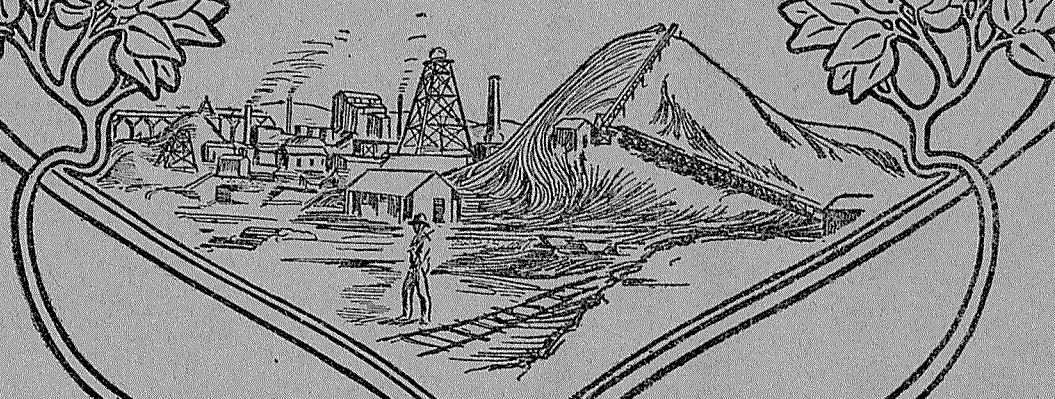




REPORT
OF THE
DEPARTMENT OF MINES
FOR THE YEAR
WESTERN · 1940 · AUSTRALIA



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



H. D. C. HIGGINS

1941.

—
WESTERN AUSTRALIA.

REPORT

of the

Department of Mines

FOR THE YEAR

1940

PERTH:

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ANNUAL REPORT OF THE DEPARTMENT OF MINES, WESTERN AUSTRALIA, 1940.

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STATE OF WESTERN AUSTRALIA.

Report of the Department of Mines for the State of Western Australia for the Year 1940.

To the Hon. Minister for Mines.

Sir,—I have the honour to submit the Annual Report of the Department for the year 1940, together with reports from the officers controlling Sub-departments, and comparative tables furnishing statistics relative to the Mining Industry.

I have, etc.,

A. H. TELFER,
Under Secretary for Mines.

Department of Mines,
Perth, 31st March, 1941.

Division I.

The Hon. Minister for Mines,—

I have the honour to submit, for your information, a report on the Mining Industry for the year 1940.

The estimated value of the mineral output of the State for the year was £5,593,494 (calculating gold at £4 4s. 11.45d. per fine ounce); an increase in value of £52,951 over the preceding twelve months. The estimated value of the premium paid to gold producers amounted to £A7,635,414, bringing the gross value of all minerals up to £A13,228,908, an increase of £897,249 in Australian currency over the 1939 production.

There were increases in the quantities and value of arsenic, asbestos, bismuth, copper, fireclay, glauconite, magnesite, mica, phosphatic guano, red oxide, scheelite, tin, vermiculite and wolfram. Decreased quantities of antimony, beryl, coal, felspar, gypsum and tantalite were reported.

The estimated value of gold received at the Perth branch of the Royal Mint and exported in gold-bearing material was £A12,696,503 (and equalled 95.97 per cent. of all minerals). (See footnote to Table 1, Part II.)

Other minerals realised:—Coal, £364,500; Arsenic, £59,977; Silver, £34,934; Tantalite, £7,811, Gypsum, £14,082, Felspar, £7,010; Antimony, £10,180; Tin, £5,174; Asbestos, £14,534; Glauconite, £4,823; Vermiculite, £757; Mica, £311; Bismuth, £891; Beryl, £16; and Scheelite, £1,960.

Dividends paid by mining companies amounted to £1,059,936, a decrease of £317,175, when compared with 1939. (See Table 6, Part II.)

To the end of 1940, the total amount distributed by gold mining companies in dividends was £38,067,846. To the same date the value of the mineral production amounted to £215,586,946, of which the gold production accounted for £198,704,771, based on normal values; but premiums on sales of gold during 1920-24 and since 1930, and payments under the Gold Bounty Act, 1930, increased the total value of gold and mineral productions by £41,415,205.

GOLD.

The quantity of gold reported as being received at the Perth Branch of the Royal Mint, 1,119,801.08 fine ounces, together with that contained in bullion, concentrates, and other gold bearing material exported for treatment, 71,680.47 fine ounces, totalled 1,191,481.55 fine ounces, and failed to equal that of 1939 by 22,765.09 fine ounces (*vide* Table 1).

The gold reported directly to the Department by producers as produced during the year was 1,154,843 fine ounces, which was a decrease of 33,443 fine ounces in comparison with the previous year's figures (*vide* Table 3). The Mint, plus export figure is treated as the official total per year, as despite a strict surveillance, a small percentage of production is not reported to the Department.

The calculated average value per ton of ore treated in the State as a whole declined from 24.65 shillings per ton in 1939, to 22.86 shillings per ton in 1940, calculated at the rate of £4 4s. 11.45d. per fine ounce, but the averaged premium obtained for gold during the twelve months (150.904 per cent.) would more than double this estimate. For the East Coolgardie Goldfield (which produced approximately 45.62 per

cent. of the State's reported yield of gold) the calculated average value of ore treated dropped from 27·63s. per ton to 25·26s. per ton. The estimates for the East Murchison (Wiluna and Youanmi Gold Mines), Mt. Margaret (Sons of Gwalia and Lancefield Mines), Murchison (Big Bell, Triton and Mt. Magnet Mines), and Dundas Goldfields (Norseman Mines and Central Norseman Gold Corporation) were 15·78s. (16·48s.); 29·83s. (29·65s.); 15·73s. (16·83s.) and 22·41s. (27·32s.) respectively; 1939 figures in parentheses.

The tonnage of ore reported to have been treated in 1940, viz., 4,291,709 tons, was the highest recorded tonnage in the history of gold mining in this State, being 196,452 tons more than the previous highest tonnage recorded for the year 1939.

Increased tonnages were reported from various goldfields as follows:—Pilbara, 3,417; East Murchison, 18,491; Murchison, 3,177; Broad Arrow, 3,585; North-East Coolgardie, 344; East Coolgardie, 132,443; Coolgardie, 55,362; Yilgarn, 20,175; Dundas, 41,534; Outside Proclaimed Goldfields, 1,055; whilst the principal goldfields showing decreased tonnages were:—Kimberley, 203; Ashburton, 1,365; Peak Hill, 427; Yalgoo, 6,928; Mt. Margaret, 67,793; North Coolgardie, 4,940; and Phillips River, 1,476.

The closing down of the Rothsay Gold Mines adversely affected the Yalgoo Goldfield output and the cessation of operations at the Lancefield Gold Mine accounts for the decrease in the Mt. Margaret Goldfield, whilst the closing of the Riverina Gold Mines would attribute largely to the decrease in the North Coolgardie Goldfield.

The quantity of gold recorded as being received at the Perth branch of the Royal Mint (1,119,801·08 fine ounces), and exported for treatment, in bullion, concentrates and other gold bearing material (71,680·47 fine ounces) failed to equal that of 1939 by 22,756·09 fine ounces (*vide* Table 1). The reported yield of fine gold from the tonnage of ore treated showed a decrease of 33,443 fine ounces when compared with that of 1939. (*Vide* Table 3.)

Thirteen goldfields failed to report yields of gold in excess of 1939 output, viz., Kimberley, 243 fine ounces; Ashburton, 148; Peak Hill, 722; East Murchison, 3,479; Murchison, 8,578; Yalgoo, 2,692; Mt. Margaret, 23,127; North Coolgardie, 2,674; Broad Arrow, 1,212; East Coolgardie, 640; Dundas, 3,002; Phillips River, 786; Outside Proclaimed Goldfields, 115.

Increased out-turns came from Pilbara, 1,551 fine ounces; North-East Coolgardie, 325; Coolgardie, 12,394; Yilgarn 5,505.

The estimated average tonnage of ore raised, and the number of ounces of gold produced, per man engaged in the industry, both showed slight increases, notably in the Pilbara, East Murchison, Coolgardie and Yilgarn Goldfields; a comprehensive comparison of 1939 and 1940 figures will be found in Table 4.

War enlistments undoubtedly account for a slight reduction in the average number of men engaged in the industry; the relative figures for 1939 and 1940 being 16,199 and 15,499 respectively; a decrease of 700 men. The average number engaged in the production of gold dwindled by 623, whilst the average number engaged in the raising of and search for other mineral showed a decline of 77 men. Less

men were reported as having been employed in operations at Koolan Island (20); in raising coal (39), and asbestos (8). The number engaged in raising other minerals showed very little fluctuation.

YILGARN GOLDFIELD.

This goldfield produced 5,505 fine ounces of gold more than in 1939, and while still being the most popular prospectors' field, has now established several large mines employing considerable labour.

