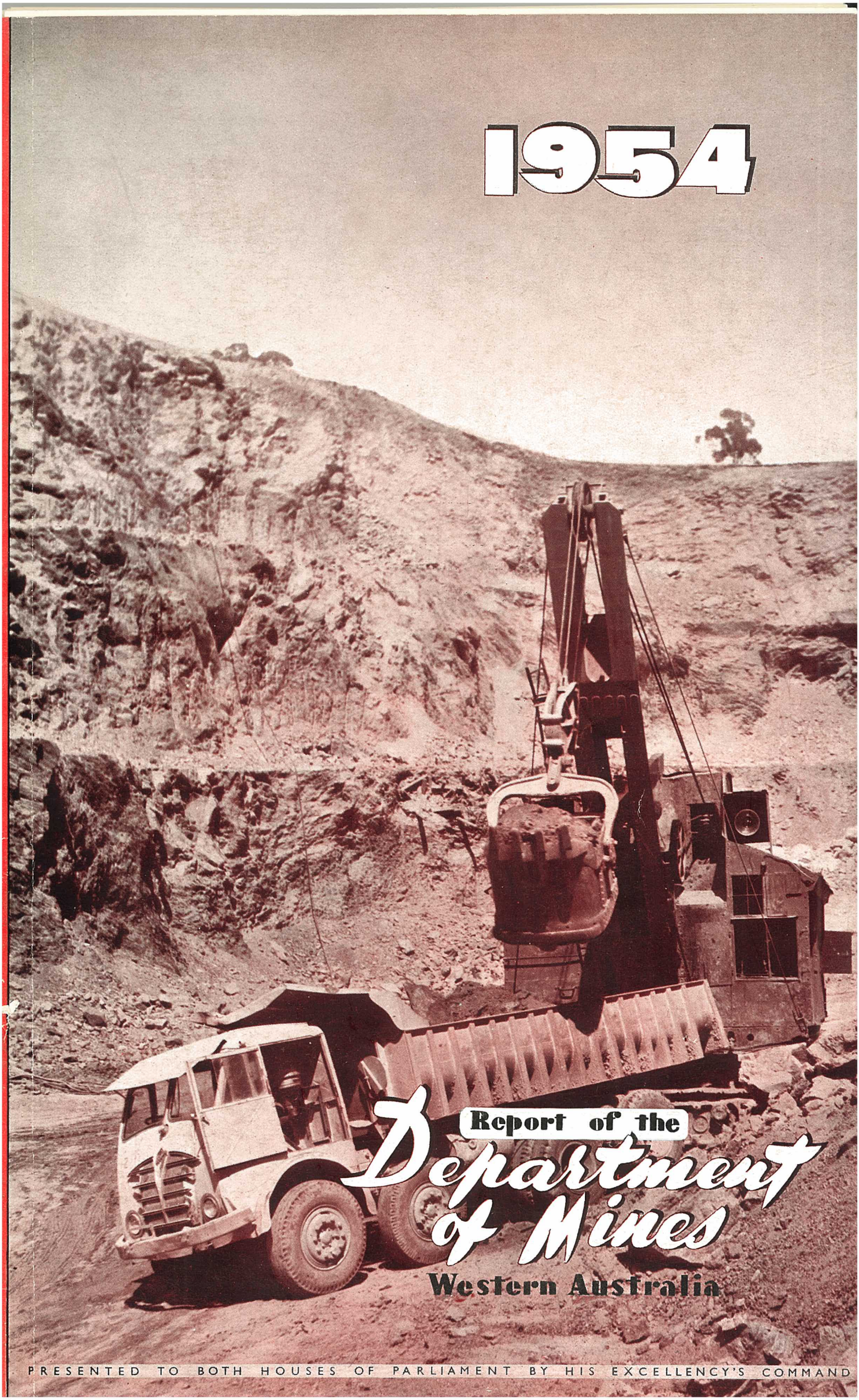


1954

Report of the Department of Mines

Western Australia

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

COVER PICTURE

Open Cut Gold Mining, by Great Western Consolidated No Liability, using quarrying methods at the "Copperhead Mine," Bullfinch, Western Australia

Picture by courtesy of W.A. Newspapers Ltd.

WESTERN AUSTRALIA — 1956

REPORT

OF THE

Department of Mines

FOR THE

YEAR 1954

PRESENTED TO BOTH HOUSES OF PARLIAMENT

PERTH:
By Authority: WILLIAM H. WYATT, Government Printer
1956
95047/4/56—610

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 1954, together with reports from the officers controlling Sub-Departments, and Comparative Tables furnishing statistics relative to the Mining Industry.

I have the honour to be, Sir,

Your obedient servant,

A. H. TELFER,

Under Secretary for Mines.

Perth, April, 1955.

TABLE OF CONTENTS

STATE OF WESTERN AUSTRALIA

Report of the Department of Mines for the Year 1954

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, 1954.

The estimated value of the mineral output of the State for the year was £10,251,180 (calculating gold at £4 4s. 11.45d. per fine ounce), an increase of £692,251 in value compared with the preceding twelve months. The estimated value of the exchange premium paid to gold producers amounted to £A9,636,916, added to which, the oversease gold sales premium of £A63,839 received by the Gold Producers' Association Limited from sales of West Australian Gold from August 1953 to April 1954, brought the gross value of all minerals to yet another new record of £A19,951,935, an increase of £A593,667 compared to that for 1953 production which was the previous highest figure.

The estimated value of gold received at the Perth Branch of the Royal Mint and exported in gold-bearing material was £A13,249,779 but with the additional oversease gold sales premium mentioned above, totalled £A13,313,618 (and equalled 66.73 per cent. of all minerals). (See footnote to Table 1(a), Part II).

Other minerals realised: Coal, £3,587,088; iron-ore (exported), £629,325; manganese, £608,215; asbestos, £555,677; pyrites, £441,466; iron-ore (pig), £209,027; lead ores and concentrates, £101,183; silver, £86,933; tanto-columbite, £76,445; tin, £62,976; cupreous ore (fertiliser), £50,381; chromite, £48,957; talc, £45,851; gypsum, £31,620; clays, £28,681; beryl, £22,607; felspar, £14,491; glauconite, £9,012; barytes, £7,631; glass sand, £5,541; bentonite, £4,111; ochre, £4,109; scheelite, £3,361; diatomaceous earth, £1,579; antimony, £1,410; emeralds, £313; magnesite, £258, and petalite, £69.

Dividends paid by Mining Companies amounted to £1,784,893, an increase of £352,041 when compared with the previous year (see Table 6, Part II).

To the end of 1954, the total amount distributed by gold mining companies was £51,525,548.

To the same date the progressive value of the Mineral production of the State amounted to £282,262,152, of which gold accounted for £239,973,948 based on normal value of £4 4s. 11.45d. per fine ounce; but the premium on the sale of gold during years 1920-1924, increasing exchange premium from 1930, payments under the Gold Bounty Act, 1930, plus additional premiums from overseas sales distributed during 1952-1954, increase the total value of gold and mineral production by £130,110,092, making a gross progressive value of £A412,372,244.

GOLD.

The quantity of gold reported as being received at the Perth Branch of the Royal Mint (847,451.09 fine ounces), together with that contained in gold-bearing material exported for treatment (3,089.08 fine ounces), totalled 850,540.17 fine ounces, and exceeded that of the previous year by 26,628.22 fine ounces (vide Table 1(a) of Part II).

Similarly, the total gold yield for the year reported directly to the Department by the producers was 861,991.91 fine ounces, which constituted an increase of 38,660.85 fine ounces in comparison with the previous year's figures (vide Table 3 of Part II.)

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

The calculated average value of ore treated in the State as a whole increased from 22.065 shillings per ton in 1953 to 22.611 shillings per ton in 1954, calculating gold at the old rate of £4 4s. 11.45d. per fine ounce, but the exchange premium rate which rose from 264.70 per cent. to 267.84 per cent. on 1st May, would more than treble this estimate. For East Coolgardie Goldfield (which produced 56.38 per cent. of the State's yield of gold), the calculated average value of the ore treated decreased slightly from 22.456 shillings to 22.241 shillings per ton. The estimates for Murchison (Big Bell Mines Ltd., and Hill 50 G.M.N.L.), Mt. Margaret (Sons of Gwalia Ltd.), Coolgardie (New Coolgardie G.M's. N.L.), Dundas (Central Norseman Gold Corporation N.L.), and Yilgarn (Great Western Consolidated) were 22.709s. (17.300s.); 22.471s. (23.315s.); 41.486s. (36.968s.); 44.845s. (40.287s.) and 12.760s. (11.753s.) respectively. Figures for 1953 being shown in parenthesis.

The tonnage of ore reported to have been treated in 1954, viz. 3,240,378 tons, was 70,503 tons, only 2 per cent. more than the previous year, and constituted 75.4 per cent. of the State record tonnage established in 1940.

The following tonnage increases were reported from the respective Goldfields—Ashburton 21, East Murchison 167, Murchison 9,715, Mt. Margaret 1,241, North Coolgardie 1,510, East Coolgardie 21,961, Yilgarn 52,516 and Dundas 1,713; those fields showing a reduction in tonnage being Kimberley 52, Pilbara 995, Peak Hill 9,009, Yalgoo 339, Broad Arrow 964, North East Coolgardie 140, and Coolgardie 6,662.

East Coolgardie Goldfield's increased tonnage of 22,000 was mainly due to the additional 18,000 tons treated by the Gold Mines of Kalgoorlie (Aust.) Ltd.; the remaining six principal producers varying only slightly from the previous year's creditable effort.

Hill 50 Gold Mine and Big Bell Mines, with increases of 8,546 and 2,778 tons respectively were again responsible for the improved showing in the Murchison Goldfield, but with news of the imminent closure of the latter company, prospects of any further continuance of such output from the field are severely curtailed.

Peak Hill Goldfield dropped 9,000 tons through the closing of the Anglo Westralian Mining Pty. Ltd. towards the end of the year, whilst the 6,000 ton decrease reported by New Coolgardie Gold Mines N.L. was reflected in the 6,600 ton loss sustained by the Coolgardie Goldfield.

In the Yilgarn Goldfield the Great Western Consolidated were solely responsible for the 52,500 ton increase recorded and show every promise of maintaining a high output for some years to come.

Although output from the remaining Goldfields was only slightly in excess of that for the previous year, a greater general interest appears to have been displayed by prospectors and investigating companies.

West Australian Gold included in sales on open dollar markets by Gold Producers' Association Ltd. between August, 1953, and April, 1954, totalled 570,924.57 fine ounces; the extra premium received therefrom, in excess of the Mint value, amounted to £A63,839, an overall average of 26.836 pence per fine ounce. This amount, less expenses, was distributed to the producer members during February and August and approximated 25.545 pence per fine ounce.

MINERALS.

Mineral production was well maintained and the North Western field continued to be very active.

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

Prices have been reasonably good and have been maintained at a level enabling profitable production of most of the minerals with the exception of wolfram and scheelite, the price of which has fallen much below production costs.

Prospecting for uranium continues and several areas have been applied for in the Kimberley Field. Little progess has been possible as yet owing to the wet season, and further testing will be done when the roads are passable.

COAL.

Coal production at Collie continued with increasing activity during the year and a record output of 1,018,342 tons was produced, of which 40.41 per cent. was produced by open cut mining and 59.59 per cent from the deep mines.

The consumption during the year was 1,017,365 tons of which 76.31 per cent was consumed by Government Instrumentalities and 26.69 per cent. by Private Consumers.

It is unlikely that this rate of consumption will be maintained during 1955 as some consumers propose to change over to the use of alternate fuels, such as crude oil, sawdust and firewood.

The industry is now faced with keen competition from other fuels and to retain its markets, and consequently production and employment, it must produce a more attractive fuel at an equally attractive price.

The programme of re-organisation and mechanisation continues satisfactorily and at present 85 per cent of the production is by mechanised means.

The development of new mines is also proceeding satisfactorily.

OIL.

West Australian Petroleum Pty. Ltd. since its formation in 1951 has planned and established an extensive programme of exploration and this has been expanded since the oil strike late in 1953.

During 1954 the Company drilled ahead on Rough Range No. 1 and passed 13,000 feet by the end of December. Two smaller drills were employed on the Exmouth area including one at Cape Range structure. None of the holes drilled around the discovery well yielded any oil showings. Further test holes are in progress.

The large Drilling Rig purchased from the Commonwealth Government was spudded in at the Grant Range site, Fitzroy Basin, on the Company's License No. 25H on 31st October, 1954. The drill reached a depth of 5,546 feet by the end of the year.

The Company employed Geological and Geophysical survey parties on all its titles throughout the year. In addition sub-contractors were at work on campsites erecting buildings and making access roads.

Associated Freney Oil Fields N.L. which succeeded Freney Kimberley Oil Coy. and went to allotment in July, 1954, purchased and transported to the field a National Type 55 Rig. This Rig is capable of drilling to more than 10,000 feet.

The drill site chosen is at Nerrima Dome approximately 2 miles North-West from Freney Kimberley's No. 1 Well. Spudding in took place on January 8, 1955.

COMPARATIVE MINERAL STATISTICS.

	1953.	1954.	Variation.
Gold—			
Reported to Department :			
Ore (tons)	3,169,875	**3,240,378**	+ 70,503
Gold (fine ozs.)	823,331	**861,992**	+ 38,661
Average grade (dwts. per ton)	5·195	**5·320**	+ ·125
Men Employed	6,359	**6,128**	— 231
Dividends (£A)	1,432,852	**1,784,893**	+ 352,041
Mint and Export :			
Gold (fine ozs.)	823,912	**850,540**	+ 26,288
Estimated Value (£A)	13,299,092	**13,313,618**	+ 14,526
Coal—			
Reported to Department :			
Tons	886,182	**1,018,342**	+ 132,160
Value (£A)	3,073,073	**†3,587,088**	+ 514,015
Men Employed	1,463	**1,560**	+ 97
Other Minerals—			
Reported to Department :			
Value (£A)	2,986,103	**3,051,229**	+ 65,126
*Men Employed	936	**886**	— 50
All Minerals—			
*Men Employed	8,758	**8,574**	— 184
Value (£A)	19,358,268	**19,951,935**	+ 593,667

* Excluding Oil Search which engaged an average of 222 men in the field throughout the year. Principal operating Company being W.A. Petroleum Pty., Ltd., the average for which was 198, ranging from 81 in January to as high as 365 in November. † Incomplete.

PART II.—MINERALS

TABLE 1.

Quantity and Value of Minerals, other than Gold and Silver, produced during Years 1953 *and* 1954.

Description of Minerals.	1953.		1954.		Increase or Decrease for year, compared with 1953.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Tons.	£A.	Tons.	£A.	Tons.	£A.
Antimony Ore and Concentrates	358·43	10,313	45·44	1,410	— 312·99	— 8,903
Asbestos—						
Chrysotile	605·58	65,769	303·65	13,474	— 301·93	— 52,295
Crocidolite	3,795·40	641,595	3,793·67	542,202	— 1·73	— 99,393
Barytes	211·87	1,790	1,043·74	7,631	+ 831·87	+ 5,841
Bentonite	217·70	741	1,121·60	4,111	+ 903·90	+ 3,370
Beryl Ore	124·62	22,223	132·15	22,607	+ 7·53	+ 384
Chromite	1,968·00	29,717	4,269·55	48,957	+ 2,301·55	+ 19,240
Clays—						
Cement Clay	13,619·90	5,266	11,901·00	5,903	— 1,718·90	+ 637
Fireclays :						
Kaolin Type	1,424·50	1,359	1,203·00	1,143	— 221·95	— 216
Kaolin and Other Type	7,393·00	7,393	5,535·00	5,535	— 1,858·00	— 1,858
White Clays :						
Ball Clay (Ceramic)	458·00	1,763	4,000·00	16,000	+ 3,542·00	+ 14,237
Kaolin (Filler Material)	20·00	100	20·00	100	....	....
Coal	886,182·20	3,073,073	1,018,342·53	3,588,818	+ 132,160·33	— 515,745
Copper Ore	50·29	3,199	*Nil*	*Nil*	— 50·29	— 3,199
Cupreous Ore (Fertiliser)	1,948·08	21,004	4,748·11	50,381	+ 2,800·03	+ 29,377
Diatomaceous Earth (Calcined)	*Nil*	*Nil*	150·00	1,579	+ 150·00	+ 1,579
Emeralds (Carats—Cut)	*Nil*	*Nil*	8·68	313	+ 8·68	+ 313
Felspar	2,127·00	8,860	3,225·91	14,491	+ 1,098·91	+ 5,631
Fullers Earth	15·75	79	*Nil*	*Nil*	— 15·75	— 79
Glass Sand	6,905·74	4,690	7,803·01	5,541	+ 897·27	+ 851
Glauconite	319·50	11,182	257·50	9,012	— 62·00	— 2,170
Graphite	20·00	180	*Nil*	*Nil*	— 20·00	— 180
Gypsum	40,247·11	30,178	41,142·00	31,620	+ 894·89	+ 1,442
Iron Ore (for Pig)	16,851·77	221,006	18,298·29	209,027	+ 1,446·52	— 11,979
Iron Ore (Exported)	687,895·00	682,162	634,514·00	629,325	— 53,381·00	— 52,837
Lead, Silver-Lead, Silver-Lead-Zinc Ore and Concentrates	6,425·48	358,328	2,166·97	101,183	— 4,258·51	— 257,145
Magnesite	19·60	73	91·75	258	+ 72·15	+ 185
Manganese	16,324·00	150,991	40,581·00	608,215	+ 24,257·00	+ 457,224
Ochre—						
Red	286·67	2,742	388·00	3,694	+ 101·33	+ 952
Yellow	20·50	145	41·45	415	+ 20·95	+ 270
Petatite	*Nil*	*Nil*	15·00	69	+ 15·00	+ 69
Pyrites	59,248·00	489,985	56,150·00	441,466	— 3,098·00	— 48,519
Talc	2,228·07	30,932	2,920·03	45,851	+ 691·96	+ 14,919
Tantalo/Columbite Ore and Concentrates	8·09	20,200	52·11	76,445	+ 44·02	+ 56,245
Tin	113·27	63,129	121·32	62,977	+ 8·05	— 152
Tungsten—						
Scheelite (lb.)	6,520·00	3,361	8,279·00	3,361	+ 1,759·00	....
Wolfram (lb.)	7,733·00	4,473	*Nil*	*Nil*	— 7,733·00	— 4,473
Vermiculite	29·00	348	*Nil*	*Nil*	— 29·00	— 348
*Zinc (Metallic)	114·16	1,376	73·85	*Nil*	— 40·31	— 1,376
Zinc Ore (Fertiliser)	10·00	50	*Nil*	*Nil*	— 10·00	— 50
Total	....	5,969,775	....	6,553,114	....	+ 583,339

TABLE 1 (a).—*Quantity and Value of Gold and Silver exported and minted during Years* 1953 *and* 1954.

	Fine ozs.	£A.	Fine ozs.	£A.	Fine ozs.	£A.
Gold (Exported and Minted)	823,911·95	†13,299,092	850,540·17	†13,313,618	+ 26,628·22	+ 14,526
Silver (Exported and Minted)	229,364·39	89,401	228,377·43	86,933	— 986·96	— 2,468
Total	....	13,388,493	....	13,400,551	....	+ 12,058

* By-product from Silver-Lead-Zinc mining. † Included in the value of Gold shown are the following estimated Mint premiums :—1953, £A9,264,009 ; 1954, £A9,636,916 ; and further Gold Sales Premiums received from the Sales of Gold on Overseas markets by Gold Producers' Association, Ltd.—1953, £A535,330 ; 1954, £A63,839.

TABLE 2.

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

Year.	Total Exports. †	Mineral Exports (exclusive of Coal).	Percentage.
	£	£	
1902	9,051,358	7,530,319	83·20
1903	10,324,732	8,727,060	84·53
1904	10,271,489	8,625,676	83·98
1905	9,871,019	7,731,954	78·33
1906	9,832,679	7,570,305	76·99
1907	9,904,860	7,544,992	76·17
1908	9,518,020	7,151,317	75·13
1909	8,860,494	5,906,673	66·66
1910	8,299,781	4,795,654	57·78
1911	10,606,863	7,171,638	67·61
1912	8,941,008	5,462,499	61·09
1913	9,128,607	4,608,188	50·48
1914	8,406,182	3,970,182	47·23
1915	6,291,934	2,969,502	47·19
1916	10,878,153	6,842,621	62·92
1917	9,323,229	5,022,694	53·87
1918	6,931,834	2,102,923	30·34
1919	14,279,240	6,236,585	43·67
1920	15,149,323	3,096,849	20·44
1921	10,331,405	1,373,810	13·30
1922	11,848,025	2,875,402	24·27
1923	11,999,500	3,259,476	27·16
1924	13,808,910	1,424,319	13·24
1925	13,642,852	173,126	1·27
1926	14,668,184	1,597,698	10·89
1927	15,805,120	472,041	2·99
1928	16,911,932	996,099	5·88
1929	16,660,742	1,802,709	10·82
1930	19,016,639	6,370,396	33·49
1931	14,266,650	4,333,421	30·37
1932	16,771,465	5,657,870	33·74
1933	18,098,214	5,328,869	29·44
1934	16,784,705	5,759,324	34·31
1935	17,611,547	5,698,721	32·36
1936	19,564,716	7,130,381	36·45
1937	21,594,942	9,026,313	41·80
1938	24,220,864	10,417,458	43·01
1939	23,244,509	11,969,562	51·49
1940	25,800,562	12,480,721	48·37
1941	24,536,777	12,411,316	50·58
1942	20,681,284	8,476,622	40·99
1943	18,014,340	6,539,295	36·30
1944	19,453,001	(a) 1,282,867	6·59
1945	20,170,624	(b) 205,587	1·02
1946	26,342,125	(b) 211,890	0·80
1947	42,389,125	(c) 4,162,892	9.82
1948	57,779,996	(b) 342,646	0·59
1949	58,197,775	(b) 465,124	0·80
1950	78,804,864	(b) 531,245	0·67
1951	115,880,457	(*d*) 7,479,601	6·45
1952	101,620,138	(*c*) 7,952,834	7·82
1953	106,678,014	(*e*)13,239,076	12·41
1954	79,955,207	(*e*) 5,342,462	6·68
Total since 1902	1,299,026,015	279,858,804	21·54

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

Comparative Statistical Diagrams

showing:

OUTPUT AND VALUE OF GOLD AND OTHER MINERALS, LANDS LEASED FOR GOLD MINING IN WESTERN AUSTRALIA

and the

GOLD PRODUCTION OF AUSTRALASIA FOR THE YEAR 1954

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

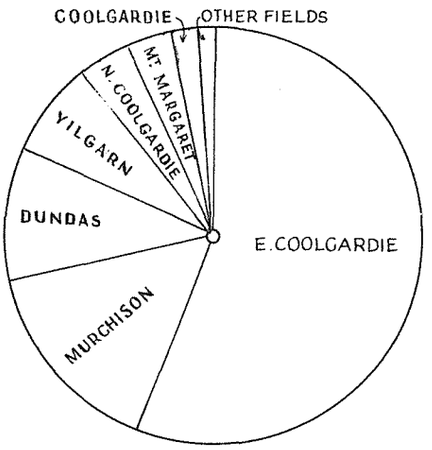


Fig. 2 Gold produced from various Goldfields as given by the Export and Mint Returns

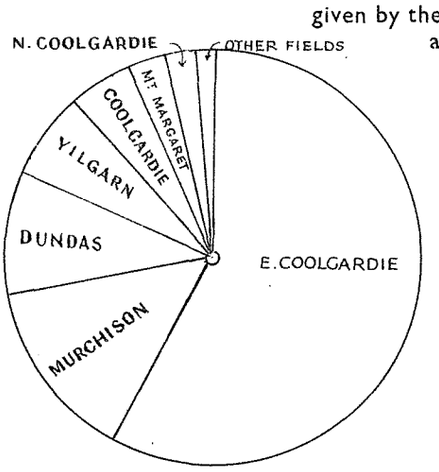


Fig. 3 Value of Gold and other Minerals

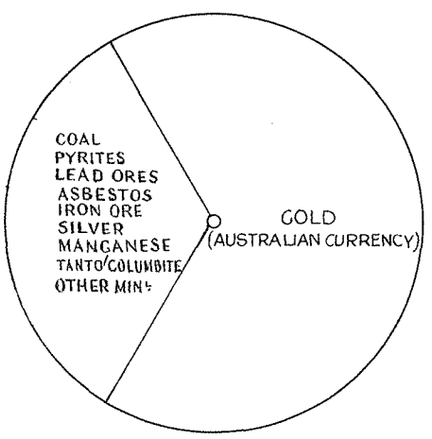


Fig. 4 Value of Minerals other than Gold

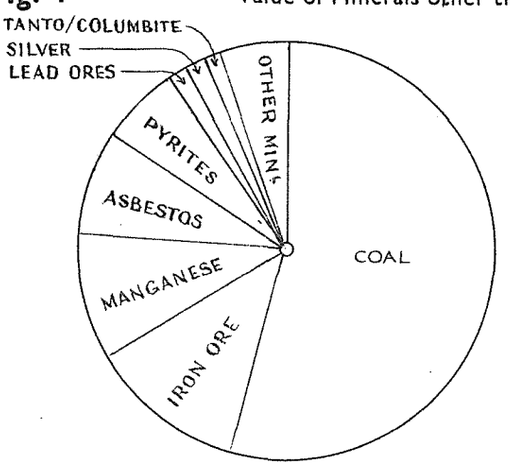


Fig. 5 Areas of land leased for Goldmining on various Goldfields

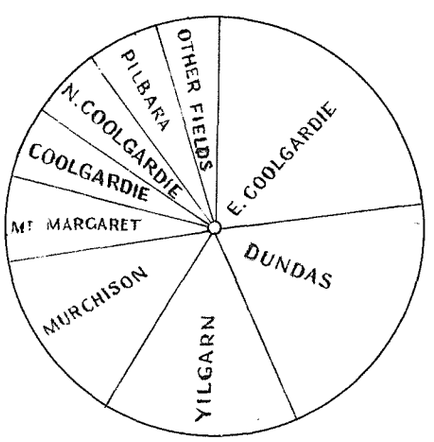


Fig. 6 Output of Gold in the States of Australia

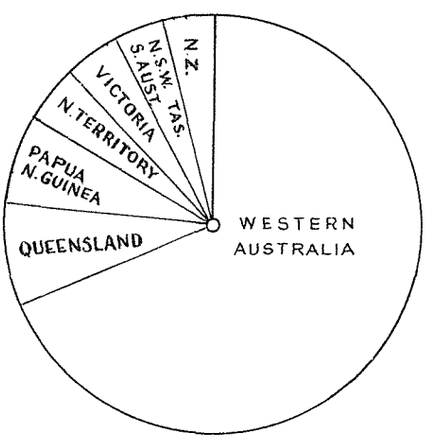
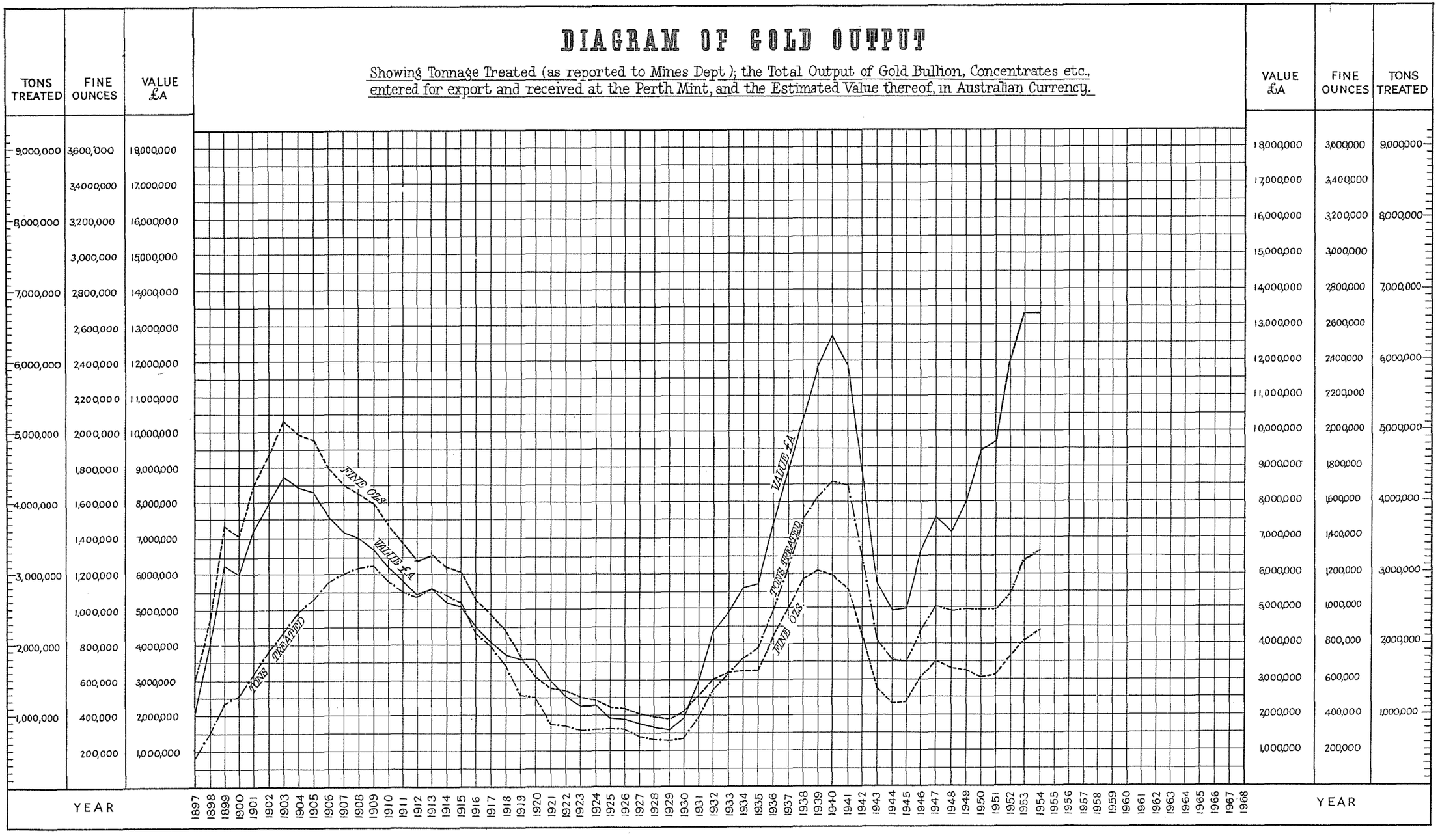


DIAGRAM OF GOLD OUTPUT

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 total reported, and the average value of the yield of Gold per ton of ore treated.

Goldfield.	Reported Yield.		Percentage for each Goldfield.		Average Value per ton of Ore Treated, (Gold at £4 4s. 11.45d. per fine oz.).	
	1953.	1954.	1953.	1954.	1953.	1954.
	Fine ozs.	Fine ozs.	%	%	Shillings.	Shillings.
1. Kimberley	238	83	·029	·010	....	....
2. West Kimberley	....	....	....	....	....	....
3. Pilbara	7,974	2,800	·968	·325	75·500	29·821
4. West Pilbara	4	11	·001	·001	....	....
5. Ashburton	84	89	·010	·010	165·542	118·086
6. Gascoyne	....	21	....	·003	....	....
7. Peak Hill	9,013	8,683	1·095	1·007	13·800	15·870
8. East Murchison	P1,199	348	·146	·040	294·455	57·535
9. Murchison	101,030	135,214	12·271	15·686	17·300	22·709
10. Yalgoo	423	....	·051	....	106·321	....
11. Mt. Margaret	29,140	28,413	3·539	3·296	23·315	27·550
12. North Coolgardie	36,459	34,530	4·428	4·006	52·565	48·541
13. Broad Arrow	2,550	2,848	·310	·330	48·088	68·321
14. North East Coolgardie	384	213	·047	·025	36·611	24·054
15. East Coolgardie	484,949	486,040	58·901	56·386	22·456	22·241
16. Coolgardie	19,601	18,743	2·380	2·175	36·968	41·486
17. Yilgarn	55,630	60,341	6·757	7·000	11·753	11·276
18. Dundas	74,135	83,425	9·004	9·678	40·287	44·844
19. Phillips River	479	76	·058	·009	....	....
20. Outside Proclaimed Goldfields	39	114	·005	·013	....	....
Totals and Averages	823,331	861,992	100·000	100·000	22·066	22·600

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

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

TABLE 4.

Average Quantities of Gold Ore raised and treated, and Gold produced therefrom, per man employed on the several Goldfields of the State, during 1953 *and* 1954.

Goldfield.	1953.				1954.			
	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 ozs.	Fine ozs.	Tons.	Tons.	Fine ozs.	Fine ozs.
1. Kimberley	....	10·50	....	5·25	....	....	....	13·77
2. West Kimberley	....	....	....	....	....	....	....	....
3. Pilbara	157·42	56·79	133·91	48·31	166·20	67·60	58·34	23·73
4. West Pilbara	....	....	....	....	....	....	....	10·88
5. Ashburton	21·50	10·75	41·58	20·79	32·00	21·33	44·48	29·65
6. Gascoyne	....	....	....	....	....	....	....	....
7. Peak Hill	5,044·40	924·80	819·32	150·21	5,164·38	1,080·91	964·75	201·92
8. East Murchison	31·45	9·35	108·41	32·23	51·35	16·56	34·78	11·22
9. Murchison	1,545·52	767·97	313·38	155·72	1,839·37	838·85	491·68	224·23
10. Yalgoo	37·44	16·92	45·64	20·54	....	....	....	....
11. Mt. Margaret	573·92	288·52	157·18	79·02	599·08	302·93	158·72	80·26
12. North Coolgardie	390·22	184·71	240·59	113·88	434·77	214·30	248·42	122·45
13. Broad Arrow	112·62	41·71	62·85	23·28	72·26	32·19	58·12	25·89
14. North-East Coolgardie	66·70	20·25	23·58	8·57	46·95	20·30	13·29	5·75
15. East Coolgardie	1,095·91	550·75	289·68	145·58	1,132·55	567·39	296·18	148·54
16. Coolgardie	234·60	132·87	101·83	57·67	221·86	119·20	108·34	58·20
17. Yilgarn	1,914·74	802·58	264·90	111·03	1,902·14	768·58	252·47	115·15
18. Dundas	651·37	381·29	308·90	180·81	678·29	390·22	358·05	205·99
19. Phillips River	....	....	239·62	59·90	....	....	38·29	12·76
20. Outside Proclaimed Goldfields	....	....	....	....	....	....	....	....
Total Averages	1,015·66	498·48	263·37	129·26	1,073·32	528·78	285·52	140·66

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 1954.

State.	Output of Gold.	Value.*	Percentage of Total.	
			Output of Commonwealth.	Output of Australasia.
	Fine ozs.	£	%	%
Western Australia	850,540	3,612,863	71·333	68·605
Victoria	52,665	223,617	4·417	4·248
New South Wales	31,321	133,049	2·627	2·526
Queensland	97,338	413,483	8·164	7·851
Tasmania	19,368	82,274	1·624	1·562
South Australia	54	229	0·004	0·004
Territory of Papua and New Guinea	86,728	368,414	7·274	6·996
Northern Territory	54,339	230,828	4·557	4·383
New Zealand	47,413	201,406	....	3·825
	1,239,766	5,266,163	100·000	100·000

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

TABLE 6.

Dividends, etc., paid by Western Australian Mining Companies during 1954, *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.	
		1954.	Grand Total to end of 1954.
		£	£
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.	600,000	1,065,626
	Various Companies	....	2,764,945
Mt. Margaret	Sons of Gwalia, Ltd.	....	2,075,050
	Various Companies	....	958,286
North Coolgardie	do. do.	....	712,551
Broad Arrow	do. do.	....	92,500
North-East Coolgardie	do. do.	....	129,493
East Coolgardie	Boulder Perseverance, Ltd.	35,128	(*a*) 2,719,884
	Golden Horseshoe (New), Ltd.	....	(*b*) 4,101,670
	Gold Mines of Kalgoorlie, Ltd.	120,703	1,187,869
	Great Boulder Proprietary G.M's., Ltd.	125,000	7,746,900
	Kalgoorlie Enterprise Mines, Ltd.	....	287,375
	Lake View and Star, Ltd.	393,750	(*c*) 6,874,500
	North Kalgurli (1912), Ltd.	120,312	1,883,748
	South Kalgurli Consolidated, Ltd.	....	1,234,098
	Various Companies	....	11,128,894
Coolgardie	New Coolgardie G.M., N.L.	....	21,300
	Various Companies	....	388,700
Yilgarn	do. do.	....	(*d*) 1,205,556
Dundas	Central Norseman Gold Corporation, N.L.	390,000	2,047,500
	Various Companies	....	786,162
	Totals	1,784,893	51,552,478

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

TABLE 7.

Quantity and Value of Minerals, other than Gold and Silver, reported to the Mines Department during 1954.

Goldfield, District or Mineral Field.	1954.		Increase or Decrease as compared with 1953.	
	Quantity.	Value.	Quantity.	Value.
	Tons.	£A.	Tons.	£A.
ANTIMONY ORE AND CONCENTRATES—				
Pilbara	45·44	1,410	— 312·99	— 8,903
ASBESTOS (Chrysotile)—				
Pilbara	124·79	2,620	— 216·90	— 4,467
West Pilbara	178·86	10,854	— 85·03	— 47,828
ASBESTOS (Crocidolite)—				
West Pilbara	3,793·67	542,202	— 1·73	— 99,393
BARYTES—				
Murchison	111·74	615	+ 111·74	+ 615
North-East Coolgardie	....	....	— 42·22	— 380
Outside Proclaimed Goldfield	932·00	7,016	+ 762·35	+ 5,606
BENTONITE—				
Outside Proclaimed Goldfield	1,121·60	4,111	+ 903·90	+ 3,370
BERYL—				
Pilbara	105·60	18,070	+ 1·11	— 579
Ashburton	0·14	25	+ 0·14	+ 25
Gascoyne	11·78	2,092	+ 9·71	+ 1,690
Yalgoo	3·48	547	— 4·52	— 843
Coolgardie	11·15	1,873	+ 1·09	+ 91
CHROMITE—				
Peak Hill	4,269·55	48,957	+ 2,301·55	+ 19,240
CLAYS (Cement, Fire and White Clay, including Kaolin)—				
Outside Proclaimed Goldfield	22,659·00	28,681	— 256·85	+ 12,800
COAL—				
Collie	1,018,342·53	3,588,818	+ 132,160·33	+ 515,745
COPPER ORE AND CONCENTRATES—				
Pilbara	....	....	— 32·93	— 2,424
West Pilbara	....	....	— 13·32	— 674
Outside Proclaimed Goldfield	....	....	— 4·04	— 101
CUPREOUS ORE (Fertiliser)—				
Pilbara	310·58	9,200	+ 310·58	+ 9,200
West Pilbara	3,080·16	17,228	+ 2,407·94	+ 10,377
Ashburton	0·75	7	— 9·04	— 107
East Murchison	553·04	12,671	— 339·06	+ 2,628
Peak Hill	328·57	5,915	+ 165·27	+ 4,775
Murchsion	286·15	2,653	+ 260·61	+ 2,192
Mt. Margaret	72·86	660	+ 63·36	+ 587
Board Arrow	....	....	— 22·00	— 368
East Coolgardie	....	....	— 29·00	— 100
Dundas	....	....	— 12·69	— 117
Phillips River	116·00	2,047	+ 44·00	+ 641
Outside Proclaimed Goldfield	....	....	— 39·94	— 331
DIATOMACEOUS EARTH—				
Outside Proclaimed Goldfield	150·00	1,579	+ 150·00	+ 1,579
EMERALD—	Carats (cut).		Carats (cut).	
Pilbara	8·68	313	+ 8·68	+ 313
FELSPAR—				
Coolgardie	3,173·00	14,293	+ 1,093·50	+ 5,611
Outside Proclaimed Goldfield	52·91	198	+ 5·41	+ 20
FULLER'S EARTH—				
Outside Proclaimed Goldfield	....	....	— 15·75	— 79
GLASS SAND—				
Outside Proclaimed Goldfield	7,803·01	5,541	+ 897·27	+ 851
GLAUCONITE—				
Outside Proclaimed Goldfield	257·50	9,012	— 62·00	— 2,170
GRAPHITE—				
Outside Proclaimed Goldfield	....	....	— 20·00	— 180
GYPSUM—				
Yilgarn	24,347·00	18,290	— 869·00	— 751
Dundas	30·00	15	+ 18·00	+ 9
Outside Proclaimed Goldfield	16,765·00	13,315	+ 1,745·89	+ 2,194

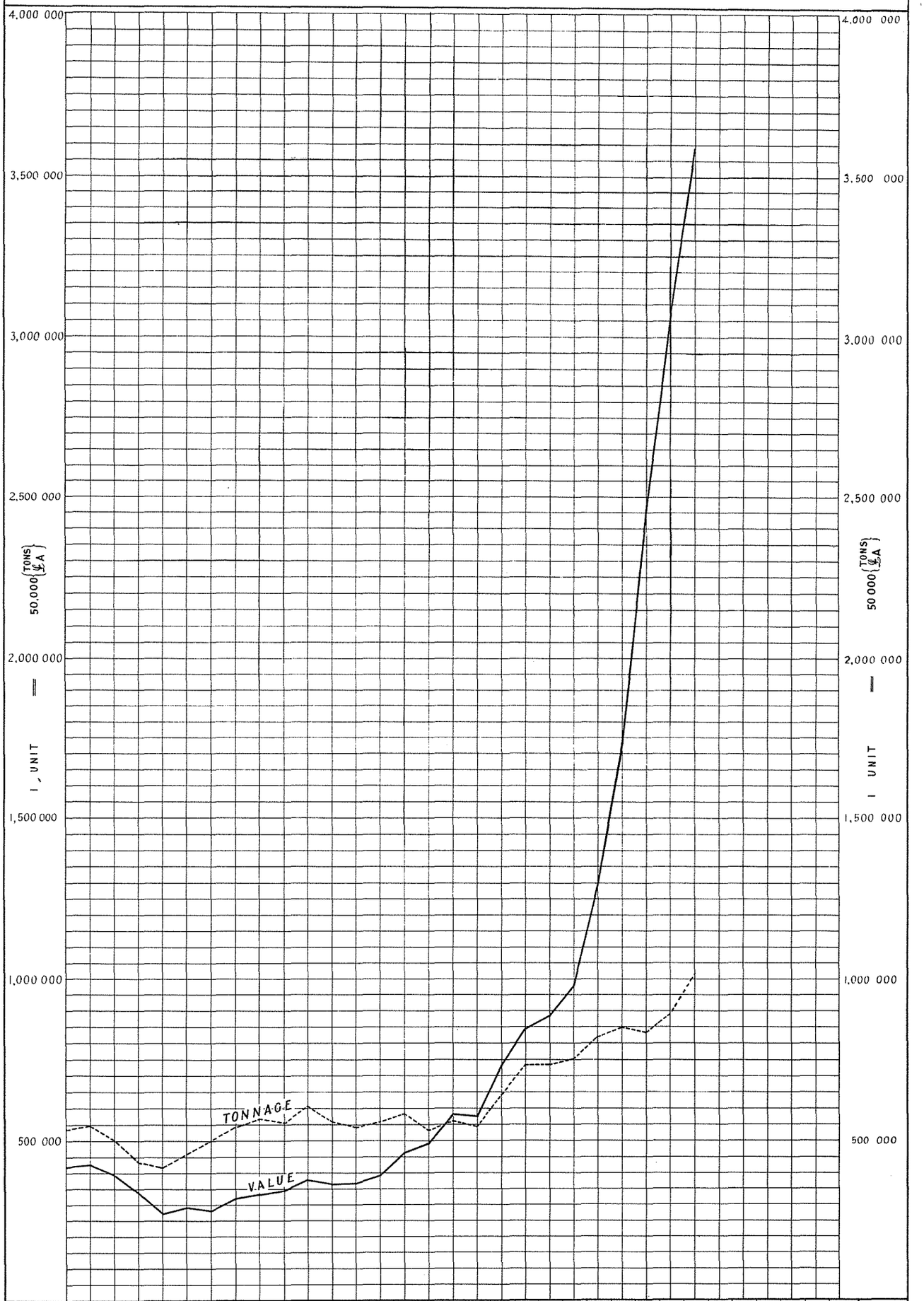
TABLE 7—*continued.*

Quantity and Value of Minerals, other than Gold and Silver, reported to the Mines Department during 1954—*continued.*

Goldfield, District or Mineral Field.	1954.		Increase or Decrease as compared with 1953.	
	Quantity.	Value.	Quantity.	Value.
IRON ORE (for Pig Iron)—	Tons.	£A.	Tons.	£A.
Yilgarn	16,664·99	195,997	+ 3,489·11	+ 10,327
Outside Proclaimed Goldfield	1,633·30	13,030	— 2,042·59	— 22,306
IRON ORE (exported)—				
West Kimberley	634,514·00	634,514	— 53,381·00	— 52,837
LEAD ORE AND CONCENTRATES—				
Northampton	1,338·94	70,370	— 3,437·17	— 214,154
SILVER-LEAD ORE AND CONCENTRATES—				
Pilbara	155·27	7,679	— 238·50	— 13,296
West Pilbara	....	....	— 3·29	— 28
Ashburton	393·50	20,533	— 319·78	— 19,662
SILVER-LEAD-ZINC ORE AND CONCENTRATES—				
West Kimberley	279·26	2,601	— 165·35	— 4,517
Pilbara	....	....	— 94·42	— 5,488
MAGNESITE—				
Coolgardie	91·75	258	+ 72·15	+ 185
MANGANESE—				
Pilbara	8,982·00	163,473	+ 8,982·00	+P163,473
Peak Hill	31,599·00	444,742	+ 15,275 ·00	+ 293,751
OCHRE—RED—				
Kimberley	....	....	— 20·61	— 330
Murchison	388·00	3,694	+ 121·94	+ 1,282
OCHRE—YELLOW—				
Murchison	41·45	415	+ 41·45	+ 415
East Coolgardie	....	....	— 20·50	— 145
PETALITE—				
Coolgardie	15·00	69	+ 15·00	+ 69
PYRITES ORE AND CONCENTRATES—				
Dundas	56,150·00	441,466	— 3,098·00	— 48,519
TALC—				
East Coolgardie	37·00	166	— 71·70	— 321
Outside Proclaimed Goldfield	2,883·03	45,685	+ 763·66	+ 15,240
TANTALO/COLUMBITE ORE AND CONCENTRATES—	lb.		lb.	
Greenbushes	10,845·00	5,941	+ 3,928·00	— 1,311
Pilbara	104,644·00	68,997	+ 98,175·00	+ 60,437
Gascoyne (Yinnietharra)	....	....	— 1,797·00	— 1,038
Coolgardie	1,230·00	1,507	— 1,224·00	— 1,453
TANTALO/COLUMBITE ORE AND CONCENTRATES (Microlite)—				
Phillips River	....	....	— 487·00	— 390
TIN—	Tons.		Tons.	
Greenbushes	42·85	22,885	+ 1·44	— 426
Pilbara	78·47	40,092	+ 7·50	+ 706
West Pilbara	....	....	— 0·59	— 310
East Murchison	....	....	— 0·30	— 122
TUNGSTEN (Scheelite)—	lb.		lb.	
Pilbara	3,782·00	1,867	+ 3,782·00	+ 1,867
Yalgoo	....	....	— 65·00	— 43
Mt. Margaret	....	....	— 1,758·00	— 842
North Coolgardie	4,497·00	1,494	— 1,566·00	— 77
Coolgardie	....	....	— 1,665·00	— 867
Yilgarn	....	....	— 101·00	— 38
TUNGSTEN (Wolfram)—	lb.		lb.	
Murchison	....	....	— 6,731·00	— 3,861
Yalgoo	....	....	— 1,002·00	— 612
VERMICULITE—	Tons.		Tons.	
Outside Proclaimed Goldfield	....	....	— 29·00	— 348
ZINC—				
West Kimberley	73·85	*Nil*	— 35·93	— 1,376
Pilbara	....	....	— 4·38	*Nil*
ZINC ORE (Fertiliser)—				
Pilbara	....	....	— 10·00	— 50

GRAPH OF COAL OUTPUT

Showing Quantities and Values as reported to Mines Dept.



YEAR	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	YEAR
VALUE £A	420145	426706	394758	336178	270630	289806	278704	318013	331565	340444	375083	362811	364600	389278	461495	489721	583075	572896	730104	840249	880236	972245	1,287745	1,716788	2,457286	3,073073	3,588,818							VALUE £A
TONS	528420	544719	501425	432400	415719	458399	500343	537188	565075	553510	604793	557535	539427	566574	581176	531546	588322	543363	642287	730506	732938	750394	814351	848475	830461	886182	1083433							TONS

GRAPH OF TREND IN COAL OUTPUT

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

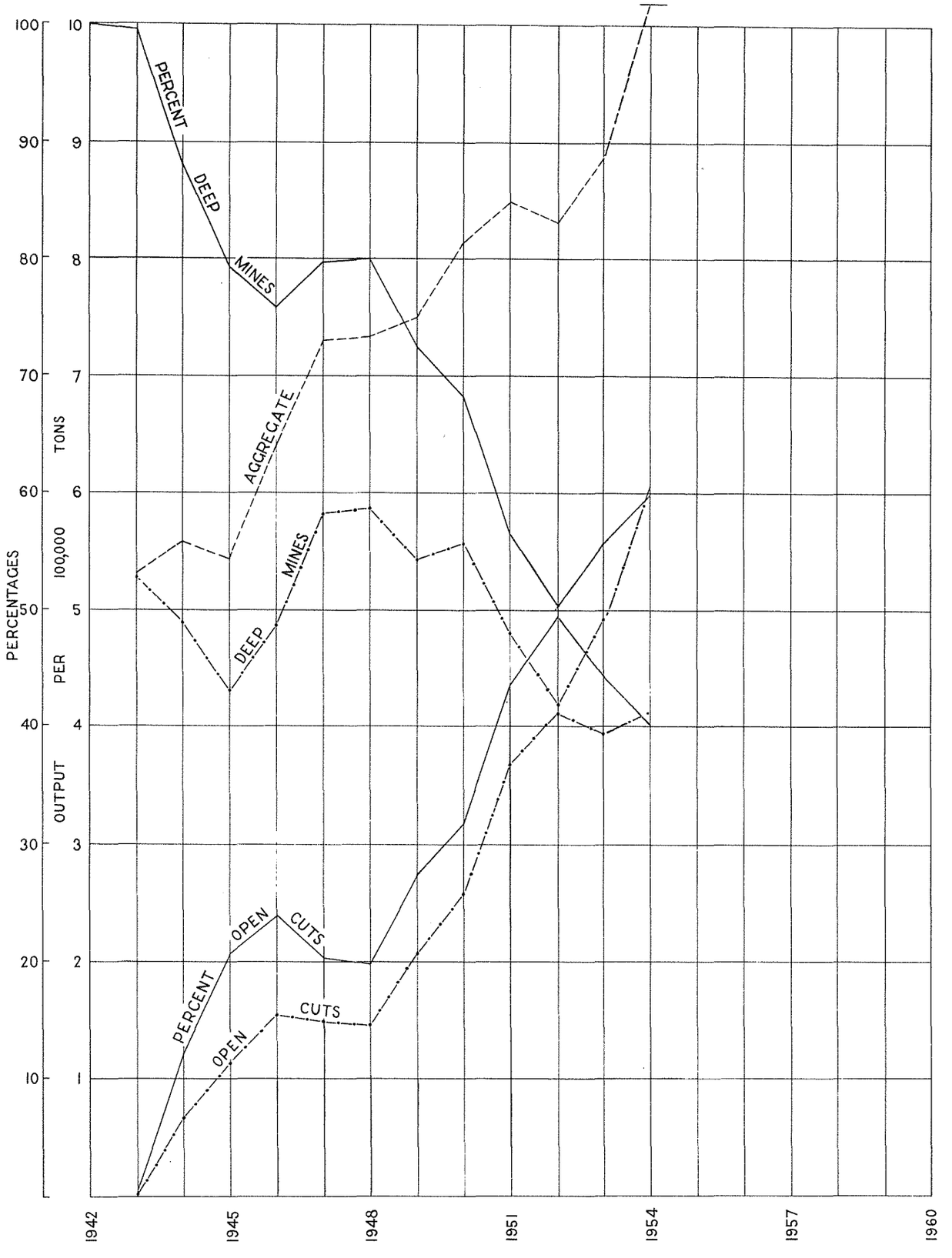


TABLE 8.

Total Coal output from Collie Coalfield during 1953 *and* 1954, *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—								
1952	493,035	1,730,919	355	816	1,171	1,389	604	421
1953	607,727	2,141,851	375	852	1,227	1,621	713	495
Open Cut Mining—								
1952	393,147	1,342,154	292	....	292	1,346	....	1,346
1953	410,616	1,446,967	333	....	333	1,233	....	1,233
Totals—								
1952	886,182	3,073,073	647	816	1,463	1,370	1,086	606
1953	1,018,343	3,588,818	708	852	1,560	1,438	1,195	653

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

TABLE 9.

Total Number and Acreage of Lease, Mineral Claims and Prospecting Areas held for Mining on the 31*st December,* 1953 *and* 1954.

Leases and Other Holdings.	1953.		1954.	
	No.	Acreage.	No.	Acreage.
Gold Mining Leases on Crown Lands	1,335	24,860	1,340	24,821
Gold Mining Leases on Private Property	25	594	20	462
Mineral Leases on Crown Lands	253	43,155	281	44,350
Mineral Leases on Private Property	19	2,069	22	2,136
Mineral Claims	342	23,318	452	33,897
Prospecting Areas	*537	9,285	†509	13,623
Totals	2,511	103,281	2,624	118,289

* Includes 68 Prospecting Areas for Minerals of a total of 1,522 acres.

† Includes 97 Prospecting Areas for Minerals of a total of 5,297 acres.

PART IV.—MEN EMPLOYED.

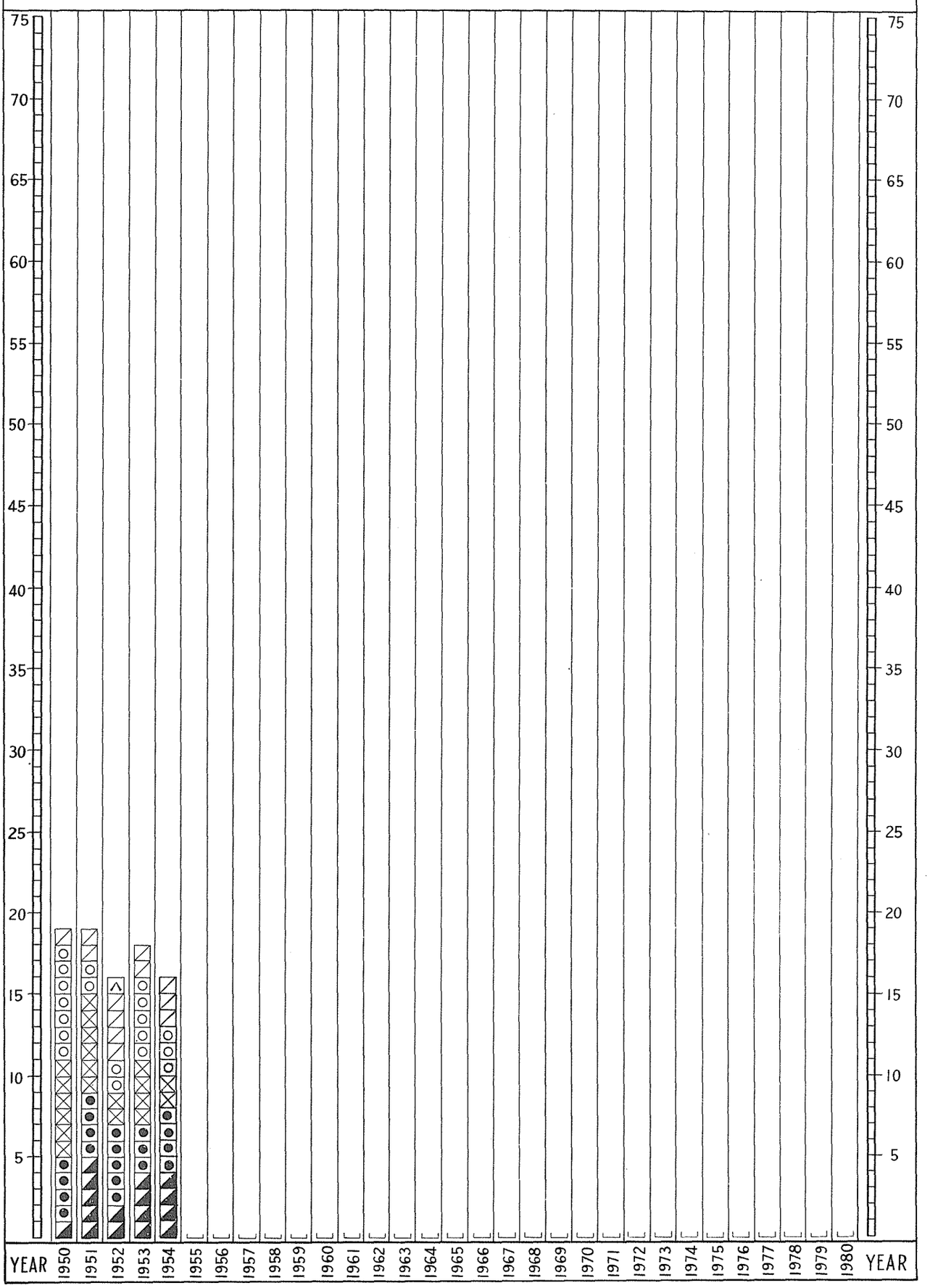
TABLE 10.

Average number of Men reported as engaged in Mining during 1953 and 1954.

Goldfield.	District.	Reef or Lode.		Alluvial.		Total.	
		1953.	1954.	1953.	1954.	1953.	1954.
Kimberley	....	5	6	....	....	5	6
West Kimberley	....	....	....	....	....	....	....
Pilbara	Marble Bar	77	46	....	....	77	46
	Nullagine	81	72	....	....	81	72
West Pilbara	....	1	1	....	....	1	1
Ashburton	....	4	3	....	....	4	3
Gascoyne	....	....	....	....	....	....	....
Peak Hill	....	60	43	....	....	60	43
East Murchison	Lawlers	8	9	....	....	8	9
	Wiluna	20	12	....	....	20	12
	Black Range	9	10	....	....	9	10
Murchison	Cue	442	380	....	....	442	380
	Meekatharra	35	31	....	....	35	31
	Day Dawn	16	16	....	....	16	16
	Mt. Magnet	153	176	....	....	153	176
Yalgoo	....	20	11	....	....	20	11
Mt. Margaret	Mt. Morgans	25	15	....	....	25	15
	Mt. Malcolm	286	360	....	....	286	260
	Mt. Margaret	57	79	....	....	57	79
North Coolgardie	Menzies	148	136	7	5	155	141
	Ularring	89	82	2	1	91	83
	Niagara	22	15	....	....	22	15
	Yerilla	50	42	1	1	51	43
Broad Arrow	....	104	106	4	4	108	110
North-East Coolgardie	Kanowna	35	30	4	4	39	34
	Kurnalpi	3	2	2	1	5	3
East Coolgardie	East Coolgardie	3,309	3,251	7	10	3,316	3,261
	Bulong	12	8	3	3	15	11
Coolgardie	Coolgardie	318	301	....	....	318	301
	Kunanalling	21	21	....	....	21	21
Yilgarn	....	501	524	....	....	501	524
Dundas	....	410	405	....	....	410	405
Phillips River	....	8	6	....	....	8	6
State Generally	....	....	....	....	....	....	....
Total, Gold Mining	....	6,329	6,099	30	39	6,359	6,128
MINERALS OTHER THAN GOLD.							
Asbestos	....	243	246	....	....	243	246
Barytes	....	3	3	....	....	3	3
Bentonite	....	1	2	....	....	1	2
Beryl	....	30	53	....	....	30	53
Clays	....	8	10	....	....	8	10
Coal	....	6	4	....	....	6	4
Copper Ore	....	1,463	1,560	....	....	1,463	1,560
Chromite	....	1	....	....	....	1	....
Cupreous Ore (Fertiliser)	....	18	41	....	....	18	41
Diatomaceous Earth	....	....	....	....	....	....	....
Dolomite	....	9	13	....	....	9	13
Felspar	....	4	4	....	....	4	4
Glass Sand	....	2	2	....	....	2	2
Glauconite	....	26	24	....	....	26	24
Gypsum	....	129	134	....	....	129	134
Iron Ore	....	122	51	....	....	122	51
Lead	....	1	1	....	....	1	1
Magnesite	....	24	35	....	....	24	35
Manganese	....	2	3	....	....	2	3
Ochre—Red and Yellow	....	209	173	....	....	209	173
Pyrites	....	6	5	....	....	6	5
Talc	....	23	23	....	....	23	23
Tantalo/Columbite	....	57	59	....	....	57	59
Tin	....	2	....	....	....	2	....
Tungsten—Scheelite	....	8	....	....	....	8	....
Wolfram	....	2	....	....	....	2	....
Vermiculite	....						
Total, Other Minerals	....	2,399	2,446	....	....	2,399	2,446
Grand Total	....	8,728	8,545	30	29	8,758	8,574

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 1953 AND 1954.

A.—*According to Locality of Accident.*

Goldfield.	Killed.		Injured.		Total Killed and Injured.	
	1953.	1954.	1953.	1954.	1953.	1954.
1. Kimberley	....	....	....	....	....	....
2. West Kimberley	....	....	7	3	7	3
3. Pilbara	....	....	4	9	4	9
4. West Pilbara	2	....	11	18	13	18
5. Ashburton	....	....	1	....	1	....
6. Gascoyne	....	....	....	....	....	....
7. Peak Hill	....	....	3	2	3	2
8. East Murchison	....	....	....	....	....	....
9. Murchison	....	....	32	32	32	32
10. Yalgoo	....	....	....	....	....	....
11. Mount Margaret	....	....	30	27	30	27
12. North Coolgardie	1	....	20	12	21	12
13. North-East Coolgardie	....	....	....	1	....	1
14. Broad Arrow	....	....	....	....	....	....
15. East Coolgardie	6	8	319	301	325	309
16. Coolgardie	....	....	19	19	19	19
17. Yilgarn	3	2	18	34	21	36
18. Dundas	1	3	64	48	65	51
19. Phillips River	....	....	....	....	....	....
Mining Districts—						
Northampton	2	....	14	5	16	5
Greenbushes	....	....	....	....	....	....
Collie	2	....	130	147	132	147
South-West	1	3	9	4	10	7
Totals	18	16	681	662	699	678

From the above Table it will be seen that the number of fatal accidents for the year 1954 was 18 as against 16 in 1952. The number injured showed an increase of 72. These accidents are classified according to theircauses 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.	1953.		1954.		Comparison with 1953.	
	Fatal.	Serious.	Fatal.	Serious.	Fatal.	Serious.
1. Explosives	4	10	4(*b*)	3	....	— 7
2. Falls of Ground	3	71(*d*)	4	43	+ 1	— 28
3. In Shafts	4	14	2	20	— 2	+ 6
4. Miscellaneous Underground	5	427	3	431	— 2	+ 4
5. Surface	2(*a*)	158(*e*)	3(*c*)	165(*f*)	+ 1	+ 7
6. Fumes	....	1	....	....	....	— 1
Totals	18	681	16	662	— 2	— 19

(*a*) Includes 1 fatal accident in quarries.
(*b*) Includes 1 fatal accident in quarries.
(*c*) Includes 6 serious accidents in quarries.
(*d*) Includes 7 serious accidents in quarries.
(*e*) Includes 2 serious accidents in puarries.

(2)—95047

PART VI.—STATE AID TO MINING.

(a) State Batteries.

The number of State Batteries existing at the end of the year was 19 including Northampton Base Metal Plant.

The tonnage of gold ore crushed was again lower than the previous year being 34,599¾ tons for 1954 compared with 40,218½ tons for 1953, a reduction of 5,618¾ tons. The bullion produced amounted to 13,980 ozs. which is estimated to contain 11,848 ozs. of fine gold or 6 dwts. 20 grains of gold per ton of ore.

Cyaniding.—Eight plants handled 19,907 tons of crushed ore for a production of 3,302 fine ozs. worth £51,237. The average content of this tonnage was 4 dwts. 5 grains before treatment while the residue contained 23 grains. The theoretical extraction by cyanidation was therefore 76.9 per cent. and the actual extraction 77.2 per cent. The cost of cyanidation was 35s. 3d. per ton, an increase of 1s. per ton on the previous year. Cue and Laverton showed the best figures with 26s. 10d. and 27s. 1d. respectively, whilst Kalgoorlie was 29s. 4d. per ton.

The working expenditure for all plants was £80,710 which does not include depreciation and interest.

Tonnages crushed for 1952, 1953, and 1954 were 42,270, 40,218 and 34,600 respectively.

Northampton plant commenced crushing lead ore in January, 1954. During the year 3,879 tons were put through for an average estimated content of 15.90 per cent lead. There were 24 parcels giving an average of 161.66 tons of ore per parcel. A total of 516.57 tons of concentrates were produced which averaged 71.88 per cent. lead. In addition this plant treated 4½ tons of wolfram ore for a yield of 567 lbs. of concentrates.

(b) Geological Survey of Western Australia.

The principal work of the Geological Survey Branch for the year 1954 is covered by the following reports published in Division 14 of this report.

Report on Water Supply, Carnarvon Banana Plantation Area, Carnarvon, W.A.

