease since 1953	— 100,670	....	+ 138,720	....	+17,834	....	—66,846	....	+11,367	....	—47,200	....	—46,795
Per cent. Increase or Decrease since 1953	—27·18	....	+51·41	....	+39·91	....	—100·00	....	+44·94	....	—43·51	....	—5·28

* Includes 17,434 tons for S.E.C. Gas.

TABLE E.

COLLIE COAL PRODUCED 1948–1957 (AS OFFICIALLY REPORTED TO THE MINES DEPARTMENT BY THE PRODUCERS).

	1948.	1949.	1950.	1951.	1952.	1953.	1954.	1955.	1956.	1957.
Open Cuts	145,948	206,650	258,310	368,330	411,344	393,147	410,616	304,130	208,541	148,779
Deep Mines	586,990	543,944	556,042	480,145	419,117	493,035	607,727	599,662	621,464	689,881
Aggregate All Mines	732,938	750,594	814,352	848,475	830,461	886,182	1,018,343	903,792	830,005	838,660
Percentage Open Cuts to Aggregate	19·91	27·53	31·72	43·41	49·53	44·36	40·32	33·65	25·13	17·74
Percentage Deep Mines to Aggregate	80·09	72·47	68·28	56·59	50·47	55·64	59·68	63·35	74·87	82·26
Persons Employed	1,064	1,044	1,099	1,125	1,281	1,463	1,560	1,386	1,219	1,136

TABLE F.

SERIOUS ACCIDENTS—COLLIE COALFIELD, 1957.

Month	Major Injuries—Exclusive of Fatal.																							Minor Injuries.												
	Fractures.											Amputations.												Fractures.												
	Head.	Shoulder.	Arm.	Hand.	Spine.	Rib.	Pelvis	Thigh.	Leg.	Ankle.	Foot.	Arm.	Hand.	Finger.	Leg.	Foot.	Toe.	Loss of Eye.	Serious Internal.	Hernia.	Dislocations.	Other Major.	Total Major.	Finger.	Toe.	Head.	Eyes.	Shoulder.	Arm.	Hand.	Back	Rib.	Leg.	Foot.	Other Minor.	Total Minor.
Jan.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	2	....	....	....	....	....	1	2	2	....	2	....	3	10
Feb.	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	1	2	....	1	1	1	6
Mar.	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	2	....	1	....	....	1	....	2	5	....	....	....	3	12
April	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	2	....	1	....	3	7
May	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	1	....	4	....	1	1	5	12
June	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	2	....	1	....	....	....	1	1	3	....	1	....	1	8
July	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	2	....	1	3	1	....	2	....	....	9
Aug.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	1	1	2	3	....	....	1	1	9
Sept.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	2	....	....	2	1	....	6
Oct.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	1	....	....	1	1	5
Nov.	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	2	....	1	1	....	2	6
Dec.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	5	....	....	....	....	7
Total	....	....	....	2	....	....	....	....	1	....	....	....	....	4	....	....	....	....	....	2	1	2	12	....	3	....	2	3	6	18	28	1	11	5	20	97

TABLE G.

ACCIDENT RATE FOR INDIVIDUAL MINES, SHOWING COMPARISON WITH 1956 (NOT INCLUDING CENTRAL WORKSHOPS AND OPEN CUTS).

Serious Accidents.

Name of Mine.	Number of Accidents.				Total Number Accidents.		Number Employed.		Rate per 100 men Employed.		Rate per 100,000 tons Produced.		Rate per 10,000 man-shifts Worked.	
	Surface.		Underground.											
	1956	1957	1956	1957	1956	1957	1956	1957	1956	1957	1956	1957	1956	1957
Co-operative	4	4	23	27	27	31	196	212	13·78	14·60	21·13	18·10	5·03	5·13
Neath	....	1	20	17	20	18	174	216	11·49	8·33	18·43	10·44	4·27	2·88
Stockton	1	2	22	6	23	8	119	113	19·33	7·08	32·21	11·02	7·45	2·63
Westralia*	3	....	6	....	9	....	49	4	18·37	....	30·14	....	6·47	....
Black Diamond†	1	....	9	1	10	1	49	5	20·41	20·00	33·49	....	7·59	10·41
Ewington	1	....	1	4	2	4	42	58	4·76	6·88	7·15	10·43	1·67	2·35
Wyvern	1	....	10	10	11	10	100	83	11·00	12·05	23·16	24·51	4·36	5·12
Phoenix	....	....	7	3	7	3	43	36	16·28	8·33	24·14	14·45	6·45	3·65
Centaur	1	....	3	5	4	5	62	46	6·45	10·87	18·21	22·44	2·48	4·71
Hebe	1	....	3	2	4	2	55	58	7·27	3·44	10·03	5·49	2·77	1·46
Western No. 1	1	2	16	10	17	12	126	126	13·49	9·52	31·53	19·54	5·44	3·86
Western No. 2	1	....	13	13	14	13	61	71	22·95	18·40	34·79	24·22	8·99	7·37
Total	15	9	133	98	148	107	1,076	1,028	13·66	10·31	23·83	15·51	5·19	3.93

* Not in operation during 1957. † Closed early in 1957.

Note.—Above does not include one accident at Ewington Open Cut and one at Muja Open Cut.

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	1·61
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	13,096	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	1·24
1956	1,219	25,279	1	31	0·82	1·23
1957	1,136	26,415	....	31	....	1·17

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 the Annual Report of the Board of Examiners for the year 1957.

April Examinations: There was only one inquiry for Third Class Certificate of Competency from a Mr. Hughes. On investigation by Mr. Sweeney it was found that Mr Hughes did not have the necessary qualifications to permit him to take the examination.

October Examinations: Once again there was only one inquiry for Third Class Certificate of Competency. This was from a Mr. Smith, but a report regarding his eyesight proved him to be unfit in this capacity.

As there were no applications for First or Second Class Certificates of Competency there were no examinations held during 1957.

(Sgd.) G. MORGAN, Chairman,
Chief Coal Mining Engineer.

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

(Sgd.) C. K. SWEENEY, Member,
Senior Inspector of Mines.

(7)—18619

DIVISION XI

Report of the Chief Draftsman for the Year 1957

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 of the Surveys and Mapping Branch for the year ended 31st December, 1957.

STAFF.

The staff of the Branch numbering 21 is divided into three main sections, namely, Surveys and Survey Examination, Drafting and Mapping.

Summarised reports of these individual sections follow.

SURVEYS AND SURVEY EXAMINATION.

Surveys.

Three Surveyors were attached to the Department on a contract basis and work was completed as follows:—

L. M. Norman — 11 Field Books — 83 surveys.
F. G. Medcalf — 3 Field Books — 47 surveys.
E. Brook — 4 Field Books — 17 surveys.

Instructions for survey with relevant survey information were prepared and issued as required.

In addition to surveys of Mining Tenements the following projects were completed:—

(1) Location and fixing of "Woodstock" and "Dead Bullock Well" areas by traversing and triangulation, by L. M. Norman.

(2) Location and fixing of "Lynas Find", Pilbara Goldfield, by L. M. Norman.

(3) Fixing of old surveys at "Braeside" and "Ragged Hills", Pilbara Goldfield, by traversing to the Rabbit Proof Fence, by L. M. Norman.

(4) Preliminary triangulation near Skull Springs, Pilbara Goldfield, by L. M. Norman.

(5) Location of High Water Mark in the vicinity of Dredging Claims Nos. 11H and 19H, Minninup, by E. Brook.

The following localities were visited during the year by our Surveyors and surveys completed:—

Outside Proclaimed Goldfield:—
Hines Hill.
Kunjin.
Wonnerup.
Hassel Beach.
Metropolitan Area.
Bunbury.
Wanneroo.

Pilbara Goldfield:—
Cooglegong.
Woodstock.
Braeside.
Marble Bar.
Moolyella.
Skull Springs.

Murchison Goldfield:—
Meekatharra.
Big Bell.
Cue.
Mt. Magnet.

East Murchison Goldfield:—
Wiluna.
Agnew.
Lawlers.
Leonora.

East Coolgardie Goldfield:—
Kalgoorlie.
Boulder.
Mt. Monger.

Dundas Goldfield:—
Norseman.

Northampton Mineral Field:—
Northampton.

Field work under supervision of a Licensed Surveyor was arranged for the following Cadets:—

	Days.
P. C. Alver	10
D. W. Stewart	6
J. N. Clift	15
R. E. Black	8
A. J. Smith	13
Total	52

Geodetic.

13 Sheets on the Transverse Mercator Projection were laid down.

General.

Duplicate and Original Plans were prepared for 74 Lease Instruments.

Inspections of surveys and pegging, encroachment and level checks were carried out during the year by the Chief Draftsman and/or the Senior Examiner.

DRAFTING.

The main work of this section was the maintenance of all Mines Department Public Plans for Head Office and Mining Registrars throughout the State and the registration and plotting of all mining tenements and checks for encroachments and conditions.

The widespread increase in mineral activity has resulted in complications and difficulties in the location of tenements. Many of the claims are located on private property requiring searching of titles for ownership of minerals and holder of titles.

Public enquiries and the preparation of descriptions and plans resulting from this activity are increasing.

Approximately 1,200 applications for every type of mining tenement were dealt with

MAPPING.

This section carried out the main mapping required for all branches of this Department as follows:—

(1) The compilation of field sheets for the Geological Branch from air photo and cadastral survey information.

(2) 69 plans for reproduction prepared for the Government Geologist and the State Geological Sketch Map drawn and presented for publication.

(3) 26 sheets of Original Compilation Plans for Transverse Mercator Projection on the National Mapping Grid drawn.

(4) 30 sheets of Astrafoil originals of Pilbara areas on scale of 20 chain and 80 chains to an inch. Photo interpretation of covered areas.

(5) Geological map of S.W. of W.A. on scale of 20 miles = 1", on astrafoil with overlays for seven colour variations for University of W.A.

(6) Miscellaneous plans and sketches for the Chemical Laboratories, School of Mines, State Mining Engineer, Chief Coal Mining Engineer.

(7) Colour posters for Fisheries Department and other Exhibitions.

(8) Rough drawing and Key Drawings for Annual Report Cover.

Liaison work is carried out with the various Government Departments relating to the releasing of land for alienation, mining on reserves and survey matters.

The Chief Draftsman is a member of the State Survey and Mapping Committee and every attempt is made to co-ordinate the mapping and surveys of this Department with the Lands and Titles Surveys.

(Sgd.) L. A. JONES.
Chief Draftsman.

MINING STATISTICS

to 31st December, 1957

Table of Contents

(8)—18619

TABLE I.

PRODUCTION OF GOLD AND SILVER FROM ALL SOURCES, SHOWING IN FINE OUNCES THE OUTPUT AS REPORTED TO THE MINES DEPARTMENT DURING 1957, 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 Ore. ‡ Denotes mainly derived from Copper Ore. § Concentrates. || Tantalum.

Mining Centre	Number of Lease	Registered Name of Company or Lease	Total for 1957					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	....	....	....	....	....	....	....	1,545·75	1,455·34	....
		Sundry claims	....	....	....	....	....	7·62	7·62	2,484·00	1,871·92	....
Halls Creek		Voided leases	....	....	....	....	....	....	....	423·00	477·76	....
		Sundry claims	....	....	....	....	....	27·73	....	217·05	179·57	12·64
Mary		Voided leases	....	....	....	....	....	82·66	951·52	399·00	210·03	....
		Sundry claims	....	....	....	....	....	....	14·36	46·85	53·66	....
Mt. Dockrell		Voided leases	....	....	....	....	....	9·17	13·66	1,173·70	1,206·09	93·00
		Sundry claims	....	....	....	....	....	18·89	31·31	160·00	89·64	....
Panton		Voided leases	....	....	....	....	....	....	....	42·95	140·47	....
		Sundry claims	....	....	....	....	....	....	6·28	6·15	18·01	....
Ruby Creek	97	Ruby Queen	....	....	....	....	....	....	....	3,039·25	1,718·38	2·14
		Voided leases	....	....	....	....	....	....	16·05	12,902·20	9,619·82	....
		Sundry claims	....	....	....	....	....	12·71	....	281·25	183·30	....
		From Goldfield generally :—										
		Sundry claims	....	....	....	....	....	....	....	....	....	†20·98
		Reported by Banks and Gold Dealers	....	67·85	....	....	....	8,816·42	1,806·56	·75	2·53	....
		Total	....	**67·85**	....	....	....	**8,975·20**	**2,847·36**	**22,721·90**	**17,226·52**	**128·76**

West Kimberley Goldfield.

Napier Range	M.C. 29	Devonian Silver Lead Mine	....	....	....	....	....	....	....	....	....	....	....	....	13,575·29
	From Goldfield generally :—														
	Sundry claims		....	....	....	....	....	....	1·30	24·68	1·00	2·49	....		
	Total		....	....	....	....	....	....	**1·30**	**24·68**	**1·00**	**2·49**	**13,575·29**		

Pilbara Goldfield.

MARBLE BAR DISTRICT.

Bamboo Creek	1120	Bamboo Queen	....	....	....	....	....	....	....	....	....	70·50	23·56	·34	
	1107	Bulletin	....	....	....	....	....	....	....	....	....	845·50	416·91	2·02	
	850	Federation	....	....	....	....	....	....	....	8·22	3,026·00	2,203·86	6·35		
	1118	Kitchener	....	....	....	....	....	....	....	....	100·00	40·03	1·05		
	1095, 1096, 1097	Mt. Prophecy Leases	....	....	210·00	51·11	....	....	....	24·50	2,264·00	959·14	49·63		
	817	Prince Charlie	....	....	310·00	259·39	14·99	....	....	3·68	4,896·00	4,281·04	79·42		
	1072	Princess May	....	....	....	....	....	....	....	....	92·50	24·27	....		
	924	True Blue	....	....	....	....	....	....	....	....	2,378·75	93·76	....		
		Voided leases	....	....	....	....	....	13·54	560·19	46,237·85	53,505·43	2·62			
		Sundry claims	....	....	....	....	....	8·97	307·83	5,174·85	3,022·97	7·21			
Boodalyerrie	....	Voided leases	....	....	....	....	....	....	292·07	120·25	587·86	....			
		Sundry claims	....	....	....	....	....	....	7·16	....	....	....			
Braeside	....	Sundry claims	....	....	....	....	611·05	....	....	....	....	†25,690·69			
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	....	....	321·75	40·56	....	....	....	755·50	103·21	....			
	1111	Four Aces	....	....	17·00	4·74	....	....	....	17·00	4·74	....			
	927, etc.	Halley's Comet	....	....	....	....	....	....	....	6,360·00	6,390·33	680·36			
	1125	Laura Dawn	....	....	....	....	....	....	....	43·00	53·47	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	165,930·29	151,637·42	583·57			
		Sundry claims	....	....	239·75	14·36	....	67·08	251·77	20,867·04	12,764·74	9·43			
North Pole	1122 (1123)(1124)	Normay Leases	....	....	110·00	104·67	....	....	....	1,685·00	1,435·98	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	....			

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 1957					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	M.C. 291	Northern Territory Prospecting and Development Co. Ltd.	....	....	....	....	....	....	2·12	....	§35·14	....
		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	....	....	11·50	6·67	....	....	....	1,082·75	594·97	17·28
		Voided leases	....	....	....	....	....	1·43	....	1,739·50	1,969·65	1·16
		Sundry claims	....	....	8·75	7·23	....	163·14	47·93	1,159·50	1,675·34	·97
Talga Talga	....	Voided leases	....	....	....	....	....	....	93·15	1,799·00	1,760·68	....
		Sundry claims	....	....	....	....	....	76·17	85·18	1,975·90	1,499·86	·70
Tambourah	(1139)	Stella Kathleen	....	....	....	....	....	....	....	27·00	3·93	....
		Voided leases	....	....	....	....	....	....	73·90	1,576·50	1,882·29	....
		Sundry claims	....	....	....	....	....	89·52	294·75	3,742·25	2,689·78	....
Warrawoona	1013	Trump	....	....	121·00	10·71	....	....	....	4,405·05	663·07	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
Wymen's Well	1084	New Copenhagen	....	....	....	....	....	....	....	510·00	144·74	1·35
		Voided leases	....	....	....	....	....	....	42·86	2,977·29	1,258·44	....
		Sundry claims	....	....	11·00	3·14	....	4·47	51·52	2,695·96	1,313·67	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
		From District generally :										
		Sundry Parcels treated at :										
		State Battery, Bamboo Creek	....	....	....	....	....	....	....	40·00	*11,239·58	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	1·33	·67	....	....	†2,164·91	14,494·85	456·67	....	15·41	† 2,175·44
		Total	**1·33**	**·67**	**1,360·75**	**502·58**	**2,790·95**	**15,250·89**	**4,565·07**	**331,113·17**	**325,072·35**	**32,201·66**

NULLAGINE DISTRICT.

Eastern Creek	....	Voided leases	....	....	....	....	....	8·96	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	....
McPhee's Creek	....	Voided leases	....	....	....	....	....	....	....	113·00	137·92	....
		Sundry claims	....	....	....	....	....	....	....	134·00	197·09	....
Middle Creek	229L	Barton	....	....	89·00	106·68	....	1·22	....	7,016·00	3,982·93	35·28
	231L, etc.	Blue Spec Mining Co. N.L.	....	....	....	*10·22	....	....	....	53,391·41	31,998·64	10·99
		Voided leases	....	....	....	....	....	....	1·02	18,459·65	11,718·61	8·37
		Sundry claims	....	18·69	344·25	50·84	....	....	18·69	5,936·85	2,143·96	....
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	....	11·14	11·75	8·92	....	3·85	1,159·85	138·85	331·29	63·45
	(311L)	Conglomerate	....	....	....	....	....	....	....	84·00	6·43	·43
		Voided leases	....	....	....	....	....	....	599·59	9,108·75	13,370·03	36·49
		Sundry claims	....	2·85	117·50	27·98	....	315·53	681·09	6,472·05	10,506·11	15·22
Spinaway Well	314L	Copper Hills Copper Mine	....	....	....	....	‡483·78	....	....	....	....	‡483·78
Twenty Mile Sandy	M.C. 112L	J. C. and G. M. Baker	....	....	....	·93	‡51·20	....	....	....	·93	‡51·20
		Voided leases	....	....	....	....	....	....	16·97	7,243·70	9,007·72	320·50
		Sundry claims	....	....	83·00	12·02	....	33·10	30·50	7,793·85	6,283·29	2·76
	From District generally :—											
	Sundry Parcels treated at :											
	Barton Battery		....	....	....	....	....	....	....	....	45·19	....
	W. M. McKinnon Plant (D.Cs. 10L, 14L, 15L)		....	....	....	....	....	3·89	2·23	....	7·20	....
	Various Works		....	....	....	....	....	....	....	124·50	8,110·35	1·37
	Reported by Banks and Gold Dealers		30·63	....	....	....	....	10,004·47	115·55	....	29·81	5·80
	Total		**30·63**	**32·68**	**645·50**	**217·59**	**534·98**	**10,372·09**	**2,866·46**	**135,763·70**	**128,094·75**	**1,067·30**

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 1957					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	....	Voided leases	....	....	....	....	....	9·90	48·12	267·00	432·84	....
		Sundry claims	....	....	....	....	....	1·11	86·24	163·00	255·42	....
Roebourne	....	Voided leases	....	....	....	....	....	....	....	2,396·86	1,424·04	385·15
		Sundry claims	....	....	....	‡56·95	‡16·15	15·17	3·29	1,934·85	811·86	130·21
Station Peak	....	Voided leases	....	....	....	....	....	177·74	41·37	11,016·00	11,388·18	·08
		Sundry claims	....	....	....	....	....	·69	....	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	....	....	....	....	....	....	....	....	....	‡883·8
		From Goldfield generally :—										
		Sundry Parcels treated at :										
		Various Works	....	....	....	....	....	....	....	....	*102·39	4·90
		Sundry claims and leases	....	....	....	....	12·26	....	11·77	....	....	†503·36
		Reported by Banks and Gold Dealers	....	....	....	....	....	6,098·03	177·50	103·50	228·32	·81
		Total	....	....	....	**56·95**	**28·41**	**6,334·78**	**374·74**	**24,680·96**	**24,277·10**	**1,909·60**
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	....	....	....	....	....	....	....	128·35	203·51	....

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
From Goldfield generally :—												
		Sundry claims (Silver Lead)	....	....	....	....	†758·34	....	....	....	....	†32,206·05
		Reported by Banks and Gold Dealers	·69	....	....	....	....	8,889·78	123·17	....	7·12	....
		Total	**·69**	....	....	....	**758·34**	**9,266·82**	**482·46**	**6,807·10**	**2,913·43**	**40,389·76**

Gascoyne Goldfield.