Bullfinch Centre showed a greater tonnage production, but a slightly smaller yield than in 1939. Its main producers were "Copperhead Deeps," "Frances May," "Mistletoe" (which recorded 1,022 fine ounces from 1,405 tons, but cut out during the year), "Peter Pan" and "Rising Sun" (which produced 1,426 fine ounces from 8,479 tons). The number of men engaged on mining operations in the centre averaged 69, and the Copperhead battery supplied crushing facilities.

Corinthia Centre reported 2,093 tons, from which came 1,005 fine ounces. The main producers were "Corinthian North" (1,406 tons, 640 fine ounces), and "Deliverance" (590 tons, 265 fine ounces). An average of 13 men were mining during the year.

Eenuin Centre had an excellent year returning 4,963 tons for 4,217 fine ounces, being four times the yield for 1939.

Yellowdine Gold Areas, N.L., was mainly responsible, as its "Newfield Central" property employing 20 men, produced 3,907 fine ounces of gold from 4,646 tons (including 447 fine ounces from sands).

Over thirty (30) prospectors were also engaged in the district during the year.

Evanston Centre also has a large producer in the "Evanston" mine, owned by Messrs. Ridge Bros., which almost doubled its output in returning 8,391 fine ounces from 11,352 tons. This mine looks like being one of the best of the new discoveries of recent years; it employs 48 men. There is other activity in the centre, which is one of considerable promise.

Golden Valley increased its production compared with 1939, and has a number of consistent properties. The Stirling Gold Mines, N.L. (formerly Ora Banda Gold Mines, N.L.) is the largest, employing 30 men, and producing 3,118 fine ounces, plus 149 fine ounces from sands.

The "Radio" reported 1,159 fine ounces from 594 tons, and continues to develop well.

Fifty-five men were engaged in mining in the centre.

Greenmount Centre showed an increased yield without any developments of special note occurring.

Holleton Centre was quiet with the exception of a reported new find on Mr. J. C. Symes' farm, the importance of which has yet to be proved. The centre's yield was 42 fine ounces from 348 tons.

Hopes Hill Centre employed 17 men, and produced 560 fine ounces from 2,665 tons. The "Pilot" was the foremost producer, and carried out a programme of development during the year.

Kennyville Centre recorded 332 fine ounces from 1,655 tons. The main producers were the "Battler" (98 ounces from 630 tons); "Leviathan" (136 ounces from 411 tons), and the "Rainbow" (56 ounces from 390 tons).

Marvel Loch Centre was as usual the most popular, and had 184 men engaged therein. It recorded 7,390 fine ounces from 35,303 tons treated, a drop in yield, but a considerable increase in tonnage in comparison with 1939.

The principal mines were "Frances Firness" (560 ounces from 1,869 tons); "Grand National" (1,899 ounces from 13,139 tons); Lipis Gold Mining Coy. (263 ounces from 3,732 tons, plus 37 ounces from sands); "Prince George" (270 ounces from 3,061 tons, plus 167 ounces from sands); "Sunshine-Reward Amalgamated" (914 ounces from 2,962 tons, plus 434 ounces from sands).

The "Grand National" has been taken over by Burbidge Gold Mines, N.L. and its future is most encouraging. Generally speaking, this centre appears to possess excellent prospects, and 1941 should prove a bigger year again.

Mt. Jackson Centre had a number of consistent producers, and contained 16 men. The main property was that worked by Mt. Jackson Gold Mines, N.L., which reported 201 ounces from 289 tons.

"The Great Unknown" had the excellent return of 198 ounces from 94 tons.

Mt. Palmer Centre produced the most gold of any centre, as a result of the operations of Yellowline Gold Development, Ltd. Its yield was 19,054 fine ounces from 46,346 tons treated. It employs 147 men, and is also carrying out a diamond drilling exploratory programme.

Mt. Rankin Centre possessed only one producer in the "No Trumps" Mine, with 185 fine ounces from 549 tons.

Parkers Range Centre exceeded its 1939 output, and contained 31 miners and prospectors. The main producer was the "White Horseshoe" with 356 fine ounces from 469 tons.

Southern Cross Centre showed a decided increase in both tonnage and fine ounces, producing 7,907 tons for 1,200 fine ounces.

The "Three Boys" was mainly responsible, returning 556 fine ounces from 4,440 tons treated. It has its own battery, and crushes also for the public. The latter factor has been greatly responsible for the number of prospectors attracted to the centre. Thirty-five men were employed here in the industry during the year.

Westonia Centre was another to exceed its 1939 output, the figures being 9,806 fine ounces from 17,806 tons.

Edna May Amalgamated Gold Mines, N.L., with 9,448 fine ounces from 17,339 tons led the way.

COOLGARDIE GOLDFIELD.

This field, comprising the Coolgardie and Kunanaling districts, considerably improved upon its 1939 production, returning 38,682 fine ounces of gold, compared with 26,288 fine ounces in the previous year.

Coolgardie District:

This district was responsible for the major portion of the output, recording 35,564 fine ounces, mainly as a result of the operations of two large mines in the persons of the Consolidated Gold Mines of Coolgardie, Ltd. (Tindals), and the Phoenix Gold Mines (Bayleys), which have now become units in the industry.

The main centres in the Coolgardie district during the year were as follows:—

Burbanks Centre contained mostly small producers, and no outstanding results were reported.

Cave Rocks Centre.—The "Squeaker" lease, with 127 fine ounces from 338 tons, was the main producer.

Coolgardie Centre.—The Tindals and Bayleys properties were, as mentioned above, most active as regards development and plant erection. The former has been granted additional Government assistance to duplicate its treatment plant, and should in 1941 show further improved output. It employed 176 men at the end of the year, and produced 12,857 fine ounces of gold. The Bayleys property yielded 7,329 fine ounces, and employed 167 men.

With these two mines consistently producing, Coolgardie looks to possess a bright future, and the town itself is gradually expanding.

In addition to the two large mines, prospectors were active, and some good crushings were reported. The "Iron Duke" lease, now under option to New Goleconda Mines, N.L., returned 90 fine ounces from 182 tons, the "Caledonia" produced 159 fine ounces from 1,061 tons, while a new discovery, "Grey's Hill," reported 64 fine ounces from 52 tons. There were numerous other payable crushings.

Gibraltar Centre.—The "Lloyd George" Mine, which possesses a battery, experienced a satisfactory year, its output totalling 471 fine ounces from 1,364 tons, together with 21 ounces from 150 tons of sands treated.

Grosmont Centre was quite an active one, the principal producer being the "Vice Regal" lease, with 94 fine ounces, from 477 tons.

Hampton Plains—Block 59 had a large number of prospectors at work. One promising show was the "Surprise" Mine, which returned 633 fine ounces from 1,143 tons of ore. The "Golden Eagle" recorded 198 ounces from 490 tons, but it is reported that the gold has now cut out.

Higginsville Centre was also popular. The "Two Boys" lease, with 114 fine ounces of gold from 515 tons, was the principal producer, but a new find by W. H. Phillips on Prospecting Area 5405, promises well. A trial parcel of 100 tons crushed from it yielded 57 fine ounces.

Larkinville Centre had a number of small, but comparatively rich crushings.

Paris Group.—The consistent "Lister" Mine recorded 393 ounces from 1,145 tons treated. Apart from this property, only the "Paris" showed any activity.

Spargoville Centre was notable solely on account of the "Spargo's Reward (1935), N.L.," operations. This reliable producer from 19,815 tons returned 7,083 fine ounces, and carried out a programme of development. It employs 60 men and appears to be in an excellent position.

St. Ives Centre showed a revival mainly because the "Ives Reward" Mine was again being worked by a syndicate. One hundred and forty-four fine ounces were produced by this syndicate from 630 tons treated. It is hoped that operations this year will be on a bigger scale.

Wannaway Centre reported several small crushings.

Widgiemooltha Centre as usual continued active from a prospecting viewpoint, and recorded numerous crushings of a payable, although not specially outstanding character.

The "Cardiff Castle," with 274 fine ounces from 1,875 tons, plus 18 fine ounces from 540 tons of sands treated, was the largest producer. It possesses its own treatment plant.

A new discovery in virgin ground three miles west of the town was responsible for 35 fine ounces from 7¾ tons, but further work will be necessary to assess its importance.

Kunanalling District:

This district fell away during the year, and its production only totalled 3,117 fine ounces. Rainfall was so low that prospectors were unable, with the absence of water supplies, to prospect the outlying centres.

The production came mainly from the following centres:—

Balgarrie Centre.—The low grade property owned by Homeward Bound Gold Mines, N.L., recorded 141 fine ounces of gold from 2,887 tons of ore, while 307 fine ounces came from 4,100 tons of sands treated.

Carbine Centre.—The "Carbine" Lease consistently produced, and returned 432 fine ounces from 1,920 tons, in addition to 557 fine ounces from 10,630 tons of sands treated. There were several other crushings reported, but none of special importance.