Report on Search for Alleged Meteorite Crates, West-North-West of Madura "Motel," Great Eastern Highway, W.A.

The Search for Oil in Western Australia.

A Summary Report on the Mt. Magnet District, Murchison G.F. Part I., Regional Geology; Part II, Report on Selected Mining Groups in the Mt. Magnet District, Murchison G.F.

Report on Ground Water Prospects on Location F (4,700 acres) Barramming, Williams, South-West Division, W.A.

Notes on a Reconnaissance of the Stirling Range Area, South-West Division.

Manganese Deposits of the Hamersley River and Mount Chester Areas, Phillips River G.F.

Report on Radioactivity occurrence "Elverdton" workings, Phillips River G.F.

Report on Alleged Opal and Uranium Claims P.A. 948H and 951H, Jeramungup, South-West Division, W.A.

Report on Reconnaissance of Diamondiferous Country in the Vicinity of Nullagine, Pilbara G.F., W.A.

Notes on the Geology of the Nullagine District, Pilbara G.F., W.A.

Report on the Manganese Deposits of Frazer Range, Dundas G.F.

Report on Chiron Coal Seam in the vicinity of the Centaur Colliery, Collie Coal Field, with particular reference to its suitability for deep mining.

Report on some Roof and Floor Conditions, drilling ahead of the Centaur Colliery, Collie Mineral Field.

Progress Report on Diamond Drilling, Collie Mineral Field, (W.A.) (7): Bore No. 8—Site B—Coal Mining Leases 440, 60 chains South-West of Western No. 2 Colliery.

Report on some Roof and Floor Conditions, drilling ahead of Western No. 2 Colliery, Collie Mineral Field.

Report on Uranium Deposit on Location 6100, Brookton, South-West Division, W.A.

Report on Radioactivity near Lake Dundas, Dundas Goldfield.

Propress Report on Exploratory Diamond Drilling of Abandoned Gold Shows: D.D.H.Y1, "White Horseshoe" G.M., Yilgarn G.F.

Progress Report on Exploratory Diamond Drilling of Abandoned Gold Shows: D.D.H.Y2. Site B—"Spring Hills" G.M., Parker's Range, Yilgarn G.F.

Progress Report on Exploratory Diamond Drilling of Abandoned Gold Shows: D.D.H.Y3, Site C1—"Centenary" G.M., Parker's Range, Yilgarn G.F.

Progress Report on Exploratory Diamond Drilling of Abandoned Gold Shows: D.D.H.Y4, Site D1—"Great Unknown" G.M., Reidel's Find, Yilgarn G.F.

Progress Report on Exploratory Diamond Drilling of Abandoned Gold Shows: D.D.H.Y5, Site D1—"Great Unknown" G.M., Reidel's Find, Yilgarn G.F.

Progress Report on Exploratory Diamond Drilling of Abandoned Gold Shows: D.D.H.Y6, Site E1—"Allen's Find" G.M., Marda, Yilgarn G.F.

Report on "Pernatty" G.M., G.M.L. 227PP, Location 50, Hampton Plains Properties, Feysville, East Coolgardie G.F.

Report on Investigation of Radioactivity on Government Reserve 5913, Canning River Catchment Area G.F. 22

Report on "Marjorie Glen Reward" G.M., G.M.L. 76PP, Jilbadji Location 387, Yilgarn G.F.

Report on New Gold Strike (P.A. 373PP), Location 387, Yilgarn G.F.

Report on P.A. 6728 (late G.M.L. 1837) Nevoria, Yilgarn G.F.

Report on Investigation of Radioactivity on P.A. 356PP, Woonanup, Mt. Barker, S.W. Division.

Report on "Greta" G.M., G.M.L. 5955, Bullabulling Group, Coolgardie G.F.

Report on Inspection of P.A. 953H for Uranium, ¾ mile North 30° East of Kalamunda, South-West Land Division, W.A.

During the year the following publications were issued:

Annual Progress Report of the Geological Survey of Western Australia for 1951.

The following publications are still in the press:

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

Annual Progress Reports of the Geological Survey of Western Australia for 1952 and 1953.

The following Reports have been compiled and await publication:

Mineral Resources of Western Australia, Bulletin No. 6, Silver, Lead and Zinc, by W. Johnson, B.Sc. (Hons.).

Mineral Resources of Western Australia, Bulletin No. 7, Vermiculite, Talc and Soapstone, Fuller's Earth, Bentonite and Diatomite, by W. Johnson, B.Sc. (Hons.).

Mineral Resources of Western Australia, Bulletin No. 8, Gypsum, by L. E. de la Hunty, B.Sc. and C. H. Low, B.Sc.

In course of Preparation:

Bulletin No. 109: A Geological Survey of Ravensthorpe District, Phillips River G.F., W.A., by J. Sofoulus, B.Sc.

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

ASSISTANCE UNDER THE MINING DEVELOPMENT ACT, 1902.

The following Statement shows the sums advanced during the year 1954 under this Act.

	£	s.	d.
1. Advanced in aid of mining work and equipment of mines with machinery	96,621	5	4
2. N.A.			
3. Providing means of transport, equipment and sustenance for prospectors	13,520	17	3
4. Other assistance			
	£110,142	2	7

The receipts under this Act exclusive of interest payments amounted to

1. Refunds of Advances	78,711	13	11
2. Prospecting Refunds	1,991	13	7
	£80,703	7	6

For the year 1953, the amount of Assistance advanced under this Act was £170,294 14s. 2d.

Wages Gt. Fingall paid from C.R.F. amounting to £5,310 9s. 6d.

PART VII.–INSPECTION OF MACHINERY.

The Chief Inspector of Machinery reports that the number of useful boilers registered at the end of the year totalled 7,087 against 6,818 total for the preceding year, showing an increase of 269 boilers after all adjustments.

Of the total 7,087 useful boilers, 3,643 were out of use at the end of the year; 2,907 thorough and 996 working inspections were made and 3,281 certificates were issued.

Permanent condemnations totalled 44 and temporary condemnations 10, 3 boilers were transferred beyond the jurisdiction of the Act.

The total number of machinery groups registered was 35,212 against 33,025 for the previous year, showing an increase of 2,187.

Inspections made total 27,051 and 6,406 certificates were granted.

The total miles travelled for the year were 78,112 against 78,375 miles for the previous year, showing decrease of 263 miles. The average miles travelled per inspection were 2.6.

365 applications for engine driver's and boiler attendant's certificates were received and dealt with, and 294 certificates all classes were granted as follows:—

Winding Competency (including certificates issued under Regulation 40 and Section 60)	7
First Class Competency (including certificates issued under Regulations 40 and 45, and Sections 60 and 63) —	8
Second Class Competency (including certificates issued under Regulation 40 and Section 60)	12
Third Class Competency (including certificates issued under Regulation40 and 45 and Sections 60 and 63 of the Act)	31
Locomotive Competency (including certificates issued under Regulation 40 and Section 60)	7
Traction Competency (including certificates issued under Regulation 40 and Section 60)	—
Internal Combustion Competency (including certificates issued under Regulation 40 and Section 60)	44
Crane and Hoist Competency (including certificates issued under Regulation 40 and Section 60)	79
Boiler Attendant's Competency (including certificates issued under Regulation 40 and Section 60)	101
Interim	1
Copies	4
Total	294

The total revenue from all sources during the year was £13,837 2s. as against £13,529 10s. 2d. previous year, showing an increase of £307 11s. 10d.

The total expenditure for the year was £25,381 10s. 5d. against £24,798 9s. 1d. for the previous year, showing an increase of £583 1s. 4d.

PART VIII.–THE GOVERNMENT CHEMICAL LABORATORIES.

The total number of samples registered for analysis, chemical and mineral examinations during the years was 15,876 as aginst 18,439 last year. The volume of work of an advisory nature for Government Departments and various industries other than actual analytical work continues to increase. Departments for whom reports and examinations were made were Mines, Agriculture, Public Health, Metropolitan Water Supply, Sewerage and Drainage, Public Works, Police, Factories, State Housing, Government Stores and Tender Board, Charcoal Iron and Steel Industry and other State Industries, Forests and Department of Industrial Development. Samples were also received from various Commonwealth Government Departments and the general public.

Samples were allocated to the various Divisions according to the specialised nature of the chemical work undertaken by each Division.

Although the variety and scope of the activities of the Fuel, Drugs, Toxicology and Industrial Hygiene Division, materially increased during the year, the total number of samples examined namely 9,076, was considerably less than the total for 1953. This was due to a decrease in the number of systematic and investigational samples taken in connection with sewer corrosion research carried out in collaboration with the Metropolitan Water Supply, Sewerage and Drainage Department.

The main activities of this Division were concerned with chemical work undertaken for the Department of Public Health, Police Department and to a lesser extent Metropolitan Water Supply Department, Department of Agriculture, Milk Board and Tender Board and embraced a wide

variety of products, including human and animal toxicological exhibits, criminal investigation exhibits, drugs and medicines, trade wastes, insecticides, river and harbour pollution samples, explosives, cleaning materials and detergents, paints and colourings and a number of miscellaneous products. The programme of work on sewer corrosion in co-operation with the Water Supply, Sewerage and Drainage Department was continued at the Lincoln Street annexe laboratory and collaboration in this work was maintained with other authorities in Australia working on similar problems.

The chief sources from which samples were received by the Mineral Division were the State Batteries, Government Geologist and the general public, while some were received from the Public Works Department and the Metropolitan Water Supply Department. Its activities are largely concerned with the development of the mineral industry in this State. Apart from general analyses and assaying a large number of minerals and ores of potential economic values were examined. Metals, alloys and building materials were also examined for their susceptibility to corrosion and for compliance to specifications. A large number of samples were tested for radioactivity both departmentally and for the general public. Samples are tested free to assist the search for radio-active minerals in this State.

The Agriculture, Forestry and Water Supply Division received 4,923 samples during the year, an increase of 946 from last year. Of these, the majority were for the Department of Agriculture or primary producers. There were 2,065 samples of water tested for suitability for domestic, irrigation and stock purposes. Other samples included soils, pastures, cereals, various plant and tree products and miscellaneous elements of fertilising value as required by various branches of the Department of Agriculture Plant Nutrition, Plant Pathology, Horticulture, Dairying, Entomology, Animal Health and Nutrition, Poultry, Wheat and Sheep, Vegetable, Irrigation and Tobacco, etc., were all represented. A number of fertilisers and feeding stuffs for compliance with the respective Acts were analysed. The routine examinations of existing water supplies to cities and towns both metropolitan and country have been continued.

The main activity of the Fuel Technology Division has been development work on the production of coked briquettes from Collie coal. A considerable part of this work has been carried out in conjunction with the Department of Industrial Development at Welshpool, contact has been maintained with Broken Hill Proprietary on the same project, an account of the theoretical background of the work has been published in the Journal of the Institute of Fuel (London) and a pilot plant for the fluidised carbonisation of Collie coal has been designed, erected and put into operation. Parallel work carried out on charcoal has resulted in the formulation of a method for charcoal briquette production. The Division has made a number of fuel efficiency investigations for factories and works. Assistance was given to various industries and manufacturers in problems of a similar nature. A number of consultants has referred to the division frequently on uses of Collie coal, gas manufacture and sawdust utilisation. Regular fuel survey sampling continued at Collie on face samples and on drill cores from the Government Geologist.

The fitting out of the new Industrial Chemistry Division building proceeded steadily throughout the year. Some units of the Denver Plant have been tested functionally; the entire plant cannot be tested as a continuous unit until the new substation is in operation. The laboratory section was completed in August.

For the major part of the year work had to proceed under cramped conditions as before, but progress accelerated notably from August onwards. The Unit Process Plant should be fully operational by July, 1955. Research work was done on the utilisation of *Duboisia Hopwoodii* as a potential source of nicotine.

PART IX.—SCHOOL OF MINES.

(a) Kalgoorlie.

The total number of students enrolled was 381, a decrease of 20 by comparison with 1953.

During the year 444 samples were received for assay and/or mineral examination from the mining public, as against 607 for the previous year.

The work received at the Metallurgical Laboratory was more than sufficient to keep the staff fully occupied. Twenty-three reports and 50 certificates were issued. The certificates were instituted from the 1st January, 1954, to cover reports involving analyses, assays and other measurements only.

(b) Norseman.

The enrolments for the year were 67, an increase of 7 compared with 1953.

(c) Bullfinch.

The total number of enrolments was 43, a decrease of 26 compared with 1953, the year in which the School was opened. The number enrolled in 1954 is the number which might be reasonably expected from a town the size of Bullfinch.

The building from Chandler has now been erected at Bullfinch and altered to provide two classrooms, an office and store.

The Bullfinch Country Club again offered a prize to the student under 18 doing the best year's work.

PART X.—EXPLOSIVES.

The total amount of explosives imported into the State during 1954 was 120,201 cases, or 6,010,050 lb. net in addition to small quantities of special explosives used in oil exploration. This was an increase of 5,285 cases compared with 1953.

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

No remote country districts were covered during the year, but considerable attention was paid to nearby quarry magazines and advice given on safety measures.

Imported stocks of fireworks were also tested before distribution was permitted.

As part of the Royal Visit celebrations, a display of fireworks was presented from Mill Point. Arrangements for storage, transport and safety at the firing point were handled by the Explosives Branch.

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

In 1954 all Goldfields were visited with the exception of Ashburton, Gascoyne, Kimberley and Phillips River, which are all remote and contain few mine workers.

The number of examinations made was 5,630 as compared with 4,809 for the previous year.

PART XII.—COAL MINING SECTION.

The Chief Coal Mining Engineer's report shows that coal production at Collie continued with increasing activity and that during the year a record output of 1,018,342 tons of coal were produced as compared with 885,433 tons for 1953.

The consumption of coal during the year was 1,017,365 tons of which 76.31 per cent. was consumed by Government instrumentalities and 23.69 per cent, by private consumers.

The industry is now faced with keen competition from alternate fuels and to retain its markets, and consequently production and employment, it must produce a more attractive fuel at an equally attractive price.

Reorganisation and mechanisation continued satisfactorily and at present 85 per cent. of the production is by mechanical means.

The development of new mines is also proceeding satisfactorily.

STAFF.

I would again like to thank all members of the staff, Head Office and Outstations, for their loyal and efficient service during the year.

In dealing with the various activities I have commented only on the principal items. Detailed reports of the responsible branch officers are contained in Divisions II. to X.

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

Department of Mines,
Perth, 23rd June, 1955.

DIVISION II

Report of the State Mining Engineer for the Year 1954

The Under Secretary For Mines.

I have the honour to submit for the information of the Hon. the Minister for Mines, my Annual Report on this branch of the Mines Department for the year 1954.

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

STAFF.

Mr. J. Boyland, who was formerly Inspector of Mines stationed at Cue, was promoted to the position of Senior Inspector of Mines rendered vacant by the retirement of Mr. J. H. Verran. The vacancy at Cue was filled by transferring Mr. A. W. Ibbotson to Cue, where he commenced duty on 26th February, 1954.

Mr. F. W. G. Power resigned as from 5th February, 1954, to take up a position in the mining industry and Mr. H. L. Burrows, formerly Assistant Inspector, was promoted to fill the vacancy and commenced duty on 17th May, 1954.

TABLE A.

SERIOUS ACCIDENTS FOR 1954.

(Minerals other than Coal and Oil).

Class of Accident.	West Kimberley.	East Coolgardie.	Peak Hill.	Yilgarn.	Coolgardie.	Dundas.	Mt. Margaret.	North Coolgardie.	Murchison.	Pilbara.	West Pilbara.	South-West.	Northampton.	N.E. Coolgardie.	TOTAL.
Major Injuries—Exclusive of Fatal—															
Fractures :															
Head	....	....	....	....	....	....	....	....	....	....	....	1	....	....	5
Shoulder	....	2	....	....	....	....	....	....	....	....	....	....	....	....	2
Arm	....	3	....	....	....	1	1	1	....	....	1	....	....	....	7
Hand	....	3	....	....	....	....	....	....	....	....	....	1	....	1	5
Spine	....	....	....	....	1	....	....	....	....	....	....	....	....	....	1
Rib	....	2	....	1	....	1	1	1	1	....	1	....	....	....	8
Pelvis	....	1	....	....	....	....	....	....	3	....	1	....	....	....	4
Thigh	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5
Leg	....	3	....	2	....	....	....	....	....	....	....	....	....	....	2
Ankle	....	2	....	....	....	....	....	....	....	....	....	....	....	....	9
Foot	....	5	....	1	1	2	....	....	....	....	....	....	....	....	
Amputations :															
Arm	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Hand	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Finger	....	....	....	....	....	....	....	....	....	....	....	....	....	....	10
Leg	1	....	1	2	....	2	2	1	....	....	1	....	....	....	1
Foot	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....
Toe	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Loss of Eye	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....
Serious Internal	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
Hernia	....	1	....	1	....	....	....	....	....	....	....	....	....	....	8
Dislocations	....	4	....	1	....	2	....	....	1	....	....	....	....	....	2
Other Major	....	....	....	....	....	....	....	....	2	....	....	....	....	....	6
Total Major	1	27	1	12	3	9	8	3	8	....	4	2	....	1	79
Minor Injuries—															
Fractures :															
Finger	1	6	....	....	1	....	2	1	3	....	1	1	1	....	17
Toe	....	6	....	1	3	2	1	....	....	....	1	....	....	....	14
Head	....	6	....	2	....	1	....	....	2	....	1	....	....	....	12
Eyes	....	6	....	....	....	2	....	1	1	1	....	....	1	....	12
Shoulder	....	8	....	....	1	2	1	....	....	....	....	....	....	....	12
Arm	....	17	....	2	....	2	....	1	4	....	2	....	....	....	28
Hand	....	85	....	7	5	7	4	3	4	1	6	....	1	....	123
Back	....	52	....	5	1	6	6	2	....	2	2	....	1	....	77
Rib	....	1	....	....	....	....	....	....	....	....	....	....	1	....	2
Leg	....	46	....	3	3	9	3	1	2	1	1	1	....	....	70
Foot	....	27	....	....	1	5	2	....	....	....	....	....	....	....	35
Other Minor	1	14	1	2	1	3	....	....	8	4	....	....	....	....	34
Total Minor	2	274	1	22	16	39	19	9	24	9	14	2	5	....	436
Grand Total	3	301	2	34	19	48	27	12	32	9	18	4	5	1	515

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

Ashburton. East Murchison. Kimberley. Yalgoo,

Broad Arrow, Gascoyne. Phillips River,

Mr. B. L. Berry was appointed Assistant Inspector to fill the vacancy caused by the promotion of Mr. Burrows and commenced duty on 5th July, 1954.

ACCIDENTS.

Fatal and serious accidents in metal mines and quarries reported to the Department are shown below. The corresponding figures for 1953 are shown in brackets.

There were 16 (16) fatal and 515 (551) serious accidents.

In gold mines there were 11 (10) fatal and 465 (481) serious accidents. The number of men employed in such mines was 6,128 (6,359). The accident rate per 1,000 men employed was thus 1.79 (1.57) for fatal accidents and 75.88 (75.64) for serious accidents.

Of the remaining fatal accidents, two occurred in a pyrites mine and three in quarries.

A classification of serious accidents showing the nature of the injuries is given in Table "A," (see page 23).

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

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

Oil Drilling companies have reported 24 serious accidents.

TABLE B.

(Minerals other than Coal and Oil.

Mineral.	Men Employed.	Accidents.		
		Fatal.	Injured.	
			Serious.	Minor.
Copper	....	....	....	....
Gold	6,128	11	465	2,102
Iron Ore (for Pig)	36	....	....	....
Iron Ore (for Export)	98	....	3	4
Lead, Zinc, Silver	51	....	5	14
Tin, Wolfram, Tantalite	91	....	....	....
Asbestos	246	....	18	73
Other Minerals.	1,924	2	20	66
Quarries	Not available	3	4	8
Total	8,574	16	515	2,267

TABLE C.

Fatal and Serious Accidents showing Causes and Districts.

(Minerals other than Coal and Oil).

District	Explosives.		Falls of Ground.		In Shafts.		Fumes.		Miscellaneous Underground.		Surface.		Total.	
	Fatal.	Serious.	Fatal.	Serious.	Fatal.	Serious.	Fatal.	Serious.	Fatal.	Serious.	Fatal.	Serious.	Fatal.	Serious.
Ashburton	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Broad Arrow	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Coolgardie	....	2	....	....	....	....	....	....	....	10	....	7	....	19
Dundas	....	5	....	4	....	....	....	....	2	26	1	13	3	48
East Coolgardie	1	2	3	22	2	6	....	....	1	226	1	45	8	301
East Murchison	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Gascoyne	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Greenbushes	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Kimberley	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Mt. Margaret	....	1	....	4	....	3	....	....	....	14	....	5	....	27
Murchison	....	....	....	2	....	3	....	....	....	16	....	11	....	32
North Coolgardie	....	....	....	2	....	1	....	....	....	5	....	4	....	12
North-East Coolgardie	....	....	....	....	....	1	....	....	....	....	....	....	....	1
Northampton	....	....	....	....	....	....	....	....	....	2	....	3	....	5
Peak Hill	....	....	....	....	....	....	....	....	....	....	....	2	....	2
Phillips River	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Pilbara	....	....	....	....	....	1	....	....	....	3	....	5	....	9
South-West	2	....	....	....	....	....	....	....	....	....	1	4	3	4
West Kimberley	....	....	....	....	....	....	....	....	....	....	....	3	....	3
West Pilbara	....	....	....	1	....	....	....	....	....	11	....	6	....	18
Yalgoo	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Yilgarn	1	....	1	....	....	1	....	....	....	13	....	20	2	34
Totals for 1954	4	3	4	38	2	20	....	....	3	326	3	128	16	515
Totals for 1953	3	10	3	64	4	14	....	1	4	326	2	136	16	551

FATAL ACCIDENTS.

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

Name and Occupation.	Date.	Mine.	Details and Remarks.
Byrne, Leo Patrick (Miner)	22–2–54	Ivanhoe Gold Mine, Kalgoorlie	Some steel slipped from a cage and caught under wall plate of the shaft pulling Byrne with it as the cage began to ascend. He was crushed between the shaft timbering and the cage.
Bardsley, Edward George (Miner)	4–3–54	Central Norseman, Norseman	Bardsley received a fractured skull when he was crushed between a timber bearer and a loading box in which he was riding.
Downey, Michael James (Miner)	11–3–54	Copperhead Gold Mine, Bullfinch	The deceased and P. J. Garrity were employed boring a face out of the 1,200 ft. level plat. Downey assisted Garrity to collar a hole in an area that appeared free from butts. Downey returned to his own machine. Shortly afterwards an explosion occurred which fatally injured Downey and slightly injured Garrity.
Wasley, Ernest John (Trucker)	18–3–54	Lake View & Star, Kalgoorlie	Wasley was struck by a fall of earth which it is assumed was caused by an earth tremor.
Vitetti, Dominic (Trucker)	22–3–54	Boulder Perseverance, Kalgoorlie	Whilst bringing down a slab 2½ tons the rock hit him and threw him clear. Death was due to a rupture of the heart and fractured pelvis.
Sawyer, Harold Henry (Machine Miner)	21–4–54	Boulder Perseverance, Kalgoorlie	While engaged in charging up a face in the No. 2 level west branch " F " lode stope an explosion occurred inflicting severe chest and arm injuries.
McManus, James (Mill Labourer)	17–5–54	Norseman Gold Mines, Norseman	Killed when ore rilled and dragged him into the ore bin.
Seinor, Keith Hugh (Mechanical Bogger Operator)	22–6–54	Lake View & Star Gold Mine, Kalgoorlie	Seinor was trapped in a fall of earth on the 1,900 ft. level of the Ivanhoe Shaft.
Bertone, Ottavio (Miner)	26–7–54	Lake View & Star, Kalgoorlie	Bertone was working with another miner in an ore pass on the 2,800 ft. level of the Chaffers Shaft when the ore suddenly rilled down, burying him about 30 ft. down with 12 ft. of ore on top of him.
Brown, Jeffrey James (Trainee Machine man)	30–7–54	Copperhead Mine, Bullfinch	Brown was knocked off the bench by a big rock which severed the rope attached to the safety belt and fell about 100 ft. down an empty stope between the 400 ft. and 600 ft. levels.
Baker, Sidney George (Shaft Sinker)	11–8–54	Iron King, Norseman Gold Mines, N.L., Norseman	Baker was stripping the ore pass off the main shaft when he slipped on the staging near the 700 ft. level and fell to the loading station at the 900 ft. level.
Separovich, Vjekoslav (Quarry man)	24–8–54	Evas' Quarry, Spearwood	Separovich with F. Pelliccione was working near the quarry face when masses of limestone fell on them killing Separovich and injuring Pelliccione.
Moriarty, Thomas Edward (Apprentice Welder)	31–8–54	Boulder Perseverance, Gold Mine, Kalgoorlie	This accident was caused by the earth wire coming loose inside a plug which connected a portable welder to the electric supply. When the current was switched on this wire was in contact with a live wire of the supply system and the frame of the welder was thus alive. Moriarty received a fatal shock when he came in contact with it.
Peek, Herbert Leslie (Miner)	3–9–54	Great Boulder Gold Mine, Kalgoorlie	Peek had taken two other men and certain gear, including a fan and two lengths of canvas tubing into the cage, to shift to another level. While the cage was in transit there was a violent bump which resulted in Peek being thrown against the shaft timbers and pulled out of the cage.
Agnello, Francisco; Colautti, Pietro (Quarry Workers)	18–11–54	White Rock Quarries, Gosnells	Both men were killed in an explosion in a magazine at the Quarry.

WINDING MACHINERY ACCIDENTS.

Twelve accidents involving winding machinery were reported during the year. Two of these resulted in the death of persons in the cage and details are given under the heading of fatal accidents. Both these accidents resulted from the movement of materials in the cage.

Overwinds (5).—Two of these accidents were due to errors of judgment, while in one case the driver omitted to reverse his engine. In another case the engine failed to reverse although the position of the lever had been changed and in one case the driver's attention was distracted. No serious damage resulted in any case.

Derailment (1).—A skip was derailed at the Sons of Gwalia mine while coming out of the tip. No damage resulted.

Cages hung up (3).—In two cases cages were held up because of trucks of ore moving in the cage. In the remaining case a skip fouled a sill piece. The detaching hook carried away and the skip was supported by the safety catches.

Cage out of control (1).—A cage ran away when declutched owing to the brake linkage being out of adjustment.

PROSECUTIONS.

Six prosecutions were conducted during the year and all were successful.

Four men were prosecuted for boring in butts or in faces which had not been properly cleaned down.

One man was prosecuted for firing a charge without giving proper warning.

The manager of a mine was prosecuted for not enforcing the regulation which requires a man to wear a safety belt in an ore bin.

SUNDAY LABOUR PERMITS.

Four permits to employ Sunday labour were granted during the year. One permit was granted for shaft sinking, one for churn drilling, one for the employment of trucks and loaders and one for boring and firing a large pillar.

AUTHORISED MINE SURVEYORS.

The Survey Board issued eight certificates during the year.

CERTIFICATES OF EXEMPTION (Section 46).

Thirteen certificates were issued as compared with nine in 1953.

PERMITS TO FIRE OUTSIDE PRESCRIBED TIMES (Regulation 51).

Three permits were issued to enable men to fire outside the hours prescribed by regulation. In all cases any possible risk to other parties was carefully guarded against.

CERTIFICATE OF BRAVERY.

A certificate of bravery was presented to Jerry Vitek, who rescued his injured mate from a difficult position. Vitek displayed not only great courage but also resource and considerable strength and endurance to effect the rescue.

ADMINISTRATIVE.

Mines Regulation Act.—An amending Act, No. 24 of 1954, received the assent on 8th October, 1954. By this Act Section 12 was amended to provide that an Inspector shall where practicable give notice of his intention to enter a mine.

Section 14 was also amended to permit a Workmen's Inspector to make reports to any union whose members are employed in a mine.

Section 25, subsection (4), was amended to provide for the temporary appointment of an underground manager for a period of four weeks instead of two as formerly.

Section 44 was amended to include cleaning of spillage in a shaft with the other duties that may be performed on Sundays.

A second amending Act, No. 49 of 1954, received the assent on 8th December, 1954. This Act amended Section 31 of the parent Act to provide that accidents shall be reported to the Australian Workers' Union.

Sections 36, 37 and 39 were amended to conform with the current hours of work.

Several amendments to the Regulations have been gazetted. Brief details are as follows:—

Regulation 16 has been amended to provide that candidates for appointment as Workmen's Inspectors shall produce a medical certificate of fitness with their application.

Regulation 21 has been amended to provide for alterations in the fees paid for conducting elections for Workmen's Inspector of Mines.

Regulation 23 has been amended to provide that all current working places in a mine must be visited by the Inspector.

Regulation 44 which relates to the storage of explosives underground has been amended.

Regulation 47 which relates to the handling of explosives has been amended.

Regulation 53 which provided that all holes deeper than nine feet should be charged through a loading tube has been repealed.

Regulation 57 has been amended to provide that meters for testing circuits in the face shall be approved and stamped by the Chief Inspector of Explosives.

Regulation 58 has been amended to provide that no drilling shall be done in any face until it has been washed down and examined for misfires.

Regulation 61 which refers to men working in dangerous ground has been amended.

Regulation 68 has been amended to provide for the fencing of platforms at the sheaves of headframes.

Regulation 77 which refers to the wearing of safety belts by men travelling in buckets has been clarified by amendment.

Regulation 94 has been brought into conformity with Section 46 of the Act.

Regulation 101 has been amended to provide for the supervision of men entering and leaving cages at the end of shift.

Regulation 106 has been amended and now provides for overhead protection not fixed to the winding rope for shaft repairers.

Regulation 144 has been corrected.

In Regulation 149 the power to instruct that extra winzes be sunk has been restricted to the District Inspector.

Regulation 171 has been amended to secure the provision of change houses for surface workers.

Minor alterations have been made to Regulation 177.

Mining Act.—The boundaries of the Yilgarn, Pilbara, Kimberley and Gascoyne Goldfields have been amended by proclamations dated 9th December, 1954, and 19th February, 1954.

Division II, Part XIII (Sections 328 to 341 inclusive), came into operation on 19th February, 1954.

Regulation 83 has been amended and now has a general application.

The scale of Survey Fees was amended by notice in the *Government Gazettes* of 11th June, 1954, and 20th August, 1954.

Mine Workers' Relief Act.—Regulation 14 has been amended to provide an additional seven days in which the ballot may be conducted.

Regulation 26 has been amended to provide for alterations in the fees paid to those conducting elections of representatives.

VENTILATION.

Ventilation work has been under the control of Inspector Faichney, who has been assisted by Assistant Inspector Berry.

Particular attention has been paid to the appointment of ventilation officers and the keeping of ventilation record books in the major mines.

The main ventilation system on the western leases of the Lake View and Star remains unaltered. Some further connections to the Golden Link Shaft on the Lake View Mine have resulted in an improvement in the air flow.

Some major alterations have been made in the Great Boulder ventilation system and the position will be further improved when Hamilton Shaft, which is now being deepened, reaches the 3,100 ft. level.

Enterprise has remodelled its ventilation system and now has two fans handling a total of 38,500 c.f.m. at the surface while the internal fan at No. 25 level handles 28,000 c.f.m.

Boulder Perseverance and South Kalgurli are both naturally ventilated. These mines are now under the same management and the amalgamation should result in some benefits to the ventilation of both mines.

No major alterations have been made in the Gold Mines of Kalgoorlie but on both this mine and the North Kalgurli the problem of dealing with dust in ore handling systems has been tackled by carrying the dusty air in duct work out of the critical areas or by passing it through filters.

The Barbara mine at Coolgardie is ventilated by three exhaust fans at the surface and is controlled within the mine by the use of fans and regulating doors. Mechanical ventilation has also been installed at Bayley's Shaft.

The Iron King is well ventilated by two exhaust fans with a total capacity of 35,000 cubic feet per minute. The dust produced by scraping and secondary blasting clears away quickly.

The Royal Shaft of the Central Norseman Gold Corporation is ventilated much as in the previous year but the fan on the Royal Shaft workings has been speeded up. The main difficulty in the ventilation of these mines is the clearing of large stopes particularly the pockets formed in cutting pillars.

Good ventilation has been maintained on the Callion and Timoni mines in the North Coolgardie Goldfield.

Minor changes have been made in the ventilation system at Great Western Consolidated.

At Sons of Gwalia the main air current is handled by the fan at No. 30 level with small splits at No. 28 and No. 29 levels.

Some trouble in clearing the dust from secondary blasting is encountered at Big Bell but such difficulties are always encountered in big open stope mines.

A similar type of mining is used at Hill 50 and difficulty has been experienced in clearing smoke from stopes. The position here has been improved and is still under observation.

Particular attention was paid to the mine at Wittenoom Gorge where it was found that in spite of high atmospheric temperature, conditions in the mine were satisfactory.

Several smaller mines were also visited.

Dust counts have been continued throughout the year and the results obtained are tabulated below—

	No. of Samples.	Samples giving over 1000 ppcc.	Average Count.
Development	184	2	200
Stoping	254	9	215
Levels	58	2	273
Surface	90	3	231

Results are comparable with those obtained in former years. The higher value for the average of samples taken on levels may be due to investigational work in dusty areas around ore passes and other places where ore is handled underground.

Treatment with aluminium powder for the prevention of silicosis has been continued throughout the year.

The Joint Safety Committee has arranged for educational talks and films.

The exposure of individuals to the treatment has been checked by recording the time spent in the change rooms and the results of the annual medical examinations have been analysed.

It is with great pleasure that I reported that for the second year in succession there has been no fatal accident due to the fumes of explosives.

GOLD MINING.

The ore produced during the year amounted to 3,240,378 tons as compared with 3,169,875 tons in the previous year.

The gold recovered was 861,992 fine ounces as compared with 823,331 fine ounces in the previous year.

The average return was 5.32 dwts. per ton, sligtly better than the figure of 5.20 dwts. realized in the previous year.

TABLE D.

Gold Production Statistics.

Year.	Tons Treated. (2,240 lb.)	Total Gold Yield.	Estimated Value of Yield.	Value of Yield per ton.	Number of Men Employed.	Average Value of Gold per oz.	Average Yield per ton of ore.
	tons.	fine ozs.	£A.	shillings A.		shillings A.	dwts.
1929 ...	628,400	372,064	1,580,426	50·30	4,108	84·96	11·84
1930 ...	645,344	419,767	1,874,484	58·09	4,284	89·33	13·01
1931 ...	982,163	518,045	3,042,019	61·94	5,961	117·44	10·55
1932 ...	1,327,021	599,421	4,358,989	65·70	8,695	145·44	9·03
1933 ...	1,588,979	636,928	4,884,112	61·48	9,900	153·36	8·01
1934 ...	1,772,931	639,871	5,461,004	61·60	12,523	170·69	7·22
1935 ...	1,909,832	646,150	5,676,679	59·45	14,708	175·71	6·77
1936 ...	2,492,034	852,422	7,427,687	59·61	15,698	174·27	6·84
1937 ...	3,039,608	1,007,289	8,797,662	57·99	16,174	174·68	6·64
1938 ...	3,759,720	1,172,950	10,409,928	53·38	15,374	177·50	6·24
1939 ...	4,095,257	1,188,286	11,594,221	56·62	15,216	195·14	5·80
1940 ...	4,291,709	1,154,843	12,306,816	57·35	14,594	213·15	5·38
1941 ...	4,210,774	1,105,477	11,811,989	56·10	13,105	213·70	5·25
1942 ...	3,225,704	845,772	8,840,642	54·81	8,123	209·04	5·24
1943 ...	2,051,011	531,747	5,556,756	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	11,269,689	85·81	6,394	309·83	5·54
1953	3,169,875	823,331	12,754,770	80·47	6,359	309·83	5·20
1954	3,240,378	861,992	13,429,834	82·88	6,128	311·51	5·32

The calculated value of the gold produced was £A13,428,368 which excludes £A63,839 from the sale of gold at premium. In the previous year the amount realised was £A12,754,770, and the premium obtained was £A535,330. The gross return is thus £A13,492,207 as compared with £A13,290,100 in the previous year.

The average production of ore per man for the year was 528.78 tons valued at 82.88 shillings per ton. In 1953 the production per man was 498.49 tons valued at 80.48 shillings per ton.

Gold recovery per man was 140.66 fine ounces as compared with 129.47 fine ounces in the previous year.

Rising costs are thus being met by increased efficiency. The comparative figures five years ago (1949) were 362.98 tons and 95.53 fine ounces per man. The future of the industry would appear to depend upon how much further this process can be extended.

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

Table "D"—Gold Production Statistics (see page 27).

Table "E"—Classification of gold output by districts (see below).

Table "F"—Classification of gold output 1949-1953 (see page 29).

Table "G"—Mines producing 5,000 ounces and over for the past five years (see page 30).

Table "H"—Development Footages (see page 31).

TABLE E.

Classification of Gold Output for 1954 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.	
		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.
Kimberley	83	....	....	....	....	....	....	....	....	....	....
Ashburton	89	....	....	....	....	....	....	....	....	....	....
Pilbara	242	13	399	1	294	1	860	1	1,006	....	....
Peak Hill	10	5	149	....	....	....	....	....	....	1	8,524
East Murchison	82	9	265	....	....	....	....	....	....	....	....
Murchison	621	19	491	5	1,039	2	1,264	....	....	....	....
Mount Margaret	546	10	397	4	733	1	569	....	....	....	....
Yalgoo	....	....	....	....	....	....	....	....	....	....	....
North Coolgardie	148	12	436	2	454	4	2,807	1	1,782	....	....
Broad Arrow	322	9	527	5	873	2	1,125	....	....	....	....
North-East Coolgardie	89	3	124	....	....	....	....	....	....	....	....
East Coolgardie	322	28	492	3	815	2	1,668	1	1,070	2	14,274
Coolgardie	604	21	522	....	....	....	....	1	1,856	....	....
Yilgarn	914	15	393	2	403	2	1,373	1	1,927	....	....
Dundas	21	2	8	....	....	....	....	....	....	....	....
Phillips River	....	3	77	....	....	....	....	....	....	....	....
West Pilbara	11	....	....	....	....	....	....	....	....	....	....
West Kimberley	....	....	....	....	....	....	....	....	....	....	....
Gascoyne	21	....	....	....	....	....	....	....	....	....	....
State Generally	114	....	....	....	....	....	....	....	....	....	....
Totals	4,239	149	4,280	22	4,611	14	9,666	5	7,641	3	22,798

Goldfield.	10,000–20,000 ozs.		20,000–30,000 ozs.		30,000–40,000 ozs.		40,000–50,000 ozs.		50,000–100,000 ozs.		Over 100,000 ozs.	
	No. of Producers.	Gold.	No. of Producers.	Gold.	No. of Producers.	Gold.	No. of Producers.	Gold.	No. of Producers.	Gold.	No. of Producers.	Gold.
		fine ozs.		fine ozs.		fine ozs.		fine ozs.		fine ozs.		fine ozs.
Kimberley	....	....	....	....	....	....	....	....	....	....	....	....
Ashburton	....	....	....	....	....	....	....	....	....	....	....	....
Pilbara	....	....	....	....	....	....	....	....	....	....	....	....
Peak Hill	....	....	....	....	....	....	....	....	....	....	....	....
East Murchison	....	....	....	....	....	....	....	....	....	....	....	....
Murchison	....	....	....	....	....	....	....	....	2	131,799	....	....
Mount Margaret	....	....	1	26,168	....	....	....	....	....	....	....	....
Yalgoo	....	....	....	....	....	....	....	....	....	....	....	....
North Coolgardie	2	28,903	....	....	....	....	....	....	....	....	....	....
Broad Arrow	....	....	....	....	....	....	....	....	....	....	....	....
North-East Coolgardie	....	....	....	....	....	....	....	....	....	....	....	....
East Coolgardie	....	....	3	43,796	1	31,150	....	....	2	117,315	2	275,139
Coolgardie	1	15,761	....	....	....	....	....	....	1	55,330	....	....
Yilgarn	....	....	....	....	....	....	....	....	1	83,396	....	....
Dundas	....	....	....	....	....	....	....	....	....	....	....	....
Phillips River	....	....	....	....	....	....	....	....	....	....	....	....
West Pilbara	....	....	....	....	....	....	....	....	....	....	....	....
West Kimberley	....	....	....	....	....	....	....	....	....	....	....	....
Gascoyne	....	....	....	....	....	....	....	....	....	....	....	....
State Generally	....	....	....	....	....	....	....	....	....	....	....	....
Totals	3	44,664	4	69,964	1	31,150	....	....	6	387,840	2	275,139

TABLE F.

Classification of Gold Output, 1950–1954.

Range of Output.	1954.			1953.			1952.			1951.			1950.		
	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	2	275,139	31·9	2	272,467	33·2	1	146,256	20·1	1	155,044	23·9	1	126,749	20·9
50,000–100,000	6	387,840	45·1	5	296,444	36·0	4	293,217	40·3	2	146,381	22·6	2	139,252	22·9
40,000– 50,000	....	....	....	1	41,799	5·1	1	47,286	6·5	3	140,437	21·7	3	131,549	21·6
30,000– 40,000	1	31,150	3·6	1	33,677	4·1	1	30,578	4·2	1	33,126	5·1	....	....	....
20,000– 30,000	4	69,964	8·1	2	49,699	6·0	1	23,616	3·3	2	45,340	7·0	3	71,291	11·7
10,000– 20,000	3	44,664	5·2	4	64,358	7·8	6	104,197	14·3	3	47,485	7·3	4	59,421	9·8
5,000– 10,000	3	22,798	2·6	2	18,142	2·2	4	29,537	4·1	2	14,116	2·2	3	22,527	3·7
4,000– 5,000	....	....	....	1	4,636	0·6	....	....	....	1	4,283	0·7	....	....	....
3,000– 4,000	....	....	....	1	3,795	0·5	2	7,290	1·1	1	3,327	0·5	....	....	....
2,000– 3,000	....	....	....	1	2,703	0·3	3	6,735	0·9	5	12,522	1·9	3	6,770	1·1
1,000– 2,000	5	7,641	0·9	6	7,685	0·9	5	6,869	0·9	6	8,517	1·3	8	10,592	1·7
500– 1,000	14	9,666	1·1	12	7,894	0·9	14	9,704	1·3	15	10,222	1·6	15	10,596	1·7
100– 500	22	4,611	0·5	54	12,378	1·5	56	13,293	1·8	71	16,208	2·5	76	17,620	2·9
Under 100	149	4,280	0·5	184	3,988	0·5	177	5,081	0·7	175	5,277	0·8	211	5,890	1·0
Sundry Claims, etc.	....	4,239	0·5	....	3,666	0·4	....	3,808	0·5	....	5,960	0·9	....	6,376	1·0
Totals	209	861,992	100·0	276	823,331	100·0	275	727,467	100·0	288	648,245	100·0	329	608,633	100·0

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—							
Pilbara	Comet	....	50	....	....	230	280
	Blue Spec	....	305	177	....	....	482
Murchison	Big Bell	....	499	344	334	....	1,177
	Hill 50	33	1,462	613	775	1,891	4,774
	Hill 50 Consolidated	39	....	....	....	....	39
	Hill 50 Central	126	59	22	....	2,828	3,035
	Hill 50 Extended	....	....	....	....	6,683	6,683
	Caledonian	....	10	10	....	....	20
	Mount Magnet Development	....	....	....	....	10,349	10,349
	Fortuna	20	110	....	37	....	167
	Blue Bird	....	....	....	30	1,200	1,230
East Coolgardie	Lake View & Star	....	17,968	2,396	7,354	7,855	35,573
	Great Boulder Pty., Ltd.	....	12,940	3,563	3,051	9,545	29,099
	North Kalgurli (1912), Ltd.	....	6,745	983	2,106	10,540	20,374
	Gold Mines of Kalgoorlie	....	6,114	2,550	1,884	24,881	35,429
	Boulder Perseverance, Ltd.	104	....	3,964	2,329	8,912	15,309
	Kalgoorlie Enterprise	....	1,609	426	553	3,406	5,994
	South Kalgurli Consolidated	27	4,179	844	1,081	4,872	11,003
	Haoma	....	309	281	105	280	975
	Daisy	....	300	54	105	983	1,442
	Kalgoorlie Southern	....	....	....	....	7,602	7,602
Yilgarn	Great Western Consolidated	824	1,833	509	677	65,340	69,183
	Central Norseman Gold Corporation	458	8,372	399	2,780	29,722	41,731
	Norseman Gold Mines	....	....	....	....	3,327	3,327
Coolgardie	Barbara	53	1,752	476	894	5,623	8,798
	Bayley's Reward	....	668	94	166	1,420	2,348
Mount Margaret	Sons of Gwalia	....	791	450	210	5,236	6,687
	Lancefield	453	1,511	204	271	4,534	6,973
	Boomerang	....	300	429	165	....	894
	Queen of the May	....	194	51	125	....	370
North Coolgardie	Timoni	....	1,416	180	648	....	2,244
	Callion	205	1,478	269	709	680	3,341
	Yilgangie Queen	....	238	281	....	275	794
	Total in Gold Mines	2,342	71,212	19,569	26,389	218,214	337,726
Pyrites—							
Dundas	Norseman Gold Mine	90	206	86	815	582	1,779
Asbestos—							
West Pilbara	Australian Blue Asbestos	....	1,134	1,389	394	....	2,917
	Nunyerri Asbestos Mine	....	248	....	67	....	315
	Total in Asbestos Mines	....	1,382	1,389	461	....	3,232
Copper—							
Pilbara	Copper Hills	130	50	....	....	....	180
Lead—							
Northampton	Paringa Wheal Fortune	....	409	26	427	....	862
	Gurkha	163	345	46	99	....	653
	Mary Springs	41	35	....	....	....	76
	Protheroe	82	17	....	....	....	99
	Three Sisters North	25	60	25	25	....	135
	Isseka	50	40	20	60	....	170
	White Peaks	....	70	....	18	....	88
	Total in Lead Mines	361	976	117	629	....	2,083
	Total in all Mines	2,923	73,826	21,161	28,294	218,796	345,000

OPERATIONS IN THE PRINCIPAL MINES.

East Coolgardie Goldfield.—The total ore treated in this goldfield was 1,856,517 tons and the gold yield of 486,040 fine ounces is an average of 5.23 dwts. per ton. The gold production is 56.5% of the State total. In the previous year the treatment of 1,834,556 tons of ore yielded 484,949 fine ounces of gold at an average of 5.29 dwts. per ton. Conditions here have been practically stable. The number of men employed was 3,272 as against 3,331 in the previous year.

Very little work was done in the *Bulong District* only 35 fine ounces of gold being reported.

In the *East Coolgardie District* 486,005 fine ounces of gold were obtained from 1,856,356 tons of ore at an average of 5.23 dwts. per ton. The figures are very close to those recorded in the previous year when 484,773 fine ounces of gold were recovered from 1,834,029 tons of ore at an average of 5.29 dwts. per ton.

Increases in other fields have reduced the output expressed as a proportion of the total from 59.0% in 1953 to 56.5% for this year.

Lake View & Star milled 657,197 tons, which is a little below the figure of 657,621 tons for the previous year. Gold won was 157,667 fine ounces which is slightly above the figure of 156,589 fine ounces for the previous year. The average grade of 4.80 dwts. per ton is thus slightly higher than the 4.76 dwts. per ton recorded in the previous year.

The main constructional change was the electrification of the winder at the Associated shaft.

The total development was a little less than for the previous year but the ore of average grade added to the ore reserves was higher than the amount broken.

The mine has run smoothly throughout the year and is in excellent condition.

Great Boulder reported increased tonnage and recovery—417,874 tons for 107,670 fine ounces as against 409,814 tons for 106,776 fine ounces. The average recovery of 5.15 dwts. per ton is slightly lower than the average of 5.21 dwts. per ton for the previous year.

Ore reserves have been increased by 10,742 short tons.

Considerable additions have been made to the surface plant and further mechanical equipment has been installed underground.

Gold Mines of Kalgoorlie increased the tonnage treated to 209,311 tons as compared with 191,292 tons in the previous year. Gold recovery rose to 60,370 fine ounces as compared with 57,184 fine ounces, the average grade of 5.77 dwts. per ton being lower than 5.98 dwts. per ton for the previous year.

The *Paringa* leases contributed some 22,000 tons to the ore treated.

An electric service winder has been installed on the Paringa North Shaft and a further alternator of 485 KW capacity has been installed in the power house.

North Kalgurli (1912) Ltd. reported the treatment of 251,988 tons for a recovery of 56,945 fine ounces, being an average recovery of 4.52 dwts. per ton. The figures for the previous year were 253,967 tons treated for 61,057 fine ounces at an average of 4.81 dwts. per ton.

The principal change was the removal of the steel head frame from North Kalgurli Shaft to Pomeroy Shaft.

Boulder Perseverance was also a little below last year's output, the figures for the present year being 133,800 tons of ore milled for 31,150 fine ounces of gold at an average of 4.66 dwts. per ton as compared with 136,257 tons treated for 33,677 fine ounces at an average of 4.94 dwts. per ton in the previous year. There were no extraordinary developments.

South Kalgurlie Consolidated treated 97,711 tons for a recovery of 22,197 fine ounces for an average of 4.54 dwts. per ton. These figures are all silghtly lower than those reported for the previous year, which were 102,449 tons for 23,673 fine ounces at an average of 4.62 dwts. per ton.

Some call was made on reserves of broken ore to mantain mill tonnage. Some 25,000 cubic yards of material was placed in open stopes to secure the mine.

Kalgoorlie Enterprise treated an increased tonnage of ore of better grade than usual, the figures being 69,789 tons of ore treated for a return of 21,599 fine ounces at an average of 6.19 dwts. per ton, as compared with 65,220 tons for 18,119 fine ounces at an average of 5.56 dwts. per ton for the previous year.

There were no unusual developments.

Kalgoorlie Southern completed the sixth hole at 4,701 feet and the seventh had reached 2,901 feet at the end of the year.

The *Haoma* mine at Mount Monger with 5,290 fine ounces from the treatment of 4,609 tons of ore recorded the best return yet received and the *Daisy* mine at the same centre obtained 916 fine ounces from the treatment of 1,319 tons of ore.

MURCHISON GOLDFIELD.

The total ore treated in this goldfield amounted to 505,827 tons and the gold yield was 135,214 fine ounces, the average return being 5.34 dwts. per ton. In the previous year the treatment of 496,112 tons of ore yielded 101,030 fine ounces, the average being 4.07 dwts. per ton. The gold production is 15.8 per cent of the State's total.

The number of men employed was 603 as compared with 646 in the previous year.

Cue District produced 60,584 fine ounces from the treatment of 406,777 tons of ore at an average of 2.98 dwts. per ton. In the previous year 54,782 fine ounces were obtained from the treatment of 403,916 tons of ore at an average of 2.71 dwts. per ton.

Big Bell Mines with 405,684 tons for 59,985 fine ounces at an average of 2.96 dwts. per ton showed a fair increase over the previous year when 402,906 tons of ore yielded 54,142 fine ounces of gold at an average of 2.69 dwts. per ton.

Unfortunately this mine has reached its economic limit and the closure of the mine at an early date is inevitable.

Meekatharra District produced 1,788 fine ounces from the treatment of 4,043 tons of ore averaging 8.84 dwts. per ton. In the previous year, 3,459 fine ounces was obtained from the treatment of 6,244 tons of ore at an average of 11.08 dwts. per ton.

The principal producers were the *Margueritta* at Chesterfield with 109 fine ounces from 400 tons, the *Fortuna* at Gabanintha with 231 fine ounces from 1,510 tons, the *New Australia* with 466 fine ounces from 32 tons and the *Caledonian* at Nannine with 234 fine ounces from 1,025 tons.

Day Dawn District with 850 fine ounces from the treatment of 2,401 tons of ore as compared with 731 fine ounces from 1,672 tons in the previous year relied mainly on *Mountain View* which contributed 798 fine ounces obtained from the treatment of 2,325 tons of ore. The ore reserves of this mine are now almost exhausted.

Mount Magnet District continues to advance at a spectacular rate. Production for the year was 71,992 fine ounces from 92,607 tons of ore at an average of 15.54 dwts. per ton. This is due to the treatment of increased tonnage of high grade ore from the *Hill 50* mine which reported the treatment of 92,411 tons for a return of 71,813 fine ounces at an average of 15.5 dwts. per ton. In the previous year the treatment of 83,865 tons of ore yielded 41,799 fine ounces at an average of 9.97 dwts. per ton.

The success of *Hill 50* has prompted several other companies to undertake exploration in the district but no results of established value have been achieved.

DUNDAS GOLDFIELD.

The reported production was 83,425 fine ounces, equal to 9.6 per cent. of the State's total. This was obtained from 158,042 tons of ore at an average of 10.55 dwts. per ton. The number of men employed was 410 as against 405.

Central Norseman produced nearly the whole of this gold, the figures being 157,877 tons treated for 83,396 fine ounces at an average of 10.56 dwts. per ton, as compared with 155,451 tons treated for 73,869 fine ounces at an average of 9.50 dwts per ton in the previous year.

In addition to increased tonnage and improved grade this mine reports very satisfactory developments. A further alternator of 675 K.W. capacity has been added to the power plant.

YILGARN GOLDFIELD.

Production for the year was 60,341 fine ounces from 454,613 tons of ore at an average of 2.65 dwts. per ton, as compared with 55,630 fine ounces from 402,097 tons of ore in the previous year. This is 7.1 per cent. of the State's total production. The number of men employed was 524, as against 501 in the previous year.

Great Western Consolidated reported an increase in tonnage treated—445,864 tons this year as against 392,308 tons in the previous year. They recovered 55,330 fine ounces, which is higher than the figure of 50,192 fine ounces for the previous year but the grade has dropped slightly to 2.48 dwts. per ton as against 2.56 dwts. per ton in the previous year.

Associated with this mine are the operations at Fraser's mine. Following a successful drilling campaign the mine has been unwatered and a 33,000 volt power line from the Great Western power house has been constructed.

The *Radio* leases at Bullfinch produced 750 fine ounces from the treatment of 1,465 tons. This mine is under option and exploration at depth is under way.

The *Marjorie Glen* at Mount Rankin obtained 623 fine ounces from 409 tons of ore. Developments at the 250 level were disappointing but the characteristics of the ore body are not well established and it is hoped that further ore will be found.

Edward's Reward treated 4,971 tons for a return of 1,927 fine ounces. Development is lagging here. The mill has recently been taken under option and development in depth will be undertaken.

The *Frances Furness* mine obtained 247 fine ounces from the treatment of 253 tons of ore. This ore was won by underhand stoping. The shaft is now being deepened to develop the ore at a lower level.

NORTH COOLGARDIE GOLDFIELD.

An increased tonnage, 60,434 tons as against 58,923 tons in the previous year, was reported, but the grade declined from 12.38 dwts. per ton to 11.42 dwts. per ton, and the gold yield was thus 34,530 fine ounces as compared with 36,459 fine ounces. Production is equal to 4.0 per cent of the State's total. The number of men employed was 282 as against 319 in the previous year.

Menzies District recorded the treatment of 24,300 tons of ore for 13,959 fine ounces of gold mostly from the *Timoni* mine at Mount Ida, which treated 24,290 tons for a return of 13,518 fine ounces at an average of 11.13 dwts. per ton, as compared with 23,105 tons for 13,039 fine ounces at an average of 11.29 dwts. per ton in the previous year. Some additions have been made to the treatment plant and a new well developed during the year has alleviated the shortage of domestic water.

A new State battery was opened at Menzies during the year and this has stimulated prospecting in the area.

In the *Ularring District* the treatment of 32,752 tons of ore yielded 17,367 fine ounces of gold at an average of 10.60 dwts. per ton, as compared with 32,313 tons for 18,197 fine ounces at an average of 11.26 dwts. per ton in the previous year.

The principal mine is the *Callion* at Davyhurst, which produced 30,974 tons of ore yielding 15,385 fine ounces of gold at an average of 9.93 dwts. per ton, as compared with 29,926 tons for 16,023 fine ounces at an average of 10.71 dwts. per ton in the previous year. The main shaft was sunk from 562 to 767 feet and levels commenced at 600 and 730 feet.

Among the smaller mines the best returns were from *Ajax West* at Mulline, with 737 fine ounces from 1,255 tons and *Oakley* at *Mulwarrie* with 515 fine ounces from 300 tons.

Niagara District reported 1,289 fine ounces from 495 tons but this includes 969 fine ounces from Vickery Syndicate. The only other considerable producer was *Altona* with 274 fine ounces from 495 tons.

Yerilla District reported 1,916 fine ounces from the treatment of 2,887 tons at an average of 13.26 dwts. per ton, the only producer of note being *Yilgangie Queen* with 1,781 fine ounces from 1,977 tons.

MOUNT MARGARET GOLDFIELD.

The ore treated during the year amounted to 107,238 tons and the gold yield was 28,413 fine ounces equal to 3.3 per cent. of the State's total. The average grade was 5.30 dwts. per ton. In the previous year the treatment of 106,176 tons of ore yielded 29,140 fine ounces at an average of 5.49 dwts. per ton.

The number of men employed was 354 as compared with 368 in the previous year.

Mount Morgans District produced 209 fine ounces from the treatment of 408 tons of ore averaging 10.26 dwts. per ton, as compared with 748 fine ounces from 1,511 tons of ore at an average of 9.91 dwts. per ton. The principal producer was the *Queen of the May* at Yundamindera with 143 fine ounces from 380 tons.

Mount Malcolm District produced 26,605 fine ounces from the treatment of 103,663 tons of ore at an average of 5.13 dwts. per ton, compared with 26,240 fine ounces from 101,372 tons at an average of 5.18 dwts. per ton in the previous year. The *Sons of Gwalia* improved on the previous year by producing 26,168 fine ounces as compared with 26,026 fine ounces. Some improvement in tonnage was also recorded, 103,237 tons as against 100,525 tons, but the grade declined from 5.18 dwts. per ton to 5.07 dwts. per ton. A programme for the mechanisation of this mine and the improvement of the treatment plant and of living conditions which has been financed by the Department is now under way.

There was no other producer of appreciable size in the district.

Mount Margaret District produced 1,599 fine ounces from the treatment of 3,167 tons of ore at an average of 10.09 dwts. per ton as compared with 2,151 fine ounces from 3,293 tons at an average of 13.06 dwts. per ton. Several small mines were active in this district the most important being *Boomerang* with 217 fine ounces from 79 tons of ore and *Nil Desperandum* with 209 fine ounces from 95 tons of ore at Burtville. The *Lancefield* at Laverton was taken under option by a development company, who sank a vertical shaft to 276 feet and drove levels at 150 feet and 260 feet. A party working on the old *Gladiator* lease obtained 196 fine ounces from 891 tons of ore.

COOLGARDIE GOLDFIELD.

This goldfield produced 18,743 fine ounces, equal to 2.1 per cent of the State's total, from 38,381 tons of ore averaging 9.76 dwts. per ton. In the previous year 19,601 fine ounces were obtained from 45,043 tons of ore averaging 8.70 dwts. per ton. There is thus a considerable decrease in tonnage treated and although there has been some increase in grade there has also been a decline in gold production.

The number of men employed was 322 as compared with 339 in the previous year.

Coolgardie District produced 18,664 fine ounces from the treatment of 38,158 tons of ore at an average of 9.78 dwts. per ton. In the previous year 19,560 tons of ore was obtained from 44,904 tons of ore at an average of 8.72 dwts. per ton.

New Coolgardie Gold Mines reported the treatment of 33,534 tons of ore for 15,761 fine ounces at an average of 9.40 dwts. per ton, as compared with 39,570 tons for 17,176 fine ounces at an average of 8.68 dwts. per ton in the previous year. The Barbara shaft was advanced 53 feet to 1,002 feet below the surface. At Bayley's two shafts are being opened up and renovated. Both have been equipped with steel head frames and electric winders. Several small mines were in operation but no large individual returns were reported.

The *Kunanalling District* reported 74 fine ounces from the treatment of 223 tons of ore.

PEAK HILL GOLDFIELD.

In this goldfield the treatment of 46,480 tons of ore yielded 8,683 fine ounces at an average of 3.73 dwts. per ton. In the previous year 55,489 tons yielded 9,014 fine ounces at an average of 3.25 dwts. per ton.

Gold production is equal to 1.0 per cent. of the State's total.

There were 43 men employed as compared with 60 in the previous year.

The only substantial producer was the *Horseshoe* which treated 45,347 tons for 8,524 fine ounces at an average of 3.76 dwts. per ton. This mine reached its economic limit and closed on September 30th.

BROAD ARROW GOLDFIELD.

This goldfield produced 2,848 fine ounces from the treatment of 3,541 tons at an average of 16.08 dwts. per ton. In the previous year 2,550 fine ounces were recovered from the treatment of 4,505 tons of ore averaging 11.32 dwts. per ton.

The men employed numbered 110 as compared with 108 in the previous year.

High grade ore was produced at Black Flag by *Bellevue* with 196 fine ounces from 132 tons and by *New Mexico* at Christmas Reef with 351 fine ounces from 180 tons. Tributers on the *Ora Banda Amalgamated* obtained 519 fine ounces from 469 tons. The *Wentworth* returned 104 fine ounces from 371 tons and *Gimlet South* 126 fine ounces from 373 tons.

PILBARA GOLDFIELD.

This goldfield produced 2,800 fine ounces from the treatment of 7,978 tons of ore at an average of 7.02 dwts. per ton as compared with 7,974 fine ounces from 8,973 tons at an average of 17.77 dwts. per ton. The fall in grade may be attributed in part to gold in parcels of concentrate from the *Blue Spec* mine which has not been brought to account.

Marble Bar District produced 1,556 fine ounces from the treatment of 1,012 tons of ore at an average of 30.76 dwts. per ton. Very little work was done on *Halleys Comet* which reported 860 fine ounces of gold from accumulated concentrate. Seven small producers in the Bamboo Creek area obtained a total of 200 fine ounces.

Nullagine District produced 1,245 fine ounces from the treatment of 6,966 tons of ore at an average of 3.57 dwts. per ton. This represents practically the gold recovered at the *Blue Spec* mine, which treated 6,614 tons for 1,006 fine ounces. Gold exported with concentrates has not yet been accounted for.

No mining is reported from any other goldfield except for a return of 89 fine ounces from 64 tons in the *Ashburton Goldfield.* This was obtained from *Polands Find* near Lyndon Station.

MINERALS OTHER THAN GOLD AND COAL.

The production of minerals other than gold and coal for 1953 and 1954 is shown in the table appearing on page 35.

Antimony.

The Blue Spec mine was operated by a reconstructed company with the intention of treating the bulk concentrate in Perth. The venture has not been successful and the future of the company is uncertin. The mine is in good order.

Asbestos.

The only Chrysotile produced was from Nunyerri. Australian Blue Asbestos continued to mine Crocidolite at Wittenoom Gorge. Operations are not on payable basis and the company has an application before the Tariff Board.

Barytes.

There was a small demand for ground barytes for use in oil drilling muds. Production was mainly from Cranbrook, which supplied 932 tons, and the balance of 112 tons was from Chesterfield in the Murchison Goldfield.

Bentonite.

Local bentonites also found some use in drilling muds and the production rose to 1,122 tons.

Beryl.

Beryl was obtained by a number of prospectors in the Pilbara and a parcel of seven tons was obtained from the Spargoville pegmatite. Total production was 132 tons with an average grade of 1.5%.

Chromite.

The total production of 4,270 tons came from Coobina, the average assay being 43.55 per cent.

Clays.

Clays totalling 22,659 tons were used in local cement and pottery works.

Cupreous Ore.

Although a considerable increase is indicated in the recorded production of 4,748 tons, the demand for carbonate ores to be used as fertilizer is still above the supply.

Diatomaceous Earth.

The Wanneroo deposits supplied 1,052 cubic yards of raw material which yielded 150 tons of calcined material.

Emeralds.

The production of 8.68 carats of finished emeralds from McPhee's Patch in the Pilbara was reported.

Felspar.

Australian Glass Manufacturers stepped up production by 50 per cent. on last year's figures to obtain 3,226 tons from their Londonderry quarry, and a further 53 tons was obtained from Balingup.

PRINCIPAL MINERALS OTHER THAN GOLD AND COAL.

Mineral.	1953.		1954.	
	Tons.	Value. £A.	Tons.	Value. £A.
Antimony Ore and Concentrates	358·43	10,313	45·44	1,410
Asbestos—				
Chrysotile	605·58	65,769	303·65	13,474
Crocidolite	3,795·40	641,595	3,793·67	542,202
Barytes	211·87	1,790	1,043·74	7,631
Bentonite	217·70	741	1,121·60	4,111
Beryl Ore	124·62	22,223	132·15	22,607
Chromite	1,968·00	29,717	4,269·55	48,957
Clays—				
Cement Clay	13,619·90	5,266	11,901·00	5,903
Fire Clays—				
Kaolin Type	1424·95	1,359	1,203·00	1,143
Kaolin and Other Type	7,393·00	7,393	5,535·00	5,535
White Clays—				
Ball Clay (Ceramic)	458·00	1,763	4,000·00	16,000
Kaolin (Filler Material)	20·00	100	20·00	100
Copper Ore	50·29	3,199	....	....
Cupreous Ore (Fertiliser)	1,948·08	21,004	4,748·11	50,381
Diatomaceous Earth (Calcined)	....	....	150·00	1,579
Emeralds (carats—cut)	....	....	8·68	313
Felspar	2,127·00	8,860	3,225·91	14,491
Fuller's Earth	15·75	79	....	....
Glass Sand	6,905·74	4,690	7,803·01	5,541
Glauconite	319·50	11,182	257·50	9,012
Graphite	20·00	180	....	....
Gypsum	40,247·11	30,178	41,142·00	31,620
Iron Ore (Exported)	687,895·00	682,162	634,514·00	629,325
Iron Ore (for Pig)	16,851·77	221,006	18,298·29	209,027
Lead / Silver-Lead / Silver-Lead-Zinc Ore and Concentrates	6,425·48	358,328	2,166·97	101,183
Magnesite	19·60	73	91·75	258
Manganese	16,324·00	150,991	40,581·00	608,215
Ochre—				
Red	286·67	2,742	388·00	3,694
Yellow	20·50	145	41·45	415
Petalite	....	....	15·00	69
Pyrites	59,248·00	489,985	56,150·00	441,466
Silver (Fine Ozs.)	229,364·39	89,401	228,377·43	86,933
Talc	2,228·07	30,932	2,920·03	45,851
Tantalo/Colombite Ore and Concentrates	8·09	20,200	52·11	76,445
Tin	113·27	63,129	121·32	62,977
Tungsten—				
Scheelite (lbs.)	6,520·00	3,361	8,279·00	3,361
Wolfram (lbs.)	7,733·00	4,473	....	....
Vermiculite	29·00	348	....	....
Zinc (Metallic) (*a*)	114·16	1,376	73·85	*
Zinc Ore (Fertilizer)	10·00	50	....	....
TOTAL		2,986,103		3,051,229

(*a*) By-product from Silver/Lead/Zinc mining. * Not payable

Glass Sand.