Bangemall	....	Voided leases	....	....	....	....	....	....	6·22	350·70	313·82	....
		Sundry claims	....	....	....	....	....	88·97	33·55	36·30	203·47	....
From Goldfield generally :—												
		Reported by Banks and Gold Dealers	....	....	....	....	....	604·47	23·20	....	....	....
		Total	....	....	....	....	....	**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	Anglo-Westralian Mining Pty. Ltd.	....	....	1,339·00	160·27	....	....	....	137,211·00	23,031·07	1,407·05
		Prior to transfer to present holders	....	....	....	....	....	....	....	3,914·00	894·44	....
	575P	Labouchere Main Lode	....	....	205·00	9·65	....	....	....	740·00	70·03	....
		Voided leases	....	....	....	....	....	15·57	1,975·37	4,371·38	2,684·27	2·00
		Sundry claims	....	....	180·80	44·57	....	20·12	829·58	2,120·35	773·14	....
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 1957					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	....	....	....	....	....	....	....	3,745·25	591·05	....
	584P	Dazzle Star	....	....	10·00	5·64	....	....	....	303·00	80·98	....
	567P	Miner Bird	....	....	62·50	34·98	....	....	....	1,650·00	776·12	....
	553P	Morning Star	....	....	....	....	....	....	4·43	2,804·25	410·09	....
	587P	Murray Heath	....	....	....	....	....	....	....	41·00	6·17	....
	506P	No. 1 North	....	....	23·50	4·47	....	....	86·47	7,162·70	1,656·81	....
	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	....
	From Goldfield generally :—											
	Sundry Parcels treated at :											
	Australian Machinery and Investment Co.		....	....	....	....	....	....	....	....	*1,686·20	....
	State Battery, Peak Hill		....	....	....	....	....	....	3·05	15·00	*7,168·89	....
	Various Works		....	....	....	....	....	....	....	30·00	*5,661·37	23·12
	Reported by Banks and Gold Dealers		....	....	....	....	....	2,847·65	444·36	....	12·51	....
	Total		....	....	**1,820·80**	**259·53**	....	**3,376·86**	**5,300·33**	**763,384·23**	**320,440·90**	**3,768·47**

East Murchison Goldfield.

LAWLERS DISTRICT.

Kathleen Valley	....	Voided leases	....	....	....	....	....	....	144·85	80,503·65	49,020·54	....
		Sundry claims	....	....	....	4·85	‡430·95	14·37	526·03	5,693·75	2,636·02	‡430·95

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	....	Voided leases	....	....	....	....	....	....	359·03	275,417·55	141,829·52	10,234·80
		Sundry claims	3·75	....	30·00	3·09	....	57·64	64·96	7,728·00	4,571·48	·02
		From District generally :—										
		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. prior to transfer	....	....	....	....	....	....	....	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	....
		Total	**3·75**	....	**30·00**	**7·94**	**430·95**	**6,908·05**	**2,343·19**	**2,011,381·92**	**822,708·49**	**26,721·72**

WILUNA DISTRICT.

Coles	....	Voided leases	....	....	....	....	....	....	....	2,765·50	1,240·40	....
		Sundry claims	....	....	....	....	....	....	21·03	3,844·50	1,507·23	....
Corboys	....	Voided leases	....	....	....	....	....	5·24	1·25	14,946·29	11,036·71	5·00
		Sundry claims	....	....	....	....	....	21·58	....	9,082·35	5,210·79	....
Gum Creek	....	Voided leases	....	....	....	....	....	20·75	....	1,380·00	595·73	....
		Sundry claims	....	....	....	....	....	....	1·36	407·25	131·08	....
Mt. Eureka	....	Voided leases	....	....	....	....	....	....	....	142·25	96·36	....
		Sundry claims	....	....	....	....	....	....	....	783·75	548·56	....
Mt. Keith	....	Voided leases	....	....	....	....	....	....	44·54	20,259·50	13,551·08	....
		Sundry claims	....	....	....	....	....	4·81	227·29	3,862·50	2,480·03	....
New England	....	Voided leases	....	....	....	....	....	5·74	95·70	5,364·25	3,490·87	....
		Sundry claims	....	....	....	....	....	9·31	5·78	4,534·75	3,111·97	....
Wiluna	280J	Lake Violet Consols Deeps	....	....	....	*109·89	4·50	....	....	....	*217·51	4·50
	679J	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
		From District generally :—										
		Sundry Parcels treated at :										
		State Battery, Wiluna	....	....	....	....	....	....	....	637·00	23,679·00	219·70
		Various Works	....	....	....	....	....	....	....	139·00	5,322·12	12·72
		Reported by Banks and Gold Dealers	....	....	....	*6·34	....	52·03	56·58	....	65·11	....
		Total	....	....	....	**116·23**	**4·50**	**224·85**	**1,254·11**	**8,873,554·94**	**1,872,070·11**	**10,286·88**

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 1957					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 MURCHISON GOLDFIELD—continued.												
BLACK RANGE DISTRICT.												
Barrambie	....	Voided leases	....	....	....	....	....	....	22·49	18,443·92	17,355·15	125·60
		Sundry claims	....	....	69·00	64·97	216·73	5·07	170·20	978·55	1,062·22	216·73
Bellchambers	....	Voided leases	....	....	....	....	....	....	111·80	4,349·27	3,130·56	....
		Sundry claims	....	....	....	....	....	....	....	1,182·80	557·95	....
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	....	Voided leases	....	....	....	....	....	....	6,968·16	33,726·00	36,664·76	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	....	....	36·75	9·46	....	44·95	1,421·07	15,631·45	6,882·45	....
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	....

From District generally :—														
Sundry Parcels treated at :														
State Battery, Sandstone	....	....	....	....	....	....	....	....	....	....	290·50	*23,572·27	61·02
State Battery, Youanmi	....	....	....	....	....	....	....	....	....	....	40·00	*5,504·08	....
Various Works	....	....	....	....	....	....	....	....	....	....	104·50	*11,496·73	....
Reported by Banks and Gold Dealers	....	....	2·99	....	....	....	....	1,494·84	52·23	....	20·38	....
Total	....	....	....	....	**2·99**	....	**105·75**	**74·43**	**216·73**	**1,670·40**	**18,521·80**	**1,729,286·97**	**953,529·29**	**22,712·29**

Murchison Goldfield.

CUE DISTRICT.

Big Bell	(2050), etc.	Big Bell Mines Ltd.	....	....	....	*136·73	23·26	....	....	5,538,877·00	730,486·35	251,813·67
	(2050)	Little Bell	....	....	....	....	....	....	4·49	579·75	60·95	....
	2282	Orange Bell	....	....	373·25	84·41	2·34	....	....	373·25	84·41	2·34
	2274	Silver City	....	....	....	....	....	....	....	36·75	18·45	....
		Voided leases	....	....	....	....	....	....	....	401·00	422·83	....
		Sundry claims	....	....	....	....	....	·39	6·32	553·25	479·76	6·61
Cuddingwarra	....	Voided leases	....	....	....	....	....	10·59	132·46	102,115·91	56,152·11	100·71
		Sundry claims	....	....	288·50	36·97	....	18·46	384·38	10,209·64	5,708·52	16·85
Cue	(2262)	Table Top	....	....	12·75	17·01	....	....	....	1,338·05	1,095·06	3·92
	2247	Victory	....	....	....	....	....	....	....	226·75	125·38	....
		Voided leases	....	....	....	....	....	202·71	911·60	288,796·44	221,102·80	69·11
		Sundry claims	....	....	110·25	19·67	....	252·92	894·70	46,502·19	20,449·98	4·24
Eelya	2241	Eaglehawk	....	....	....	....	....	....	....	1,408·75	417·30	....
		Voided leases	....	....	....	....	....	....	8·78	1,069·00	1,811·26	....
		Sundry claims	....	....	....	....	....	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	....	....	....	....	....	170·71	137·16	7,084·00	2,667·35	·62
Tuckabianna	2237	Gidgee	....	....	24·00	13·30	....	....	297·73	2,789·90	2,108·79	33·57
	2244	Winston	....	....	56·50	29·27	....	....	671·45	750·80	355·49	4·05
		Voided leases	....	....	....	....	....	649·70	324·77	13,152·23	7,465·12	....
		Sundry claims	....	....	168·75	20·39	....	154·26	489·40	5,168·60	2,732·75	·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 1957					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.*												
From District generally :—												
Sundry Parcels treated at :												
J. Alexander Gill, L.T.T. 2/56			....	....	53·00	*58·30	6·54	....	....	53·00	*58·30	6·54
J. Hamilton, L.T.T. 8/57			....	....	....	*40·13	....	....	....	....	*40·13	....
H. Bradbrook, L.T.T. 4/57			....	....	....	*121·87	14·82	....	....	....	*121·87	14·82
B. Woinar, L.T.T. 5/57			....	....	....	*74·69	15·06	....	....	....	*74·69	15·06
F. W. Turner, L.T.T. 1/57			....	....	....	*5·95	....	....	....	....	*5·95	....
State Battery, Cue			....	....	....	*2·85	....	....	....	76·25	*26,347·75	123·99
State Battery, Tuckanarra			....	....	....	....	....	....	....	518·50	*5,535·57	....
Various Works			....	....	....	....	....	....	....	8,022·27	*29,521·58	1,147·77
Reported by Banks and Gold Dealers			4·12	....	....	....	....	3,421·40	109·87	....	22·62	·07
Total			**4·12**	....	**1,087·00**	**661·54**	**62·02**	**5,092·47**	**9,096·19**	**6,808,021·79**	**1,400,281·62**	**274,048·47**
MEEKATHARRA DISTRICT.												
Abbotts			Voided leases	....	....	....	....	....	....	26·45	36,841·35	38,775·28	....
			Sundry claims	....	....	....	....	....	....	5·29	3,819·57	2,347·89	....
Burnakura			Voided leases	....	....	....	....	....	....	3,247·59	39,172·70	30,890·16	26·90
			Sundry claims	....	....	....	....	....	17·03	129·24	2,486·55	1,310·84	1·54
Chesterfield	1942N, 1946N		Margueritta Leases	....	....	50·00	6·72	....	....	....	2,040·00	530·89	....
	1942N		Margueritta	....	....	....	....	....	....	....	732·00	197·73	7·74
	1946N		Margueritta East	....	....	....	....	....	....	....	1,420·00	250·09	10·65
			Voided leases	....	....	....	....	....	29·02	420·32	6,875·25	7,500·57	·80
			Sundry claims	....	....	....	....	....	....	42·19	960·55	740·97	....
Gabanintha	(1948N)		Fortuna	....	....	....	....	....	....	....	3,181·75	915·97	....
			Voided leases	....	....	....	....	....	11·79	38·14	29,809·60	21,272·91	815·57
			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	1,102·59
			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	....

Holdens	1551N	New Waterloo	....	....	....	....	....	....	....	·99	1,468·00	918·92	....
		Voided leases	....	....	....	....	....	....	18·00	16,593·00	6,401·50	....
		Sundry claims	....	....	....	....	....	164·95	49·07	425·15	279·25	....
Jillawarra	....	Voided leases	....	....	....	....	....	....	1,263·53	1,999·80	3,565·40	....
		Sundry claims	....	....	....	....	....	173·02	150·04	440·75	403·14	....
Meeka Pools	....	Voided leases	....	....	....	....	....	....	....	111·58	82·27	....
		Sundry claims	....	....	....	....	....	....	2·84	233·57	205·38	....
Meekatharra	1922N	Albury Heath	....	....	62·50	61·21	....	....	13·16	1,406·75	1,927·19	....
	1559N	Ingliston	....	....	59·50	62·04	....	....	498·32	1,987·85	1,823·97	....
	1967N	Lady Central	....	....	1,619·50	318·80	....	....	....	1,619·50	318·80	....
	1577N	Mopoke	....	....	....	....	....	....	12·47	1,361·50	827·50	....
	(1956N)	New Australia	3·69	....	....	....	....	3·69	107·61	46·75	408·20	....
	1529N	Prohibition	....	....	41·50	13·27	....	....	....	3,991·50	1,940·73	4·25
	1529N, etc.	Prohibition Gold Mining Co. N.L.	....	....	....	....	....	....	....	24,844·25	4,978·31	11·83
	1529N	Prior to transfer to present holders	....	....	....	....	....	....	....	29,422·00	4,971·30	....
	R.C. 75N	C. J. S. White and W. E. Fisher	....	....	....	....	....	173·82	43·80	372·50	131·88	....
		Voided leases	....	....	....	....	....	3·88	1,520·32	1,708,095·62	925,036·29	2,455·04
		Sundry claims	....	....	1,619·45	264·53	....	279·84	982·76	28,371·85	11,143·16	....
Mistletoe	....	Voided leases	....	....	....	....	....	4·15	1,000·24	417·00	486·21	....
		Sundry claims	....	....	....	....	....	119·14	71·85	19·75	2·03	....
Mt. Maitland	....	Voided leases	....	....	....	....	....	....	....	88·00	80·11	....
		Sundry claims	....	....	....	....	....	....	....	420·75	240·86	....
Munara Gully	....	Voided leases	....	....	....	....	....	....	....	13,283·50	6,559·93	....
		Sundry claims	....	....	....	....	....	....	34·23	1,009·75	373·74	....
Nannine	1872N	Blue Pedro	....	....	....	....	....	4·06	15·26	9,566·40	2,021·11	....
	1941N	Caledonia Gold Mine	....	....	....	....	....	....	....	3,747·00	1,047·71	....
	1958N	Mt. Hall	....	....	....	....	....	....	....	36·00	3·08	....
		Voided leases	....	....	....	....	....	43·25	828·76	116,140·48	73,408·98	167·45
		Sundry claims	2·17	....	....	....	....	138·95	1,248·76	6,169·43	4,669·01	....
Quinns	....	Voided leases	....	....	....	....	....	7·30	1,186·50	33,356·91	13,464·37	90·70
		Sundry claims	....	....	....	....	....	15·07	1,289·65	3,841·67	2,718·33	....
Ruby Well	....	Voided leases	....	....	....	....	....	....	43·46	7,461·00	4,046·70	....
		Sundry claims	....	....	....	....	....	1,015·87	409·39	520·25	629·60	....
Stake Well	....	Voided leases	....	....	....	....	....	....	200·12	21,362·00	9,566·18	....
		Sundry claims	....	....	....	....	....	31·91	34·73	1,003·60	584·54	....
Star of the East	....	Voided leases	....	....	....	....	....	....	....	27,244·00	20,305·40	....
		Sundry claims	....	....	....	....	....	....	....	127·62	94·97	....

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 1957					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	Bluebird	....	....	397·25	115·97	....	....	....	8,953·50	2,752·50	....
		Voided leases	....	....	....	....	....	19·03	1,972·23	28,175·54	14,609·36	8·68
		Sundry claims	....	....	....	....	....	61·89	647·51	11,081·92	5,028·61	....
		From District generally :—										
		Sundry Parcels treated at :										
		G. H. Sparrowhawk, L.T.T. 3N/57	....	....	206·05	10·45	....	....	....	206·05	10·45	....
		D. Rinaldi (L.T.T. 1368H)	....	....	604·50	35·17	....	....	....	604·50	35·17	....
		W.A. Copper Products Syndicate (L.T.T. 1289N)	....	....	....	‡·95	....	....	....	....	‡·95	....
		State Battery, Meekatharra	....	....	....	....	....	....	....	130·00	*27,492·30	24·34
		Various Works	....	....	....	....	....	....	....	2,763·25	*13,895·55	391·20
		Reported by Banks and Gold Dealers	13·18	....	....	....	....	12,224·55	179·70	13·50	65·31	·60
		Total	**19·04**	....	**4,660·25**	**889·11**	....	**14,614·99**	**18,164·04**	**2,290,699·96**	**1,305,248·16**	**5,119·88**
DAY DAWN DISTRICT.												
Day Dawn	573D, etc.	Mountain View Gold N.L.	....	....	781·00	41·62	....	....	....	13,612·10	17,376·85	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	....	....	71·00	10·90	....	96·42	523·56	13,629·26	6,741·64	1·55
Lake Austin	....	Voided leases	....	....	....	....	....	613·00	3,079·62	36,872·20	51,050·49	....
		Sundry claims	....	....	....	....	....	59·07	965·49	3,299·44	1,319·62	4·60
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	664D	Eclipse	....	....	149·25	13·85	....	....	....	149·25	13·85	....
	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	....	....	14·00	4·31	....	62·93	509·50	4,616·92	1,787·99	....
		From District generally :—										
		Sundry Parcels treated at :										
		Various Works	....	....	....	....	....	....	16·61	988·00	1,988·33	....
		Reported by Banks and Gold Dealers	4·29	....	....	....	....	2,220·42	37·30	....	12·57	·01
		Total	**4·29**	....	**1,015·25**	**70·68**	....	**3,241·76**	**11,341·63**	**2,036,040·13**	**1,375,410·92**	**169,434·20**

MOUNT MAGNET DISTRICT.

Jumbulyer	1410M	Gold Bug	....	....	39·25	14·16	....	....	2·20	927·35	277·15	....
		Voided leases	....	....	....	....	....	....	13·37	680·10	361·74	....
		Sundry claims	....	....	....	....	....	20·32	116·27	1,216·70	886·47	....
Lennonville	1566M	Empress	....	....	....	9·51	....	....	....	....	9·51	....
		Voided leases	....	....	....	....	....	....	3,226·91	151,502·55	128,568·28	459·62
		Sundry claims	....	....	141·25	53·07	....	23·30	108·82	14,476·07	5,569·35	....
Mt. Magnet	1476M	Cascade	....	....	....	....	....	....	....	10·50	7·14	....
	1527M	Eclipse	....	....	90·60	61·64	....	....	....	272·10	141·41	1·34
	1255M, 1415M	Edward Carson Leases	....	....	27·25	3·51	....	1·82	....	18,042·75	12,895·28	7·76
	1455M	Evening Star	....	....	331·75	31·12	....	....	....	945·75	109·03	....
	1480M	George M	....	....	20·00	1·37	....	....	....	20·00	1·37	....
	1287M	Havelock	....	....	....	....	....	....	11·05	4,332·50	840·14	....
	1479M	Hill 50 Consolidated N.L.	....	....	....	....	....	....	....	68·00	5·10	....
	1282M, etc.	Hill 50 Gold Mine N.L.	....	....	107,127·50	83,192·69	2,133·31	....	....	1,089,233·40	531,794·44	12,057·03
	1246M	(Neptune)	....	....	....	....	....	....	829·41	8,787·65	4,122·61	·21
	1361M	Jupiter	....	....	....	....	....	....	·83	658·05	261·71	....
	1444M	Late Comer	....	....	41·50	3·74	....	....	2·53	511·00	391·31	....
	1447M	Morning Star	....	....	658·00	99·21	....	....	....	2,092·65	458·61	....
	1536M	Pat Omeara	....	....	....	....	....	....	....	34·00	·68	....
	1505M	Perseverance	....	....	....	....	....	....	....	107·25	11·40	....
	1588M	Three Boys	....	....	48·00	2·47	....	....	....	48·00	2·47	....
		Voided leases	....	....	....	....	....	29·26	9,811·54	834,262·31	312,761·69	851·39
		Sundry claims	....	....	463·00	112·20	....	123·08	2,626·24	60,860·65	29,874·18	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	....	....	....	....	....	....	....	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	....
	From District generally :											
	Sundry Parcels treated at :											
	State Battery, Boogardie	....	....	....	390·05	8·75	....	....	348·26	34,903·73	15·62
	Various Works	....	....	....	....	....	....	....	56·06	18,949·24	10·04
	Reported by Banks and Gold Dealers	3·93	....	....	....	....	2,290·84	114·39	8·00	113·15	·22
	Total	**3·93**	....	**108,988·10**	**83,974·74**	**2,142·06**	**2,570·70**	**20,433·86**	**2,211,073·15**	**1,109,266·54**	**14,165·49**

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 1957					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.												
Bilberatha		Voided leases	....	....	....	....	....	1·27	90·94	3,384·50	1,845·05	....
		Sundry claims	....	....	....	....	....	....	6·64	3,075·05	1,401·56	....
Carlaminda		Voided leases	....	....	....	....	....	1·28	3·39	2,056·57	862·42	3·30
		Sundry claims	....	....	....	....	....	....	....	1,368·50	600·68	....
Fields Find	1119	Fields 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	....	....	....	*2·36	·07	....	....	418·67	254·46	1·59
		Voided leases	....	....	....	....	....	....	226·72	45,534·96	32,578·72	·59
		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	....	....	170·00	23·94	....	....	....	19,096·05	14,016·94	....
	1145	Oversight	....	....	....	....	....	....	10·62	2,338·35	875·92	....
		Voided leases	....	....	....	....	....	146·70	288·66	60,077·31	51,418·40	....
		Sundry claims	....	....	60·00	14·11	....	152·96	169·70	10,282·30	5,114·70	....
Gullewa		Voided leases	....	....	....	....	....	....	19·05	39,913·60	20,966·51	113·70
		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	28,564·95	1,083·01
		Sundry claims	....	....	....	....	....	463·12	333·98	1,595·10	588·36	·07
Mt. Farmer		Voided leases	....	....	....	....	....	....	....	64·00	40·19	....
		Sundry claims	....	....	....	....	....	....	....	462·90	145·06	....
Mt. Gibson		Voided leases	....	....	....	....	....	....	6·44	526·50	888·70	....
		Sundry claims	....	....	18·00	3·25	....	1·66	44·72	1,152·60	502·15	1·00
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	4·04
		Voided leases	....	....	....	....	....	7·88	31·96	11,069·75	5,526·90	....
		Sundry claims	....	....	....	....	....	39·32	310·31	8,499·05	3,561·25	....
Nyounda	....	Voided leases	....	....	....	....	....	....	217·63	416·00	183·91	....
		Sundry claims	....	....	126·00	17·44	....	....	30·88	955·00	223·90	....
Pinyalling	....	Voided leases	....	....	....	....	....	....	313·79	2,318·90	1,146·19	....
		Sundry claims	....	....	7·50	4·49	....	3·13	134·09	1,500·00	959·31	....
Retaliation	....	Voided leases	....	....	....	....	....	....	....	5,089·25	1,872·98	....
		Sundry claims	....	....	135·00	16·81	....	....	....	913·25	321·52	....
Rothsay	....	Voided leases	....	....	....	....	....	....	24·06	40,680·75	10,777·98	....
		Sundry claims	....	....	....	....	....	....	·73	6,469·50	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	6,314·50	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	....
From Goldfield generally :—												
Sundry Parcels treated at :												
State Battery, Paynes Find		....	....	118·00	15·64	....	....	....	156·50	*4,548·42	....
State Battery, Warriedar		....	....	....	....	....	....	....	....	*6,537·13	·37
State Battery, Yalgoo		....	....	....	....	....	....	....	....	*1,200·51	....
B. Sher-Ali and F. Sheriff, L.T.T. 1/57		....	....	201·00	12·19	....	....	....	201·00	12·19	....
Various Works		....	....	....	....	....	9·42	....	664·00	*3,325·00	99·84
Reported by Banks and Gold Dealers		2·02	....	....	....	....	948·13	58·32	....	48·90	·20
Total		**2·02**	....	**835·50**	**110·23**	**·07**	**1,789·28**	**3,223·19**	**442,239·33**	**263,644·97**	**1,502·63**

Mt. Margaret Goldfield.