Chadwin Centre was not as active as usual, but nevertheless some payable ore was reported. The "Magdala" lease obtained 277 fine ounces of gold from 843 tons of ore, and 49 fine ounces was reported from 17 tons produced from a new discovery by Messrs. Wisbey and Fennell. It is too early to know the importance of this find. Fifty-seven ounces from 261 tons was also recorded from Prospecting Area No. 1279 S.

Kintore Centre had several producers, the principal one being the "Newhaven," with 84 fine ounces from 297 tons. The Goldfields Australian Development Company, Ltd., cleaned up 979 tons of sands for 163 fine ounces, and then ceased operations at Kintore.

Kunanalling Centre.—A large number of men operated in this locality and some good results were obtained. The "Premier" Mine had four crushings, totalling 824 tons, from which was obtained 447 fine ounces. The Golden Bounty Syndicate crushed 270 tons for 191 fine ounces, but has now ceased operations on account of lack of capital.

Numerous other smaller crushings were reported.

DUNDAS GOLDFIELD.

The production for 1940 was 74,639 fine ounces of gold, which is slightly below 1939. Activity was well maintained, and considerable development work was undertaken on the field, which now looks to be well established.

Norseman Centre contains the main producers in the Central Norseman Gold Corporation which employs 440 men and mined 98,799 tons for 34,620 fine ounces, and the Norseman Gold Mines, N.L., employ-

ing 395 men and which treated 152,289 tons for 25,906 fine ounces. Both are progressive companies. The latter has two subsidiary companies in the Norseman Associated, and Norseman Developments, which respectively reported 9,908 tons for 1,850 ounces, and 10,065 tons for 1,556 ounces of gold.

Blue Bird Gold Mines, N.L., an extraordinarily rich proposition, recorded 2,667 tons for 5,877 fine ounces.

The Groundlark Gold Mines, N.L., also came into production with 1,314 tons, which returned 558 fine ounces, while the Empress Gold Mines, N.L., continued to develop its lease on the northern boundary of the "Blue Bird." It is expected to produce high grade ore in 1941.

EAST COOLGARDIE GOLDFIELD.

This field comprises the East Coolgardie and Bulong districts, and produces approximately half the State's total gold yield. There was a very slight reduction on the 1939 figure, but this was purely the result of the introduction of the four-weekly clean-up on the big mines.

The field has never looked better, all companies possessing ample ore reserves and pushing ahead with vigorous development programmes.

East Coolgardie District:

This district's output totalled 526,142 fine ounces of gold from 1,769,226 tons of ore treated. While the output is 6,407 fine ounces less than in 1939; the tonnage treated exceeds that of the previous year by 132,339, which is indicative of the increased activity in the industry during the twelve months.

Boulder and Kalgoorlie Centres.—The State Mining Engineer in his report deals fully with the activities of the companies operating at this centre, and I will merely record that the future of the Golden Mile is exceedingly bright and that the North End is gradually but surely assuming importance from a mining viewpoint.

Celebration Centre.—The Consolidated Gold Areas operated throughout the year and recorded 34,377 tons for 7,315 fine ounces of gold. Mining operations are carried on at White Hope, while the ore is hauled seven miles to the milling plant at Celebration for treatment. An average of 70 men were employed. The "New Hope" produced 970 fine ounces of gold, and employed nine men.

Mt. Monger Centre was again an active one, the main happening being the floating of the New Milano, N.L. This Company's mine produced 4,729 fine ounces from 2,925 tons, and employed 50 men. A large sum is being expended on development and plant, and future prospects appear promising.

Numerous rich prospectors' crushings were reported, and the ore from this district is generally of an excellent grade.

Bulong District:

This district recorded a slight increase in both yield and tonnage, the principal centres being Bulong, Ramdalls and Taurus.

NORTH-EAST COOLGARDIE GOLDFIELD.

This field includes the Kanowna and Kurnalpi districts, the former showing increased output and the latter a decrease.

Kanowna District:

The main centres were again Gordon and Whiteheads. At the former the "Sirdar" reported 1,092 fine ounces of gold from 682 tons of ore and 3,168 tons of sands.

The Lady Betty at Whiteheads produced 150 fine ounces from 40 tons of ore and 230 fine ounces dollied gold and specimens. The owner was an assisted prospector.

At Kanowna itself numerous small prospectors' crushings were recorded.

Kurnalpi District:

Jubilee, Kurnalpi, and Mulgabbie were the principal centres, and as is habitual with this district much dollied gold was reported. No find of note was made.

BROAD ARROW GOLDFIELD.

This busy field has many centres, and its production of 17,390 fine ounces of gold from 42,676 tons of ore compared with 1939, showed slightly less gold but an increased tonnage.

The most active centres were as follows:—

Bardoc Centre.—The "Wyeheproof" Mine, a consistent producer, recorded 220 fine ounces from 580 tons, while the "Ellen Pearce" as a Prospecting Area reported 169 fine ounces from 144 tons, and after conversion to leasehold, 272 fine ounces from 314 tons. Several other payable crushings from prospecting areas were listed.

Broad Arrow Centre.—Sixty-three men were at work here, and the outstanding return came from Fieldings Prospecting Area No. 3915W. Forty-eight tons for 166 fine ounces, plus 29 fine ounces dollied. Values subsequently, it is reported, cut out.

The "Grace Darling" produced 240 fine ounces from 522 tons. There were numerous other producing shows.

Lady Bountiful Centre was chiefly notable for the operations of the Carbine Gold Mines, N.L., which recorded 1,610 fine ounces from 3,662 tons treated.

Paddington Centre employed 36 men and recorded numerous crushings. The "Mt. Corlae" lease with 538 tons, yielding 113 fine ounces, was the principal producer.

Smithfield, Waverley and Windanya Centres also reported a number of payable crushings.

NORTH COOLGARDIE GOLDFIELD.

This field, as a whole, showed a falling off in both tonnage and yield, although the main district, Menzies, recorded an all round increase, and in fact has bright future prospects.

Menzies District:

This district yielded 11,472 fine ounces for the year as compared with 9,355 fine ounces for 1939.

Copperfield Centre.—The Goldfields Australian Development Coy., Ltd., commenced operations on the Timoni property and crushed 2,980 tons for 1,329 fine ounces of gold.

Comet Vale Centre.—H. J. Van Vierssen Trip treated 3,980 tons of Sand Queen-Gladsome tailings for 425 fine ounces of gold. Beyond this, there was little activity.

Goongarrie Centre recorded one very high grade crushing of six tons from Prospecting Area 2194Z, which realised 101 fine ounces.

Menzies Centre employed 104 men, and was responsible for numerous good crushings. The "Aspacia" output was particularly good, 248 tons of ore returning 432 fine ounces of gold. The "Dark Horse" lease yielded 106 fine ounces from 38 tons.

ULARRING DISTRICT.

This district showed a very considerable decrease on the previous year's figures; mainly on account of the fact that in the previous year the "Two Chinamen" Lease produced the amazing figures of 3,706 fine ounces from 365 tons of ore. This year its production, although excellent, was not as large.

Morleys Centre was the main one, and the "Two Chinamen" property returned 925 fine ounces of gold from 249 tons, including dollied and specimen stone.

The "First Hit" had the high grade yield of 512 fine ounces from 60 tons of ore, while the "Rabbit" Lease No. 1078U recovered 234 fine ounces dollied and specimen stone in addition to 48 fine ounces from six tons crushed.

Thirty-eight men were employed in the centre, which had a number of other good crushings.

Davyhurst and Riverina Centres were also busy, one good producer at the latter being the "Ajax West" with 339 fine ounces of gold from 149 tons of ore.

Yerilla District:

This district produced 2,222 fine ounces compared with 1,734 in 1939.

Principal centres were Edjudina, Patricia, Hep-
pingstone's, Welch's Find, Yilgange and Yarri.

There were no developments of particular note.

Niagara District:

A slightly increased gold yield was recorded, and the main centres were Butterfly, Kookynie, Niagara and Tampa. Seventy-eight men were engaged in mining in this district on 31/12/1940, and four crushing batteries are operating.

MURCHISON GOLDFIELD.

This field includes the Cue, Day Dawn, Meekatharra, and Mt. Magnet districts, and while an increased tonnage was treated, the yield was slightly less than in the previous year.

Cue District:

This district recorded 577,614 tons for 89,280 fine ounces of gold, the tonnage being higher and the gold production lower than in 1939.

It was, generally speaking, a satisfactory year and activity was well maintained all over the field.

The main centres were as follows:—

Big Bell Centre.—The mine of that name had a successful year, producing 53,890 fine ounces from 466,142 tons and employing 444 men. The Company

increased its staff amenities by adding a swimming pool, and an air-conditioned dormitory for night-shift men, for which it is to be congratulated.

At Harris' Find, the "Paraliser" Mine yielded 173 fine ounces from 156 tons, and several other local crushings were reported.

Cuddingwarra Centre.—Crushings were low grade, but some of the shows have promise, and are being developed.