Glass Sand for local use amounting to 7,803 tons was obtained from Lake Gnangarra.

Glauconite.

Glauconite from the Gingin greensand was produced as usual. The treatment of 1,545 tons yielded 257.5 tons of glauconite.

Graphite.

Extensive deposits have been located on the Young River but the grade is not attractive to existing markets.

Gypsum.

The local plaster manufacturers obtained their requirements from the central part of the State. Production slightly increased at 41,142 tons.

Iron Ore.

Production was at a slightly higher level at Koolyanobbing, which supplied 18,298 tons to Wundowie Charcoal Iron Works. Yampi Sound exported 634,514 tons, which is a little below last year's figure of 687,895 tons.

Lead.

The production of the ores of silver lead and zinc was considerably below the previous year's tonnage. The Northampton Mineral Field reported 1,339 tons, Ashburton 549 tons and West Kimberley 279 tons. These figures include some carry over from the previous year and actual mining would be at a lower level.

Magnesite.

A parcel of 92 tons was obtained at Coolgardie.

Manganese.

Ragged Hills deposit produced 8,982 tons assaying 53.08 per cent. and the Horseshoe deposit 31,599 tons assaying 46.43 per cent. manganese.

Ochre.

Production was at the usual level, the total production being 388 tons of red ochre and 41.45 tons of yellow ochre.

Petalite.

From time to time interest is shown in lithium minerals and a parcel of 15 tons of petalite assaying 4.13 per cent. lithium oxide was obtained at Londonderry.

Petroleum.

The deep test hole Rough Range No. 1 was drilling ahead at 13,599 feet at the end of the year. Some shows of gas and oil were obtained but no successful test was obtained other than that recorded in December, 1953.

Rough Range Holes 2, 3, 4 and 5 to test the formation in which oil was discovered were completed during the year and Rough Range No. 6 was in progress.

Cape Range No. 1 was spudded in on 2nd September, 1954, and drilled to 8,019 feet the limit of the available equipment.

Grant Range No. 1 was commenced on 31st October, 1954.

Pyrites.

Norseman Gold Mines continued to produce pyrites for acid manufacture. Output was down slightly, the total tonnage being 56,150.

Silver.

Silver obtained as a by-product from gold mining and from lead-zinc ores amounted to 228,377 fine ounces.

Talc.

Production was at the usual level, the output for the year being 2,920 tons. Mt. Monger contributed 37 tons, the remainder coming from the Coodawa deposit near Three Springs.

Tantalo-Columbite Ores.

Under the stimulation of the high prices offering production rose to 52.11 tons as compared with 8.09 tons in the previous year. No new finds were reported. Approximately 44 tons were produced by a group of aborigines by primitive methods. About 4½ tons were obtained as a by-product from tin mining at Greenbushes.

Tin.

Production was a little ahead of the previous year the total production being 121 tons. About 77 tons were obtained from the Pilbara and the remainder was obtained from Greenbushes.

Tungsten.

Total production was a little under 4 tons of scheelite from Pilbara and North Coolgardie.

Vermiculite.

Only 74 tons were produced. It appears that vermiculite cannot compete with other isulators except for special purposes.

Conclusion.

The results detailed indicate a very satisfactory year for the gold mining industry. The effects of the Commonwealth assistance have not yet been fully effective and some of our mines undoubtedly receive considerable help from it.

The closure of Big Bell has been anticipated and in view of rising costs was inevitable. Exploration has been very active and although the proportion of successful developments was small some encouraging results have been obtained.

In the base metal field production has been fairly well maintained and some important discoveries made.

No economic deposit of radio-active ore has been discovered but indications have been found. With the improvement of geo-physical methods the discovery of a useful deposit can be anticipated.

Oil search is proceeding in several localities. While the failure to find any further oil is a disappointment encouraging indications have been found and it seems certain that some oil will eventually be discovered.

I should like to record my appreciation of the work done by all members of the staff. The extension of the drilling programme has placed a very considerable burden on the head office staff. Consideration should be given to the establishment of a section to administer this programme on a permanent basis.

The field officers have given excellent service. Vacancies have been difficult to fill and for some time we have been short of staff.

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

Appendix No. 1.

DIAMOND DRILLING.

This Department had four drills operating during the year, two in the Yilgarn Goldfield and two in the Collie Coalfields.

Contractor A. E. Horsham continued drilling the Iron and Pyrite deposits at Koolyanobbing. Five holes were drilled for a total of 3,510 feet. Progress was slow in the overburden which contained innumerable loose boulders which made drilling hazardous till this zone was cased.

The Government Geologist reports that two bodies have been discovered, both containing high grade pyrite. Exploration of Dowd's Hill has proved the existence of a good grade pyritic lode over a length of 1,800 feet with true widths varying between 30 and 213 feet at depths ranging between 500 and 1,100 feet below the surface. The full extent of this ore body has not been reached by the exploratory drilling but sufficient information has been obtained to prove the existence in this locality of a large tonnage of pyritic ore plus downward continuation of the outcropping iron ore. Exploration of the second ore body some two miles south-east of Dowd's Hill is not yet complete, but two intersections have indicated that a smaller but still commercial ore body will be found there.

It is anticipated that the drilling at Koolyanobbing, which commenced in November, 1952, will be completed in August, 1955.

A new Mindrill A.2,000, plus ancillary equipment, was purchased early in the year and a contract let to L. C. Honey for drilling in the Yilgarn Goldfield.

Drilling operations commenced on the 24th March at the "White Horseshoe" Gold Mine, Parkers Range. The vertical hoe drilled "AXT" to 606 feet passed through some mineralisation in quartz bars but no payable gold values were encountered. Drilling south of Marvel Loch was discontinued after two more unsuccessful holes were drilled on abondoned leases at "Spring Hills" and "Centenary."

Surveys, carried out with a Tro Pari bore hole surveying instrument, indicated that the average rate of deflection from the vertical of the above three holes was 3° per 100 feet with an easterly drift.

The plant was then moved to the "Great Unknown" Gold Mine, Reidel's Find, some 62 miles north of Bullfinch where two inclined holes drilled respectively to 705 feet 6 inches and 586 feet failed to cut any ore body of economic importance. A short hole drilled to 269 feet at Allen's Find did not attain its target due to constant caving of the hole. The first hole at the "Hazel Merle" drilled to 711 feet cut good values in a strong shear zone about 200 feet in the footwall of the projected main ore body. Drilling will continue on this lease in the coming year. To the end of the year seven exploratory holes had been drilled on abandoned gold mining leases for a total of 4,082 feet.

Contract drilling in the goldfields is at present based on the following footage payments—

Depth.	Rate per foot. £ s. d.
0— 500 feet	2 0 0
500—1,000 feet	2 5 0
1,000—1,500 feet	2 10 0

The above prices are on a basis of 100% core recovery and if all core is not recovered the Government Geologist may order that the rate per foot be reduced by 3d. for each 1% that core recovery is less than 100%. The contractor is also required to keep the equipment in good order and condition, supply at his own cost the necessary diamonds, fuel, water, etc. and pay annual hiring fees equivalent to 10% of the value of the plant. This rental is approximately £1,000 per year.

Two drills, namely a Boyles Bros. BBS. 4 and a Failing M-1, were in operation at Collie during the year. The BBS. 4 was operated under contract by McCallum and Grill and the Failing by day labour.

At the end of 1953 the hole at Site B on lease 440 some 60 chains south west of Western No. 2 Colliery was at 40 feet. This hole was being drilled three inches diameter with the BBS. 4. To the end of July the hole had advanced to 2,796 feet where the hole was abandoned following the termination of the contract. Difficulty in drilling this hole can be attributed to lack of mud control and insufficient clearance between the NX core barrel and the wall of the hole. Nine significant coal seams over three and a half feet were passed through, the more important seams being encountered at 383 feet (11 feet 3 inch coal), 1,154 feet (8 feet 3 inches coal) and 2,263 feet (8 feet 9 inches coal).

Failing drill operations for the year were highly successful, 19 holes being drilled in the Collie district for a total footage of 11,167 feet at an average rate of 931 feet per month, which figure includes holidays, cutting tracks, transportation of drill, setting up, etc.

Details of the holes are tabulated below—

Segregation of Operational Costs for 1954.

	£ s. d.	Per foot. £ s. d.
Supervision	1,745 4 2	3 1
Wages	9,241 19 10	16 7
Bits	2,407 9	4 4
Fuel	713 4 6	1 3
Bentonite	406 10 5	9
Repairs and Replacements	7,139 1 11	12 9
Transport	1,075 4 6	1 11
Total	£22,728 14 4	£2 0 8

Holes 10, 11 and 12 were short holes drilled 286, 195 and 276 feet directly ahead of the Centaur Colliery at Muja. This work was carried out to ascertain roof and floor conditions for the Griffin Company. Low core recovery and the friable nature of the core recovered indicate that both roof and floor sediments are poorly cemented and unconsolidated.

Two main seams of coal were cut in these holes, they being 11 feet 5 inches at 148 feet and 13 feet 9 inches at 247 feet in hole No. 10. This hole had a combination string of 5 and 6 inch casing landed at 250 feet to be used as an outlet for mine water when connection with it is made underground.

Core recovery of 89.8% from hole No. 13, drilled to 779½ feet at site K in the Muja area, represents the highest core recovery so far obtained in this field. Slightly more than half the cost of the operation was brought about by the introduction of 500 feet of Failing drill pipe to replace "N" rod which had seen considerable service. Seventeen coal seams were cut, giving a total of 59 feet 4 inches coal in 770 feet. The more important seams were 5 feet 8 inches, 7 feet 5 inches, 5 feet 3 inches, 5 feet 1 inch, 5 feet 1 inch, 5 feet 7 inches, and 9 feet 6 inches thick.

Hole No. 14 was drilled to 1,351 feet at Site I, lease 454 about one and three quarter miles south west of the Muja railway siding. Six coal seams between 4 and 10 feet were passed through before entering the granite basement at 1,343 feet. Costs on this hole were high, mainly due to the completion of the changeover to drill pipe.

Hole No. 15 situated one and a quarter miles north-west of the Centaur Colliery was drilled to 662 feet in two weeks. Seven coal seams were cut, the more importaot ones being eight feet at 370 feet, and 11 feet 10 inches at 470 feet below the surface.

Hole Nos. and Position		Date Commenced	Footage	% Core Recovery	Cost per foot Drilled. £ s. d.
10, 11, 12	Ahead of Centaur Colliery	28th Jan.	757	40 Av.	3 1 7
13	Site K. Centaur	23rd Feb.	779½	89·8	2 12 7
14	Site I. Lease 454—Centaur	13th March	1,351	80·0	3 3 1
15	Site D. Lease 459—Centaur	7th May	662	60·8	1 3 11
16	Site L. Lease 425 Western Colliery	21st May	1,515	78·8	1 11 6
17	Site M. Lease 424 Western Colliery	11th July	1,585½	85·7	1 9 7
18	Site N. Lease 425 Western Colliery	31st Aug.	396	32·6	1 1 7
19-27 (inc.)	Ahead of Western No. 2	9th Sept.	2,067	43 Av.	1 2 9
28	Site A.—South East Cardiff area....	20th Oct.	Drilling Ahead at 2,054	78·1	2 16 3

Total Footage Drilled for Year = 11,167 feet
Average Cost per Foot Drilled = £2/0/8

Hole No. 16 at site L, Lease 425, on ground held by Western Collieries, was drilled to a depth of 1515 feet during the period 21st May—10th July. The following important coal seams were intersected—

8 feet	10 inches	at	240 feet.
6 feet	10 inches	at	263 feet.
8 feet	4 inches	at	277 feet.
40 feet	5 inches	at	440 feet.
5 feet	10 inches	at	579 feet.
6 feet	0 inches	at	922 feet.
5 feet	6 inches	at	966 feet.
7 feet	0 inches	at	1,025 feet.
8 feet	3 inches	at	1,221 feet.
8 feet	6 inches	at	1,367 feet.
9 feet	0 inches	at	1,498 feet.

Hole No. 17 was drilled to 1,585½ feet to basement rock (dolerite) during the period 11th July—30th August. Thirteen coal seams between 3 feet 3 inches and 10 feet thick were cored in the interval between 83 and 1,370 feet. The cost of drilling this hole was low (£1 9s. 7d. per foot) considering the high core recovery of 85.7%.

Core recovery and costs were low for the 396 foot drill hole bored at site N on Western Collieries' ground. This was the last hole of the series drilled in the Muja basin.

Nine holes (Nos. 19-27), varying between 184 and 294 feet, were drilled to test roof and floor conditions ahead of Western No. 2 Colliery. A total of 2,067 feet was drilled at an average rate of 1,550 feet per month for a cost of £1 2s. 9d. per foot. Core recovery was poor due mainly to the unconsolidated nature of the sediments above and below the coal seams. It was noted however, that some improvement in rock strength was evident further down the dip.

Drilling commenced on hole No. 28, site A, in the South East Cardiff area on the 20th October. To the end of the year the hole had advanced to 2,054 feet. At this time the hole was conditioned with new mud and the machine shut down for the drill crews' three weeks annual holidays. This was the first hole drilled in the sedimentary basin at Collie that was left for an extended period before recommencement of drilling. No difficulty was encountered in getting to bottom after the holidays, though usually several hours are lost in washing to bottom even after the week end shutdown. Eleven coal seams between 3 feet and 8 feet 4 inches thick were cut in the first 1500 feet of hole.

During 1954 the changeover from "N" rod to Failing 2⅜ inch drill pipe was completed. The introduction of drill pipe has decreased the time of bottom as the external pipe joints with tapered threads made breaking of joints easier, and the use of elevators eliminated the time spent in screwing in the hoisting plug. The use of a larger bit (3.13/16 inch diameter) enabled drilling rate to be increased, except in mudstone, as more weight could be placed on the bit, lowered pump pressures and reduced the hazard of stuck tools. No casing was lost in the year's drilling operations, in fact very little casing was used, there being no more than 100 feet in any one hole. Control of the wall of the hole was achieved by using Volclay (bentonite) having an initial viscosity of 35 seconds.

Since November 1952 the Failing M. 1 has completed 21,124 feet of exploratory drilling in the Collie basin. It is anticipated that the programme will continue for another eighteen months.

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

Appendix No. 2.

REPORT ON ACTIVITIES OF EXAMINERS FOR UNDERGROUND SUPERVISORS' AND MINE MANAGERS' CERTIFICATES FOR 1954.

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

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

I submit herewith the Annual Report on the work of the Board of Examiners for Mine Managers' and Underground Supervisors' Certificates for the year 1954.

Mr. J. Boyland, Senior Inspector of Mines, successor to Mr. J. H. Verran, took up his position as a Member of the Board of Examiners from the beginning of the year.

Examination in Mining Law.

An examination in Mining Law was held on April 5th, 1954. Eleven candidates sat for the examination and seven passed. The names of the successful candidates are as follows:—

R. S. Boylen
G. S. Compton
R. J. Elliott
J. C. McDermott
G. Newman
E. G. Timoney
J. J. Zuvich

A copy of the examination paper is attached.

The Board decided that, in future, candidates would be required to pass in each section of the examination paper and that candidates must obtain at least 50 per cent. in each section and an aggregate of 60 per cent. for a complete pass.

Underground Supervisors' Examination.

An examination for Underground Supervisors' Certificates of Competency was held on September 6th, 1954. The examination paper for the Mining Section was prepared by Mr. Boyland and the paper in the Mining Law Section was prepared by Mr. Hobson.

Twenty-two candidates sat for the examination at the following centres:—

Kalgoorlie	14
Kalgoorlie (oral only)	1
Coolgardie	2
Mt. Magnet	2
Norseman	1
Northampton	1
Nullagine (oral only)	1

Sixteen candidates were successful in passing the examination. One was deferred, to take the oral examination again next year, and one deferred pending completion of the required length of experience.

Four candidates failed to pass the examination.

Following are the names of the successful candidates:—

W. A. Allin	F. L. Lithgow
A. B. Buchanan	J. P. Moore
A. E. Brabazon	P. J. O'Sullivan
J. A. Cedro	L. E. Quan
D. F. Dellar	K. E. Selsmark
H. S. Fraser	J. P. Shanahan
D. H. Harper	M. Turich
F. H. Holt	C. M. Wilson

Copies of the examination papers are attached.

One duplicate Underground Supervisors' Certificate of Competency was issued during the year.

Mine Manager's Certificates of Competency.

Five applications for Mine Managers' Certificates of Competency were approved during the year.

The names of the recipients are as follows:—

E. T. Forster
T. G. P. McDonald
F. H. Jones
E. G. Timoney
G. S. Compton

It was decided by the Board that Science Degrees submitted by applicants for Mine Managers' Certificates would not be recognised as being equivalent to the Mine Managers' Certificate course at the School of Mines.

Reciprocity.

The New South Wales Board of Examiners have not yet given a decision on the matter of reciprocity, and the Chief Inspector of Mines, Sydney, was notified in November, that until such time as the matter is clarified, the Western Australian Board of Examiners is unable to recognise the New South Wales Mine Managers' Certificates of Competency.

(Sgd.) G. M. LUMB,
Secretary,
Board of Examiners,

Mines Regulation Act, 1946.

EXAMINATION FOR MINE MANAGER'S CERTIFICATE OF COMPETENCY.

Mining Law.

April, 1954.

Time allowed—three hours.—Attempt six (6) questions from Section A. Four (4) questions from section B.

Candidates should note:

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

(b) In answering questions on the Mining Act candidates should summarize the requirements of the Act or the regulations, and should refer to the appropriate sections of the Act or of the regulations by numbers thus—Act, section 160; regulation 150.

Section A.

(Mines Regulation Act).

Attempt six (6) questions from this section. Do not attempt more than six questions from this section.

Marks allowed are 10 per question.

1. (a) If a mine employs 25 or more men underground what is required in regard to the supervision of the underground workings?

   (b) If the mine employs less than 25 men underground what is required in regard to the supervision of the underground workings?

2. (a) A person who cannot read the English language may not be employed in certain positions. What are they?

   (b) What is the minimum age at which a person may be employed underground?

   What is the limit of age for a braceman?

   What is the limit of age for persons handling explosives?

3. (a) Who may give permission for Sunday labour in mines?

   (b) Under what conditions may permission be given?

4. (a) What do the regulations require regarding the wrappers of nitro-glycerine explosives?

   What is the reason for this?

   (b) What time must elapse before approaching a misfire?

   (c) What do the regulations say about boring in butts?

5. (a) Where is the control valve on the air supply to a winze placed? Why?

   (b) What other provisions for safety in winzes are there?

6. (a) The methods which may be employed for clearing chutes or draw-off points which have "hung-up" differs from the methods permitted for the clearing of passes which have "hung-up" in one important detail. Why is this?

   (b) When are men required to wear safety belts?

7. (a) What are the prescribed limits for the burning rate of safety fuse?

   (b) What are the permitted times of blasting?

Section B.

(Mining Act.)

Attempt four (4) questions from this section. Do not attempt more than four questions from this section.

Marks allowed are 10 per question.

8. (a) A Miner's Right gives the holder the right to occupy certain holdings under the Mining Act. What are they?

   (b) What are the important differences between a goldmining lease and a mineral lease.

9. What is the procedure when gold is found on a mineral lease?

10. How many men are required to work—
    (a) a goldmining lease;
    (b) a mineral claim;
    (c) a coalmining lease?

11. Outline the conditions under which exemption from labour conditions may be granted.

12. Outline the method of marking out a mining lease.

Western Australia.

Mines Regulation Act, 1946.

EXAMINATION FOR CERTIFICATE OF COMPETENCY AS UNDERGROUND SUPERVISOR.

Mining.

September, 1954.

Time allowed—three hours. All questions to be answered.

Note.—Read the examination paper carefully. Answers must be written in ink.

Candidates should illustrate with sketches where possible.

1. A dead end leading stope has been broken out in a vertical ore body 10ft. wide. Two-thirds of the broken ore remain to be cleaned off the level. Twelve months have elapsed since men last worked in this leading stope and the back of the stope is 20ft. above the solid floor of the level.

   The leading stope is 2,000 ft. from the nearest workings or travelling way.

   It is desired to clean out all broken ore using a mechanical bogger.

   (a) What equipment would you supply to have this work carried out?

   (b) Whom would you detail to do the work?

   (c) What instructions would be given?

   (d) The performance of this work is hazardous—Why?

2. (a) Describe the timbering of a section of a level with stulls, stating under what conditions this method would be used. Sketch to show chutes and mainways.

   (b) If a level is timbered with sets and it subsequently becomes necessary to stope out the ore immediately under the level and to leave the level in good order for trucking, etc., explain how you would support the sets while taking out the ore directly beneath them and leave a permanent trucking level.

3. (a) An ore pass which has an inclination of 60° to horizontal has become "hung-up."

   Explain fully the procedure you would take to clear it.

   (b) An opening used for drawing off ore from a shrinkage stope has become obstructed; explain fully the procedure you would take to clear it.

4. Describe—

   (a) A burn cut and give sketches indicating the method of boring and charging the holes and order of firing for two successive faces.

   (b) the method of boring a cut in a wet winze and the precautions necessary in charging and firing same.

5. State what you know about ventilation, the suppression of dust and how to keep a mine free from dust and fumes whilst men are working underground.

6. (a) An underground ore bin is 20ft. long, 10ft. wide and 50ft. deep. How many tons of broken ore will it hold when completely filled. Broken ore at 22 cubic feet per ton.

   (b) A skip which holds four a half tons is to be used to hoist the ore. How many skip loads would be hoisted before the bin is emptied?

   (c) Each complete journey of the skip takes five and a half minutes. How long will it take to empty the bin?

7. Explain fully how you would proceed in sinking a winze from one level to another, describing the equipment and lay out on the upper level and the method of sinking, with all necessary safety precautions for both levels.

Western Australia.

Mines Regulation Act, 1946.

EXAMINATION FOR CERTIFICATE OF COMPETENCY AS UNDERGROUND SUPERVISOR.

Mining Law.

September, 1954.

Time allowed—two hours. Attempt all questions.

Note.—Read the examination paper carefully. Answers must be written in ink.

1. What does the mines Regulation Act and/or the regulations made under that Act require regarding the following:—

   (a) The types of main magazine;

   (b) handling of explosives;

   (c) time of blasting;

   (d) misfires;

   (e) what, if anything, is necessary before a rise can be commenced;

   (f) safety belts;

   (g) ladders in winzes;

   (h) gates to cages;

   (i) testing of winding engines after repairs;

   (j) regular examination of ropes and winding appliances;

   (k) return airways;

   (l) crib places;

   (m) raising and lowering of material?

2. What age restrictions, if any, are made for the following:—

   (a) Bracemen;

   (b) those handling explosives;

   (c) applicants for Underground Supervisors' Certificates;

   (d) applicants for Mine Managers' Certificates;

   (e) Hoist driver (less than 12 h.p.);

   (f) a man working underground?

3. What do the following signals mean to the driver of a winding engine or hoist:—
   Knocks or rings: 4, 5, 6, 7.

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DIVISION III

Report of the Superintendent of State Batteries

UNDER SECRETARY FOR MINES:

For the information of the Hon. Minister I submit my report on the operation of State Batteries for the year ending 31st December, 1954.

CRUSHING GOLD ORES.

One 15 head, five 10 head, and nine 5 head mills crushed 34,599¾ tons of ore made up of 533 separate parcels, an average of 64.92 tons per parcel. The bullion produced amounted to 13,980 oz. which is estimated to contain 11,848 fine oz. or 6 dwts 20 grs. of gold per ton of ore.

The cost of crushing including administration was 49s. 6d. per ton as against 41s. 8d. for the previous year, a rise of 7s. 10d. per ton. Kalgoorlie, the only 15 head mill had the best cost figure at 30s. 4d. per ton.

The average assay value of all the ore after amalgamation but before cyanidation was 2 dwts. 23 grs. Thus the total head value of the ore was 9 dwts. 19 grains which is 19½ grains less than the previous year's figure.

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

	Tons.	%
Over 2 dwts. 8 grs. per ton	12,363	35.8
1 dwt. 18 grs. to 2 dwts. 8 grs. per ton	2,875	8.3
Under 1 dwt. 18 grs. per ton	18,865	54.5
Refractory	496¾	1.4
	34,599¾	100.0

CYANIDING.

Eight plants handled 19,907 tons of crushed ore for a production of 3,302 fine oz. worth £51,237. The average content of this tonnage was 4 dwts 5 grains before treatment while the residue contained 23 grains. The theoretical extraction by cyanidation was therefore 76.9 per cent. and the actual extraction 77.2 per cent.

The cost of cynidation was 35s. 3d. per ton an increase of 1s. per ton on the previous year. Cue and Laverton showed the best figures with 26s. 10d. and 27s. 1d. respectively, whilst Kalgoorlie was 29s. 4d.

ESTIMATED OVERALL RECOVERY.

Figures for estimated recovery are:—

——	Content.	Per ton Crushed.		Percentage.
	Fine ozs.	Cwt.	Grs.	
Head Value	16,956	9	19	100·00
Amalgamation Recovery	11,848	6	20	69·87
Cyanidation Recovery	3,302	1	22	19·47
Total Recovery	15,150	8	18	89·34

VALUE OF PRODUCTION.

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

	1954.	Grand Total.
	£	£
Par Production:		
Crushing	50,329	8,268,729
Cyanidation	13,973	2,056,646
Gold Premium:		
Crushing	134,802	4,049,762
Cyanidation	37,426	1,234,743
Open Market Premium:		
Crushing	142	28,570
Cyanidation	31	9,875
Tin Production:		
Ore	—	94,005
Residues	—	572
Tungsten Production:		
Concentrates	—	17,893
	236,703	15,760,795

FINANCIAL.

The loss of £80,710 is a decrease of £2,609 on the previous year and does not include depreciation or interest.

——	Tons.	Expenditure.	Receipts.	Profit.	Loss.
		£	£	£	£
Crushing	34,599¾	93,500	20,695	....	72,805
Cyaniding	19,907	35,088	27,183	....	7,905
	....	128,588	47,878	....	80,710

Capital expenditure was incurred as below:—

——	General Loan Fund.	Consolidated Revenue Fund.
	£ s. d.	£ s. d.
Cue—Freight, Crossley Engine and Parts	....	129 17 9
Lake Darlot—Proportion Cost Overhaul Construction Engineer's Truck	....	35 8 7
Northampton—Erection of Battery	4,558 19 7	1,483 3 8
Yarri—Conversion of Engine	....	1,147 16 5
Coolgardie—Conversion of Engine	1,066 6 0	....
Laverton—Conversion of Engine	1,066 6 0	....
Menzies—Erection of Battery	24,811 13 3	....
	31,503 4 10	2,796 6 5

Cartage Subsidies.

	Tons.	Cost. £.
On ore carted to State Plants	7,682	2,759
On ore carted to private plants	49	31
	7,731	£2,790

Comparative figures for the last three years are:—

	Tons Crushed.	State Plants.			Private Plants.		Total Cost.
		Tons Subsidised.	% Subsidised.	Cost.	Tons Crushed.	Cost.	
				£		£	£
1952	42,270	12,895	30·5	5,894	607	372	6,266
1953	40,218	11,645	29·0	5,553	371	228	5,781
1954	34,600	7,682	22·2	2,759	49	31	2,790

Treatment of Ores other than Gold.

4¼ tons of Wolfram ore were treated at the Northampton Battery for a recoverey of 567 lb. of concentrates.

Copper Ores.

130 tons of copper ore were crushed at the Meekatharra Battery. The crushed ore was for use in Agriculture.

Lead Ores.

The Northampton State Battery commenced crushing lead ore in January, 1954. During the year 3,879½ tons of lead ore, with an estimated average content of 15.90 per cent. lead was crushed. There were 24 separate parcels, giving an average of 161.66 tons of ore per parcel.

A total of 516.57 tons of concentrates were produced. The concentrates averaged 71.88 per cent. lead, giving an estimated content of 371.33 tons of lead in concentrates.

3,362.93 tons of tailings were discarded. The tailings had an estimated average content of 3.03 per cent. lead, giving a total of 101.89 tons of lead discarded in tailings.

The recovery of lead in concentrates was 83.52 per cent. of the lead in the ore delivered to the Battery.

The cost of operating amounted to £8,669 12s. 5d., the cost per ton being 43s. 6d. Revenue received was £3,487 2s. 7d. being 17s. 6d. per ton. Operating loss was £5,182 9s. 10d., or 26s. per ton. Crushing charges outstanding amounted to £606 11s 5d., and when collected will increase the revenue earned by 3s 1½d. per ton to 20s. 7½d., reducing the loss to 22s 10½d. per ton. The expenditure includes Administration costs, but not Interest, Sinking Fund, Depreciation and Superannuation Charges.

No sales of lead concentrates have yet been reported, so no value can be given for the lead concentrates produced.

STAFF.

The starting of the Northampton Battery, and preparations for starting the Menzies Battery made several staff changes necessary.

Manager Mack was transferred from the Boogardie, Paynes Find, Sandstone Circuit to Manager of the Northampton Battery. Mr. C. Morrow was appointed manager of the Boogardie circuit.

Manager Ross was transferred from Laverton to prepare the Menzies Battery and to manage it when it operated. Assistant Manager Casserly was sent from Kalgoorlie to manage the Laverton Battery.

Leading Hand Steel went to Lake Darlot as Acting Manager.

I wish to thank the staff at Head Office and in the field for their efficient service to the Department, and for the maintenance of good relations with our customers.

ADMINISTRATION.

Expenditure amounted to £15,019 9s. 3d. as against £13,954 1s. 8d. for 1953, and was equivalent to 5s 6d. per ton of ore crushed and cyanided as against 4s. 2d.

	1953. £ s. d.	1954. £ s. d.
Salaries	7,616 9 1	8,647 11 0
Pay Roll Tax	2,084 4 0	1,941 4 4
Workers Compensation	2,839 14 2	2,353 15 9
Travelling and Inspection	1,236 2 11	1,920 4 5
Sundries	177 11 6	156 13 9
	13,954 1 8	15,019 9 3

GENERAL REMARKS.

The tonnage of gold ore crushed was again lower than the previous year, being 34,599¾ tons for 1954, compared with 40,218½ tons for 1953, a reduction of 5,618¾ tons. The crushing costs showed a marked rise of 7s. 10d. per ton. This rise was caused mainly by the decreased tonnage crushed and by increased maintenance work.

The Northampton State Battery started crushing lead ore in January and crushed almost continuously throughout the year. This plant operated fairly satisfactorily but it was found that the trommel was too small. A larger trommel is being made and will be installed in 1955.

The Menzies Battery was constructed during the year. It was given a trial run at the end of December and will start crushing early in January.

K. M. PATERSON,
Superintendent of State Batteries.

SCHEDULE 1.

Number of Parcels Treated, Tons Crushed and Head Value for the Year ended 31st December, 1954.

No. of Parcels Treated	Battery.	Tons Crushed.	Yield by Amalgamation. (Bullion).	Yield by Amalgamation. (Fine Gold).	Tailings Gross @ 100%	Total Contents of Ore. (Fine Gold).	Average per Ton (Fine Gold).	Gross Value per Ton fine gold at £4 4s. 11½d. per Ounce.
			Ozs. Dwts.	Ozs. Dwts.	Ozs. Dwts.	Ozs. Dwts.	Dwts. Grs.	£ s. d.
20	Bamboo Creek	513	285 5	241 15	278 0	519 15	20 6	4 6 0
90	Coolgardie	2,878½	898 13	761 12	403 12	1,165 4	8 2	1 14 4
46	Cue	3,527¼	1,459 9	1,236 17	552 5	1,789 2	10 3	2 3 0
160	Kalgoorlie	14,718	3,203 12	2,715 1	1,227 4	3,942 5	5 8	1 2 8
7	Lake Darlot	422	204 13	173 8	97 18	271 6	12 20	2 14 6
33	Laverton	3,174½	1,256 16	1,065 3	917 6	1,982 9	12 12	2 13 1
9	Marble Bar	431¼	90 4	76 9	91 13	168 2	7 19	1 13 1
34	Marvel Loch	1,343	544 6	461 6	182 7	643 13	9 14	2 0 8
37	Meekatharra	1,054	1,224 7	1,037 12	209 17	1,247 9	23 16	5 0 6
6	Norseman	164¼	44 3	37 8	25 6	62 14	7 15	1 12 4
8	Nullagine	330	142 16	121 0	49 3	170 3	10 7	2 3 8
47	Ora Banda	1,905½	1,982 18	1,680 10	737 9	2,417 19	25 9	5 7 9
12	Peak Hill	1,132½	197 3	167 1	65 9	232 10	4 2	17 4
6	Sandstone	119½	187 8	158 16	22 17	181 13	30 10	6 9 2
18	Yarri	2,885	2,258 12	1,914 3	247 12	2,161 15	15 0	3 3 9
533		34,599½	13,980 5	11,848 1	5,107 18	16,955 19	9 19	2 1 7

Average Tons per Parcel .... 64·92.
Average Yield by Amalgamation per ton (fine gold).... .... 6 dwts. 20·37 grains.
Average Value by Amalgamation per ton (fine gold).... .... £1 9s. 1d. Australian £5 7s. 0d.
Average Head Value of Tailings (fine gold) .... 2 dwts. 23 grains.
Average Value of Tailings per ton .... 12/7 Australian £1 13s. 8d.

SCHEDULE 2.

Details of Extraction—Tailings Treatment, 1954.

Battery.	Tons Treated.	Head Value.	Contents.	Tail Value.	Contents.	Recovery.	Call.	Recovery.	Shortage.	Surplus.
		Dwts. Grs.	Dwts.	Dwts. Grs.	Dwts.	%	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Bamboo Creek	1,708	4 10	7,520	1 2	1,860	75	1,201 16 6	1,242 8 7	....	40 12 1
Coolgardie	1,892	3 10	6,500	19	1,500	77	1,063 9 2	1,019 19 8	43 9 6	....
Cue	2,828	2 20	8,040	16	1,900	76	1,302 13 4	1,304 15 7	....	2 2 3
Kalgoorlie	7,530	3 7	24,920	18	5,700	77	4,080 13 2	4,168 7 9	....	87 14 7
Laverton....	2,536	6 2	15,420	1 19	3,460	78	2,539 8 8	2,568 5 3	....	28 16 7
Meekatharra	1,318	4 16	6,160	1 4	1,520	75	995 12 9	990 3 9	5 9 0	....
Ora Banda	1,969	7 17	14,940	1 17	3,360	78	2,461 5 8	2,417 9 9	43 15 11	....
Sandstone	126	3 19	480	23	120	75	75 16 6	74 6 8	1 9 10	....
	19,907	4 5	83,980	23	19,420	76·9	13,720 15 9	13,785 17 0	94 4 3	159 5 6

Net Surplus: £65 1s. 3d.

Head Value .... 4 dwts. 5 grains.
Tail Value .... 23 grains.
Theoretical Recovery .... 76·9%.
Actual Recovery .... 77·2%.

SCHEDULE No. 3.

Cyanide Yield, 1954.

Battery.	Tons.	Fine ozs.	Value.	Premium.	Total.
Bamboo Creek	1,708	293·63	1,255·303	3,340·690	4,595·993
Coolgardie	1,892	240·12	1,019·982	2,731·952	3,751·934
Cue	2,828	306·36	1,304·778	3,485·622	4,790·400
Kalgoorlie	7,530	1,000·56	4,252·995	11,327·153	15,580·148
Laverton	2,536	603·89	2,568·259	6,843·850	9,412·109
Linden	....	5·15	21·891	57·925	79·816
Marvel Loch	....	5·85	24·849	66·532	91·381
Meekatharra	1,318	233·11	990·186	2,652·143	3,642·329
Ora Banda	1,969	596·01	2,460·450	6,561·720	9,022·170
Sandstone	126	17·50	74·333	196·766	271·099
	19,907	3,302·18	13,973·026	37,264·353	51,237·379

SCHEDULE 4.

Statement of Receipts and Expenditure for Year ended 31st December, 1954.

MILLING.

Batteries.	Tonnage Crushed.	Expenditure.									Receipts.		Profit.	Loss.
		Management.	Wages.	Stores.	Total Working Expenditure.	Cost per Ton.	Repairs and Renewals.	Sundries.	Gross Expenditure.	Cost per Ton.	Receipts.	per Ton.		
		£ 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	533	287 5 6	1,063 1 4	455 8 3	1,805 15 1	67 9·3	565 5 3	216 19 0	2,587 19 4	97 1·1	459 2 2	17 2·3	....	2,128 17 2
Boogardie	....	442 12 3	30 15 4	26 9 7	499 17 2	....	17 8 5	111 11 4	628 16 11	....	10 0	....	....	628 6 11
Coolgardie	2,960·75	839 15 6	2,925 12 2	2,023 9 7	5,788 17 3	39 1·3	2,196 4 4	1,133 7 10	9,118 9 5	61 4·3	1,451 12 4	9 9·3	....	7,666 17 1
Cue	3,247·75	751 17 8	3,616 2 0	2,012 7 4	6,380 7 0	39 4·5	1,533 14 11	1,526 1 10	9,440 3 9	58 1·2	2,051 13 2	12 7·2	....	7,388 10 7
Kalgoorlie	14,466	1,386 5 3	7,128 3 3	6,946 16 5	15,461 4 11	21 4·3	2,000 1 1	4,491 10 11	21,952 16 11	30 4·1	5,614 14 8	7 9·1	....	16,338 2 3
Lake Darlot	422	350 17 4	953 17 0	419 6 5	1,724 0 9	81 9·3	320 2 2	347 5 2	2,391 8 1	113 4	231 12 6	10 11·3	....	2,159 15 7
Laverton	3,286·5	511 19 8	2,835 10 6	1,776 4 5	5,123 14 7	31 2·1	1,449 7 10	1,097 18 7	7,671 1 0	46 8·1	1,775 18 8	10 9·3	....	5,895 2 4
Marble Bar	431·75	312 18 6	687 7 3	695 18 4	1,696 4 1	79 6·3	517 10 8	570 12 4	2,784 7 1	128 11·3	784 4 8	36 4	....	2,000 2 5
Marvel Loch	1,309	331 8 9	2,182 7 2	572 14 9	3,086 10 8	47 1·3	761 7 8	502 0 5	4,349 18 9	66 5·3	781 1 2	11 10·3	....	3,568 17 7
Meekatharra	1,054	308 8 0	1,809 0 0	863 0 4	2,980 8 4	56 6·1	629 6 2	539 0 9	4,148 15 3	78 8·3	845 2 6	16 0	....	3,303 12 9
Norseman	164·5	60 10 0	298 0 7	25 15 0	384 5 7	46 8·3	1 4 2	85 11 4	471 1 1	57 3·1	112 9 4	13 8	....	358 11 9
Nullagine	330	312 0 10	903 12 10	454 0 8	1,669 14 4	101 1·5	840 4 11	266 0 10	2,776 0 1	168 3	203 0 6	12 3·3	....	2,572 19 7
Ora Banda	1,950·5	519 18 3	2,136 3 3	1,475 16 10	4,131 18 4	42 3·2	545 18 1	745 17 7	5,423 14 0	55 7·4	980 10 4	10 0·2	....	4,443 3 8
Paynes Find	....	....	78 0 0	....	78 0 0	....	....	1 0 0	79 0 0	....	....	....	....	79 0 0
Peak Hill	1,132·5	....	1,408 15 6	218 5 10	1,627 1 4	28 8·3	231 2 3	442 9 11	2,300 13 6	40 7·2	418 17 9	7 4·3	....	1,881 15 9
Sandstone	119·5	220 17 1	278 14 4	135 3 9	634 15 2	106 2·3	339 11 2	85 15 1	1,060 1 5	177 5	64 4 10	10 9	....	995 16 7
Yarri	2,844	973 19 4	3,342 2 8	1,391 12 10	5,707 14 10	40 1·2	825 7 10	1,113 6 1	7,646 8 9	53 9·1	1,424 13 8	10 0	....	6,221 15 1
Head Office	....	....	....	....	....	....	....	....	....	....	8 10 4	....	8 10 4	....
	34,251·75	7,610 13 11	31,677 5 2	19,492 10 4	58,780 9 5	34 3·9	12,773 16 11	13,276 9 0	84,830 15 4	49 6·4	17,207 18 7	10 0·6	8 10 4	67,631 7 1
Northampton	3,982·75	913 12 0	3,633 8 0	1,673 17 4	6,220 17 4	31 2·3	1,136 18 7	1,311 16 6	8,669 12 5	43 6·1	3,487 2 7	17 6	....	5,182 9 10
	....	8,524 5 11	35,310 13 2	21,166 7 8	65,001 6 9	....	13,910 15 6	14,588 5 6	93,500 7 9	48 10·9	20,695 1 2	10 9·9	8 10 4	72,813 16 11
Net Loss	....	....	....	....	....	....	....	....	....	....	....	....	....	72,805 6 7

SCHEDULE No. 5.

Statement of Receipts and Expenditure for Year ended 31st December, 1954.

TAILING TREATMENT.

Batteries.	Tons Treated.	Expenditure.									Receipts.		Profit.	Loss.
		Management.	Wages.	Stores.	Total Working Expenditure.	Cost per Ton.	Repairs and Renewals.	Sundries.	Gross Expenditure.	Cost per Ton.	Receipts.	per Ton.		
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	s. d.	£ s. d.	£ s. d.	£ s. d.	s. d.	£ s. d.	s. d.	£ s. d.	£ s. d.
Bamboo Creek	1,708	360 16 4	1,032 7 9	695 17 1	2,089 1 10	24 5·3	358 14 1	286 0 0	2,733 15 11	32 0	2,621 10 5	30 8·1	....	112 5 6
Boogardie	....	111 0 0	11 0	38 3 10	149 14 10	....	5 10 0	....	155 4 10	....	....	....	....	155 4 10
Coolgardie	1,892	305 7 1	2,115 17 8	540 16 2	2,962 0 11	31 3·3	1,063 18 2	544 16 8	4,570 15 9	58 3·3	1,731 2 3	18 3·2	....	2,839 13 6
Cue	2,828	376 8 3	1,717 17 1	729 13 1	2,823 18 5	19 11·3	214 1 6	752 10 3	3,790 10 2	26 10·2	2,997 18 5	21 2·2	....	792 11 9
Kalgoorlie	7,530	1,488 12 7	5,538 7 7	1,782 6 8	8,809 6 10	23 4·3	154 3 4	2,097 14 9	11,061 4 11	29 4·3	12,388 13 3	32 11	1,327 8 4	....
Laverton	2,536	552 17 4	1,719 4 8	370 15 7	2,642 17 7	20 10·1	132 18 6	666 14 2	3,442 10 3	27 1·3	3,911 7 3	31 10·1	468 17 0	....
Marble Bar	....	....	13 0 0	....	13 0 0	....	....	94 3 8	107 3 8	....	....	....	....	107 3 8
Marvel Loch	....	....	....	....	....	....	....	30 0 0	30 0 0	....	....	....	....	30 0 0
Meekatharra	1,318	840 19 9	1,079 5 1	1,187 14 4	3,107 19 2	47 2	1,001 0 6	394 17 7	4,503 17 3	68 4·1	2,078 15 3	31 6·2	....	2,425 2 0
Ora Banda	1,969	630 1 3	1,864 0 5	904 18 1	3,398 19 9	34 3·1	216 15 1	568 7 8	4,184 2 6	42 6	3,141 8 11	31 11	....	1,042 13 7
Sandstone	126	....	254 18 3	76 6 4	331 4 7	52 3·3	53 19 3	45 3 9	430 7 7	68 3·3	176 17 3	28 1	....	253 10 4
Yarri	....	....	36 15 6	14 16 9	51 12 3	....	....	26 13 8	78 5 11	....	....	....	....	78 5 11
Linden	....	....	....	....	....	....	....	....	....	....	9 10 0	....	9 10 0	....
Mount Ida	....	....	....	....	....	....	....	....	....	....	33 17 0	....	33 17 0	....
Youanmi	....	....	....	....	....	....	....	....	....	....	12 8 9	....	12 8 9	....
	19,907	4,666 2 7	15,372 5 0	6,341 8 7	26,379 16 2	26 6	3,201 0 5	5,507 2 2	35,087 18 9	35 3	29,103 8 9	27 4	1,852 1 1	7,836 11 1
Interest Paid to Treasury	....	....	....	....	....	....	....	....	....	....	1,920 0 0	....	....	1,920 0 0
											27,183 8 9	....	1,852 1 1	9,756 11 1
														1,852 1 1
Net Loss	....	....	....	....	....	....	....	....	....	....	....	....	....	7,904 10 0

TABLE G.

Mines Producing 5,000 ounces and upwards for the Past Five Years.

Mine.	1954.			1953.			1952.			1951.			1950.		
	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.	405,684	59,985	2·96	402,906	54,142	2·69	400,563	53,610	2·68	369,412	49,726	2·69	359,082	47,592	2·65
Blue Spec Mining Co., N.L.*	6,614	1,006	3·05	2,297	3,795	33·04	6,819	6,494	19·05	....	....	....	....	....	....
Boulder Perseverance, Ltd.	133,800	31,150	4·66	136,257	33,677	4·94	131,840	30,578	4·64	135,474	33,126	4·89	114,443	24,455	4·27
Callion (Western Mining Corporation Ltd.)	30,974	15,385	9·93	29,926	16,023	10·71	25,214	14,697	11·66	....	....	....	....	....	....
Central Norseman Gold Corporation, N.L.	157,877	83,396	10·56	155,451	73,869	9·50	158,447	78,241	9·88	151,322	43,868	5·80	155,822	42,475	5·45
Gold Mines of Kalgoorlie (Aust.), Ltd.	209,311	60,370	5·77	191,292	57,184	5·98	171,659	47,286	5·51	167,889	46,843	5·58	163,829	41,482	5·06
Great Boulder Pty. Gold Mines, Ltd.	417,874	107,670	5·15	409,814	106,775	5·21	376,564	96,111	5·10	325,924	96,985	5·34	331,739	79,827	4·81
Great Western Consolidated, N.L.	445,864	55,330	2·48	392,508	50,192	2·56	....	....	....	....	....	....	....	....	....
Hannan's North (Broken Hill Pty., Ltd.)	....	....	....	....	....	....	....	273	....	9,324	3,327	7·13	39,166	9,256	4·73
Haoma Gold Mine	4,609	5,487	23·81	....	....	....	....	....	....	....	....	....	....	....	....
Hill 50 Gold Mines, N.L.	92,411	71,813	15·5	83,865	41,799	9·97	53,803	15,839	5·89	28,352	7,557	5·33	44,632	11,517	5·16
Horseshoe (Anglo Westralian Mining Pty., Ltd.)	45,347	8,524	3·76	54,923	8,896	3·24	35,602	5,428	3·05	....	....	....	....	....	....
Kalgoorlie Enterprise, Ltd.	69,789	21,599	6·19	65,220	18,119	5·56	62,869	18,826	5·99	56,050	16,897	6·03	46,940	14,417	6·14
Lake View & Star, Ltd.	657,197	157,667	4·80	657,621	156,589	4·76	610,111	146,256	4·79	614,051	145,681	4·75	525,924	122,083	4·64
Mountain View Gold, N.L.	2,324	798	6·85	1,460	710	9·73	1,434	1,160	16·18	805	489	11·98	1,655	2,332	28·18
New Coolgardie Gold Mines, N.L.	33,534	15,761	9·40	39,570	17,176	8·68	37,436	19,387	10·36	41,756	20,914	10·02	32,154	16,429	10·22
North Kalgurli (1912), Ltd.	251,988	56,945	4·52	253,967	61,057	4·81	256,040	65,255	5·10	255,315	59,395	4·65	241,365	59,425	4·92
Paringa Mining & Exploration, Ltd.	....	....	....	....	....	....	1,493	204	2·73	8,231	2,811	6·83	96,488	17,058	3·54
South Kalgurli Consolidated, Ltd.	97,711	22,197	4·54	102,449	23,673	4·62	93,992	23,616	5·03	98,594	24,426	4·96	90,094	21,279	4·72
State Batteries	34,600	11,848	6·84	40,218	15,003	7·47	42,270	17,386	8·23	48,959	19,578	8·00	50,871	20,390	8·02
The Sons of Gwalia	103,237	26,168	5·07	100,525	26,026	5·18	85,263	23,768	5·58	73,825	19,186	5·20	88,745	25,558	5·76
Timoni (Moonlight Wiluna G.M., Ltd.)	24,290	13,518	11·13	23,105	13,039	11·29	23,410	11,680	9·98	23,976	11,402	9·51	11,211	5,610	10·00
Total	3,225,035	826,617	5·12	3,143,374	777,744	4·95	2,574,829	676,095	5·25	2,409,269	592,211	4·92	2,394,160	561,185	4·69
Other Sources (excluding large Retreatment Plants)	15,343	14,484	18·88	26,501	22,946	17·32	51,783	27,046	10·44	62,410	32,580	10·44	69,262	17,972	5·19
Total (excluding large Retreatment Plants)	3,240,378	841,101	5·19	3,169,875	800,690	5·05	2,626,612	703,141	5·35	2,471,679	624,791	5·06	2,463,422	589,157	4·79
Golden Horseshoe Sands Retreatment	....	8,787	....	....	9,246	....	....	9,767	....	....	6,559	....	....	7,661	....
Lake View & Star Retreatment	....	8,802	....	....	9,102	....	....	7,848	....	....	9,384	....	....	4,665	....
State Batteries Tailing Treatment	....	3,302	....	....	4,293	....	....	6,712	....	....	7,511	....	....	7,150	....
GRAND TOTAL	3,240,378	861,992	5·32	3,169,875	823,331	5·20	2,626,612	727,468	5·54	2,471,679	648,245	5·25	2,463,422	608,633	4·94

* Return of gold produced not complete for 1954.

DIVISION IV

Annual Progress Report of the Geological Survey Branch of the Mines Department for the Year 1954

CONTENTS

(4)—95047

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 Reports for 1954."*

DIVISION IV

Annual Progress Report of the Geological Survey of Western Australia for the year ended 31st December, 1954

The Under Secretary for Mines,

I have the honour to submit, for the information of the Honourable the Minister for Mines, my report on the operations and progress of the Geological Survey for the year ended 31st Dec. 1954.

STAFF.

Strength as at 31st December:—

			Total.
Professional.			
Ellis, H. A., B.Sc., A.O.S.M.	Government Geologist		
Berliat, K., D.Sc.	Senior Geologist		
Sofoulis, J., B.Sc.	Geologist, Grade 1		6
de la Hunty, L. E., B.Sc.	Geologist, Grade 1		
Low, G. H., B.Sc.	Geologist, Grade 1		
Noldart, A. J., B.Sc.	Geologist, Grade 1		
Clerical.			
Connolly, R. R.	Clerk		
Clift, J. N.	Junior Clerk		3
White, S. V. G.	Typiste		
Laboratory.			
Fimmell, L. H.	Laboratory Technician		1

Promotions, Resignations, Appointments.

Dr. K. Berliat was promoted on 1st October to Senior Geologist, in which position he had been acting for twelve months.

Messrs. Sofoulis, de la Hunty and Low were promoted to Geologists Grade 1 on 1st January, 1954.

Mr. A. J. Noldart acted in the vacant Geologist Grade 1 position from 1st January and his appointment to this position was confirmed on 1st October.

Mr. L. H. Fimmell was promoted to the position of Laboratory Technician on 1st January.

Mr. T. H. McNamara was absent on National Service Training from 4th January to 7th June, and on completion of this service was transferred to the Hospitals Collection Service, Chief Secretary's Department.

Mr. J. N. Clift joined the staff as Trainee Junior Clerk on 18th January, replacing Mr. McNamara.

Professional Staff.

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

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

This year, despite an Australia wide demand for geologists at most attractive salaries, no professional officers resigned, and the professional staff numerical strength is therefore the same as at the end of 1953. Efforts were made during the year to fill the existing vacancies, but without success.

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 Govt. Geologist.	Area of State (sq. miles).	Square Miles per Geologist.	Population of State.
Jan.-Dec. 1954	6	975,920	162,650	641,679

ACTIVITIES OF PROFESSIONAL OFFICERS

H. A. Ellis, Government Geologist.

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

Places Visited	Purpose of Visit or Matters Investigated	Period
Katanning	Water Supply	Jan.
Koolyanobbing	Pyrite Drilling	
Collie	Coal Drilling	
Yilgarn G.F.	Gold Drilling	Feb.
Cuballing	Ochre and Uranium Claims	
Collie	Coal Drilling	March
Koolyanobbing	Pyrite Drilling	
Leonora	Sons of Gwalia G.M. inspection	
Collie	Coal Drilling	April
Koolyanobbing	Pyrite Drilling	
Dundas	Uranium Claims inspection	
Madura	Alleged Meteorite Crater	
Ravensthorpe	Uranium, Dundas	May
Koolyanobbing	Pyrite Drilling	
Carnarvon	Water Supply	
Exmouth Gulf	Oil Drilling Activity inspection	June
Mt. Magnet	Regional Survey inspection	
Koolyanobbing	Pyrite Drilling	July
Collie	Coal Drilling	
Koolyanobbing	Pyrite Drilling	Aug.
Collie	Coal Drilling	
Cue	Big Bell G.M. inspection	Sept.
Koolyanobbing	Pyrite Drilling	
Collie	Coal Drilling	Oct.
Koolyanobbing	Pyrite Drilling	
Kalgoorlie	Diamond Drilling Technique	Nov.
Spargoville	Beryl and Columbite	
Cue	Great Fingall Drilling	Dec.
Koolyanobbing	Pyrite Drilling	

K. Berliat, Senior Geologist—

Jan.-Feb.—Office work in connection with the Linden Area Survey.

Mar.—Water Supply investigations, Williams District. Geological investigations in connection with proposed Serpentine Dam sites.

Apl.-Oct.—Field work—Mt. Magnet Survey.

Nov.-Dec.—Office work in connection with Mt. Magnet Survey.

J. Sofoulis, Geologist Grade 1—

Jan.-May—Compilation of reports and completion of regional investigations and minor examinations, Phillips River Goldfield, Stirling Ranges and Kent District.

May-June—Reconnaissance of Nullagine District, Pilbara Goldfield.

June-Dec.—Compilation of Bulletin 110 on the Geology of the Phillips River Goldfield.

L. E. de la Hunty, Geologist Grade 1—

Jan.—Report writing.

Feb.—Miscellaneous inspections in Dundas, Coolgardie and Yilgarn Goldfields.

Mar.—Damsite survey, Serpentine River. Collection of bulk samples of Gypsum in South-West Division and Yilgarn Goldfield.

Apl.-Oct.—Field work—Mt. Magnet Survey.

Nov.-Dec.—Report writing.

G. H. Low, Geologist Grade 1—

Jan.-Dec.—Supervision of Collie Coal Drilling and general colliery investigations.

A. J. Noldart, Geologist Grade 1—

Jan.-Dec.—Supervision Diamond Drill programme to test Abondoned Gold Shows, Yilgarn Goldfield. Preparation of Diamond Drill exploratory programme for Murchison and Pilbara Goldfields. Miscellaneous inspections of gold and radioactive mineral claims.

FIELD WORK.

Major Field Work completed during the Year and in Progress as at Dec. 31.

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

(2) A geological survey of the Mt. Magnet Mining District was commenced and completed.

(3) A drilling programme to test abondoned gold shows mainly in the Yilgarn Goldfield was commenced and continued throughout the year. No payable ore had been discovered at any of the six prospects drilled during the year.

(4) Diamond Drilling of the Koolyanobbing iron ore and pyrites deposits continued during the year to give further information on the extent and attitude of the ore bodies.

Due to the continued shortage of staff and the frequent demands for water supply and mineral assessment projects made on the existing staff, several major items of fieldwork proposed for the year could not be undertaken.

Field Work for 1955.

(1) Completion of Collie Coal Field exploratory drilling.

(2) Completion of group work in the Linden Mining District.

(3) Continuation of the Koolyanobbing exploratory drilling.

(4) Continuation of diamond drilling to test abandoned gold shows in the Yilgarn and other goldfields.

(5) Drilling of the "Great Fingall" G.M. to determine the possibility of payable gold ore at depth.

(6) A reconnaissance survey of portions of the Kimberley Division to determine the possibility of occurrence of uranium-bearing minerals.

(7) A regional survey of an area between Coolgardie and Dundas.

(8) An assessment of the water potentialities of an area between Mingenew and Mullewa.

(Items 2, 6 and 7—provided staff can be obtained.)

TRANSPORT.

Tabulated details of transport at present in use by the Geological Survey are as shown below.

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

Much information, both written and oral, was given to a variety of applicants during the year, and our publications were frequently sought. As the technical reports show, considerable assistance has been rendered to both private interests and other Government departments in the search for water and minerals in this State.

ACTIVITIES OF THE COMMONWEALTH BUREAU OF MINERAL RESOURCES.

Geological and geophysical work was continued in the Kimberley and North-West Divisions in the potentially oil bearing sedimentary basins by two geological parties and three geophysical parties. One of these parties, to which was attached two W.A. Lands Department surveyors, operated in the South-West Desert Basin, in the far North-Western part of the Eastern Division. Air-borne magnetometer traverses were flown across the Desert Basin, and also over the Eucla Basin by Bureau planes during the year, and an air-borne scintillometer survey of a reconnaissance nature (E-W flights at 4 mile intervals) was conducted over the belt of

TRANSPORT.

Vehicle W.A.G.	Make & Type	Load cwt.	Mileage as at 31/12/54	Mileage for 1954	Date Vehicle Purchased	Remarks
1175	Ford Utility	15	?	1,219	1946 (new)	Disposed of 4/11/54
1194	do.	15	81,322	2,613	1946 (new)	
1307	Chevrolet Utility	15	120,660	4,037	1947 (used)	Disposed of 28/5/54
1413	do.	15	80,490	7,688	1947 (new)	
1421	do.	15	65,520	5,491	1947 (new)	
2044	Dodge Utility	18	45,361	9,661	1950 (new)	Mileage inc. 2411 w/o speedo
2393	International Utility	14	45,223	16,195	1950 (new)	
2412	do.	14	62,079	14,383	1950 (new)	
2608	do.	14	38,132	6,863	1951 (new)	
909	Willys Jeep	5	12,632	5,402	1953 (new)	
3135	Fargo Utility	15	8,765	8,765	1954 (new)	

Total miles, 82,317.

Pre-Cambrian country extending from the vicinity of Hall's Creek N-N-E. to the Northern Territory—W.A. border. Many radioactive anomalies were recorded in this latter work, but the preparation of the 1 mile = 1 inch maps had not been completed by the end of the year.

The Commonwealth Bureau of Mineral Resources has thus given much high quality assistance in the search for oil and uranium in the State during the year.

THE SEARCH FOR URANIUM IN WESTERN AUSTRALIA.

During the year numerous companies have had prospecting parties, all equiped with geiger counters and some with aeroplanes and air-borne scintillometers, operating over the known mineral bearing areas of the State from the far north to the Southern borders. The Commonwealth Bureau of Mineral Resources covered an area (recommended by me subsequent to a visit of inspection to the uranium localities of the Northern Territory in Oct. 1953) extending from south of Hall's Creek in the Kimberley Division E.-N.-E. to the Northern Territory border in a reconnaissance air-borne scintillometer survey, the results of which are not yet available in map form, although we have been advised that some high grade anomalies have been discovered. When the 1 mile = 1 inch maps are available early in 1955 some of these anomalies will no doubt be investigated on the ground by interested companies.

The much publicised Dundas uranium find (of Norseman Gold Mines N.L. association—Dec. 1953) has failed under exploration to be of any commercial value whatever, as has the occurrence at Wilgie Mia and Ravensthorpe. These deposits were officially described by me as being of no commercial value at the time of discovery.

Some, as yet unexplored, secondary uranium mineral occurrences have been found by two companies in the East Kimberley area, and several claims have been pegged on them. Prospecting operations on these finds are to continue at the end of the Wet Season early in 1955.

PUBLICATIONS.

Issued during 1954.

Annual Progress Report of the Geological Survey of Western Australia for 1951.

In the Press.

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

Annual Progress Reports of the Geological Survey of Western Australia for 1952 and 1953.

Compiled and Awaiting Authority to Print.

Mineral Resources of Western Australia Bulletin No. 6: Silver, Lead and Zinc, by W. Johnson, B.Sc. (Hons.).

Mineral Resources of Western Australia Bulletin No. 7: Vermiculite, Talc and Soapstone, Fuller's Earth, Bentonite and Diatomite, by W. Johnson, B.Sc. (Hons.).

Mineral Resources of Western Australia Bulletin No. 8: Gypsum, by L. E. de la Hunty, B.Sc., and G. H. Low, B.Sc.

In Course of Preparation.

Bulletin No. 110: A Geological Survey of the Ravensthorpe District, Phillips River Goldfield, W.A., by J. Sofoulis, B.Sc.

H. A. ELLIS,
Government Geologist.

January, 1955.

DIVISION V

School of Mines, Western Australia

The Under Secretary for Mines.

I have the honour to submit for the information of the Honourable the Minister for Mines my report for the year, 1954.

KALGOORLIE.

Enrolments.

The total number of enrolments received during 1954 was 381—a decrease of 20 by comparison with 1953. The figure for 1954 includes 12 Eastern Goldfields High School boys who enrolled for junior geology. A special class was held in this subject. Table I gives the individual and class enrolments for 1952, 1953 and 1954, and Table II gives the enrolments in the various subjects in 1954.

TABLE I

Enrolments—1952, 1953, 1954.

Year.	First Term.		Second Term.		Third Term.	
	Individual.	Class.	Individual.	Class.	Individual.	Class.
1952	391	857	363	711	303	582
1953	365	787	341	699	294	606
1954	355	837	307	691	284	593

TABLE II.

Class Enrolments 1954.

Subject	1st Term	2nd Term	3rd Term
Preparatory Chemistry	25	17	14
Chemistry IA	18	17	17
Chemistry IB	6	5	5
Chemistry II	2	2	2
Analytical Chemistry I	2	2	2
Metallurgy II	1	1	1
Physical Metallurgy I	6	6	5
Mineral Dressing I	18	14	14
Mineral Dressing II	4	4	4
Engineering Metallurgy	4	4	3
Heat Treatment of Steels	—	1	—
Assaying	11	11	9
Preparatory Mathematics	33	25	22
Mathematics I	40	35	31
Mathematics IIA	28	25	22
Mathematics IIB	5	3	3
Mathematics IIC	10	15	5
Applied Mathematics	22	16	15
Preparatory Physics	21	16	16
Physics I	29	25	23
Physics IIA	15	10	9
Physics IIB	6	5	5
Trade Mathematics I	29	21	12
Preparatory Engineering Drawing	37	27	23
Engineering Drawing I	31	20	6
Engineering Drawing and Design IIA	16	11	9
Engineering Drawing and Design IIB	7	6	7
Engineering Drawing and Design IIC	4	3	4
Engineering Drawing and Design IID	2	2	2
Surveying Drawing II	7	—	7
Mechanical Engineering I	5	5	5
Mechanical Engineering II	8	7	7
Practical Electricity	12	13	10
Electrical Engineering I	17	17	13
Electrical Engineering II	8	8	8
Internal Combustion Engines	29	18	10
Workshop Practice I	19	12	9
Workshop Practice II....	8	8	7
Workshop Practice IIIA	7	6	4
Engineering Workshop Practice	1	—	—
Welding I	37	35	36
Welding II	14	14	11
Steam Engine Driving	4	4	2
Structural Engineering I	7	7	7
Structural Engineering II	7	6	5
Machine Design	5	4	3
Materials of Construction	9	8	6
Hydraulics	10	8	7
Preparatory Geology	16	14	11
Geology IA	18	17	15
Geology IB	20	15	16
Geology IIA	6	5	5
Geology IIB	11	8	8
Geology IIIA	2	2	2
Geology IIIC	2	2	2
Mining I	26	20	16
Mining II	5	5	5
Mining IIA	1	—	—
Mining IIC	—	—	2
Mining III	5	4	4
Mining IIIA	4	4	—
Mining IIIB	—	—	1
Mine Ventilation	8	7	6
Surveying I	20	19	20
Surveying II	5	6	5
Surveying IIA	—	1	—
Preparatory English	8	7	4
English I	5	6	5
English IA	16	12	11
Junior Geology	12	7	7
Totals: 1954	837	691	593
1953	787	699	606

The total enrolment was made up as follows:—

(1) Students paying class fees (21 years of age and over)—		
Full-time	5	
Part-time	116	
		121
(2) Students nominated by Repatriation Department (C.R.T.S. and others).		
Full-time	1	
Part-time	9	
		10
(3) Students paying a registration fee of 5s. or students who pay no fees, including E.G.H.S. pupils (under 21 years of age).		
Full-time	12	
Part-time	160	
		172
(4) Students who are returned servicemen and are exempt from Class fees (General Regulation 5). Not nominated by Repatriation Department.		
Full-time	—	
Part-time	78	
		78
TOTAL		381

Thus about two-thirds of the students attending the school pay no fees or at the most only a registration fee of five shillings. Approximately 45 per cent of the students are enrolled for set courses and the remainder for selected subjects, which are likely to be useful to them in the course of their daily work. Of the students enrolled for set courses approximately 60 per cent are taking Associateship Courses and the remainder Certificate or Technicians Courses.