MOUNT MORGANS DISTRICT.

Australia United....	....	Voided leases	....	....	....	....	....	....	1,911·63	15,913·69	23,305·76	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 claim	....	....	....	....	....	....	591·62	2,160·30	2,011·78	....

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 1957					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 MORGANS DISTRICT—*continued.*												
Linden		Voided leases	....	....	....	....	....	7·53	566·97	72,919·81	66,208·35	·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.	Morgan's Gold Mines Ltd.	....	....	350·00	62·32	....	....	....	4,941·05	13,911·46	....
		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	5,104·07	3,396·77	....
Murrin Murrin		Voided leases	....	....	....	....	....	10·43	231·35	136,940·22	104,029·97	29·60
		Sundry claims	....	....	·10	96·55	....	51·15	557·24	6,485·68	4,557·00	....
Redcastle	557F	Trixie	....	....	10·00	17·73	....	....	37·09	177·75	68·44	....
		Voided leases	....	....	....	....	....	4·49	436·54	4,107·20	4,043·41	....
		Sundry claims	....	....	....	....	....	....	113·84	1,183·57	642·45	....
Yundamindra	560F	Queen of the May Linden (W.A.) Gold N.L.	....	....	205·00	76·45	....	....	....	4,077·00	1,756·80	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	....
		From District generally :—										
		Sundry Parcels treated at :										
		C. C. Crocker (Anniversary Battery), M.A. 14F	....	....	....	....	....	....	....	10·00	*26·96	....
		State Battery, Linden	....	....	....	3·61	....	....	9·16	299·54	*15,502·97	....
		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	5·12	....	....	....	....	3,078·15	141·84	10·30	95·75	·68
		Total	**5·12**	....	**565·10**	**256·66**	....	**3,491·66**	**9,380·81**	**1,214,958·31**	**717,151·51**	**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	....	....	·05	1·98	....	11·21	332·13	4,626·85	4,469·91	....
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	....	Voided leases	....	....	....	....	....	....	4,482·18	74,717·46	52,293·77	7·56
		Sundry claims	....	....	233·00	135·74	....	129·92	906·52	8,845·87	5,907·20	2·60
Leonora	1829C	Jessie Alma	....	....	83·00	77·07	....	....	578·11	706·50	1,911·58	....
	1579C, etc.	Sons of Gwalia Ltd.	....	....	137,934·00	31,043·09	2,640·36	....	....	6,201,394·53	2,393,448·24	171,464·66
		Prior to transfer to present holders	....	....	....	....	....	....	....	109,081·00	55,989·21	8·66
		Voided leases	....	....	....	....	....	....	1,866·86	176,575·00	91,197·84	94·57
		Sundry claims	....	....	396·60	141·30	·21	37·73	367·26	18,748·95	11,880·49	·21
Malcolm	....	Voided leases	....	....	....	....	....	11·65	47·07	62,656·53	47,563·43	....
		Sundry claims	....	....	....	....	....	5·75	33·39	4,576·47	2,711·34	·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	....	....	....	....	....	....	163·16	32·00	148·64	....
		Voided leases	....	....	....	....	....	....	1,623·35	9,556·96	16,492·17	....
		Sundry claims	....	....	....	....	....	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	....	....	....	....	....	4·68	54·46	1,612·16	1,416·41	....
	From District generally :—											
	Sundry Parcels treated at :											
	State Battery, Darlot	....	....	....	....	....	....	....	....	18·00	*786·34	....
	Reefer Cyanide Plant	....	....	....	....	....	....	....	....	20·00	*3,125·37	22·38
	Various Works	....	....	....	....	....	....	....	....	789·50	*22,175·93	135·97
	Reported by Banks and Gold Dealers	1·95	....	....	....	....	3,509·48	252·83	21·50	51·57	....
	Total	**1·95**	....	**138,646·65**	**31,399·18**	**2,640·57**	**3,923·30**	**16,649·68**	**6,904,801·47**	**2,877,407·62**	**173,332·88**

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 1957					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.												
Burtville	2138T	Nil Desperandum	....	....	....	....	....	....	5·30	1,940·47	4,523·90	....
		Voided leases	....	....	....	....	....	4·89	413·80	72,327·98	117,930·32	948·27
		Sundry claims	....	....	106·50	66·99	....	2·65	208·27	7,516·16	5,572·28	....
Duketon	....	Voided leases	....	....	....	....	....	5·35	3,216·10	31,889·42	22,542·63	....
		Sundry claims	....	....	4·50	5·87	....	61·45	528·26	2,442·65	2,196·49	29·76
Eagle's 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	....	....	10·00	3·28	....	1,181·65	165·05	5,716·59	3,888·89	....
Euro	....	Voided leases	....	....	....	....	....	....	65·14	91,821·50	37,678·25	....
		Sundry claims	....	....	....	....	....	4·87	73·04	1,507·00	835·30	....
Laverton	2514T	Gladiator	....	....	....	....	....	....	....	2,551·50	402·86	....
	2245T, etc.	Lancefield Leases	....	....	1,009·00	41·61	....	....	....	47,978·75	5,109·23	22·62
	2245T	Lancefield Extended West	....	....	....	....	....	....	....	881·25	846·77	....
	2489T	(Wedge)	....	....	....	....	....	....	....	222·00	21·19	....
	2478T	Lancefield North	....	....	....	....	....	....	....	2,235·25	438·99	....
	(2552T)	Last Hope	....	....	123·00	24·05	....	....	....	123·00	24·05	....
	2541T	Mary Mack	....	....	....	....	....	....	....	92·00	11·21	....
		Voided leases	....	....	....	....	....	28·59	2,028·85	2,075,638·37	813,222·85	56,923·16
		Sundry claims	....	....	65·00	6·90	....	215·58	1,492·90	17,547·50	9,250·60	....
Mt. Barnicoat	....	Voided leases	....	....	....	....	....	....	23·08	2,370·00	2,251·99	....
		Sundry claims	....	....	....	....	....	....	·68	1,309·75	1,087·77	....
Mt. Shenton	....	Voided leases	....	....	....	....	....	....	....	15·00	26·65	....
		Sundry claims	....	....	....	....	....	....	....	279·25	209·67	....
		From District generally :—										
		Sundry Parcels treated at :										
		State Battery, Laverton	....	....	....	*707·37	169·27	....	....	97·50	*19,346·56	561·11
		United Gold Recoveries Pty. Ltd.	....	....	....	....	....	....	....	·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	....
		Total	....	....	**1,318·00**	**856·07**	**169·27**	**4,070·70**	**9,354·35**	**2,525,029·64**	**1,173,868·76**	**66,187·03**

North Coolgardie Goldfield.

MENZIES DISTRICT.

Comet Vale	5766Z	Coonega Extended	....	....	....	....	....	....	....	54·75	23·81	....
	(5775Z)	Gladsome East	....	....	....	....	....	....	....	40·75	10·15	....
	(5757Z)	King of the Hills	....	....	....	....	....	....	....	156·75	42·43	....
		Voided leases	....	....	....	....	....	....	419·74	267,188·22	193,191·04	5,355·33
		Sundry claims	....	....	32·25	3·57	....	....	40·19	1,943·16	1,004·00	....
Goongarrie	5777Z	New Goongarrie Gold Mine	....	....	49·75	29·48	....	....	....	49·75	29·48	....
	5740Z	Gull's Blow	....	....	....	....	....	....	164·75	348·75	221·44	....
		Voided leases	....	....	....	....	....	·94	1,385·26	29,848·04	18,095·35	....
		Sundry claims	....	21·72	28·83	141·51	....	46·46	2,109·79	2,835·85	3,342·42	....
Menzies	5543Z	Black Swan	....	....	55·00	13·80	....	....	....	1,135·63	1,658·49	9·08
	5736Z	Bodington	....	....	....	....	....	....	134·83	100·50	154·47	....
	5511Z	First Hit	....	....	214·50	193·07	....	....	....	3,634·50	6,719·67	21·25
	5511Z, etc.	First Hit Gold Mines (1934) Ltd.	....	....	....	....	....	....	....	68,473·70	49,060·96	6,676·23
	5542Z	Good Block Lease	....	....	25·75	9·03	....	....	7·32	2,524·50	2,905·07	....
	(5714Z)	Lady Harriet North	....	....	....	1·39	....	....	....	108·00	19·52	....
	(5549Z)	Lady Harriet	....	....	39·00	31·02	....	....	....	767·00	322·46	....
	5520Z	Mignonette	....	....	....	....	....	....	....	543·50	378·92	....
	(5774Z)	Spion Kopp	....	....	171·50	32·65	....	....	....	968·75	168·91	....
		Voided leases	....	....	....	....	....	45·42	1,125·41	935,954·75	726,588·71	13,586·39
		Sundry claims	....	....	137·00	87·47	....	49·50	623·61	34,667·44	25,354·04	776·49
Mt. Ida	(5776Z)	Idella Syndicate	....	....	17·75	2·30	....	....	....	17·75	2·30	....
	5701Z, etc.	Moonlight Wiluna Gold Mines Ltd.	....	....	31,445·00	15,780·98	....	....	40·77	198,246·86	105,277·59	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	106·63
		Sundry claims	....	....	11·25	5·03	....	48·14	436·08	16,077·41	8,240·74	·12
Twin Hills	....	Voided leases	....	....	....	....	....	....	....	582·30	574·93	....
		Sundry claims	....	....	....	....	....	....	....	97·80	86·69	....
	From District generally :—											
	Sundry Parcels treated at :											
	Bracegirdle and Bennetts (L.T.T. 1Z/57)	....	....	202·00	8·64	....	....	....	....	202·00	8·64	....
	State Battery, Menzies	....	....	....	*80·13	....	....	....	....	....	*80·13	....
	(Lady Harriet Battery)	....	....	....	....	....	....	....	....	279·50	*19,381·31	30·00
	State Battery, Mt. Ida	....	....	....	*19·24	....	....	....	....	1,866·25	*7,498·36	·05
	Various Works	....	....	....	....	....	....	....	....	2,528·30	39,363·16	3,032·11
	Reported by Banks and Gold Dealers	·10	15·24	15·00	15·68	....	1,484·86	403·04	100·00	30·37	....
	Total	**·10**	**36·96**	**32,444·58**	**16,454·99**	....	**1,675·32**	**6,983·00**	**1,671,806·88**	**1,298,536·68**	**31,272·59**

ULARRING DISTRICT.

Davyhurst	1016U, etc.	New Coolgardie Gold Mines N.L.	....	....	....	....	....	....	....	132,198·00	67,724·52	15,808·01
	1016U, 1085U....	(New Callion)	....	....	....	....	....	....	....	5,293·30	2,002·37	119·67
		Voided leases	....	....	....	....	....	2·93	152·64	166,783·32	126,011·36	5,408·47
		Sundry claims	....	....	119·25	29·37	....	....	208·48	13,773·19	5,719·76	....

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 1957					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.*												
Morleys	1101U	Emerald	....	....	482·50	124·93	....	....	26·24	3,991·00	2,385·64	....
	1094U	First Hit	....	....	201·75	145·27	....	....	....	3,229·25	6,331·82	....
	1169U	First Hit North	....	....	3·50	5·79	....	....	....	3·50	5·79	....
	1168U	Hazel Dawn	....	....	21·25	45·30	....	....	....	43·25	93·39	....
	1081U	Mabel Gertrude	....	....	....	....	....	....	17·19	1,566·50	1,916·51	....
	1089U	Paramount	....	....	219·50	259·44	....	....	1·49	3,945·00	3,632·54	....
	1163U	Two Chinamen	....	....	....	....	....	....	....	9·25	15·28	....
		Voided leases	....	....	....	....	....	....	3,854·94	2,956·50	5,944·69	10·54
		Sundry claims	....	....	138·25	80·17	....	2·16	932·23	1,881·25	2,607·77	....
Mulline	1107U	Ajax West	....	....	965·75	525·02	....	....	1·37	6,811·00	5,953·34	....
	1170U	Golden Wonder	....	....	42·25	206·56	....	....	....	42·25	206·56	....
	1070U	Riverina	....	....	16·00	4·89	....	....	....	283·00	75·30	....
	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	....	97·75	126·25	450·58	....	10·82	296·42	10,941·64	9,393·17	1·10
Mulwarrie	1153U	Fourmile	....	....	8·00	83·74	....	....	....	69·00	403·09	....
	1113U	Oakley	....	....	248·00	256·19	....	....	....	3,214·00	4,740·19	....
		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		....	....	....	....	....	....	....	....	*900·46	....
	Various Works		....	....	....	....	....	....	15·82	268·15	9,639·15	11·15
	Reported by Banks and Gold Dealers		....	347·29	....	48·07	....	112·81	411·29	100·00	71·55	....
	Total		....	**445·04**	**2,592·25**	**2,265·32**	....	**129·52**	**7,203·12**	**526,408·35**	**437,136·65**	**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	....	....	2,097·00	897·70	....	....	....	6,666·50	5,306·97	·44
	911G	Cosmopolitan South	....	....	100·00	109·03	....	....	....	2,290·00	1,212·96	....
	933G	New Gladstone	....	....	217·00	122·64	....	....	....	673·25	265·47	....
	937G	Victory	....	....	....	....	....	....	....	10·00	13·54	....
		Voided leases	....	....	....	....	....	3·35	347·30	744,917·21	394,601·81	5,375·97
		Sundry claims	....	....	31·00	12·76	....	60·92	106·60	9,061·55	6,775·51	3·02
Niagara	....	Voided leases	....	....	....	....	....	....	104·54	85,876·50	52,365·05	....
		Sundry claims	....	....	....	....	....	28·10	97·22	14,645·16	8,257·78	....
Tampa	....	Voided leases	....	....	....	....	....	....	41·58	50,477·57	23,287·71	174·24
		Sundry claims	....	....	....	....	....	32·60	283·40	8,041·33	4,113·02	....
	From District generally :—											
	Sundry Parcels treated at :											
	Various Works		....	....	....	....	....	....	....	1,220·50	*20,884·22	120·98
	Reported by Banks and Gold Dealers		....	....	....	....	....	1,593·39	823·66	....	63·53	....
	Total		....	....	**2,445·00**	**1,142·13**	....	**1,718·36**	**1,821·77**	**935,914·02**	**525,595·86**	**5,686·69**

YERILLA DISTRICT.

Ejudina	....	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	....	....	86·00	42·90	....	....	....	3,860·00	1,208·17	....
	1327R	Nil Desperandum	....	....	9·00	2·58	....	....	....	328·00	76·26	....
	1126R, etc.	Porphyry (1939) Gold Mines N.L.	....	....	224·00	25·56	·09	....	....	66,939·00	9,893·51	261·95
	1126R, etc.	(Ejudina 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	44,584·75	21,248·26	2·00
		Sundry claims	....	....	89·00	24·20	....	·87	5·93	17,147·55	6,127·13	·98
Yerilla	....	Voided leases	....	....	....	....	....	....	3,107·25	16,481·43	12,925·74	13·93
		Sundry claims	....	....	....	....	....	19·30	97·63	2,752·83	1,590·03	....
Yilgangie	1176R, etc.	Western Mining Corporation	....	....	2,848·00	3,085·55	534·15	....	....	19,072·75	19,281·71	2,739·71
		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 1957					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)*.												
		From District generally :—										
		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	....	....	....	....	....	1,161·60	160·08	....	27·36	....
		Total	....	....	**3,256·00**	**3,180·79**	**534·24**	**1,311·91**	**3,817·12**	**279,193·03**	**166,169·13**	**3,602·24**

Broad Arrow Goldfield.