Cue Centre recorded 746 fine ounces from 2,516 tons, together with 902 fine ounces from 5,690 tons of sands.

Numerous good crushings were reported, the main producer being the "Travato di Pietro" Lease, with 132 fine ounces from 203 tons.

Mindoolah Centre had a good producer in the "Two Reef" Lease which returned 496 fine ounces from 568 tons.

Reedy's Centre.—The Triton Gold Mines, N.L., treated a higher tonnage for a slightly lesser yield than in the previous year, 30,982 fine ounces coming from 104,525 tons. An average of 325 men was employed. A number of prospectors' crushings, some of good grade ore, were put through at the Cue State Battery from this centre.

Tuckabianna Centre was not very active, although the "Vienna" Lease crushed 128 tons for 155 fine ounces of gold.

Tukanarra Centre had some sensational returns from the "Blue Peter" Lease early in the year, when 212 fine ounces were obtained from 1 cwt. of stone, to be followed by 38 ounces from another cwt., and later 33 fine ounces from 26 tons. In 1939 it produced some equally rich ore.

Other crushings were on the small side, although a number of prospectors were at work.

Day Dawn District:

This district showed little alteration compared with 1939, the main centres being—

Day Dawn Centre, where the "Klondike" Lease showed the excellent figures of 813 fine ounces from 596 tons. Other good producers were the "New Fingall" and the "Cooee," which, unfortunately however, cut out. The "Klondike" has possibilities, and is being developed.

Lake Austin Centre was not very active. The "New Goleonda" had the good return of 116 fine ounces from 19 tons.

Messrs. Capelli and party from Prospecting Area 822D obtained 58 fine ounces from one cwt. of stone, and later crushed 35 tons for 53 fine ounces.

Pinnacles Centre reported a number of small crushings and a fair amount of prospecting activity.

Mt. Magnet District:

This district, while recording a decreased tonnage showed an increased gold yield, and activity generally was well maintained in all centres, the main ones being as follows:—

Jumbulyer Centre recorded numerous crushings, mostly small, and maintained an average of 20 men at work. The principal producer was the "Elk," with 116 fine ounces from 353 tons.

Lennonville Centre.—Fifty-five men were engaged in mining during the year, and some fair crushings were reported. The biggest output came from the "Galtee Moore," which returned 292 fine ounces from 1,356 tons of ore and 1,455 tons of sands.

The "Souvenir," a consistent producer of small rich crushings, treated 50 tons for 95 fine ounces.

Mt. Magnet Centre is by far the most important centre in the field, possessing as it does Hill 50 Gold Mines, Ltd., which employs 71 men and produced 9,802 fine ounces from 26,065 tons, and Mt. Magnet Gold Mines, Ltd., whose output was 4,121 fine ounces from 38,452, and whose employees totalled 80. This mine, towards the end of the year, through shortage of capital, had to cease development and concentrated on the treatment of low grade ore from adjacent properties. With governmental assistance it hopes to further develop the mine this year, and again put it on a payable footing.

Swan Bitter Gold Mining Coy., N.L., obtained 2,000 fine ounces from 5,858 tons of ore, and 5,782 tons of sands from the "Broken Bond" Lease. It has carried out considerable development during the year. The "Black Cat" Mine, owned by Metropolitan Mining and Development Company, continued breaking and treating high grade ore, its figures being 2,147 fine ounces from 3,356 tons. It employs 19 men and continues to crush at the Boogardie State Battery.

Other large producers were the "Edward Carson," with 866 fine ounces from 2,851 tons of ore, and 308 tons of sands; "Saturn" Mine with 1,828 fine ounces from 11,731 tons; the "Neptune," which has a five-head mill and produced 2,057 tons of ore for 708 fine ounces, and the "Corona," with 169 fine ounces from 484 tons.

Some exceedingly rich crushings from the Boogardie-Mt. Magnet ore channel are worth recording, and are as follows:—Messrs. Watson and Wellington, 348 tons for 463 fine ounces. Messrs. Hudson and Crick, 633 fine ounces obtained by Berdan pan treatment, and A. Dewar, with 22½ tons for 104½ fine ounces.

Numerous other good crushings were reported from the centre, and its future looks exceedingly bright.

Moyagee Centre possesses a high grade producer in the "Moyagee" Mine, employing 20 men, and whose returns totalled 1,563 fine ounces from 1,310 tons.

Meekatharra District:

This district showed a decrease, both in tonnage treated and gold produced, in comparison with 1939. This mainly resulted from the cessation of operations early in the year on the Ingliston Consols group. Prospecting in the various centres was well maintained, and details of the principal centres are as under:—

Abbott's Centre had six men engaged in operations and several fair crushings were recorded.

Burnakura Centre.—The main lease was the "New Alliance," which yielded 81 fine ounces from 63 tons. Six men were also at work in this district.

Gabanintha District:

This district showed increased activity, 16 men being employed, and some good crushings reported. The "Golden Star" produced 162 fine ounces from 70 tons, and the "New Brew," 101 fine ounces from 111 tons, both good yields.

Jillawarra Centre had an excellent crushing of 178 fine ounces from 80 tons from old workings in Lease 1871N. Four men are working this lease, and reports show a considerable tonnage of ore in sight.

Meekatharra Centre is the principal one in the district, 72 men being engaged in mining operations. The "Fenian" Mine, one of the Consols group, is now being worked by tributaries, and fairly substantial tonnages are put through each month. Its year's output was 1,501 fine ounces from 5,397 tons. The "Prohibition" group under the management of Spencers Gold Mines, N.L., continued operations throughout the year and produced 648 fine ounces from 5,895 tons.

Numerous other crushings were reported.

Nannine Centre.—Aladdin Gold Mines Ltd., the principal property in the centre, was idle throughout the year. Nannine is noted for occasional rich dabs, and several of these were located. Lease 1867N produced 124 fine ounces of dollied gold, and crushed 13 ounces from two tons of ore. Messrs. C. and F. Hebbard also struck a patch which dollied 76 fine ounces. Messrs. Hunter and Pryce crushed 276 tons from Prospecting Area 2843N (now Lease 1872N), which yielded 59 fine ounces. They then disposed of the property to a syndicate which has done considerable development and opened up a good tonnage of ore. The syndicate crushed 664 tons for 178 fine ounces.

Yaloginda Centre continued to show a pleasing increase in activity and there were 26 men engaged in mining operations. The "Bluebird" Lease possessing a large low grade ore body, was the main producer, with 2,086 tons, which yielded 378 fine ounces, while a further 309 fine ounces were obtained from the treatment of 2,620 tons of sands. A three head mill is erected on the property and during the year the owners added a cyanide plant.

The "Edenhope" Mine had the good return of 44 fine ounces from 44 tons, and several other crushings were recorded.

YALGOO GOLDFIELD.

This field again had a reduced production, although paradoxically enough, it was most active from the point of view of prospecting operations. Its smaller output is mainly owing to the falling away of several of the larger mines. The Rothsay Company shut down during the previous year, while the King Solomon Company very greatly reduced its operations in 1940.

Bilberatha Centre had two fair producers in "Blancys" Gold Mine, which produced 226 fine ounces from 223 tons of ore, and the "Picata Joker," with 121 fine ounces from 376 tons.

Fields Find Centre.—Yalgoo Gold Areas, Ltd., recorded an output of 2,142 tons for 562 fine ounces. It employs 25 men, and will possibly increase the scale of operations during the present year.

There was good general activity in the centre.

Goodingnow Centre (Paynes Find).—This was the largest producing centre in the field, and possesses numerous active small mines. The "Orchid" property treated 1,324 tons for 409 fine ounces; the "Carnation," 1,308 tons for 525 fine ounces; the "Mari-gold," 921 tons for 426 fine ounces, and the "Aster," 943 tons for 505 fine ounces, while in addition, a number of other mines crushed varying smaller quantities of ore.

As will be noted, the centre has horticultural leanings, as far as lease nomenclature is concerned. Sixty-five men were engaged in the centre.

Gullewa Centre.—King Solomon's Gold Mines treated only 650 tons for 160 fine ounces, and has since lapsed into liquidation. An option has been given over the mine to J. S. Allen, and with some Government financial assistance rendered, it is hoped that it will be resuscitated.

The "Mugga King," owing to several minor breakdowns, treated a smaller tonnage than usual, returning 394 fine ounces from 1,145 tons.

Messengers Patch Centre.—The "Gnows Nest" at its own battery treated 910 tons for 150 fine ounces. Otherwise this centre was quiet.

Mt. Gibson Centre had seven prospectors at work and recorded a number of small crushings.

Noongal Centre was active, and good producers were the "Revival" and "City of Melbourne" Leases. Two particularly good returns were from Prospecting Areas 2210 and 2247, with 172 fine ounces from 131 tons, and 125 fine ounces from 50 tons respectively.

Other centres containing a number of prospectors and reporting numerous small crushings were Nyounda, Pinyalling, Retaliation, Rothsay, Wadgin-garra, Warriedar and Yalgoo.