Revenue.

Fees received from students, including those nominated by the Repatriation Department, lecture note fees, and fees from the sale of official publications amounted to £607 4s. 9d., a decrease of approximately £20 by comparison with 1953. Fees received for work done in the Kalgoorlie Metallurgical Laboratory and paid into Trust Fund amounted to £456 5s. 10d., an increase of approximately £79 by comparison with 1953.

Staff.

Staff changes as indicated below occured during the year:

Connolly, M.A.; Cadet; 22/2/54; appointed.

Crisp, C. E.; Cadet; 12/11/54; resigned.

Flottman, R. A.; Assistant; 23/7/54; resigned.

George, T. J. F.; Laboratory Assistant; 10/12/54; resigned.

Jones, J. L.; Cadet; 24/9/54; resigned.

Miles, A. T.; Acting Research Metallurgist; 3/9/54; appointed Research Metallurgist.

Smith, L. I.; Assistant; 12/3/54; resigned.

Tasker, E.; Acting Research Metallurgist; 21/4/54; appointed.

Courses of Study.

No changes were made in the Courses, and these remained as in 1953.

Annual and Supplementary Examinations.

At the Annual Examinations 521 entries for individual subjects were received. This figure is 58 per cent. of the possible number, and is seven per cent. less than the corresponding figure for 1953. The proportion of passes at the Annual Examinations and at the Supplementary Examinations remained approximately the same as in previous years. Details are given in Table III.

TABLE III.

Examination Results, 1950-1954.

Kalgoorlie.

	1950	1951	1952	1953	1954
Class Enrolments = A	946	833	856	837	901
Number of entries for Annual Examinations = B	579	434	458	546	521
B/A per cent.	61	51	54	65	58
Number of passes at Annual Examinations, as a per cent. of A	48	41	43	54	47
Number of passes at Annual Examinations, as a per cent. of B	78	79	80	83	82
Number of passes at Annual and Supplementary Examinations, as a per cent. of A	50	44	44	56	49
Number of passes at Annual and Supplementary Examinations, as a per cent. of B	81	84	82	85	85

As would be expected the proportion of set course students sitting for the Annual Examinations is much higher than for other students. In 1954 approximately 75 per cent. of the set course students sat for the Examinations, and 50 per cent. of the non-course students.

Scholarships and Prizes.

G. M. Sainsbury, who held a Mines Department Senior Scholarship in 1953 and 1954, completed a satisfactory year's work, and passed in seven subjects with one credit pass. No applications for Mines Department Scholarships were received during the year.

Two additional Chamber of Mines Scholarships were awarded in 1954—to C. L. Smith and to J. D. Turich. Unfortunately Mr. Turich contracted poliomyelitis about two-thirds of the way through first term, and was not able to continue his studies. Mr. Smith completed a satisfactory year's work. C. H. Annear and G. M. Sainsbury, who had been awarded scholarships in 1953, also completed a satisfactory year's work. The two last named students will continue their studies in 1955 as part-time students.

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

Diplomas and Certificates.

The following Diplomas and Certificates were granted during 1954:

Associateship Course in Mining	7
Associateship Course in Metallurgy	6
Associateship Course in Mechanical and Electrical Engineering	1
Associateship Course in Engineering	3
Associateship Course in Mining Geology	1
Total	18

Assayer's Certificate Course	4
Industrial Chemist's Certificate Course	1
Surveyor's Certificate Course	9
Mine Manager's Certificate Course	2
Engineering Draughtsman's Certificate Course	-
Electrical Engineer's Certificate Course	2
Mechanical Engineer's Certificate Course	-
Total	18

Engine Operation & Maintenance Course	3
Workshop Foreman's Course	-
Total	3

The figures given above include Diplomas or Certificates gained by students at Branch Schools—Norseman or Bullfinch.

Students nominated by Repatriation Department.

Only 10 students assisted by the Repatriation Department are now attending the School. Details are as follows:

C.R.T.S.	1952	1953	1954
Full-time	—	—	—
Part-time	24	14	9

D.M.W.T.S.	1952	1953	1954
Full-time	—	1	1
Part-time	—	—	—

Classes for High School Pupils.

A special class in junior geology was held for 12 pupils, who required that subject. During 1953 and 1954 there has not been a great demand for geology by High School pupils, and after discussion with the Headmaster it was decided to discontinue these classes in 1955. These classes were commenced in 1950, and the results obtained are summarized below:

	Pupils enrolled.		Junior Examination.	
	Sub-Junior.	Junior.	Entered.	Passed.
1950	20	—	—	—
1951	37	12	11	9
1952	37	15	11	9
1953	18	—	—	—
1954	—	12	6	4
	112	39	28	22

Services to the Public.

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

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

During the year 444 samples were received from prospectors for assay and/or mineral examination. This is a decrease by comparison with 1953 when 607 samples were received. As in previous years all assays were made in the Kalgoorlie Metallurgical Laboratory and all mineral examinations by Mr. Cleverly, Head of the Department of Geology at the School. Details of the work done on samples are as follows:

	1952	1953	1954
Assay—gold	99	276	191
Assay—gold and other constituents	16	8	6
Assay—metals other than gold	18	13	27
Assay plus mineral determination	22	14	—
Mineral examination	213	288	218
Rejected or transferred to Met. Lab. pay	6	8	2
	374	607	444

As in previous years the Junior and Leaving Examinations were held at the School, and various professional bodies continued to meet at the School.

Buildings.

No new buildings were added to the School during the year. Most of the buildings were painted externally, and one section internally. Generally the buildings are in satisfactory condition, but additional painting externally and internally is required.

Requirements of the School.

The major requirements of the School remain as listed in last year's report:

(1) A mineral dressing laboratory for student use.

(2) Alterations and extensions to the Kalgoorlie Metallurgical Laboratory.

(3) A central library and staff.

Requirement (1) was first submitted in its present form in 1949, and it is very disappointing to find that year after year passes and no building is obtained. Somewhat similar proposals were submitted in 1946 and in 1941 by previous Directors of the School. A mineral dressing laboratory for student use has been a long felt need at the School. Mineral Dressing is the major subject of the Associateship Course in Metallurgy, and present provisions for laboratory work are most inadequate. Use is being made of portion of one building intended for physical metallurgy and of another which was originally a store room. Neither building is suitable for the purpose for which it is being used.

Alterations and extensions to the Metallurgical Laboratory are necessary—particularly in the chemical and sampling sections. This work was first asked for in 1950.

The School library is housed at the present time in various places throughout the School. No central reading room or storage is available. There should be no need to stress the importance of a properly organised library to the School.

Advisory Committee.

The advisory committee met nine times and attendances were as follows:

Mr. M. Harwood (Chairman)	9
Mr. J. E. Manners	8
Mr. C. H. Warman	6
Mr. J. A. Maloney	6
Mr. F. Collard	4
Mr. R. A. Hobson	9

During the year the Chamber of Mines and the Mines Department each contributed a further £1,000 to the Apparatus and Equipment Trust Fund. Additional equipment was purchased during the year, and the estimated balance available in the Fund at the end of the year was £1,900.

Kalgoorlie Metallurgical Laboratory.

More than sufficient work was received to keep the staff fully occupied during the year. The number of Reports of Investigations issued appears less than in previous years, because for the first time the results of assays, analyses, and similar work have been issued as Certificates rather than as Reports of Investigations. In previous years Reports have included assays, analyses, and similar work. This year the number of Reports issued is therefore a reflection of the investigations completed. The work done is summarized in Table IV.

TABLE IV.

Kalgoorlie Metallurgical Laboratory.

	1954.	1953.	1952.
Investigations outstanding (1st January, 1954)	12	11	11
Investigations asked for	20	63	48
	32	74	59
Investigations completed	23	61	47
Investigations outstanding (31st December, 1954)	6	12	11
Investigations cancelled	3	1	1
	32	74	59
Certificates issued (assays, analyses, etc.)	50	....	....

Of the 23 Reports of Investigations issued eight referred to gold ores, one to gold-copper ore, one to gold-antimony ore, seven to the ores of other metals, and six to non-metallics. In addition to the work summarized in Table IV (Reports of Investigations and Certificates) 224 assays and analyses were made for prospectors without charge. This work is part of a free service to prospectors provided by the School (see "Services to the Public").

In Appendix I the Senior Research Metallurgist has summarised the work of the Laboratory during 1954, and outlined the more important investigations.

To speed up the work on the pilot plant a temporary fitter was employed towards the end of the year, and all work on this plant should be completed by the middle of 1955.

The main requirements of the Laboratory remain as set down in last year's report—buildings. A new chemical laboratory and improvements in the sampling section of the building are urgently needed. An assay laboratory as part of the existing building is also required.

During the year the C.S.I.R.O. continued to assist the Laboratory, and for the 1954/55 financial year provided £2,600 for salaries and equipment.

Students Association.

During the year the Students Association held two very successful functions—the Annual Ball on July 30th and a Dinner on November 26th. The Association also provided the usual Scholarship.

NORSEMAN.

The total number of students enrolled during the year was 67—an increase of seven by comparison with 1953. During the year science equipment was provided at the Norseman High School, and very little assistance was required from the School of Mines. Details of enrolments are given in Table V, which also shows the 1952 and 1953 figures for comparison. In Table VI the enrolments in the various subjects are given.

TABLE V.

Enrolments—1952, 1953, 1954.

Year.	First Term.		Second Term.		Third Term.	
	Individual.	Class.	Individual.	Class.	Individual.	Class.
1952	55	139	59	142	55	138
1953	54	141	53	124	45	107
1954	63	150	58	137	56	129

Revenue.

The revenue received was £44 7s. 6d.

Staff.

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

Thomas, A. V.; Lecturer (in-charge Norseman); 31/12/54; Transferred to Kalgoorlie.

Williamson, H. C.; Lecturer, Grade II; 10/6/54; Resigned.

At the start of the year seven part-time instructors were employed. After Mr. Williamson resigned this number was increased by two.

TABLE VI.

Class Enrolments, Norseman, 1954.

	1st Term	2nd Term	3rd Term
Preparatory Chemistry	4	4	4
Preparatory Mathematics	6	8	6
Mathematics IIA	4	4	4
Applied Mathematics (External)	1	1	1
Physics I	3	3	3
Trade Mathematics I	15	14	14
Trade Mathematics II	4	4	4
Preparatory Drawing	18	16	16
Engineering Drawing I	13	13	13
Engineering Drawing and Design IIA	7	5	5
Surveying Drawing II	1	1	1
Practical Electricity	10	7	7
Internal Combustion Engines	6	6	4
Workshop Practice I	16	16	16
Welding I	15	12	12
Preparatory Geology	7	7	7
Geology IIA	5	3	2
Mining I	5	4	5
Surveying II	6	4	3
Preparatory English	4	5	2
Totals	150	137	129

Subjects Taught

Nineteen School of Mines subjects were taught during 1954—four less than in the previous year. As in previous years classes in Workshop Practice, in Welding, and in Practical Electricity were held in the workshops of Central Norseman Gold Corporation.

Examinations.

The number of entries for individual subjects at the Annual Examinations was 100, which is 64 per cent. of the class enrolments. The figure is a slight improvement on the corresponding figure for 1953. The proportion of passes was slightly less than for 1953, due mainly to a higher proportion of younger and less experienced students. In Table VII the examination results for the past five years are summarized, and in Table VIII the examination results for Norseman and Kalgoorlie are compared.

TABLE VII.

Examination Results, 1950-1954.

Norseman.

	1950	1951	1952	1953	1954
Class Enrolments = A	78	112	149	144	157
Number of Entries for Annual Examinations = B	47	68	108	84	100
B/A per cent.	60	61	72	58	64
Number of passes at Annual Examinations, as a per cent. of A	55	53	54	46	48
Number of passes at Annual Examinations, as a per cent. of B	91	88	75	80	76
Number of passes at Annual and Supplementary Examinations, as a per cent. of A	56	54	58	48	49
Number of passes at Annual and Supplementary Examinations, as a per cent. of B	93	89	80	82	77

TABLE VIII.

Examination Results, Norseman and Kalgoorlie.

Note: The letters A and B have the same meanings as in Table VI.

	Norseman.			Kalgoorlie.		
	1952.	1953.	1954.	1952.	1953.	1954.
B/A per cent.	72	58	64	54	65	58
Total passes as a per cent. of A	58	48	49	44	56	49
Total passes as a per cent. of B	80	82	77	82	85	85

Scholarships and Prizes.

The two students who were awarded Reg Dowson Scholarships at the end of 1953 both completed a very good year's work in 1954—S. R. Baker passed in five subjects and obtained four credit passes, and R. B. Atkinson passed in four subjects with three credit passes. The Scholarships for 1954 were awarded to K. C. Green and C. H. Basset.

In addition I. R. Worth was awarded the £5 prize presented by the Institute of Mining Surveyors and also a Mining Standard Prize.

Diplomas and Certificates.

Diplomas and Certificates were awarded to Norseman students as shown below:—

Associateship Course in Mining	1
Surveyor's Certificate Course	1

Buildings.

Towards the end of the year approval was given for the building at Norseman to be extended and for the existing building to be painted. The increased space will greatly improve the teaching conditions at Norseman, and has been under consideration for some years.

Advisory Committee.

Mr. Dutton continued as Chairman of the Advisory Committee, and the thanks of the Department are due to members of the Committee, who, during the year, took a lively interest in the affairs of the School.

BULLFINCH.

Enrolments.

The total number of enrolments received during the year was 43, which is 26 less than during 1953—the year in which the School was opened. The number enrolled during 1954 is the number which might be reasonably expected from a town the size of Bullfinch. Table IX sets out the enrolments in each term during 1953 and 1954, and Table X shows the enrolments in each of the subjects taught at Bullfinch in 1954.

TABLE IX

Enrolments, 1953 and 1954.

Year.	First Term.		Second Term.		Third Term.	
	Individual.	Class.	Individual.	Class.	Individual.	Class.
1953	69	108	42	71	42	71
1954	42	72	36	71	32	62

Revenue.

The revenue received was £22 5s. 0d.

Staff.

Mr. J. C. Browne continued as part-time Registrar. The teaching staff were all part-time, and were drawn from the staff of the mine. Nine part-time instructors were employed.

TABLE X.

Class Enrolments, 1954.

Subject	1st Term	2nd Term	3rd Term
Preparatory Mathematics	6	5	5
Mathematics I	7	7	5
Mathematics IIA	4	4	3
Trade Mathematics I	8	8	7
Trade Mathematics II	3	3	3
Practical Electricity	5	5	4
Welding I	3	2	2
Welding II	6	5	4
Workshop Practice I	4	4	3
Internal Combustion Engines	4	4	4
Electrical Engineering I (External)	1	1	1
Preparatory Drawing	9	9	8
Engineering Drawing I	5	5	4
Engineering Drawing and Design IIA	1	1	1
Preparatory Geology	6	4	4
Surveying I	4	3	3
Surveying II (External)	1	1	1
Total	77	71	62

Examinations.

Forty-eight entries were received for individual subjects at the Annual Examinations. This is 61 per cent. of the possible entries, and compares quite satisfactorily with the corresponding figures for Kalgoorlie and for Norseman. The proportion of passes is, however, much lower at Bullfinch. Table XI sets out information about the Annual Examinations. Corresponding information for Kalgoorlie and for Norseman has been added for comparison.

Scholarships and Prizes.

The Bullfinch Country Club again offered a prize to the student under 18 doing the best year's work. No student was recommended for this prize.

Buildings.

The building from Chandler referred to in last year's Annual Report was re-erected at Bullfinch, and altered to provide the following accommodation: two class-rooms, office, store. The building is very satisfactory at present, but as additional subjects are taught at Bullfinch a third class-room will be required. Towards the end of the year approval was given for laboratory benches to be built to enable Preparatory Physics and Preparatory Chemistry to be taught.

TABLE XI.

Examination Results, 1953, 1954.

BULLFINCH.

	Bullfinch.		Norseman.		Kalgoorlie.	
	1953.	1954.	1953.	1954.	1953.	1954.
Class enrolments = A	107	79	144	157	837	901
Number of entries for Annual Examinations = B	68	48	84	100	546	521
B/A per cent.	64	61	58	64	65	58
Number of passes at Annual Examinations, as a per cent. of A	35	37	46	48	54	47
Number of passes at Annual Examinations, as a per cent. of B.	54	47	80	76	83	82
Number of passes at Annual and Supplementary Examinations, as a per cent. of A	36	37	48	49	56	49
Number of passes at Annual and Supplementary Examinations, as a per cent. of B	57	47	82	77	85	85

ACKNOWLEDGMENTS.

Much of the information included in this report has been compiled by the Registrar at Kalgoorlie. The Senior Research Metallurgist, the Registrars at Norseman and at Bullfinch, and the officer-in-charge, Norseman have also provided information, and my thanks are due to all these officers. All members of the Staff have endeavoured during the year to assist students and others who came to the School, and have carried out their various duties efficiently. Thanks are also due to members of the Advisory Committees, who have given of their time, knowledge, and experience to assist the School. Mining companies at Norseman and at Bullfinch, who have made their workshops available for classes, have provided much appreciated assistance.

R. A. HOBSON,
Director, School of Mines.

APPENDIX I.

KALGOORLIE METALLURGICAL LABORATORY.

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

INTRODUCTION.

Twenty-three reports and 50 certificates were issued during the year. The reports covered a wide range of subjects and a brief description of the more comprehensive investigations is included in this report. The complete list of reports issued, owners, localities of samples, ore types, and scope of the test work is contained in the table with this report.

For further information regarding these reports apply to

The Secretary,
Industrial and Physical Sciences,
C.S. and I.R.O.,
314 Albert Street,
East Melbourne, Vict.

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

The certificates were instituted from 1st January, 1954, to cover reports of work involving analyses, assays and other measurements only. This type of results is usually only of interest to the sender of the sample and does not warrant the issue of a widely distributed report.

During the year the Laboratory became a registered laboratory of the National Association of Testing Authorities (NATA), for Section 7.18 which covers analyses of ferrous, non-ferrous, gold, silver ores, and other minerals.

GOLD ORES AND PRODUCTS.

Report 624.

The three samples supplied for this investigation were an almost completely oxidised ore, a semi-sulphide ore, and a heavily pyritised ore, from the Lancefield Mine, Beria.

Fine grinding, and cyanidation after amalgamation gave a satisfactory gold recovery from the oxidised and semi-sulphide ores. The oxidised ore gave a recovery of 94.8 per cent. of the gold, and the semi-sulphide ore a recovery of 86.3 per cent.

The heavy sulphide ore was not amenable to "straight" cyanidation but a satisfactory gold recovery was obtained by flotation. Fine grinding, amalgamation and flotation gave a flotation tailing assaying 0.4 dwt. of gold per ton from a head value of 8.2 dwt per ton. Roasting of the flotation concentrate followed by cyanidation of the calcine gave a gold recovery of 82.2 per cent of the gold in the calcine.

The filtering and thickening characteristics of the ground ore samples and products were satisfactory.

Report 635.

A laboratory heavy medium separation unit using ferrosilicon was used to investigate the possibilities of this method of concentration on a Kalgoorlie gold ore.

The results of the tests showed that the presence of free gold (or gold telluride) in the quartz and other lighter material as well as in the heavier lode material, prevented the use of heavy media separation to produce a "float" or "sink" product sufficiently low grade to be discarded.

Report 638.

This report covered the sampling and assaying of a large tailing dump at Yunndaga, and the detailed testing of composite samples for amenability to gold recovery by leaching.

The dump had been sampled by boring on a grid pattern and the individual bore hole samples were assayed for gold. An assay plan and sections were prepared and after a study of these, composite samples were made up from the assay rejects.

Series of percolation leaching tests were carried out on the four composite samples to determine the gold recovery and comparative leaching rates with various depths of bed and with and without a vacuum applied.

The sample representing the sandy portion of the dump gave a recovery of 1.07 dwts. per ton with satisfactory leaching rates.

The two composite samples containing some "slime" gave gold recoveries of 0.38 and 0.68 dwt. per ton. The leaching rate was slow but was increased substantially by applying a vacuum.

The gold recovery from the sample consisting mainly of "slime" was 0.92 dwt. per ton but the leaching rate even when assisted by vacuum was very slow.

Report 645.

An investigation was carried out in conjunction with the Mineragraphic Section, Commonwealth Scientific and Industrial Research Organization, Melbourne, to determine any essential differences in ore character between three ore samples from the Hill 50 Gold Mine. The ore samples were from the three main draw-points in the mine.

Chemical analyses showed that there was no constant ratio of either "total" sulphur or "pyrrhotite" sulphur to gold either in the original samples, or after removal of the free gold.

Gold recovery tests showed that about 99 per cent. of the gold in all three samples could be recovered by very fine grinding, amalgamation, and cyanidation.

The mineragraphic work showed that there were no apparent differences in mineral association.

The ore types submitted, although they varied considerably in gold value, were, therefore, all essentially of the same character.

GOLD—ANTIMONY.

Report 649.

A sample of low grade gold-stibnite ore and a sample of high grade ore were received from Costerfield, Victoria. The low grade material which had been crushed to minus 1½ inches was concentrated by sink-float separation using ferrosilicon as the heavy medium. A recovery of 2.3 per cent. antimony per ton from a head value of 2.6 per

cent. antimony was obtained. The assay value of the sink product was 8 per cent. antimony. Crushing the ore finer than 1½ inches and concentrating the plus ¼th inch material by sink-float separation gave a lower overall recovery. The gold values followed the antimony.

The high grade stibnite ore after fine grinding, amalgamation, and cyanidation gave a recovery of about 50 per cent. of the gold. The recovery of gold was not increased by intense aeration, or by the addition of up to 5 lb. of lead nitrate per ton.

Tests using ammonium persulphate as an oxidising agent gave a recovery of over 90 per cent. of the gold. The use of this reagent on a plant scale would depend upon the cost of the reagent.

FLOTATION RESEARCH.

Report 514.

An investigation into the frothability characteristics of an industrial detergent (Stanvac 40-E).

A frothmeter was constructed and standardised over a wide range of values for terpineol and pine oil. Series of tests in the frothmeter were then carried out using the detergent.

Laboratory flotation tests using the detergent as a frother were carried out on a pyritic gold ore and a limestone.

The results showed that although satisfactory frothability and persistence could be obtained with the detergent at low concentrations the quality of the froth was poor at all concentrations of the detergent. Better results were obtained when the detergent was used in conjunction with pine oil.

The mineral recovery tests indicated that the detergent has little use as frother for sulphide flotation, but may be of some value as a froth modifier in non-metallic flotation.

TIN AND COLUMBITE.

Reports 622 and 637.

Investigations to determine methods of treatment were carried out on a tin bearing clay and a columbite gravel from the Marble Bar area.

Methods of treatment and flow sheets were developed from the results of the test work to enable the design and construction of treatment plants for these ores.

LIME SANDS.

Report 646.

The fluidisation characteristics at atmospheric temperature of beneficiated lime sand were determined. This work was a preliminary investigation to further planned in 1955 on the high temperature calcination of the lime sands in a fluid bed (Investigation 651).

BENTONITE CLAY.

A study of the properties of a bentonite clay from Carbadia in the Exmouth Gulf area was made to determine its suitability for drilling mud.

The clay without beneficiation was not satisfactory, but after grinding with water and a small quantity of caustic soda and sodium aluminate a satisfactory gel was obtained. A suspension, six per cent. by weight of Carbadia bentonite, had properties similar to a five per cent. Volclay (imported bentonite) suspension.

OTHER INVESTIGATIONS.

A number of small investigations were made on various gold ores, copper ores, manganese ore (sink float), scheelite ore, and graphite.

CERTIFICATES.

The 50 certificates issued covered a wide range of measurements such as sizing, surface area, and chemical analyses and assays of a wide variety of ores and products.

TECHNICAL ASSISTANCE.

During the year technical advice and assistance were given to a considerable number of people engaged in the mining and other industries.

KALGOORLIE METALLURGICAL LABORATORY.

SUMMARY OF YEAR'S WORK (1954).

Report No.	Owner.	State.	Locality.	Ore Type.	Type of Investigation.	Date available for publication	Number of Metallurgical tests.	Number of Assays.	
								Gold.	Other Metals, etc.
514	Vacuum Oil Company	W.A.	....	Detergent	Determination of Frothing Characteristics	30-1-55	36 series of 40 tests	84	182
607	I. Walters	W.A.	Whim Creek	Copper	Flotation Tests	24-9-54	13	20	50
622	Northern Mineral Syndicate	W.A.	Marble Bar	Tin	Method of Treatment	2-1-55	7	....	38
624	Lancefield No Liability	W.A.	Beria	Gold	Method of Treatment	30-6-55	73	506	250
625	Horseshoe Gold Mine	W.A.	Peak Hill	Gold	Settlement Tests	11-8-54	41	....	....
626	Western Mining Corporation	W.A.	Kalgoorlie	Gold	Elutriation of Flotation Concentrate	9-8-54	2	....	....
630	J. L. Cable	W.A.	Laverton	Tungsten	Method of Treatment	15-10-54	2	8	8
633	H. Tarlton Phillips	W.A.	Bunbury	Ilmenite	Magnetic Concentration	17-9-54	1	....	....
635	Croesus Pty. Treatment Coy.	W.A.	Kalgoorlie	Gold	Sink-Float Separation Tests	22-5-55	18	72	72
636	Swan Portland Cement Coy.	W.A.	Perth	Portland Cement	Surface Area Measurements	11-11-54	11	....	....
637	Northern Mineral Syndicate	W.A.	Marble Bar	Columbite	Method of Treatment	6-10-54	3	....	....
638	A. Vickery Syndicate	W.A.	Yunndaga	Gold	Method of Treatment	24-11-54	25	436	....
639	Norseman Gold Mines, N.L.	W.A.	Dundas	Uranium	Analysis	21-7-54	....	....	6
640	Cancelled	....	....	....	....	....	....	....	....
641	Engineering Service Coy.	W.A.	Kalgoorlie	Moulding Sand	SizingAnalyses	22-9-54	2	....	....
642	Cancelled	....	....	....	....	....	....	....	....
643	Cancelled	....	....	....	....	....	....	....	....
645	Hill 50 Gold Mine, N.L.	W.A.	Mt. Magnet	Gold	Investigation of Gold Occurrence	16-2-55	12	90	36
646	Dept. of Industrial Development	W.A.	Perth	Lime Sands	Determination of Fluidisation Characteristics	8-12-54	22	....	....
647	Bell and Robinson	W.A.	Marvel Loch	Gold-Copper	Gravity concentration of copper minerals	2-2-55	2	10	8

Kalgoorlie Metallurgical Laboratory—Summary of Year's Work (1954)—continued.

Report No.	Owner.	State.	Locality.	Ore Type.	Type of Investigation.	Date available for publication	Number of Metallurgical Tests.	Number of Assays.	
								Gold.	Other Metals, etc.
648	Lancefield No Liability	W.A.	Beria	Gold	Cyanidation Tests	13–1–55	2	14	....
649	Victorian Antimony Mines	Vic.	Costerfield	Gold-Antimony	Sink-Float and Cyanidation Tests	20–7–55	26	186	50
650	J. R. Hylton	W.A.	Munglinup	Graphite	Thickening and Filtration Tests	18–4–55	9	....	....
652	Esperance Oil Syndicate	W.A.	Laverton	Tungsten	Concentration Tests	13–1–55	2	....	16
653	J. R. Hylton	W.A.	Peak Hill	Manganese	Sink-Float Tests	18–4–55	3	....	28
654	E. Hoffman	W.A.	Porphyry	Gold	Recovery Tests	20–2–55	2	10	....
....	Certificates Nos. 1–50	....	....	....	....	....	....	286	270
....	Free Assays	....	....	....	....	....	....	201	40
....	School of Mines	....	....	....	....	....	....	33	91
	THE FOLLOWING INVESTIGATIONS WERE INCOMPLETE OR PENDING AT 31–12–54.								
644	O. J. Parker	W.A.	Kalgoorlie	Gold	Cyanidation of Products of Test work	....	10	74	42
651	Dept. of Industrial Development	W.A.	Perth	Lime Sands	Fluid bed calcination	....	....	....	....
655	The British Phosphate Commissioners	....	Christmas Island	Phosphate Rock	Beneficiation	....	....	....	....
656	Westralian Ores Pty., Ltd.	W.A.	Mt. Marion, Coolgardie	Lithium	Sink-Float Tests for Recovery of Spodumene	....	2	....	16
657	Warman Equipment Coy.	N.S.W.	Marulan	Limestone	Comparison of Grinding Techniques	....	....	....	56
658	Govt. Geologist. Perth	W.A.	Koolyanobbing	Iron-Sulphur	Beneficiation of Magnetite and pyrite	....	....	....	....

DIVISION VI

Annual Report of the Inspection of Machinery Branch of the Mines Department for the Year 1954

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, 1954, 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, 1921-1954 for the year ended 1954.

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.

New boilers registered during the year totalled 299, an increase of 106 above the new registrations in 1953. Types and sources of origin are recorded in Return No. 1.

At the close of the year the total of useful boilers in the register amounted to 7,087 and of these 3,444 were in service. The various types with the number of vessels respective of each are tabulated in Return No. 2.

It may have been noted in the Annual Report of last year that a Cornish Boiler had been converted to a Return Multitubular Underfired type; it is of some interest that a similar conversion was also carried out this year and has given much satisfaction.

During the year 3,903 inspections of boilers were carried out, an increase of 216 inspections over those in the year previous. The operations of the Inspection of Machinery Act relative to boilers for the year under review are shown in Return No. 3.

RETURN No. 1.—SHOWING THE NUMBER OF BOILERS OF EACH TYPE, AND COUNTRY OF ORIGIN OF NEW REGISTRATION FOR THE YEAR ENDED 31ST DECEMBER, 1954.

Type.	Country of Origin.					Total.
	United Kingdom.	U.S.A.	Eastern States.	Western Australia.	Unknown Sources.	
Cornish	....	....	....	5	....	5
Vert. Stationary	2	....	4	12	1	19
Return Multi Stat. Underfired.	....	....	1	16	....	17
S/Marine	1	....	....	....	....	1
Water Tube	8	....	1	25	....	34
Locomotive	....	....	2	....	....	2
Vert. Cyl	....	....	....	....	1	1
Digester	....	....	4	1	....	5
Vulcanizer	....	....	39	2	....	41
Steam Jacketed Vessel	1	....	8	19	....	28
Sterilizer	....	1	2	4	1	8
Air Receiver	15	6	49	60	2	132
Gas Receiver	2	....	....	4	....	6
Totals	29	7	110	153	5	299

RETURN No. 2.—SHOWING CLASSIFICATION OF VARIOUS TYPES OF USEFUL BOILERS IN PROCLAIMED DISTRICTS ON 31ST DECEMBER, 1954.

Types of Boilers.	Districts Worked from PERTH.	Districts Worked from KALGOORLIE.	Totals.	
			1954.	1953.
Lancashire	45	50	95	98
Cornish	158	449	607	611
Semi Cornish	11	37	48	48
Vert. Stationary	449	343	792	779
Vert. Portable	66	17	83	84
Vert. Multi Stat.	53	25	78	76
Vert. Multi Port.	16	3	19	19
Vert. Pat. Tubular	48	....	48	48
Loco. Rect. F/box Stat.	86	61	147	149
Loco Rect. F/box Port.	255	64	319	319
Loco Circ. F/box Port	138	8	146	147
Locomotive	84	37	121	124
Water Tube	435	110	545	544
Ret. Multi U/Fired Stat.	258	58	316	286
Ret. Multi U/Fired Port	1	8	9	9
Ret. Multi Int. fired Stat.	46	12	58	60
Ret. Multi Int. fired Port	2	....	2	2
Egg ended and other types not elsewhere specified	507	36	543	518
Digesters	298	10	308	301
Air Receivers	1,262	559	1,821	1,683
Gas Receivers	44	....	44	38
Vulcanizers	407	10	417	381
Steam Jacketed Vessels	508	13	521	494
Total Registration Useful Boilers	5,177	1,910	7,087	6,818
Total Boilers out of use 31st December, 1954	2,177	1,466	3,643	3,694

RETURN No. 3.—SHOWING OPERATIONS IN PROCLAIMED DISTRICTS DURING YEAR ENDED 31ST DECEMBER, 1954.

Types of Boilers.	Districts Worked from PERTH.	Districts Worked from KALGOORLIE.	Totals.	
			1954.	1953.
Total number of useful boilers registered	5,177	1,910	7,087	6,818
New boilers registered during year	280	19	299	195
Boilers Reinstated	....	....	....	2
Boilers Converted	3	....	3	1
Boilers Amalgamated	4	....	4	....
Boilers inspected—thorough	2,463	444	2,907	2,744
Vessels exempt under Act constructed for export—thorough	311	....	311	233
Boilers inspected—working	996	....	996	943
Boilers condemned during year temporarily	9	1	10	11
Boilers condemned during year permanently	33	11	44	20
Boilers sent to other States during the year	3	....	3	2
Boilers sent from other States during the year	3	....	3	2
Transferred to other Departments	2	....	2	....
Transferred from other Departments	2	....	2	1
Number of notices of repairs issued during year	629	71	700	666
Number of Certificates issued, including those issued under Section 30 during year	2,837	444	3,281	3,124

GENERAL.

The steady expansion of industrial activities in this State is reflected in the large increase of small boilers of evaporative capacities ranging between 600 and 3,000 lb. per hour oil fired and fitted with automatic equipment. The high standard of their performances and the labour-saving qualities of these boilers make them invaluable to steam users requiring a generous supply of this heating medium for processes associated with their industries.

It was unfortunate for some owners, as they found to their costs, that they had come to regard the labour-saving appliances attached to such boilers as being intended to wholly relieve the necessity of having anybody give some attention to the safe working of these units at regular intervals during the hours they are in service.

No mechanical or electrical appliance, however reputable, can be considered as absolutely infallible against some influence or other, and in the year just passed incidents of water shortage and consequent damage to vessels due to neglect such as I refer to came to our notice.

As I have stated in previous reports, whilst it has no objection to the person detailed by an owner to take charge of a steam raising plant being given additional duties provided such extraneous duties are carried out within reasonable proximity, this department considers it most improper if an owner does not ensure that reasonably frequent and regular attention be given to a boiler, irrespective of it being equipped with automatic appliances.

At all times the welfare of any boiler while it is under steam is the first responsibility of an attendant.

Sawdust as a fuel has not lost its popularity and here and there during the year additional sawdust burning equipment was in process of being installed. Naturally, the economy of its use depends much upon adequate supply and the distance it is to be conveyed from its source to storage at the boiler plant.

Of some interest is the mutual advantage to two unassociated Companies in the Metropolitan area which has been gained by the boilers on the premises of one of the firms being provided with sawdust burning facilities. On the adjacent land a prominent Sawmilling Company operates, and sawdust which formerly was an encumbrance is now blown through trunking from one property to the other and directed into a 10 ton storage bin close to the boilers.

From the bin the sawdust is conveyed to the hoppers of the grates by a belt conveyor driven by a variable speed motor manually controlled. The boilers are of the Return Multitubular Underfired type.

Toward the close of the year the Oil Refinery which has been under construction at Kwinana was near to completion and the five Spearing and Partners' Water Tube Boilers which were installed were brought into commission. These boilers were designed for 250 P.S.I., and each has an evaporative capacity of 75,000 lb. per hour.

A feature in construction of portable air compressor plants which is popular with one or two makers outside this State is one which is of doubtful quality. The units to which I refer have the compressors and power engines mounted on the shells of the receivers and attached by the legs or lugs being welded to the shell plates.

During the year just past two air receivers that had developed cracks in the shells adjacent to the fillet welds securing the machines to the receivers came to the notice of the department.

In one instance cracks at the welding of two legs had occurred.

Undoubtedly a concentration of stresses had resulted from the welding and the vibration of the compressor units ultimately caused fatigue in those parts wherein were "locked up" stresses.

I am of the firm opinion that other measures for securing compressors to air receivers should be devised and direct attachment by welding should be discarded. This would be a simple matter but perhaps a little more costly in construction. Safety however should not be sacrificed for cheapness.

Section 2.

EXPLOSIONS AND INTERESTING DEFECTS.

Item (a)

This incident relates to a fuel explosion in the furnace of a small oil fired water tube boiler and, though of minor nature in this instance, is one example of the importance that should be attached to the necessity of routine testing of automatic equipment on boilers.

The boiler concerned was in operation on the premises of a Commonwealth Department and inquiries into the mishap revealed that a minor explosion occurred due to an ignition failure in the automatic firing system.

The firebox casing brickwork sustained some damage and the lagging at the front end of the boiler drum was cracked.

When tested by an Inspector subsequent to the occurrence he found that there was a time lag of 18 seconds between the time of switching on the oil firing unit and the actual operation of the ignition circuit. The boiler was fitted with a photo-electric cell as a protection device but there did not appear to be any facilities readily available for routine testing of this equipment.

There is no doubt that this failure was caused by lack of suitable maintenance and proper facilities for testing the circuits.

Item (b)

This accident has reference to the disintegration of a safety valve on a large water tube boiler.

Immediately prior to the failure of this valve which was one of a pair of the Ramsbottom type, the boiler had been blowing off. Upon the boiler

pressure dropping appreciably and the safety valves continuing to "feather," the boiler attendant attempted to stop this feathering by a light blow over the top of the valve spindle.

During this attempt one of the valves fractured in two pieces near the centre and the attendant was severely scalded.

Investigation disclosed that 50 per cent. of the length of the fracture was not of recent occurrence and that, furthermore, the material of the valve was cast iron. On examination of the other valve forming the pair it was discovered that this likewise was of cast iron and also contained a crack. Further investigation revealed that a spare valve was of similar material and it was consequently condemned.

Section 3.

INSPECTON OF MACHINERY.

See Returns Nos. 4, 5 and 6.

Groups of machinery registered at the close of 1954 numbered 35,212, an increase of 2,187 groups above the number registered in the previous year.

RETURN No. 4.—SHOWING CLASSIFICATION ACCORDING TO MOTIVE POWER OF GROUPS OF MACHINERY IN USE OR LIKELY TO BE USED BY PROCLAIMED DISTRICTS AND WHICH WERE ON THE REGISTER DURING THE YEAR ENDED 31ST DECEMBER, 1954.

Classification.	Districts Worked from PERTH.	Districts Worked from KALGOORLIE.	Totals.	
			1954.	1953.
No. of Groups driven by steam engines	292	391	683	721
No. of Groups driven by oil engines	2,397	1,146	3,543	3,398
No. of Groups driven by gas engines	42	168	210	216
No. of Groups driven by Compressed air	1	61	62	63
No. of Groups driven by Electric motors	26,626	4,088	30,714	28,624
No. of Groups driven by hydraulic pressure	....	....	....	3
Totals	29,358	5,854	35,212	33,025

RETURN No. 5.—SHOWING OPERATIONS IN PROCLAIMED DISTRICTS DURING YEAR ENDED 31ST DECEMBER, 1954.

(*Machinery Only.*)

Classification.	Districts Worked from PERTH.	Districts Worked from KALGOORLIE.	Totals.	
			1954.	1953.
Total registrations useful machinery	29,358	5,854	35,212	33,025
Total inspections made	23,110	3,941	27,051	26,251
Certificates (bearing fees)	5,671	707	6,378	6,094
Certificates (steam without fees)	28	....	28	52
No. of extension certificates issued under Sec. 42 of Act	....	....	....	....
Notices issued (Mach. dangerous)	570	21	591	567

RETURN No. 6.—SHOWING CLASSIFICATION OF LIFTS ON 31ST DECEMBER, 1954.

Types.	How Driven.	Totals.	
		1954.	1953.
Passenger	Electrically driven	201	198
	Hydraulically driven	1	1
Goods	Electrically driven	107	104
	Hydraulically driven	3	3
	Belt driven	4	4
Service	Electrically driven	46	46
		362	356

(5)—95047

ACCIDENTS TO MACHINERY.

Item (a)—Failure of Mine Skip Safety Hook—During haulage of ore in a Kagoorlie gold mine the skip fouled a displaced wearing plate attached to the sill timber at one of the plats, and the sudden obstruction to the skip's ascent caused the jaws of the Omerod type safety hook to open out and release the shackle by which it was attached to the rope.

The safety grippers with which the skip was provided immediately came into operation and held the skip without drop.

In the course of his investigations into this mishap a departmental Inspector ascertained from his calculations that the safety hook was of such construction that it was a little overstressed under normal load conditions. It was not considered however that the hook was actually defective immediately prior to the accident.

Item (b)—Brake Failure on Unclutched Winding Engine Drum.—The brakes on this winding engine which is powered by electricity are operated by a common lever and are both applied when both drums are in gear, but when one drum is unclutched the brake on that drum is automatically applied and also additional pressure is applied by the admission of oil to the top of the cylinder; the brake is then out of the control of the driver.

In this case, a drum was unclutched and when the clutched drum was moved the friction on the shaft caused the unclutched drum to move, with the result that the cage ran to the bottom of the shaft causing considerable damage to the cage, loss of the winding rope and some damage to the winder house, top of head frame and shaft timbers, but fortunately no persons were injured.

It was found that the brake had automatically been applied to the unclutched drum, but had worn to such an extent that the piston of the brake donkey had bottomed.

This type of winder has a dynamic brake which is used as the general brake, the post brakes being used only when the winder has practically stopped.

This accident revealed the disturbing fact that one brake could get into this serious condition without being noticed by the driver in normal operations, and also the necessity for the maintenance men to keep a constant and frequent check on both brakes and the position of the piston in the brake donkeys when the brakes are applied.

Section 4.

PROSECUTIONS FOR BREACHES OF THE ACT.

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

Section 5.

ACCIDENTS TO PERSONS.

During the year 106 accidents caused by machinery which was subject to the provisions of the Act were reported to this department and investigated. None of these was attended by fatality and 25 of them were classified as being of minor character.

Wood planers (buzzers) when compared to all other idividual classes of machines used throughout industry continue to extract by far the greater toll in the infliction of injuries.

Of 81 serious accidents which were reported through the year distributed over 35 classes of machines which were involved, buzzers were responsible for no less than 14.8% of the occurences. Next in order in this respect were sheet-metal presses to which were accounted 7.4% of the total accidents.

Eye injuries caused by particles of grindings from emery wheels are of course disregarded in this report as such mishaps are not machinery accidents within the meaning of the Inspection of Machinery Act

In the majority of instances of buzzer accidents, safe guards to minimise the risk of operators' fingers coming in contact with the blades have been provided by owners, but were removed from the machines by the operators themselves for some purpose or other and had not been re-attached.

It is conceded that in some instances accidents have occurred notwithstanding guards being in place. In such cases however it has been ascertained that the pieces of timber have either been of very small cross-sectional area or defective and have been kicked back by the blades causing the operators' fingers to be dislodged from the material.

There can be no doubt however that a more frequent habit of using suitable guards would further reduce if not entirely eliminate accidents.

In respect to the accidents for which power presses were responsible during the year, some were caused by the non-provision of guards and some by defective interlocking arrangements fitted between the grille fences and the clutches.

In a few instances owners have been somewhat tardy in coming to grips with the problems involved in fitting guards which require some adaptation for the particular process work required of their machines. However, the position in this regard is steadily improving.

Returns Nos. 7 and 7a—See page 67.

Section 6.

EXAMINATION OF ENGINE DRIVERS, CRANE DRIVERS AND BOILER ATTENDANTS.

During the year 1954 the Board of Examiners granted 109 Engine Drivers', 79 Crane and Hoist Drivers' and 101 Boiler Attendants' Certificates.

Compared to the previous year these figures represent decease 3, decrease 6 and increase 16 respectively.

Section 7.

AMENDMENTS TO ACT.

Four amendments to the Inspection of Machinery Act were passed by Parliament. Briefly, these were for the following purposes—

(a) To eliminate some confusion as to the intended interpretation of paragraph (f) subsection (3) of Section 53.

(b) To make it obligatory for any overhead travelling crane operated from a driver's platform attached to it, excepting those cranes which are used solely for maintenance of the plants of the owners of such cranes, being under the control of a person holding a crane driver's certificate.

(c) To empower the Governor, by Order in Council, to make regulations not inconsistant with the Act—

(i) prescribing fees to be charged for inspection of cranes driven by hand power.

(ii) regulating the construction, inspection, maintenance and testing of lifting tackle and gear and other appliances or contrivances of whatever description connected or used therewith.

Section 8.

STAFF.

No change of members of the staff occurred and the numbers or personnel in the inspection and clerical sections remained unaltered from those of the previous year.

All officers have responded with every effort to meet the steadily increasing work which has been a natural result of the expansion of general industry and the construction of new buildings. I wish, therefore, to record my appreciation for the enthusiasm to assist in the efficient conduct of this Branch which at all times has been characteristic of every member of the Staff.

I desire also to express my thanks to all other officers generally with whom we have been associated in the Department of Mines for the help and co-operation which I and members of this Branch on all occasions received throughout the year.

An expression of appreciation from this Branch is due also to the Police Department for the unfailing action taken by its officers to have us informed of any accident causing injury by machinery whether an incident taken place in the Metropolitan Area or in a country district.

J. F. WINZAR,
Deputy Chief Inspector of Machinery.

RETURN No. 7.—SHOWING NUMBER OF SERIOUS ACCIDENTS BOTH FATAL AND NON-FATAL WHICH OCCURRED IN PROCLAIMED DISTRICTS DURING THE YEAR ENDED 31st DECEMBER, 1954.

"F" denotes "Fatal."

Industry.	Circular Saw.	Radial Arm Docking Saw.	Trenching Machine.	Buzzer.	Thicknesser.	Spindle Moulder (Shaper).	Drum Sander.	Brushmaking Machines.	Mixer.	Bottle Washing Machine.	Printing Press.	Stapler or Metal Stitcher.	Cardboard Box Machine.	Fibre Teasing Machine.	Laundry Calender.	Press (Metal).	Press (Other).	Emery Wheels.	Lathe.	Belts and Shafting.	Gearing and Chain Drives.	Conveyor (Belt, Chain, Screw).	Bag Elevator.	Lift.	Rolls.	Wiredrawing & Bobbin M/C.	Cork Rod Packer.	NH3 Compressor.	Buffing Machine.	Guillotine.	Cement Pipe Machine.	Mincer.	Creaming Machine.	Grain Drying Machine.	Dough Break.	Totals per Industry.
Woodworking and Furniture	2	1	....	12	1	3	1	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	22
Metalworking and Engineering	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	6	....	5	1	1	....	....	....	....	....	5	....	....	1	....	....	....	....	....	....	20
Leather Processing	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	2
Printing and Allied Industries	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	2
Fertiliser Manufacturing	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	4
Mining	....	....	....	....	....	....	....	....	2	1	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Food and Drink Processing	....	....	....	....	....	....	....	2	1	....	....	....	....	....	....	....	....	....	....	1	....	2	1	....	1	....	....	....	....	....	2	1	1	1	....	13
Building Materials and Building	1	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	1	....	....	....	....	1	....	....	....	....	....	....	....	1	2	....	....	....	....	8
Glassmaking	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Other	....	....	....	....	....	....	....	1	....	....	....	....	....	....	1	....	....	....	....	1	1	....	....	2	....	....	1	1	....	....	....	....	....	....	....	....	8
Totals per Type of Machine	4	1	1	13	1	3	1	1	2	1	1	2	1	1	1	7	1	5	1	5	1	6	1	2	2	5	1	1	1	1	2	2	1	1	1	81

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, 1954.

Industry.	Circular Saw.	Buzzer.	Spindle Moulder (Shaper).	Disc Sanding Machine.	Brushmaking Machines.	Fibre Teasing Machine.	Press (Other).	Lathe.	Belts and Shafting.	Chain Drive.	Conveyor (Belt, Chain).	Lift.	Rolls.	Wiredrawing & Spiral Machine.	Mobile Crane	Excavator.	Centreless Grinder.	Dough Break.	Caskwashing.	Totals per Industry.
Woodworking and Furniture	2	1	1	1	1	1	....	....	1	....	....	....	....	....	....	....	....	....	....	8
Metalworking and Engineering	....	....	....	....	....	....	....	1	....	....	....	....	1	2	....	....	1	....	....	5
Fertiliser Manufacturing	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	1	....	....	....	2
Food and Drink Processing	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	1	1	4
Building Materials and Building	....	....	....	....	....	....	1	....	....	1	....	....	....	....	2	....	....	....	....	4
Glassmaking	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	1
Other	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	1
Totals per Type of Machine	2	1	1	1	1	1	1	1	2	1	2	1	2	2	2	1	1	1	1	25

DIVISION VII

Annual Report of the Government Chemical Laboratories

The Under Secretary for Mines.

I have the honour to present to the Honourable the Minister for Mines my Annual Report on the operations of the Government Chemical Laboratories for the year ending 31st December 1954.

The numerical strength of the Laboratories as at 31st December 1954 was 57 comprising forty four professional officers, seven general and six clerical officers.

Staff changes during the year were as follows:

Retirement	1
Resignations	8
Appointments	1

Mr. A. J. Hoare, Second-in-Charge of the Agricultural Division retired after 45 years service in the Laboratories. I wish to place on record our appreciation of his valuable services over this long period which commenced in the year 1909 and finished on 29th July this year.

ADMINISTRATION.

The Laboratories as constituted consist of five Divisions, a Physics Section, a central office and library, all of which are under the control of the Director (Government Mineralogist, Analyst and Chemist) as follows:

Director—H. P. Rowledge, A.W.A.S.M. F.R.A.C.I.

Foods, Drugs and Toxicology—J. C. Hood, O.B.E., F.R.A.C.I., Deputy Government Analyst.

Agriculture, Water Supply and Forestry—L. W. Samuel, Ph.D. Lond. F.R.A.C.I. A.R.I.C., Deputy Government Agricultural Chemist.

Mineralogy, Mineral Technology and Geochemistry—C. R. LeMesurier, A.W.A.S.M., A.R.A.C.I., Deputy Government Mineralogist.

Fuel Technology—R. P. Donnelly, M.A., B.Sc. (Oxon), Fuel Technologist.

Industrial Chemistry—A. Reid, M.A., B.Sc. (Aber), Chief Industrial Chemist.

Library—Miss M. E. Redman, B.Sc., Librarian.

Office—Miss D. E. Henderson, Senior Clerk.

The work of the Annexe Laboratory at Collie on coal washing having been completed, Mr. L. Brennan, Fuel Chemist and Research Officer, was transferred back to Perth. Mr. E. Hodgson, Analyst and Research Officer, was employed at the Lincoln Street Annexe Laboratory on work for the Metropolitan Water Supply, Sewerage and Drainage Department.

NEW EQUIPMENT.

The Laboratories have now been brought up to date by the purchase of the following items of modern equipment:—

Hilger Automatic Large Quartz Spectograph.
Mueller Micro 600 X-Ray Diffraction Unit.
Unicam X-Ray Powder Camera.
Universal Stage Microscope.
Beta-gamma Counter (Autoscaler).

GENERAL.

The total number of samples registered for analysis, chemical and mineral examination, this year was 15,876. The volume of work of an advisory nature for Government Departments and various Industries other than actual analytical work continues to increase from year to year.

The Source of Samples was as follows:—

Mines Department	910
Agriculture Department	3,107
Public Health Department (Royal Perth Hospital) (167 + 56)	223
Metropolitan Water Supply. Sewerage & Drainage Department	7,628
Government Stores and Tender Board	96
Department of Industrial Development	24
Police Department	271
Commonwealth Department	15
Other Departments—	
War Service Land Settlement Scheme, Factories, Public Works, Native Affairs, Local Governing Bodies, Railways, Tramways, Milk Board, Fisheries Department, Prisons Department, Mental Hospital, Minister for North West, Princess Margaret Hospital, Crown Law Department	718
State Industries—	
Wundowie Wood Distillation, Charcoal, Iron and Steel Industry	11
Forests	13
State Brickworks	8
State Engineering Works	2
Wyndham Meat Works	1
Public (Pay and Free)	2,849
	15,876

These are classified in detail according to the actual source from which they were received.

Table I.

Source of Samples received during 1954.

	Total.
State Mining Engineer	20
Chief Coal Mining Engineer	4
State Batteries	290
Government Geologist	148
District Inspector Mines, Cue	4
Explosives	7
Departmental	437
Industrial Development Department	24
Wood Distillation Charcoal Iron and Steel Industry	11
Public Works Department	423
Metropolitan Water Supply	7,628
Public Health Department	167
Agricultural Department	3,107
Factories Chief Inspector	7
Police and Coroner	218
Police C.I.B.	50
Police L.I.B.	3
Government Stores and Tender Board	96
Royal Perth Hospital	56
War Service and Land Settlement Scheme	58
Minister for North West	1
Prisons Department	3
Native Affairs Department	2
Mental Hospital	1
Fisheries Department	20
Princess Margaret Hospital	2
Free	704
Pay, Public	2,145
Pay, Taxation Department	2
Pay, Civil Aviation Department	1
Pay, Department of Navy	1
Pay, Aeronautical Inspection Directorate	5
Pay, Forests Department	13
Pay, Milk Board of W.A.	123
Pay, Crown Law Department	1
Pay, West Australian Government Tramways	2
Pay, West Australian Government Railways	34
Pay, Midland Junction Abattoirs Board	27
Pay, Local Governing Bodies	14
Pay, Repatriation Department	3
Pay, Department of Army	1
Pay, Royal Australian Air Force	2
Pay, Wyndham Meat Works	1
Pay, State Brickworks	8
Pay, State Engineering Works	2
	15,876

Samples are allocated to the various Divisions according to the specialised nature of the chemical work undertaken by each Division.

FOOD, DRUGS, TOXICOLOGY AND INDUSTRIAL HYGIENE DIVISION.

Although the variety and scope of the activities of this division have materially increased during the year, the total number of samples examined, namely 9076, is a marked decrease from the total for 1953. This is due to a decrease in the number of systematic and investigational samples taken in connection with sewer corrosion research carried out in collaboration with the Metropolitan Water Supply, Sewerage and Drainage Department.

The main activities of the division are concerned with chemical work undertaken for the Department of Public Health, Police Department and to lesser extent Metropolitan Water Supply Department, Department of Agriculture, Milk Board, Government Tender Board and specialised and miscellaneous work for other Government Departments and the general public.

These activities are under the broad classification of health and include the examination of foodstuffs representing inspectors samples taken to check food products supplied to the general public and specific instances of sophistication and tests for quality carried out on tendered samples for supplies to government hospitals and public institutions. The total number of food samples was 364 of which 58 were received from the Department of Public Health and 62 from the Government Tender Board. The number of legal samples of milk and check samples taken in connection with a programme of investigation into the composition and freezing point of milk carried out by the Milk Board has greatly increased, amounting to 123 samples. Prosecutions were launched in a large number of the legal samples and the analyst called to give expert evidence to support the legal standard for milk composition and freezing point depression on which charges for adulteration with water had been calculated.

An investigation in collaboration with the Department of Agriculture to determine maturity and palatibility of varieties of grapes by chemical criteria correlated with organoleptic tests was continued during the season with fairly satisfactory results. A further investigation for this Department covered chemical tests applied to apples to ascertain the degree of ripening gave good confirmatory evidence.

289 exhibits and specimens were examined for the Police Department representing 115 specimens of blood and urine in connection with deaths due to traffic accidents or deaths of violence. 19 exhibits were received from the Criminal Investigation Branch and a total of 147 exhibits under the heading of human toxicology and applied to suspected suicides, fatalities with drugs or death under anaesthetics or Coroners' inquiries.

Expert evidence was given in Local, Coroners' and Criminal Courts.

Animal toxicological specimens from the Department of Agriculture and public which amounted to 32 were mainly from stock accidentally or maliciously poisoned by the common poisons. An increasing number of deaths suspected to be due to new and toxic pesticides has required considerable research and development of techniques for trace identification.

Under the heading of industrial hygiene 124 samples were received from the Department of Public Health and Factories Department and various industrial establishments. 34 specimens of urine from lead workers at the West Australian Government Railways were examined as a routine check on workers exposed to a lead hazard. The specimens of blood and urine received from the Department of Public Health were collected in periodic surveys of hazardous industries associated with lead and other industrial poisons.

The preparation and formulation of some insecticides for the Department of Agriculture for use in the Argentine ant campaign was undertaken. Also, experimental work on suitable solvents and emulsifiers. The analyses of a number of proprietary preparations for the above purpose were made and others newly introduced into the ever-expanding field of pesticides. Advice was sought by officers of the Vermin Branch on toxicity of materials used in vermin exterminating and control campaigns.

86 specimens of teeth, bones and stock foods were received from the Animal Nutrition Laboratory for the determination of fluorine, phosphates and calcium in connection with feeding trials and research on phosphate deficiency in stock and the successful efforts attending the use of rock phosphate.

The collection and examination of samples taken during monthly surveys of pollution of the Swan River was continued throughout the year. The results show a continuous improvement since testing was systematically carried out. Similar tests taken periodically as an index of pollution of the Leschenault Inlet, Bunbury, also showed improvement and consequently the testing has been reduced to two surveys a year, during mid summer and mid winter.

The Deputy Government Analyst representing these Laboratories on the Swan River Reference Committee was appointed as one of a sub-commitee commissioned to define pollution and prepare standards for acceptance of trade wastes and effluents received into the Swan River and other estuarine waters. A comprehensive report has been presented and is now in the course of printing.

The annexe laboratory under the control of this division situated at Lincoln Street, North Perth, which undertakes the chemical sewage control work and investigation for the Metropolitan Water Supply, Sewerage and Drainage Department examined a total of 7,874 samples. 2,376 samples represented routine control samples taken in connection with operations of the sewage treatment plants at Subiaco, Swanbourne and Fremantle. Continuation of systematic testing and research on the content and generation of hydrogen sulphide in sewage and its effect on corrosion of sewer pipes accounted for 5,065 samples. Collaboration in this work is maintained with other authorities in Australia working on similar problems.

36 samples of trade wastes were also examined to ensure that they are of such composition or dilution that they can be received into the Metropolian Water Supply, Sewerage and Drainage Department sewers.

The wide scope of work undertaken by the division is indicated by the variety of materials examined which are difficult of broad classification and include such materials as oils, both naturally occurring and manufactured, suspected oil finds; kerosine; explosives and fireworks; air from coal and gold mines; cleansing materials and detergents; paints and colourings; inks; polishes; linseed, sunflower and lupin seeds; drugs; human and whale milks; clothing for wool content and miscellaneous natural and industrial products.

Table II, see pages 72 and 73.

AGRICULTURE, FORESTRY AND WATER SUPPLY DIVISION.

The major activities of this Division continued to be the chemical work required by the Department of Agriculture and the examination of water samples from the Metropolitan, Town and Country water supplies and for primary producers.

The total number of samples received during the year was 4,923, a marked increase on the number (3,977) received in 1953 and the 3,882 samples received in 1952. The increase was due almost entirely to increases in three items, (a) waters for primary producers, increase 513 samples, (b) subterranean clover, increase 293 samples, and (c) tobacco leaf, increase 182 samples.

Waters.

Of the large number of water samples received (2,065) the great majority, nearly 90 per cent., were from primary producers for determination of suitability for domestic, irrigation and stock purposes. With each report on such samples is enclosed a copy of a Leaflet "Waters for Agricultural Purposes in Western Australia" and in 1954 a third printing of this leaflet incorporated a few additions which experience had shown to be desirable. A short article on "Treating Hard Water" by the Deputy Government Agricultural Chemist was published in the Journal of Agriculture of Western Australia and a reprint of this is included in reports when necessary.

The routine examination of existing water supplies to cities and towns was continued and samples were analysed from Canning, Churchman's Brook and Victoria Reservoirs, the Wungong pipehead dam and Mt. Eliza Reservoir; Mundaring Weir and the Kalgoorlie Water Supply; Wellington Dam. In addition some 51 samples were examined from existing or prospective supplies to 27 smaller communities.

Two interesting sets of samples analysed during the year showed:—

(a) The constancy of some natural supplies. A bore at Gosnells, analysed in December, 1954 showed 307 grains of total salts per gallon compared with 294 grains per gallon in February, 1930. A sample of water from Millstream Station analysed in 1954 showed a total salts of 983 parts per million compared with 958 in April, 1923.

(b) The variability of the water supplied to the Metropolitan area in summer when bore water is used. In connection with corrosion of a cooling tower, samples of tap water were taken at four hourly intervals over a period of 32 hours. The analyses varied from a minimum value of 17.2 grains of total salts per gallon at 8 a.m. to a maximum of 40.8 grains per gallon at 4 p.m. the same day. The values for 4 p.m., 8 p.m. and midnight were substantially the same.

The long term experiment on the bacterial decomposition of sewage sludge in saline waters was continued and the evidence to date is that our present safe upper limit of salinity of water for septic tank systems is well founded.

Soils.

A total of 545 samples of soil were examined during 1954, more than half of these being in connection with the unthriftiness of vines in the Swan Valley. The increased interest in the use and effect of soil dressings of lime which has been apparent in the past few years was maintained in 1954 as evidenced by the determination of the pH value of 72 samples of soils from two Agricultural Research Stations and an experiment on a private farm.

During 1954 a method of soil analysis not previously used in these laboratories, namely quinol soluble manganese, was applied to eleven samples of soil in an attempt to assess manganese deficiency in soils.

Fertilisers and Manures.

Analyses were made of 53 official Inspectors' samples of fertilisers under the Fertilisers Act, 1928-1953 and eleven samples failed to comply with the analysis supplied by the Department of Agriculture as registered under the Act. Causes of non-compliance were deficiency of nitrogen, water soluble potash, phosphoric acid and copper but there were no samples deficient in zinc or in fineness of grinding. Samples of one brand of imported Blood and Bone Fertiliser showed either the admixture of superphosphate or the formation of superphosphate in situ by the addition of sulphuric acid.

Consequent upon the 1953 amendment to the Fertilisers Act to require a prescribed maximum moisture content of superphosphate, the investigations on this matter which were commenced in 1953 were continued in 1954. The laboratory investigations showed that the moisture content of superphosphate varied remarkably rapidly with variations in the relative humidity of the atmosphere. Consignments of superphospate received at the Agricultural Research Stations were sampled and forwarded to the Laboratories for the determination of moisture content for comparison with subsequent behaviour on storage and use.

Other samples examined included:—

(a) Fertilisers and foliage sprays used in experiments by officers of the Department of Agriculture to ascertain whether impurities of trace elements could affect the experimental results.

TABLE II.

FOOD AND DRUG DIVISION, 1954.