Bardoc		Voided leases	....	....	....	....	....	....	2,335·41	85,370·59	55,699·50	203·60
		Sundry claims	3·26	120·50	23·32	....	54·95	1,218·09	17,292·03	8,261·75	....
Black Flag .... 2229W....		Bellevue	4·32	380·00	99·59	....	....	212·68	2,341·25	2,866·99	....
		Voided leases	....	....	....	....	27·81	405·90	48,277·79	28,175·08	....
		Sundry claims	....	39·55	14·08	....	712·92	251·59	8,081·51	4,980·65	....
Broad Arrow		Voided leases	....	....	....	....	70·32	10,453·81	155,895·94	120,088·05	20·23
		Sundry claims	....	400·50	94·26	....	1,007·72	3,046·17	34,069·89	16,912·59	·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	....	500·25	47·34	....	....	6·61	2,304·33	921·90	....
Cashman's		Voided leases	....	....	....	....	67·51	813·76	8,172·15	7,090·91	....
		Sundry claims	....	....	....	....	....	40·31	1,205·12	361·74	·05

Christmas Reef	(2286W)	Golden Fleece	....	....	....	....	....	....	....	9·00	7·62	....
	2279W....	New Mexico	....	....	....	....	....	....	....	51·50	147·19	....
	2253W....	New Mexico South	....	....	646·50	655·17	....	....	....	1,381·00	2,428·23	....
		Voided leases	....	....	....	....	....	....	55·49	1,856·12	3,599·03	....
		Sundry claims	....	....	68·25	44·48	....	....	441·85	3,096·64	2,977·89	....
Fenbark	....	Voided leases	....	....	....	....	....	....	4·42	6,771·00	2,711·68	....
		Sundry claims	....	....	....	....	....	....	51·96	3,031·52	1,000·47	....
Grants Patch	(2261W)	Bent Tree	....	....	....	....	....	....	....	1,277·00	327·53	....
	2277W....	Coronation	....	....	234·75	235·75	....	....	....	379·25	286·85	....
	2278W....	Prince of Wales Syndicate	....	....	181·50	265·61	....	....	....	263·75	546·33	....
	2277W, 2278W	Ora Banda Amalgamated Mines N.L.	....	....	....	....	....	....	....	961·00	1,146·17	....
	(2208W)	Wentworth	....	....	227·75	59·64	....	....	1·30	4,129·50	1,220·11	....
		Voided leases	....	....	....	....	....	....	272·83	198,269·24	78,499·67	175·00
		Sundry claims	....	....	8·00	3·33	....	....	356·66	6,514·79	3,099·64	....
Ora Banda	T.A. 42W, M.A. 41W	Associated Northern Ora Banda N.L....	....	....	....	....	....	....	....	2,786·50	464·53	21·07
		Prior to transfer	....	....	....	....	....	....	....	315,958·95	123,252·22	1,664·70
	2270W, (2269W)	Gimlet South Leases	....	....	1,306·00	237·97	....	....	....	5,863·75	1,169·07	....
	(2280W)	New Victorious	....	....	94·00	15·67	....	....	....	123·50	29·29	....
	(2289W)	Trafalgar	....	....	268·50	17·29	....	....	....	784·50	51·87	....
		Voided leases	....	....	....	....	....	....	846·13	103,811·32	27,390·64	....
		Sundry claims	....	....	171·85	77·40	....	....	467·18	13,790·10	4,571·26	....
Paddington	(2287W)	Pakeha	....	....	612·25	34·73	....	....	....	1,179·25	154·50	....
	2294W....	Shirley Lorna	....	....	42·25	4·01	....	....	....	42·25	4·01	....
		Voided leases	....	....	....	....	....	5,566·30	463·31	195,119·31	86,278·23	32·15
		Sundry claims	....	....	29·50	13·51	....	1,714·16	291·43	16,978·98	9,212·62	....
Riche's Find	(2285W)	Lady Correll	....	....	....	....	....	....	8·22	59·50	77·81	....
		Voided leases	....	....	....	....	....	....	13·42	7,583·59	6,017·88	71·36
		Sundry claims	....	....	....	....	....	....	296·26	1,943·75	2,289·23	·13
Siberia	2293W....	Cave Hill	....	....	66·50	24·72	....	....	....	66·50	24·72	....
		Voided leases	....	....	....	....	....	1·07	2,649·28	28,928·97	31,751·34	....
		Sundry claims	....	....	....	....	....	289·06	1,261·72	21,257·79	12,880·54	....
Smithfield	2264W....	King of Kings	....	....	307·50	38·34	....	....	19·19	7,017·00	893·89	....
		Voided leases	....	....	....	....	....	....	....	4,700·71	1,174·69	....
		Sundry claims	....	....	....	....	....	....	124·29	3,255·84	1,275·89	....
		From Goldfield generally :—										
		Sundry Parcels treated at :										
		H. J. Harvey Cyanide Plant, L.T.T. (1374H)	....	....	....	*2·78	....	....	....	....	*2·78	....
		State Battery, Ora Banda	....	....	....	*893·87	9·06	....	....	128·05	*24,732·71	11·56
		Golden Arrow Battery	....	....	....	....	....	....	....	80·75	*4,333·07	2·30
		Various Works	....	....	....	....	....	2,275·66	1·24	16,967·02	49,501·99	3,103·45
		Reported by Banks and Gold Dealers	12·75	4·54	....	....	....	10,015·60	150·16	61·68	91·05	....
		Total	**12·75**	**12·12**	**5,705·90**	**2,902·86**	**9·06**	**21,979·12**	**27,475·30**	**1,343,316·74**	**734,119·85**	**5,305·71**

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 1957					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.												
KANOWNA DISTRICT.												
Gindalbie		Voided leases	....	....	....	....	....	....	1,151·99	46,180·53	41,748·13	38·31
		Sundry claims	....	....	....	....	....	....	716·52	5,534·02	3,192·22	....
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	....
Kanowna	1572X	Kanowna Red Hill	....	2·38	186·00	81·08	....	....	2·38	2,305·25	683·06	....
		Voided leases	....	....	....	....	....	24·94	4,516·76	685,557·10	380,497·36	2,482·24
		Sundry claims	....	....	196·25	23·34	....	125·32	2,163·30	27,019·27	11,898·10	1·50
Mulgarrie		Voided leases	....	....	....	....	....	....	1,216·63	6,902·26	4,197·98	....
		Sundry claims	....	....	....	....	....	....	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	....
		From District generally :—										
		Sundry Parcels treated at :										
		Various Works	....	....	....	....	....	330·42	867·52	158,935·05	*153,205·89	....
		Reported by Banks and Gold Dealers	2·85	....	....	....	....	106,020·30	40·42	·50	109·73	....
		Total	**2·85**	**2·38**	**382·25**	**104·42**	....	**106,525·68**	**13,520·90**	**1,006,139·76**	**626,225·29**	**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	....	....	28·50	5·85	....	324·12	727·39	4,406·11	2,298·13	....
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	....

From District generally :—													
Sundry Parcels treated at :													
Various Works	....	....	....	....	....	....	....	....	101·50	388·63	....
Reported by Banks and Gold Dealers	....	....	....	....	....	12,105·52	70·70	....	2·35	1·49
Total	....	....	**28·50**	**5·85**	....	**12,834·45**	**8,298·91**	**13,470·82**	**18,719·18**	**12·71**

East Coolgardie Goldfield.

EAST COOLGARDIE DISTRICT.

Binduli	(6025E)	Belle of Kalgoorlie	....	....	12·25	·96	....	....	....	837·25	90·62	....
		Voided leases	....	....	....	....	....	....	....	803·10	385·19	....
		Sundry claims	....	....	8·00	1·53	....	....	13·01	5,177·77	1,682·98	....
Boorara	....	Voided leases	....	....	....	....	....	....	459·07	309,467·82	172,861·95	411·37
		Sundry claims	....	....	....	....	....	·49	145·56	3,535·34	1,524·15	....
Boulder	6145E	Boomerang	....	....	....	....	....	....	....	77·00	8·00	....
	5531E	Cassidy's Hill	....	....	....	....	....	....	....	75·50	7·77	....
	5964E	Croesus Extended	....	....	....	....	....	....	....	192·75	16·57	....
	6537E	Golden Key	....	20·43	239·50	198·99	....	....	47·90	319·50	281·58	....
	5159E, etc.	Gold Mines of Kalgoorlie (Aust.) Ltd.	....	....	487,930·00	129,661·54	24,886·13	....	....	487,930·00	129,661·54	24,886·13
		Prior to transfer to present holders	....	....	....	....	....	....	791·73	15916155·97	6,415,881·49	819,123·27
	5696E, etc.	Great Boulder Pty. Gold Mines Ltd.	....	....	459,734·00	128,928·03	52,853·66	....	1·53	12282644·97	5,888,411·64	1,413,492·69
	5845E	Happy Returns	....	....	65·25	10·04	....	....	....	7,928·00	1,462·92	....
	5478E, etc.	Lake View and Star Ltd.	....	....	664,895·00	169,744·51	19,321·63	....	....	13797943·30	4,133,817·77	447,476·70
		Prior to transfer to present holders	....	....	....	....	....	....	8·49	15792500·38	9,149,223·80	1,348,055·82
	6230E	New Look	....	....	....	....	....	....	....	256·75	22·68	....
	5431E, etc.	North Kalgurli (1912) Ltd.	....	....	337,888·00	75,326·86	5,770·03	....	127·55	4,638,568·24	1,300,519·43	270,646·10
	5405E, etc.	North Kalgurli (1912) Croesus Pty. Group	....	....	....	....	....	....	51·20	90,159·00	19,261·22	....
	5891E	(New Croesus)	....	....	....	....	....	....	....	193·00	48·74	....
	5700E, etc.	Prior to transfer to present holders	....	....	....	....	....	43·99	....	4,018,436·01	2,815,911·21	97,625·03
		Voided leases	....	....	....	....	....	129·24	12,023·37	1,814,371·31	760,447·86	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.	....	....	....	....	....	....	....	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 Proprietaries Ltd.—Mt. Martin	....	....	....	....	....	....	....	14,953·75	5,574·11	....
	P.P.L. 460	Hampton Xmas Gift	....	....	....	....	....	6·72	37·57	107·00	89·44	....
	P.P.L. 12	Junction Extended	....	....	....	....	....	....	....	3,581·75	527·74	....
	P.P.L. 277	Pernatty	....	....	569·75	57·94	....	....	....	6,648·25	773·58	....
	P.P.L. 277	(New Hope)	....	....	....	....	....	....	17·23	61,468·55	11,175·94	....

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 1957					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.*										
	P.P.L. 23	Scherini and Rowe—Mutooroo	....	....	768·50	51·32	....	....	....	1,747·50	134·82	....
	P.P.L. 10	F. C. Shoppe	....	....	888·75	37·82	....	....	....	888·75	37·82	....
	P.P.L. 175	Jubilee	....	....	126·25	12·45	....	....	....	6,708·00	906·81	....
		Cancelled leases	....	....	....	....	....	4,578·52	203·94	126,877·34	39,711·84	69·83
		Sundry claims and Leases	....	....	....	....	....	2·68	70·85	46,439·41	8,509·67	....
Kalgoorlie	6048E	Auld Acquaintance	....	....	....	....	....	....	....	7·50	2·36	....
	6562E	Bretvic	....	....	62·00	6·41	....	....	....	326·50	26·09	....
	6563E, 6564E....	Champagne Syndicate N.L.	....	....	2,504·00	299·54	....	....	....	12,287·75	1,348·10	61·41
		Prior to transfer to present holders	....	....	....	....	....	....	5·72	73,435·85	16,819·11	110·15
	6503E	Coronation	....	....	....	....	....	....	....	20·50	2·52	....
	5913E	Devon Consuls	....	....	....	....	....	....	93·19	2,298·46	699·66	....
	5915E	Edna Derby	....	....	393·50	88·69	....	....	....	400·00	91·18	....
	5647E	Golden Cross	....	....	....	....	....	....	....	156·25	19·77	....
	5510E	Golden Dream	....	....	....	....	....	....	....	99·00	6·53	....
	5774E	Golden Goose	....	....	....	....	....	....	....	215·50	53·07	....
	5739E	Golden Star	....	....	....	....	....	....	....	918·50	85·96	....
	6502E	Hannans North	....	....	....	....	....	....	....	256·00	65·07	4·28
	6504E	Historic	....	....	....	....	....	....	....	257·00	17·27	....
	5460E	Kalgoorlie Star	....	....	....	....	....	....	....	290·25	56·54	....
	5878E	Lady May	....	....	....	....	....	....	62·05	4,740·50	1,177·07	....
	6091E	Lesanben	....	8·10	137·00	42·03	....	....	193·96	713·00	383·28	....
	6485E	Maritana Hill	....	....	435·00	55·52	....	....	....	2,951·75	388·02	....
	6535E	Mary A	....	....	1,102·25	73·28	....	....	....	2,726·50	217·80	....
	6321E	North End Extended	....	....	61·25	39·18	....	....	69·28	1,811·00	416·72	....
	5852E, etc.	Pedestal Leases	....	....	50·25	4·68	....	....	....	1,828·50	490·37	....
	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	....	....	....	....	....	....	5·64	3,831·75	656·15	....
		Voided leases	....	....	....	....	....	242·48	10,572·12	1,457,335·80	578,523·61	45,973·47
		Sundry claims	....	....	56·25	1·41	....	232·41	1,124·61	61,311·88	23,185·22	....
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	....	....	1,012·20	928·83	46·38	....	....	11,729·70	8,541·00	52·30
	5497E	(Daisy)	....	....	....	....	....	....	....	6,282·25	5,031·93	....

5500E	(Happy-Go-Lucky)	....	....	....	....	....	....	....	2,075·25	1,675·85	....
6032E	Dry Mount	....	....	50·50	4·63	·60	....	....	1,206·75	1,141·10	·60
6325E	Great Hope	....	....	....	....	....	....	....	150·00	64·66	....
5689E	Haoma Gold Mines N.L.	....	....	4,043·00	3,232·76	222·44	....	....	8,929·00	6,945·09	256·37
5689E, etc.	(Haoma Leases)	....	....	....	....	....	....	....	27,396·50	25,445·40	79·15
5689E	(Haoma)	....	....	....	....	....	....	....	2,168·00	1,948·36	....
5525E	(Xmas Flat)	....	....	....	....	....	....	....	330·25	264·74	....
5798E	(Maranoa)	....	....	....	....	....	....	32·17	3,183·50	1,633·27	....
5493E	(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	....
6312E	Inverness	....	....	361·75	55·39	....	....	....	2,201·75	404·12	....
6540E	Launa Doone	....	....	142·75	31·65	....	....	....	142·75	31·65	....
6487E	Leslie	....	....	65·25	68·60	....	....	....	149·75	147·21	....
6213E	Pauline	....	....	....	....	....	....	....	242·00	222·17	....
6570E	Rock-and-Roll	....	....	549·00	44·10	....	....	....	549·00	44·10	....
6533E	Rosemary	....	....	1,147·75	465·56	....	....	....	1,777·25	3,184·91	....
	Voided leases	....	....	....	....	....	3·80	2,464·78	29,227·09	41,054·88	....
	Sundry claims	....	....	522·00	92·69	....	....	711·10	23,911·68	14,251·15	....
From District generally :—											
Sundry Parcels treated at :											
Golden Horseshoe (New) Ltd. (T.Ls. 101, etc.)	....	....	....	....	....	....	....	....	....	*350,028·15	354,192·20
State Battery, Kalgoorlie	....	....	....	*984·33	20·44	....	....	....	390·70	*33,010·01	66·68
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	8·45	28·41	12·50	103·72	....	16,917·62	10,013·61	372·18	7,305·43	....
Total	**8·45**	**56·94**	**1,965,833·45**	**510,654·99**	**103,121·31**	**33,635·44**	**41,036·54**	**71429433·35**	**32335030·97**	**4,867,062·32**

BULONG DISTRICT.

Balagundi	....	Voided leases	....	....	....	....	....	....	2,408·98	1,115·93	1,488·91	12·92
		Sundry claims	....	....	....	....	....	3·51	293·52	806·01	505·93	....
Bulong	1311Y	Blue Quartz	....	....	308·50	48·62	....	....	....	1,619·00	607·72	....
		Voided leases	....	....	....	....	....	107·54	8,526·12	108,330·55	85,785·57	....
		Sundry claims	....	....	242·50	54·27	....	1,655·86	1,611·58	17,059·73	17,819·10	....
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	....
Mount Monger	....	Voided leases	....	....	....	....	....	....	2,771·39	1,437·85	1,256·10	....
		Sundry claims	....	....	....	....	....	215·60	....	379·05	308·48	....
Randalls	....	Voided leases	....	....	....	....	....	....	60·04	33,180·35	11,100·46	....
		Sundry claims	....	1·68	28·25	5·02	....	20·70	9·79	4,842·56	1,216·07	....
Taurus	....	Voided leases	....	....	....	....	....	2·06	3·70	1,765·10	909·84	....
		Sundry claims	....	....	....	....	....	112·69	51·88	2,656·60	1,049·81	....

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 1957					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.												
BULONG DISTRICT—*continued.*												
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	....
		From District generally :—										
		Sundry Parcels treated at :										
		Various Works	....	....	....	....	....	....	....	6,102·15	6,675·38	....
		Reported by Banks and Gold Dealers	....	....	....	....	....	25,224·93	70·15	·01	28·44	....
		Total	....	**1·68**	**579·25**	**107·91**	....	**27,405·22**	**16,034·57**	**185,900·55**	**131,971·21**	**12·92**
Coolgardie Goldfield.												
COOLGARDIE DISTRICT.												
Bonnievale	5986	Jenny Wren	....	....	22·25	7·48	....	....	....	22·25	7·48	....
	5622	Lucky Hit	....	....	53·00	19·68	....	....	3·28	998·60	511·27	....
	4600	Melva Maie	....	....	137·50	24·18	....	....	....	3,759·90	3,838·67	2·35
		Prior to transfer to present holders	....	....	....	....	....	....	....	614·50	1,099·21	11·63
	5977	Mystery	....	....	67·75	8·14	....	....	....	463·75	177·96	....
	5890	Rayjax	....	....	55·00	114·83	....	....	....	256·50	553·80	....
		Voided leases	....	....	....	....	....	....	212·48	357,741·97	191,281·36	5·88
		Sundry claims	....	....	45·25	20·57	....	....	163·19	8,064·63	5,356·32	·04
Bulla Bulling	....	Voided leases	....	....	....	....	....	....	....	953·31	719·78	....
		Sundry claims	....	....	207·25	86·76	....	5·21	15·98	1,893·01	753·35	....
Burbanks	5605	Burbanks Deeps	....	....	....	....	....	....	....	103·00	53·46	....
		Voided leases	....	....	....	....	....	14·90	376·98	420,488·86	306,392·85	521·06
		Sundry claims	....	....	79·25	26·34	....	55·05	497·55	16,129·85	8,988·67	....
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	....
	5935, etc.	Gold Mines of Kalgoorlie (Aust.) Ltd.	....	....	26,341·00	10,306·96	....	....	....	51,989·00	21,067·79	907·43
	5876	Bayleys West (New Coolgardie Gold Mines N.L.)	....	....	....	....	....	....	....	6·25	2·22	....

	5868	El Dorado	....	....	....	....	9·25	·93	....	....	498·20	175·45	1,034·94	....	
	5844	Jackpot	....	....	....	....	1,141·00	393·46	....	....	....	7,212·75	2,763·83	....	
	5884	Lone Hand	....	....	....	....	....	....	....	....	19·85	475·25	77·30	....	
	(5954)	Pat Jan	....	....	....	....	40·00	3·72	....	....	·43	72·00	12·80	....	
		Voided leases	....	....	....	....	....	....	....	1,301·71	4,763·64	1,108,487·54	449,248·69	4,819·59	
		Sundry claims	....	....	....	·86	3·38	2,290·50	371·94	....	218·69	2,717·72	74,982·44	27,671·03	....
Eundynie	....	Voided leases	....	....	....	....	....	....	....	....	3·70	16·09	31,772·98	16,531·34	1·75
		Sundry claims	....	....	....	....	147·04	....	29·74	....	....	229·32	694·12	497·75	....
Gibraltar	....	5990	Eleventh Hour	....	....	....	....	104·00	3·05	....	....	....	104·00	3·05	....
		5723	Lloyd George	....	....	....	....	....	....	....	....	....	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	Chatanooka	....	....	....	....	....	....	....	....	....	....	1,267·75	295·73	1·10
		P.P.L. 335	D. and C. P. Clews	....	....	....	....	38·75	39·35	....	....	....	....	149·75	119·66	....
		P.P.L. 338	Dry Hill	....	....	....	....	....	....	....	....	....	....	43·00	58·42	....
		P.P.L. 465	G. Dugan and Party	....	....	....	....	....	....	....	....	....	....	53·75	17·54	....
		P.P.L. 454	Golden Dollar	....	....	....	....	....	....	....	....	....	....	105·50	13·66	....
		P.P.L. 319	Lady May	....	....	....	....	12·50	51·37	....	....	....	....	12·50	51·37	....
		P.P.L. 319	Lady May	....	....	....	....	....	....	....	....	....	....	1,742·25	981·39	....
		P.P.L's. 316, 330	Gold Mines of Kalgoorlie (Aust.) Ltd.	....	....	....	....	9,346·00	7,372·36	....	....	....	....	259,731·00	132,723·72	29,871·18
		P.P.L. 316	(Surprise Gold Mine)	....	....	....	....	....	....	....	....	....	....	7,189·00	3,425·59	....
		P.P.L. 330	(Barbara)	....	....	....	....	....	....	....	....	....	....	2,157·75	1,655·63	....
			Cancelled leases	....	....	....	....	....	....	....	....	451·32	13,950·84	11,118·69	....
			Sundry claims and leases	....	....	....	....	....	....	....	1·63	132·06	1,948·00	856·51	....
Higginsville	....	5985	New Hope	....	....	....	....	54·00	4·80	....	....	....	54·00	4·80	....
		5877	Sons of Erin	....	....	....	....	24·00	25·16	1·21	....	26·40	44·00	33·60	1·21
		5293	Two Boys	....	....	....	....	....	....	....	....	....	360·00	1,260·43	·01
		5293	(Two Boys)	....	....	....	....	....	....	....	....	....	6,888·00	3,193·95	....
			Voided leases	....	....	....	....	....	....	....	....	407·74	66,461·35	20,595·60	159·52
			Sundry claims	....	....	....	....	10·00	6·10	....	....	187·25	3,664·76	1,957·50	....
Larkinville	....	Voided leases	....	....	....	....	....	....	....	22·77	54·44	2,335·16	3,256·49	....	
		Sundry claims	....	....	....	....	....	....	....	....	147·20	448·53	1,029·03	....	
Logans	....	5324, etc.	Spargo's Reward Gold Mine (1935) N.L.	....	....	....	....	....	....	....	....	....	105,397·50	26,324·42	....
			Voided leases	....	....	....	....	....	....	....	....	....	1,263·31	607·26	....
			Sundry claims	....	....	....	....	28·00	3·96	....	6·88	128·95	1,997·10	911·43	....
Londonderry	....	Voided leases	....	....	....	....	....	....	....	....	95·04	34,155·35	22,238·37	·35	
		Sundry claims	....	....	....	....	·17	248·50	5·36	....	16·68	78·66	4,164·17	2,671·71	22·42
Mungari	....	Voided leases	....	....	....	....	....	....	....	....	....	17·71	1,872·50	458·43	....
		Sundry claims	....	....	....	....	....	41·00	2·06	....	1·77	153·24	2,828·94	752·60	....