PEAK HILL GOLDFIELD.

This field's production again dropped, and no new finds of importance were made.

The number of men employed totalled 53, and the main producing centres were—

Labouchre Centre where Lease 560P produced 1,200 tons of ore for 179 fine ounces, and Prospecting Area 725P had the nice return of 83 fine ounces from 93 tons.

Mt. Egerton Centre where the "Pegasus" continued its consistent progress by producing 166 fine ounces from 143 tons, together with 120 fine ounces from 245 tons of tailing.

Peak Hill Centre which is the mainstay of the field, and employs 36 men. A number of large, although not high grade, crushings were put through the local State Battery which ran for most of the year.

EAST MURCHISON GOLDFIELD.

This field comprises Black Range, Lawlers and Wiluna Districts, and while the total fine ounces of gold produced was slightly less than in 1939, the tonnage was considerably higher.

Black Range District:

This District again increased its yield and generally well maintained its activity. It looks to have a steady future. Its most active centres were as under:—

Barrambie Centre which contained seven men and recorded several good crushings.

Bellchambers Centre employing nine men, and the main producer being the "Bellchambers" Mine, with 180 fine ounces from 571 tons.

Hancocks Centre which had some excellent returns, including 101 ounces from 114 tons from Prospecting Area 1812B. Fifteen men were at work in the centre.

Jonesville Centre.—The "North End" Mine, a consistent producer, reported 900 fine ounces from 4,601 tons, and employed 12 men.

Nungarra Centre produced numerous crushings of low grade ore, mostly treated at the State Battery, Sandstone; twelve prospectors were at work.

Sandstone Centre possessed 29 men engaged in mining, and reported numerous crushings, the best being from the "Lady Mary" of 77 tons for 75 fine ounces.

Youanmi Centre.—This centre contains the Youanmi Gold Mines Ltd., which was naturally the highest producer. This company, employing 232 men, showed increased production, in comparison with 1939, its figures being 85,017 tons for 22,569 fine ounces of gold.

The "Camberra" Mine, equipped with a three head battery, treated 588 tons for 232 fine ounces of gold, and appears to have a promising future. Considerable development work has been done and new plant installed.

Several other good crushings were reported, and a total of 242 men were engaged in the industry.

Lawlers District:

A slight decrease in both tonnage and gold yield occurred in this district, but the industry was well maintained and on a solid basis.

Kathleen Valley Centre employed twelve men, and recorded a number of crushings, the main return being from the "Mossbecker" Lease and totalling 159 fine ounces from 1,372 tons of ore.

Lawlers Centre.—Emu Gold Mines, Ltd., despite fire and flood during the year treated 47,050 tons for 11,941 fine ounces, and also undertook considerable development and installed additional plant.

A large number of prospectors' crushings also came from this centre.

Mt. Sir Samuel Centre had 27 men engaged in mining, and several crushings were reported, mostly on the smaller side.

Wiluna District:

This district also recorded slightly less tonnage and yield, the figures being 707,083 tons for 119,229 fine ounces of gold.

The main centres were:—

Coles Find Centre employing 22 men. Several crushings, mostly small, were reported.

Corboy's Find Centre was active with 28 men and numerous small crushings. The "Old Toscana" and "Waratah" Mines treated fairly considerable tonnage of sands.

Diorite Centre was not as busy as in 1939, although 14 men were prospecting and mining.

Joyner's Find Centre similarly was quiet, the main operator being Linden (W.A.) Gold, N.L., which employed 20 men.

Mt. Fisher Centre was notable only for the "Vindurum" Lease which returned 158 fine ounces from 569 tons.

New England Centre contained 22 men and recorded several crushings, the most important being "Sims Find" Mine which treated 177 tons and obtained 209 fine ounces.

Wiluna Centre was quite active, and the production from the Wiluna Gold Mines, Ltd., the Moonlight Wiluna, and the Coolgardie Brilliant, N.L., was well maintained. No major ore bodies were developed

in the former. A number of prospectors operated in the district, the returns being mainly low grade. The average number of men employed at this centre was 855.

The Wiluna Gold Mines output was 583,516 tons for 86,732 fine ounces, while the Moonlight Wiluna Company recorded 106,467 tons for 26,735 fine ounces, and the Coolgardie Brilliant, 9,335 tons for 2,690 fine ounces.

MT. MARGARET GOLDFIELD.

This field, which includes the districts of Mt. Morgans, Mt. Malcolm, and Mt. Margaret, produced some 23,000 ounces of gold less than in 1939, mainly as a result of the closure of the Lancefield Mine in May of 1940. Apart from this setback the field had a busy year.

Mt. Margaret District:

This district reported 101,748 tons of ore for 32,795 fine ounces, a big reduction compared with 1939, but attributable to the closure of the Lancefield property.

Burtville Centre attracted the attention of prospectors and recorded some good crushings. The rich "Boomerang" Lease owned by D. Cable produced 807 fine ounces of gold from 50 tons of ore, and looks likely to continue on similar ore. Forty-one men were prospecting and mining in this centre.

Duketon Centre was also active, 23 men being engaged and numerous good grade crushings obtained.

Erlistoun Centre.—Cox's Find Mine, owned by the Western Mining Corporation, was the main producer, with 19,116 tons for 9,200 fine ounces. Excellent returns, totalling 461 fine ounces from 11 tons came from the "Victory Extended" Lease.

With the Cox's Find employees, a total of 160 men were engaged in mining operations at this centre.

Laverton Centre.—With the closure of the Lancefield, the Gladiator Gold Mines, Ltd., became the premier producer, and recorded 7,795 fine ounces from 27,788 tons treated.

Numerous other prospectors' parcels were reported, but no new finds of major importance were noted. Two hundred and twenty-five men are employed in the industry at this centre.

Mt. Barnicoat Centre.—One good crushing of 80 fine ounces from 29 tons of ore came from a prospecting area, otherwise activity was slight.

Mt. Morgans District:

This district showed an increased gold yield compared with 1939. Activity was fairly general and the main centres were:—

Eucalyptus Centre, where 17 men were engaged in mining, the total yield being 488 fine ounces from 547 tons.

Linden Centre, which was the most productive, and employed 80 men. The main lease was the "North Democrat" with a return of 988 fine ounces of gold from 422 tons of ore. Numerous other excellent small crushings were reported.

Mt. Margaret Centre produced mainly low grade ore. The Mission Station continued its prospecting operations.

Mt. Morgans Centre.—Sands Retreatment Coy., Ltd., was responsible for the main production here, returning 5,640 fine ounces of gold from 68,029 tons of sands. It employs 26 men.

Good results were obtained by the Mt. Morgans Gold Mines, Ltd., from Leases 400F and 511F, 78 tons realising 88 fine ounces from the former, and 52 tons 35 ounces from the latter.

Murrin Murrin Centre.—"Hill End" Lease was the principal producer, with 296 fine ounces from 794 tons. The lessees have their own battery. One excellent crushing of 6 tons for 65 fine ounces was recorded by assisted prospectors from Area No. 1346F.

Red Castle and Yundamindera Centres were moderately busy, several crushings coming from each.

Mt. Malcolm District:

An increased tonnage but a decreased yield was recorded by this district for 1940, as compared with 1939. Activity generally increased, and the number of men employed was 32 more at the end of 1940 than on 31/12/39. The principal centres were:—

Cardinia Centre which had two leases in production, each possessing its own crushing plant.

Darlot Centre employed 15 men and reported numerous crushings of medium grade ore.

King of the Hills Centre where two good producers were the "Puzzle" and "Innit" leases, whose ore averaged over one ounce per ton. The latter possesses a five-head mill.

Leonora Centre contained the field's biggest producers in the "Sons of Gwalia" and "Leonora Central." The former recorded 44,512 fine ounces from 138,162 tons, and employed 385 men. The latter produced 481 fine ounces from 3,895 tons. Numerous other crushings were reported.

Mt. Malcolm, Mt. Clifford and Randwick centres of the others were most active.

PHILLIPS RIVER GOLDFIELD.

This field's production dropped, but towards the end of the year renewed activity was being shown by the Beryl Company, and indications point to a revival in 1941, particularly with the gold copper ores, as copper is now of national importance.

Hatters Hill Centre treated 484 tons for 122 fine ounces of gold, and activity was on a much reduced scale to previous years.

Kundip Centre returned 442 fine ounces from 2,557 tons treated, and contained 65 men engaged in mining operations.

Ravensthorpe Centre was the largest producer, with 599 fine ounces from 2,245 tons, the tonnage being greater, but the return less than in 1939.

PILBARA GOLDFIELD.

This field produced 16,800 fine ounces of gold, this being an increase on the 1939 figures of 15,249 fine ounces. It experienced a successful mining year notwithstanding drought conditions.