	Public Health Department.	Agriculture Department.	Metropolitan Water Supply, Sewerage and Drainage Department.	Police and Coroner.	Police—C.I.B.	Police—L.I.B.	Public Works Department.	Chief Coal Mining Engineer.	Departmental.	Royal Perth Hospital.	Government Stores and Tender Board.	Explosives Branch.	Factories.	Mental Hospital.	Industrial Development Department.	Fisheries Department.	Forests Department.	Princess Margaret Hospital.	Free.	Pay—Public.	Pay—Royal Australian Navy.	Pay—Repatriation Department.	Pay—Milk Board of W.A.	Pay—Crown Law Department.	Pay—A.I.D.	Pay—W.A. Government Railways.	Pay—Midland Junction Abattoir Board.	Pay—Local Governing Bodies.	Pay—W.A. Government Tramways.	Pay—Civil Aviation Department.	TOTAL.
Foods—																														
Cheese	1	45	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	46
Potatoes (D.D.T.)	....	15	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	15
Cows Milk	16	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	123	....	....	....	....	....	....	....	139
Meats and Sausages	9	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	10
Jam	2	....	....	....	....	....	....	....	....	....	18	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	20
Grapes	3	31	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	34
Tallow	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5	....	....	....	....	....	1	....	....	....	6
Baked Beans	....	....	....	....	....	....	....	....	....	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3
Cornflour	....	....	....	....	....	....	....	....	....	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3
Tomato Soup	....	....	....	....	....	....	....	....	....	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3
Chutney	....	....	....	....	....	....	....	....	....	....	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4
Pickles	....	....	....	....	....	....	....	....	....	....	7	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7
Sauces	....	....	....	....	....	....	....	....	....	....	10	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	10
Vinegar	12	....	....	....	....	....	....	....	....	....	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	16
Powdered and Evaporated Milk	....	2	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4
Tinned Fruit	....	....	....	....	....	....	....	....	....	....	6	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6
Mustard	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
Apples	....	13	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	13
Bread	1	....	....	....	....	....	....	....	....	....	....	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4
Tea	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Fish, Prawns, etc.	9	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	9
Biscuits	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Butter	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Peanut Oil	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Eggs (Mercury)	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Meat Tenderiser	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Salt	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	2
Sugar	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	1
Flour	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Human Toxicology—																														
Exhibits—Alcohol	2	....	....	103	9	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	115
Anaesthetics	....	....	....	8	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	8
Exhibits—Human Toxicology	9	....	....	104	22	....	....	....	6	6	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	147
Industrial Toxicology—																														
Blood and Urines	53	....	....	....	....	....	....	....	....	27	....	....	....	....	....	....	....	2	....	2	....	3	....	....	....	34	....	....	....	121
Sanding Sealer	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Furniture Finish	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Battery Sand (Cyanide)	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Animal Toxicology—																														
Exhibits, Death of Sheep, Dogs, Fowls, Pigs and Cattle	....	25	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	....	....	....	....	....	....	....	....	....	32
Sewage—																														
Weekly Routine	....	....	2,376	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2,376
Investigational	....	....	5,065	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5,065
Trade Wastes	....	....	36	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	36

Rinsing Water																							1															1
Carbonisation Liquor																																					3
Ocean Survey											3																										81
Swan River and Bunbury Pollution				81																																	310
University Hygea Disinfector								310																													1
Septic Tank Effluent				1																																	1
Liquors—		1																																			1
Brandy																																					3
Beer		1					1																														48
Wine		1	45				2																														
Criminal Cases—						19																															19
Exhibits																																					19
Insecticides, Fungicides and Weedicides			17																																		3
Disinfectants		2		1																																	
Drugs and Medicines—																																					3
Codeine											3																										2
Drugs and Tablets		1												1																							1
Tincture Belladonna		1																																			86
Teeth, Bones and Stockfoods (Fluorine)			86																																		5
Lubricating Oil																																		1			7
Water		4																																			4
Coal Mine Air									4																												1
Gas from Gold Mine																																					
Cleansing Materials—																																					2
Liquid Soap											2																										2
Cleanser Paste											3																										3
Soap Extract											2																										2
Sandsoap											11																										12
Detergents		1									7																										7
Floor Polish											2																										2
Stove Polish											2																										2
Candles																																					2
Rabbit Poison			2																																		5
Wall Boards								5																													8
Inks										8																											22
Ether											20	2																									
Explosives—													1																								1
Cartridges													5																								5
Fireworks													1																								1
Home Made Bombs																																					
Petroleum Tests—																																					12
Water, Soil and Materials		13					5																														18
Paints and Colourings			1																																		1
Lupin Seed																																					2
Spongolite (Filter)			25																																		25
Linseed			1																																		1
Poison Plant																																					3
Rubber Seal																																					1
Scale from Steam Cleaner			15																																		15
Cattle Dip		5																																			5
Human Milk																																					1
Bat Guano		1																																			1
Squeegee Oil			5																																		5
Cool Storage Air																																					3
Kerosene			11																																		11
Sunflower Seed																																					15
Whale Milk																																					1
Corongite																																					1
Glass Fragments (Milk Bottle)		1																																			5
Trout and Water																																					1
Natural Carbon Black		1																																			1
Vitamin Concentrate (Poultry Food)			1																																		1
Liquid Filler								1																													1
Boys Knickers (% Wool)																																					1
Nitrous Oxide																																					1
Spinifex Wax																																					1
Foreign Substance (Oil System)																																					1
Spent Transformer Oil (Preservative)																																					
	156	340	7,560	218	50	3	321	4	18	53	96	7	7	1	1	20	1	2	13	34	1	3	123	1	5	34	1	1	1	1	9.076

(b) Lime (34 samples) for their value in neutralising soil acidity.

(c) Guano (six samples) which varied in nitrogen (N) from 1.5 per cent. to 5.2 per cent. in phosphoric acid (P_2O_5) from 0.9 per cent. to 16.8 per cent. and in water soluble potash (K_2O) from 0.04 per cent. to 0.84 per cent.

(d) Poultry manure (six samples) which also show marked variation in nitrogen, phosphoric acid and potash content.

Feeding Stuffs and Pastures.

Under the Feeding Stuffs Act, 1928-1951 analyses were made of 97 official Inspectors' samples and 35 of these failed to comply with the Act for those constituents compulsorily registered. The main causes of non-compliance were in crude protein, salt and calcium content. Only 18 of the samples complied with all constituents registered, both compulsory and voluntary registration.

General pastures and feeding stuffs analysed, mainly for field experiments by the Department of Agriculture, included a wide variety, lucerne, Paspalum, Kikuyu, Erodium, subterannean clover, oats, wheat, peas, lupins, silage as well as mixed pastures and poultry feeds. The experiments concerned included; at Bramley Research Station on the phosphorus intake and milk production of cows; the beef raising experiment at the Wokalup Research Station; the variation in nutritive value with time of cutting; methods of renovating pastures; a rotational and grazing productivity trial; cereal grazing and recovery trials and poultry feeding trials.

Plant Nutrition.

Analyses of plant material under this heading are mainly for (a) the effect of fertiliser treatment on plant composition (b) the diagnosis of unhealthy plants and (c) the effect of various fertiliser treatments in correcting unthriftiness in plants. The plants and trees involved included apple, barley, clover, lucerne, maize, oats, orange, peach, tobacco, tomato, vines and wheat. The fertilisers used included, sulphate of ammonia, copper (five different types of copper fertiliser), gypsum, lime, manganese, magnesium, nitrogen, phosphorus (as superphosphate and as finely ground rock phosphate), potassium and zinc as well as hormone spraying and cultural treatment. This great variety is not suitable for summarising but one or two individual points deserve mention.

(a) The relative inefficiency of finely ground rock phosphate compared with superphosphate.

(b) The general and regular response of potassium content of plants with increasing rates of application of potassium fertiliser.

(c) A group of red clover plants which had very high molybdenum contents irrespective of fertiliser treatment, 10 p.p.m. to 53 p.p.m. compared with the usual plant analysis of 1 p.p.m. or less.

(d) The difficulty of field diagnosis of deficiency from the appearance of the plants.

(e) The great variability of composition between individual leaves of the same plant, or between leaves of adjacent plants receiving the same treatment, which was previously found for a number of analyses of tobacco leaves and stalks was also found for vine petioles.

(f) The marked variation in the efficiency of various types of copper containing material used as fertilisers in affecting the copper content of plants.

Miscellaneous.

Miscellaneous samples examined included, flour, pearl barley and official samples of the W.A. f.a.q. wheat of the 1953-1954 season.

Table III., see page 75.

MINERALOGY, MINERAL TECHNOLOGY AND GEO-CHEMISTRY DIVISION.

One thousand three hundred and forty-two (1342) samples were received during the year, being eighty-three less than in the previous year. The main sources of samples were as follows, the corresponding figures for the previous year are given in brackets: Assays and determinations for the general public; free, 680 (553); pay, 150 (173); State Batteries, 289 (246); Government Geologist, 75, (303); State Mining Engineer, 20 (56); Public Works Department, 25 (28); Metropolitan Water Supply Department, 18 (16).

Alloys and Metals.

Determinations of one or more constituents were made on 23 samples of metals and alloys, mainly phosphor bronze for use in aircraft bearings and cast iron.

Clays and Refractories.

Thirty-one samples of clay were examined and burning tests were made on eleven of these. Apart from several useful red brick clays from Caversham and Allanson, near Collie, these were of no value.

Metallic Ores and Minerals.

Five hundred and fifty-four samples of metallic ores and minerals were received for indentification and/or assay as follows:—

Gold.

Fifty-six gold ores were assayed for prospectors and the Government Geologist and 246 gold tailings, of which 44 were for umpire assay, for State Batteries.

Copper.

The increased price of copper and the demand for oxidised copper ore for agricultural purposes maintained public interest in copper ores, 33 being received during the year, four of them being from new localities, mentioned below.

Lead.

Twenty-three samples of lead ore were examined and 35 samples of lead concentrates and tailings from the newly established State Battery at Northampton were assayed for lead and zinc.

Iron.

Fifty-two samples of bore core from a drilling programme at Koolyanobbing were submitted by the Government Geologist and a further nine ore samples from prospectors and others.

Manganese.

The restriction on the export of manganese ore caused a loss of interest in manganese and only nine samples were received.

Columbium-Tantalum.

The high price of columbo-tantalum ores has resulted in considerable activity in this field and 46 samples of concentrates were submitted as well as 22 samples of tin-tantalite concentrates, the latter mainly from Greenbushes. Mechanisation of the method of working the alluvial deposits of columbo-tantalite has resulted in several cases in the production of a low grade concentrate carrying a large proportion of iron oxide minerals, difficult to remove by either gravity or magnetic separation. Tests carried out in the laboratory showed that a preliminary reducing roast followed by magnetic separation produced a marketable concentrate.

Non-metallic Industrial Minerals.

Samples submitted included limestone, dolomite, graphite, pyrites, lithia bearing minerals and foundry sands.

TABLE III.

AGRICULTURE DIVISION, 1954.

	Agriculture Department	Public Works Department	Metropolitan Water Supply	War Service Land Settlement Scheme	Departmental	Public Health Department	Prisons Department	Native Affairs Department	State Batteries	Free	Pay—Public	Pay—Taxation Department	Pay—Forests Department	Pay—Department of Army	Pay—R.A.A.F.	Pay—Local Governing Bodies	Pay—Midland Junction Abattoir Board	Pay—Wyndham Meat Works	TOTAL
Water	12	77	50	57	14	10	3	2	1	5	1,784	2	12	1	2	13	20	....	2,065
Soils & Soil Extracts	519	....	....	....	....	....	....	....	....	....	26	....	....	....	....	....	....	....	545
Limestone & Limesand	8	....	....	....	....	....	....	....	....	2	26	....	....	....	....	....	....	....	36
Superphosphate	28	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	29
Fertiliser (Pelts)	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	2
Fertiliser	6	....	....	....	....	....	....	....	....	....	7	....	....	....	....	....	....	....	13
Sheeptruck Washings	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Bat Guano	....	....	....	....	....	....	....	....	....	....	3	....	....	....	....	....	....	....	3
Zinc Super	2	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	3
Fowl Manure	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	1
Poultry Litter	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	1
Bonemeal Fertiliser	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Animal Fertiliser	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	1
Garden Fertiliser	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	2
Copper Ore	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	1
Blood & Bone	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	2
Copper Sulphate	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Muriate of Potash	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Farmyard Manure	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Foliage Spray (Mn.)	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
Fertiliser Act	49	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	49
Pasture	94	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	94
Sub-Clover	402	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	402
Lucerne	7	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7
Tree Lucerne	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4
Wheat Plants	139	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	139
Oat Plants	88	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	88
Wheat Grain	415	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	415
Wheat Meal	167	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	167
Oat Grain	10	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	10
Oat Dust	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	2
Hay	6	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6
Barley Grain	18	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	18
Pearl Barley	3	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	4
Oaten Hay	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Wheat & Oat Grain	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Wheaten Chaff	44	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	44
Cereal Rye	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
Sudan Grass	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Paspalum	5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5
Kikuyu Grass	30	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	30
Vetch	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4
Red Clover	19	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	19
Elephant Grass	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Oaten Chaff	24	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	24
Fodder Beet	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4
Silage	15	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	16
Crysopogon Gryllis	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Triodia Pungens	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
Maize Plants	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
Shrub	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Lupins	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4
Peas	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3
Winter Grass	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
Erodium	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4
Broom Genista Radiata	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Chicken Mash	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
Cowfeed	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	1
Meatmeal	1	....	....	....	....	....	....	....	....	....	4	....	....	....	....	....	1	....	6
Bonemeal	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	1	2
Crayfish	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	1
Laying Mash	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
Crushed Linseed	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Poultry Food	27	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	28
Malt Combings	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Ox-Lung Residue	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1
Feeding Stuffs Act	86	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	86
Volunteer Grass	20	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	20
Linmix	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Vine Leaf Petioles	94	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	94
Vine Prunings	9	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	9
Tomato Plants	9	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	9
Apple Leaves	54	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	54
Peach Leaves	17	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	17
Orange Leaves	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
Strawberry Leaves	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Rockmelon Leaves	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Tobacco Leaf	273	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	273
Wheat	1	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	2
Flour	10	....	....	....	1	....	....	....	....	....	4	....	....	....	....	....	....	....	15
Salt	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Economiser Flue Dust	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Pyrite Conc. & Tails	....	....	....	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	3
Aluminium Alloy	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	1
	2,767	77	50	57	22	10	3	2	1	7	1,874	2	12	1	2	13	22	1	4,923

Radioactive Minerals.

Twelve samples of radioactive ore were assayed chemically for uranium and a further 55 samples submitted for test were proved non-radioactive.

Minerals for Determination.

Five-hundred and fifty-one samples and specimens were submitted for identification and evaluation. The following were of interest as being from new localities:—

Allanite (hydrous silicate of calcium, iron, aluminium and cerium).

Specimens of detrital allanite were received from four miles north of Tabba Trig, from eight miles south of Hillside Station Homestead and from 20 miles south of Byro Station Homestead in N.W. Division.

Beryl (aluminium beryllium silicate).

Hexagonal crystals of beryl with some intergrown quartz came from ten miles north-east of Melangata Station Homestead and a specimen of poorly crystallised beryl associated with wolframite and quartz from Weld Range.

Copper Ore.

A sample of copper ore from 47 miles north-west of Marble Bar contained chalcopyrite (iron copper sulphide) and malachite (green copper carbonate) associated with quartz and limonite.

An ore from Karunjie Station, Kimberly Divison, consisted of chalcopyrite, cuprite (cuprous oxide), tenorite (cupric oxide) and malachite in a quartz-carbonate vein. Oxidised copper ores were also received from five miles north-north-west of Jimble Bar, N.W., and Moonlight Valley, Kimberley.

Copiapite (basic ferric sulphate).

From the junction of the Fortescue and Portland Rivers, N.W., and associated with epsomite, from three miles north of the Robe River crossing on Northern Highway, N.W.

Cummingtonite (hydrous magnesium iron silicate).

Cummingtonite schist in which the mineral occurs as elongated bladed prisms occurs as detrital boulders four miles north of Toodyay on the Goomalling Road.

Epsomite (hydrated magnesium sulphate).

In addition to the specimen received from Robe River, nickeliferous epsomite was recorded from Glen Ross Creek, Mt. Vernon Station, N.W.

Fluorite (calcium floride).

A specimen of fluorite was received from Wubin, S.W.

Monazite (phosphate of cerium and lanthanum).

A Biotite gneiss from Observatory Island, Esperance, contained a small percentage of monazite and zircon.

Tanteuxenite (tantalite of yttrium, titanium, etc.).

Detrital material from Hillside Station contained tanteuxenite associated with monazite and xenotime.

Tantalite (tantalate of iron and manganese).

A sample of columbite concentrates from Upper Five Mile Creek, Nullagine, contained one fragment of tantalite (G. 6.58).

Triplite (fluo-phosphate of iron and manganese).

A specimen from three miles south-west of Moolyella, N.W., proved to be triplite, a rare phosphate mineral occurring in pegmatites. In mass it is garnet brown in colour with strong cleavage directions.

This is the first record of this mineral in W.A.

Wolframite (iron manganese tungstate).

Specimens of wolframite, in most cases accompanied by scheelite were received from new localities during the year. At the True Blue G.M. Bamboo Creek wolframite occurs as a narrow vein in the lode, with scheelite disseminated through the lode material.

A sample of antimonial gold and silver ore from 9 miles south of Southern Cross contained wolframite.

Specimens of wolframite were also received from Upper Five Mile Creek, Nullagine, and from Weld Range, the latter being associated with beryl and quartz.

Meteorites.

Two meteorites recently presented to the W.A. Museum were examined and classified. One, found near Rawlinna in 1948 weighed 152 kilograms (335 lbs.) and is a meteoric iron, class medium octahedrite. It has been named Haig. The other, from Cocklebiddy Rock Hole, close to Eyre Highway, north-west of Eyre is an aerolite or meteoric stone. Its weight is 19.5 kilogramms (43 lbs.) and class bronzite chondrite. Named Cocklebiddy.

Corrosion.

Several corrosion problems were investigated and remedial measures suggested.

Leaching and permeability tests were made on the components of a flat roof structure from which lime was leaking and blocking down pipes.

Slight pitting of unpainted structural members of a prefabricated aluminium building situated near the coast was found to be due to salt spray. As a result salt spray tests were carried out on samples of anodised and natural finish aluminium, the results indicating a greatly increased resistance to corrosion in the anodised sample.

Building Materials.

During the year tests were carried out on samples of local sands for two firms interested in the manufacture of limesand bricks. In this process a mixture of hydrated lime and sand is moulded under high pressure and then autoclaved. Well graded clean sharp sand and high grade hydrated lime are essential for the process. In the same connection samples of burnt lime and carbide sludge, a waste product from the production of acetylene containing a high percentage of hydrated lime, were analysed.

Samples of local cement were analysed for conformity with specifications.

Table IV., see page 77.

FUEL TECHNOLOGY DIVISION.

The main activity of the fuel Technology Division during the past year has been development work on the production of coked briquettes from Collie coal. A considerable part of this work has been carried out in conjunction with the Department of Industrial Development at Welshpool, contact has been maintained with Broken Hill Proprietary on the same project, an account of the theoretical background of the work has been published in the Journal of the Institute of Fuel (London) and a pilot plant for the fluidised carbonisation of Collie coal has been designed, erected and put into operation. An Australian patent has been granted for the method of briquetted coke production and the same patent has also been granted by the British, South African and Indian patent offices, and New Zealand pending.

Parallel work carried out on charcoal has resulted in the formulation of a method for charcoal briquette production which is also the subject of a patent application. The possibilities of fluidised carbonisation of charcoal are considerable, and because of the abundance of wood waste in the

TABLE IV.

MINERAL DIVISION, 1954.

Mineral.	Pay Public.	Free.	State Batteries.	Government Geologist.	State Mining Engineer.	Departmental.	District Inspector of Mines, Cue.	Wood Distillation Charcoal Iron and Steel Industry.	Industrial Development Department.	Metropolitan Water Supply, Sewerage and Drainage Department.	Public Works Department.	Public Health Department.	Minister for North-West.	War Service Land Settlement Scheme.	Royal Perth Hospital.	State Brickworks.	State Engineering Works.	TOTAL.
Alloys and Metals	13	....	....	....	....	....	....	7	....	....	....	1	....	....	....	....	2	23
Corrosion	....	....	....	....	....	....	....	....	....	....	16	....	....	....	3	....	....	19
Ceramics—																		
Clays	1	20	....	....	....	....	....	....	6	....	....	....	....	....	....	4	....	31
Refractories	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	1
Natural Mineral Pigments Ochres and Oxides	....	7	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	8
Metallic Ores and Minerals—																		
Beryllium	2	4	....	....	....	3	....	....	....	....	....	....	....	....	....	....	....	9
Copper Ores	1	32	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	33
Gold Ores	4	43	....	9	....	....	....	....	....	....	....	....	....	....	....	....	....	56
Gold Umpire	....	....	44	....	....	....	....	....	....	....	....	....	....	....	....	....	....	44
Gold Tailings	1	....	202	....	....	....	....	....	....	....	....	....	....	....	....	....	....	203
Heavy Sands	....	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4
Iron Ores	3	3	....	52	....	....	....	3	....	....	....	....	....	....	....	....	....	61
Lead Ore	1	7	....	....	....	15	....	....	....	....	....	....	....	....	....	....	....	23
Lead Concentrate	....	....	18	....	....	....	....	....	....	....	....	....	....	....	....	....	....	18
Lead Tailings	....	....	17	....	....	....	....	....	....	....	....	....	....	....	....	....	....	17
Chromite	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	1
Manganese	3	6	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	9
Columbite	12	9	....	....	15	....	....	....	....	....	....	....	....	....	....	....	....	36
Tantalite	5	....	....	....	5	....	....	....	....	....	....	....	....	....	....	....	....	10
Tin/Tantalite Concentrate	20	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	22
Titanium	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Tungsten	....	2	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4
Zinc	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
Uranium	4	3	....	4	....	7	....	....	....	....	....	....	....	....	....	....	....	18
Minerals for R.A. Test	....	47	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	49
Other Economic Minerals—																		
Limestone	....	....	....	....	....	....	....	....	5	....	....	....	....	....	....	....	....	5
Gypsum	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Lithia	2	3	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	6
Graphite	1	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5
Dolomite	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Cobalt	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
Euxenite	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Allanite	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
Epsomite	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Garnet	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	2
Spongolite	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2
Pyrites	....	....	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	3
Foundry Sand	....	....	....	....	....	....	....	....	4	....	....	....	....	....	....	....	....	4
Mineral Specimens for Determinations	62	474	....	3	....	8	4	....	1	....	....	....	1	1	....	....	....	554
Miscellaneous—																		
Construction and Building Materials	9	2	....	....	....	....	....	....	6	....	9	....	....	....	....	....	....	26
Cement, pipes and linings	....	....	....	....	....	....	....	....	....	18	....	....	....	....	....	....	....	18
Water	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Caustic Lime	....	....	6	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6
TOTAL	150	680	289	75	20	36	4	11	22	18	25	1	1	1	3	4	2	1,342

TABLE V.

Fuel Technology Samples received during 1954.

Mineral.	Government Geologist.	Industrial Development Department.	Departmental	Pay.	Western Australian Government Tramways.	State Brickworks.	Midland Junction Abattoirs.	TOTAL.
Coal and Coke	....	....	....	58	....	2	....	60
Coal-Drilling	68	....	....	....	....	....	....	68
Coal Fuel Laboratory Survey	....	....	21	....	....	....	....	21
Coal State Electricity Commission	....	....	9	....	....	....	....	9
Coal Miscellaneous	....	....	6	....	....	....	....	6
Coal Washing	....	....	205	....	....	....	....	205
Coal Storage	....	....	4	....	....	....	....	4
Coal Drying	....	....	....	....	....	....	....	....
Coal Railway Trials	....	....	3	....	....	....	....	3
Coal Nannup	....	....	1	....	....	....	....	1
Briquetting samples	....	....	69	....	....	....	....	69
Refractories	....	....	....	8	....	....	....	8
Bricks	....	....	....	....	....	2	....	2
Yallourn Briquettes	....	....	1	....	....	....	....	1
Wood and Ash	....	....	....	8	....	....	....	8
Coke Breeze	....	....	....	1	....	....	....	1
Fly Ash	....	....	....	1	....	....	....	1
Cinders	....	1	....	....	....	....	....	1
Thermoscope Bars	....	....	....	3	....	....	....	3
Plaster	....	....	....	2	....	....	....	2
Flue Gas	....	....	....	2	....	....	....	2
Detergent and Sediment	....	....	....	....	1	....	....	1
Meatmeal	....	....	....	....	....	....	4	4
TOTAL	68	1	319	83	1	4	4	480

State the production of a briquetted charcoal may not be expensive and because of the purity the prospects for such a fuel should be good.

The Division has made a number of fuel efficiency investigations for factories and works. A prolonged investigation of the fuel and steam consumptions of the Midland Junction Abattoir was concluded and exact figures were provided for the future fuel and steam consumptions and possible economies in steam. A steam meter has now been acquired by the Division to use or to loan to works for such future investigations. Difficulties in firing a tile kiln were resolved for a tile manufacturer and advice and assistance were given to him in instrumentation for temperature recording in his firing schedules. Assistance was given to a plaster burner on the use of coal in his furnaces and a design was given to him for an efficient cyclone to trap dust from his plant. Liaison was also maintained with State Brickworks and the Government Railways on the utilisation of Collie coal and with the co-operation of the latter work on the storage of Collie coal has been commenced. A number of consultants have referred to the division frequently on uses of Collie coal, gas manufacture and sawdust utilisation.

Regular fuel survey sampling continues at Collie on face samples taken by ourselves and on drill cores from the Government Geologist.

Table V., see page 77.

INDUSTRIAL CHEMISTRY DIVISION.

General.

The fitting out of the new Industrial Chemistry building proceeded slowly but steadily throughout the year. Some units of the Denver Plant have been tested functionally; the entire plant cannot be tested as a continuous unit until the new Substation is in operation. The laboratory section was completed (except for some minor details) in August and the staff was transferred to the new quarters. For the major part of the year, therefore, work had to proceed under the cramped conditions mentioned in previous reports but progress was made on research projects. Progress accelerated notably from August onwards. The Unit Process Plant should be fully operational by July, 1955.

Research Work.

Much work was done on the utilisation of Duboisia Hopwoodii as a potential source of nicotine. Quarterly samples were taken from selected sites at Bencubbin and Perenjori and examined firstly as to their nicotine content, secondly as to the deterioration in various types of storage conditions, and thirdly as to the best means of transporting samples. Methods of analysis were reviewed and a standard procedure adopted. Propagation of Duboisia Hopwoodii asexually was attempted in the Government Nursery by Government Gardener and his staff. The results of this work are being embodied in an internal report, the main conclusions of which may be summarised as follows:—

(1) Duboisia Hopwoodii bushes at Bencubbin appear to give higher yields than those at Perenjori.

(2) Although definite proof is lacking it appears that the highest nicotine yield (about 7-8% total alkaloids) is obtained in the summer months.

(3) Storage of samples in canvas bags or polythene appears quite adequate, and if samples are kept in dry ice there is only a slight loss of nicotine up to three weeks. Loss in the first four days after sampling is negligible.

(4) The silico-tungstic acid method of analysis has been found to give satisfactory results.

(5) No success was had in attempts to propagate Duboisia Hopwoodii by cuttings but successful grafts were made on Nicotiana glauca which withstands the hot dry conditions favoured by Duboisia Hopwoodii.

Work on the chemistry of Duboisia Hopwoodii as a whole is proceeding. Apart from the isolation of small quantities of what appears to be a saturated hydrocarbon, the work has so far revealed nothing of interest.

Some work has been done on the beneficiation of felspar by jigging but the work has not yet progressed far enough for comment.

Rumbling tests were carried out on gypsum with a view to its beneficiation. Results were not promising.

Preliminary work on the spectrophotometric determination of uranium met with some success. A Unicam S.P.500 spectrophotometer was used; this instrument is proving a valuable addition to the equipment of the Laboratories.

Much work was done on the spectrophotometric determination of nicotine and nor-nicotine. These two alkaloids together can be determined with satisfactory accuracy but there is not sufficient difference between the absorption curves of the two for their accurate determination by the spectrophotometer. For this work a sample of pure nor-nicotine was prepared from a sample of Duboisia from the Coolgardie area; this specimen contains only nor-nicotine, nicotine being completely absent. Advantage was taken of the pure nor-nicotine sample to determine some of its physical characteristics, hitherto unreported in the literature.

As a preliminary to work on the beneficiation of antimonial pyrites and the preparation of golden sulphide of antimony a sample of antimonial concentrate from the Blue Spec mine, Nullagine, was analysed.

Four bentonite samples were analysed and tested. None of these showed any marked commercial possibilities, particularly for oil field work.

INFORMATION SERVICE.

Over 1,000 queries by telephone, letter, and personal calls were dealt with. As in previous years we had the fullest co-operation from commercial firms and manufacturers in this work.

DIVISION VIII

Annual Report of the Chief Inspector of Explosives for the Year, 1954

The Under Secretary for Mines:

For information of the Hon. Minister for Mines, I have the honour to submit my report on the functioning and progress of the Explosive Branch in 1954.

Importation of Explosives.

Ten shipments from Victoria to Woodman's Point Reserve and two direct to Cockatoo Island brought a total of 120,201 cases, or 6,010,050 lb. net in addition to small quantities of special explosives used in oil exploration. Table 1 below replaces the former grouping which stressed an arbitrary division into permitted explosives (as far as W.A. is concerned), and yet included several distinct varieties under the heading of gelignite. To some extent the list reflects phases of the State's industrial development. All the Goephex, for example, was used in geoseismic work, the special gunpowder by a local pyrotechnician in manufacturing display fireworks, and the Monograin in open-cut metalliferous mining. Monograin is a free-running powder which can be poured rapidly into shotholes with a minimum of tamping. The figures also indicate the important part now played by Semigel, introduced in 1951.

TABLE No. 1

Importations in 1954.

(Cases of 50 lb. net weight.)

A.N. Gelatin Dynamite	4,446
A.N. Gelignite 60	72,914
Plastergel	751
Quarigel	56
Ajax	1,661
A2 Monobel	301
A3 Monobel	250
Semigel	33,485
Quarry Monobel	4,505
Monograin	703
Blasting Powder	509
Geophex	506
Mealed and P1 Gunpowder	7
Whaling Powder	102
Safety and Detonating Fuse	7,363,200 yards
Detonators (number)—	
Plain	3,300,000
Electric	192,000
Electric, delay	252,100
Submarine	1,750

The next list compares current importations with those of recent years:—

Use of Explosives.

TABLE No. 3.

Main Consumers in 1954.

(Cases of 50 lb.)

Mining—	
Gold	77,554
Coal	14,257
Asbestos	3,447
Lead	742
Tin	8
Iron	1,635
Quarrying	5,955
Construction—	
Main Roads	77
Railway	7
Timber	332
Brickworks	651
Public Works	1,359
Miscellaneous	5,070

Examination, Analysis etc. of Explosives.

About 4,000 determinations were conducted as outlined below:—

TABLE No. 4.

Explosives—	
Heat Testing, Sensitivity, Velocity of Detonation	2,448
Fuse—	
Burning rate	612
Fireworks—	
Prohibited Chemical compositions etc.	574
General—	
Detonators, Packaging materials, Fuse igniters, Exploders, Circuit testing instruments etc. approx.	300

Storage.

Except for small quantities exempted by the Act, all commercial explosives were kept under license in magazines or resellers' stores, comprising:—

TABLE No. 5.

Licensed Magazines and Stores.

Magazines on Government Reserves.	60
Magazines on Government owned Lands not declared as reserves	26
Magazines owned privately, on non-governmental land	120
Resellers' store licenses, Mode A	75
Reseller's store license, Mode B	1

TABLE No. 2.

——	1950.	1951.	1952.	1953.	1954.
Explosives (cases)	72,565	90,264	121,017	114,916	120,201
Detonators (number)	3,626,000	2,222,376	3,931,943	4,447,870	3,745,850
Fuse (yards)	5,324,800	5,820,000	5,368,000	6,438,400	7,363,200

Other Licenses operative were:—

TABLE No. 6.

Fireworks resellers'	368
Fireworks Manufacturers'	2
Importation (of explosives)	2

Quality of Explosives.

As one of this Branch's primary functions is to ensure compliance of all explosives with recognised standards, the recent trend has been to concentrate on consignments as received. Athough making inroads on time allocated for general inspectional duties, the procedure seems justified in the light of relative freedom from complaint by consumers. Naturally, no guarantee of complete perfection is possible; each unit such as a detonator, a stick of gelignite or coil of fuse is not necessarily identical in properties with another or others selected from the same package. In short, explosives cannot readily be sampled so that a small quantity represents bulk. But by wide objective examination, coupled with results of heat-testing, sensitivity and velocity of detonation, it may be fairly stated that the 1954 explosives were of high standard. Admittedly defects occurred in packaging and cartridging, of which explosive composition external to the paper proved the most troublesome. Except where the surplus material lay within the end concavity, such plugs were rejected as dangerous. In effect, their use is prohibited under Section 52 (1) of the Mines Regulation Act. Similar instances have been encountered where improper end closure of powder-type cartridges allowed the contents to spread over adjoining ones which, however, could be made safe by a simple wiping process. Protection of wrappers by waxing, though not invariaby up to standard, showed improvement over past years, and no mushy or wet explosive was reported. Slight damage by sea water to explosives aboard A. V. Wongala again occurred due to certain inherent defects in the vessel rather than its cargo, but rigid inspection prevented any such material from reaching the consumers.

Shipping and Unloading.

Twice in 1954 the discharge of explosives at Woodman's Point Jetty was interrupted by storms which caused the vessel to seek shelter in the lee of Garden Island. The delay, however, was negligible compared with that expected had the older system of lightering from Gage Roads still been operative. Movement of explosives from hold to magazine was expedited about mid-year when the sole remaining horse, kept for manoeuvering trucks on the jetty, was replaced by a tractor, and extra labor engaged to cope with the augmented throughput. From the beginning the innovation proved its worth. As an example, M.V. Taranui arrived late on August 11th with 16,127 cases of explosives, of which only 500 could be removed that afternoon. On the 12th and 13th, the daily output was 7,813 cases, against a previous maximum of 6,500 and a working average of about 1,000 less than this amount. It is believed that nowhere else in Australia have commercial explosives been transferred from ship to magazine so rapidly. The process is economically sound because additional labor costs less than demurrage. From the departmental viewpoint it reacts advantageously by saving time spent on supervision, thereby enabling an earlier start on sampling, inspection and heat-testing. Unfortunately it is inapplicable to the smaller ship, A.V. Wongala, whose holds and disposition of cargo restrict the number of men gainfully employed.

Inspections.

No remote country districts were covered this year. Considerable attention, however, was paid to nearby quarry magazines, from which petty thefts have been a source of worry to the Police and Explosives Departments. No simple remedy suggests itself except for insisting on greater security with the drum-type magazine, which is now required to be locked in a larger receptacle or building. Little control can be exercised over the indifferent powderman who plants explosives surplus to the day's job under the nearest stone. Several instances of gelignite and detonators in juvenile hands were attributable to this unauthorised practice.

A class of inspectional work assuming increasing frequency relates to munitioning of naval vessels. Although ordnance of the armed forces is exempt from provisions of the Explosives Act, Fremantle Harbour Trust Regulation 211 confers wide powers on the Inspector over the shipping and discharge of explosives, by whomsoever owned, within the Port. Some earlier jobs of this nature were unsatisfactorily executed, but recently a commendable co-operation between all concerned has gone far in reducing hazards. The explosives, segregated into groups and conveyed according to Commonwealth regulations, are delivered to the ship's side from the Naval Armament Reserve, Byford. Dockyard and civilian police are in attendance, the area is cordoned off, fire-fighting facilities are available and strict discipline maintained. All these measures, nevertheless, are no absolute guarantee against a major explosion in the harbor, and at this stage I must reiterate former protests at the Commonwealth's failure to establish and use isolated facilities, as has been done by each State explosives department since its inception.

New Explosive Compositions.

Polar Hydrogel, developed from blasting gelatin, was introduced for underwater use. With a submarine-type aluminium detonator it may be fired at high velocity of 6,000 meters per second under a hydrostatic pressure of 500 lb. per square inch, equivalent to 1,150 feet head of water. Another improvement was in the instance of Semigel by incorporating pre-waxed woodmeal. Of strength equal to A.N. Gelignite 60 for the same sized cartridge, the new variety neither indurates appreciably on storage nor exhibits the affinity for moisture characteristic of its prototype. Wet shotholes may be charged up to four hours before firing. This enhanced stability marks definite progress, as evident from a paragraph in last year's report on investigations at Kalgoorlie, where zero sensitivity and failure to propagate detonation were encountered in moisture-deteriorated Semigel.

Transport of Explosives.

Along general lines nothing need be said except that the old rail vans at Woodman's Point Explosives Reserve require supplementing by larger ones to cope with mechanical traction and the present-day rate of unloading incoming consignments. In another field, however, a departure from orthodox practice consisted in air-freighting small amounts of explosives when urgently required at some distant point. The practice is not encouraged, and permission is given only after the Civil Aviation Department and Explosives Branch have considered each application. Packing and stowage requirements are rigidly defined, and there must be provision for jettisoning certain classes of explosives should fire or other danger occur in flight.

Explosives Reserve.

Thanks to a substantial vote, the boundary fence should be completely reconditioned by 1955. Many of the magazines, including three governmentally-owned, were repaired and repainted with a bitumen base aluminium composition for improved appearance and lower temperatures. The jetty decking was timbered along the rail lines to facilitate the tractor's movements, and several additional bollards installed as an aid to shipping.

Accidents with Explosives.

Although many disasters occur each year, only those where doubt exists as to the quality of an explosive or its mode of use are in general dealt with by this Branch. One example of negligent practice was that of a man whose death occurred through ignition of gunpowder in an open canister alongside which he stood after placing a charge. The evidence left no doubt that a carelessly discarded match or fuse remnant was responsible.

Another accident in which two men were killed and a reinforced-concrete capping station wrecked occurred last November at a Gosnells quarry. Nobody saw the explosion which, followed by fire, precluded any real reconstruction of preceding conditions and possible explanation. The devastation could not be reconciled with that due to 1,000 detonators, said to have been the only explosive in the room at the time. Incidentally, some valuable information on damage to buildings by known amounts of explosives has been promised by a consultant to the British Ministry for Supply on his return to England early in 1955. Though too late for the coronial inquiry, the detail may permit of a useful check should unfortunately there be future disasters of this description.

Destruction of Explosives.

A few police exhibits, surplus explosive from testing, and that wetted in transit were either burnt or dumped at sea, according to quantity. The only other destruction necessary consisted of some old exuding gelignite at Port Hedland and a dozen cases from a magazine on Rous Head, North Fremantle.

Electrical Blasting.

Mines Regulations now require that apparatus for testing electrical continuity or resistance of a blasting circuit at the face be first certified as safe by the Chief Inspector of Explosives. It is not difficult to measure the current across the terminals of an instrument and to ascertain that only a special high resistance cell is employed. In such respects the recently introduced Nobel "Blast-o-meter" fulfils requirements; but to give unequivocal assurance that this or other galvanometer or ohmeter simply will not fire any detonator borders on extrapolation from experience. The minimum current is 310 milliamperes, whilst the Nobel and similar good instruments furnish 20 to 50, and therefore may be used without danger until applied to the odd detonator—perhaps one out of millions—with a thin spot or some other abnormality in the filament. Advice from England indicates that such is no mere hypothesis. Hence to ensure complete immunity from mishap it is believed that electric detonators should first be tested out of contact with the primers, followed by an overall determination of continuity and resistance from the exploder end of the firing cable.

Fireworks.

Samples representing 2456 cases imported complied with State requirements. Although two more English manufacturers marketed their wares locally, certain foreign lines condemned by Eastern States inspectors have not yet appeared. One article, a so-called "indoor" firework, when demonstrated to the writer in the Sydney Explosives Laboratory, ignited by friction under foot and executed rapid unpredictable movement about the floor. Another forcibly projected a cork which exploded on hitting any solid object. Judging by smell, phosphorus entered into the composition of both. These and similar fireworks will get short shrift if introduced here.

A fireworks factory license was issued through the year to a new-comer with considerable European experience in the pyrotechnic art. He has already given some creditable exhibitions, particularly with aerials like rockets and star shells.

As part of the Royal Visit celebrations, a display was presented from Mill Point on March 29th. The committee previously responsible for the Coronation fireworks again functioned, and arrangements for storage, transport and safety at the firing point were handled by the Explosives Branch.

Conference.

The fourth interstate explosives conference commenced in Sydney on October 12th. Discussions covering a wide field continued over about seven days, following which delegates attended laboratory and outdoor demonstrations dealing with various phases of pyrotechnics and explosives technology. Among the excursions, as part of the programme, a day was spent at the Bantry Bay Explosives Reserve.

Inflammable Liquids and Dangerous Substances.

The intensive search for petroleum in Western Australia, inpending completion of the Kwinana Refinery and greatly increased use of liquid fuel having all focused attention on the desirability of control by Act and Regulations, the writer was commissioned to make inquiries when in N.S.W. after the explosives conference. The Superintendent at Sydney (counterpart of the Chief Inspector here) and his staff offered every facility, and although time permitted assimilation of principle rather than detail, sufficient was learnt for the substance of a report now in preparation. An important point emerging was that in administering both the Inflammable Liquids and Explosives Acts from the one branch of the Mines Department, with laboratory facilities attached, and by assigning each inspector to the dual role, revenue exceeded expenditure.

Staff.

There were no changes in personnel at the Explosives Reserve. Head Office, however, suffered a loss on June 8th by the retirement of Mr. T. K. Wood, who for many years carried out the clerical work of the Branch. An efficient and esteemed officer whose training and experience well qualified him for the position, he was some time ago gazetted as sub-inspector because of his acquired technical knowledge. In this capacity his work was on the same high plane as that of his primary duty. Mr. R. Bishop temporarily filled the vacancy until Mr. L. M. Calneggia assumed office late in July.

Acknowledgments.

The usual but well merited expression of appreciation to the writer's associates both inside and outside the Department is again recorded. During his short stay, Mr. Bishop acquitted himself creditably, and Mr. Calneggia, with his aptitude and interest in the work, has already proven a promising successor to Mr. Wood.

F. F. ALLSOP,
Chief Inspector of Explosives.

(6)—95047

DIVISION IX

Report of Chairman, Miners' Phthisis Board and Superintendent Mine Workers' Relief Act

The 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 1954.

Under arrangements similar to previous years, the Commonwealth Health Department continued the periodical examination of mine workers, the work being carried on continuously by the Kalgoorlie Health Laboratory and by a mobile X-Ray Unit which visits the mining centres in various Goldfields. The Goldfields not visited during the year were the Ashburton, Gascoyne, Kimberley and Phillips River, which are all remote and contain few mine workers.

On November 12th, 1954, the State Public Health Department took over the Kalgoorlie Laboratory from the Commonwealth Health Department, and continued the examination of mine workers under the same arrangements.

MINE WORKER'S RELIEF ACT.

Examinations under the Mine Workers' Relief Act during the year totalled 5,630 as compared with 4,809 for the previous year—an increase of 821. The results of the examinations for 1954 together with figures for previous years are shown in the table 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 5,142, or 91.33 per cent. of the men examined, and included men having first class lives or suffering from pneumonoconiosis only, the figures for the previous year being 4,474 or 93.03 per cent.

Early Silicosis.—These numbered 429 of which 154 were new cases and 275 had been previously reported, the figures for 1953 being 74 and 225 respectively. Early Silicotics represented 7.62 per cent. of the men examined, the percentage for 1953 being 6.22. The new cases again showed an unaccountable increase from eight in 1952, and 74 in 1953, to 154 in 1954. This is the highest number recorded in one year since 1925 when examinations began.

Advanced Silicosis.—Of the 43 cases reported, 22 were men who advanced from Early Silicosis during the year, the other 21 having been previously reported. Advanced Silicotics represented 0.76 per cent. of the men examined, the percentage for the previous year being 0.67.

Silicosis Plus Tuberculosis.—Nine cases were reported compared with two in 1953.

Tuberculosis Only.—Seven cases were reported compared with two for the previous year.

MINES REGULATION ACT.

Examinations under the Mines Regulation Act totalled 1,669. These were in addition to the 5,630 examinations under the Mine Workers' Relief Act. The Mines Regulation Act examinations showed an increase of 173 compared with the number of men examined in 1953. Of the total of 1,669 men, 1120 were new applicants and 549 re-examinees for the Initial Certificate.

Particulars of the examinations are as follows:—

New Applicants.

Normal	1,101
Pneumoconiosis	5
Silicosis Early	0
Silicosis Advanced	0
Query Tuberculosis	7
Tuberculosis	0
Other Conditions	7
	1,120

Of the above applicants for admission into the industry, 1,101 received the Initial Certificate (Form 2), seven received temporary Rejection Certificates (Form 3), eight received permanent Rejection Certificates (Form 4), and four received Re-admission Certificates (Form 5). Thus of 1,120 applicants, 1,101 or 98 per cent. were eligible for employment anywhere on a mine.

Re-Examinations.

Normal	408
Pneumoconiosis	85
Early Silicosis	15
Advanced Silicosis	0
Query Tuberculosis	16
Pneumoconiosis with Query Tubercolosis	5
Early Silicosis with Query Tuberculosis	0
Other Conditions	20
	549

These men had previously been examined and some were engaged in the industry prior to this examination. Of the total, 408 received the Initial Certificate (Form 2), five received temporary Rejection Certificates (Form 3), eight received permanent Rejection Certificates (Form 4), 61 received Re-admission Certificates (Form 5), 65 received Special Certificates (Form 9) and in two cases no certificates were issued.

Thus of 549 men re-examined, 469 were eligible for employment anywhere on a mine, 65 were eligible for surface work only, and 15 were not eligible for employment on a mine.

Grouping the two sets of figures discloses that the following Certificates were issued under the Mines Regulation Act:—

Initial Certificate (Form 2)	1,509
Rejection Certificate (Form 3)	12
Rejection Certificate (Form 4)	16
Re-Admission Certificate (Form 5)	65
Special Certificate (Form 9)	65
No Certificate	2
Total	1,669

The percentage of men of normal health to the number examined was 90, compared with 88 per cent. for 1953.

Miner's Phthisis Act.

The amount of compensation paid during the year, totalled £19,897 18s. 9d. compared with £21,393 13s. 4d. for the previous year, a decrease of £1,495 14s. 7d. attributable to the death of some of the beneficiaries and the attainment of the age of 16 years by some of the dependant children.

The number of beneficiaries remaining under the Act on the 31st December, 1954, was 181, being 16 ex-miners and 165 widows.

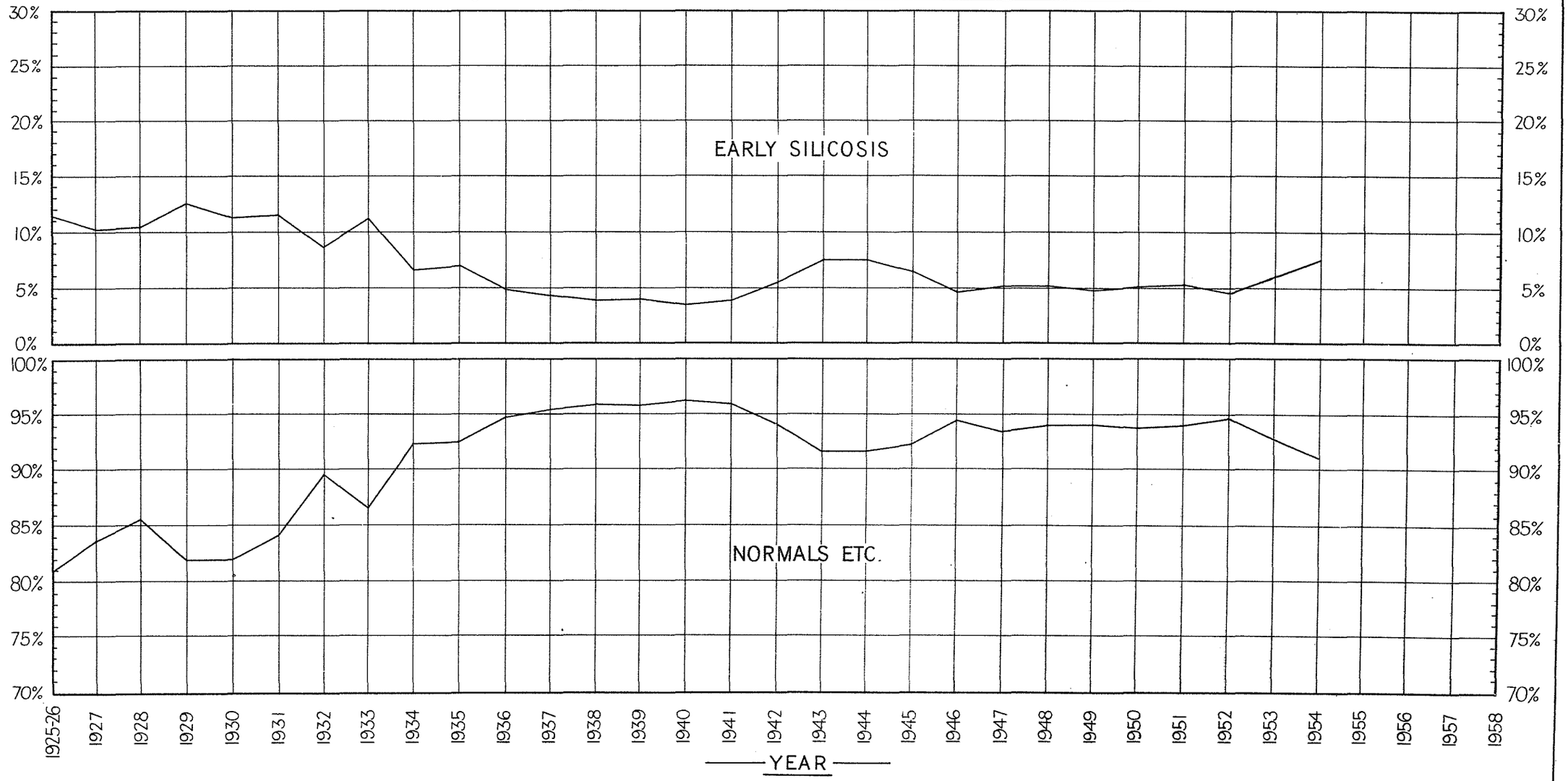
B. ROGERS,

Chairman Miners' Phthisis Board and Superintendent Mine Worker's Relief Act.

PERIODICAL EXAMINATION OF MINE WORKERS

GRAPH Nº 1

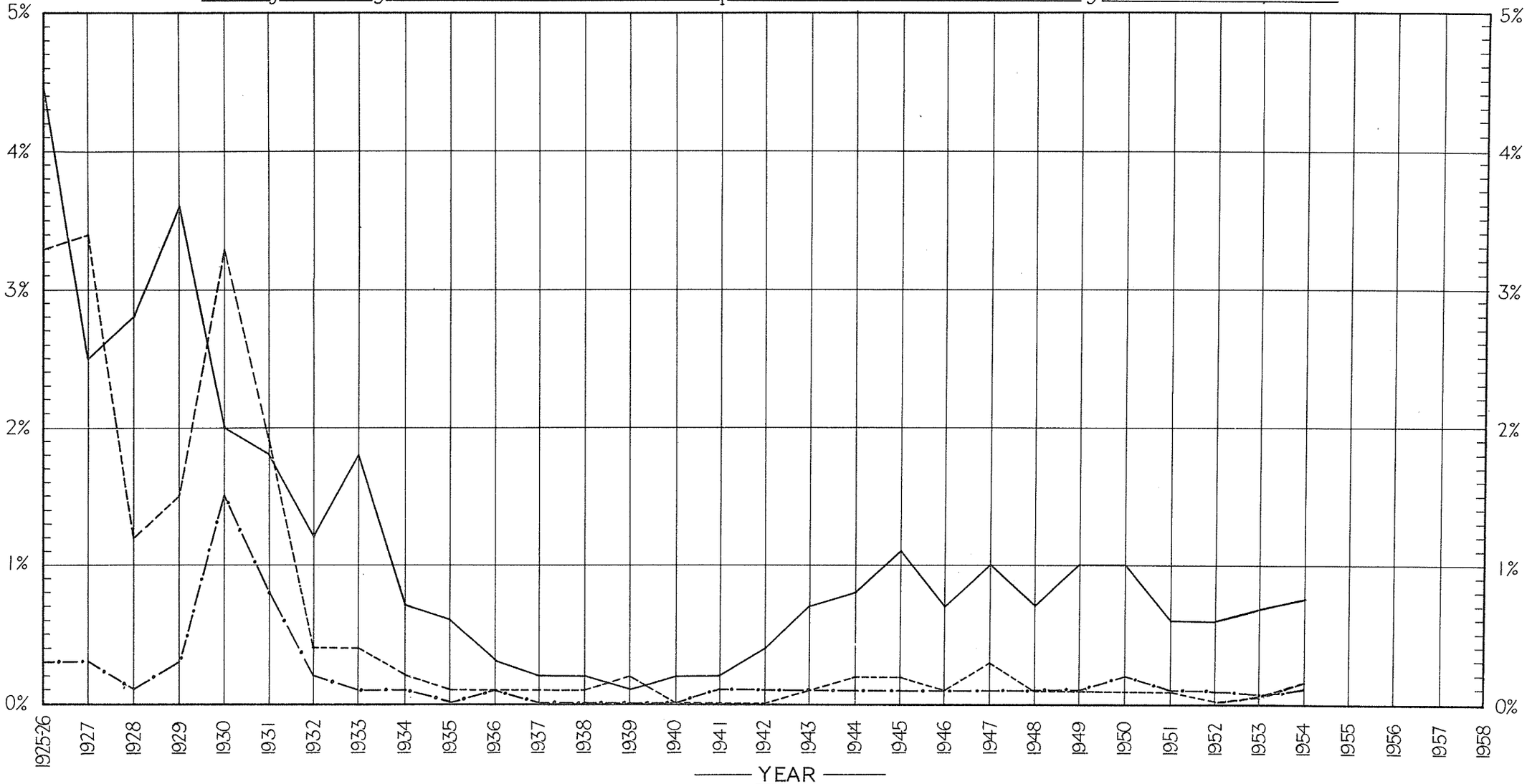
Showing Percentages of Normals and Early Silicotics from 1925-26 onwards



PERIODICAL EXAMINATION OF MINE WORKERS

GRAPH No 2

Showing Percentages of Silicosis Advanced, Silicosis plus Tuberculosis and Tuberculosis only, from 1925-26 onwards.



Silicosis Advanced ———— Silicosis Plus Tuberculosis – – – – – – Tuberculosis Only —·—·—·—

TABLE 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

DIVISION X

Report of the Chief Coal Mining Engineer for the Year, 1954

Under Secretary for Mines:

I have the honour of submitting to the Hon. Minister for Mines the Annual Report on the operations of the Collie Coalfield for the year ended 31st December, 1954.

The aggregate amount of coal sold for the year was 1,017,456 tons as compared with 885,448 tons for the previous year, an increase of 132,008 tons or 14.91 per cent on the output for 1953.

The output comprised 606,777 tons of deep mined coal or 59.64 per cent. of the aggregate, as compared with 492,302 tons or 55.6 per cent. the previous year, and 410,679 tons of open cut or 40.36 per cent. of the aggregate as compared with 393,146 tons or 44.40 per cent. the previous year.

The aggregate output of 1,017,456 tons is a record in the history of the coalfield as also is the deep mined output of 606,777 tons.

The deep mined output will continue to increase and will soon be in a position to produce the State requirements.

During the year two new mines came into production: the Hebe and Western No. 3 Open Cut. The former was opened up by open cut methods to expose the seam for the development of a deep mine at a later date, the seam at this point is approximately 42ft. 0in. thick.

Details of the output of the individual mines and values are shown on Table "A" which also shows, for sake of comparison, similar details for the previous year. Table "A" also shows the relative percentages of deep mined and open cut coal for the individual mines and companies.

The deep mined output shows an increase in all the Amalgamated and Western Collieries mines. The total increase from all the mines is 132,008 tons, of which 114,475 tons is from the deep mines and 17,533 tons from the open cuts.

Apportionment of Output:

The State Electricity Commission were the largest consumers of coal, consuming 349,634 tons or 34.37 per cent. of the aggregate at the Metropolitan Power Stations, and 51,603 tons or 5.07 per cent. of the aggregate at the Collie Power Station. Their total consumption was 401,237 tons or 39.44 per cent. of the total production. It is anticipated that the consumption by the S.E.C. will continue to increase steadily for some time.

The next largest consumers were the Railways with a consumption of 375,148 tons or 36.87 per cent of the aggregate. This is an increase of 4,763 tons on the consumption for 1953. However, during 1955 the consumption by the Railways will decrease due to the use of Diesel Locomotives.

The Cement Works consumed 81,617 tons or 8.02 per cent. of the total, as compared with 66,846 tons the previous year, or an increase of 14,771 tons. During 1955 it is the intention of the Cement Works to change over to burning residual oil and eliminate entirely the use of coal. If such eventuates it will have serious repurcussions on the coal mining industry.

The Kalgoorlie Electricity and Power Corporation also intend changing over to wood burning.

The effect of the two above industries eliminating the use of coal will cause a surplus of approximately 2,500 tons per week of small coal, an excess of which is already being produced. The companies will therefore have to adjust the excess production of small coal to meet the demand as otherwise much small coal will have to be put on grass.

The total amount of coal consumed by the Cement Works and the K.E.P.C. during the year was 123,991 tons and should both these consumers cease using coal then production need only be approximately at the rate of 900,000 tons per year, provided that no other consumers cease using coal.

The indications, however, are that other private consumers will also use alternative fuels and thus cause a grim situation for the industry.

Mechanisation:

As previously stated the deep mines produced a record tonnage in the history of the coalfield of 606,777 tons of which no less than 89.1% was produced and transported by mechanical means. This compares with 82.24% the previous year. The Collie Coalfield is thus by far the most highly mechanised in Australia. However, there are some instances where hand filling into scraper chain conveyors would probably yield better results and the Companies would be well advised, in such cases, to experiment with same.

Statistics:

Table "F" shows the number of persons employed at the indivdual mines, also the output from each mine and the manshifts worked in each category.

The total average number of men employed was 1230 as compared with 1096 for the previous year. The number of faceworkers increased from 290 during 1953 to 378 during the period under review.

The percentage of manshifts worked on the coal face was 29.1% as compared with 24.99% the previous year. This increase in faceworkers reflected itself in the O.M.S. which increased from 1.57 tons during 1953 to 1.94 tons in 1954. A further increase in faceworkers is essential to increase the O.M.S. to at least 3 tons per manshift. This could be achieved by concentrating the labour force on to double units instead of single units so as to limit the amount of non-productive labour to a minimum. The managements are now considering the above policy.

Developments:

The following is a brief description of the re-organisation and developments at each of the individual mines:

AMALGAMATED COLLIERIES.

Co-operative:

The output from this mine increased from 59,802 tons during 1953 to 123,386 tons during this year. This is an appreciable increase of over 100%. There is no reason why a further similar increase should not take place when the fault on the South side is proved and developments commenced in this area. The management would be well advised to accelerate this very important work as, although much coal remains to be worked on the North side of the fault, the future of the mine lies on the South side.

The erection of new bath and change rooms continues slowly. The need for the completion of same is important as the existing rooms are congested.

The erection of the new screening plant and sidings also continued but were held up due to slow deliveries of plant.

When the work on the two projects mentioned is complete this mine will become one of the most modern in Australia, and when the fault is proved it should be one of the largest mines in Australia. It should certainly become one of the largest in Collie.

Proprietary:

In view of the poor quality of coal in the top seam of this mine, further expenditure to bring it into an economical state was not, in the opinion of the consumers, justified and it was decided to close the mine.

Neath:

This mine continues to develop rapidly and a reasonable output for many years is assured. Although most of the output is obtained from developments, it increased from 66,512 tons in 1953 to 69,105 tons in 1954.

The Continuous Miner continues to give excellent service. The only objection against increasing the output by Continuous Miner methods is the amount of small coal produced in the process. The markets should adjust themselves to this factor as they have done in Europe, as, in my opinion, the increasing use of Continuous Miners could produce all the coal required at a much more attractive price.

Arrangements are in hand for the installation of new sidings and screening plant which are essential before the mine can be brought into full production.

Ewington:

This mine is still in the process of development. It was commenced late in 1953 and only produced 3,850 tons during that period as against 10,455 tons during 1954.

It is the intention of the Company to continue with developments only for some considerable distance before bringing the mine into production. One cannot dispute the wisdom of this policy as it is the intention of the Company to ultimately develop this mine into a large producer which can only be achieved when developments are well ahead of production.

Westralia and Black Diamond:

It is the intention of the Company to ultimately couple these two mines into one. At present both mines are in the development stage and will continue as such for some considerable time.

The existing system of work with the use of shuttle cars is open to criticism as the floor conditions are not conducive to obtaining the most efficient results. Furthermore the Westralia seam contains a band of dirt, varying in thickness up to 2 feet 3 inches, in the middle of the seam, which with mechanised mining makes it difficult to produce clean coal as loaders cannot discriminate between coal and dirt. Unless satisfactory arrangements can be made for the efficient cleaning of this coal then history may repeat itself, as the markets have changed from a sellers to a buyers, and discriminating purchasing of coal on quality will take place.

Stockton:

The output from this mine is wholly produced by hand filling. No mechanisation or any re-organisation has taken place.

Prior to any mechanisation taking place it is necessary to re-organise the transport system and before doing so it is necessary to put down further boreholes to prove continuity or otherwise of the two seams in production. It is hoped to complete the necessary boring during the coming year.

WESTERN COLLIERIES.

Western No. 1:

This mine has now probably reached its potential output unless the Company decides to develop the other two seams. It is my opinion that this mine should have been developed from the bottom seam on the retreating block system. I would again recommend the management to seriously consider this suggestion.

Western No. 2:

The short career of this mine is one of much misfortune caused by the adverse geological conditions in the form of washouts or vugs. The large quantities of water contained in these vugs have on numerous occasions inundated the workings. Developments have consequently been seriously affected.

The main dip headings were inundated with slurry and had to be abandoned on this account. It will be necessary to recover the main headings before the mine can be completely developed.

It is my considered opinion that if the geological conditions improve sufficiently for normal developments to take place it should be developed on the retreating system of work.

GRIFFIN COLLIERIES:

Griffin:

This mine was closed late during the year due to the heavy financial losses incurred in its operation. The Hebe Mine was developed to take its place and the labour was transferred to this mine.

Wyvern:

As stated in previous Annual Reports the working conditions were adversely affected by geological disturbances in the form of vugs and faults. The workings are confined between two major faults which are converging on each other, and as the workings advance closer to where the faults will probably meet ultimately the conditions will deteriorate.

If the assumption is correct then the whole of the workings could be be cut out almost overnight. The direction of the faults is fairly consistent and being so the management would be well advised to drive the headings at right angles to the faults.

Phoenix:

This mine continues to yield satisfactory results from a production point of view.

An amended form of retreating system is in operation and from experience gained with the system of work it indicates that with the full retreating system better results could be achieved.

In view of the experience gained it is difficult to understand the reluctance of the management in this matter.

It is unfortunate that this seam contains a band of carbonaceous shale approximately 15 inches thick on the bottom of the seam.

Centaur:

This mine is still operated under Section 17 of the Coal Mines Act. Only dip headings are in progress and output is therefore limited. The dip headings should be continued for some considerable time before any lateral headings are commenced.

Hebe:

This mine was commenced late in the year so as to absorb the labour involved in the closure of the Griffin Mine.

The seam to be developed is the thick seam now worked at the Muja Open Cut.

It is the intention of the management to develop this mine in the middle of the seam thus leaving approximately 12ft. 0in. of coal as a roof and floor of the seam.

The wisdom of this policy is questionable as it will be difficult, in practice, to keep on the same horizon unless the seam contains a well-defined parting, which will be unusual at Collie.

General:

Much development is needed at many of the deep mines in order to place development well ahead of production.

As no mine can reach and maintain its potential output until the above principle is accomplished, then it is of paramount importance that all necessary developments proceed with speed and without interruption.

Much has been accomplished, but much still remains to be accomplished and the reluctance of the managements to achieve the objective and maintain it is incomprehensible.

I would reiterate my views on the system of work and state that it is my considered opinion that all the Collie seams lend themselves to the retreating system of work and I have every confidence that many of the roof and other difficulties now experienced would be eliminated if the system was put into operation.

It is also my opinion that overcutting would also eliminate many roof difficulties and probably create roof conditions whereby roof control would become much easier. Shear-cutting of both sides would also, in my opinion, prevent shedding of the pillars.

The essence of good and efficient mining is good roof control, and it is difficult to comprehend why the subject has not been studied at Collie, and I would again recommend that the managements devote to the subject the time it warrants as I am convinced that the application of a little science to the matter of roof control will pay handsome dividends.

The industry is now facing the most difficult time of its career due to the increasing use of alternative fuels, especially residual oil from the Kwinana Refineries. However, due to the reorganisation and mechanisation over the past five years, the industry can meet the challenge but a programme of rationalistation and further reorganisation will be necessary to concentrate output to the more productive and economical producers.

Accidents:

The total number of serious accidents for the year was 139, as compared with 128 for 1953, an increase of 11 accidents. However the rate per 100 men employed decreased from 12.69 during 1953 to 11.46 during 1954.

The accident rate per 100,000 tons produced also decreased from 26.15 during 1953 to 23.34 during 1954, also the rate per 10,000 manshifts worked reduced from 4.37 during 1953 to 3.97 during 1954.

However, it is regrettable to record that the miscellaneous accidents increased from 339 during 1953 to 381 during 1954, an increase of over 12 per cent., and as stated in previous reports the management would be well advised to investigate this prolific source of accidents as it is possible a considerable reduction could be accomplished.

It is pleasing to record that no fatal accidents occurred.

Staff:

No changes in staff occurred during the year and I would once again record the appreciation and thanks to the Mines Inspectors for the valuable work performed during the year, also the administrative staff at Perth, the managerial staff at the individual mines and the workmen's representatives for their co-operation during the year.

G. MORGAN,
Chief Coal Mining Engineer.

TABLE "A."

TABULATED DATA AND ESTIMATED VALUE OF COAL SOLD IN 1954 FROM INDIVIDUAL MINES AS COMPARED WITH 1953.

Mines.	1953.		1954.		Increase on 1953.	Decrease on 1953.	Estimated Value, 1953.	Estimated Value, 1954.
	Output.	Percentage of Total.	Output.	Percentage of Total.				
Co-operative	59,802	6·75	123,386	12·13	63,584	....	201,988	439,147
Proprietary	50,030	5·65	55,439	5·45	5,409	....	172,643	179,135
Cardiff-Neath	66,512	7·51	69,105	6·79	2,593	....	233,943	247,718
Stockton	62,843	7·10	66,216	6·51	3,373	....	214,121	235,704
Black Diamond Tunnel	4,358	0·49	14,491	1·43	10,133	....	12,881	51,528
Westralia	9,883	1·12	21,270	2·09	11,387	....	32,939	75,865
Ewington	3,850	0·43	10,455	1·03	6,605	....	12,666	37,060
Griffin	52,416	5·92	40,695	4·00	....	11,721	190,724	142,299
Wyvern	63,269	7·15	56,213	5·52	....	7,056	229,586	192,406
Phoenix	28,003	3·16	31,832	3·13	3,829	....	100,640	109,052
Centaur	32,742	3·70	24,262	2·38	....	8,480	121,523	82,976
Hebe	....	....	903	0·09	903	....	....	3,252
Western No. 1	42,104	4·76	62,661	6·16	20,557	....	149,464	221,591
Western No. 2	16,490	1·86	29,849	2·93	13,359	....	58,046	105,108
Total	492,302	55·60	606,777	59·64	114,475	....	1,731,164	2,140,751
Open Cuts—								
Stockton	138,795	15·68	113,143	11·12	....	25,652	472,312	403,061
Black Diamond	6,004	0·68	....	....	....	6,004	22,673	....
Ewington	210,412	23·76	141,930	13·95	....	68,482	717,553	505,209
Muja	6,693	0·75	95,311	9·37	88,618	....	19,979	325,720
Collie Burn	31,242	3·53	....	....	....	31,242	109,392	....
Western No. 3	....	....	60,295	5·92	60,295	....	....	212,347
Total	393,146	44·40	410,679	40·36	17,533	....	1,341,909	1,446,337
Deep Mines	492,302	55·60	606,777	59·64	114,475	....	1,731,164	2,140,751
Open Cuts	393,146	44·40	410,679	40·36	17,533	....	1,341,909	1,446,337
Grand Total	885,448	100·00	1,017,456	100·00	132,008	....	3,173,073	3,587,088

TABLE "B."