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 1957					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.*										
Paris	5873	Paris West	....	....	....	....	....	....	....	19·00	11·03	....
		Voided leases	....	....	....	....	....	·88	4·30	15,497·00	8,625·37	79·19
		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	1,417·14	1,034·03	....
Ryans Find		Voided leases	....	....	....	....	....	....	....	54·16	151·69	....
		Sundry claims	....	....	....	....	....	....	·44	116·44	355·83	....
St. Ives		Voided leases	....	....	....	....	....	63·34	146·87	39,318·46	16,208·86	....
		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	1,324·87	1,307·03	....
Widgiemooltha	5663	Bobs	....	....	....	....	....	....	....	16·00	4·94	....
	5834	Harpers	....	....	....	....	....	....	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	....	....	....	....	....	46·49	470·06	16,186·16	6,863·69	·07
		From District generally :—										
		Sundry Parcels treated at :										
		State Battery, Coolgardie	....	....	....	*95·62	....	....	....	771·01	*38,445·36	17·00
		Australian Machinery and Investment Coy. Ltd. Cyanide Plant (T.L's. 63H and 127H)	....	....	....	....	....	....	....	....	*3,044·44	86·31
		T. A. James (T.a. 201)	....	....	....	*5·68	....	....	....	361·00	*373·02	....
		Various Works	....	....	....	....	....	7·75	....	4,014·61	*29,780·07	223·06
		Reported by Banks and Gold Dealers	22·45	1·65	....	4·68	....	14,964·22	725·51	48·25	128·33	·65
		Total	**23·31**	**152·67**	**40,395·75**	**19,034·28**	**1·21**	**16,992·42**	**17,013·79**	**2,821,115·35**	**1,455,733·77**	**36,731·97**
		KUNANALLING DISTRICT.										
Carbine	970S	Carbine	....	....	....	....	....	....	....	13,820·00	7,047·96	....
	970S	(Carbine Leases)	....	....	....	....	....	....	687·98	51,991·86	39,862·25	....
		Voided leases	....	....	....	....	....	....	....	20,116·00	5,470·81	....
		Sundry claims	....	3·00	5·00	2·43	....	136·08	96·96	6,245·63	2,255·26	....

Chadwin	1047S	Resolute	....	....	....	....	....	....	....	....	....	51·75	56·73	....
		Voided leases	....	....	....	....	....	....	....	....	....	4,781·55	5,232·25	2·50
		Sundry claims	....	....	....	....	....	....	14·28	82·36	5,972·55	2,945·14	·25
Dunnsville	....	Voided leases	....	....	....	....	....	....	....	828·58	17,548·85	8,657·45	....
		Sundry claims	....	....	74·50	14·58	....	21·00	1,034·08	2,990·71	2,084·70	....
Jourdie Hills	....	Voided leases	....	....	....	....	....	....	18·00	28,009·74	19,401·09	28·45
		Sundry claims	....	....	50·25	8·18	....	1·86	49·81	1,931·75	875·15	1·05
Kintore	....	Voided leases	....	....	....	....	....	18·70	169·33	56,822·89	40,044·61	677·88
		Sundry claims	....	....	26·75	5·00	....	111·91	102·70	4,561·03	2,530·88	....
Kunanalling	....	Voided leases	....	....	....	....	....	86·13	1,734·92	130,303·61	100,812·73	40·77
		Sundry claims	....	·23	84·50	22·84	....	216·53	815·72	15,086·27	9,666·89	....
Kundana	....	Voided leases	....	....	....	....	....	....	....	465·00	68·12	....
		Sundry claims	....	....	....	....	....	....	....	475·25	60·38	....
		From District generally :—										
		Sundry Parcels treated at :										
		Goldfields Australian Development Cyanide Plant	....	....	....	....	....	....	....	....	*548·07	....
		Various Works	....	....	....	....	....	42·23	....	1,782·26	*5,063·55	....
		Reported by Banks and Gold Dealers	....	....	....	....	....	868·40	17·93	....	5·85	·49
		Total	....	**3·23**	**241·00**	**53·03**	....	**1,517·12**	**5,638·37**	**362,956·70**	**252,689·87**	**751·39**

Yilgarn Goldfield.

Blackbourne's	....	Voided leases	....	....	....	....	....	....	....	....	1,282·50	341·37	....
		Sundry claims	....	....	....	....	....	....	....	....	392·50	81·15	....
Bullfinch	3350, etc.	Great Western Consolidated N.L.	....	....	380,144·00	51,988·15	16,000·69	....	....	2,086,331·00	284,731·53	89,631·84
		Prior to transfer to present holders	....	....	....	....	....	....	64·80	78,404·34	24,644·88	....
	4287	Volcana	....	....	....	....	....	....	....	175·00	166·03	....
		Voided leases	....	....	....	....	....	....	10·14	490,361·07	185,489·03	27,958·41
		Sundry claims	....	....	....	....	....	8·47	37·04	7,484·75	4,068·00	....
Corinthian	3398	Great Western Consolidated N.L.	....	....	30,853·00	6,127·43	1,541·71	....	....	32,868·00	6,345·26	1,541·71
		Prior to transfer to present holders	....	....	....	....	....	....	....	14,416·58	6,248·03	....
	4180	Deliverance	....	....	....	....	....	....	....	480·00	167·55	....
		Voided leases	....	....	....	....	....	....	23·46	138,241·40	33,293·21	....
		Sundry claims	....	....	....	....	....	....	2·68	1,088·35	640·61	....
Eenuin	4414	Birthday	....	15·00	130·00	141·37	....	....	15·00	160·00	183·37	....
	4425	Patricea Lea	....	....	10·00	19·36	....	....	....	10·00	19·36	....
		Voided leases	....	....	....	....	....	....	181·74	10,038·06	10,457·92	·01
		Sundry claims	....	....	28·00	33·70	....	2·50	73·97	2,750·60	1,964·56	....
Evanston	....	Voided leases	....	....	....	....	....	....	79·27	64,533·06	33,191·88	10·14
		Sundry claims	....	....	....	....	....	4·98	....	638·35	159·55	....

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 1957					Tota 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.												
Forrestonia	....	Voided leases	....	....	....	....	....	....	....	1,185·00	298·15	....
		Sundry claims	....	....	....	....	....	....	....	378·00	144·01	....
Golden Valley	4247	Lily of the Valley	....	....	....	....	....	....	....	709·00	177·73	....
	4220	Manxman South	....	....	....	....	....	....	....	19·00	4·42	....
	4427, etc.	Radio Leases	....	....	1,482·00	1,864·91	51·65	....	2·70	31,652·80	55,003·42	771·86
		Voided leases	....	....	....	....	....	....	36·34	36,835·92	28,969·41	10·99
		Sundry claims	....	3·75	....	....	....	4·58	241·60	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	3,099·58	816·65	....
Holleton	37P.P.	Brittania	....	....	....	....	....	....	....	2,150·00	1,711·48	....
		Voided leases	....	....	....	....	....	....	9·33	45,003·25	13,147·88	36·69
		Sundry claims	....	....	....	....	....	....	3·75	3,464·05	923·78	·20
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	....	....	40·00	15·82	....	....	....	5,284·00	1,164·76	·63
		Voided leases	....	....	....	....	....	....	18·76	55,876·63	21,625·66	·59
		Sundry claims	....	....	....	....	....	....	5·06	8,700·50	2,337·49	....
Koolyanobbing	....	Voided leases	....	....	....	....	....	....	·99	1,768·05	972·77	....
		Sundry claims	....	....	10·00	·88	....	·26	17·33	666·10	330·08	....
Marvel Loch	4243	Christmas Gift	....	....	....	....	....	....	32·56	75·60	52·95	....
	13P.P.	Cricket	....	....	....	....	....	....	....	1,671·00	932·04	....
	4039	Cromwell	....	....	188·00	28·47	....	....	....	821·00	126·93	....
	3942, etc.	Edward's Reward Leases	....	....	....	....	....	....	....	64,780·50	28,472·56	....
	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 Furness	....	....	438·00	178·82	....	....	....	14,189·75	6,852·71	....
	4375	Great Western Consolidated N.L.	....	....	14,802·00	2,408·63	595·96	....	....	15,099·00	2,459·84	595·96
	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	....

	4384	Newry	....	....	110·00	33·35	....	....	....	218·00	60·74	....
	4362	North Star	....	....	....	....	....	....	....	104·00	18·60	....
	4035	Undaunted	....	....	....	....	....	....	....	865·00	113·59	....
		Voided leases	....	....	....	....	....	....	1,504·26	860,034·48	206,859·69	2,474·95
		Sundry claims	....	....	465·00	64·07	....	11·35	809·31	36,343·61	13,436·90	·04
Mt. 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	....	....	540·00	68·62	....	2·03	....	583·00	97·60	....
	4345	Speedie	....	....	....	....	....	....	....	90·00	38·03	....
	M.L. 4	Yellowdine Gold Development Pty. Ltd. (in liquidation)	....	....	....	....	....	....	....	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	81P.P.	Golden View	....	72·16	5·00	9·60	....	....	72·16	50·00	87·03	....
	88P.P.	Lynette	....	....	48·00	8·79	....	....	....	660·00	205·28	....
	76P.P.	Marjorie Glen Reward	....	....	296·00	384·52	....	....	191·46	2,158·00	3,111·61	....
	3555	No Trumps	....	....	....	....	....	....	....	5,562·37	853·06	....
		Voided leases	....	....	....	....	....	3·84	5·20	496·00	122·17	....
		Sundry claims	....	....	....	....	....	....	1·85	749·00	952·01	....
Parkers Range	4423	Spring Hill	....	....	52·00	8·73	....	....	....	52·00	8·73	....
		Voided leases	....	....	....	....	....	·42	270·76	63,642·10	32,711·48	26·46
		Sundry claims	....	....	121·00	15·52	....	6·59	303·93	12,512·30	5,425·23	·98
Southern Cross	4002, etc.	Great Western Consolidated N.L.	....	....	37,000·00	12,842·30	3,570·91	....	....	64,213·00	23,121·71	6,384·26
		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	....	....	211·50	31·39	....	....	....	999·50	518·70	....
		Voided leases	....	....	....	....	....	....	4·06	596,118·64	380,916·67	5,104·07
		Sundry claims	....	....	....	....	....	9·51	64·96	4,310·76	2,823·33	·72
	From Goldfield generally :—											
	Sundry Parcels treated at :											
	W. B. Ridge (late Evanston Leases)		....	....	....	*461·33	119·65	....	....	....	*461·33	119·65
	State Battery, Marvel Loch		....	....	....	*409·47	....	....	....	29·00	*1,281·19	....
	Great Western Consolidated (Copperhead)		....	....	....	*2,751·96	283·86	....	....	....	*5,084·50	283·86
	Great Western Consolidated (Nevoria)		....	....	....	....	....	....	....	....	*276·58	....
	Cyril V. Davies, L.T.T. 1344H		....	....	....	....	....	....	....	....	*15·19	....
	Great Western Consolidated (Frasers)		....	....	....	*960·44	27·63	....	....	....	*1,131·76	27·63
	Kurrajong Battery		....	....	....	....	....	....	....	....	*409·57	....
	Pilot Cyanide Plant		....	....	....	....	....	....	....	30·00	*3,753·59	....
	R. R. Robinson (L.T.T. 1315H)		....	....	....	....	....	....	....	....	*1,408·40	....
	Three Boys Cyanide Plant		....	....	....	*12·46	....	....	....	7·00	*3,846·33	....
	E. Coward (L.T.T. 1366H)		....	....	10·00	4·89	....	....	....	10·00	4·89	....
	W. J. Grace (L.T.T. 1279H)		....	....	....	*19·22	....	....	....	....	*82·38	....
	Various Works		....	....	....	....	....	....	....	341·48	*99,101·07	107·98
	Reported by Banks and Gold Dealers		....	9·68	....	....	....	323·20	81·41	·60	120·60	....
		Total	....	**100·59**	**466,983·50**	**80,894·20**	**22,192·06**	**2,193·56**	**5,475·33**	**6,047,552·45**	**2,060,096·43**	**138,786·33**

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 1957					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.												
Buldania		Voided leases	....	....	....	....	....	....	3·02	846·05	708·99	....
		Sundry claims	....	....	....	....	....	....	39·25	1,324·27	861·36	·72
Dundas	(1860)	Coronation	....	....	17·00	1·02	....	....	....	138·50	15·15	....
		Voided leases	....	....	....	....	....	1·88	28·02	6,103·48	2,545·38	155·02
		Sundry claims	....	....	18·00	11·34	1·32	·76	413·85	2,148·75	1,114·16	19·64
Norseman	1859	Mt. Barker	....	....	....	....	....	....	....	30·50	4·51	·19
	1288, etc.	Central Norseman Gold Corporation N.L.	....	....	168,846·00	91,913·49	46,586·03	....	....	2,493,632·20	1,036,424·63	767,839·96
		Prior to transfer to present holders	....	....	....	....	....	....	1,663·32	69,819·83	47,892·08	16,508·85
	1315, etc.	Norseman Gold Mines N.L.	....	....	....	*108·55	....	....	....	964,099·00	241,009·50	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	915,759·17	601,761·91	39,001·04
		Sundry claims	....	....	164·00	36·27	7·42	1,052·09	3,402·99	47,623·20	22,281·88	208·06
Peninsula		Voided leases	....	....	....	....	....	....	24·29	9,603·39	6,102·61	12·20
		Sundry claims	....	....	....	....	....	....	....	217·25	119·32	·97
	From Goldfield generally :—											
	Sundry Parcels treated at :											
	State Battery, Norseman		....	....	....	....	....	....	....	417·89	*25,351·51	1,051·13
	Various Works		....	....	....	....	....	....	54·52	760·64	15,104·14	2,588·35
	Reported by Banks and Gold Dealers		....	....	....	....	....	1,181·77	49·59	47·50	21·37	·70
	Total		....	....	**169,045·00**	**92,070·67**	**46,594·77**	**2,250·77**	**16,280·00**	**4,533,228·62**	**2,005,228·10**	**1,185,574·37**
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	6,434·68	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.	....	....	....	....	....	....	....	....	....	....	....	1·99	....
	M.Cs. 35, 50, 419	Ravensthorpe Copper Mines N.L.	....	....	....	....	§356·74	738·97	....	....	....	....	§356·74	738·97	
	M.L. 421	Big Surprise	....	....	....	....	§2·51	83·72	....	....	6·46	§3·03	116·48		
		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		
West River	....	Voided leases	....	....	....	....	....	....	....	....	....	10·34	31·06		
		Sundry claims	....	....	....	....	....	....	....	....	....	6·60	3·44		
	From Goldfield generally :														
	Sundry Parcels treated at :														
	F. E. Daw (T.A. 11)	....	....	....	....	....	....	....	....	....	*128·45	....			
	Various Works	....	....	....	....	....	....	....	....	....	27·00	*4,118·73	515·43		
	Reported by Banks and Gold Dealers	....	....	....	....	....	....	....	164·69	12·31	....	4·76	....		
	Total	....	....	....	**359·25**	**822·69**	**607·11**	**821·02**	**130,491·99**	**104,390·45**	**16,882·05**				

Outside Proclaimed Goldfield.

Burracoppin	....	Voided leases	....	....	....	....	....	....	....	....	710·85	706·38	....		
		Sundry claims	....	....	....	....	....	....	....	·98	372·75	213·97	....		
Donnybrook	....	Voided leases	....	....	....	....	....	....	23·24	....	1,613·30	816·23	....		
		Sundry claims	....	....	....	....	....	....	44·01	43·03	119·50	15·71	15·18		
Jimperding	45P.P.	Hillsdale	....	....	....	....	....	....	....	....	1,261·75	308·00	....		
Northampton	....	Sundry lead claims	....	....	....	....	21·52	....	....	....	....	2,624·03			
Ongerup	103H	Hornblende	....	....	....	....	....	....	....	....	24·50	2·85	....		
		Sundry claims	....	....	....	....	....	....	....	1·58	·33	1·74	....		
	From State generally :—														
	Sundry Parcels treated at :														
	Miscellaneous voided leases and sundry claims	....	....	....	....	....	245·83	3·07	210·35	45·19	....				
	Sundry specimens	....	....	....	....	....	4·24	56·85	....	....	....				
	Various Works	....	....	....	....	....	....	....	27·00	9,009·75	31,521·73				
	Reported by Banks and Gold Dealers	4·45	10·11	....	1·78	144·85	1,124·58	942·21	....	458·10	549·11				
	Total	**4·45**	**10·11**	....	**1·78**	**166·37**	**1,441·90**	**1,047·72**	**4,340·33**	**11,577·92**	**34,710·05**				

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 1957

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	....	....	....	....	....	....	....	....	67·85	....	....	67·85	....
West Kimberley	....	....	....	....	....	....	....	....	....	....	....	....	....
Pilbara	Marble Bar	1·33	·67	1,360·75	502·58	504·58	2,790·95	31·96	33·35	2,006·25	720·17	785·48	3,325·93
	Nullagine	30·63	32·68	645·50	217·59	280·90	534·98						
West Pilbara	....	....	....	....	....	....	....	....	....	....	56·95	56·95	28·41
Ashburton	....	....	....	....	....	....	....	·69	....	....	....	·69	758·34
Gascoyne	....	....	....	....	....	....	....	....	....	....	....	....	....
Peak Hill	....	....	....	....	....	....	....	....	....	1,820·80	259·58	259·58	....
East Murchison	Lawlers	3·75	....	30·00	7·94	11·69	430·95	6·74	....	135·75	198·60	205·34	652·18
	Wiluna	....	....	....	116·23	116·23	4·50						
	Black Range	2·99	....	105·75	74·43	77·42	216·73						
Murchison	Cue	4·12	....	1,087·00	661·54	665·66	62·02	31·38	....	115,750·60	85,596·07	85,627·45	2,204·08
	Meekatharra	19·04	....	4,660·25	889·11	908·15	....						
	Day Dawn	4·29	....	1,015·25	70·68	74·97	....						
	Mt. Magnet	3·93	....	108,988·10	83,974·74	83,978·67	2,142·06						
Yalgoo	....	....	....	....	....	....	....	2·02	....	835·50	110·23	112·25	·07
Mt. Margaret	Mt. Morgans	5·12	....	565·10	256·66	261·78	....	7·07	....	140,529·75	32,511·91	32,518·98	2,809·84
	Mt. Malcolm	1·95	....	138,646·65	31,399·18	31,401·13	2,640·57						
	Mt. Margaret	....	....	1,318·00	856·07	856·07	169·27						
North Coolgardie	Menzies	·10	36·96	32,444·58	16,454·99	16,492·05	....	·10	482·00	40,737·83	23,043·23	23,525·33	534·24
	Ularring	....	445·04	2,592·25	2,265·32	2,710·36	....						
	Niagara	....	....	2,445·00	1,142·13	1,142·13	....						
	Yerilla	....	....	3,256·00	3,180·79	3,180·79	534·24						
Broad Arrow	....	....	....	....	....	....	....	12·75	12·12	5,705·90	2,902·86	2,927·73	9·06
N.E. Coolgardie	Kanowna	2·85	2·38	382·25	104·42	109·65	....	2·85	2·38	410·75	110·27	115·50	....
	Kurnalpi	....	....	28·50	5·85	5·85	....						
East Coolgardie	East Coolgardie	8·45	56·94	1,965,833·45	510,654·99	510,720·38	103,121·31	8·45	58·62	1,966,412·70	510,762·90	510,829·97	103,121·31
	Bulong	....	1·68	579·25	107·91	109·59	....						
Coolgardie	Coolgardie	23·31	152·67	40,395·75	19,034·28	19,210·26	1·21	23·31	155·90	40,636·75	19,087·31	19,266·52	1·21
	Kunanalling	....	3·23	241·00	53·03	56·26	....						
Yilgarn	....	....	....	....	....	....	....	....	100·59	466,983·50	80,894·20	80,994·79	22,192·06
Dundas	....	....	....	....	....	....	....	....	....	169,045·00	92,070·67	92,070·67	46,592·77
Phillips River	....	....	....	....	....	....	....	....	....	....	359·25	359·25	822·69
Outside Proclaimed Goldfields		....	....	....	....	....	....	4·45	10·11	....	1·78	16·34	166·37
Total		....	....	....	....	....	....	131·77	922·92	2,951,011·08	848,685·98	849,740·67	183,220·56

TABLE III.