Marble Bar District:

There was little change in the producers, and the main centres were as under:—

Bamboo Creek Centre.—The "Bulletin" and "Federation" mines were equipped with Government assistance, with pumping and hauling gear and should show considerable benefit. The chief producing mine was the Mt. Prophecy which recorded 419 fine ounces from 687 tons. There were numerous other reported crushings and the State Battery was kept busy.

Marble Bar Centre.—The "Comet Gold Mines" were again the largest producers, with 10,901 tons

of high grade ore, returning 8,027 fine ounces of gold. Sixty-nine men were employed by the Company. Two other good producers were the "Ora Banda South" with 380 fine ounces from 666 tons, and the "Homeward Bound" with 564 fine ounces from 1,105 tons. The Comet during the year brought into operation its new plant, and is still erecting further machinery.

Numerous other excellent crushings were recorded.

North Pole Centre was hampered through lack of water for crushing purposes. Considerable activity is being displayed, and this centre shows distinct promise.

Tambourah.—Bligh's empire mill at this centre crushed 735 tons of prospectors' ore for 465 fine ounces of gold.

Wyman's Well and *Warrawoona Centres* were both active, and recorded several fair crushings.

Nullagine District:

Eastern Creek Centre.—Doherty's Reward resumed work and crushed 133 tons for 137 fine ounces, while several other holdings produced gold.

Middle Creek Centre was the main one in the district, and included the Blue Spec Lease which produced 1,235 tons of ore for 477 fine ounces of gold. Other active shows were the "All Nations" and "Little Wonder." The "Barton" leaseholders completed a 10-head mill, and commenced crushing operations.

20-Mile Sandy and Nullagine Centres were moderately busy, a new find at the latter being the "Valentine" which returned 57 fine ounces from 115 tons.

KIMBERLEY GOLDFIELD.

Operations were continued on the Ruby Creek Mine and several other areas reported limited gold production. In all, the field produced 722 fine ounces of gold which was slightly less than in 1939.

WEST KIMBERLEY, GASCOYNE AND ASHBURTON GOLDFIELDS.

Practically no activity has been displayed in gold mining during the year.

OUTSIDE PROCLAIMED GOLDFIELD.

Production was reported from Jumperdine and West Pilbara, districts outside proclaimed goldfields. At the former, a three-head battery was installed and treated 365 tons from the "Hillside" Mine, for 80 fine ounces of gold.

In the West Pilbara tributaries operated on the "Pilgrims Progress" Mine and produced 137 fine ounces from 760 tons of ore. A battery, with Departmental assistance, has been installed on the property.

MINERAL INDUSTRY.

TIN.

The quantity and value of tin reported was 37 tons valued at £5,174, being 26 tons and £3,727 in excess of the previous year. Greenbushes produced 34 tons whilst the remainder was credited to the Pilbara Goldfield.

TANTALITE.

Only six tons of tantalite valued at £7,811 were reported—four tons from the Pilbara Goldfield and two from the Coolgardie Goldfield. This production was two tons short of the 1939 figure.

ASBESTOS.

The reported production of asbestos was 364 tons valued at £14,534, an increase of 331 tons and £13,214 in value when compared with the previous year. Of the quantity reported 355 tons came from the Pilbara Goldfield and nine from Outside Proclaimed Goldfields.

COAL.

The coal output was 539,427 tons valued at £364,500, a decrease of 18,108 in tonnage, but an increase of £1,690 in value.

The whole production came from the Collie Coalfield, and the average number of men employed was 713, the output per man working out to 756 tons compared with 741 tons in the previous year.

GYPSUM.

The quantity of gypsum reported was 13,020 tons of £14,082 in value, a decrease of 1,320 in tonnage, but an increase of £590 in value. The production coming mainly from Outside Proclaimed Goldfields (11,661 tons), whilst the remainder (1,359 tons) was derived from the Yilgarn Goldfield.

OTHER MINERALS.

The quantity of silver obtained as a by-product and exported was 274,741 fine ounces valued at £34,934; a decrease of 12,698 fine ounces, but an increased value of £2,044 compared with 1939.

Felspar amounting to 3,505 tons valued at £7,010 was produced—3,457 tons from the Coolgardie Goldfield and 48 tons from Outside Proclaimed Goldfields. This was a decrease of 287 tons and £574.

Glauconite valued at £4,823 from 200 tons was reported from Outside Proclaimed Goldfields.

Arsenic totalling 3,332 tons valued at £59,977 was recorded from Wiluna—an increase of 1,916 tons valued at £34,489, when compared with the previous year.

Antimony amounting to 264 tons of £10,180 in value also came from Wiluna, a decrease of 100 tons, but an increase of £6,946 in value.

A total of 109 tons of vermiculite valued at £757 was reported—65 tons from Bulong and 44 from Outside Proclaimed Goldfields. The production was an increase of 79 tons and £507 in value compared with 1939.

Scheelite ore amounting to 821 tons valued at £1,960 and wolfram ore of one ton valued at £211, were reported from the Coolgardie Goldfield and Outside Proclaimed Goldfields respectively.

The quantity of mica reported from Outside Proclaimed Goldfields was 2,408 lbs., valued at £311, and included 1,708 lbs. of crude mica of only £11 in value.

Other minerals reported were 257 tons of magnesite, 3,070 tons of fireclay, 39 tons of phosphatic guano, and 238 tons of red oxide valued at £230, £1,990, £273, and £2,384 respectively. Each of these minerals showed a substantial increase when compared with the previous year.

MINING GENERALLY.

The only base metals produced were tin, tantalite and antimony.

The anticipated record yield of gold in 1940 did not eventuate. This was the result of a combination of circumstances, principal among which were (a)

shortage of skilled labour as a result of enlistments and internments; (b) incidence of the English excess war profits tax which has had the effect of causing producers to concentrate on larger tonnages of lower grade ore; (c) unavoidable delays in obtaining essential mining stores and equipment.

These are all disabilities resulting from the war, and the progress of the industry in the face of same has been rather remarkable.

It may be mentioned here that every assistance in regard to maintaining reserved occupations in the industry has been given by the Military authorities, while the Customs Department and the Commonwealth authorities generally have co-operated at all times, in order to ensure that essential mining supplies should be obtained with as little delay and inconvenience as possible.

The assistance to prospectors was continued during the year, and since the inception of the scheme in June, 1933, 8,606 men have been helped. At the end of the year the number in receipt of assistance was 330. This was lower than in any previous year, and is accounted for by enlistments, and by the fact that many prospectors have, as a result of shortage of labour, obtained positions on the employing mines.

During the year assisted men crushed 10,082 tons for a return of 4,492 fine ounces of gold, and refunded to the department, £7,760 1s. 4d. These are excellent figures.

Total returns since inception of the scheme are 73,018 tons for 36,014 fine ounces, while total expenditure amounts to £260,852, and total refunds to £50,195. Once a prospector strikes payable gold, he goes off the scheme and his progress is not followed. Thus the scheme is responsible for a much greater production than that quoted.

Drought conditions in the greater part of the State during 1940 considerably affected prospecting and small mining operations.

During the year, operations in regard to the search for petroleum were continued on a more active scale than for many years. The Freney Kimberley Oil Company, despite some setbacks with plant, maintained progress with their oil bore, and it should be completed in 1941.

The Caltex Oil Company, which, following the passing of the amending Petroleum Act, applied for and was granted titles in the north and north-western portions of the State, has been actively engaged with well-equipped geological parties in examining the areas. The Company has a comprehensive programme and there is no doubt that operations will be conducted in a thorough and up-to-date manner.

COMMONWEALTH LEGISLATION.

The industry experienced the first full year under the Commonwealth Gold Tax, and while I have not the exact figure of tax paid, it is approximately £1,000,000. Prospectors and certain low grade producers have under the provisions of the Act been enabled to obtain a refund of portion or the whole of the tax paid.

Under the Commonwealth Encouragement to Mining Act, this State received during the year, an amount of £111,000 for the purpose of stimulating the output of gold. Such sum is being advanced

mainly to mines which possess the ore reserves but lack plant of a capacity sufficient to produce same on the scale considered to be warranted. The advances are to be used mainly to instal and increase such treatment plants.

MINING DEVELOPMENT ACT.

The expenditure incurred in rendering assistance to mine owners and the industry generally under the provisions of this Act totalled £40,263 11s. 2d., and in the preceding year, £47,458 18s. 4d.

PART II.—MINERALS.

§ TABLE 1.—Quantity and Value of Minerals produced and/or exported during Years 1939 and 1940.