Comparison of Overall Production Losses for 1953 *and* 1954 *showing where Losses Occurred.*

Year.	Pit Top Meetings.	Railway Wagon Shortage.	Strikes.	Other Causes.	Total.
1953	2,025	6,445	....	4,320	12,790
1954	3,505	15,745	....	5,515	24,765
Increase on 1953	1,480	9,300	....	1,195	11,975
Decrease on 1953	....	....	....	....	....

TABLE C.

Tabulation showing Apportionment of Coal Sold during 1954.

Colliery.	Locos.	%	Trams (Power)	%	Private Large.	%	Private Small.	%	Cement Works.	%	Kalgoorlie Electric Power and Lighting Corpn. Ltd.	%	Collie Power House.	%	Total
Co-operative .... Black Diamond Westralia .... Proprietary	80,770	47·95	23,000	13·65	4,044	2·41	78	0·05	14,224	8·44	....	....	46,323	27·50	168,439 (*a*)
Ewington Open Cut Ewington	58,960	29·70	79,405	40·00	39,697	20·00	2,412	1·21	12,991	6·54	713	0·36	4,354	2·19	198,532 (*b*)
Cardiff .... Neath	11,583	16·76	11,251	16·28	21	0·03	1,793	2·60	44,435	64·30	....	....	22	0·03	69,105
Stockton .... Stockton Open Cut	117,967	65·77	49,090	27·37	1,430	0·80	34	0·02	9,967	5·56	....	....	871	0·48	179,359
Griffin	1,017	2·50	15,500	38·09	9,898	24·32	6,273	15·42	....	....	7,904	19·42	12	0·03	40,695 (*c*)
Wyvern	658	1·17	26,169	46·55	7,429	13·21	12,589	22·40	....	....	9,358	16·65	10	0·02	56,213
Phoenix	498	1·56	26,212	82·34	629	1·98	3,380	10·62	....	....	1,113	3·50	....	....	31,832
Centaur	10,096	41·61	12,893	53·14	287	1·18	975	4·02	....	....	....	....	11	0·05	24,262
Bebe	277	30·67	387	42·75	....	....	....	....	....	....	240	26·58	....	....	903
Muja Open Cut	33,371	35·01	32,511	33·70	4,759	4·99	14,695	15·42	....	....	10,371	10·88	....	....	95,311
Western No. 1	11,818	18·86	33,380	53·27	6,502	10·38	....	....	....	....	10,961	17·49	....	....	62,661
Western No. 2 Western No. 3 Open Cut	48,133	53·40	40,233	44·63	64	0·07	....	....	....	....	1,714	1·90	....	....	90,144
Total	375,148	36·87	349,634	34·37	74,760 (*d*)	7·35	42,229	4·15	81,617	8·02	42,374	4·17	51,603	5·07	1017456

(*a*) Includes 9,292 tons from Ewington Open Cut. (*b*) Excludes 9,292 tons from Ewington Open Cut. (*c*) Includes 91 tons apportioned to Colliery Boiler Consumption.
(*d*) Includes 35,891 tons supplied to S.E.C. Gas Works by Proprietary Colliery.

TABLE D.

Tabulation showing Apportionment of Collie Coal Sold during the Five Years 1950–1954.

Year.	Railways.	%	S.E.C.	%	Collie Power Station.	%	Cement Works.	%	Kalgoorlie Electric Power and Lighting Corpn. Ltd.	%	Private Consumers.	%	Total.
1950	371,510	45·61	276,156	33·91	32,288	3·96	41,692	5·12	....	....	92,850	11·40	814,496
1951	373,866	44·07	299,156	35·26	27,586	3·25	49,082	5·79	....	....	98,657	11·63	848,347
1952	298,587	35·94	338,913	40·79	38,247	4·60	53,826	6·48	....	....	101,284	12·19	830,857
1953	370,382	41·83	269,744	30·46	44,689	5·05	66,846	7·55	25,294	2·86	108,493	12·25	885,448
1954	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
Increase or Decrease since 1950	3,638	....	73,478	....	19,315	....	39,925	....	42,374	....	24,230	....	202,960
Per cent. Increase since 1950	0·98	....	26·61	....	59·82	....	95·76	....	100·00	....	26·10	....	24·92

TABLE E.

Collie Coal Produced 1945–1954 (*as officially reported to the Mines Department by the Producers*).

	1945.	1946.	1947.	1948.	1949.	1950.	1951.	1952.	1953.	1954.
Open Cuts	112,781	154,392	148,345	145,948	206,650	258,310	368,330	411,344	393,147	410,616
Deep Mines	430,582	487,895	582,161	586,990	543,944	556,042	480,145	419,117	493,035	607,727
Aggregate All Mines	543,363	642,287	730,506	732,938	750,594	814,352	848,475	830,461	886,182	1,018,343
Percentage Open Cuts to Aggregate	20·76	24·04	20·31	19·91	27·53	31·72	43·41	49·53	44·36	40·32
Percentage Deep Mines to Aggregate	79·24	75·96	79·69	80·09	72·47	68·28	56·59	50·47	55·64	59·68
Persons Employed	860	955	1,032	1,064	1,044	1,099	1,125	1,281	1,463	1,560

TABLE F.

Table Showing :—

1. *Average number of men employed at each deep mine and percentage each category to total employed.*
2. *Manshifts actually worked during year at each deep mine and percentage each category to total worked.*
3. *Output per manshift in each category.*

1954.

Name of Mine.	Face Workers.	Haulage.	Underground Maintenance.	Pump attendants.	Officials.	Total Underground.	Total Surface.	Total Employed.
Co-operative—								
No. of men employed	52	23	31	2	9	117	75	192
Percentage to total employed	27·10	12·00	16·10	1·00	4·70	60·90	39·10	100·00
Manshifts worked during year	14,604	6,202	8,844	847	2,852	33,338	22,348	55,686
Percentage Manshifts to total worked	26·20	11·20	15·90	1·50	5·10	59·90	40·10	100·00
O.M.S. in each category	8·75	19·84	13·93	145·30	43·15	3·69	5·50	2·21
Proprietary—								
No. of men employed	22	27	53	6	10	118	51	169
Percentage to total employed	13·00	16·00	31·40	3·50	5·90	69·80	30·20	100·00
Manshifts worked during year	6,081	7,146	14,135	2,322	3,194	32,878	15,254	48,132
Percentage Manshifts to total worked	12·60	14·90	29·40	4·80	6·60	68·30	31·70	100·00
O.M.S. in each category	9·12	7·76	3·92	23·90	17·37	1·68	3·63	1·15
Cardiff-Neath—								
No. of men employed	30	16	43	3	7	99	52	151
Percentage to total employed	19·90	10·60	28·50	2·00	4·60	65·60	34·40	100·00
Manshifts worked during year	8,383	4,290	12,245	1,118	2,582	28,618	15,408	44,026
Percentage Manshifts to total worked	19·00	9·80	27·80	2·50	5·90	65·00	35·00	100·00
O.M.S. in each category	8·27	16·17	5·66	62·06	26·87	2·42	4·50	1·57
Stockton—								
No. of men employed	38	25	16	3	7	89	34	123
Percentage to total employed	30·90	20·30	13·00	2·50	5·70	72·40	27·60	100·00
Manshifts worked during year	10,053	6,470	4,381	1,116	2,147	24,167	10,349	34,516
Percentage Manshifts to total worked	29·10	18·80	12·70	3·20	6·20	70·00	30·00	100·00
O.M.S. in each category	6·58	10·22	15·09	59·27	30·81	2·73	6·39	1·91
Black Diamond—								
No. of men employed	11	1	3	2	2	19	12	31
Percentage to total employed	35·50	3·20	9·60	6·50	6·50	61·30	38·70	100·00
Manshifts worked during year	3,327	97	1,101	682	708	5,915	3,640	9,555
Percentage Manshifts to total worked	34·80	1·00	11·50	7·20	7·40	61·90	38·10	100·00
O.M.S. in each category	4·35	14·93	13·16	21·24	20·46	2·45	3·98	1·51
Westralia—								
No. of men employed	18	3	10	1	3	35	17	52
Percentage to total employed	34·60	5·80	19·20	1·90	5·80	67·30	32·70	100·00
Manshifts worked during year	5,341	814	3,067	414	1,020	10,656	5,150	15,806
Percentage Manshifts to total worked	33·80	5·10	19·40	2·60	6·50	767·40	32·60	100·00
O.M.S. in each category	4·00	26·20	6·95	51·52	20·91	2·00	4·14	1·35

						Total Underground.	Total Surface.	Cent. Workshops.	
Total, Amalgamated Deep mines—									
No. of men employed	178	96	157	18	40	489	139	108	736
Percentage to total employed	24·20	13·00	21·30	2·50	5·40	66·40	18·90	14·70	100·00
Manshifts worked during year	50,099	25,521	44,099	6,741	13,199	139,659	40,981	33,037	213,677
Percentage Manshifts to total worked	23·40	12·00	20·60	3·20	6·20	65·40	19·20	15·40	100·00
O.M.S. in each category	7·19	14·12	8·17	53·46	27·30	2·58	8·79	10·90	1·68

						Total Underground.	Total Surface.	
Griffin—								
No. of men employed	28	14	29	3	7	81	28	109
Percentage to total employed	25·70	12·80	26·60	2·80	6·40	74·30	25·70	100·00
Manshifts worked during year	7,510	3,431	7,629	1,069	2,086	21,725	8,336	30,061
Percentage Manshifts to total worked	25·00	11·40	25·40	3·60	6·90	72·30	27·70	100·00
O.M.S. in each category	5·54	12·13	5·45	28·95	19·96	1·91	5·00	1·38
Wyvern—								
No. of men employed	39	5	25	3	5	77	19	96
Percentage to total employed	40·60	5·20	26·10	3·10	5·20	80·20	19·80	100·00
Manshifts worked during year	10,625	1,291	6,853	1,076	1,453	21,298	5,500	26,798
Percentage Manshifts to total worked	39·70	4·80	25·60	4·00	5·40	79·50	20·50	100·00
O.M.S. in each category	5·28	43·49	8·19	52·18	38·64	2·63	10·20	2·09

Table F—*continued.*

Name of Mine.	Face Workers.	Haulage.	Underground Maintenance.	Pump attendants.	Officials.	Total Underground.	Total Surface.	Total Employed.
Phoenix—								
No. of men employed	21	1	8	1	3	34	11	45
Percentage to total employed	46·70	2·20	17·80	2·20	6·70	75·60	24·40	100·00
Manshifts worked during year	5,370	392	2,074	353	945	9,134	3,053	12,187
Percentage Manshifts to total worked	44·10	3·20	17·00	2·90	7·70	74·90	25·10	100·00
O.M.S. in each category	5·92	81·20	15·34	90·17	33·68	3·48	10·42	2·61
Centaur—								
No. of men employed	26	3	12	3	5	49	18	67
Percentage to total employed	38·80	4·50	17·90	4·50	7·40	73·10	26·90	100·00
Manshifts worked during year	6,878	862	3,572	1,004	1,790	14,106	5,245	19,351
Percentage Manshifts to total worked	35·50	4·50	18·50	5·20	9·20	72·90	27·10	100·00
O.M.S. in each category	3·52	28·14	6·79	24·16	13·55	1·71	4·62	1·25
Hebe—								
No. of men employed	....	....	....	....	....	....	1	1
Percentage to total employed	....	....	....	....	....	....	100·00	100·00
Manshifts worked during year	....	....	....	....	....	....	218	218
Percentage Manshifts to total worked	....	....	....	....	....	....	100·00	100·00
O.M.S. in each category	....	....	....	....	....	....	4·14	4·14
Total, Griffin Deep Mines—								
No. of men employed	114	23	74	10	20	241	77	318
Percentage to total employed	35·80	7·20	23·30	3·20	6·30	75·80	24·20	100·00
Manshfits worked during year	30,383	5,976	20,128	3,502	6,274	66,263	22,352	88,615
Percentage Manshifts to total worked	34·30	6·70	22·70	4·00	7·10	74·80	25·20	100·00
O.M.S. in each category	5·09	25·90	7·69	44·20	24·67	2·33	6·92	1·74
Western No. 1—								
No. of men employed	67	7	10	1	7	92	32	124
Percentage to total employed	54·00	5·70	8·00	0·80	5·70	74·20	25·80	100·00
Manshifts worked during year	16,777	1,859	2,748	362	2,166	23,912	9,829	33,741
Percentage Manshifts to total worked	49·70	5·50	8·20	1·10	6·40	70·90	29·10	100·00
O.M.S. in each category	3·73	33·70	22·80	173·10	28·93	2·62	6·37	1·85
Western No. 2—								
No. of men employed	19	8	3	....	3	33	19	52
Percentage to total employed	36·50	15·40	5·80	....	5·80	63·50	36·50	100·00
Manshifts worked during year	4,711	2,011	805	....	1,086	8,613	5,397	14,010
Percentage Manshifts to total worked	33·60	14·40	5·70	....	7·80	61·50	38·50	100·00
O.M.S. in each category	6·34	14·86	37·14	....	27·53	3·47	5·54	2·13
Total, Western Deep Mines—								
No. of men employed	86	15	13	1	10	125	51	176
Percentage to total employed	48·80	8·50	7·40	0·60	5·70	71·00	29·00	100·00
Manshifts worked during year	21,488	3,870	3,553	362	3,252	32,525	15,226	47,751
Percentage Manshifts to total worked	45·00	8·10	7·40	0·80	6·80	68·10	31·90	100·00
O.M.S. in each category	4·30	23·91	26·05	255·70	28·46	2·84	6·07	1·93
Grand Total all Deep Mines—								
No. of men employed	378	134	244	29	70	855	375	1,230
Percentage to total employed	30·70	10·90	19·80	2·40	5·70	69·50	30·50	100·00
Manshifts worked during year	101,970	35,367	67,780	10,605	22,725	238,447	111,596	350,043
Percentage Manshifts to total worked	29·10	10·10	19·40	3·00	6·50	68·10	31·90	100·00
O.M.S. in each category	5·96	17·18	8·96	57·30	26·74	2·54	5·44	1·94

TABLE G.

SERIOUS ACCIDENTS—COLLIE COALFIELD, 1954.

Month	Major Injuries—Exclusive of Fatal.																						Minor Injuries.										
	Fractures.											Amputations.						Loss of Eye.	Serious Internal.	Hernia.	Dislocation.	Other Major.	Total Major.	Fractures.										
	Head.	Shoulder.	Arm.	Hand.	Spine.	Rib.	Pelvis	Thigh.	Leg.	Ankle.	Foot.	Arm.	Hand.	Finger.	Leg.	Foot.	Toe.							Finger.	Toe.	Head.	Eyes.	Shoulder.	Arm.	Hand.	Back.	Rib.	Leg.	Foot.	Other Minor.	Total Minor.
Jan.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	2	....	....	1	....	....	4
Feb.	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	1	....	....	....	1	....	4	....	....	....	1	....	2	1	....	4	2	3	13
Mar.	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	1	....	1	3	....	....	....	....	1	....	3	....	3	....	1	8
Apr.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	....	....	4	1	....	2	1	8
May	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	1	....	....	1	1	2	1	....	6	1	15
June	....	....	1	1	1	1	....	....	....	....	1	....	....	1	....	....	....	....	....	....	....	....	6	....	1	....	....	....	6	6	2	....	1	1	12
July	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	1	....	....	1	....	....	1	2	1	1	2	1	10
Aug.	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	1	2	1	1	....	....	....	2	5	....	....	1	1	13
Sept.	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	2	....	1	....	....	....	....	....	1	....	....	....	3	5
Oct.	....	....	....	....	1	1	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	1	4	....	1	....	....	....	....	2	2	....	5	1	1	12
Nov.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	2	....	....	....	2	2	3	1	....	1	12
Dec.	....	....	....	....	....	1	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	2	....	....	2	....	....	1	....	2	....	2	....	1	8
Total	....	....	1	3	1	4	1	....	....	1	4	....	....	3	....	....	1	....	....	3	1	4	27	1	6	5	....	3	6	27	16	4	26	9	17	120

TABLE H.

ACCIDENT RATE FOR INDIVIDUAL MINES, SHOWING COMPARISON WITH 1953 (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.											
	1953.	1954.	1953.	1954.	1953.	1954.	1953.	1954.	1953.	1954.	1953.	1954.	1953.	1954.
Co-operative	2	6	10	18	12	24	137	192	8·76	12·50	20·07	19·45	2·53	4·31
Proprietary	6	13	22	17	28	30	159	169	17·61	17·75	55·97	54·11	5·76	6·23
Cardiff-Neath	2	....	13	17	15	17	127	151	11·81	11·25	22·55	24·6	3·62	3·86
Stockton	6	3	16	12	22	15	115	123	19·13	12·19	35·01	22·65	6·34	4·34
Westralia	....	....	4	4	4	4	14	52	28·57	7·69	40·47	18·8	5·52	2·53
Black Diamond....	....	1	2	3	2	4	10	31	20·00	12·87	45·89	27·6	3·52	4·18
Griffin	2	2	14	5	16	7	120	109	13·33	6·41	30·53	17·2	4·64	2·33
Wyvern	1	....	8	10	9	10	93	96	9·68	10·41	14·22	19·00	3·34	3·73
Phoenix	....	....	2	6	2	6	42	45	4·76	13·33	7·14	18·85	1·65	4·92
Centaur	....	1	5	2	5	3	67	67	7·46	4·47	14·82	12·36	2·51	1·60
Western No. 1	....	2	8	12	8	14	83	124	9·64	11·29	19·00	22·35	3·40	4·14
Western No. 2	1	1	2	4	5	5	42	52	11·90	9·61	30·32	16·95	4·13	3·56
Total	20	29	108	110	128	139	1,009	1,211	12·69	11·46	26·15	23·34	4·37	3·97

NOTE : The above statistics do not include the following-

Muja Open Cut	4
Ewington Open Cut	1
Western No. 3 Open Cut	3
	8

TABLE I.

TABLE SHOWING FATAL ACCIDENT RATE PER 1,000 PERSONS EMPLOYED FOR EACH YEAR AND PROGRESSIVELY SINCE 1929 TO DATE.

Year.	Men Employed.		Fatal Accident.		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	13,906	1	21	1·05	1·51
1947	1,032	14,938	....	21	....	1·40
1948	1,064	16,002	....	21	....	1·31
1949	1,044	17,046	1	22	0·96	1·29
1950	1,099	18,145	1	23	0·91	1·27
1951	1,125	19,270	2	25	1·77	1·29
1952	1,281	20,551	2	27	1·56	1·31
1953	1,463	22,014	2	29	1·37	1·32
1954	1,560	23,574	....	29	....	1·23

COAL MINES REGULATION ACT, 1946-51.

ANNUAL REPORT OF THE BOARD OF EXAMINERS FOR MINE MANAGERS, UNDER MANAGERS AND DEPUTIES.

The Under Secretary for Mines:

We submit herewith for the information of the Hon. Minister for Mines, the Annual Report of the Board of Examiners for the year 1954.

May Examinations.—There were no applicants for First or Second Class Certificates of Competency.

There were thirteen applicants for Third Class Certificates of Competency, but of these only twelve were eligible to take part, the other applicant not having had sufficient experience. Of these twelve only one passed, three failed completely, the remainder failing in one subject only, i.e. Arithmetic. It was decided that as these eight candidates had failed in a subject common to all they would be permitted to take part in a supplementary examination to be held later in the year. This examination was held on 25th August, 1954 and six were successful, thus enabling them to obtain their Third Class Certificates.

October Examination.—There were no applicants for First or Second Class Certificates of Competency.

There were fourteen applicants for Third Class Certificates of Competency, but of these only twelve were eligible to take part. One applicant was ineligible because of insufficient experience and the other did not attend owing to illness. Of the twelve who took part only six were successful in obtaining a pass.

During the year thirteen Certificates were issued as follows:—

Third Class Certificates of Competency:

Adams, J.
Ainsworth, L.
Bastow, E.
Borlini, P.
Davies, J. M.
Greaves, M.
Greaves, N.
Jones, W. H.
Piavanini, L. P.
Riley, J. B. G.
Scott, C. S.
Simmonds, A. C.
Wallis, E. B.

Third Class Reciprocal Certificate of Competency was issued to Mr. T. A. Summerville, holder of a Third Class Certificate issued in New South Wales.

G. MORGAN,
Chief Coal Mining Engineer, Chairman.

H. A. ELLIS,
Government Geologist, Member.

C. K. SWEENEY,
Senior Inspector of Mines, Member.

MINING STATISTICS

to 31st December, 1954

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(7)—95047

TABLE I.

PRODUCTION OF GOLD AND SILVER FROM ALL SOURCES, SHOWING IN FINE OUNCES THE OUTPUT AS REPORTED TO THE MINES DEPARTMENT DURING 1954, AND THE TOTAL PRODUCTION TO DATE.

(*Note.*—Lease numbers in brackets indicate that the holding was *voided* during the year.)

(*Note.*—* denotes mainly derived from treatment of tailings. † denotes mainly derived from Silver/Lead Ores and Concentrates. ‡ denotes mainly derived from Copper Ores and Concentrates.

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1954.					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	....
Hall's 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	....	....	....	....	....	....	....	6·15	18·01	....
Ruby Creek	....	(98) Goliath	....	....	....	....	....	....	....	120·70	103·72	....
		97 Ruby Queen	....	....	....	....	....	....	....	2,959·25	1,637·68	2·14
		(100) St. Lawrence	....	....	....	....	....	....	....	10·00	11·32	....
		Voided leases	....	....	....	....	....	....	16·05	12,771·50	9,504·78	....
		Sundry claims	....	....	....	....	....	12·71	....	281·25	183·30	....
		From Goldfield generally :—										
		Sundry claims	....	....	....	....	....	....	....	....	....	†20·98
		Reported by Banks and Gold Dealers	43·93	38·68	....	....	....	8,767·61	1,503·09	·75	2·53	....
		Totals	**43·93**	**38·68**	....	....	....	**8,926·39**	**2,537·61**	**22,641·90**	**17,145·82**	**128·76**

West Kimberley Goldfield.

Napier Range		Devonian Silver Lead Mine	....	....	....	....	†2,118·44	....	....	....	....	†13,575·29
From Goldfield generally :—												
Sundry claims	....	....	....	....	....	....	1·30	24·68	1·00	2·49	....
Totals	....	....	....	....	**2,118·44**	**1·30**	**24·68**	**1·00**	**2·49**	**13,575·29**

Pilbara Goldfield.

MARBLE BAR DISTRICT.

Bamboo Creek	(1126)	Abbey	....	....	5·00	1·44	·23	....	....	15·50	4·76	·45
	1120	Bamboo Queen	....	....	25·00	7·52	·34	....	....	25·00	7·52	·34
	1107	Bulletin	....	....	....	....	....	....	....	845·50	416·91	2·02
	850	Federation	....	....	54·00	38·26	1·98	....	8·22	3,026·00	2,203·86	6·35
	1118	Kitchener	....	....	59·00	21·24	1·05	....	....	71·00	27·69	1·05
	1095, etc.	Mt. Prophecy Leases	....	24·50	69·00	47·79	10·67	....	24·50	1,746·00	861·66	49·63
	817	Prince Charlie	....	....	133·00	59·65	9·61	....	3·68	4,048·00	3,663·51	64·43
	1072	Princess May	....	....	....	....	....	....	....	68·50	21·36	....
	924	True Blue	....	....	162·00	(*a*)	....	....	....	2,255·25	85·22	....
		Voided leases	....	....	....	....	....	13·54	560·19	46,222·35	53,500·67	2·17
		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	....	....	....	....	†1,003·04	....	....	....	....	†16,484·55
Lalla Rookh	....	Voided leases	....	....	....	....	....	....	4·78	3,612·00	4,696·33	574·01
		Sundry claims	....	....	....	....	....	....	....	7,943·00	7,675·09	....
Marble Bar	930 (956)	Alexander Leases	....	....	....	....	....	....	....	354·50	120·94	·81
	1094	Blue Bar	....	....	....	....	....	....	....	361·00	51·05	....
	927, etc.	Halley's Comet	....	....	(*b*)	859·62	180·52	....	....	5,670·00	5,853·45	634·93
	912	Homeward Bound	....	....	....	....	....	....	....	6,292·25	3,111·75	....
	1125	Laura Dawn	....	....	....	30·78	2·33	....	....	28·00	36·80	3·06
	1121	Little Portree	....	....	73·00	36·50	4·51	....	....	103·00	66·88	6·93
	1127	New Atlas	....	....	....	....	....	45·98	....	....	....	2·72
	1089	Repeater	....	....	....	....	....	....	....	548·20	123·83	6·26
		Voided leases	....	....	....	....	....	....	199·09	159,638·04	148,525·67	583·57
		Sundry claims	....	....	345·75	62·18	2·84	67·08	251·77	20,459·04	12,699·67	9·43
North Pole	1122, 1124	Normay Leases	....	....	....	1·07	....	....	....	1,465·00	1,241·09	1,697·74
		Voided leases	....	....	....	....	....	....	....	4,339·00	1,930·51	260·08
		Sundry claims	....	....	....	....	....	....	....	669·75	298·62	15·82
North Shaw	....	Voided leases	....	....	....	....	....	7·53	....	1,072·45	996·29	....
		Sundry claims	....	....	....	....	....	2·84	579·91	179·75	121·72	....

(*a*) Gold content too fine for plate recovery—Purchased by State Battery. (*b*) Gold recovered from previous year's Exported Concentrates.

Table I.—*Production of Gold and Silver from all sources, etc.*—continued.

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1954.					Total Production.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240 lb.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240 lb.).	Fine ozs.	Fine ozs.
PILBARA GOLDFIELD—continued.												
MARBLE BAR DISTRICT—*continued.*												
Pilgangoora	....	Voided leases	....	....	....	....	....	16·65	....	2,255·00	403·60	....
		Sundry claims	....	....	....	....	....	161·08	45·64	481·60	146·39	....
Sharks	1081, etc.	Table Top Leases	....	....	....	....	....	....	....	959·25	548·05	17·28
		Voided leases	....	....	....	....	....	1·43	....	1,739·50	1,969·65	1·16
		Sundry claims	....	....	....	....	....	163·14	47·93	1,150·75	1,668·11	·97
Talga Talga	....	Voided leases	....	....	....	....	....	....	93·15	1,799·00	1,760·68	....
		Sundry claims	....	....	....	....	....	76·17	85·18	1,975·90	1,499·86	·70
Tambourah	....	Voided leases	....	....	....	....	....	....	73·90	1,576·50	1,882·29	....
		Sundry claims	....	....	....	....	....	89·52	294·75	3,742·25	2,689·78	....
Warrawoona	1013	Trump	....	....	86·00	4·35	·45	....	....	4,085·55	631·25	10·36
		Voided leases	....	....	....	....	....	....	16·99	13,029·25	18,958·41	13·34
		Sundry claims	....	....	....	....	....	70·98	623·67	6,632·79	4,247·38	·08
Western Shaw	....	Voided leases	....	....	....	....	....	....	....	1,222·50	957·80	....
		Sundry claims	....	....	....	....	....	22·34	67·47	71·50	81·49	....
Wodgina	....	Sundry claims	....	....	....	....	....	....	43·37	·50	....	3·25
Wyman's Well	1084	New Copenhagen	....	....	....	·74	·16	....	....	410·00	83·73	1·35
		Voided leases	....	....	....	....	....	....	42·86	2,977·29	1,258·44	....
		Sundry claims	....	....	....	....	....	4·47	51·52	2,604·46	1,291·29	1·47
Yandicoogina	....	Voided leases	....	....	....	....	....	....	140·76	3,159·20	6,218·83	....
		Sundry claims	....	....	....	....	....	4·32	239·89	574·50	642·82	40·96
		From District Generally :—										
		Sundry Parcels treated at :—										
		State Battery, Bamboo Creek	....	....	....	*293·63	....	....	....	40·00	*11,055·79	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	61·80	·96	....	4·46	4·78	14,451·75	450·12	....	15·41	10·53
		Totals	**61·80**	**25·46**	**1,011·75**	**1,469·23**	**1,222·51**	**15,207·79**	**4,556·40**	**327,110·42**	**323,054·88**	**20,712·65**

NULLAGINE DISTRICT.

Eastern Creek	(276L)	Rose	....	....	....	....	....	....	....	....	333·00	287·21	2·99
		Voided leases	....	....	....	....	....	8·96	8·19	5,261·00	9,567·00	11·77
		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	279L	All Nations	....	....	122·00	33·30	·72	....	....	1,257·50	348·16	·87
	229L	Barton	....	....	....	....	....	1·22	....	6,283·00	3,558·87	35·28
	231L, etc.	Blue Spec Mining Co., N.L.	....	....	6,614·08	1,006·18	6·88	....	....	50,003·10	28,565·59	7·09
	(300L)	Middle Creek	....	....	....	....	....	....	....	310·00	91·38	....
		Voided leases	....	....	....	....	....	....	1·02	16,872·15	11,271·20	7·50
		Sundry claims	....	....	....	....	....	....	....	5,573·10	2,335·57	....
Mosquito Creek	....	Voided leases	....	....	....	....	....	1·07	30·12	8,392·30	12,839·13	....
		Sundry claims	....	....	....	....	....	....	181·64	3,707·44	3,789·21	....
Nullagine	292L	Alice	3·85	72·00	4·00	16·47	12·48	3·85	818·14	98·10	225·89	61·15
	311L	Conglomerate	....	....	....	....	....	....	....	84·00	6·43	·43
	294L	Nullagine View	....	....	....	....	....	....	289·63	41·00	397·35	23·69
	289L	Paul's Leader	....	....	....	....	....	....	269·40	25·50	348·52	12·60
		Voided leases	....	....	....	....	....	....	40·56	9,042·25	12,624·16	·20
		Sundry claims	....	....	226·00	107·40	7·92	315·53	678·24	6,228·55	10,427·26	15·22
Spinaway Well	M.Cs. 34L, 35L	Stubbs & Baker	....	....	....	....	....	....	....	....	....	‡320·18
Twenty Mile Sandy	....	Voided leases	....	....	....	....	....	....	16·97	7,243·70	9,007·72	·32
		Sundry claims	....	....	....	....	....	33·10	30·50	7,654·85	6,255·56	2·76
	From District Generally :—											
	Sundry Parcels treated at :—											
	Barton Battery	....	....	....	....	....	....	....	....	....	*45·19	....
	McKinnon, W. M. (D.Cs. 10L, etc.)	....	....	....	....	....	3·89	2·23	....	....	....
	Various Works	....	....	....	....	....	....	....	124·50	*8,110·35	1·37
	Reported by Banks and Gold Dealers	4·76	....	....	....	·72	9,882·04	100·89	....	29·81	5·80
	Totals	**8·61**	**72·00**	**6,966·08**	**1,163·35**	**28·72**	**10,249·66**	**2,488·55**	**130,835·39**	**123,931·27**	**526·12**

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	....

Table I.—*Production of Gold and Silver from all sources*—continued.

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1954. Alluvial. Fine ozs.	Dollied and Specimens. Fine ozs.	Ore treated. Tons (2,240 lb.).	Gold therefrom. Fine ozs.	Silver. Fine ozs.	Total Production. Alluvial. Fine ozs.	Dollied and Specimens. Fine ozs.	Ore treated. Tons (2,240 lb.).	Gold therefrom. Fine ozs.	Silver. Fine ozs.
WEST PILBARA GOLDFIELD—continued.												
Mallina	....	Voided leases	....	....	....	....	....	....	....	141·60	128·44	....
Nicol	....	Voided leases	....	....	....	....	....	....	....	30·00	11·47	....
Pilbara	....	Voided leases	....	....	....	....	....	....	48·12	267·00	413·59	....
		Sundry claims	....	....	....	....	....	1·11	86·24	163·00	255·42	....
Roebourne	173 (174)	Corderoy Mines, Ltd.	....	....	....	....	....	....	....	1,954·50	471·13	10·79
		Voided leases	....	....	....	....	....	....	....	442·36	952·91	374·36
		Sundry claims	....	....	....	....	....	15·47	3·29	1,934·85	754·91	114·06
Station Peak	....	Voided leases	....	....	....	....	....	177·74	41·37	11,016·00	11,388·18	·08
		Sundry claims	....	....	....	....	....	....	....	86·50	77·23	....
Towranna	....	Voided leases	....	....	....	....	....	....	2·62	3,965·80	5,187·51	....
		Sundry claims	....	....	....	....	....	....	....	22·00	12·35	....
Upper Nicol	....	Sundry claims	....	....	....	....	....	....	....	6·50	2·57	....
Weerianna	....	Voided leases	....	....	....	....	....	....	....	3,200·15	3,214·45	....
		Sundry claims	....	....	....	....	....	....	....	336·00	135·26	1·29
Whim Creek	....	Voided leases	....	....	....	....	....	....	....	....	....	‡883·80
		From Goldfield generally :—										
		Sundry Parcels treated at :										
		Various Works	....	....	....	....	....	....	....	....	*102·39	4·90
		Sundry claims and leases	....	....	....	....	....	....	11·77	....	....	†491·10
		Reported by Banks and Gold Dealers	10·88	....	....	....	·70	6,098·03	177·43	103·50	228·32	·81
		Totals	**10·88**	....	....	....	**·70**	**6,324·19**	**374·67**	**24,680·96**	**24,200·90**	**1,881·19**
Ashburton Goldfield.												
Belvedere	....	Voided leases	....	....	....	....	....	....	9·88	1,560·00	435·86	176·48
Dead Finish	....	Voided leases	....	....	....	....	....	....	....	1,699·00	874·60	·03
		Sundry claims	....	....	....	....	....	....	11·89	104·25	245·08	....
Linden Station	....	Sundry claims	....	....	64·00	88·96	....	....	....	113·35	189·48	....

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	....	....	....	....	†2,785·71	....	....	....	....	†30,953·14
		Reported by Banks and Gold Dealers	....	....	....	....	....	8,885·73	120·11	....	7·12	....
		Totals	....	....	**64·00**	**88·96**	**2,785·71**	**9,262·77**	**479·40**	**6,792·10**	**2,899·40**	**39,136·85**

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	....	21·40	....	....	....	604·47	23·20	....	....	....
		Totals	....	**21·40**	....	....	....	**693·44**	**62·97**	**387·00**	**517·29**	....

Peak Hill Goldfield.

Bulloo Downs	....	Voided leases	....	....	....	....	....	....	....	....	....	†50·09
Egerton	....	Voided leases	....	....	....	....	....	62·31	224·68	7,292·25	6,604·91	....
		Sundry claims	....	....	....	....	....	235·35	23·51	1,501·77	791·34	....
Horseshoe	568P, etc.	Anglo-Westralian Mining Pty., Ltd.	....	....	45,347·00	8,524·11	367·51	....	....	135,872·00	22,847·63	1,407·05
		Prior to transfer to present holders	....	....	....	....	....	....	....	3,914·00	894·44	....
	575P	Labourchere Main Lode	....	....	....	....	....	....	....	535·00	60·38	....
		Voided leases	....	....	....	....	....	15·57	1,975·37	4,371·38	2,684·27	2·00
		Sundry claims	....	....	....	....	....	20·12	829·58	1,939·55	728·57	....
Jimblebar	....	Voided leases	....	....	....	....	....	....	172·75	7,526·25	2,561·95	·58
		Sundry claims	....	....	....	....	....	13·79	65·95	1,048·05	574·16	....
Mt. Fraser	....	Voided leases	....	....	....	....	....	....	....	389·50	320·96	....
		Sundry claims	....	....	....	....	....	88·28	40·61	400·75	341·14	....
Mt. Seabrook	....	Voided leases	....	....	....	....	....	....	5·05	620·25	428·26	....
		Sundry claims	....	....	....	....	....	....	....	1,089·35	803·12	....

Table I.—*Production of Gold and Silver from all sources, etc.*—continued.

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1954.					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	....	....	431·50	26·16	....	....	....	3,636·25	568·38	....
	584P	Dazzle Star	....	....	....	....	....	....	....	207·00	70·21	....
	567P	Miner Bird	....	....	119·00	44·42	....	....	....	1,452·50	675·11	....
	553P	Morning Star	....	....	....	....	....	....	4·43	2,804·25	410·09	....
	587P	Murray Heath	....	....	26·00	2·02	....	....	....	41·00	6·17	....
	506P	No. 1 North	....	....	360·00	73·02	....	....	86·47	7,129·20	1,641·29	....
	492P	North Star	....	....	....	....	....	23·20	69·63	13,186·50	2,079·21	....
	(593P)	Swanie	....	....	....	....	....	....	....	97·00	3·87	....
		Voided leases	....	....	....	....	....	7·39	920·21	521,744·33	247,050·17	2,285·63
		Sundry claims	....	....	160·00	9·66	....	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	(572P)	O.K.	....	....	36·00	3·36	....	....	....	102·00	9·46	....
		Voided leases	....	....	....	....	....	....	23·54	128·50	146·79	....
Wilthorpe	....	Voided leases	....	....	....	....	....	....	....	47·00	20·93	....
		Sundry claims	....	....	....	....	....	....	....	89·00	25·71	....
owereena	....	Voided leases	....	....	....	....	....	....	....	19·50	36·46	....
		Sundry claims	....	....	....	....	....	....	....	117·25	203·16	....
		From Goldfield generally :—										
		Sundry Parcels treated at :										
		Australian Machinery & 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	....
		Totals	....	....	**46,479·50**	**8,682·75**	**367·51**	**3,376·86**	**5,300·33**	**761,223·43**	**320,053·27**	**3,768·47**

East Murchison Goldfield.

LAWLERS DISTRICT.

Kathleen Valley	....	Voided leases	....	....	....	....	....	....	144·85	80,503·66	49,020·54	....
		Sundry claims	....	....	....	....	....	14·37	526·03	5,615·75	2,601·75	....

Lawlers	1236	Waroonga	....	....	....	....	....	....	....	....	....	....	99·40	·50
		Voided leases	....	....	....	....	....	....	25·51	692·45	1,622,917·40	575,150·65	14,803·08
		Sundry claims	....	....	....	....	....	....	400·21	451·61	17,347·48	9,568·69	268·34
Sir Samuel	1357	Twins	....	....	40·00	2·48	....	....	....	....	40·00	2·48	....
		Voided leases	....	....	....	....	....	....	....	359·03	275,377·55	141,827·04	10,234·80
		Sundry claims	....	....	125·00	19·66	....	....	53·89	64·96	7,623·00	4,550·24	·02
	From District generally :—												
	Sundry Parcels treated at :												
	Australian Machinery & Investment Co.		....	....	....	....	....	....	....	....	5·00	*4,291·25	29·00
	Prior to transfer to present holders		....	....	....	....	....	....	....	....	....	*1,371·33	15·64
	Vanguard Cyanide Plant		....	....	....	....	....	....	....	....	4·00	*1,014·04	3·18
	State Battery, Sir Samuel		....	....	....	....	....	....	....	....	53·50	*2,356·81	....
	Various Works		....	....	....	....	....	....	2·12	2·35	1,711·53	*30,788·76	936·21
	Reported by Banks and Gold Dealers		....	....	....	·16	....	6,408·20	101·91	·05	10·00	....	
	Totals		....	....	**165·00**	**22·30**	....	**6,904·30**	**2,343·19**	**2,011,198·92**	**822,652·98**	**26,290·77**

WILUNA DISTRICT.

Coles	662J	Black Adder	....	....	79·00	15·08	....	....	....	1,935·00	1,083·55	....
		Voided leases	....	....	....	....	....	....	....	830·50	156·85	....
		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	....	8,964·35	5,173·34	....
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	....	....	....	1·85	....	....	....	....	1·85	....
	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 :—												
	Black Adder Battery		....	....	....	....	....	....	....	....	*154·02	....
	State Battery Wiluna		....	....	....	....	....	....	....	637·00	*23,679·00	219·70
	Woosnam H.G.		....	....	....	*24·90	....	....	....	....	*76·90	·04
	Various Works		....	....	....	....	....	....	....	139·00	5,010·03	12·68
	Reported by Banks and Gold Dealers		....	....	....	....	....	52·03	56·58	....	58·49	....
	Totals		....	....	**79·00**	**41·83**	....	**224·85**	**1,254·11**	**8,873,436·94**	**1,871,729·21**	**10,282·38**

Table I.—*Production of Gold and Silver from all sources, etc.*—continued.

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1954					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	....	....	....	....	....	5·07	170·20	833·55	915·51	....
Bellchambers	....	Voided leases	....	....	....	....	....	....	111·80	4,349·27	3,130·56	....
	....	Sundry claims	....	....	....	....	....	....	....	1,008·30	547·06	....
Birrigrin	....	Voided leases	....	....	....	....	....	....	820·68	12,042·93	15,086·09	....
	....	Sundry claims	....	....	....	....	....	....	179·92	2,487·55	1,238·22	....
Currans	....	Voided leases	....	....	....	....	....	18·24	222·89	7,252·25	3,116·68	....
	....	Sundry claims	....	....	....	....	....	....	29·38	2,158·75	827·18	....
Errolls	....	Voided leases	....	....	....	....	....	14·17	152·29	14,170·50	9,328·92	....
	....	Sundry Claims	....	....	....	....	....	6·53	399·11	964·75	595·45	....
Hancocks	1074B	Apples	....	....	48·00	56·49	....	....	443·79	1,023·75	3,212·98	....
	1107B	Comedy King	....	....	15·75	10·62	....	....	....	15·75	10·62	....
	....	Voided leases	....	....	....	....	....	....	6,524·37	32,686·50	33,441·16	55·72
	....	Sundry claims	....	....	....	....	....	4·21	142·89	8,459·10	3,219·53	....
Maninga Marley	....	Voided leases	....	....	....	....	....	....	195·20	60,833·48	48,494·40	22·55
	....	Sundry claims	....	....	....	....	....	....	158·16	3,079·65	1,768·16	....
Montague	(967B) (1100B)	North end leases	....	....	....	....	....	....	....	39,877·95	6,556·80	....
	....	Voided leases	....	....	....	....	....	....	100·17	39,672·65	16,888·02	....
	....	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	(1106B)	Hacks	....	....	179·25	58·57	....	....	....	179·25	58·57	....
	958B	Lady Mary	....	....	....	....	....	....	383·35	7,165·75	7,119·35	2·35
	....	Voided leases	....	....	....	....	....	4·75	4,363·69	696,252·57	447,505·37	11,754·22
	....	Sundry claims	....	....	26·50	27·72	....	44·95	1,421·07	15,533·45	6,848·57	....
Youanmi	....	Voided leases	....	....	....	....	....	·36	126·92	731,497·55	273,884·97	10,474·10
	....	Sundry claims	....	....	....	....	....	1·07	18·79	6,258·55	1,814·66	....

From District generally :—															
Sundry Parcels treated at :—															
State Battery Sandstone	....	....	....	....	....	....	*19·63	....	....	....	290·50	*23,572·27	61·02		
State Battery Youanmi	....	....	....	....	....	....	*42·25	....	....	....	40·00	*5,504·08	....		
Sciaresa P.	....	....	....	....	....	....	*36·06	....	....	....	....	*36·06	....		
Various Works	....	....	....	....	....	....	....	....	....	....	92·50	*11,444·26	....		
Reported by Banks and Gold Dealers	....	....	32·30	....	....	....	....	....	1,491·85	52·23	....	20·38	....		
Totals	....		**32·30**	....	**269·50**	**251·84**	....	**1,667·41**	**18,521·80**	**1,728,857·47**	**953,321·40**	**22,495·56**			

Murchison Goldfield.

CUE DISTRICT.

Big Bell	2050 etc.	....	Big Bell Mines, Ltd.	....	....	405,684·00	59,985·49	16,561·27	....	....	5,524,186·00	724,193·58	249,885·49		
	2050	....	(Little Bell)	....	....	....	....	....	....	4·49	579·75	60·95	....		
	....		Voided leases	....	....	....	....	....	....	....	401·00	422·83	....		
	....		Sundry claims	....	....	....	....	....	·39	6·32	382·75	357·46	....		
Cuddingwarra	2273	....	Molly Boss	....	....	12·25	7·68	....	....	....	12·25	7·68	....		
	2266	....	William	....	....	59·00	2·05	....	....	....	68·50	2·52	....		
	....		Voided leases	....	....	....	....	....	10·59	132·46	102,035·16	56,141·91	100·71		
	....		Sundry claims	....	....	210·25	19·26	....	18·46	384·38	9,900·14	5,633·88	9·00		
Cue	2262	....	Table Top	....	....	222·20	94·93	....	....	....	1,060·30	1,031·00	....		
	2247	....	Victory	....	....	....	....	....	....	....	226·75	125·38	....		
	....		Voided leases	....	....	....	....	....	202·71	911·60	45,081·09	221,102·50	69·11		
	....		Sundry claims	....	....	496·00	82·86	....	252·92	894·70	288,796·44	20,290·77	....		
Eelya	2241	....	Eagle Hawk	....	....	....	1·22	....	....	....	1,408·75	417·30	....		
	....		Voided leases	....	....	....	....	....	....	8·78	1,069·00	1,811·26	....		
	....		Sundry claims	....	....	....	....	....	6·20	143·81	2,291·40	1,083·70	....		
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	7,072·00	2,661·56	....		
Tuckabianna	2237	....	Gidgie	....	....	11·50	40·51	....	....	79·16	2,682·65	1,844·35	....		
	(2260)	....	Montorio	....	....	22·25	4·36	....	....	27·09	243·75	143·69	....		
	2244	....	Winston	....	37·17	6·00	17·60	....	....	671·45	630·00	257·03	2·30		
			Voided leases	....	....	....	....	....	649·70	297·68	12,908·48	7,321·43	....		
			Sundry claims	....	....	53·25	13·09	....	151·38	489·40	4,810·85	2,688·95	....		
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 1954.					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 :												
State Battery, Cue			....	....	....	*270·16	1·97	....	....	76·25	*26,030·44	123·99
State Battery, Tuckanarra			....	....	....	....	....	....	....	518·50	*5,535·57	....
Various Works			....	....	....	....	....	....	....	7,340·27	*29,481·92	1,147·77
Reported by Banks and Gold Dealers			8·02	....	....	....	....	3,414·54	107·60	....	22·62	·07
Totals			**8·02**	**37·17**	**406,776·70**	**60,539·21**	**16,563·24**	**5,082·73**	**8,875·35**	**6,789,390·64**	**1,392,379·84**	**272,021·46**
MEEKATHARRA DISTRICT.												
Abbotts	....	Voided leases	....	....	....	....	....	....	26·45	36,841·35	38,775·28	....
		Sundry claims	....	....	....	....	....	....	5·29	3,781·27	2,328·66	....
Burnakura	1849N	New Alliance	....	....	....	....	....	....	....	132·25	114·39	....
		Voided leases	....	....	....	....	....	....	3,247·59	39,040·45	30,775·77	26·90
		Sundry claims	....	....	....	....	....	17·03	129·24	2,486·55	1,310·84	1·54
Chesterfield	1942N, 1946N	Margueritta Leases	....	....	400·00	109·00	....	....	....	1,990·00	524·17	....
	1942N	(Margueritta)	....	....	....	....	....	....	....	732·00	197·73	7·74
	1946N	(Margueritta, East)	....	....	....	....	....	....	....	1,420·00	250·09	10·65
		Voided leases	....	....	....	....	....	29·02	420·32	6,875·26	7,500·57	·80
		Sundry claims	....	....	....	....	....	....	42·19	960·55	740·97	....
Gabanintha	1948N	Fortuna	....	....	1,510·00	231·18	....	....	....	3,130·00	907·28	....
	1943N	Nance	....	....	....	28·94	....	....	....	39·50	47·41	....
	1725N	New Brew	....	....	49·25	19·23	....	....	....	4,828·35	6,287·45	....
		Voided leases	....	....	....	....	....	11·79	38·14	24,864·50	104,929·37	815·57
		Sundry claims	....	....	15·50	4·77	....	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	....

Holden's	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									1,299·25	1,807·41		
	1855N	Commodore			10·00	7·08					1,282·75	403·61		
	1571N	Coolgardie Brilliant, N.L.			162·75	13·70					2,614·11	555·08		
		Prior to transfer to present holders									8,107·50	4,907·48		
	1559N	Ingliston								498·32	1,846·10	1,691·61		
	1951N	Lucky Wheel			12·50	3·81					12·50	3·81		
	1577N	Mopoke								12·47	1,361·50	827·50		
	1956N	New Australia		107·61	32·00	358·57				107·61	32·00	358·57		
	1923N	Peter Pan									337·25	30·92		
	1529N	Prohibition									3950·00	1,918·02	4·25	
	1529N	(Prohibition Gold Mining Co., N.L.)									24,844·25	4,978·31	11·83	
	1529N	Prior to transfer									29,422·00	4,971·30		
	(1934N)	United				·86					117·25	176·92		
	R.C. 75N	Wilson, C. J. and Fisher, W. E.							173·82	43·80	372·50	130·10		
		Voided leases							3·88	1,520·32	1,695,555·51	918,923·61	2,455·04	
		Sundry claims		166·37	661·25	205·18			243·93	954·26	26,100·25	10,742·50		
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			1,025·00	233·61					3,684·00	1,029·14		
	1958N	Mt. Hall			36·00	3·08					36·00	3·08		
		Voided leases							43·25	828·76	116,140·48	73,408·98	167·45	
		Sundry claims			50·00	7·12			120·08	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 1954. Alluvial. Fine ozs.	Dollied and Specimens. Fine ozs.	Ore treated. Tons (2,240 lb.).	Gold therefrom. Fine ozs.	Silver. Fine ozs.	Total Production. Alluvial. Fine ozs.	Dollied and Specimens. Fine ozs.	Ore treated. Tons (2,240 lb.).	Gold therefrom. Fine ozs.	Silver. Fine ozs.
MURCHISON GOLDFIELD—continued.												
MEEKATHARRA DISTRICT—*continued.*												
Yaloginda	1853N	Blue Bird	....	....	....	70·78	....	....	....	7,797·00	2,496·47	....
		Voided leases	....	....	....	....	....	19·03	1,972·23	28,175·54	14,609·36	8·68
		Sundry claims	....	....	78·50	14·86	....	61·89	647·51	10,930·92	5,012·22	....
		From District generally :—										
		Sundry Parcels treated at :										
		State Battery, Meekatharra	....	....	....	*195·26	....	....	....	130·00	*27,222·64	24·34
		Various Works	....	....	....	....	....	....	....	172·75	*13,601·19	342·17
		Reported by Banks and Gold Dealers	4·25	....	....	2·35	·60	12,182·63	179·70	13·50	56·93	·60
		Totals	**4·25**	**273·98**	**4,042·75**	**1,509·38**	**·60**	**14,514·60**	**18,122·38**	**2,281,445·76**	**1,303,214·30**	**5,070·85**
DAY DAWN DISTRICT.												
Day Dawn	573D, etc.	Mountain View Gold, N.L.	....	....	2,324·50	797·57	31·21	....	....	12,710·35	17,292·63	213·51
		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	....	....	22·00	43·10	....	96·42	523·56	13,474·01	6,679·09	·41
Lake Austin	....	Voided leases	....	....	....	....	....	613·00	3,079·62	36,872·20	51,050·49	....
		Sundry claims	....	....	....	....	....	59·07	965·49	3,252·19	1,278·82	....
Mainland	....	Voided leases	....	....	....	....	....	·41	3,296·77	7,575·62	25,026·07	....
		Sundry claims	....	....	....	....	....	17·85	771·56	1,337·95	701·31	....
Pinnacles	676D	Eclipse Amalgamated North	....	....	....	1·83	....	....	....	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	....	....	54·50	6·09	....	62·93	509·50	4,429·17	1,765·50	....
		From District generally :—										
		Sundry Parcels treated at :										
		Various Works	....	....	....	....	....	....	16·61	988·00	1,988·33	....
		Reported by Banks and Gold Dealers	·92	....	....	....	....	2,214·87	37·30	....	12·57	·01
		Totals	**·92**	....	**2,401·00**	**848·59**	**31·21**	**3,236·21**	**11,341·63**	**2,034,598·88**	**1,375,187·01**	**169,424·37**

MOUNT MAGNET DISTRICT.

Jumbulyer	1410M	Gold Bug	....	....	....	....	....	....	2·20	645·70	215·38	....
		Voided leases	....	....	....	....	....	....	13·37	680·10	361·74	....
		Sundry claims	....	....	....	....	....	20·32	116·27	1,205·70	878·98	....
Lennonville	1308M	Empress	....	....	....	....	....	....	....	460·00	167·30	....
		Voided leases	....	....	....	....	....	....	3,226·91	151,042·55	128,400·98	459·62
		Sundry claims	....	....	7·00	3·01	....	23·30	108·82	14,043·57	5,457·92	....
Mt. Magnet	1476M	Cascade	....	....	....	....	....	....	....	10·50	7·14	....
	1255M, etc.	Edward Carson Leases	....	....	125·00	55·79	....	1·82	....	18,015·50	12,891·77	7·76
	1455M	Evening Star	....	....	....	....	....	....	....	382·00	46·08	....
	1287M	Havelock	....	....	....	....	....	....	11·05	4,332·50	840·14	....
	1282M, etc.	Hill 50 Gold Mine, N.L.	....	....	92,411·00	71,813·27	1,940·31	....	....	771,616·90	283,080·60	5,465·37
	1246M	(Neptune)	....	....	....	....	....	....	829·41	8,787·65	4,122·61	·21
	1361M	Jupiter	....	....	....	....	....	....	·83	658·05	261·71	....
	1444M	Late Comer	....	....	27·00	50·76	....	....	2·53	453·50	374·09	....
	1447M	Morning Star	....	....	....	....	....	....	....	387·65	133·05	....
	1505M	Perseverance	....	....	....	....	....	....	....	107·25	11·40	....
	1322M	Three Boys	....	....	....	....	....	....	231·11	578·53	682·98	....
		Voided leases	....	....	....	....	....	29·26	9,580·43	833,683·78	312,078·71	851·39
		Sundry claims	....	....	3·00	40·10	....	122·27	2,626·24	60,057·65	29,641·20	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	29·53	....	....	....	33·75	29·53	....
		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	....	....	....	....	....	....	....	....	125·26	*34,460·61	6·87
	Various Works	....	....	....	....	....	....	....	....	56·06	18,949·24	10·04
	Reported by Banks and Gold Dealers	....	....	....	....	....	....	2,286·74	114·28	8·00	113·15	·22
	Totals	....	....	**92,606·75**	**71,992·46**	**1,940·31**	**2,565·79**	**20,433·75**	**1,888,909·90**	**859,121·64**	**7,563·74**

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	....

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 1954					Total Production.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240 lb.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240 lb.).	Fine ozs.	Fine ozs.
YALGOO GOLDFIELD—continued.												
Field's Find	1113, 1220	Field's Find Central Leases	....	....	....	....	....	....	....	10·00	10·13	·49
	1113	Field's Find	....	....	....	....	....	....	....	44·00	17·96	·10
	1220	Field's Find Central	....	....	....	....	....	....	....	5·00	3·53	....
	1119	Field's Find Central West	....	....	....	....	....	....	....	156·75	39·26	·80
	(1114), 1119	Field's Find Central West Leases	....	....	....	....	....	....	....	4,625·00	1,074·53	56·69
	1207	Rose Marie	....	....	....	....	....	....	....	418·67	252·10	1·52
		Voided leases	....	....	....	....	....	....	226·72	45,475·96	32,547·10	....
		Sundry claims	....	....	....	....	....	5·77	188·67	5,458·85	1,777·91	....
Goodingnow	1063	Ark	....	....	....	....	....	....	12·49	2,270·50	1,927·29	....
	1025	Carnation	....	....	....	....	....	....	....	18,926·05	13,993·00	....
	1206	Orchid	....	....	....	....	....	....	....	157·50	33·74	....
	1145	Oversight	....	....	....	....	....	....	....	2,338·35	875·92	....
	1208	Oversight South	....	....	....	....	....	....	8·03	2,935·00	1,214·21	....
		Voided leases	....	....	....	....	....	146·70	280·63	56,984·81	50,170·45	....
		Sundry claims	....	....	....	....	....	152·96	169·70	10,222·30	5,100·59	....
Gullewa	(1189)	King Solomon's Mine	....	....	....	....	....	....	....	315·00	135·89	5·79
	(1189, etc.)	(King Solomon's Mines, Ltd.)	....	....	....	....	....	....	....	5,130·10	2,101·25	26·49
		Voided leases	....	....	....	....	....	....	19·05	34,468·50	18,729·37	81·42
		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	....	....	....	....	....	1·66	44·72	1,134·60	498·90	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	Rivival	....	....	....	....	....	....	....	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	....	....	....	....	....	....	....	30·88	829·00	206·46	....
Pinyalling	(1217)	Broken Doll	....	....	....	....	....	....	....	219·99	7·55	148·38	....
		Trump	....	....	....	....	....	....	....	....	15·00	38·31	....
		Voided leases	....	....	....	....	....	....	....	93·80	2,296·35	959·50	....
		Sundry claims	....	....	....	....	....	3·13	134·09	1,492·50	954·82	....
Retaliation	....	Voided leases	....	....	....	....	....	....	....	....	5,089·25	1,872·98	....
		Sundry claims	....	....	....	....	....	....	....	....	778·25	304·71	....
Rothsay	1216	Dollar	....	....	....	....	....	....	....	....	....	2·14	....
		Voided leases	....	....	....	....	....	....	24·06	40,680·75	10,775·84	....
		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 Goldfields generally :—											
	Sundry Parcels treated at :											
	State Battery, Payne's Find	....	....	....	....	....	....	....	....	38·50	*4,532·78	....
	State Battery, Warriedar	....	....	....	....	....	....	....	....	....	*6,537·13	·37
	State Battery, Yalgoo	....	....	....	....	....	....	....	....	....	*1,200·51	....
	Various Works	....	....	....	....	....	9·42	....	664·00	3,325·00	99·84
	Reported by Banks and Gold Dealers	....	....	....	....	....	944·94	58·32	....	48·90	·20
	Totals	....	....	....	....	....	**1,786·09**	**3,212·57**	**441,403·83**	**263,534·74**	**1,502·56**

Mt. Margaret Goldfield.

MOUNT MORGAN 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 claims	....	....	....	....	....	....	591·62	2,160·30	2,011·78	....
Linden	529F	Second Fortune	....	....	....	....	....	....	....	543·00	292·75	....
		Voided leases	....	....	....	....	....	7·53	566·97	72,376·81	65,915·60	·68
		Sundry claims	....	....	....	....	....	132·11	244·96	19,272·35	13,768·96	....

Table I.—*Production of Gold and Silver from all sources, etc.*—continued.

Mining Centre.	Number of Lease.	Registered Name of Company & Lease.	Total for 1954.					Total Production.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240 lb.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240 lb.).	Fine ozs.	Fine ozs.
MOUNT MARGARET GOLDFIELD—continued.												
MOUNT MORGAN DISTRICT.—*continued.*												
Mt. Margaret	....	Voided leases	....	....	....	....	....	12·13	1·89	8,900·39	5,291·51	12·55
		Sundry claims	....	....	....	....	....	25·22	111·18	1,779·60	658·99	....
Mt. Morgans	399F, etc.	Morgans Gold Mines, Ltd.	....	....	11·25	53·36	....	....	....	4,580·05	13,843·29	....
		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	....	....	16·50	4·06	....	36·41	398·78	5,100·57	3,391·18	....
Murrin Murrin	....	Voided leases	....	....	....	....	....	10·43	231·35	136,940·22	104,029·97	29·60
		Sundry claims	....	....	....	....	....	51·15	557·24	6,455·33	4,442·16	....
Redcastle	557F	Trixie	....	....	....	....	....	....	16·10	167·75	50·71	....
		Voided leases	....	....	....	....	....	4·49	436·54	4,107·20	4,043·41	....
		Sundry claims	....	....	....	....	....	....	113·84	1,183·57	642·45	....
Yundamindra	560F	Linden (W.A.) Gold, N.L.	....	....	380·00	142·69	....	....	....	1,625·00	750·92	9·52
		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	....	....	....	....	....	....	....	10·00	26·36	....
		State Battery, Linden	....	....	....	5·15	....	....	9·16	293·29	*15,495·73	....
		The United Aborigines Mission (M.A. 12F)	....	....	....	....	....	113·08	18·87	403·00	135·50	·09
		Various Works	....	....	....	....	....	....	....	1,257·81	8,561·39	99·97
		Reported by Banks and Gold Dealers	3·91	....	....	....	....	3,049·44	141·84	10·30	95·75	·68
		Totals	**3·91**	....	**407·75**	**205·26**	....	**3,462·95**	**9,359·82**	**1,212,084·71**	**715,929·03**	**5,791·16**
MOUNT MALCOLM DISTRICT.												
Cardinia	1795C	Rangoon	....	....	....	....	....	....	6·49	330·00	178·07	....
	1805C	Wanghi	....	....	....	....	....	....	....	320·00	22·02	....
		Voided leases	....	....	....	....	....	13·87	1,591·66	4,881·74	4,027·89	....
		Sundry claims	....	....	....	....	....	4·25	121·91	1,865·25	575·01	·66
Diorite	....	Voided leases	....	....	....	....	....	....	945·65	38,879·03	35,144·28	33·18
		Sundry claims	....	....	....	....	....	11·21	332·13	4,626·80	4,467·93	....

Dodger's Well	....	Voided leases	....	....	....	....	....	....	57·90	1,373·30	1,936·52	....
		Sundry claims	....	....	....	....	....	·95	28·32	1,440·25	904·23	....
Lake Darlot	1834C	Monte Christo	....	....	354·00	18·08	....	....	....	2,650·00	173·21	....
		Voided leases	....	....	....	....	....	....	4,482·18	70,928·46	52,038·63	7·56
		Sundry claims	62·24	120·95	68·00	161·32	....	129·92	678·65	8,240·34	5,478·72	2·60
Leonora	1837C	Great Gwalia	....	....	....	....	....	....	....	200·00	45·75	....
	1829C	Jessie Alma	....	....	4·00	11·12	....	....	454·52	623·50	1,834·51	....
	1788C	Little Gwalia	....	....	....	*52·19	....	....	....	1,576·00	530·53	....
	1341C, etc.	Sons of Gwalia, Ltd.	....	....	103,237·00	26,167·55	2,176·23	....	....	5,847,120·53	2,311,802·97	164,644·01
		Prior to transfer to present holders	....	....	....	....	....	....	....	109,081·00	55,989·21	8·66
		Voided leases	....	....	....	....	....	....	1,866·86	174,799·00	90,621·56	94·57
		Sundry claims	....	....	....	....	....	37·73	361·86	18,338·25	11,705·51	....
Mt. Malcolm	....	Voided leases	....	....	....	....	....	11·65	47·07	62,656·53	47,563·43	....
		Sundry claims	....	....	....	....	....	5·75	33·39	4,572·47	2,711·17	·12
Mertondale	....	Voided leases	....	....	....	....	....	....	....	89,024·75	60,935·32	1,497·58
		Sundry claims	3·60	....	....	....	....	5·42	85·74	3,216·41	2,295·52	....
Mt. Clifford	....	Voided leases	....	....	....	....	....	....	1,623·35	9,556·96	16,492·17	....
		Sundry claims	....	....	....	....	....	53·98	351·65	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	1,594·16	1,407·27	....
	From District generally :—											
	Sundry Parcels treated at :											
	State Battery, Darlot	....	....	....	....	....	....	....	18·00	*786·34	....
	Reefer Cyanide Plant	....	....	....	*3·32	....	....	....	20·00	*3,125·37	22·38
	Various Works	....	....	....	....	....	....	....	789·50	*22,175·93	135·97
	Reported by Banks and Gold Dealers	4·19	....	....	....	....	3,482·76	252·83	21·50	51·57	....
	Totals	**70·03**	**120·95**	**103,663·00**	**26,413·58**	**2,176·23**	**3,896·58**	**14,621·31**	**6,548,235·19**	**2,794,839·96**	**166,512·02**

MOUNT MARGARET DISTRICT.

Burtville	2446T	Boomerang	....	....	78·50	216·54	....	....	....	1,683·65	8,521·82	462·30
	2138T	Nil Desperandum	....	....	94·50	208·52	....	....	5·30	1,877·72	4,397·05	....
		Voided leases	....	....	....	....	....	4·89	413·80	70,494·33	108,785·83	485·97
		Sundry claims	....	....	9·50	14·58	....	2·65	208·27	7,409·66	5,505·29	....

Table I.—*Production of Gold and Silver from all sources, etc.*—continued.