Return showing total production reported to the Mines Department, and respective Districts and Goldfields from whence derived, to 31st December, 1957

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		....	....	....	....	....	....	8,983·73	2,838·83	22,721·90	17,226·52	29,049·08	128·76
West Kimberley		....	....	....	....	....	....	1·30	24·68	1·00	2·49	28·47	13,575·29
Pilbara	Marble Bar	15,250·89	4,565·07	331,113·17	325,072·35	344,888·31	32,201·66	25,622·98	7,431·53	466,876·87	453,167·10	486,221·61	33,268·96
	Nullagine	10,372·09	2,866·46	135,763·70	128,094·75	141,333·30	1,067·30						
West Pilbara		....	....	....	....	....	....	6,334·78	374·74	24,680·96	24,277·10	30,986·62	1,909·60
Ashburton		....	....	....	....	....	....	9,266·82	482·46	6,807·10	2,913·43	12,662·71	40,389·76
Gascoyne		....	....	....	....	....	....	693·44	62·97	387·00	517·29	1,273·70	....
Peak Hill		....	....	....	....	....	....	3,376·86	5,300·33	763,384·23	320,440·90	329,118·09	3,768·47
East Murchison	Lawlers	6,908·05	2,343·19	2,011,381·92	822,708·49	831,959·73	26,721·72						
	Wiluna	224·85	1,254·11	8,873,554·94	1,872,070·11	1,873,549·07	10,286·88	8,803·30	22,119·10	12,614,223·83	3,648,307·89	3,679,230·29	59,720·89
	Black Range	1,670·40	18,521·80	1,729,286·97	953,529·29	973,721·49	22,712·29						
Murchison	Cue	5,092·47	9,096·19	6,808,021·79	1,400,281·62	1,414,470·28	274,048·47						
	Meekatharra	14,614·99	18,164·04	2,290,699·96	1,305,248·16	1,338,027·19	5,119·88						
	Day Dawn	3,241·76	11,341·63	2,036,040·13	1,375,410·92	1,389,994·31	169,434·20	25,519·92	59,035·72	13,345,835·03	5,190,207·24	5,274,762·88	462,768·04
	Mt. Magnet	2,570·70	20,433·86	2,211,073·15	1,109,266·54	1,132,271·10	14,165·49						
Yalgoo		....	....	....	....	....	....	1,789·28	3,223·19	442,239·33	263,644·97	268,657·44	1,502·63
Mt. Margaret	Mt. Morgans	3,491·66	9,380·81	1,214,958·31	717,151·51	730,023·98	5,812·32						
	Mt. Malcolm	3,923·30	16,649·68	6,904,801·47	2,877,407·62	2,897,980·60	173,332·88	11,485·66	35,384·84	10,644,789·42	4,768,401·58	4,815,272·08	245,332·23
	Mt. Margaret	4,070·70	9,354·35	2,525,029·64	1,173,842·45	1,187,267·50	66,187·03						
North Coolgardie	Menzies	1,675·32	6,983·00	1,671,806·88	1,298,536·68	1,307,195·00	31,272·59						
	Ularring	129·52	7,203·12	526,408·35	437,136·65	444,469·29	21,928·23						
	Niagara	1,718·36	1,821·77	935,914·02	525,595·86	529,135·99	5,686·69	4,835·11	19,825·01	3,413,322·28	2,427,438·32	2,452,098·44	62,489·75
	Yerrila	1,311·91	3,817·12	279,193·03	166,169·13	171,298·16	3,602·24						
Broad Arrow		....	....	....	....	....	....	21,979·12	27,475·30	1,343,316·74	734,119·85	783,574·27	5,305·71
N.E. Coolgardie	Kanowna	106,525·68	13,520·90	1,006,139·76	626,225·29	746,271·87	3,039·73	119,360·13	21,819·81	1,019,610·58	644,944·47	786,124·41	3,052·44
	Kurnalpi	12,834·45	8,298·91	13,470·82	18,719·18	39,852·54	12·71						
East Coolgardie	East Coolgardie	33,635·44	41,036·54	71,429,433·35	32,335,030·97	32,409,702·95	4,867,062·32	61,040·66	57,071·11	71,615,333·90	32,467,002·18	32,585,113·95	4,867,075·24
	Bulong	27,405·22	16,034·57	185,900·55	131,971·21	175,411·00	12·92						
Coolgardie	Coolgardie	16,992·42	17,013·79	2,821,115·35	1,455,733·77	1,489,739·98	36,731·97	18,509·54	22,652·16	3,184,072·05	1,708,423·64	1,749,585·34	37,483·36
	Kunanalling	1,517·12	5,638·37	362,956·70	252,689·87	259,845·36	751·39						
Yilgarn		....	....	....	....	....	....	2,193·56	5,475·33	6,047,552·45	2,060,096·43	2,067,765·32	138,786·33
Dundas		....	....	....	....	....	....	2,250·77	16,280·00	4,533,228·62	2,005,228·10	2,023,758·87	1,185,574·37
Phillips River		....	....	....	....	....	....	607·11	821·02	130,491·99	104,390·45	105,818·58	16,882·05
Outside Proclaimed Goldfields		....	....	....	....	....	....	1,441·90	1,047·72	4,340·33	11,577·92	14,067·54	34,710·05
	Total	....	....	....	....	....	....	334,095·97	308,745·85	129623215·61	56,852,327·87	57,495,169·69	7,213,723·93

TABLE IV.

Total output of Gold (Bullion and Concentrates entered for Export and Gold reviewed at the Perth Branch of the Royal Mint) from 1st January, 1886, to 31st December, 1957; Showing in Fine Ounces the quantity credited to 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 1954	22,422·06	16,602·97	39,025·03	170,892·47	383,329·18	554,221·65
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
1956	....	172·97	172·97	673·60	913·63	1,587·23
1957	....	69·13	69·13	13·28	787·95	1,801·23
Total	22,422·06	17,093·86	39,517·92	175,478·03	388,800·04	564,278·07
		(*a*) West Pilbara.			**Ashburton.**	
Prior to 1954	4,351·11	26,896·41	31,247·52	4,104·96	6,322·31	10,427·27
1954	....	9·73	9·73	....	29·31	29·31
1955	....	2·29	2·29	....	13·60	13·60
1956	....	7·59	7·59	....	1·01	1·01
1957	56·96	....	56·96	....	0·91	0·91
Total	4,408·07	26,916·02	31,324·09	4,104·96	6,367·14	10,472·10
		(*b*) Gascoyne.			**(*c*) Peak Hill.**	
Prior to 1954	304·55	1,068·17	1,372·72	41,102·76	220,912·73	262,015·49
1954	....	21·40	21·40	....	8,104·51	8,104·51
1955	....	....	....	....	103·50	103·50
1956	....	....	....	....	22·03	22·03
1957	....	0·60	0·60	....	272·50	272·50
Total	304·55	1,089·63	1,394·18	41,102·76	229,415·27	270,517·56
		East Murchison.			**Murchison.**	
Prior to 1954	259,358·66	3,024,334·85	3,283,693·51	1,577,213·58	3,581,797·65	5,159,011·23
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
1956	270·74	69·32	340·06	174·62	81,083·19	81,257·81
1957	13·40	228·44	241·84	25·02	81,012·11	89,037·13
Total	259,740·39	3,024,879·83	3,284,620·22	1,577,543·66	3,946,882·62	5,532,426·28
		(*d*) Yalgoo.			**(*e*) Mt. Margaret.**	
Prior to 1954	13,650·56	197,225·11	210,875·67	694,644·87	3,841,151·35	4,535,796·22
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
1956	....	0·48	0·48	64·85	25,986·30	25,051·15
1957	....	108·58	108·58	124·30	32,622·75	32,747·05
Total	13,650·56	197,344·57	210,995·13	695,144·38	3,950,215·17	4,645,359·55
		(*f*) North Coolgardie.			**(*g*) Broad Arrow.**	
Prior to 1954	263,511·77	2,061,134·13	2,324,645·90	122,799·54	441,749·24	564,548·78
1954	23·84	19,767·03	19,790·87	40·96	2,343·13	2,384·09
1955	117·56	19,410·57	19,538·13	75·50	1,559·24	1,634·74
1956	14·67	21,752·28	21,766·95	3·72	1,802·30	1,806·02
1957	....	24,178·72	24,178·72	....	2,548·36	2,548·36
Total	263,667·84	2,146,242·73	2,409,910·57	122,919·72	450,002·27	572,921·99
		(*f*) North-East Coolgardie.			**(*f*) East Coolgardie.**	
Prior to 1954	235,893·69	459,467·41	695,361·10	7,032,548·19	25,194,578·03	32,227,126·22
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
1956	....	128·27	128·27	946·39	491,466·14	492,412·53
1957	....	105·58	105·58	1,529·11	542,866·97	544,396·08
Total	235,893·69	459,956·57	695,850·26	7,037,380·59	27,536,332·61	34,273,713·20
		(*h*) Coolgardie.			**Yilgarn.**	
Prior to 1954	663,526·65	1,345,872·22	2,009,398·87	220,452·34	1,610,270·97	1,830,723·31
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
1956	22·72	10,828·17	10,850·89	70·98	86,353·75	86,424·73
1957	1·05	20,344·33	20,345·38	12·40	84,765·72	84,778·12
Total	663,584·23	1,413,165·35	2,111,490·52	220,630·67	1,910,727·89	2,131,358·56
		(*i*) Dundas.			**(*j*) Phillips River.**	
Prior to 1954	170,787·39	1,564,030·69	1,734,818·08	40,650·82	63,932·85	104,583·67
1954	....	78,668·52	78,668·52	....	437·74	437·74
1955	....	88,031·33	88,031·33	....	3·06	3·06
1956	....	88,670·54	88,670·54	0·52	....	0·52
1957	....	95,726·05	95,726·05	266·75	92·49	359·24
Total	170,787·39	1,915,137·13	2,085,914·52	40,918·09	74,466·14	105,384·23
		¶ Donnybrook.			**Outside Proclaimed Goldfields.**	
Prior to 1954	282·21	557·53	839·74	22,769·12	41,607·31	64,376·43
1954	....	....	....	....	557·59	557·59
1955	....	....	....	....	704·33	704·33
1956	....	....	....	88·29	790·31	879·00
1957	....	....	....	....	907·52	907·52
Total	282·21	557·53	839·74	22,857·41	44,567·46	67,424·87

(*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	1,874,920
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
1956	2,331·10	810,048·68	812,379·78	12,705,581
1957	2,042·27	894,638·71	896,680·98	14,038,185
Total	11,572,821·26	47,472,893·31	59,045,714·57	403,203,600

	1956. £A.	1957. £A.
Estimated total par value of above production	247,001,104	250,809,968
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	1,169,911	1,197,460
Exchange Premium paid by Mint above par value, 1930-1957 (approximate)	138,404,798	148,606,570
Estimated Total	£A389,165,415	£A403,203,600
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	484,357	496,784
Gross estimated value of gold won	£A389,811,220	£A403,861,832

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 1957, 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.
	tons.	£	tons.	£	tons.	£	tons.	tons.	£
Prior to 1954	1·50	9	9,073·05	215,865	‡38,674·08	747,205	7,883·66	3,870·93	157,298
1954	....	....	....	....	....	....	....	....	....
1955	....	....	....	....	....	....	....	....	....
1956	....	....	....	....	....	....	....	....	....
1957	....	....	....	....	....	....	....	....	....
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.
	tons	tons	£	tons	tons	£	tons	£
Prior to 1954	1,592·04	690·28	82,217	†9,501·93	4,574·77	240,115	10·10	959
1954	45·44	23·49	1,410	45·44	23·49	1,410	....	....
1955	203·88	59·11	230	203·88	59·11	230	....	....
1956	78·44	23·26	742	78·44	23·26	742	....	....
1957	....	....	....	....	....	....	....	....
Total	**1,919·80**	**796·14**	**84,599**	**9,819·69**	**4,680·63**	**242,497**	**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.		Tota	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons	£	tons	£	tons	£	tons	£
Prior to 1954	1,871·32	68,045	17,355·08	1,999,867	501·10	6,732	19,745·80	2,075,645
1954	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
1956	267·25	5,612	7,779·82	820,464	....	....	8,047·07	826,076
1957	360·52	8,031	12,133·66	1,229,670	....	....	12,494·18	1,237,701
Total	**2,640·33**	**84,645**	**87,243·59**	**5,104,745**	**501·10**	**6,732**	**49,003·37**	**5,197,136**

Period.	Barytes.							
	Murchison Goldfield.		North-East Coolgardie Goldfield.		Outside Proclaimed Goldfield.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons	£	tons	£	tons	£	tons	£
Prior to 1954	9·00	50	52·22	430	190·65	1,484	251·87	1,964
1954	111·74	615	....	....	932·00	7,016	1,043·74	7,631
1955	....	....	....	....	10·00	70	10·00	70
1956	426·10	2,031	....	....	501·00	3,156	927·10	5,187
1957	....	....	....	....	140·00	910	140·00	910
Total	**546·84**	**2,696**	**52·22**	**430**	**1,773·65**	**12,636**	**2,372·71**	**15,762**

Period.	Bentonite.		Bery l Ore.					
	Outside Proclaimed Goldfield.		Pilbara Goldfield.		Ashburton Goldfield.		Gascoyne Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons	£	tons	£	tons	£	tons	£
Prior to 1954	2,638·83	7,865	1,092·57	74,730	....	....	118·60	6,238
1954	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
1956	1,403·54	5,658	239·27	43,753	....	....	50·11	9,603
1957	741·79	2,981	284·05	52,129	....	....	22·73	4,399
Total	**6,602·70**	**23,206**	**1,894·63**	**208,394**	**0·14**	**25**	**214·30**	**24,327**

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.
	tons	£	tons	£	tons	£	lb.	£
Prior to 1954	8·00	1,390	121·70	9,554	1,378·90	83,229	5,634·31	1,884
1954	3·48	547	11·15	1,873	132·15	22,607	....	....
1955	2·33	439	11·47	2,185	198·63	34,430	....	....
1956	....	....	20·81	3,757	310·19	57,113	....	....
1957	·58	109	42·40	7,469	350·37	64,233	....	....
Total	**14·39**	**2,485**	**207·53**	**24,838**	***2,360·24**	**261,612**	**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, 10·61 tons valued at £219 from Outside Proclaimed Goldfield, and 0·58 tons valued at £109 from Yalgoo 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.
	tons	£	tons	£	tons	£	tons	£
Prior to 1954	5·00	25	2,741·00	40,817	41·75	207	139,706·18	92,868
1954	....	....	4,269·55	48,957	....	....	22,659·00	28,681
1955	....	....	....	....	....	....	41,912·32	32,693
1956	....	....	6,096·20	97,526	....	....	29,841·00	33,507
1957	....	....	1,312·30	20,996	....	....	17,849·70	21,831
Total	**5·00**	**25**	**14,409·05**	**207,296**	**41·75**	**207**	**241,968·20**	**209,680**

Period.	Clays (Cement, etc.)—*continued.*		Coal.		Copper Ore.			
	Total.		Collie Coalfield.		Pilbara Goldfield.		West Pilbara Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons	£	tons	£	tons	£	tons	£
Prior to 1954	*140,798·73	93,913	23981030·16	24,324,251	108·61	4,461	82,758·77	749,156
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	....	....
1956	29,841·00	33,507	830,006·65	2,797,506	22·71	1,058	....	....
1957	29,400·70	34,171	838,660·53	2,552,656	459·10	21,013	381·75	8,967
Total	**264,611·75**	**222,965**	**27571832·09**	**36,395,305**	**590·95**	**26,666**	**83,140·52**	**758,123**

* 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.
	tons	£	tons	£	tons	£	tons	£
Prior to 1954	378·07	6,937	47,861·82	231,003	95,924·47	589,467	180·70	2,046
1954	....	....	....	....	....	....	....	....
1955	....	....	....	....	....	....	....	....
1956	....	....	....	....	6·46	770	....	....
1957	4·59	325	19·92	404	558·83	13,189	....	....
Total	**382·66**	**7,262**	**47,881·74**	**231,407**	**96,489·76**	**603,426**	**180·70**	**2,046**

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.
	tons	£	tons	£	tons	£	tons	£
Prior to 1954	253,709·67	1,753,177	54·00	380	3,527·71	32,897	....	....
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
1956	212·23	12,742	....	....	2,331·23	18,418	1,853·17	42,971
1957	*1,303·97	58,563	....	....	629·86	5,380	1,859·93	41,814
Total	**†255,737·99**	**1,825,473**	**63·15**	**655**	**12,895·32**	**97,904**	**4,880·80**	**117,853**

* Including 264·83 tons valued at £6,906 from East Murchison Goldfield, 96·16 tons valued at £7,365 from Peak Hill Goldfield, 9·35 tons valued at £193 from Yalgoo Goldfield, and 9·44 tons valued at £201 from Northampton Mineral Field. † Including 109·52 tons valued at £1,709 from West Kimberley Goldfield, 649·76 tons valued at £14,089 from East Murchison Goldfield, 91·70 tons valued at £1,004 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, 1,226·78 tons valued at £48,939 from Peak Hill Goldfield, 24·035·69 tons valued at £119,698 from Northampton Mineral Field, 1,053·61 tons valued at £12,157 from Murchison Goldfield, and 3·39 tons valued at £339 from State generally. ‡ From West Kimberley 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.
	tons	£	tons	£	tons	£	tons	£
Prior to 1954	51·20	639	1,796·89	20,388	1,501·08	18,618	311·69	3,114
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
1956	2·00	53	2,443·12	37,839	411·43	7,261	524·93	4,589
1957	....	....	1,464·37	20,352	575·54	10,504	....	....
Total	**67·90**	**840**	**7,830·80**	**114,553**	**3,736·67**	**62,038**	**1,633·01**	**20,075**

Period.	Cupreous Ore (Fertiliser)—*continued.*							
	Yalgoo Goldfield.		Mt. Margaret Goldfield.		Broad Arrow Goldfield.		East Coolgardie Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons	£	tons	£	tons	£	tons	£
Prior to 1954	47·00	288	38·11	357	22·00	368	29·00	100
1954	....	....	72·86	660	....	....	....	....
1955	10·29	102	133·00	599	7·05	....	....	....
1956	....	....	81·67	807	5·54	11	....	....
1957	....	....	9·60	163	....	....	....	....
Total	**57·29**	**390**	**334·24**	**2,586**	**34·59**	**379**	**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.
	tons	£	tons	£	tons	£	tons	£
Prior to 1954	12·69	117	198·67	3,969	39·94	331	7,328·20	78,666
1954	....	....	116·00	2,047	....	....	4,748·11	50,381
1955	....	....	52·50	1,146	17·85	193	7,730·78	101,731
1956	....	....	32·48	1,259	1·19	22	7,713·31	113,442
1957	....	....	99·35	3,913	....	....	4,638·69	82,126
Total	**12·69**	**117**	**999·00**	**12,334**	**58·98**	**546**	***32,159·09**	**426,348**

* Includes 64·97 tons valued at £345 from Yilgarn Goldfield and 21·79 tons valued at £186 from Northampton Minera Field.

Period.	Diamonds.		Diatomaceous Earth.		Dolomite.		Emerald.	
	Pilbara Goldfield.		Outside Proclaimed Goldfield.		Murchison Goldfield.		Murchison Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Carats	£	tons	£	tons	£	Carats (cut and rough)	£
Prior to 1954	....	24	828·00	4,510	1,574·90	7,155	18,373·00	1,609
1954	....	....	150·00	1,579	....	....	....	....
1955	....	....	....	....	81·00	324	....	....
1956	....	....	....	....	171·00	690	....	....
1957	....	....	....	....	60·00	239	....	....
Total	....	**24**	**978·00**	**6,089**	**1,886·90**	**8,399**	**18,373·00**	**1,609**

Period.	Emerald—*continued.*				Emery.		Felspar.	
	Pilbara Goldfield.		Total.		West Kimberley Goldfield.		Coolgardie Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Carats (cut and rough)	£	Carats (cut and rough)	£	tons	£	tons	£
Prior to 1954	....	....	18,373·00	1,609	13·00	130	46,394·80	130,986
1954	8·68	313	8·68	313	....	....	3,173·00	14,293
1955	....	....	....	....	8·15	245	3,565·00	16,660
1956	....	....	....	....	....	....	2,773·00	17,686
1957	....	....	....	....	....	....	995·00	4,611
Total	**8·68**	**313**	**18,381·68**	**1,922**	**21·15**	**375**	**56,900·80**	**184,236**

Table VI.—*Minerals other than Gold*—continued.