Description of Minerals.	1939.		1940.		Increase or Decrease for Year compared with 1939.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Statute Tons.	£A.	Statute Tons.	£A.	Statute Tons.	£A.
Antimony (reported) ...	364	3,234	264	10,180	— 100	+ 6,946
Arsenic (reported) ...	1,416	25,488	3,332	59,977	+ 1,916	+ 34,489
Asbestos (reported) ...	275	11,036	364	14,534	+ 89	+ 3,498
Beryl (reported) ...	7	60	2	16	— 5	— 44
Bismuth (reported) ...	1	442	2	891	+ 1	+ 449
Coal (raised) ...	557,535	362,811	539,427	364,500	— 18,108	+ 1,689
Copper (reported) ...	25	1,373	36	357	+ 11	— 1,016
Felspar (reported) ...	3,792	7,584	3,505	7,010	— 287	— 574
Fireclay (reported) ...	830	522	3,070	1,990	+ 2,240	+ 1,468
Glauconite (reported) ...	151	3,770	200	(a)4,823	+ 49	+ 1,053
Gold (exported and minted) ...	Fine ozs. 1,214,238	11,842,964	Fine ozs. 1,191,482	12,696,503	Fine ozs. — 22,756	+ 853,539
Gypsum (reported) ...	Statute Tons. 14,340	13,492	Statute Tons. 13,020	14,082	Statute Tons. — 1,320	+ 590
Magnesite (reported) ...	...	...	257	230	+ 257	+ 230
Mica (reported) ...	lbs. 444	196	lbs. 2,408	311	lbs. + 1,964	+ 115
Molybdenite (exported)* ...	Nil	Nil	Nil	Nil	...	...
Phosphatic Guano (reported) ...	Statute Tons. ...	...	Statute Tons. 39	273	Statute Tons. + 39	+ 273
Red Ochre (reported) ...	142	1,398	238	2,384	+ 96	+ 986
Scheelite Ore (reported) ...	3	249	821	1,960	+ 818	+ 1,711
Silver (exported) ...	Fine ozs. 287,439	32,890	Fine ozs. 274,741	34,934	Fine ozs. — 12,698	+ 2,044
Tantalite (reported) ...	Statute Tons. 14	19,969	Statute Tons. 6	7,811	Statute Tons. — 8	— 12,158
Tin (reported) ...	28	3,871	37	5,174	+ 9	+ 1,303
Vermiculite (reported) ...	30	250	109	757	+ 79	+ 507
Wolfram (reported) ...	1	60	1	211	...	+ 151
	...	*12,331,659	...	13,228,908	...	+ 897,249

Included in the Value of Gold for 1938, 1939 and 1940 are the following estimated premiums:—£A5,402,565, £A6,685,214 and £A7,637,302 respectively.

§As export information is not available under war conditions, reported figures are used for 1940 for minerals other than gold and silver. *Amended from previous report. (a) Reviewed F.O.B. cost figure accepted.

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.
INFORMATION NOT AVAILABLE UNDER WAR CONDITIONS.			

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.).	
	1939.	1940.	1939.	1940.	1939.	1940.
	fine ozs.	fine ozs.			shillings.	shillings.
1. Kimberley	965	722	·082	·062	83·560	78·746
2. Pilbara	15,249	16,800	1·283	1·455	52·330	50·662
3. Ashburton	741	593	·063	·051	27·998	56·927
4. Gascoyne	64	25	...	...	...	...
5. Peak Hill	2,536	1,814	·213	·157	39·040	30·265
6. East Murchison	161,957	158,478	13·630	13·723	16·485	15·782
7. Murchison	139,879	131,300	11·772	11·370	16·834	15·731
8. Yalgoo	7,795	5,103	·656	·442	30·616	29·485
9. Mt. Margaret	113,374	90,246	9·542	7·815	29·651	29·828
10. North Coolgardie	21,933	19,259	1·846	1·668	63·815	67·447
11. Broad Arrow	18,602	17,390	1·565	1·506	40·426	34·618
12. North-East Coolgardie	2,265	2,591	·191	·224	68·884	70·140
13. East Coolgardie	533,235	526,835	44·875	45·620	27·629	25·257
14. Coolgardie	26,288	38,682	2·212	3·350	26·832	23·711
15. Yilgarn	62,938	68,444	5·297	5·927	40·161	37·927
16. Dundas	77,638	74,636	6·534	6·463	27·327	22·414
17. Phillips River	2,149	1,363	·181	·118	30·002	25·117
Outside Proclaimed Goldfield	678	563	·058	·049	...	...
Totals and Averages	1,188,286	1,154,844	100·000	100·000	24·650	22·860

The total yield of the State is as 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 1939 and 1940.

Goldfield.	1939.				1940.			
	Tons of Gold Ore raised and treated.		Fine ounces of Gold produced therefrom.		Tons of Gold Ore raised and treated.		Fine ounces of Gold produced therefrom.	
	Per man employed under ground.	Per man employed above and under ground.	Per man employed under ground.	Per man employed above and under ground.	Per man employed under ground.	Per man employed above and under ground.	Per man employed under ground.	Per man employed above and under ground.
	tons.	tons.	fine ozs.	fine ozs.	tons.	tons.	fine ozs.	fine ozs.
1. Kimberley	54·51	33·83	53·62	33·28	26·85	19·47	24·89	18·04
2. Pilbara	159·70	72·81	98·38	36·02	216·71	98·85	129·23	58·95
3. Ashburton	160·66	59·19	52·94	19·51	44·23	16·38	29·64	10·98
4. Gascoyne ... ..	...	...	...	...	...	...	...	...
5. Peak Hill	239·93	84·90	110·26	39·01	299·50	92·57	106·70	32·98
6. East Murchison	786·63	470·20	152·64	91·24	913·39	555·04	169·68	103·11
7. Murchison	800·35	429·91	158·59	85·19	735·57	423·59	136·20	78·44
8. Yalgoo	162·64	70·69	58·68	25·38	122·53	53·66	42·53	18·62
9. Mt. Margaret	395·65	215·98	138·09	75·38	361·52	195·02	126·93	68·47
10. North Coolgardie	77·66	36·55	58·33	27·45	88·21	39·38	70·03	31·27
11. Broad Arrow	131·18	60·70	62·42	28·88	175·62	84·17	71·57	34·30
12. North-East Coolgardie	52·72	23·47	42·74	19·04	61·53	28·27	50·80	23·34
13. East Coolgardie	612·93	370·11	199·34	120·37	655·83	399·11	194·98	118·66
14. Coolgardie	131·07	66·37	41·39	20·96	199·41	105·80	55·66	29·53
15. Yilgarn	277·94	146·63	131·39	69·31	331·84	175·21	148·15	78·22
16. Dundas	361·86	239·44	116·40	77·02	389·66	259·30	102·80	68·41
17. Phillips River	121·71	82·23	42·98	29·04	109·75	63·14	32·45	18·67
18. Outside Proclaimed Goldfields ... ..	...	...	...	...	53·41	30·35	22·53	12·80
Total Averages	490·39	273·73	142·29	79·43	525·04	298·70	141·28	80·38

COMPARATIVE STATISTICAL DIAGRAMS

RELATING TO

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

AND THE GOLD PRODUCTION OF AUSTRALASIA FOR THE YEAR 1940

FIG. 1.

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

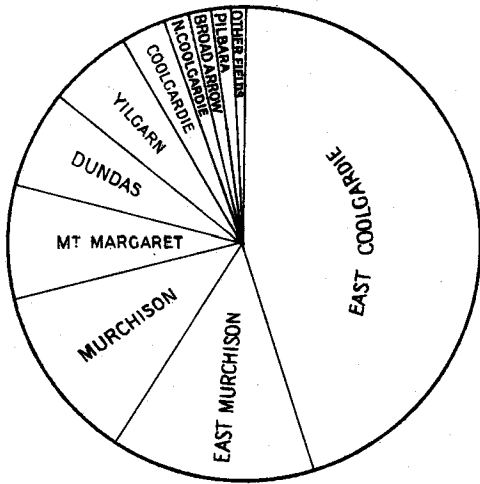


FIG. 2.

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

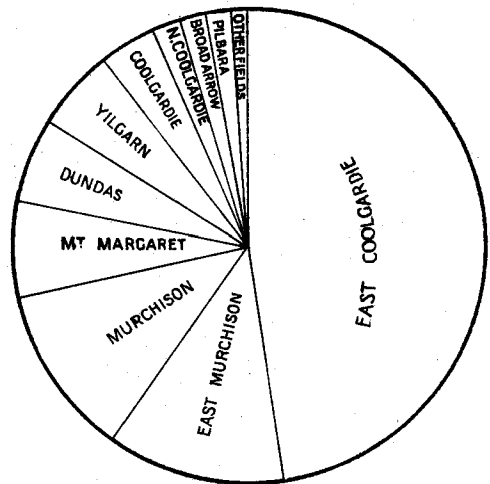


FIG. 3.

Value of Gold and other Minerals.

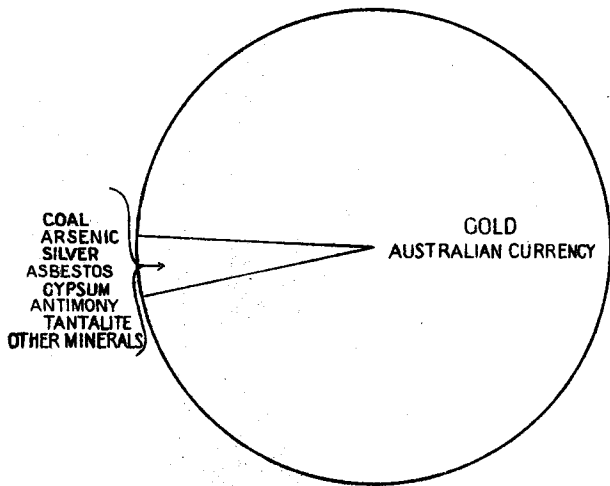


FIG. 4.