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1954.					Total Production.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240 lb.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240 lb.).	Fine ozs.	Fine ozs.
MOUNT MARGARET GOLDFIELD—continued.												
MOUNT MARGARET DISTRICT—*continued.*												
Duketon		Voided leases	....	....	....	....	....	5·35	3,216·10	31,889·42	22,542·63	....
		Sundry claims	21·87	....	....	....	....	21·87	528·26	2,402·65	2,164·55	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	(2508T)	Morgood	....	....	....	1·65	....	....	....	150·25	151·74	....
	2558T	Nancydale	....	....	25·00	51·38	....	....	....	25·00	51·38	....
	2500T	Westralia	....	....	....	....	....	....	....	....	*122·50	....
		Voided leases	....	....	....	....	....	10·07	393·41	156,555·65	101,309·48	4,327·81
		Sundry claims	....	16·82	32·00	48·51	....	1,181·65	165·05	5,666·09	3,824·93	....
Euro		Voided leases	....	....	....	....	....	....	65·14	91,821·50	37,678·25	....
		Sundry claims	....	....	71·50	9·62	....	4·87	73·04	1,433·00	821·31	....
Laverton	2514T	Gladiator	....	....	891·00	196·07	....	....	....	2,341·75	371·11	....
	2245T, etc.	Lancefield, No Liability (Optionee)	....	....	1,893·50	111·59	6·94	....	....	1,893·50	111·59	6·94
	2245T, etc.	(Lancefield Leases)	....	....	....	....	....	....	....	30,929·25	3,991·93	15·68
	2245T	(Lancefield Extended West)	....	....	....	....	....	....	....	881·25	846·77	....
	2489T	(Wedge)	....	....	....	....	....	....	....	222·00	21·19	....
	2478T	Lancefield North	....	....	....	....	....	....	....	2,235·25	438·99	....
		Voided leases	....	....	....	....	....	28·59	2,028·85	2,075,638·37	813,222·85	56,923·16
		Sundry claims	....	5·35	51·00	55·08	....	215·58	1,492·90	17,410·25	9,217·60	....
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		....	....	....	*569·35	2·20	....	....	97·50	*16,245·10	381·00
	United Gold Recoveries Pty., Ltd.		....	....	....	*59·53	....	....	....	·25	*3,786·44	3,374·06
	Esperance Oil Syndicate (24T)		....	....	20·25	3·79	....	....	....	20·25	3·79	....
	Various Works		....	....	....	....	....	....	....	194·50	*19,399·89	·24
	Reported by Banks and Gold Dealers		8·60	....	....	....	....	2,531·53	108·08	....	26·76	....
	Totals		**30·47**	**22·17**	**3,166·75**	**1,546·21**	**9·14**	**4,031·12**	**9,354·35**	**2,508,827·89**	**1,168,735·18**	**66,006·92**

North Coolgardie Goldfield.

MENZIES DISTRICT.

Comet Vale	5766Z	Coonega Extended	....	....	....	....	....	....	....	16·50	15·34	....
	5757Z	King of the Hills	....	....	....	....	....	....	....	156·75	42·43	....
		Voided leases	....	....	....	....	....	....	419·74	267,144·22	193,180·54	5,352·39
		Sundry claims	....	....	....	....	....	....	40·19	1,908·91	998·31	....
Goongarrie	5740Z	Gull's Blow	....	....	....	....	....	....	....	318·25	132·03	....
	5760Z	Pretty Easy	....	....	....	....	....	....	....	9·25	9·71	....
		Voided leases	....	....	....	....	....	·94	1,385·26	29,838·79	18,085·64	....
		Sundry claims	....	33·90	....	·91	....	46·46	2,088·07	2,695·02	3,104·71	....
Menzies	5543Z	Black Swan	....	....	....	....	....	....	....	1,000·63	1,633·52	9·08
	5736Z	Bodington	....	70·61	....	....	....	....	130·27	73·00	52·97	....
	5511Z	First Hit	....	....	....	....	....	....	....	3,236·75	6,461·84	21·25
	5511Z, etc.	(First Hit Gold Mines (1934), Ltd.)	....	....	....	....	....	....	....	68,473·70	49,060·96	6,676·23
	5542Z	Good Block Lease	....	....	....	....	....	....	7·32	1,589·00	2,523·97	....
	5714Z	Lady Harriet North	....	....	....	....	....	....	....	21·00	4·01	....
	5549Z	Lady Harriet	....	....	....	....	....	....	....	728·00	291·44	....
	5520Z	Mignonette	....	....	....	....	....	....	....	538·50	367·23	....
	5749Z	Woolgar	....	....	....	....	....	....	....	553·00	386·91	....
	5572Z	Woolgar South	....	....	....	....	....	....	....	60·00	25·56	....
		Voided leases	....	....	....	....	....	45·42	1,125·41	934,445·50	725,962·51	13,586·39
		Sundry claims	....	25·71	....	1·43	....	49·50	623·61	33,027·94	24,951·13	776·49
Mt. Ida	5701Z, etc.	Moonlight Wiluna Gold Mines, Ltd.	....	....	24,290·00	13,518·00	....	....	40·77	105,991·86	55,207·92	787·54
		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	....	3·43	9·75	17·70	....	48·14	436·08	16,044·16	8,230·02	·12
Twin Hills	....	Voided leases	....	....	....	....	....	....	....	582·30	574·93	....
		Sundry claims	....	....	....	....	....	....	....	97·80	86·69	....
	From District generally :—											
	Sundry Parcels treated at :											
	Lady Harriet Battery	....	....	....	*180·47	....	....	....	....	279·50	*19,380·30	30·00
	Mt. Ida State Battery	....	....	....	*24·29	....	....	....	....	1,866·25	*7,404·05	·05
	B. W. Sander's Cyanide Plant	....	....	....	*21·49	....	....	....	....	....	*223·43	46·39
	Yundaga Treatment Works	....	....	....	*60·40	....	....	....	....	....	*328·35	·03
	Various Works	....	....	....	....	....	....	....	....	2,528·30	*38,811·38	2,985·69
	Reported by Banks and Gold Dealers	·19	....	....	....	....	1,467·64	382·80	35·00	8·02	....	....
	Totals	**·19**	**133·65**	**24,299·75**	**13,824·69**	....	**1,658·10**	**6,771·73**	**1,573,824·30**	**1,246,246·97**	**31,269·65**	

ULARRING DISTRICT.

Davyhurst	1016U, etc.	New Coolgardie Gold Mines, N.L.	....	....	30,974·00	15,385·32	3,764·95	....	....	96,971·00	50,642·21	12,408·27
	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	....	....	....	....	....	....	208·48	13,653·94	5,690·39	....

Table I.—*Production of Gold and Silver from all sources, etc.*—**continued.**

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1954.					Total Production.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240 lb.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240 lb.).	Fine ozs.	Fine ozs.
NORTH COOLGARDIE GOLDFIELD—continued.												
ULARRING DISTRICT—*continued.*												
Morley's	1101U	Emerald	....	....	....	....	....	....	26·24	2,072·00	1,880·78	....
	1094U	First Hit	....	....	114·50	22·78	....	....	....	2,132·25	4,767·65	....
	1081U	Mabel Gertrude	....	17·19	....	....	....	....	17·19	1,411·00	1,479·21	....
	1089U	Paramount	....	....	108·00	94·08	....	....	1·49	2,800·00	2,564·08	....
	....	Voided leases	....	....	....	....	....	....	3,854·94	2,956·50	5,944·69	10·54
	....	Sundry claims	....	....	....	....	....	2·16	932·23	1,585·25	2,401·91	....
Mulline	1107U	Ajax West	....	....	1,255·00	736·70	....	....	1·37	5,124·25	4,952·99	....
	1070U	Riverina	....	....	....	8·91	....	....	....	267·00	70·41	....
	1070U etc.	(Riverina Gold Mines Pty., Ltd.)	....	....	....	....	....	....	....	32,085·50	11,669·45	·07
	....	Voided leases	....	....	....	....	....	....	274·09	102,637·22	103,360·32	530·75
	....	Sundry claims	....	....	....	....	....	10·82	198·67	10,677·64	8,747·38	1·10
Mulwarrie	1153U	Four Mile	....	....	....	....	....	....	....	48·00	241·84	....
	1113U	Odkley	....	....	300·00	515·31	....	....	....	2,370·00	3,596·73	....
	....	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		....	....	....	*585·79	....	....	....	....	*636·43	....
	Various Works		....	....	....	....	....	....	15·82	268·15	*9,639·15	11·15
	Reported by Banks and Gold Dealers		....	·92	....	....	....	112·68	64·00	100·00	23·48	....
		Totals	....	**18·11**	**32,751·50**	**17,348·89**	**3,764·95**	**129·39**	**6,758·08**	**483,519·60**	**412,655·46**	**18,528·49**
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	....	....	495·00	273·73	....	....	....	3,300·50	3,798·39	....
	911G	Cosmopolitan south	....	....	....	*43·25	....	. ..	....	2,133·00	1,063·44	....
	933G	New Gladstone	....	....	....	....	....	....	....	360·00	124·47	....
	....	Voided leases	....	....	....	....	....	3·35	347·30	744,917·21	394,601·81	5,375·97
	....	Sundry claims	2·49	....	....	....	....	59·23	106·18	8,868·05	6,566·55	·18
	....	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 :—											
	A. Vickery Treatment Syndicate	....	....	....	*969·33	....	....	....	....	*4,477·93	79·81
	Various Works	....	....	....	....	....	....	....	1,220·50	*16,406·29	41·17
	Reported by Banks and Gold Dealers	·41	....	....	....	....	1,592·75	823·66	....	63·53	....
	Totals	**2·90**	....	**495·00**	**1,286·31**	....	**1,716·03**	**1,821·35**	**931,874·27**	**523,574·26**	**5,683·41**

YERILLA DISTRICT.

Edjudina	....	Voided leases	....	....	....	....	....	....	18·44	35,523·70	43,374·19	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	....	....	420·00	57·03	....	....	....	3,216·00	1,031·12	....
	1330R	Margaret North	....	....	260·00	12·84	....	....	....	260·00	12·84	....
	1327R	Nil Desperandum	....	....	32·00	3·33	....	....	....	319·00	73·68	....
	1126R	Porphyry (1939) G.M.,N.L.	....	....	....	....	....	....	....	66,715·00	9,867·95	261·86
	1126R	(Edjudina Gold Mining Co., N.L.)	....	....	....	....	....	....	....	30,220·00	5,409·93	507·51
	....	Prior to Transfer	....	....	....	....	....	....	....	124·50	38·89	....
	....	Voided leases	....	....	....	....	....	6·30	87·08	44,324·75	21,235·42	2·00
	....	Sundry claims	....	....	196·00	28·63	·94	·87	5·93	16,735·05	6,034·07	·98
Yerilla	....	Voided leases	....	....	....	....	....	....	3,107·25	16,481·43	12,925·74	13·93
	....	Sundry claims	....	22·83	2·25	9·44	....	19·30	97·63	2,744·83	1,577·78	....
Yilgangie	1176R etc.	Western Mining Corporation	....	....	1,977·00	1,781·54	318·23	....	....	12,072·75	11,976·29	1,485·91
	....	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 1954.					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	....	23·09	....
Totals			....	**22·83**	**2,887·25**	**1,892·87**	**319·17**	**1,311·91**	**3,817·12**	**270,895·53**	**158,548·94**	**2,348·35**

Broad Arrow Goldfield.

Bardoc	....	Voided leases	....	....	....	....	....	....	....	2,335·41	85,370·59	55,699·50	203·60
	....	Sundry claims	....	3·81	4·00	19·60	....	54·95	1,197·92	17,063·53	8,209·52	....
Black Flag	2229W....	Bellevue	....	6·19	131·50	189·61	....	....	208·36	1,246·75	2,500·31	....
	....	Voided leases	....	....	....	....	....	27·81	405·90	48,223·79	28,152·20	....
	....	Sundry claims	....	....	92·25	152·30	....	712·92	251·59	8,027·71	4,961·01	....
Broad Arrow	2039W....	Golden Arrow	....	....	17·25	33·72	....	....	....	5,674·75	864·42	....
	2254W....	Grace Darling	....	....	89·25	67·66	....	....	....	2,426·75	1,044·92	....
	2276W....	Johnnie	....	....	64·25	15·59	....	....	1·09	95·25	27·18	....
	(1771W)	North Duke....	....	....	....	....	....	....	1,670·51	333·60	690·37	....
	....	Voided leases	....	....	....	....	....	70·32	8,782·21	147,317·09	117,438·60	20·23
	....	Sundry claims	....	1·42	80·75	20·82	....	1,007·72	3,046·17	32,509·89	16,626·38	·11
Cane Grass	....	Voided leases	....	....	....	....	....	....	27·77	669·82	460·72	....
		Sundry claims	....	....	....	....	....	....	227·55	717·45	505·06	....
Carnage	....	Voided leases	....	....	....	....	....	176·04	659·31	2,402·00	2,170·67	....
		Sundry claims	....	....	....	....	....	....	6·61	1,840·08	874·56	....

Cashmans	....	Voided leases	....	....	....	....	....	67·51	813·76	8,172·15	7,090·91	....
		Sundry claims	....	....	....	....	....	....	40·31	1,205·12	361·74	·05
Christmas Reef	(2262W)	Gull's Neck	....	·50	....	....	....	....	25·81	3·00	6·58	....
	2253W	New Mexico, South	....	....	180·25	351·29	....	....	....	509·25	1,216·47	....
		Voided leases	....	....	....	....	....	....	29·68	1,853·12	3,592·45	....
		Sundry claims	....	....	....	....	....	....	441·85	2,914·89	2,670·55	....
Golden Penny	2188W	Golden Penny	....	....	....	....	....	....	....	2,873·25	630·89	....
		Voided leases	....	....	....	....	....	....	4·42	3,897·75	2,080·79	....
		Sundry claims	....	....	8·00	4·98	....	....	51·96	2,999·02	997·31	....
Grant's Patch	2261W	Bent Tree	....	....	....	....	....	....	....	741·00	241·45	....
	(2242W)	Lady Agnes	....	....	....	....	....	....	2·11	1,089·50	388·36	....
	2277W, 2278W	Ora Banda Amalgamated Mines, N.L. (in liquidation)	....	....	469·00	518·76	....	....	....	168,784·79	63,540·33	175·00
		Prior to transfer to present holders	....	....	....	....	....	....	....	12,424·50	9,540·07	....
	2208W	Wentworth	....	....	371·00	103·93	....	....	1·30	3,557·50	1,060·86	....
	2224W	Whip-Pole	....	....	57·50	23·45	....	....	12·20	914·10	391·88	....
		Voided leases	....	....	....	....	....	....	258·52	15,440·10	5,340·79	....
		Sundry claims	....	....	26·50	14·09	....	....	356·66	6,143·79	3,064·13	....
Ora Banda	T.A. 42W, M.A. 41W, etc.	Associated Northern Ora Banda, N.L.	....	....	....	....	....	....	....	2,786·50	464·53	21·07
		Prior to transfer to present holders	....	....	....	....	....	....	....	315,958·95	123,252·22	1,664·70
	2270W, 2269W	Gimlet South Leases	....	....	372·75	126·11	....	....	....	1,903·25	506·29	....
	2280W	New Victorius	....	....	18·00	7·48	....	....	....	18·00	7·48	....
	2275W	Squanderbug	....	....	....	....	....	....	....	13·25	5·05	....
		Voided leases	....	....	....	....	....	....	845·72	103,798·07	27,385·59	....
		Sundry claims	....	19·53	54·75	32·97	....	....	406·44	13,299·75	4,426·33	....
Paddington	2122W	Pakeha	....	....	....	....	....	....	....	5,050·15	1,671·62	13·19
		Voided leases	....	....	....	....	....	5,566·30	463·31	189,970·16	84,586·82	18·96
		Sundry claims	....	....	13·50	1·64	....	1,714·16	291·43	16,401·23	9,126·27	....
Riche's Find	(2257W)	Yalbalgo	....	....	2·50	6·90	....	....	6·41	107·50	555·80	....
		Voided leases	....	....	....	....	....	....	7·01	7,476·09	5,462·08	71·36
		Sundry claims	....	....	....	....	....	....	296·26	1,905·80	1,998·78	·13
Siberia	....	Voided leases	....	....	....	....	....	1·07	2,649·28	28,928·97	31,751·34	....
		Sundry claims	....	....	77·25	27·76	....	289·06	1,233·18	21,063·04	12,845·09	....
Smithfield	2264W	King of Kings	....	19·19	1,312·75	175·46	....	....	19·19	3,871·75	563·80	....
		Voided leases	....	....	....	....	....	....	....	4,700·71	1,174·69	....
		Sundry claims	....	....	71·00	12·40	....	....	124·29	3,198·59	1,254·80	....
	From Goldfield generally :—											
	Sundry Parcels treated at :											
	State Battery, Ora Banda	....	....	....	*606·74	....	....	....	128·05	*23,282·21	2·50
	Golden Arrow Battery	....	....	27·00	*252·70	2·30	....	....	63·00	*4,298·64	2·30
	K. McFarlane	....	....	....	*20·49	....	....	....	....	*20·49	....
	Various Works	....	....	....	....	....	2,275·66	1·24	16,967·02	*49,481·50	3,103·45
	Reported by Banks and Gold Dealers	1·79	8·85	....	....	....	9,991·55	143·82	61·68	90·35	....
	Totals	**1·79**	**59·49**	**3,541·00**	**2,786·45**	**2·30**	**21,955·07**	**27,346·56**	**1,325,113·39**	**726,652·75**	**5,296·65**

Table I.—*Production of Gold and Silver from all sources, etc.*—continued.

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1954.					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.												
Gindalbi	1576X	Kurrajong	....	....	20·50	3·75	....	....	....	20·50	3·75	....
	(1581X)	Lady Betty	....	....	104·00	40·12	....	....	....	104·00	40·12	....
	(1579X)	Leader's	....	....	....	....	....	....	....	130·00	14·71	....
	(1578X)	Walls Reward	....	....	....	....	....	....	....	579·00	744·37	....
		Voided leases	....	....	....	....	....	....	1,151·99	45,233·78	40,931·71	38·31
		Sundry claims	....	....	110·50	45·09	....	....	716·52	5,445·77	3,168·28	....
Gordon	....	Voided leases	....	....	....	....	....	....	682·54	53,900·58	20,072·51	517·61
		Sundry claims	....	....	....	....	....	....	177·38	2,155·70	1,194·71	....
Kalpini	....	Voided leases	....	....	....	....	....	....	38·73	13,543·50	6,753·78	·07
		Sundry claims	....	....	....	....	....	24·70	269·72	1,492·50	1,026·37	....
Kanowna	1572X	Kanowna Red Hill	....	....	365·25	80·16	....	....	....	1,666·25	497·29	....
	(1574X)	Snowdrop	....	....	....	....	....	....	....	21·75	19·65	....
		Voided leases	....	....	....	....	....	24·94	4,516·76	685,535·35	380,477·71	2,482·24
		Sundry claims	1·76	....	145·75	39·80	....	120·70	2,163·30	26,505·02	11,760·56	1·50
Mulgarrie	....	Voided leases	....	....	....	....	....	....	1,216·63	6,902·26	4,197·98	....
		Sundry claims	....	....	....	....	....	....	16·78	1,281·75	641·69	....
Six Mile	....	Voided leases	....	....	....	....	....	....	1,603·72	559·00	767·72	....
		Sundry claims	....	....	5·25	2·03	....	....	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	....	....	....	....	....	106,016·31	37·35	·50	108·04	....
		Totals	**1·76**	....	**751·25**	**210·95**	....	**106,517·07**	**13,515·44**	**1,004,776·76**	**625,857·97**	**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	....	....	....	....	....	324·12	727·39	4,305·36	2,089·90	....

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	....	....	....	....	....	12,105·10	70·70	....	2·35	1·49
	Totals	....	....	....	....	....	**12,834·03**	**8,298·91**	**13,370·07**	**18,510·95**	**12·71**

East Coolgardie Goldfield.

EAST COOLGARDIE DISTRICT.

Binduli	6025E	Belle of Kalgoorlie	....	....	12·50	1·69	....	....	....	732·50	85·92	....
		Voided leases	....	....	....	....	....	....	....	803·10	385·19	....
		Sundry claims	....	....	27·50	2·80	....	....	13·01	5,119·27	1,675·92	....
Boorara	(6310E)	Roma	....	....	269·75	12·03	....	....	....	861·75	82·07	....
		Voided leases	....	....	....	....	....	....	459·07	308,606·07	172,779·88	411·37
		Sundry claims	....	....	41·50	9·26	....	·49	145·56	3,369·84	1,493·39	....
Boulder	6145E	Boomerang	....	....	....	....	....	....	....	77·00	8·00	....
	5690E, etc.	Boulder Perseverance, Ltd.	....	....	133,799·81	31,150·33	7,144·71	....	....	2,982,746·44	1,061,305·28	335,510·87
		Prior to transfer to present holders	....	....	....	....	....	....	....	3,306,942·88	1,841,159·00	203,821·43
	5531E	Cassidy's Hill	....	....	....	....	....	....	....	75·50	7·77	....
	5694E	Croesus Extended	....	....	49·75	1·86	....	....	....	192·75	16·57	....
	6320E	Edith Joy	....	....	37·75	2·60	....	....	....	188·25	23·81	....
	6537E	Golden Key	....	....	....	....	....	18·27	24·33	432·25	165·02	....
	5159E, etc.	Gold Mines of Kalgoorlie (Aust.), Ltd.	....	....	209,311·00	60,369·72	5,853·72	....	....	2,536,066·30	704,144·62	162,497·59
	5466E	(South Star)	....	....	....	....	....	....	233·46	4,237·43	1,494·78	....
	5466E	Prior to transfer to present holders	....	....	....	....	....	....	5·22	1,835·75	748·78	....
	5159E, etc.	(Lake View South (G.M.K.), Ltd.)	....	....	....	....	....	....	....	62,278·38	21,536·66	....
	5692E, etc.	Prior to transfer to present holders	....	....	....	....	....	....	545·23	527,790·53	568,643·05	4,844·50
	5853E, etc.	(Paringa Junction North Leases)	....	....	....	....	....	....	7·82	1,686·79	701·11	....
	5853E	(Paringa Junction)	....	....	....	....	....	....	....	123·75	17·77	....
	5854E	(Paringa Junction North)	....	....	....	....	....	....	....	60·50	10·64	....
	5855E	(Paringa Junction South)	....	....	....	....	....	....	....	1,473·25	228·42	....
	5696E, etc.	Great Boulder Pty. Gold Mines, Ltd.	....	....	417,874·00	107,669·88	72,205·24	....	1·53	10970460·97	5,522,610·35	1,235,546·62
	5845E	Happy Returns	....	....	127·75	19·78	....	....	....	7,804·25	1,442·01	....
	5345E, etc.	Kalgoorlie Enterprise Mines, Ltd.	....	....	69,789·25	21,598·85	2,252·20	....	....	954,214·48	293,524·78	27,977·23
		Prior to transfer to present holders	....	....	....	....	....	....	....	15,320·68	8,957·01	....
	4476E, etc.	Lake View and Star, Ltd.	....	....	657,197·00	167,469·22	23,201·18	....	....	11819844·30	3,630,750·31	388,964·94
		Prior to transfer to present holders	....	....	....	....	....	....	8·49	15792500·38	9,149,223·80	1,348,055·28
	6230E	New Look	....	....	....	....	....	....	....	256·75	22·68	....
	5431E, etc.	North Kalgurli (1912), Ltd.	....	16·00	251,987·67	56,929·03	6,969·74	....	127·55	3,600,536·84	1,082,007·75	255,544·70
	5405E, etc.	North Kalgurli (1912), Ltd. Croesus Pty., Group	....	....	....	....	....	....	51·20	90,159·00	19,261·22	....
	5891E	(New Croesus)	....	....	....	....	....	....	....	193·00	48·74	....
	5700E	Prior to transfer to present holders	....	....	....	....	....	43·99	....	4,018,436·01	2,815,911·21	97,625·03
	5429E, etc.	(North Kalgurli United Mines, Ltd.)	....	....	....	....	....	....	....	4,661·51	928·18	232·93
		Prior to transfer	....	....	....	....	....	....	....	131·74	76·74	....
	6095E	Raymond	....	....	15·50	3·52	....	....	....	271·25	52·71	....

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 1954.					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.*												
	5695E, etc.	South Kalgurli Consolidated, Ltd.	....	....	97,711·11	22,197·19	....	....	....	3,208,297·51	1,155,184·61	26,389·19
		Prior to transfer to present holders	....	....	....	....	....	....	....	1,344,254·70	531,792·77	17,722·97
	5716E	Two B's	....	....	....	....	....	....	....	464·25	88·66	....
		Voided leases	....	....	....	....	....	110·97	11,999·04	1,813,479·56	760,206·32	24,046·96
		Sundry claims	....	....	23·00	5·91	....	24·58	212·32	11,649·99	4,300·62	....
Cutter's 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	....	....	8·25	1·12	....	....	199·00	1,237·10	645·88	....
Hampton Plains	P.P.L. 1	Consolidated Gold Areas, N.L.	....	....	125·50	13·74	....	....	....	142,515·48	37,240·32	5,835·85
	P.P.L. 86	Golden Hope, N.L.	....	....	....	....	....	....	....	5,964·00	2,006·14	....
	P.P.L. 192	Golden Hope North	....	....	....	....	....	....	....	353·00	201·02	....
	P.P.L. 252	Hampton Properties, Ltd.—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. 255	Lees & Nunn	....	....	....	....	....	....	....	16·75	3·06	....
	P.P.L. 122	W. J. Meyers	....	....	52·50	3·84	....	....	....	52·50	3·84	....
	P.P.L. 289	Mt. Martin	....	....	....	....	....	....	....	529·00	119·26	....
	P.P.L. 277	New Hope	....	....	....	....	....	....	17·23	61,468·55	11,175·94	....
	P.P.L. 299	C. T. Norris	....	....	....	....	....	....	....	506·50	130·71	....
	P.P.L. 148	O'Reilly & Andrews	....	....	....	....	....	....	....	20·00	4·84	....
	P.P.L. 227	Pernatty	....	....	2,123·25	289·38	....	....	....	4,530·00	544·94	....
	P.P.L. 98	S. Reid	....	....	13·25	6·66	....	....	....	13·25	6·66	....
	P.P.L. 175	F. C. Schoppe (Jubilee)	....	....	....	....	....	....	....	6,253·00	867·28	....
	P.P.L. 270	R. J. Taylor	....	....	....	....	....	....	....	40·25	11·05	....
	P.P.L. 179	J. E. Trinidad	....	....	....	....	....	....	....	64·00	4·91	....
	P.P.L. 371	Victory	....	....	....	....	....	....	....	1,901·75	251·63	....
		Voided leases	....	....	....	....	....	4,578·52	203·94	123,733·34	39,175·88	69·83
		Sundry claims	....	....	....	....	....	2·68	70·85	46,439·41	8,509·67	....
Kalgoorlie	5927E	A.I.F.	....	....	....	....	....	....	....	101·25	18·02	....
	6048E	Auld Acquaintance	....	....	....	....	....	....	....	7·50	2·36	....
	4547E, 4548E	Champagne Syndicate, No Liability	....	....	6,509·25	751·37	59·85	....	....	6,509·25	751·37	59·85
	4547E, etc.	(Mt. Charlotte (Kalgoorlie) Gold Mines, Ltd.)	....	....	208·00	17·63	....	....	....	25,143·25	2,888·32	110·15
		Prior to transfer to present holders	....	....	....	....	....	....	5·72	48,292·60	13,930·79	....
	6503E	Coronation	....	....	20·50	2·52	....	....	....	20·50	2·52	....
	5913E	Devon Consols	....	....	153·50	21·51	....	....	93·19	2,246·46	689·03	....

	5647E	Golden Cross	....	....	46·50	5·17	....	....	....	156·25	19·77	....
	5510E	Golden Dream	....	....	....	....	....	....	....	79·00	6·53	....
	5774E	Golden Goose	....	....	150·00	44·12	....	....	....	150·00	44·12	....
	5739E	Golden Star	....	....	129·25	10·54	....	....	....	724·50	77·40	....
	6504E	Historic	....	....	45·50	3·13	....	....	....	45·50	3·13	....
	5460E	Kalgoorlie Star	....	....	40·75	13·27	....	....	....	40·75	13·27	....
	5878E	Lady May	....	....	22·25	1·65	....	....	62·05	4,740·50	1,177·07	....
	6091E	Lesanben	....	9·44	132·25	41·69	....	....	184·20	478·75	297·85	....
	6485E	Maritana Hill	....	....	545·00	62·63	....	....	....	1,684·25	233·09	....
	6321E	North End Extended	....	....	59·50	50·58	....	....	....	167·50	90·00	....
	5852E, etc.	Pedestal Leases	....	....	32·25	8·34	....	....	....	1,660·00	465·19	....
	5852E	(Pedestal)	....	....	....	....	....	....	....	1,608·75	444·93	....
	6024E	(Trident)	....	....	....	....	....	....	....	58·75	36·67	....
	5468E	Phar Lap	....	....	695·50	151·78	....	....	....	2,083·25	750·82	2·50
	5415E, 5803E....	Return	....	....	30·50	1·81	....	....	5·64	3,831·75	656·15	....
		Voided leases	....	....	....	....	....	242·48	10,572·12	1,457,234·55	578,505·59	45,973·47
		Sundry claims	....	·23	363·75	46·00	....	232·41	1,124·61	60,512·63	23,125·09	....
Wombola	6051E	Big Bull	....	....	....	....	....	....	....	595·50	432·86	....
	5688E, (5697E)	Caledonian Leases	....	....	....	....	....	....	....	970·00	659·67	....
	5688E	(Caledonian)	....	....	....	....	....	....	....	4,275·00	3,632·98	....
	(5697E)	(North Caledonian)	....	....	....	....	....	....	1·27	22·25	8·15	....
	6943E	Confidence	....	....	32·50	9·42	....	....	....	32·50	9·42	....
	5497E, 5500E....	Daisy Leases	....	....	1,319·00	916·22	....	....	....	7,827·15	5,584·98	5·92
	5497E	(Daisy)	....	....	....	....	....	....	....	6,282·25	5,031·93	....
	5500E	(Happy-Go-Lucky)	....	....	....	....	....	....	....	2,075·25	1,675·85	....
	6032E	Dry Mount	....	....	....	....	....	....	....	1,120·50	1,121·40	....
	6325E	Great Hope	....	....	90·00	42·51	....	....	....	150·00	64·66	....
	5689E, etc.	Haoma Leases	....	....	4,609·00	5,487·09	65·24	....	....	24,986·50	23,015·65	65·24
	5689E	(Haoma)	....	....	....	....	....	....	....	2,168·00	1,948·36	....
	5525E	(Xmas Flat)	....	....	....	....	....	....	....	330·25	264·74	....
	6312E	Inverness	....	....	122·75	24·91	....	....	....	1,268·25	243·23	....
	6043E	Launa Doone	....	....	122·75	18·65	....	....	....	1,578·75	673·76	....
	6043E, etc.	(Launa Doone Leases)	....	....	....	....	....	....	....	32·50	42·76	....
	6487E	Leslie	....	....	26·75	36·47	....	....	....	26·75	36·47	....
	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	....
	6213E	Pauline	....	....	....	....	....	....	....	195·00	196·39	....
	6533E	Rosemary	....	....	54·50	283·73	....	....	....	54·50	283·73	....
	(5866E)	(Rosemary)	....	....	31·50	89·73	....	....	....	85·00	174·46	....
	6255E	Spinifex	....	....	....	....	....	....	....	371·25	106·78	....
		Voided leases	....	....	....	....	....	3·80	2,464·78	27,031·84	40,025·29	....
		Sundry claims	....	....	131·50	41·19	....	....	711·10	23,159·68	14,051·56	....
	From District generally :—											
	Sundry claims	....	....	....	....	....	11,014·57	465·61	5,440·46	2,541·10	....
	Golden Horseshoe (New), Ltd. (T.L.101, etc.)	....	....	....	*8,787·36	13,379·69	....	....	....	*338,418·76	344,711·09
	Pericles Cyanide Plant	....	....	....	....	....	....	....	....	*3,982·90	....
	State Battery, Kalgoorlie	....	....	30·00	*1,069·72	....	....	....	390·70	*31,702·51	46·24
	Various Works	....	....	....	....	....	384·36	64·70	41,135·02	*266,773·43	14,114·46
	Reported by Banks and Gold Dealers	11·42	23·82	4·00	144·84	....	16,889·11	9,983·97	359·66	6,931·18	....
	Totals	**11·42**	**49·49**	**1,856,356·09**	**485,943·99**	**131,131·57**	**33,606·93**	**40,879·96**	**65609509·53**	**30860983·86**	**4,540,775·75**

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 1954.					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.												
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	....	....	....	....	....	....	....	1,285·00	529·23	....
		Voided leases	....	....	....	....	....	107·54	8,526·12	108,330·55	85,785·57	....
		Sundry claims	....	....	161·00	34·20	....	1,655·86	1,611·58	16,121·48	17,677·20	....
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	....
Mt. 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	....	....	....	....	....	20·70	8·11	4,814·31	1,211·05	....
Taurus	....	Voided leases	....	....	....	....	....	2·06	3·70	1,765·10	909·84	....
		Sundry claims	....	....	....	....	....	112·69	51·88	2,656·60	1,049·81	....
Trans Find	P.P.L. 308	Dawn of Hope	....	....	....	....	....	....	2·87	1,145·75	330·33	....
		Voided leases	....	....	....	....	....	....	....	1,098·42	876·22	....
		Sundry claims	....	....	....	....	....	....	5·93	808·25	335·33	....
	From District generally :—											
		Various Works	....	....	....	....	....	....	....	6,102·15	6,675·38	....
		Reported by Banks and Gold Dealers	1·09	....	....	....	....	25,224·58	70·15	·01	28·44	....
		Totals	**1·09**	....	**161·00**	**34·20**	....	**27,404·87**	**16,032·89**	**184,600·05**	**131,745·80**	**12·92**

Coolgardie Goldfield.

COOLGARDIE DISTRICT.

Bonnievale	5622	Lucky Hit	....	....	....	....	....	....	3·28	945·60	491·59	....
	4600	Melva Maie	....	....	9·00	7·76	....	....	....	2,501·40	3,650·01	2·35
		Prior to transfer to present holders	....	....	....	....	....	....	....	614·50	1,099·21	11·63

	5890	Rayjax	....	....	50·00	79·35	....	....	....	103·50	197·77	....
	(5767, 5768)	Victory Explorations, N.L.	....	....	45·00	14·47	....	....	....	3,157·00	770·81	....
	(5767)	(Red Ridge)	....	....	....	....	....	....	....	108·00	53·63	....
		Voided leases	....	....	....	....	....	....	212·48	354,476·97	190,456·92	5·88
		Sundry claims	....	....	346·25	110·18	....	....	163·19	7,781·38	5,241·63	·04
Bulla Bulling	5955	Greta	....	....	81·75	17·47	....	....	....	81·75	17·47	....
		Voided leases	....	....	....	....	....	....	....	776·81	668·19	....
		Sundryclaims	....	....	23·00	3·47	....	5·21	15·98	1,673·26	660·33	....
Burbanks	5605	Burbanks Deeps	....	....	....	....	....	....	....	103·00	53·46	....
	(5685)	Lady Robinson	....	....	33·75	4·93	....	....	....	120·25	19·78	....
	5956	Lord Bobs	....	....	....	....	....	....	....	34·50	11·98	....
	5872	Vice Regal	....	2·81	94·90	15·00	....	....	2·81	155·40	25·09	....
		Voided leases	....	....	....	....	....	14·90	374·17	420,153·21	306,332·12	521·06
		Sundry claims	....	....	208·00	56·69	....	55·05	489·57	15,866·35	8,881·75	....
Cave Rocks	....	Voided leases	....	....	....	....	....	....	....	8,223·16	1,941·42	....
		Sundry claims	....	....	....	....	....	....	50·00	4,473·65	1,082·79	....
Coolgardie	5679	Ada	....	....	175·75	9·88	....	....	....	1,602·70	153·57	....
	5938	Bailey's South—New Coolgardie G.M.s, N.L.	....	....	1,665·00	1,856·28	237·22	....	....	1,665·00	1,856·28	237·22
	5876	Bailey's West	....	....	....	....	....	....	....	6·25	2·22	....
	5868	El Dorado	....	....	62·00	11·05	....	....	498·20	166·20	1,034·01	....
	5878	Ellen Jean	....	....	130·50	63·90	....	....	....	358·00	116·88	·69
	5844	Jackpot	....	....	....	....	....	....	....	2,847·25	1,247·53	....
	5643	Lloyd George South	....	....	....	....	....	....	....	....	10·25	....
	5884	Lone Hand	....	19·10	157·00	42·88	....	....	19·85	369·25	66·35	....
	(5854)	Lucky Star	....	....	....	....	....	....	....	21·50	1·51	....
	5881	MacPherson's Reward	....	....	143·25	76·38	....	....	....	690·50	280·74	....
	5743	Moya Jan	....	....	28·25	9·01	....	....	....	2,233·25	917·10	....
	5954	Pat Jan	....	....	32·00	9·08	....	....	....	32·00	9·08	....
	5912	Ruin Ridge	....	....	17·75	5·17	....	....	....	83·00	9·19	....
	5914	Sydenham	....	....	137·50	14·13	....	....	....	151·75	17·69	....
		Voided leases	....	....	....	....	....	1,301·71	4,763·64	1,104,687·04	447,590·02	4,818·90
		Sundry claims	....	1·55	763·50	132·80	....	205·49	2,712·30	71,877·14	27,023·87	....
Eundynie	....	Voided leases	....	....	....	....	....	3·70	16·09	31,772·98	16,531·34	1·75
		Sundry claims	....	....	....	....	....	....	82·28	694·12	468·01	....
Gibraltar....	5723	Lloyd George	....	....	....	....	....	....	....	670·00	169·18	....
	5960	Pamela	....	....	6·00	·77	....	....	....	6·00	·77	....
	(5684)	Winston Churchill	....	....	....	....	....	....	....	60·00	12·96	....
		Voided leases	....	....	....	....	....	....	33·97	38,592·63	20,097·49	....
		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.	C. W. Cattanach	....	....	11·50	1·41	....	....	....	11·50	1·41	....

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 1954.					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.*												
	P.P.L. 335	Dr. C. Clews	....	....	55·50	29·66	....	....	....	55·50	29·66	....
	P.P.L. 338	Dry Hill	....	....	....	....	....	....	....	43·00	58·42	....
	P.P.L. 21	Eva	....	....	....	....	....	....	....	24·25	6·08	....
	P.P.L. 454	Golden Dollar	....	....	....	....	....	....	....	105·50	13·66	....
	P.P.L. 434	Locker & Dempster	....	....	....	....	....	....	....	11·75	3·66	....
	P.P.L. 319	Lady May	....	....	....	....	....	....	....	1,742·25	981·39	....
	P.P.L. 316, 330	New Coolgardie Gold Mines, N.L.	....	....	33,534·00	15,760·96	4,094·71	....	....	208,512·00	98,966·20	25,660·52
	P.P.L. 316	(Surprise G.M.)	....	....	....	....	....	....	....	7,189·00	3,425·59	....
	P.P.L. 330	(Barbara)	....	....	....	....	....	....	....	2,157·75	1,655·63	....
	P.P.L. 464	E. Scahill	....	....	....	....	....	....	....	15·75	17·56	....
	P.P.L. 430	W. Zadow	....	....	10·25	4·05	....	....	....	10·25	4·05	....
		Voided leases	....	....	....	....	....	....	451·32	13,877·34	11,085·93	....
		Sundry claims	....	....	88·75	17·59	....	1·63	132·06	1,942·00	855·65	....
Higginsville	5647	Fiar Play Gold Mine	....	....	....	....	....	....	....	28,276·00	3,123·82	·02
	5877	Sons of Erin	....	....	....	....	....	....	....	20·00	8·44	....
	5293, (5526)	Two Boys	....	....	....	....	....	....	....	360·00	1,260·43	·01
	5293	(Two Boys)	....	....	....	....	....	....	....	6,888·00	3,193·95	....
		Voided leases	....	....	....	....	....	....	373·93	38,141·35	17,438·49	159·50
		Sundry claims	....	....	....	....	....	....	187·25	3,654·76	1,951·40	....
Larkinville	....	Voided leases	....	....	....	....	....	22·77	54·44	2,335·16	3,256·49	....
		Sundry claims	....	....	....	....	....	....	147·20	448·53	1,029·03	....
Logans	5324, etc.	Spargo's Reward Gold Mine (1935), N.L.	....	....	....	....	....	....	....	105,397·50	26,320·67	....
		Voided leases	....	....	....	....	....	....	....	1,263·31	607·26	....
		Sundry claims	....	....	10·25	2·02	....	6·88	128·95	1,969·10	907·47	....
Londonderry	....	Voided leases	....	....	....	....	....	....	95·04	34,155·35	22,238·37	·35
		Sundry claims	....	....	96·75	16·77	....	16·68	38·72	3,596·17	2,519·82	22·42
Mungari	....	Voided leases	....	....	....	....	....	....	17·71	1,872·50	458·43	....
		Sundry claims	....	....	....	....	....	1·77	153·24	2,787·94	750·54	....
Paris	5500, (5311)	Lister's Gold Mine	....	....	....	....	....	·88	....	5,460·00	3,563·29	75·95
	5500, (5311), (5530)	Lister's Gold Mine	....	....	....	....	....	....	....	8,582·00	4,423·84	....
	5500	(Paris Central)	....	....	....	....	....	....	....	113·00	24·16	....
	5873	Paris West	....	....	....	....	....	....	....	19·00	11·03	....
		Voided leases	....	....	....	....	....	....	4·30	1,342·00	614·08	3·24
		Sundry claims	....	....	....	....	....	....	....	2,104·25	518·98	....

Red Hill		Voided leases							14·87	1,551·81	40,797·40	31,070·65	
		Sundry claims							15·29	90·33	1,403·14	999·97	
Ryan's Find		Voided leases									54·16	151·69	
		Sundry claims								·44	116·44	355·83	
St. Ives	5628, etc.	Ives Reward Leases									1,617·00	450·47	
		Voided leases							63·34	146·87	37,701·46	15,756·31	
		Sundry claims			5·38				211·25	950·23	4,177·56	1,459·39	
Wannaway		Voided leases								28·61	1,831·95	1,465·70	
		Sundry claims								193·79	1,316·37	1,300·33	
Widgiemooltha	5663	Bobs									16·00	4·94	
	5834	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	456·07	16,157·36	6,822·05	·07
	From District generally :—												
	Sundry Parcels treated at :												
	State Battery, Coolgardie					*181·30					771·01	*37,491·54	17·00
	Australian Machinery & Investment Co., Ltd. Cyanide Plant (T.L.S. 63H, 127H)											3,044·44	86·31
	T. James (T.A. 201)			24·00	27·72						361·00	346·61	
	Lister's Cyanide Plant											*269·23	
	Paris Central Cyanide Plant											*77·64	
	J. Seymour (L.T.T.)											*5·71	
	Various Works			117·00	45·25			7·75			4,014·61	29,427·49	223·06
	Reported by Banks and Gold Dealers	3·04	5·02					14,908·76	723·86		48·25	123·65	·65
	Totals	**3·04**	**33·86**	**38,158·15**	**18,627·38**	**4,331·93**		**16,923·76**	**16,737·13**	**2,707,662·75**	**1,397,677·37**	**31,849·89**	

KUNANALLING DISTRICT.

Carbine	970S	Carbine									13,820·00	7,047·96	
	970S, etc.	(Carbine Leases)									20,116·00	5,470·81	
		Voided leases								687·98	51,991·86	39,862·25	
		Sundry claims		31·50	8·39			136·08	93·96		6,106·63	2,185·62	
Chadwin		Voided leases									4,781·55	5,232·25	2·50
		Sundry claims	4·34	18·00	12·52			14·28	82·36		5,942·05	2,935·94	·25
Dunnsville		Voided leases								828·58	17,548·85	8,657·45	
		Sundry claims		·15	7·79			21·00	1,034·08		2,862·71	2,060·24	
Jourdie Hills		Voided leases								18·00	28,009·74	19,401·09	28·45
		Sundry claims		10·50	2·22			1·86	49·81		1,779·50	833·50	1·05
Kintore	1036S	Newhaven		107·25	11·23						1,993·50	465·11	
		Voided leases						18·70	169·33		54,829·39	39,579·50	677·88
		Sundry claims						111·91	102·70		4,524·78	2,503·91	

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 1954.					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.												
KUNANALLING DISTRICT—*(continued)*.												
Kunanalling	....	Voided leases	....	....	....	....	....	86·13	1,734·92	130,303·61	100,812·73	40·77
		Sundry claims	....	....	55·75	32·18	....	216·53	815·28	14,715·67	9,609·60	....
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	*5,061·33	....
		Reported by Banks and Gold Dealers	....	....	....	....	....	866·02	17·93	....	5·85	·49
		Totals	....	**4·34**	**223·15**	**74·33**	....	**1,514·74**	**5,634·93**	**362,048·35**	**252,401·71**	**751·39**
Yilgarn Goldfield.												
Blackbournes	....	Voided leases	....	....	....	....	....	....	....	1,282·50	341·37	....
		Sundry claims	....	....	....	....	....	....	....	392·50	81·15	....
Bullfinch	3350, etc.	Great Western Consolidated, Ltd.	....	....	445,864·00	55,330·10	16,434·25	....	....	868,515·00	107,656·70	33,969·45
		Prior to transfer to present holders	....	....	....	....	....	....	64·80	78,404·34	24,644·88	....
	4287	Volcano	....	....	32·00	30·55	....	....	....	119·00	129·23	....
		Voided leases	....	....	....	....	....	....	10·14	490,361·07	185,489·03	27,958·41
		Sundry claims	....	....	10·00	5·95	....	8·47	37·04	7,474·75	4,062·09	....
Corinthian	3398, 3425	Corinthian Leases	....	....	....	....	....	....	....	3,081·83	1,770·90	....
	3398	(Corinthian)	....	....	....	....	....	....	....	7,383·75	2,543·16	....
	3425	(Corinthian North)	....	....	....	....	....	....	....	3,951·00	1,934·78	....
	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	4020	Birthday	....	....	....	....	....	....	2·25	45·00	194·94	·01
		Voided leases	....	....	....	....	....	....	179·49	9,993·06	10,262·98	....
		Sundry claims	....	....	11·00	6·01	....	2·50	73·97	2,621·60	1,823·80	....

Evanston	....	Voided leases	....	....	....	....	....	....	79·27	64,533·06	33,191·88	10·14
	....	Sundry claims	....	....	....	....	....	4·98	....	638·35	159·55	....
Forrestonia	....	Voided leases	....	....	....	....	....	....	....	1,185·00	298·15	....
	....	Sundry claims	....	....	6·00	2·23	....	....	....	378·00	144·01	....
Golden Valley	4173	Inspiration	....	....	36·00	63·49	....	....	....	242·00	373·96	....
	4247	Lily of the Valley	....	....	20·00	7·33	....	....	....	538·00	127·65	....
	4220	Manxman South	....	....	....	....	....	....	....	19·00	4·42	....
	2994 etc.	Radio leases	....	....	1,465·00	750·01	....	....	2·70	28,500·80	48,869·86	667·86
	....	Voided leases	....	....	....	....	....	....	36·34	36,545·92	28,509·40	10·99
	....	Sundry claims	....	....	....	....	....	4·58	237·85	6,631·27	4,908·99	1·02
Greenmount	72P.P	Black and White	....	....	....	....	....	....	....	105·00	10·36	....
	....	Voided leases	....	....	....	....	....	45·99	21·62	125,022·64	31,575·09	944·50
	....	Sundry claims	....	....	....	....	....	·46	4·27	3,072·58	813·96	....
Holleton	37P.P	Brittania	....	....	84·00	49·21	....	....	....	1,800·00	1,601·91	....
	....	Voided leases	....	....	....	....	....	....	9·33	45,003·25	13,147·88	36·69
	....	Sundry claims	....	....	....	....	....	....	3·75	3,464·05	923·78	·20
Hopes 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	....	....	160·00	21·98	....	....	....	5,244·00	1,148·94	·63
	....	Voided leases	....	....	....	....	....	....	18·76	55,876·63	21,625·66	·59
	....	Sundry claims	....	....	....	....	....	....	5·06	8,598·50	2,302·77	....
Koolyanobbing	....	Voided leases	....	....	....	....	....	....	·99	1,765·05	972·77	....
	....	Sundry claims	....	....	....	....	....	·26	17·33	656·10	329·20	....
Marvel Loch	4243	Christmas Gift	....	....	20·00	5·72	....	....	32·56	43·00	44·93	....
	13P.P	Cricket	....	....	16·00	2·87	....	....	....	1,671·00	932·04	....
	4039	Cromwell	....	....	....	....	....	....	....	633·00	98·46	....
	3942 etc.	Edward's Reward leases	....	....	4,971·00	1,927·22	....	....	....	60,464·50	26,665·96	....
	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 Firness	....	....	253·00	247·15	....	....	....	12,850·75	6,001·55	....
	3718	Kurrajong	....	....	....	....	....	....	....	9,221·00	3,271·73	....
	3914	May	....	....	....	....	....	....	....	145·00	45·86	....
	4230	May Queen	....	....	....	....	....	....	....	286·00	43·42	....
	3970	Mountain Queen	....	....	30·00	3·80	....	....	....	1,231·00	455·65	....
	3390 etc.	N.G.M., Ltd.	....	....	147·00	8·48	....	....	....	4,516·22	417·54	2·00
	....	Prior to transfer to present holders	....	....	....	....	....	....	....	2,675·00	459·60	....
	4362	North Star	....	....	14·00	5·24	....	....	....	14·00	5·24	....
	4035	Undaunted	....	....	....	....	....	....	....	865·00	113·59	....
	4251	Union Jack	....	....	....	....	....	....	....	2,175·00	182·17	....
	....	Voided leases	....	....	....	....	....	....	1,504·26	850,668·26	205,800·38	2,472·95
	....	Sundry claims	....	....	358·00	50·57	....	11·35	230·20	35,529·61	13,224·55	·02
Mount Jackson	....	Voided leases	....	....	....	....	....	....	180·85	55,166·78	39,927·52	2,313·77
	....	Sundry claims	....	....	....	....	....	6·44	52·87	10,935·95	4,879·54	70·74

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 1954.					Total Production.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240 lb.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240 lb.).	Fine ozs.	Fine ozs.
YILGARN GOLDFIELDS—continued.												
Mount Palmer	4250	Palmerston	2·03	....	23·00	17·84	....	2·03	....	23·00	17·84	....
	M.L. 4	Yellowdine Gold Dev. Pty., Ltd	....	....	....	....	....	....	....	93·00	136·46	....
	....	Voided leases	....	....	....	....	....	....	....	306,408·40	158,486·81	....
	....	Sundry claims	....	....	....	....	....	1,643·48	18·19	450·25	387·14	....
Mount Rankin	81P.P	Golden View	....	....	30·00	75·07	...	....	....	30·00	75·07	....
	76P.P	Marjorie Glen Reward	....	....	409·00	623·47	....	....	....	897·00	1,472·49	....
	3555	No Trumps	....	....	....	....	....	....	....	5,562·37	853·06	....
	....	Voided leases	....	....	....	....	....	3·84	5·20	496·00	122·17	....
	....	Sundry claims	....	....	125·00	726·26	....	....	....	731·00	948·12	....
Parker's Range	4359	Leonard's Find	....	....	210·75	30·38	....	....	....	210·75	30·38	....
	....	Voided leases	....	....	....	....	....	·42	270·48	62,880·35	32,479·50	26·46
	....	Sundry claims	....	....	269·00	94·18	·90	6·59	303·93	12,077·30	5,299·31	·98
Southern Cross	4082	Day Dawn	....	....	....	....	....	....	....	86·00	9·16	....
	4018	Fraser's	....	....	....	....	....	....	....	1,376·50	164·49	....
	3944	Nil Desperandum	....	....	....	....	....	....	....	1,533·00	216·77	....
	3444 etc.	Western Mining Corporation	....	....	....	....	....	....	....	568·00	92·63	....
	3444 etc.	(Three Boys Gold Mines, Ltd.)	....	....	....	....	....	....	....	10,157·00	1,392·95	1·26
	3444	(Three Boys)	....	....	....	....	....	....	....	4,180·00	727·75	....
	3934	(Three Boys North)	....	....	....	....	....	....	....	106·00	14·66	....
	3981	(Three Kings)	....	....	....	....	....	....	....	104·00	10·01	....
	3444 etc.	(Yellowdine Options N.L.)	....	....	....	....	....	....	....	8,074·25	2,000·29	....
	....	Voided leases	....	....	....	....	....	4·89	261·35	454,906·68	215,351·50	364·41
	....	Sundry claims	....	....	....	....	....	95·90	648·49	8,183·66	2,626·86	....
Westonia	4326	Consols	....	....	....	....	....	....	....	718·00	453·47	....
	....	Voided leases	....	....	....	....	....	....	4·06	596,024·64	380,874·45	5,104·07
	....	Sundry claims	....	....	49·00	23·62	....	9·51	64·96	4,249·76	2,787·35	·72
		From Goldfield generally :—										
		Sundry Parcels treated at :—										
		Holleton Cyanide Plant	....	....	....	....	....	....	....	....	*880·71	48·05
		Kurrajong Battery	....	....	....	....	....	....	....	....	*409·57	....
		Mt. Palmer Cyanide Plant	....	....	....	*58·88	....	....	....	....	*295·45	....
		Pilot Cyanide Plant	....	....	....	....	....	....	....	30·00	*3,753·59	....
		State Battery, Marvel Loch	....	....	....	*9·95	....	....	....	29·00	*536·33	....
		Three Boys Cyanide Plant	....	....	....	*155·90	....	....	....	7·00	*3,613·22	....
		Various Works	....	....	....	....	....	....	....	341·48	*97,722·21	57·35

	Reported by Banks and Gold Dealers	1·33	....	....	3·88	....	320·32	71·73	·60	120·60	....
	Totals	**3·36**	....	**454,612·75**	**60,337·34**	**16,435·15**	**2,190·68**	**4,602·04**	**4,702,190·35**	**1,829,177·53**	**74,064·27**

Dundas Goldfield.

Buldania	....	Voided leases	....	....	....	....	....	....	3·02	846·05	708·99	....
		Sundry claims	....	....	....	....	....	....	39·25	1,324·27	861·36	·72
Dundas	1860	Coronation	....	....	15·00	2·04	....	....	....	46·50	8·69	....
		Voided leases	....	....	....	....	....	1·88	28·02	6,103·48	2,545·38	155·02
		Sundry claims	....	....	16·00	·54	....	·76	413·85	2,102·75	1,101·77	18·32
Norseman	1596	Abbotshall	....	....	....	....	....	....	....	2,511·45	1,096·71	754·37
	1288, etc.	Central Norseman Gold Corp., N.L.	....	....	157,877·00	83,395·74	54,487·79	....	....	2,003,601·20	759,771·71	627,024·59
		Prior to transfer to present holders	....	....	....	....	....	....	1,663·32	69,819·83	47,892·08	16,508·85
	1861	Elizabeth	....	....	72·00	6·21	....	....	....	72·00	6·21	....
	1859	Mt. Barker	....	....	....	....	....	....	....	14·50	2·94	·19
	1315, etc.	Norseman Gold Mines, N.L.	....	....	....	....	....	....	....	964,099·00	240,900·95	353,206·54
		Prior to transfer to present holders	....	....	....	....	....	....	....	20,657·00	3,909·60	4,981·00
		Voided leases	....	....	....	....	....	14·27	10,601·15	913,148·72	600,653·82	38,246·67
		Sundry claims	....	....	61·50	20·46	....	1,052·09	3,402·99	47,240·70	22,215·39	200·64
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	48·76	47·50	18·62	·70
	Totals	....	....	**158,041·50**	**83,424·99**	**54,487·79**	**2,250·77**	**16,279·17**	**4,042,634·12**	**1,728,371·80**	**1,044,750·26**

Phillips River Goldfield.

Hatter's 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	....	....	....	....	‡1·99	....
		Voided leases	....	....	....	....	....	....	141·80	24,723·55	26,070·94	4,384·07
		Sundry claims	....	....	....	....	....	163·96	7·68	7,261·57	3,195·67	41·12

Table I.—*Production of Gold and Silver from all sources, etc.*—continued.

Mining Centre.	Number of Lease.	Registered Name of Company or Lease.	Total for 1954. Alluvial. Fine ozs.	Dollied and Specimens. Fine ozs.	Ore treated. Tons. (2,240 lb.).	Gold therefrom. Fine ozs.	Silver. Fine ozs.	Total Production. Alluvial. Fine ozs.	Dollied and Specimens. Fine ozs.	Ore treated. Tons. (2,240 lb.).	Gold therefrom. Fine ozs.	Silver. Fine ozs.
PHILLIPS RIVER GOLDFIELD—continued.												
West River	....	Voided leases	....	....	....	....	....	....	....	....	10·34	31·06
		Sundry claims	....	....	....	....	....	....	....	....	6·60	3·44
	From Goldfields generally :—											
	Sundry Parcels treated at :											
	Cordingup Copper Smelter (L.T.T. 1079H)		....	....	....	....	....	....	....	....	‡46·08	8·89
	F. E. Daw (M.A. 11)		....	....	....	*73·05	....	....	....	....	*128·45	....
	Ravensthorpe Sands Pty., Ltd. (L.T.T. 1235H)		....	....	....	*1·54	....	....	....	....	*605·19	5·72
	Various Works		....	....	....	....	....	....	....	27·00	*3,464·60	500·82
	Reported by Banks and Gold Dealers		....	....	....	....	....	164·69	12·14	....	4·76	....
	Totals		....	....	....	**76·58**	....	**607·11**	**820·85**	**130,485·53**	**104,027·82**	**16,026·60**
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	Avon 1PP	Hillsdale	....	....	....	....	....	....	....	1,261·75	308·00	....
Northampton	....	Sundry lead claims	....	....	....	....	†13·76	....	....	....	....	†1,661·84
Ongerup	....	Sundry claims	....	....	....	....	....	....	1·58	·33	1·74	....
	From State generally :—											
	Miscellaneous 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		3·85	10·82	....	99·63	....	1,107·84	922·24	....	415·84	404·26
	Totals		**3·85**	**10·82**	....	**99·63**	**13·76**	**1,425·16**	**1,027·75**	**4,315·83**	**115,32·81**	**33,063·01**

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 1954.

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	....	....	....	....	....	....	....	43·93	38·68	....	....	82·61	....
West Kimberley	....	....	....	....	....	....	....	....	....	....	....	....	2,118·44
Pilbara	Marble Bar	61·80	25·46	1,011·75	1,469·23	1,556·49	1,222·51	70·41	97·46	7,977·83	2,632·58	2,800·45	1,251·23
	Nullagine	8·61	72·00	6,966·08	1,163·35	1,243·96	28·72						
West Pilbara	....	....	....	....	....	....	....	10·88	....	....	....	10·88	·70
Ashburton	....	....	....	....	....	....	....	....	....	64·00	88·96	88·96	2,785·71
Gascoyne	....	....	....	....	....	....	....	....	21·40	....	....	21·40	....
Peak Hill	....	....	....	....	....	....	....	....	....	46,479·50	8,682·75	8,682·75	367·51
East Murchison	Lawlers	....	....	165·00	22·30	22·30	....						
	Wiluna	....	....	79·00	41·83	41·83	....	32·30	....	513·50	315·47	347·77	....
	Black Range	32·30	....	269·50	251·34	283·64	....						
Murchison	Cue	8·02	37·17	406,776·70	60,539·21	60,584·40	16,563·24						
	Meekatharra	4·25	273·98	4,042·75	1,509·38	1,787·61	·60						
	Day Dawn	·92	....	2,401·00	848·59	849·51	31·21	13·19	311·15	505,827·20	134,889·64	135,213·98	18,535·36
	Mt. Magnet	....	....	92,606·75	71,992·46	71,992·46	1,940·31						
Yalgoo	....	....	....	....	....	....	....	....	....	....	....	....	....
Mt. Margaret	Mt. Morgans	3·91	....	407·75	205·26	209·17	....						
	Mt. Malcolm	70·03	120·95	103,663·00	26,413·58	26,604·56	2,176·23	104·41	143·12	107,237·50	28,165·05	28,412·58	2,185·37
	Mt. Margaret....	30·47	22·17	3,166·75	1,546·21	1,598·85	9·14						
North Coolgardie	Menzies	·19	133·65	24,299·75	13,824·69	13,958·53	....						
	Ularring	....	18·11	32,751·50	17,348·89	17,367·00	3,764·95						
	Niagara	2·90	....	495·00	1,286·31	1,289·21	....	3·09	174·59	60,433·50	34,352·70	34,530·38	4,084·12
	Yerrilla	....	22·83	2,887·25	1,892·81	1,915·64	319·17						
Broad Arrow	....	....	....	....	....	....	....	1·79	59·49	3,541·00	2,786·45	2,847·73	2·30
N.E. Coolgardie	Kanowna	1·76	....	751·25	210·95	212·71	....	1·76	....	751·25	210·95	212·71	....
	Kurnalpi	....	....	....	....	....	....						
East Coolgardie	East Coolgardie	11·42	49·49	1,856,356·09	485,943·99	486,004·90	131,131·57	12·51	49·49	1,856,517·09	485,978·19	486,040·19	131,131·57
	Bulong	1·09	....	161·00	34·20	35·29	....						....
Coolgardie	Coolgardie	3·04	33·86	38,158·15	18,627·38	18,664·28	4,331·93	3·04	38·20	38,381·30	18,701·71	18,742·95	4,331·93
	Kunalling	....	4·34	223·15	74·33	78·67	....						
Yilgarn	....	....	....	....	....	....	....	3·36	....	454,612·75	60,337·34	60,340·70	16,435·15
Dundas	....	....	....	....	....	....	....	....	....	158,041·50	83,424·99	83,424·99	54,487·79
Phillips River	....	....	....	....	....	....	....	....	....	....	76·58	76·58	....
Outside Proclaimed Goldfields		....	....	....	....	....	....	3·85	10·82	....	99·63	114·30	13·76
		....	....	....	....	....	....	304·52	944·40	3,240,377·92	860,742·99	861,991·91	237,730·94

TABLE III.

Return showing total production reported to the Mines Department, and respective Districts and Goldfields from whence derived, to 31st December, 1954.

Goldfield.	District.	District. Alluvial.	District. Dollied and Specimens.	District. Ore Treated.	District. Gold Therefrom.	District. Total Gold.	District. Silver.	Goldfield. Alluvial.	Goldfield. Dollied and Specimens.	Goldfield. Ore Treated.	Goldfield. Gold Therefrom.	Goldfield. Total Gold.	Goldfield. 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	....	....	....	....	....	....	....	8,926·39	2,537·61	22,641·90	17,145·82	28,609·82	128·76
West Kimberley	....	....	....	....	....	....	....	1·30	24·68	1·00	2·49	28·47	13,575·29
Pilbara	Marble Bar	15,207·79	4,556·40	327,110·42	323,054·88	342,819·07	20,712·65	25,457·45	7,044·95	457,945·81	446,986·15	479,488·55	21,238·77
	Nullagine	10,249·66	2,488·55	130,835·39	123,931·27	136,669·48	526·12						
West Pilbara	....	....	....	....	....	....	....	6,324·19	374·67	24,680·96	24,200·90	30,899·76	1,881·19
Ashburton	....	....	....	....	....	....	....	9,262·77	479·40	6,792·10	2,899·40	12,641·57	39,136·85
Gascoyne	....	....	....	....	....	....	....	693·44	62·97	387·00	517·29	1,273·70	....
Peak Hill	....	....	....	....	....	....	....	3,376·86	5,300·33	761,223·43	320,053·27	328,730·46	3,768·47
East Murchison	Lawlers	6,904·30	2,343·19	2,011,198·92	822,652·98	831,900·47	26,290·77	8,796·56	22,119·10	12,613,493·33	3,647,703·59	3,678,619·25	59,068·71
	Wiluna	224·85	1,254·11	8,873,436·94	1,871,729·21	1,873,208·17	10,282·38						
	Black Range	1,667·41	18,521·80	1,728,857·47	953,321·40	973,510·61	22,495·56						
Murchison	Cue	5,082·73	8,875·35	6,789,390·64	1,392,379·84	1,406,337·92	272,021·46	25,399·33	58,773·11	12,994,345·18	4,929,902·79	5,014,075·23	454,080·42
	Meekatharra	14,514·60	18,122·38	2,281,445·76	1,303,214·30	1,335,851·28	5,070·85						
	Day Dawn	3,236·21	11,341·63	2,034,598·88	1,375,187·01	1,389,764·85	169,424·37						
	Mt. Magnet	2,565·79	20,433·75	1,888,909·90	859,121·64	882,121·18	7,563·74						
Yalgoo	....	....	....	....	....	....	....	1,786·09	3,212·57	441,403·83	263,534·74	268,533·40	1,502·56
Mt. Margaret	Mt. Morgans	3,462·95	9,359·82	1,212,084·71	715,929·03	728,751·80	5,791·16	11,390·65	33,335·48	10,269,147·79	4,679,504·17	4,724,230·30	238,310·10
	Mt. Malcolm	3,896·58	14,621·31	6,548,235·19	2,794,839·96	2,813,357·85	166,512·02						
	Mt. Margaret	4,031·12	9,354·35	2,508,827·89	1,168,735·18	1,182,120·65	66,006·92						
North Coolgardie	Menzies	1,658·10	6,771·73	1,573,824·30	1,246,246·97	1,254,676·80	31,269·65	4,815·43	19,168·28	3,260,113·70	2,341,025·63	2,365,009·34	57,829·90
	Ularring	129·39	6,758·08	483,519·60	412,655·46	419,542·93	18,528·49						
	Niagara	1,716·03	1,821·35	931,874·27	523,574·26	527,111·64	5,683·41						
	Yerrilla	1,311·91	3,817·12	270,895·53	158,548·94	163,677·97	2,348·35						
Broad Arrow	....	....	....	....	....	....	....	21,955·07	27,346·56	1,325,113·39	726,652·75	775,954·38	5,296·65
N.E. Coolgardie	Kanowna	106,517·07	13,515·45	1,004,776·76	625,857·97	745,890·49	3,039·73	119,351·10	21,814·36	1,018,146·83	644,368·92	785,534·38	3,052·44
	Kurnalpi	12,834·03	8,298·91	13,370·07	18,510·95	39,643·89	12·71						
East Coolgardie	East Coolgardie	33,606·93	40,879·96	65,609,509·53	30,860,983·86	30,935,470·75	4,540,665·75	61,011·80	56,912·85	65,794,109·58	30,992,729·66	31,110,654·31	4,540,678·67
	Bulong	27,404·87	16,032·89	184,600·05	131,745·80	175,183·56	12·92						
Coolgardie	Coolgardie	16,923·76	16,737·13	2,707,662·75	1,397,677·37	1,431,338·26	31,849·89	18,438·50	22,372·06	3,069,711·10	1,650,079·08	1,690,889·64	32,601·28
	Kunanalling	1,514·74	5,634·93	362,048·35	252,401·71	259,551·38	751·39						
Yilgarn	....	....	....	....	....	....	....	2,190·68	4,602·04	4,702,190·35	1,829,177·53	1,835,970·25	74,064·27
Dundas	....	....	....	....	....	....	....	2,250·77	16,279·17	4,042,634·12	1,728,371·80	1,746,901·74	1,044,750·26
Phillips River	....	....	....	....	....	....	....	607·11	820·85	130,485·53	104,027·82	105,455·78	16,026·60
Outside Proclaimed Goldfields		....	....	....	....	....	....	1,425·16	1,027·75	4,315·83	11,532·81	13,985·72	33,603·01
		....	....	....	....	....	....	333,460·65	303,608·79	120,938,882·76	54,360,416·61	54,997,486·05	6,640,594·20

TABLE IV.