Period.	Felspar—*continued.*				Fergusonite.		Fullel's Earth.	
	Outside Proclaimed Goldfield.		Total.		Pilbara Goldfield.		Outside Proclaimed Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons	£	tons	£	tons	£	tons	£
Prior to 1954	575·50	1,228	46,970·30	132,214	0·17	165	70·75	290
1954	52·91	198	3,225·91	14,491	....	....	....	....
1955	....	....	3,565·00	16,660	0·13	226	10·76	54
1956	8·00	32	2,781·00	17,718	....	....	40·13	201
1957	....	....	995·00	4,611	....	....	....	....
Total	**636·41**	**1,458**	**57,537·21**	**185,694**	**0·30**	**391**	**91·64**	**545**

* Including 30 tons valued at £86 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.
	tons	£	tons	£	tons	£	tons	£
Prior to 1954	1·00	112	28,763·20	21,590	5,448·00	108,162	38·10	277
1954	....	....	7,803·01	5,541	257·50	9,012	....	....
1955	....	....	6,758·98	4,801	196·50	7,407	110·00	990
1956	....	....	7,343·17	5,153	114 00	4,520	5·10	37
1957	....	....	5,692·86	3,914	126·00	5,040	....	....
Total	**1·00**	**112**	**56,361·22**	**40,999**	**6,042·00**	**134,141**	**153·20**	**1,304**

Period.	Gypsum.							
	Yilgarn Goldfield.		Dundas Goldfield.		Outside Proclaimed Goldfield.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons	£	tons	£	tons	£	tons	£
Prior to 1954	199,703·50	157,724	2,039·00	1,316	212,295·52	225,343	414,038·02	384,383
1954	24,347·00	18,290	30·00	15	16,765·00	1,3315	41,142·00	31,620
1955	38,807·00	2,9411	9·00	4	1,130·00	920	39,946·00	30,335
1956	21,389·00	16,163	....	....	5,732·00	4,764	27,121·00	20,928
1957	27,842·50	21,234	....	....	5,510·40	4,732	33,352·90	25,966
Total	**292,089·00**	**242,822**	**2,078·00**	**1,335**	**241,432·92**	**249,074**	**555,599·92**	**493,232**

Period.	Ilmenite Concentrates.		* Iron Ore (for Pig Iron).					
	Outside Proclaimed Goldfield.		Yilgarn Goldfield.		Outside Proclaimed Goldfield.		Total	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantiy.	Value.
	tons	£	tons	£	tons	£	tons	£
Prior to 1954	155·95	776	42,868·84	524,111	45,449·21	279,917	88,310·05	804,129
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
1956	3,293·40	15,150	19,853·60	278,846	....	....	19,853·60	278,846
1957	40,931·99	233,475	21,838·50	324,646	....	....	21,838·50	324,646
Total	**44,381·34**	**249,401**	**118,103·75**	**1,540,472**	**47,508·57**	**296,733**	**165,612·32**	**1,837,206**

* Excludes Iron Ore used as Flux :—Yilgarn Goldfield, 84·35 tons valued at £128 ; West Pilbara Goldfield, 100·00 tons valued at £300 ; East Coolgardie Goldfield, 450·00 tons valued at £247 ; West Kimberley Goldfield, 10·50 tons valued at £12 ; Greenbushes Mineral Field, 7,481·00 tons valued at £4,629 ; and Outside Proclaimed Goldfields, 49,938·50 tons valued at £31,732.

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.
	tons	£	tons	£	tons	£	tons	£
Prior to 1954	903,224·00	895,697	9·45	37	4,215·69	21,781	434,219·84	2,758,259
1954	634,514·00	629,325	....	....	....	....	1,338·94	70,370
1955	496,882·00	492,741	....	....	....	....	1,069·04	68,529
1956	327,815·00	323,923	....	....	....	....	4,955·43	552,322
1957	389,686·00	386,440	....	....	....	....	3,322·51	255,971
Total	**2,752,121·00**	**2,728,126**	**9·54**	**37**	**4,215·69**	**21,781**	**444,905·76**	**3,605,451**

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.
	tons	£	tons	£	tons	£	tons	£
Prior to 1954	1,052·96	2,413	2,237·92	6,051	4,269·82	9,718	7,950·70	18,182
1954	....	....	91·75	258	....	....	91·75	258
1955	....	....	....	....	....	....	....	....
1956	358·35	810	445·20	1,168	....	....	803·55	1,978
1957	....	....	....	....	....	....	....	....
Total	**1,811·31**	**3,223**	**2,774·87**	**7,477**	**4,269·82**	**9,718**	**8,856·00**	**19,418**

Period.	Manganese. (Metallurgical and Battery Grades)						Mica.	
	Pilbara Goldfield.		Peak Hill Goldfield.		Total.		Outside Proclaimed Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons	£	tons	£	tons	£	lb.	£
Prior to 1954	....	....	49,684·01	352,748	*49,727·86	353,040	†32,930·00	3,984
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	....	....
1956	7,525·25	102,159	49,596·00	542,706	57,323·14	648,956	....	....
1957	13,496·14	227,329	50,440·92	702,491	63,937·06	929,820	....	....
Total	**37,597·39**	**588,103**	**211,214·59**	**2,371,371**	**199,060·72**	**2,963,861**	**32,930·00**	**3,984**

* Includes 20 tons, valued at £180 from Mt. Margaret Goldfield and 24·85 tons, 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.						Petalite.	
	West Pilbara Goldfield.		Murchison Goldfield.		Total.		Coolgardie Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons	£	tons	£	tons.	£	tons	£
Prior to 1954	3,758·85	47,014	3,262·86	32,732	*7,157·69	80,656	5·19	52
1954	....	....	429·45	4,109	429·45	4,109	15·00	69
1955	41·60	917	303·59	2,996	345·19	3,913	....	....
1956	....	....	444·38	4,349	444·38	4,349	....	....
1957	....	....	27·30	273	27·30	273	....	....
Total	**3,790·45**	**47,931**	**4,467·60**	**44,459**	**8,414·01**	**93,300**	**20·19**	**121**

* Includes 20·61 tons valued at £330 from Kimberley Goldfield and 65·85 tons valued at £308 from East Coolgardie Goldfield.

Period.	Phosphatic Guano.		Pyrites.					
	Outside Proclaimed Goldfield.		Dundas Goldfield.		East Coolgardie Goldfield.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons	£	tons	£	tons	£	tons	£
Prior to 1954	10,799·73	59,174	413,738·00	2,147,525	....	....	†487,785·56	2,193,021
1954	....	....	56,150·00	441,466	....	....	56,150·00	441,466
1955	....	....	49,485·00	397,269	....	....	49,485·00	397,269
1956	....	....	48,426·00	362,949	12,542·98	57,103	60,968·98	420,052
1957	586·89	8,974	45,342·00	327,761	12,575·72	54,806	57,917·72	382,567
Total	**11,386·62**	**68,148**	**613,141·00**	**3,676,970**	**25,118·70**	**111,909**	**712,307·26**	**3,834,375**

* 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.
	tons	£	tons	£	tons	£	tons	£
Prior to 1954	2·00	13	9·26	648	2,007·98	120,740	178·42	7,612
1954	....	....	....	....	155·27	7,679	....	....
1955	....	....	....	....	330·60	24,887	....	....
1956	....	....	....	....	1,117·94	78,549	....	....
1957	....	....	....	....	657·62	42,937	1·63	121
Total	**2·00**	**13**	**9·26**	**648**	**4,269·59**	**274,692**	**180·05**	**7,733**

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.
	tons	£	tons	£	tons	£	tons	£
Prior to 1954	6,506·72	301,174	8,707·88	429,559	1,564·88	39,688	94·42	5,488
1954	393·50	20,533	548·77	28,212	279·26	2,601	....	....
1955	16·32	992	346·92	25,878	....	....	....	....
1956	156·60	11,751	1,282·14	90,931	....	....	....	....
1957	197·43	15,362	856·68	58,420	....	....	....	....
Total	**7,270·57**	**349,912**	**11,742·39**	**634,000**	**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.
	tons	£	tons	£	tons	£	tons	£
Prior to 1954	105·36	3,983	1,764·66	49,159	517·00	1,778	*565·40	1,928
1954	....	....	279·26	2,601	....	....	....	....
1955	....	....	....	....	....	....	....	....
1956	....	....	....	....	....	....	....	....
1957	....	....	....	....	....	....	....	....
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.
	tons	£	tons	£	tons	£	tons	£
Prior to 1954	....	....	1,072·61	4,473	4,243·20	57,141	5,324·78	61,624
1954	....	....	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
1956	....	....	77·12	388	4,378·45	54,050	4,455·57	54,438
1957	....	....	175·45	877	3,478·20	49,029	3,653·65	49,906
Total	**3·89**	**57**	**1,389·01**	**6,024**	**17,541·86**	**243,562**	**18,940·87**	**249,586**

Period.	Tantalite.						Tantalo Columbite Ore and Concentrates.	
	Pilbara Goldfield.		Greenbushes Mineral Field.		Total.		Greenbushes Mineral Field.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons	£	tons	£	tons	£	tons	£
Prior to 1954	265·07	130,672	15·29	10,052	*283·17	143,233	14·35	18,053
1954	....	....	....	....	....	....	4·84	5,941
1955	....	....	....	....	....	....	2·06	2,747
1956	....	....	....	....	....	....	30·20	33,667
1957	....	....	....	....	....	....	16·55	6,546
Total	**265·07**	**130,672**	**15·29**	**10,052**	**283·17**	**143,233**	**68·00**	**66,554**

* 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.
	tons	£	tons	£	tons	£	tons	£
Prior to 1954	7·08	11,030	0·80	1,038	3·11	5,359	*0·22	390
1954	46·72	68,997	....	....	0·55	1,507	....	....
1955	10·54	21,208	....	....	0·10	251	0·28	1,556
1956	39·25	88,134	....	....	1·47	4,390	0·25	1,473
1957	5·56	4,662	....	....	....	....	0·23	622
Total	**109·15**	**194,031**	**0·80**	**1,038**	**5·23**	**11,507**	**1·08**	**4,041**

* Microlite.

Table VI.—*Minerals other than Gold*—continued.

Period.	Tantalo Columbite Ore and Concentrates—*continued.*		Tin.					
	Total.		Greenbushes Mineral Field.		Kimberley Goldfield.		West Kimberley Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons	£	tons	£	tons	£	tons	£
Prior to 1954	25·56	35,870	11,512·98	1,090,882	0·83	302	0·30	235
1954	52·11	76,445	42·85	22,885	....	....	....	....
1955	12·98	25,762	119·57	61,577	....	....	0·13	79
1956	71·27	127,664	131·17	71,273	....	....	....	....
1957	22·34	11,831	49·09	29,749	....	....	....	....
Total	**184·26**	**277,572**	**11,855·66**	**1,276,366**	**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.
	tons	£	tons	£	tons	£	tons	£
Prior to 1954	6,224·53	697,879	2·48	1,605	0·69	225	*17,747·28	1,791,560
1954	78·47	40,092	....	....	....	....	121·32	62,977
1955	60·02	33,256	....	....	....	....	179·72	94,913
1956	227·12	136,965	....	....	....	....	358·35	208,273
1957	221·16	125,330	....	....	....	....	270·25	155,079
Total	**6,811·30**	**1,033,522**	**2·48**	**1,615**	**0·69**	**225**	***18,676·92**	**2,312,802**

* Includes 4·78 tons valued at £395, 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.
	tons	£	tons	£	tons	£	tons	£
Prior to 1954	....	....	0·06	52	3·02	1,093	2·12	3,148
1954	1·69	1,867	....	....	....	....	....	....
1955	....	....	....	....	....	....	0·83	582
1956	....	....	....	....	....	....	....	....
1957	....	....	....	....	....	....	....	....
Total	**1·69**	**1,867**	**0·06**	**52**	**3·02**	**1,093**	**2·95**	**3,730**

Period.	Tungsten (Scheelite)—*continued.*							
	North Coolgardie Goldfield.		Coolgardie Goldfield.		Yilgarn Goldfield.		Total.	
	Conc.	Value.	Conc.	Value.	Conc.	Value.	Conc.	Value.
	tons	£	tons	£	tons	£	tons	£
Prior to 1954	7·76	2,601	23·10	7,643	106·79	39,125	*144·08	53,925
1954	2·01	1,494	....	....	....	....	3·70	3,361
1955	5 71	6,009	1·21	826	....	....	7·75	7,417
1956	....	....	....	....	....	....	....	....
1957	....	....	....	....	....	....	....	....
Total	**15·48**	**10,104**	**24·31**	**8,469**	**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.
	tons	£	tons	£	tons	£	tons	£
Prior to 1954	24·61	45,078	248·82	14,740	1·74	1,522	*303·93	61,759
1954	....	....	....	....	....	....	....	....
1955	....	....	....	....	....	....	....	....
1956	....	....	....	....	....	....	....	....
1957	....	....	....	....	....	....	....	....
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.
	tons	£	tons	£	tons	£	tons	£	tons	£
Prior to 1954	1,831·92	11,822	20·00	100	109·78	1,376	‡4·38	*Nil*	114·16	1,376
1954	....	....	....	....	‡73·85	*Nil*	....	....	73·85	*Nil*
1955	....	....	....	....	....	....	....	....	....	....
1956	....	....	....	....	....	....	....	....	....	....
1957	....	....	....	....	....	....	....	....	....	....
Total	***1,831·92**	**11,822**	**20·00**	**100**	**183·63**	**1,376**	**4·38**	**Nil**	**188·01**	**1,376**

* Includes 127·16 tons valued at £881 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 1957.

Number of Lease, Claim, Or Area.	Goldfield or Mineral Field.	Registered Name of Producer.	Quantity.	Metallic Content.	Value.
		ASBESTOS (Chrysotile)			
			tons		£A.
M.C. 48, etc.	West Pilbara	Hancock, L. G.	1,028·79	....	34,035·85
L.T.T. 1226H	Pilbara	Hancock, L. G.	360·52	....	8,030·70
			1,389·31	....	(*b*) 42,066·55
		ASBESTOS (Crocidolite)			
M.C. 22, etc.	West Pilbara	Australian Blue Asbestos Ltd.	11,104·87	....	*b*1,195,634·07
		BARYTES			
M.C. 511H	O.P.G. (Cranbrook)	Ferrari and Ilich	140·00	....	(*a*) 910·00
		BENTONITE			
M.C. 537H	O.P.G. (Marchagee)	Collins, A. C.	47·25	....	189·00
M.L. 437H	O.P.G. (Marchagee)	Noonan, E. J.	694·54	....	2,792·50
			741·79	....	(*a*) 2,981·50
		BERYL (*f*) (*g*)			
				BeO. Units	
Crown Lands	Gascoyne	Sundry Persons	22·73	268·90	4,399·35
M.L. 80, etc.	Coolgardie	Aust. Glass Mfrs. Pty. Ltd.	36·54	412·41	6,372·00
P.A. 7064	Coolgardie	Rule, G.	2·39	27·69	445·20
M.C. 14	Coolgardie	Rowe, E. P. and Party	0·34	3·95	64·85
M.C. 9	Coolgardie	Evans, D. J. and Party	3·13	35·72	587·35
P.A. 2494	Yalgoo	Phillips, E. R.	0·58	6·63	109·00
M.C. 111H	O.P.G. (Balingup)	Oma, V. C.	0·61	7·72	126·90
Crown Lands	Pilbara	Sundry Persons	9·25	107·04	1,717·05
P.A. 2555	Pilbara	Lockyer and Todd	6·85	87·38	1,432·80
M.C. 340, etc.	Pilbara	Sherlock and Parker	2·82	34·19	526·35
M.C. 304	Pilbara	White, A. L.	11·57	145·85	2,253·55
P.A. 2534	Pilbara	O'Donnell, P.	0·68	6·98	107·75
P.A. 2559	Pilbara	Otway, R. H.	6·02	72·58	1,121·30
Crown Lands	Pilbara	Sundry Persons	1·61	20·33	314·05
M.C. 106	Pilbara	Strelley Mining Syndicate	0·65	7·92	122·40
M.C. 354	Pilbara	McGregor, D. M.	0·84	10·82	157·10
P.A. 2531	Pilbara	Hasleby, H. M.	0·30	3·79	58·60
M.C. 116	Pilbara	Tabba Tabba Syndicate	9·87	107·94	1,774·35
P.A. 2575	Pilbara	Seigne, M.	0·35	3·70	57·10
Crown Lands	Pilbara	Sundry Persons	6·91	75·69	1,211·50
Crown Lands	Pilbara	Sundry Persons	223·24	2,523·84	40,678·10
P.A. 775L	Pilbara	Witherall and Lindeelee	1·37	16·53	271·75
P.A. 774L	Pilbara	Jarvis, D. E.	1·32	15·41	253·35
Crown Lands	Pilbara	Sundry Persons	0·40	4·39	72·10
			350·37	4,007·40	(*b*) 64,233·85
		CLAYS (Cement Clay)			
Freehold Land	O.P.G. (Maida Vale)	D. F. D. Rhodes	4,547·00	....	2,712·00
M.C. 492H, etc.	O.P.G. (Gosnells)	Cockburn Cement Ltd.	7,004·00	....	9,628·48
			11,551·00	....	(*c*) 12,340·48
		CLAY (Fireclay)			
M.C. 504H, etc.	O.P.G. (Bedfordale)	Brisbane and Wunderlich Ltd.	2,146·00	....	2,670·00
M.C. 522H, etc.	O.P.G. (Byford)	Bridges, J. S.	6,591·70	....	9,283·00
M.C. 585H	O.P.G. (Glen Forrest)	Le Vaux, C. W., and M. L.	2,489·00	....	2,489·00
Loc. 84	O.P.G. (Glen Forrest)	Darling Range Firebrick Pty. Ltd.	920·00	....	874·00
M.C. 304H, etc.	O.P.G. (Clackline)	Clackline Refractories Ltd.	5,500·00	....	5,500·00
			17,646·70	....	(*c*) 20,816·00

Table VII.—*Minerals other than Gold*—continued.

Quantity and Value of Minerals, other than Gold, reported during year 1957.