Total output of Gold (Bullion and Concentrates entered for Export and Gold received at the Royal Mint, Perth), from 1st January, 1886, to 31st December, 1954; showing in Fine Ounces the quantity credited to the respective Goldfields.

Year.	Export.	Mint.	Total.	Export.	Mint.	Total.
		Kimberley.			**Pilbara.**	
	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.
Prior to 1951	22,422·06	15,984·59	38,406·65	157,902·34	364,708·44	522,610·78
1951	....	104·35	104·35	2,093·93	5,634·59	7,728·52
1952	....	327·57	327·57	6,790·64	8,291·93	15,082·57
1953	....	186·46	186·46	4,105·56	4,694·22	8,799·78
1954	....	71·98	71·98	1,562·98	1,831·48	3,394·46
Total	22,422·06	16,674·95	39,097·01	172,455·45	385,160·66	557,616·11
		(*a*) **West Pilbara.**			**Ashburton.**	
Prior to 1951	4,351·11	26,869·33	31,220·44	4,104·96	6,247·71	10,352·67
1951	....	13·12	13·12	....	5·75	5·75
1952	....	13·96	13·96	....	....	....
1953	....	....	....	....	68·85	68·85
1954	....	9·73	9·73	....	29·31	29·31
Total	4,351·11	26,906·14	31,257·25	4,104·96	6,351·62	10,456·58
		(*b*) **Gascoyne.**			(*c*) **Peak Hill.**	
Prior to 1951	304·55	1,068·17	1,372·72	41,102·76	207,005·74	248,108·50
1951	....	....	....	....	114·89	144·89
1952	....	....	....	....	5,296·37	5,296·37
1953	....	....	....	....	8,465·73	8,465·73
1954	....	21·40	21·40	....	8,104·51	8,104·51
Total	304·55	1,089·57	1,394·12	41,102·76	229,017·24	270,120·00
		East Murchison.			**Murchison.**	
Prior to 1951	259,181·70	3,021,367·40	3,280,549·10	1,575,614·30	3,334,984·75	4,910,599·05
1951	9·13	644·67	653·80	721·62	65,210·07	65,931·69
1952	84·50	1,160·39	1,244·89	572·80	83,400·62	83,973·42
1953	83·33	1,162·39	1,245·72	304·86	98,202·21	98,507·07
1954	33·70	200·54	234·24	36·59	121,085·74	121,122·33
Total	259,392·36	3,024,535·39	3,283,927·75	1,577,250·17	3,702,883·39	5,280,133·56
		(*d*) **Yalgoo.**			(*e*) **Mt. Margaret.**	
Prior to 1951	13,650·56	195,260·95	208,911·51	694,428·76	3,768,330·13	4,462,758·89
1951	....	1,175·09	1,175·09	114·35	22,475·34	22,589·69
1952	....	505·95	505·95	101·76	24,620·40	24,722·16
1953	....	283·12	283·12	....	25,725·48	25,725·48
1954	....	8·72	8·72	197·66	24,169·56	24,367·22
Total	13,650·56	197,233·83	210,884·39	694,842·53	3,865,320·91	4,560,163·44
		(*f*) **North Coolgardie.**			(*g*) **Broad Arrow.**	
Prior to 1951	263,417·19	2,012,608·18	2,276,025·37	122,625·95	433,321·72	555,947·67
1951	22·05	11,198·65	11,220·70	1·02	3,241·41	3,242·43
1952	50·26	18,510·84	18,561·10	166·14	3,451·59	3,617·73
1953	22·27	18,816·46	18,838·73	6·43	1,734·52	1,740·95
1954	23·84	19,767·03	19,790·87	40·96	2,343·13	2,384·09
Total	263,535·61	2,080,901·16	2,344,436·77	122,840·50	444,092·37	566,932·87
		(*f*) **North-East Coolgardie.**			(*f*) **East Coolgardie.**	
Prior to 1951	235,893·69	458,731·23	694,624·92	7,027,962·84	23,808,944·87	30,836,907·71
1951	....	162·05	162·05	2,230·79	436,962·54	439,193·33
1952	....	453·56	453·56	1,577·43	455,615·32	457,192·75
1953	....	120·57	120·57	777·13	493,055·30	493,832·43
1954	....	146·35	146·35	1,108·51	494,893·95	496,002·46
Total	235,893·69	459,613·76	695,507·45	7,033,656·70	25,689,471·98	32,723,128·68
		(*h*) **Coolgardie.**			**Yilgarn.**	
Prior to 1951	663,194·68	1,237,478·24	1,900,672·92	220,138·08	1,540,668·20	1,760,806·28
1951	105·46	25,991·88	26,097·34	178·96	4,482·78	4,661·74
1952	177·31	42,139·84	42,317·15	87·78	7,732·55	7,820·33
1953	49·20	40,262·26	40,311·46	47·52	57,387·44	57,434·96
1954	16·70	35,769·72	35,786·42	68·14	59,334·09	59,402·23
Total	663,543·35	1,381,641·94	2,045,185·29	220,520·48	1,669,605·06	1,890,125·54
		(*i*) **Dundas.**			(*j*) **Phillips River.**	
Prior to 1951	170,723·23	1,385,078·89	1,555,802·12	40,647·71	62,793·01	103,440·72
1951	64·16	44,067·81	44,131·97	3·11	18·41	21·52
1952	....	68,103·96	68,103·96	....	222·45	222·45
1953	....	66,780·03	66,780·03	....	898·98	898·98
1954	....	78,668·52	78,668·52	....	437·74	437·74
Total	170,787·39	1,642,699·21	1,813,486·60	40,650·82	64,370·59	105,021·41
		¶ **Donnybrook.**			**Outside Proclaimed Goldfields.**	
Prior to 1951	282·21	557·53	839·74	22,724·25	39,760·30	62,484·55
1951	....	....	....	44·87	656·24	701·11
1952	....	....	....	....	519·14	519·14
1953	....	....	....	....	671·63	671·63
1954	....	....	....	....	557·59	557·59
Total	282·21	557·53	839·74	22,769·12	42,164·90	64,934·02

(*a*) Prior to 1st May, 1898, included with Pilbara, and from 12th July, 1929, to 16th September, 1949, included in Outside Proclaimed Goldfields. (*b*) Prior to March, 1899, included with Ashburton. (*c*) From 1st August, 1897. (*d*) Prior to 1st April, 1897, included with Murchison. (*e*) From 1st August, 1897. (*f*) Prior to 1st May, 1896, included with Coolgardie. (*g*) From 1st September, 1897. (*h*) Declared 5th April, 1894, to which date included with Yilgarn. (*i*) Prior to 1893, included with Yilgarn. (*j*) Prior to 1902, included in Outside Proclaimed Goldfields. ¶ Abolished 4th March, 1908.

TABLE V.

Total Output of Gold Bullion, Concentrates, etc., entered for Export and Received at the Perth Branch of the Royal Mint from 1st January, 1886.

Year.	Export.	Mint.	Total.	Estimated Value.
	Fine ozs.	Fine ozs.	Fine ozs.	£A.
1886	270·17	....	270·17	1,147
1887	4,359·37	....	4,359·37	18,518
1888	3,124·82	....	3,124·82	13,273
1889	13,859·52	....	13,859·52	58,871
1890	20,402·42	....	20,402·42	86,664
1891	27,116·14	....	27,116·14	115,182
1892	53,271·65	....	53,271·65	226,284
1893	99,202·50	....	99,202·50	421,385
1894	185,298·73	....	185,298·73	787,099
1895	207,110·20	....	207,110·20	879,749
1896	251,618·69	....	251,618·69	1,068,808
1897	603,846·44	....	603,846·44	2,564,977
1898	939,489·49	....	939,489·49	3,990,697
1899	1,283,360·25	187,244·41	1,470,604·66	6,246,732
1900	894,387·27	519,923·59	1,414,310·86	6,007,610
1901	923,698·96	779,729·56	1,703,416·52	7,235,654
1902	707,039·75	1,163,997·60	1,871,037·35	7,947,661
1903	833,685·78	1,231,115·62	2,064,801·40	8,770,719
1904	810,616·04	1,172,614·03	1,983,230·07	8,424,226
1905	655,089·88	1,300,226·00	1,955,315·88	8,305,654
1906	562,250·59	1,232,296·01	1,794,546·60	7,622,749
1907	431,803·14	1,265,750·45	1,697,553·59	7,210,750
1908	356,353·96	1,291,557·17	1,647,911·13	6,999,881
1909	386,370·58	1,208,898·83	1,595,269·41	6,776,274
1910	233,970·34	1,236,661·68	1,470,632·02	6,246,848
1911	160,422·28	1,210,445·24	1,370,867·52	5,823,075
1912	83,577·12	1,199,080·87	1,282,657·99	5,448,385
1913	86,255·13	1,227,788·15	1,314,043·28	5,581,701
1914	51,454·65	1,181,522·17	1,232,976·82	5,237,352
1915	17,340·47	1,192,771·23	1,210,111·70	5,140,228
1916	26,742·17	1,034,655·87	1,061,398·04	4,508,532
1917	9,022·49	961,294·67	970,317·16	4,121,646
1918	15,644·12	860,867·03	876,511·15	3,723,183
1919	6,445·89	727,619·90	734,065·79	3,618,509
1920	5,261·13	612,581·00	617,842·13	3,598,931
1921	7,170·74	546,559·92	553,730·66	2,942,526
1922	5,320·16	532,926·12	538,246·28	2,525,812
1923	5,933·82	498,577·59	504,511·41	2,232,186
1924	2,585·20	482,449·78	485,034·98	2,255,927
1925	3,910·59	437,341·56	441,252·15	1,874,320
1926	3,188·22	434,154·98	437,343·20	1,857,715
1927	3,359·10	404,993·41	408,352·51	1,734,572
1928	3,339·30	390,069·19	393,408·49	1,671,093
1929	3,037·12	374,138·96	377,176·08	1,602,142
1930	1,753·09	415,765·00	417,518·09	1,864,442
1931	1,726·66	508,845·36	510,572·02	2,998,137
1932	3,887·07	601,674·33	605,561·40	4,403,642
1933	2,446·97	634,760·40	637,207·37	4,886,254
1934	3,520·40	647,817·95	661,338·35	5,558,873
1935	9,868·71	639,180·38	649,049·09	5,702,149
1936	55,024·58	791,183·21	846,207·79	7,373,539
1937	71,646·91	928,999·84	1,000,646·75	8,743,755
1938	113,620·06	1,054,171·13	1,167,791·19	10,363,023
1939	98,739·88	1,115,497·76	1,214,237·64	11,842,964
1940	71,680·47	1,119,801·08	1,191,481·55	12,696,503
1941	65,925·94	1,043,391·96	1,109,317·90	11,851,445
1942	15,676·48	832,503·97	848,180·45	8,865,495
1943	6,408·34	540,057·08	546,475·42	5,710,669
1944	1,824·99	464,439·76	466,264·75	4,899,997
1945	5,029·38	463,521·34	468,550·72	5,010,541
1946	6,090·14	610,873·52	616,963·66	6,640,069
1947	5,220·09	698,666·29	703,886·38	7,575,574
1948	4,653·72	660,332·07	664,985·79	7,156,909
1949	4,173·14	644,252·48	648,425·62	7,962,808
1950	4,161·53	606,171·88	610,333·41	9,466,270
1951	5,589·45	622,189·64	627,779·09	9,725,343
1952	9,608·62	720,366·44	729,975·06	11,847,917
1953	5,396·30	818,515·65	823,911·95	13,299,092
1954	3,089·08	847,451·09	850,540·17	13,313,618
Total	11,564,356·38	44,930,292·20	56,494,648·58	363,284,275

	1953. £A.	1954. £A.
Estimated total par value of above production	236,361,085	239,973,948
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 during, 1953–54	1,074,688	1,138,527
Exchange Premium paid by Mint above par value 1930–1954 (Approximate)	109,945,282	119,582,198
Estimated Total	£A349,970,657	£A363,284,275
Bonus paid by Commonwealth Government under the Commonwealth Bounty Act, 1930	161,448	161,448
Gross estimated value of gold won	£A350,132,105	£A363,445,723

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 1954, 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 1951	1·50	9	9,073·05	215,865	‡38,674·08	747,205	7,883·66	3,870·93	157,298
1951	....	....	....	....	....	....	....	....	....
1952	....	....	....	....	....	....	....	....	....
1953	....	....	....	....	....	....	....	....	....
1954	....	....	....	....	....	....	....	....	....
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 1951	969·03	396·36	28,507	†8,878·92	4,280·85	186,405	10·10	959
1951	....	....	....	....	....	....	....	....
1952	264·58	129·69	43,397	264·58	129·69	43,397	....	....
1953	358·43	164·23	10,313	358·43	164·23	10,313	....	....
1954	45·44	23·49	1,410	45·44	23·49	1,410	....	....
Total	**1,637·48**	**713·77**	**83,627**	**9,547·37**	**4,598·26**	**241,525**	**10·10**	**959**

* By-product of Gold Mining. † Includes 26·23 tons Conc. containing 13·56 tons metal valued at £600 from West Pilbara.

Period.	Asbestos—*continued.*							
	Pilbara Goldfield.		West Pilbara Goldfield.		Outside Proclaimed Goldfield.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons.	£	tons.	£	tons.	£	tons.	£
Prior to 1951	1,227·41	56,013	7,886·36	483,780	501·10	6,732	9,633·22	547,526
1951	109·50	1,861	2,009·66	223,778	....	....	2,119·16	225,639
1952	192·72	3,084	3,399·72	592,032	....	....	3,592·44	595,116
1953	341·69	7,087	4,059·29	700,277	....	....	4,400·98	707,364
1954	124·79	2,620	3,972·53	553,056	....	....	4,097·32	555,676
Total	**1,996·11**	**70,665**	**21,327·56**	**2,552,923**	**501·10**	**6,732**	**23,843·12**	**2,631,321**

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 1951	....	....	10·00	50	16·00	56	26·00	106
1951	....	....	....	....	5·00	18	5·00	18
1952	9·00	50	....	....	....	....	9·00	50
1953	....	....	42·22	380	169·65	1,410	211·87	1,790
1954	111·74	615	....	....	932·00	7,016	1,043·74	7,631
Total	**120·74**	**665**	**52·22**	**430**	**1,122·65**	**8,500**	**1,295·61**	**9,595**

Period.	Bentonite		Beryl Ore.					
	Outside Proclaimed Goldfield.		Pilbara Goldfield.		Ashburton Goldfield.		Gascoyne Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons.	£	tons.	£	tons.	£	tons.	£
Prior to 1951	1,386·13	3,741	853·21	26,567	....	....	105·51	4,642
1951	449·00	1,347	65·18	7,973	....	....	9·45	910
1952	586·00	2,036	69·69	11,541	....	....	1·57	284
1953	217·70	741	104·49	18,649	....	....	2·07	402
1954	1,121·60	4,111	105·60	18,070	0·14	25	11·78	2,092
Total	**3,760·43**	**11,976**	**1,198·17**	**82,800**	**0·14**	**25**	**130·38**	**8,330**

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 1951	....	....	81·47	2,744	*1,078·22	35,270	5,506·40	1,800
1951	....	....	16·14	2,291	90·77	11,174	127·91	84
1952	....	....	14·03	2,737	85·29	14,562	....	....
1953	8·00	1,390	10·06	1,782	124·62	22,223	....	....
1954	3·48	547	11·15	1,873	132·15	22,607	....	....
Total	**11·48**	**1,937**	**132·85**	**11,427**	**1,511·05**	**105,836**	**5,634·31**	**1,884**

* Includes 3·50 tons valued at £297 from West Kimberley Goldfield, 24·53 tons valued at £928 from Murchison Goldfield and 10·00 tons valued at £92 from Outside Proclaimed Goldfield.

Period.	Calcite.		Chromite.		Clays (Cement, Fire and White Clays).			
	Mt. Margaret Goldfield.		Peak Hill Goldfield.		Murchison Goldfield.		Outside Proclaimed Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons.	£	tons.	£	tons.	£	tons.	£
Prior to 1951	5·00	25	....	....	....	....	43,307·23	37,120
1951	....	....	....	....	....	....	47,559·00	20,687
1952	....	....	773·00	11,100	41·75	207	25,924·10	19,280
1953	....	....	1,968·00	29,717	....	....	22,915·85	15,881
1954	....	....	4,269·55	48,957	....	....	22,659·00	28,681
Total	**5·00**	**25**	**7,010·55**	**89,774**	**41·75**	**207**	**162,365·18**	**121,649**

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 1951	*44,358·03	37,858	21415911·90	17,077,094	46·87	866	82,745·45	748,482
1951	47,559·00	20,687	848,474·86	1,716,788	13·30	77	....	....
1952	25,965·85	19,487	830,461·20	2,457,296	15·51	1,094	....	....
1953	22,915·85	15,881	886,182·20	3,073,073	32·93	2,424	13·32	674
1954	22,659·00	28,681	1,018,342·53	3,588,818	....	....	....	....
Total	**163,457·73**	**122,594**	**24999372·69**	**27,913,069**	**108·61**	**4,461**	**82,758·77**	**749,156**

* Includes 1,050·80 tons valued at £738 from Collie Mineral Field.

Period.	Copper Ore—*continued.*							
	Ashburton Goldfield.		Mt. Margaret Goldfield.		Phillips River Goldfield.		Outside Proclaimed Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons.	£	tons.	£	tons.	£	tons.	£
Prior to 1951	354·37	6,444	47,860·52	230,953	95,919·64	589,235	176·66	1,945
1951	23·70	493	1·30	50	4·83	138	....	....
1952	....	....	....	....	....	*94	....	....
1953	....	....	....	....	....	....	4·04	101
1954	....	....	....	....	....	....	....	....
Total	**378·07**	**6,937**	**47,861·82**	**231,003**	**95,924·47**	**589,467**	**180·70**	**2,046**

* Value of Copper separated from 1·31 tons Copper precipitates.

Period.	Copper Ore—*continued.*		Corundum.		Cupreous Ore (Fertiliser).			
	Total.		East Murchison Goldfield.		West Pilbara Goldfield.		Pilbara Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons.	£	tons.	£	tons.	£	tons.	£
Prior to 1951	†253,600·74	1,748,032	....	....	955·38	8,004	....	....
1951	43·13	758	....	....	898·21	10,471	....	....
1952	15·51	1,188	54·00	380	1,001·90	7,571	....	....
1953	50·29	3,199	....	....	672·22	6,851	....	....
1954	....	....	....	....	3,080·16	17,228	310·58	9,200
Total	**253,709·67**	**1,753,177**	**54·00**	**380**	**6,607·87**	**50,125**	**310·58**	**9,200**

† Including 109·52 tons valued at £1,709 from West Kimberley Goldfield; 284·31 tons valued at £5,052 from East Murchison Goldfield; 1,042·02 tons valued at £11,290 from Murchison Goldfield; 82·35 tons valued at £811 from Yalgoo Goldfield; 6·12 tons valued at £51 from North Coolgardie Goldfield; 50·67 tons valued at £379 from East Coolgardie Goldfield; 16·00 tons valued at £77 from Yilgarn Goldfield; 1,051·54 tons valued at £33,130 from Peak Hill Goldfield; 24,026·25 tons valued at £119,497 from Northampton Mineral Field.

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 1951	....	....	1,382·55	11,508	....	....	....	....
1951	39·66	494	22·00	660	268·93	3,079	....	....
1952	1·75	31	229·04	7,080	340·05	5,496	....	....
1953	9·79	114	163·30	1,140	892·10	10,043	25·54	461
1954	0·75	7	328·57	5,915	553·04	12,671	286·15	2,653
Total	**51·95**	**646**	**2,125·46**	**26,303**	**2,054·12**	**31,289**	**311·69**	**3,114**

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 1951	7·00	48	9·21	64	....	....	....	....
1951	40·00	240	12·55	125	....	....	....	....
1952	....	....	6·85	95	....	....	....	....
1953	....	....	9·50	73	22·00	368	29·00	100
1954	....	....	72·86	660	....	....	....	....
Total	**47·00**	**288**	**110·97**	**1,017**	**22·00**	**368**	**29·00**	**100**

Period.	Cupreous Ore (Fertiliser)—*continued.*							
	Dudas Goldfield.		Phillips River Goldfield.		Outside Proclaimed Goldfield.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons.	£	tons.	£	tons.	£	tons.	£
Prior to 1951	....	....	6·97	206	....	....	*2,399·48	19,963
1951	....	....	55·70	1,035	....	....	1,337·05	16,104
1952	....	....	64·00	1,322	....	....	1,643·59	21,595
1953	12·69	117	72·00	1,406	39·94	331	1,948·08	21,004
1954	....	....	116·00	2,047	....	....	4,748·11	50,381
Total	**12·69**	**117**	**314·67**	**6,016**	**39·94**	**331**	**12,076·31**	**129,047**

* Includes 38·37 tons valued at £133 from Yilgarn Goldfield.

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 1951	....	24	630·00	1,810	895·40	4,124	18,373·00	1,609
1951	....	....	198·00	2,700	124·25	599	....	....
1952	....	....	....	....	555·25	2,432	....	....
1953	....	....	....	....	....	....	....	....
1954	....	....	150·00	1,579	....	....	....	....
Total	....	**24**	**978·00**	**6,089**	**1,574·90**	**7,146**	**18,373·00**	**1,609**

Period.	Emerald—*continued.*				Emery.		Felspar.	
	Pilbara Goldfield.		Total.		Outside Proclaimed Goldfield.		Coolgardie Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Carats (cut and rough).	£	Carats (cut and rough).	£	tons.	£	tons.	£
Prior to 1951	....	....	18,373·00	1,609	13·00	130	40,005·30	104,463
1951	....	....	....	....	....	....	1,806·50	7,389
1952	....	....	....	....	....	....	2,503·50	10,452
1953	....	....	....	....	....	....	2,079·50	8,682
1954	8·68	313	8·68	313	....	....	3,173·00	14,293
Total	**8·68**	**313**	**18,381·68**	**1,922**	**13·00**	**130**	**49,567·80**	**145,279**

Table VI.—*Minerals other than Gold*—continued.

Period.	Felspar—*continued.*				Fergusonite.		Fuller's Earth.	
	Outside Proclaimed Goldfield.		Total.		Pilbara Goldfield.		Outside Proclaimed Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons.	£	tons.	£	tons.	£	tons.	£
Prior to 1951	528·00	1,050	40,533·30	105,513	....	....	*30·00	86
1951	....	....	1,806·50	7,389	....	....	....	....
1952	....	....	2,503·50	10,452	0·17	165	25·00	125
1953	47·50	178	2,127·00	8,860	....	....	15·75	79
1954	52·91	198	3,225·91	14,491	....	....	....	....
Total	**628·41**	**1,426**	**50,196·21**	**146,705**	**0·17**	**165**	**70·75**	**290**

* 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 1951	1·00	112	8,015·75	6,854	4,392·50	74,642	18·10	97
1951	....	....	6,172·59	4,417	506·00	15,033	....	....
1952	....	....	7,669·12	5,629	230·00	7,305	....	....
1953	....	....	6,905·74	4,690	319·50	11,182	20·00	180
1954	....	....	7,803·01	5,541	257·50	9,012	....	....
Total	**1·00**	**112**	**36,566·21**	**27,131**	**5,705·50**	**117,174**	**38·10**	**277**

Period.	Gypsum.							
	Yilgarn Goldfield.		Dundas Goldfield.		Outside Proclaimed Goldfield.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons.	£	tons.	£	tons.	£	tons.	£
Prior to 1951	76,617·50	80,420	1,999·00	1,238	166,919·85	192,564	245,536·35	274,222
1951	63,816·00	36,571	7·00	19	14,100·00	10,136	77,923·00	46,726
1952	34,054·00	21,692	21·00	53	16,256·56	11,512	50,331·56	33,257
1953	25,216·00	19,041	12·00	6	15,019·11	11,131	40,247·11	30,178
1954	24,347·00	18,290	30·00	15	16,765·00	13,315	41,142·00	31,620
Total	**224,050·50**	**176,014**	**2,069·00**	**1,331**	**229,060·52**	**238,658**	**455,180·02**	**416,003**

Period.	Ilmenite Sand.		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 1951	155·95	776	3,154·33	20,050	*89,551·58	192,141	92,705·91	212,191
1951	....	....	13,629·08	139,215	5,493·19	41,921	19,122·27	181,136
1952	....	....	12,994·90	179,405	4,708·55	47,439	17,703·45	226,844
1953	....	....	13,175·88	185,670	3,675·89	35,336	16,851·77	221,006
1954	....	....	16,664·99	195,997	1,633·30	13,030	18,298·29	209,027
Total	**155·95**	**776**	**59,619·18**	**720,337**	**105,062·51**	**329,867**	**164,681·69**	**1,050,204**

* Includes 450 tons valued at £247 from East Coolgardie and 100 tons valued at £300 from West Pilbara Goldfield.

Period.	Iron Ore (exported.)		Jarosite.		Kyanite.		Lead Ore and Concentrates.	
	West Kimberley Goldfield.		Phillips River Goldfield.		Outside Proclaimed Goldfield.		Northampton Mineral Field.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons.	£	tons.	£	tons.	£	tons.	£
Prior to 1951	....	....	9·54	37	4,215·69	21,781	422,222·72	1,542,481
1951	10,384·00	10,297	....	....	....	....	1,521·62	148,068
1952	204,945·00	203,238	....	....	....	....	5,699·39	783,186
1953	687,895·00	682,162	....	....	....	....	4,776·11	284,524
1954	634,514·00	629,325	....	....	....	....	1,338·94	70,370
Total	**1,537,738·00**	**1,525,022**	**9·54**	**37**	**4,215·69**	**21,781**	**435,558·78**	**2,828,629**

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 1951	1,034·96	1,314	819·40	2,265	4,269·82	9,718	6,124·18	13,297
1951	418·00	1,099	344·25	870	....	....	762·25	1,969
1952	....	....	1,054·67	2,843	....	....	1,054·67	2,843
1953	....	....	19·60	73	....	....	19·60	73
1954	....	....	91·75	258	....	....	91·75	258
Total	**1,452·96**	**2,413**	**2,329·67**	**6,309**	**4,269·82**	**9,718**	**8,052·45**	**18,440**

Period.	Manganese.						Mica.	
	Pilbara Goldfield.		Peak Hill Goldfield.		Total.		Outside Proclaimed Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons.	£	tons.	£	tons.	£	tons.	£
Prior to 1951	....	....	23,058·69	132,334	*23,103·54	132,626	†32,930·00	3,984
1951	....	....	5,256·52	33,789	5,256·52	33,789	....	....
1952	....	....	5,044·80	35,634	5,044·80	35,634	....	....
1953	....	....	16,324·00	150,991	16,324·00	150,991	....	....
1954	8,982·00	163,473	31,599·00	444,742	40,581·00	608,215	....	....
Total	**8,982·00**	**163,473**	**81,283·01**	**797,490**	**90,309·86**	**961,255**	**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.							
	Kimberley Goldfield.		West Pilbara Goldfield.		Murchison Goldfield.		East Coolgardie. Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons.	£	tons.	£	tons.	£	tons.	£
Prior to 1951	....	....	3,743·25	46,780	2,028·17	19,411	45·35	163
1951	....	....	15·60	234	672·10	7,657	....	....
1952	....	....	....	....	296·55	3,252	....	....
1953	20·61	330	....	....	266·06	2,412	20·50	145
1954	....	....	....	....	429·45	4,109	....	....
Total	**20·61**	**330**	**3,758·85**	**47,014**	**3,692·33**	**36,841**	**65·85**	**308**

Period.	Ochre—*continued.*		Petalite.		Phosphatic Guano.		Pyrites.	
	Total.		Coolgardie Goldfield.		Outside Proclaimed Goldfield.		Dundas Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quatity.	Value.
	tons.	£	tons.	£	tons.	£	tons.	£
Prior to 1951	*5,876·27	66,626	5·19	52	10,799·73	59,174	†328,345·56	984,019
1951	687·70	7,891	....	....	....	....	46,615·00	296,988
1952	296·55	3,252	....	....	....	....	53,577·00	422,029
1953	307·17	2,887	....	....	....	....	59,248·00	489,985
1954	429·45	4,109	15·00	69	....	....	56,150·00	441,466
Total	**7,597·14**	**84,765**	**20·19**	**121**	**10,799·73**	**59,174**	**543,935·56**	**2,634,487**

* 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 1951	2·00	13	6·53	357	892·19	37,246	126·20	2,119
1951	....	....	....	....	301·72	25,692	18·14	2,289
1952	....	....	2·73	291	420·30	36,827	30·79	3,176
1953	....	....	....	....	393·77	20·975	3·29	28
1954	....	....	....	....	155·27	7,679	....	....
Total	**2·00**	**13**	**9·26**	**648**	**2,163·25**	**128,419**	**178·42**	**7,612**

Table VI.—*Minerals other than Gold*—continued.

Period.	Silver Lead Ore and Concentrates.				Silver Lead Zinc Ore and Concentrates.			
	Ashburton Goldfield.		Total.		West Kimberley Goldfield.		Pilbara Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons.	£	tons.	£	tons.	£	tons.	£
Prior to 1951	4,166·08	102,543	5,196·50	142,550	754·67	15,259	....	....
1951	648·16	61,559	968·02	89,540	49·03	2,568	....	....
1952	979·20	96,977	1,433·02	137,271	316·57	14,743	....	....
1953	713·28	40,195	1,110·34	61,198	444·61	7,118	94·42	5,488
1954	393·50	20,533	548·77	28,212	279·26	2,601	....	....
Total	**6,900·22**	**321,807**	**9,256·65**	**458,771**	**1,844·14**	**42,289**	**94·42**	**5,488**

Period.	Silver Lead Zinc Ore and Concentrates.				Soapstone.			
	Northampton Mineral Field.		Total.		Greenbushes Mineral Field.		Outside Proclaimed Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons.	£	tons.	£	tons.	£	tons.	£
Prior to 1951	105·36	3,983	860·03	19,242	517·00	1,778	10·00	25
1951	....	....	49·03	2,568	....	....	38·40	125
1952	....	....	316·57	14,743	....	....	....	....
1953	....	....	539·03	12,606	....	....	....	....
1954	....	....	279·26	2,601	....	....	....	....
Total	**105·36**	**3,983**	**2,043·92**	**51,760**	**517·00**	**1,778**	**48·40**	**150**

Period.	Soapstone—*continued.*		Talc.					
	Total.		East Coolgardie Goldfield.		Outside Proclaimed Goldfield.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons.	£	tons.	£	tons.	£	tons.	£
Prior to 1951	527·00	1,803	840·96	3,481	381·00	4,865	1,221·96	8,346
1951	38·40	125	54·70	232	597·47	7,431	651·17	7,663
1952	....	....	68·25	273	1,155·36	14,410	1,223·61	14,683
1953	....	....	108·70	487	2,119·37	30,445	2,228·07	30,932
1954	....	....	37·00	166	2,883·03	45,685	2,920·03	45,851
Total	**565·40**	**1,928**	**1,109·61**	**4,639**	**7,135·23**	**102,836**	**8,244·84**	**107,475**

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 1951	265·07	130,672	15·29	10,052	*283·17	143,233	5·57	2,395
1951	....	....	....	....	....	....	2·06	2,350
1952	....	....	....	....	....	....	3·63	6,056
1953	....	....	....	....	....	....	3·09	7,252
1954	....	....	....	....	....	....	4·84	5,941
Total	**265·07**	**130,672**	**15·29**	**10,052**	**283·17**	**143,233**	**19·19**	**23,994**

* 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 1951	2·82	915	....	....	....	....	....	....
1951	....	....	....	....	....	....	....	....
1952	1·37	1,555	....	....	2·02	2,399	....	....
1953	2·89	8,560	0·80	1,038	1·09	2,960	*0·22	390
1954	46·72	68,997	....	....	0·55	1,507	....	....
Total	53·80	80,027	0·80	1,038	3·66	6,866	0·22	390

*** 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 1951	8·39	3,310	11,413·25	1,025,756	0·60	143	....	....
1951	2·06	2,350	22·44	17,854	0·17	117	0·15	115
1952	7·02	10,010	35·88	23,962	0·06	42	0·15	120
1953	8·09	20,200	41·41	23,311	....	....	....	....
1954	52·11	76,445	42·85	22,885	....	....	....	....
Total	**77·67**	**112,315**	**11,555·83**	**1,113,768**	**0·83**	**302**	**0·30**	**235**

Period.	Tin—*continied.*							
	Pilbara Goldfield.		West Pilbara Goldfield.		East Murchison Goldfield.		Total.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	tons.	£	tons.	£	tons.	£	tons.	£
Prior to 1951	6,055·40	593,799	....	....	0·39	103	*17,475·11	1,620,222
1951	38·31	21,389	0·03	18	....	....	61·10	39,493
1952	59·85	43,305	1·86	1,287	....	....	97·80	68,716
1953	70·97	39,386	0·59	310	0·30	122	113·27	63,129
1954	78·47	40,092	....	....	....	....	121·32	62,977
Total	**6,303·00**	**737,971**	**2·48**	**1,615**	**0·69**	**225**	**17,868·60**	**1,854,537**

* Includes 4·72 tons valued at £360, 0·15 tons valued at £15, and 0·60 tons valued at £46 from Murchison, Coolgardie and Yilgarn Goldfields, respectively.

Period.	Tungsten (Scheelite).							
	Pilbara Goldfield.		East Murchison Goldfield.		Yalgoo Goldfield.		Mt. Margaret Goldfield.	
	Conc.	Value.	Conc.	Value.	Conc.	Value.	Conc.	Value.
	tons.	£	tons.	£	tons.	£	tons.	£
Prior to 1951	....	....	....	....	2·99	1,050	....	....
1951	....	....	....	....	....	....	....	....
1952	....	....	0·06	52	....	....	1·29	2,255
1953	....	....	....	....	0·03	43	0·78	842
1954	1·69	1,867	....	....	....	....	....	....
Total	**1·69**	**1,867**	**0·06**	**52**	**3·02**	**1,093**	**2·11**	**3,148**

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 1951	6·45	1,030	21·33	5,238	106·74	39,087	*138·75	46,658
1951	....	....	0·10	164	....	....	0·14	215
1952	....	....	0·93	1,384	....	....	2·28	3,691
1953	1·31	1,571	0·74	867	0·05	38	2·91	3,361
1954	2·01	1,494	....	....	....	....	3·70	3,361
Total	**9·77**	**4,095**	**23·10**	**7,653**	**106·79**	**39,125**	**147·78**	**57,286**

* 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 1951	....	....	238·64	1,148	0·72	115	*268·12	1,682
1951	3·69	7,392	1·24	2,193	....	....	4·93	9,585
1952	20·92	37,686	5·94	7,538	0·57	795	27·43	46,019
1953	....	....	3·00	3,861	0·45	612	3·45	4,473
1954	....	....	....	....	....	....	....	....
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 1951	*1,686·42	10,239	....	....	....	....	....	....	....	....
1951	54·50	491	10·00	50	....	....	....	....	....	....
1952	62·00	744	....	....	46·01	365	....	....	46·01	365
1953	29·00	348	10·00	50	63·77	1,011	‡4·38	*Nil*	68·15	1,011
1954	....	....	....	....	‡73·85	*Nil*	....	....	73·85	*Nil*
Total	**1,831·92**	**11,822**	**20·00**	**100**	**183·63**	**1,376**	**4·38**	**Nil**	**188·01**	**1,376**

* Includes 126·12 tons valued at £872 from East Coolgardie Goldfield and 20 tons valued at £60 from Yilgarn Goldfield.

† By-product from Silver-Lead-Zinc Mining. ‡ Unpayable assayed zinc content of Silver-Lead-Zinc Ore and Concentrate.

TABLE VII.

Quantity and Value of Minerals, other than Gold, reported during year 1954.

Number of Lease, Claim, Or Area.	Goldfield or Mineral Field.	Registered Name of Producer.	Quantity.	Metallic Content.	Value.
		ANTIMONY (*f*) (*g*) (*k*).			
			tons.	tons.	£A.
G.M.L.'s 231L, etc.	Pilbara	Blue Spec G.M.'s. N.L.	45·44	23·49	(*b*) 1,410·00
		ASBESTOS (Chrysotile).			
Temp. Res. 1305H....	Pilbara	Hancock, L. G.	124·79	....	2,620·55
M.C's. 48, 68	West Pilbara	Hancock, L. G.	178·86	....	10,853·72
			303·65	....	(*b*) 13,474·27
		ASBESTOS (Crocidolite)			
M.C's. 54, etc.	West Pilbara	Australian Blue Asbestos, Ltd.	3,793·67	....	(*b*) 542,202·31
		BARYTES.			
M.C. 11N	Murchison	Rumble, P. R.	111·74	....	614·87
M.C's. 487H, etc. (Cranbrook)	O.P.G.	Ferrari, A.	932·00	....	7,015·83
			1,043·74	....	(*a*) 7,630·70
		BENTONITE.			
M.C's. 282H, 397H (Marchagee)	O.P.G.	Fennell, W. G.	260·10	....	1,026·45
M.L's. 437H, etc. (Marchagee)	O.P.G.	Noonan, E. J.	861·50	....	3,084·40
			1,121·60	....	(*a*) 4,110·85
		BERYL (*f*) (*g*).			
				BeO Units.	
M.C. 350	Pilbara	Ball, J.	14·45	176·73	2,531·70
M.C. 286	Pilbara	Coffin, W.	7·19	77·51	1,162·70
M.C. 311	Pilbara	Hall, A.	2·09	25·48	359·20
M.C's. 294, 306	Pilbara	Hall & Pinchin	3·06	35·85	505·45
M.C's. 340, 343	Pilbara	Sherlock & Parker	8·09	100·75	1,511·40
M.C. 304	Pilbara	White, A. L.	0·96	9·38	140·65
M.C's. 297, 301	Pilbara	Miller & Trembath	0·96	10·14	152·10
M.C. 313	Pilbara	Richardson Bros.	9·77	112·17	1,682·45
M.C. 283	Pilbara	Glass & Jacoby	1·01	9·62	144·35
M.C. 354	Pilbara	McGregor, D. M.	1·21	12·76	191·35
P.A. 2483	Pilbara	Walkerden & Party....	2·11	22·24	338·10
P.A. 2462	Pilbara	Williamson & Dunn	5·02	50·23	753·40
Crown Lands	Pilbara	Sundry persons	49·68	572·99	8,596·85
Crown Lands	Ashburton	Sundry persons	0·14	1·68	25·15
Crown Lands	Gascoyne	Sundry persons	11·78	139·49	2,092·25
P.A. 2506	Yalgoo	Dick, W.	2·80	30·58	431·20
P.A. 2515	Yalgoo	Phillips, D. M.	0·68	8·24	116·15
M.L. 80, etc.	Coolgardie	Aust. Glass Manufacturers, Ltd.	3·97	40·85	576·00
M.C. 9	Coolgardie	Culley, D.	6·89	83·08	1,246·20
M.C. 12	Coolgardie	Giles & Morris	0·29	3·55	50·25
			132·15	1,523·32	(*b*) 22,606·90
		CHROMITE.			
				Av. Assay. % Cr_2O_3	
M.C's. 44P, etc.	Peak Hill	Broken Hill Pty.,Ltd.	87·00	46·00	1,380·00
M.C's. 39P, etc.	Peak Hill	Ives, L.	4,182·55	43·50	47,576·95
			4,269·55	43·55	(*b*) 48,956·95

Table VII.—*Minerals other than Gold*—continued.

Quantity and Value of Minerals, other than Gold, reported during year 1954.

Number of Lease, Claim, or Area.	Goldfield or Mineral Field.	Registered Name of Producer.	Quantity.	Metallic Content.	Value.
		CLAY (Cement clay).			
			tons.		£A.
Freehold Land (Maida Vale)	O.P.G.	D. Rhodes Pty., Ltd.	11,901·00	....	(c) 5,903·40
		CLAY (Fire clay).			
Greenmount Loc. 84 (Glen Forrest)	O.P.G.	Darling Range Firebrick Co.	1,203·00	....	1,142·85
M.C's. 304H, etc. (Clackline)	O.P.G.	Clackline Refractories, Ltd.	5,535·00	....	5,535·00
			6,738·00	....	(c) 6,677·85
		CLAY (White Clay).			
M.C. 109H (Goomalling)	O.P.G.	Brisbane & Wunderlich, Ltd.	4,000·00	....	16,000·00
M.C. 247H (Mt. Kokeby)	O.P.G.	Linton, J.B.	20·00	....	100·00
			4,020·00	....	(c) 16,100·00
		COAL.			
M.L. 250, etc.	Collie	Amalgamated Collieries of W.A., Ltd. :—			
		Co-operative Mine	123,383·14	....	439,507·61
		Proprietary Mine	55,438·42	....	197,333·27
		Cardiff Mine	69,108·70	....	247,930·21
		Stockton Mine	66,216·20	....	235,893·19
		Black Diamond Mine	14,491·00	....	51,570·22
		Westralia Mine	21,330·00	....	75,928·60
		Ewington Mine	10,455·00	....	37,093·81
		Stockton Open Cut	113,143·89	....	403,352·76
		Ewington Open Cut	141,868·88	....	505,547·17
M.L's. 314, etc.	Collie	Griffin Coal Mining Co. Pty. :—			
		Griffin Mine	41,652·05	....	142,298·62
		Wyvern Mine	56,152·15	....	192,406·17
		Phoenix Mine	31,827·50	....	109,051·97
		Centaur Mine	24,259·85	....	82,976·20
		Hebe Mine	903·20	....	3,251·60
		Muja Open Cut	95,308·15	....	325,720·30
M.L's. 418, etc.	Collie	Western Collieries, Ltd. :—			
		Western Collieries No. 1	62,660·10	....	221,591·30
		Western Collieries No. 2	29,849·30	....	105,018·30
		Western Collieries No. 3 Open Cut	60,295·00	....	212,346·50
			1,018,342·53	....	3,588,817·80 (e)
		CUPREOUS ORE AND CONCENTRATES (for Fertiliser).			
				Av. Assay Cu. %.	
M.C. 48L	Pilbara	Stubbs, S. H.	268·09	17·21	7,712·01
M.C. 112	Pilbara	Tsakalos, M. E.	38·32	20·92	1,414·31
Crown Lands	Pilbara	McKinnon, W. M.	0·93	13·20	18·30
Crown Lands	Pilbara	Miller, L. M.	2·06	13·87	40·25
Crown Lands	Pilbara	Watkins, D.	1·18	9·20	15·22
M.L. 259	West Pilbara	Lee, T.	93·43	14·34	2,095·72
M.L. 260	West Pilbara	Pianta, A. H.	140·83	12·67	2,690·62
Freehold Property	West Pilbara	Walters, I.	2,845·90	5·73	12,442·00
Crown Lands	Ashburton	Keith, P. C.	0·75	7·80	7·60
M.C. 10	East Murchison	Alac, M.	553·04	14·25	12,671·49
M.C. 59P	Peak Hill	Parkinson, T. L.	60·00	21·00	3,330·00
M.C. 60P	Peak Hill	Edwards, M.	45·82	11·82	760·35
P.A. 842P	Peak Hill	Jessop, E.	222·75	6·61	1,824·31
P.A. 1046D	Murchison	McCarthy & Harrop	10·42	4·15	61·83
P.A. 3514	Murchison	McCarthy & Stone	9·54	9·05	125·27
M.C. 9N	Murchison	Rinaldi, L. V.	244·24	7·20	2,255·50
P.A. 1943N	Murchison	Terrell, J. H.	11·81	7·18	110·20
P.A. 3342N	Murchison	Young, J. F.	10·14	7·44	100·08
M.L. 24F	Mt. Margaret	Bradley, J.	60·02	6·80	466·97
M.C. 2F	Mt. Margaret	Cable, D.	12·84	10·00	192·65
P.A. 785	Phillips River....	Wehr, H.	31·00	8·34	614·33
M.L. 1229H	Phillips River....	Wehr, W.	36·50	2·08	175·53
M.L. 411	Phillips River....	Wehr & O'Dea	48·50	10·90	1,256·76
			4,748·11	8·34	50,381·30 (a) (b)

Table VII.—*Minerals other than Gold*—continued.

Quantity and Value of Minerals, other than Gold, reported during year 1954.

Number of Lease, Claim, Or Area.	Goldfield or Mineral Field.	Registered Name of Producer.	Quantity.	Metallic Content.	Value.
		DIATOMACEOUS EARTH.			
			Cub. Yds.	Calcined Material. Tons.	£A.
M.L. 56PP (Wanneroo)	O.P.G.	Uni-" Versil " Insulating (W.A.) Pty., Ltd.	1,052·50	150·00	1,578·75 (*c*)
		EMERALDS.			
			Carats (Cut).		
P.A. 2427	Pilbara	Hall, C. M.	8·68	....	313·00
		FELSPAR.			
			Tons.		
M.L's., etc.	Coolgardie	Aust. Glass Manufacturers, Ltd.	3,173·00	....	14,292·70
M.C. 111H (Balingup)	O.P.G.	Oma, V. C.	52·91	....	198·41
			3,225·91	....	(*a*)14,491·11
		GLASS SAND.			
M.C's. 417H, etc., (Lake Gnangara)	O.P.G.	Aust. Glass Manufacturers, Ltd.	7,249·01	....	4,711·82
M.C. 365 (Lake Gnangara)	O.P.G.	Leach, R. J.	359·00	....	538·50
M.C's. 161H, etc., (Lake Gnangara)	O.P.G.	Leach, W. M.	195·00	....	291·00
			7,803·01	....	(*c*)5,541·32
		GLAUCONITE.			
			Greensand Treated.	Glauconite Recovered. tons.	
Private Property (Gingin)	O.P.G.	Brook, G. E.	1,545·00	257·50	(*b*) (*d*) 9,012·00
		GYPSUM.			
M.C's. 30, etc.	Yilgarn	Ajax Plaster Co., Pty., Ltd.	6,388·00	....	5,270·08
M.C's. 9, etc.	Yilgarn	Perth Modelling Works, Ltd.	17,959·00	....	13,020·29
M.C. 12	Dundas	McDonald & Whitfield	30·00	....	15·00
M.C's. 126H, etc., (Baandee)	O.P.G.	Perth Modelling Works, Ltd.	437·00	....	437·00
M.C's. 280H, etc., (Lake Brown)	O.P.G.	H. B. Brady & Co., Ltd.	11,265·00	....	8,448·75
M.C's. 402H, (Hines Hill)	O.P.G.	Kay, C. J.	5,063·00	....	4,428·45
			41,142·00	....	(*a*) (*c*) 31,619·57

Plaster of Paris reported as manufactured during the year being 26,227·00 tons from 36,750·50 tons of Gypsum by three factories.

IRON ORE (for Pig Iron).

			Ore Treated.	Pig Iron Recovered. Tons.	
Temporary Reserve 1258H	Yilgarn	The Charcoal Iron & Steel Industry	16,664·99	10,472·29	195,996·69
Crown Lands (Wundowie)	O.P.G.	The Charcoal Iron & Steel Industry	1,633·30	688·67	13,030·53
			18,298·29	11,160·96	(*c*) (*d*) 209,027·22

Average Assay Ore Used—Koolyanobbing 62·46 % Fe, Wundowie 41·89 % Fe.

IRON ORE (Exported) (*g*).

			Ore Exported.	Av. Assayed Iron Content.	
M.L's. 10, etc.	West Kimberley	Australian Iron & Steel, Ltd.	634,514·00	63·08%	(*b*) 629,325·00

Table VII.—*Minerals other than Gold*—continued.

Quantity and Value of Minerals, other than Gold, reported during year 1954.

No. of Lease Claim or Area.	Goldfield or Mineral Field.	Registered Name of Producer.	Ore and Conc.	Lead.		Silver.		Zinc.	
			tons.	tons.	Value £A.	fine oz.	Value £A	tons.	Value £A.
LEAD ORE AND CONCENTRATES (*f*) (*g*).									
Imp. Grant on Loc. 833	Northampton	Anglo-Westralian Mining Pty., Ltd.	285·69	213·34	(*b*) 16,397·58	....	....	....	....
Vic. Loc. 832	Northampton	Isseka Mining Pty., Ltd.	45·10	34·51	2,222·87	13·76	....	....	....
Vic. Loc. 436	Northampton	Paringa Wheal Fortune	1,008·15	754·68	51,749·98	....	....	....	....
			1,338·94	1,002·53	70,370·43	13·76	*nil*	*nil*	*nil*
(Silver—Quantity transferred to Silver Item.)									
SILVER/LEAD ORE AND CONCENTRATES (*f*) (*g*).									
M.L. 143	Ashburton	" Dingo " Lead Mine	83·35	60·10	(*b*) 4,029·02	701·28	235·69	....	....
M.L. 122	Ashburton	" Gift " Lead Mine	114·76	84·30	5,908·08	688·56	220·91	....	....
P.A. 300	Ashburton	Green & Woodsbey	26·57	18·87	1,120·74	159·41	40·38	....	....
M.L. 156	Ashburton	James, A.	13·46	9·59	716·97	93·64	30·81	....	....
M.L. 135	Ashburton	" June Audrey " Mine	24·84	17·32	1,092·57	173·85	57·37	....	....
M.L. 120	Ashburton	" Kooline Queen " Mine	7·57	5·70	435·73	49·93	13·21	....	....
M.L. 155	Ashburton	" Ridge " Lead Mine	116·83	91·97	6,925·66	892·34	259·45	....	....
M.L. 121	Ashburton	" South Kooline " Mine	6·12	4·19	304·32	36·70	10·26	....	....
M.C. 189	Pilbara	Moore, R. O.	148·85	103·72	7,329·70	981·82	306·31	....	....
M.C. 255	Pilbara	Engstrom, O.	6·42	4·87	348·83	21·22	5·62	....	....
			548·77	400·63	28,211·62	3798·75	1180·01	*nil*	*nil*
(Silver—Quantity and Value transferred to Silver Item.)									
SILVER/LEAD/ZINC ORE AND CONCENTRATES (*f*) (*g*).									
M.C. 29	West Kimberley	Devonian, Pty., Ltd.	279·26	93·03	(*b*) 2,601·22	2118·44	320·07	73·85	*nil*
(Silver and Zinc—Quantities and Values transferred to Silver and Zinc Items respectively.)									

Number of Lease, Claim, or Area.	Goldfield or Mineral Field.	Registered Name of Producer.	Quantity.	Metallic Content.	Value.
MAGNESITE.					
M.L's 87, etc.	Coolgardie	Scahill & Gibbons	tons. 91·75		£A. (*a*) 257·50
MANGANESE (*f*) (*g*).					
				Av. Assay % Mn.	
M.C's. 268/9 etc.	Pilbara	L. Ives & Party	8,982·00	53·08	163,472·85
M.C's. 24P, etc.	Peak Hill	Westralian Ores Pty.,Ltd.	31,599·00	46·43	444,742·00
			40,581·00		(*b*) 608,214·85
OCHRE (Red).					
M.C's. 26, etc.	Murchison	Murchison Minerals (1951).	297·50		2,975·00
M.C. 27	do.	Cassidy, J. E.	28·50		285·00
	do.	Ashley & Vann	62·00		434·00
			388·00		(*a*) 3,694·00
OCHRE (Yellow).					
M.C. 30	Murchison	Zadow & Ball	41·45		(*a*) 414·50
PETALITE.					
				Li_2O content units.	
M.L's. 80, etc.	Coolgardie	Aust. Glass Manufacturers, Ltd.	15·00	61·95	(*a*) 69·25

Table VII.—*Minerals other than Gold*—continued.

Quantity and Value of Minerals, other than Gold, reported during year 1954.

Number of Lease, Claim, Or Area.	Goldfield or Mineral Field.	Registered Name of Producer.	Quantity.	Metallic. Content.	Value.
PYRITES ORE AND CONCENTRATES.					
				Sulphur recovered. tons.	£A.
G.M.L's. 1460, etc.	Dundas	Norseman G. M., N.L.	14,248·00	5,023·35	70,709·00
			(*h*) 41,902·00	19,434·53	370,757·00
			56,150·00	24,457·88	(*a*)441,466·00
SILVER					
			Fine Ozs.		
	By product from	Gold Mining	222,446·48		85,433·05
	,, ,, ,,	Lead Mining	13·76		Nil.
	,, ,, ,,	Silver/Lead Mining	3,798·75		1,180·01
	,, ,, ,,	Silver/Lead/Zinc Mining	2,118·44		320·07
			228,377·43		86,933·13
TALC.					
			tons.		
M.C. 14E, 15E	East Coolgardie	Bean, H.	37·00		166·50
Private Property Loc. 839, (Three Springs).	O.P.G.	Universal Milling Co., Ltd.	2,883·03		45,684·51
			2,920·03		(*a*) (*b*) 45,851·01
TANTALO/COLUMBITE ORE AND CONCENTRATES (*f*) (*g*).					
			lbs.	Combined $TaNb_2O_5$ lbs.	
	Greenbushes	Western Queen (1936), N.L.	10,845·00	5,282·00	5,941·10
M.C's. 69L, etc.	Pilbara	Dorrington & Party	2,220·00	1,528·00	2,730·60
M.C's. 294, 306	do.	Hall & Pinchin	3,799·00	2,872·00	5,420·00
	do.	Northern Dev. & Mining Co., Ltd	98,625·00	48,978·00	60,847·00
M.C. 9	Coolgardie	Culley, D.	1,030·00	785·00	1,321·00
M.C. 14	do.	Rowe, E. P.	200·00	152·00	185·75
			116,719·00	59,597·00	(*b*) 76,445·45
TIN (*f*) (*g*).					
			tons.	tons.	
L.T.T. 1273H	Greenbushes	Chapman, E. S.	0·38	0·24	167·65
M.C's. 78, etc.	do.	Tin & Strategic Minerals, Ltd.	(*i*) 25·06	16·97	13,686·25
D.C. 111	do.	Tin & Strategic Min. Syndicate	(*i*) 1·14	0·82	581·00
Crown Lands	do.	Sundry Claims	0·10	0·06	47·45
	do.	Western Queen (1936), N.L.	(*i*) 16·17	10·28	8,402·20
D.C. 60	Pilbara	Munn, W.	0·21	0·15	113·80
D.C. 25, etc.	do.	J. A. Johnston & Son	33·19	20·78	15,777·01
D.C. 68	do.	D. Rhodes Pty., Ltd.	43·40	29·23	23,355·05
Crown Lands	do.	Sundry persons	1·67	1·12	846·08
			121·32	79·65	(*b*) 62,976·49
TUNGSTEN (Scheelite) (*f*) (*g*).					
			lbs.	WO_3 content lbs.	
M.C's. 60L, 61L	Pilbara	Western Wolfram, N.L.	3,782·00	2,706·00	1,867·00
L.T.T. 1252H	North Coolgardie	Linnett & Hawkins	4,497·00	3,345·00	1,494·00
			8,279·00	6,051·00	(*b*) 3,361·00
ZINC (*f*) (*g*).					
				tons.	
	West Kimberley	By-product from Silver/Lead/Zinc Mining....		(*j*) 73·85	Nil.

References:—O.P.G. denotes Outside Proclaimed Goldfields. (*a*) Value F.O.R. (*b*) Value F.O.B. (*c*) Value at Works. (*d*) Value of mineral recovered. (*e*) Value at Pit Head. (*f*) Only results from shipments finalised during period under review. (*g*) Metallic content calculated on Assay basis. (*h*) Concentrates. (*i*) Separated from Tin/Tant./Col. Concentrates. (*j*) Unpayable assayed Zinc content of 279·26 tons Silver/Lead/Zinc Ore and concentrates realised during the year from West Kimberley Goldfield. (*k*) By-product from Gold Mining.

TABLE VIII.—SHOWING AVERAGE NUMBER OF MEN EMPLOYED ABOVE AND UNDER GROUND IN THE LARGER GOLDMINING COMPANIES OPERATING IN WESTERN AUSTRALIA DURING THE YEARS FROM 1945 to 1954 INCLUSIVE.

COMPANY.	1945.			1946.			1947.			1948.			1949.			1950.			1951.			1952.			1953.			1954.		
	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.	127	115	242	178	148	326	195	159	354	185	148	333	171	135	306	173	138	311	115	119	274	151	115	266	155	112	267	152	114	266
Broken Hill Pty. Co., Ltd.	11	2	13	33	82	115	38	95	133	38	84	122	36	73	109	34	68	102	13	12	25	6	....	6	4	....	4	2	....	2
Blue Spec Gold Mines, Ltd.	32	12	44	38	17	55	36	24	60	17	12	29	1	....	1	20	6	26	33	21	54	36	21	57	33	15	48	30	15	45
Big Bell Mines, Ltd.	29	16	45	171	143	314	186	198	384	188	193	381	197	210	407	219	246	465	230	240	470	203	205	408	200	215	415	179	167	346
Burbidge Gold Mines, N.L.	....	....	....	18	....	18	15	4	19	14	4	18	18	4	22	16	4	20	2	....	2	1	....	1	....	....	....	....	....	....
Consolidated Gold Area, N.L.	1	....	1	2	....	2	2	....	2	2	....	2	1	....	1	1	....	1	3	1	4	1	....	1	1	1	2	1	2	3
Comet Gold Mines, Ltd.	42	33	75	43	32	75	17	7	24	7	10	17	9	13	22	11	12	23	13	11	24	10	8	18	10	6	16	4	2	6
Consolidated Gold Mines of Coolgardie, Ltd.	8	1	9	2	....	2	1	....	1	1	....	1	1	....	1	1	....	1	1	....	1	1	....	1	....	....	....	....	....	....
Central Norseman Gold Corporation, N.L.	77	135	212	103	201	304	111	251	362	117	268	385	133	246	379	163	236	399	148	226	374	151	212	363	155	228	383	158	227	385
Coolgardie Gold Mines, Ltd.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	2	3	1	....	1	....	....	....	....	....	....
Dundas Gold Mines, N.L.	1	1	2	4	13	17	9	22	31	7	17	24	11	15	26	3	9	12	....	....	....	....	....	....	....	....	....	....	....	....
Emu Gold Mines, Ltd.	34	38	72	38	40	78	36	35	71	9	6	15	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Edna May Amalgamated, N.L.	33	34	67	29	42	71	28	33	61	11	9	20	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Evanston Gold, N.L.	....	....	....	28	32	60	37	26	63	2	....	2	2	....	2	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....
First Hit Gold Mine	20	15	35	7	7	14	4	5	9	2	1	3	1	1	2	1	1	2	....	....	....	....	....	....	....	....	....	....	....	....
Firelight Syndicate	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	2	....	....	....	....	....	....	....	....	....
Golden Horseshoe (New), Ltd.	39	....	39	45	....	45	46	....	46	45	....	45	43	....	43	41	....	41	39	....	39	38	....	38	42	....	42	42	....	42
Gold Mines of Kalgoorlie, Ltd.	103	114	217	144	171	315	169	158	327	166	173	339	175	179	354	187	180	367	181	191	372	185	182	367	184	182	366	199	186	385
Great Boulder Pty., Ltd.	237	344	581	310	469	779	325	496	821	316	418	734	312	392	704	327	404	731	311	354	665	344	339	683	349	359	708	342	372	714
Great Western Consolidated	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	125	72	197	148	60	208	186	113	299	191	150	341
Hill 50 Gold Mine, N.L.	41	45	86	55	48	103	49	55	104	55	67	122	68	78	146	74	66	140	62	41	103	59	48	107	68	63	131	73	63	136
Kalgoorlie Enterprise, Ltd.	....	74	74	....	99	99	....	118	118	1	105	106	7	103	110	7	95	102	8	85	93	8	93	101	8	98	106	8	89	97
Kalgurli Ore Treatment Co., Ltd.	68	....	68	73	....	73	69	....	69	69	....	69	74	....	74	74	....	74	77	....	77	81	....	81	77	....	77	78	....	78
Lake View and Star, Ltd.	246	242	488	337	422	759	366	468	834	414	465	879	454	441	895	471	476	947	492	517	1,009	486	529	1,015	494	519	1,013	488	498	986
Moonlight Wiluna Gold Mines, Ltd.	4	5	9	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Marvel Loch Gold Mines, Syndicate	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	1	....	....	....	....	....	....	....	....	....
Moonlight Wiluna Gold Mines, Ltd. (Timoni)	2	....	2	13	11	24	18	20	38	13	20	33	18	18	36	33	32	65	42	42	84	42	41	83	39	37	76	42	34	76
Mountain View Gold, N.L.	....	....	....	....	....	....	7	9	16	11	8	19	10	14	24	11	11	22	13	7	20	5	3	8	4	6	10	3	6	9
Mt. Charlotte (Kalgoorlie) Gold Mines, N.L.	....	....	....	....	....	....	2	1	3	18	18	36	24	28	52	10	8	18	2	....	2	2	3	5	3	6	9	3	2	5
North Kalgurli (1912), Ltd.	52	131	183	62	173	235	66	213	279	76	265	341	79	304	383	90	316	406	133	348	481	112	293	405	76	207	283	83	193	276
New Milano, N.L.	2	....	2	2	1	3	2	2	4	2	1	3	1	....	1	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....
*Norseman Gold Mines, N.L.	98	56	154	105	79	184	12	19	31	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
New Coolgardie Gold Mines, N.L. (Barbara Leases)	....	....	....	....	....	....	....	....	....	12	9	21	78	64	142	73	125	198	73	120	193	65	109	174	68	108	176	77	95	172
New Coolgardie Gold Mines, N.L. (Callion Leases)	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6	21	27	6	29	35	7	34	41	9	42	51
Ora Banda Amalgamated, Ltd.	4	....	4	11	20	31	23	44	67	5	4	9	3	1	4	2	....	2	1	....	1	1	....	1	3	2	5	1	2	3
Paringa Mining and Exploration Co., Ltd.	69	103	172	76	113	189	83	117	200	87	134	221	79	134	213	92	138	230	47	46	93	10	6	16	2	2	4	....	....	....
Phoenix Gold Mines, Ltd.	48	33	81	50	30	80	50	30	80	33	22	55	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Porphyry (1939) Gold Mines, Ltd.	....	....	....	....	....	....	2	1	3	18	18	36	24	28	52	10	8	18	6	1	7	1	....	1	3	3	6	2	2	4
Radio Gold Mines	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	5	3	8	4	4	8	5	5	10	5	5	10
South Kalgurli Consolidated	51	80	131	80	91	171	103	105	208	107	111	218	110	105	215	120	107	227	124	110	234	67	102	169	67	107	174	64	106	170
Sons of Gwalia, Ltd.	104	106	210	122	160	282	108	128	236	98	109	207	92	143	235	104	151	255	121	129	250	121	118	239	102	157	259	102	138	240
Sunshine Reward Amalgamated Leases	4	3	7	5	7	12	8	9	17	9	10	19	9	14	23	10	9	19	10	7	17	9	7	16	8	7	15	8	7	15
Triton Gold Mine	11	23	34	41	66	107	83	178	261	64	95	159	7	....	7	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Wiluna Gold Mines, Ltd.	214	196	410	168	96	264	117	5	122	69	....	69	49	....	49	29	....	29	20	....	20	13	....	13	2	1	3	1	1	2
Yellowdine Gold Development, Ltd.	2	....	2	4	....	4	2	....	2	2	....	2	2	....	2	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....
All other Operators	599	388	987	1,002	674	1,676	1,174	993	2,167	1,127	972	2,099	965	825	1,790	985	837	1,822	879	661	1,540	850	598	1,448	846	523	1,369	734	495	1,229
State Average (incl. Diggers)	2,424	2,394	4,818	3,416	3,545	6,961	3,612	4,037	7,649	3,416	3,762	7,178	3,260	3,540	6,800	3,404	3,676	7,080	3,378	3,388	6,766	3,265	3,129	6,394	3,238	3,121	6,359	3,109	3,019	6,128
*Also additional men engaged exclusively on Pyrites Production	5	49	54	4	53	57	78	56	134	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

* Converted solely to Pyrites production after 1947.

By Authority: WILLIAM H. WYATT, Government Printer, Perth.