Number of Lease, Claim, or Area.	Goldfield or Mineral Field.	Registered Name of Producer.	Quantity.	Metallic Content.	Value.
		CLAY (Ball Clay-Ceramic)	Tons	BeO Units	£A
M.C. 247H	O.P.G. (Mt. Kokeby)	Linton, J. B.	203·00	....	(c) 1,015·00
		COAL			
M.L. 250, etc.	Collie	Amalgamated Collieries of W.A. Ltd.	502,672·43	....	1,498,263·61
M.L. 314, etc.	Collie	Griffin Coal Mining Co.	177,702·70	....	561,325·80
M.L. 418, etc.	Collie	Western Collieries Ltd.	158,285·40	....	493,067·10
			838,660·53	....	2,552,656·51 (e) (h)
		CHROMITE		Av. Assay Cr_2O_3	
M.C. 44P, etc.	Peak Hill	Broken Hill Pty. Co. Ltd.	1,312·30	42·01	(b) 20,996·80
		COPPER ORE AND CONCENTRATES (f) (g)		Copper Units	
M.C. 35, etc.	Phillips River....	Ravensthorpe Copper Mines N.L.	529·68	8,418·00	11,154·75
G.M.L. 314L, etc.	Pilbara	Copper Hills Copper Mine	416·27	10,206·00	20,192·55
M.L. 159	Ashburton	Elsie Helen Copper Mine	4·59	145·92	325·40
M.C. 209	Pilbara	Breen's Copper Syndicate	42·83	478·02	820·00
M.C. 88W.P.	West Pilbara	Carlow Castle Copper Mine	104·58	1,023·70	1,648·05
M.L. 259	West Pilbara	Yannery Hill Copper Mine	270·51	3,759·04	7,062·50
Crown Lands	West Pilbara	Sundry Persons	6·66	103·96	256·25
P.A. 1491	East Murchison	Sawyer, H. A.	9·92	87·10	180·00
M.C. 5F	Mt. Margaret....	Grgich, G.	19·92	184·08	404·00
M.C. 13	East Murchison	Delich, T.	144·38	2,079·62	4,103·50
P.A. 1486, etc.	East Murchison	Ainsworth and Woosnam	44·66	314·25	301·25
M.C. 2B	East Murchison	Rinaldi, Motter and Motter	65·87	1,347·36	2,321·45
M.C. 65P	Peak Hill	Bettineschi and Ricci	21·18	242·09	377·25
M.L. 421	Phillips River....	Big Surprise Copper Mine	29·15	833·41	2,034·20
M.L. 60P.P.	Northampton....	Roger Malray Copper Mine	9·44	140·89	201·40
P.A. 2537	Yalgoo	Deveson, R. E.	9·35	126·01	193·20
M.C. 43P	Peak Hill	Parkinson, L. T.	74·98	2,865·00	6,988·00
			1,803·97	32,354·45	(b) 58,563·75
		Silver and Gold content transferred to respective items.			
		CUPREOUS ORE AND CONCENTRATES (Fertiliser) (f)		Av. Assay Cu %	
P.A. 2529	Pilbara	Coffin, P.	4·17	4·00	8·20
G.M.L. 314L	Pilbara	Copper Hills Copper Mine	1,827·25	12·43	40,992·30
M.C. 117L	Pilbara	Stream and Kelly	28·51	17·72	813·75
Crown Lands	West Pilbara	Sundry Persons	10·75	4·75	60·00
M.C. 88	West Pilbara	Carlow Castle Copper Mine	9·95	7·87	96·00
Loc. 71	West Pilbara	Cuming Smith and Mount Lyell	554·39	3·79	3,702·00
M.L. 259	West Pilbara	Yannery Hill Copper Mine	54·77	14·17	1,521·55
M.C. 2B	East Murchison	Rinaldi, Motter and Motter	257·82	11·10	5,032·55
P.A. 1486, etc.	East Murchison	Ainsworth and Woosnam	60·04	8·72	699·75
P.A. 1493	East Murchison	Delich, T.	100·71	9·49	1,524·40
M.C. 13	East Murchison	Delich, T.	118·66	11·96	2,619·95
P.A. 1491	East Murchison	Sawyer, H. A.	20·70	10·10	328·25
P.A. 1489	East Murchison	Howarth, C. A.	17·61	10·10	299·35
M.L. 68P	Peak Hill	Thaduna Copper Mining Co.	1,364·37	8·30	15,422·15
M.L. 65P	Peak Hill	Bettineschi and Ricci	59·36	8·71	789·35
M.C. 43P	Peak Hill	Parkinson, T. L.	40·64	33·40	4,140·60
P.A. 1650F	Mt. Margaret....	Alfred Grey	9·60	10·02	163·40
M.L. 410	Phillips River....	New Surprise Copper Mine	52·10	15·15	2,637·65
M.L. 411	Phillips River....	Wehr and O'Dea	47·29	9·20	1,275·70
			4,638·69	10·11	82,126·90 (a) (b)
		DOLOMITE			
M.L. 9M, etc.	Murchison	Westralian Ores Pty. Ltd.	60·00	....	(a) 239·80
		FELSPAR			
M.L. 80, etc.	Coolgardie	Aust. Glass Mfrs. Pty. Ltd.	995·00	....	(a) 4,610·84

Table VII.—*Minerals other than Gold*—continued.

Quantity and Value of Minerals, other than Gold, reported during year 1957.

Number of Lease, Claim, or Area.	Goldfield or Mineral Field.	Registered Name of Producer.	Quantity.	Metallic Content.	Value.
		GLASS SAND	Tons	Av. Assay Cu. %	£A
M.C. 417H, etc.	O.P.G. (Lake Gnangara)	Aust. Glass Mfrs. Pty. Ltd.	5,452·86	....	3,554·27
M.C. 365H	O.P.G. (Lake Gnangara)	Leach, R. J.	230·00	....	345·00
M.C. 161H, etc.	O.P.G. (Lake Gnangara)	Leach, W. M.	10·00	....	15·00
			5,692·86	....	(*c*) 3,914·27
		GLAUCONITE	Greensand Treated	Glauconite Recovered	
Private Property	O.P.G. (Gingin)	Brook, G. E.	630·00	126·00	(*b*)(*d*)5,040·00
		GYPSUM	Tons		
M.C. 9, etc.	Yilgarn	Perth Modelling Works	10,770·00	....	7,809·25
M.C. 51, etc.	Yilgarn	H. B. Brady and Co. Ltd.	9,050·00	....	6,787·50
M.C. 30, etc.	Yilgarn	Ajax Plaster Co. Pty. Ltd.	8,022·50	....	6,637·00
M.C. 126H, etc.	O.P.G. (Baandee)	Perth Modelling Works	2,387·00	....	2,058·30
M.C. 485H	O.P.G. (Nukarni)	Fitzgerald, E. J.	2,159·40	....	1,830·50
M.C. 402H, etc.	O.P.G. (Hines Hill)	Kay, C. J.	964·00	....	844·00
			33,352·90	....	(*a*) 25,966·55
Plaster of Paris reported as Manufactured during the year being 17,858 tons from 25,270 tons of Gypsum.					
		IRON ORE (for Pig)	Tons	Pig Iron Recovered	£A
Temp. Res. 1258H	Yilgarn	Charcoal Iron and Steel Industry	21,838·50	13,968·27	324,646·16 (*c*) (*d*)
Average Assay of Ore used = 62·88% Fe.					
		IRON ORE (for Export)		Av. Assay Fe %	
M.L. 10, etc.	West Kimberley	Aust. Iron and Steel Ltd.	389,686·00	63·09	(*b*)386,440·00

No. of Lease, Claim or Area.	Goldfield or Mineral Field.	Registered Name of Producer.	Ore and Conc.	Lead.		Silver.	
				Tons.	£A.	Fine oz.	£A.
		LEAD ORE AND CONCENTRATES (*f*) (*g*)					
P.A. 257	Northampton	A.G.M. Syndicate	1·54	0·85	57·95	10·45	4·20
M.L. 265	Northampton	Adams and McGreevy	3·29	2·52	216·00	....	....
M.L. 263	Northampton	Kathleen Hope Lead Mine	3·84	2·38	184·45	3·50	1·40
Vic. Loc. 1	Northampton	Geraldine Lead Mine	58·31	35·65	2,368·50	....	....
Vic. Loc. 436	Northampton	Wheel of Fortune Extended	29·88	21·98	1,859·65	15·75	6·35
M.L. 205, etc.	Northampton	Surprise Mine 1955	219·31	151·26	14,418·30	....	....
Imp. Grant Loc. 833	Northampton	Anglo-Westralian Mining Pty. Ltd.	1,737·72	1,325·39	138,637·15	....	....
M.L. 59P.P.	Northampton	McGuires Lead Mine	176·28	135·71	14,496·80	61·67	24·15
M.L. 256, etc.	Northampton	Gurkha Lead Mine	1,092·34	828·96	83,732·05	532·27	206·70
			3,322·51	2,504·70	255,970·85	623·64	242·80
Silver—quantity and value transferred to Silver Item.							
		SILVER/LEAD ORE AND CONCENTRATES (*f*) (*g*)					
M.L. 155	Ashburton	Ridge Lead Mine	12·41	9·31	997·75	100·62	38·85
Crown Lands	Ashburton	Sundry Persons	1·95	1·32	132·05	12·23	4·75
P.A. 315	Ashburton	Roebuck Lead Mine	34·20	25·84	2,786·65	253·87	98·05
P.A. 316	Ashburton	Griffiths, F. A.	4·82	3·44	363·55	31·92	12·35
M.L. 163	Ashburton	Redcraze Lead Mine	42·23	40·58	3,619·70	347·47	140·05
M.C. 17	Ashburton	Carlyon and Porter	6·63	4·31	390·50	....	....
M.L. 161	Ashburton	Campsite Lead Mine	8·68	6·10	660·40	59·41	22·95
M.L. 118	Ashburton	Bilrose Lead Mine	59·72	46·33	4,406·40	585·87	230·55
M.L. 122	Ashburton	Gift Lead Mine	19·94	16·00	1,477·10	137·63	55·45
Crown Lands	Ashburton	Sundry Persons	6·85	5·26	527·65	....	....
M.C. 189	Pilbara	Ragged Hills Lead Mine	657·62	422·44	42,937·69	3,158·78	1,223·51
Reward M.C. 91	West Pilbara	Watkins, D. C.	1·63	1·15	121·30	12·26	4·70
			856·68	582·08	58,420·74	4,700·06	1,831·21
Silver—quantity and value transferred to Silver Item.							

Table VII.—*Minerals other than Gold*—continued.

Quantity and Value of Minerals, other than Gold, reported during year 1957.

Number of Lease, Claim, Or Area.	Goldfield or Mineral Field.	Registered Name of Producer.	Quantity.	Metallic. Content.	Value.
MANGANESE— METALLURGICAL GRADE (*f*)					
			Tons	Av. Assay Mn %	£A
M.C. 268/9, etc.	Pilbara	Northern Minerals Syndicate	13,496·14	49·54	227,328·60
M.L. 61P	Peak Hill	Westralian Ores Pty. Ltd.	35·92	37·00	380·80
M.C. 24P, etc.	Peak Hill	Westralian Ores Pty. Ltd.	50,183·30	45·32	697,484·30
			63,715·36	....	(*b*) 925,193·70
MANGANESE— BATTERY GRADE (*f*)					
				Assay MnO_2	
M.L. 61P	Peak Hill	Westralian Ores Pty. Ltd.	221·70	84·06	(*b*) 4,626·45
MINERAL BEACH SAND—ILMENITE (*f*)					
				Av. Assay TiO_2	
D.C. 56H	O.P.G. (Bunbury)	Cable (1956) Ltd.	14,202·07	54·43	75,010·15
M.C. 516H, etc.	O.P.G. (Capel)	Western Titanium N.L.	26,729·92	54·59	158,465·43
			40,931·99	....	(*b*) 233,475·58
OCHRE—RED					
M.C. 55	Murchison	Cassidy, J. E.	10·00	....	(*a*) 100·00
OCHRE—YELLOW					
M.C. 30	Murchison	Zadow and Ball	17·30	....	(*a*) 173·25
PHOSPHATIC GUANO					
M.C. 486H	O.P.G. (Jurien Bay)	Smith, B. D.	586·89	....	(*a*) 8,974·00
PYRITES ORE AND CONCENTRATES					
				Sulphur Content tons	
G.M.L. 5345E, etc.	East Coolgardie	Gold Mines of Kalgoorlie (Aust.) Ltd.	12,575·72	4,384·52	54,806·22
G.M.L. 1460, etc.	Dundas	Norseman Gold Mines N.L.	45,342·00	20,570·23	327,761·00
			57,917·72	24,954·75	(*a*) 382,567·22
SILVER					
			Fine ozs.		£A
	By product from	Gold Mining	188,204·40	....	74,169·90
	By product from	Lead Mining	623·64	....	242·80
	By product from	Silver/Lead Mining	4,700·06	....	1,831·21
	By product from	Copper Mining	3,586·30	....	1,447·40
			197,114·40	....	77,691·31
TALC					
			tons		
Loc. 839	O.P.G. (Three Springs)	Universal Milling Co. Ltd.	3,478·20	....	(*c*) 49,029·00
M.C. 15E	East Coolgardie	Harvey Bean	175·45	....	(*a*) 877·25
			3,653·65	....	49,906·25

Table VII.—*Minerals other than Gold*—continued.

Quantity and Value of Minerals, other than Gold, reported during year 1957.

Number of Lease, Claim, or Area.	Goldfield or Mineral Field.	Registered Name of Producer.	Quantity.	Metallic Content.	Value.
TANTO/COLUMBITE ORE AND CONCENTRATES (*f*) (*g*)					
			lb.	Combined $TaNb_2O$ lb.	£A
M.C. 390	Pilbara	McPherson and Fetwadjieff	110·00	70·00	18·05
M.C. 313	Pilbara	Richardson, E. A.	8,678·00	5,576·00	2,319·60
M.C. 291, etc.	Pilbara	Pilbara Exploration N.L.	2,714·00	1,073·00	1,367·70
M.C. 116	Pilbara	Tabba Tabba Syndicate	388·00	243·00	404·55
M.C. 107, etc.	Pilbara	Wilson, L. J.	567·00	326·00	552·50
M.C. 70, etc.	Greenbushes	Tin and Strategic Minerals Ltd.	25,429·00	10,705·00	4,773·15
M.C. 56, etc.	Greenbushes	Western Queen (1936) N.L.	11,635·00	5,160·00	1,773·35
M.C. 23	Phillips River....	Pantall, D. H.	517·00	346·00	622·35
			50,038·00	23,499·00	(*b*) 11,831·25
TIN (*f*) (*g*)					
			tons	Metallic Content tons	£A
M.C. 56, etc.	Greenbushes	South West Tin Pty. Ltd.	20·81	14·78	12,707·70
M.C. 56, etc.	Greenbushes	Tin and Strategic Minerals Ltd.	28·02	19·03	16,923·35
Crown Lands	Greenbushes	Sundry Persons	0·26	0·15	117·50
D.C. 58, etc.	Pilbara	Northern Minerals Syndicate	85·13	57·18	46,944·00
D.C. 25, etc.	Pilbara	Johnston and Sons	56·17	38·76	32,857·15
M.C. 390	Pilbara	McPherson and Fetwadjieff	0·13	0·08	72·40
D.C. 196	Pilbara	Johnston and Sons	5·36	3·50	3,064·75
D.C. 26, etc.	Pilbara	Eric Newnham (Wallerawang) Pty. Ltd.	17·71	12·19	10,664·80
D.C. 49, etc.	Pilbara	Pilbara Exploration N.L.	39·05	25·45	21,091·90
M.C. 381, etc.	Pilbara	Northern Territory Prosp. and Dev.	0·20	0·12	105·00
M.C. 291, etc.	Pilbara	Pilbara Exploration N.L.	4·52	2·94	2,571·35
Crown Lands	Pilbara	Sundry Persons	10·33	7·39	6,382·00
Crown Lands	Pilbara	Sundry Persons	2·56	0·62	1,577·11
			270·25	182·19	(*b*) 155,079·01

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 1948 to 1957 INCLUSIVE.

COMPANY.	1948.			1949.			1950.			1951.			1952.			1953.			1954.			1955.			1956.			1957.		
	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.	....	....	....	....	....	....	....	....	....	....	....	....	47	4	51	37	5	42	28	6	34	....	....	....	....	....	....	....	....	....
Boulder Perseverance, Ltd.	185	148	333	171	135	306	173	138	311	115	119	274	151	115	266	155	112	267	152	114	266	171	114	285	181	113	294	....	....	....
Broken Hill Pty. Co., Ltd.	38	84	122	36	73	109	34	68	102	13	12	25	6	....	6	4	....	4	2	....	2	....	....	....	....	....	....	....	....	....
Blue Spec Gold Mines, Ltd.	17	12	29	1	....	1	20	6	26	33	21	54	36	21	57	33	15	48	30	15	45	17	9	26	....	....	....	....	....	....
Big Bell Mines, Ltd.	188	193	381	197	210	407	219	246	465	230	240	470	203	205	408	200	215	415	179	167	346	44	16	60	....	....	....	....	....	....
Burbidge Gold Mines, N.L.	14	4	18	18	4	22	16	4	20	2	....	2	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Consolidated Gold Area, N.L.	2	....	2	1	....	1	1	....	1	3	1	4	1	....	1	1	1	2	1	2	3	....	....	....	....	....	....	....	....	....
Comet Gold Mines, Ltd	7	10	17	9	13	22	11	12	23	13	11	24	10	8	18	10	6	16	4	2	6	3	....	3	....	....	....	....	....	....
Central Norseman Gold Corporation, N.L.	117	268	385	133	246	379	163	236	399	148	226	374	151	212	363	155	228	383	158	227	385	166	225	391	159	209	368	165	226	391
Dundas Gold Mines, N.L.	7	17	24	11	15	26	3	9	12	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Emu Gold Mines, Ltd.	9	6	15	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Edna May Amalgamated, N.L.	11	9	20	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Evanston Gold, N.L.	2	....	2	2	....	2	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
First Hit Gold Mine	2	1	3	1	1	2	1	1	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Golden Horseshoe (New), Ltd.	45	....	45	43	....	43	41	....	41	39	....	39	38	....	38	42	....	42	42	....	42	39	....	39	35	....	35	6	....	6
Gold Mines of Kalgoorlie, Ltd.	166	173	339	175	179	354	187	180	367	181	191	372	185	182	367	184	182	366	199	186	385	257	192	449	228	223	451	417	500	917
Great Boulder Pty., Ltd.	316	418	734	312	392	704	327	404	731	311	354	665	344	339	683	349	359	708	342	372	714	350	379	729	349	380	729	330	400	730
*Great Western Consolidated Hill 50 Gold Mine, N.L.	55	67	122	68	78	146	74	66	140	125	72	197	148	60	208	186	113	299	191	150	341	224	271	441	232	270	502	220	223	443
Kalgoorlie Enterprise, Ltd.	1	105	106	7	103	110	7	95	102	62	41	103	59	48	107	68	63	131	73	63	136	82	73	155	98	85	183	108	94	202
Kalgurli Ore Treatment Co., Ltd.	69	....	69	74	....	74	74	....	74	8	85	93	8	93	101	8	98	106	8	89	97	7	101	108	8	100	108	....	....	....
Lake View and Star, Ltd.	414	465	879	454	441	895	471	476	947	77	....	77	81	....	81	77	....	77	78	....	78	65	....	65	40	....	40	33	....	33
Moonlight Wiluna Gold Mines, Ltd. (Timoni)	13	20	33	18	18	36	33	32	65	492	517	1,009	486	529	1,015	494	519	1,013	488	498	986	482	487	969	471	523	994	460	517	977
Mountain View Gold, N.L.	11	8	19	10	14	24	11	11	22	42	42	84	42	41	83	39	37	76	42	34	76	39	33	72	37	32	69	36	31	67
Mt. Charlotte (Kalgoorlie) Gold Mines, N.L.	18	18	36	24	28	52	10	8	18	13	7	20	5	3	8	4	6	10	3	6	9	3	1	4	....	....	....	....	....	....
North Kalgurli (1912), Ltd.	76	265	341	79	304	383	90	316	406	2	....	2	2	3	5	3	6	9	3	2	5	....	....	....	....	....	....	....	....	....
New Milano, N.L.	2	1	3	1	....	1	1	....	1	133	348	481	112	293	405	76	207	283	83	193	276	95	236	331	156	239	395	158	250	408
*Norseman Gold Mines, N.L.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Gold Mines of Kalg. (Aust.) Ltd. (Barbara and Bayleys Leases)	12	9	21	78	64	142	73	125	198	73	120	193	65	109	174	68	108	176	77	95	172	79	95	174	37	73	110	34	61	95
New Coolgardie Gold Mines, N.L. (Callion Leases)	....	....	....	....	....	....	....	....	....	6	21	27	6	29	35	7	34	41	9	42	51	8	35	43	3	11	14	....	....	....
Ora Banda Amalgamated, Ltd.	5	4	9	3	1	4	2	....	2	1	....	1	1	....	1	3	2	5	1	2	3	....	2	2	....	....	....	....	....	....
Paringa Mining and Exploration Co., Ltd.	87	134	221	79	134	213	92	138	230	47	46	93	10	6	16	2	2	4	....	....	....	....	....	....	....	....	....	....	....	....
Phoenix Gold Mines, Ltd.	33	22	55	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Porphyry (1939) Gold Mines, Ltd.	18	18	36	24	28	52	10	8	18	6	1	7	1	....	1	3	3	6	2	2	4	....	....	....	....	....	....	....	....	....
Radio Gold Mines	....	....	....	....	....	....	....	....	....	5	3	8	4	4	8	5	5	10	5	5	10	6	6	12	6	6	12	7	7	14
South Kalgurli Consolidated	107	111	218	110	105	215	120	107	227	124	110	234	67	102	169	67	107	174	64	106	170	53	99	152	13	84	97	....	....	....
Sons of Gwalia, Ltd.	98	109	207	92	143	235	104	151	255	121	129	250	121	118	239	102	157	259	102	138	240	102	146	248	105	156	261	107	146	253
Sunshine Reward Amalgamated Leases	9	10	19	9	14	23	10	9	19	10	7	17	9	7	16	8	7	15	8	7	15	7	4	11	8	7	15	2	....	2
Triton Gold Mine	64	95	159	7	....	7	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Wiluna Gold Mines, Ltd.	69	....	69	49	....	49	29	....	29	20	....	20	13	....	13	2	1	3	1	1	2	....	....	....	....	....	....	....	....	....
Yellowdine Gold Development, Ltd.	2	....	2	2	....	2	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
All other Operators	1,128	972	2,100	966	825	1791	986	837	1,823	883	664	1,547	851	598	1,449	846	523	1,369	734	495	1,229	634	388	1,022	544	407	951	498	349	847
State Average (incl. Diggers)	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	2,710	2,918	5,628	2,581	2,804	5,385

* Including Copperhead, Frasers, Nevoria, and Corinthian Groups.

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