Value of Minerals other than Gold.

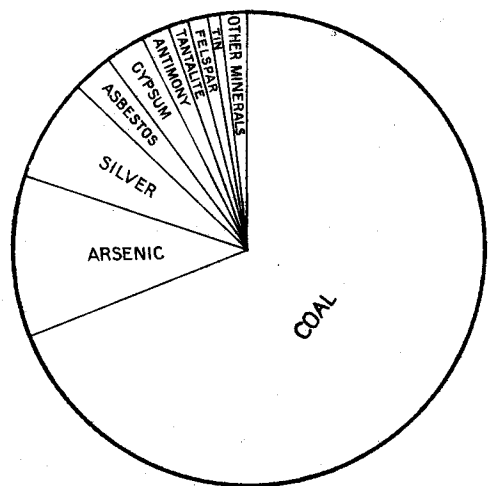


FIG. 5.

Areas of land leased for Goldmining on various Goldfields.

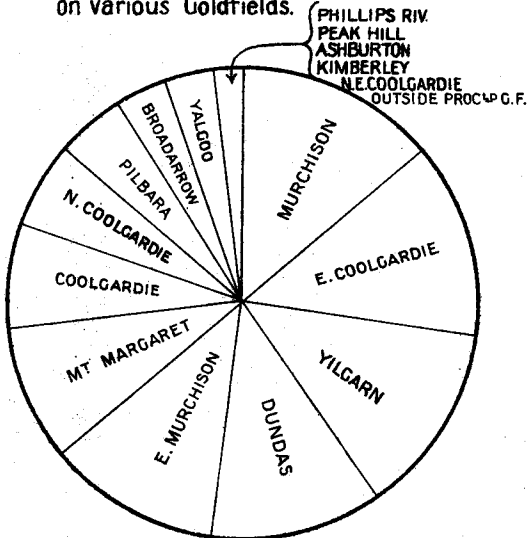


FIG. 6.

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

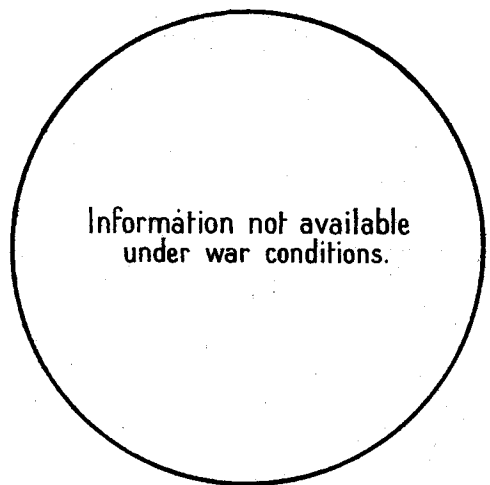


DIAGRAM OF GOLD OUTPUT

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

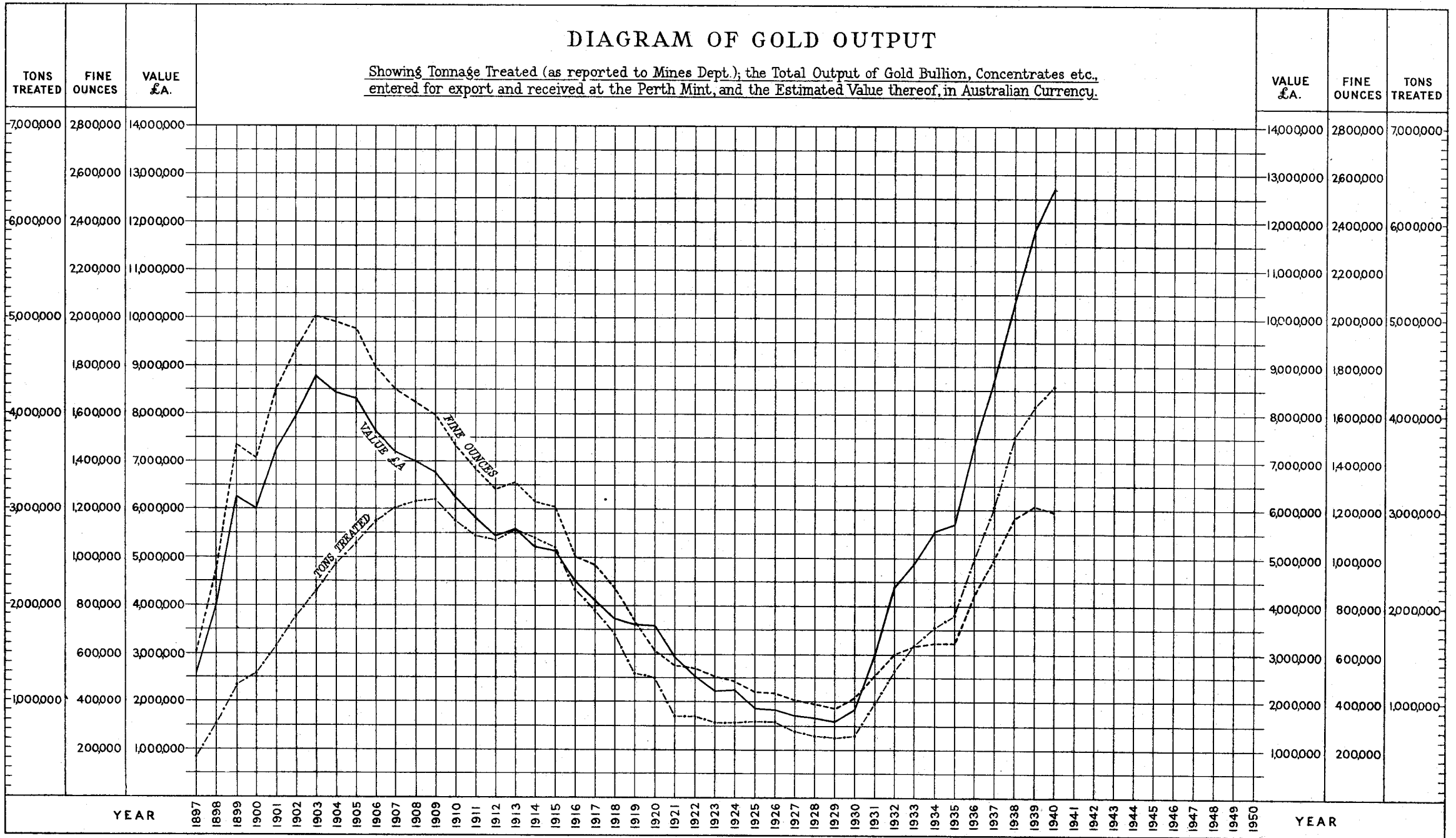


TABLE 5.

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

	Output of Gold.	Value.	Percentage of Total.	
			Output of Commonwealth.	Output of Australasia.
INFORMATION NOT AVAILABLE UNDER WAR CONDITIONS.				

TABLE 6.

Dividends, etc., paid by Western Australian Mining Companies during 1940 and the Total to date.
(Mainly compiled from information supplied to the Government Statistician's Office by the Chamber of Mines, Western Australia.)

Goldfield.	Name of Company.	Dividends.	
		1940.	Grand Total paid to end of 1940.
		£	£
Peak Hill	Various Companies ... ..	...	199,305
East Murchison	do. do. ... ..	...	1,699,053
Murchison	Big Bell Mines Limited	110,000	280,000
Do.	Hill 50 Gold Mine N.L.	25,000	43,750
Do.	Metropolitan Mining & Development Ltd.	8,890	8,890
Do.	Triton Gold Mines Limited	48,000	240,000
Do.	Western Gold Mines, N.L.	7,500	31,250
Do.	Various Companies ... ..	...	2,045,805
Mt. Margaret	Lancefield (W.A.) G.Ms., Ltd.	25,000	387,500
Do.	Sons of Gwalia Ltd.	65,000	1,802,863
Do.	Various Companies ... ..	...	430,852
North Coolgardie	First Hit (1934) G.Ms., N.L.	18,644	55,931
Do.	Various Companies ... ..	...	614,671
Broad Arrow	Ora Banda Amalgamated Mines Ltd.	20,000	80,000
Do.	Ora Banda Mines N.L.	5,000	7,500
North East Coolgardie	Various Companies ... ..	...	129,493
East Coolgardie	Boulder Perseverance Ltd.	89,928	(a) 2,074,849
Do.	Gold Mines of Kalgoorlie	53,375	152,500
Do.	Great Boulder Proprietary Ltd.	62,500	6,738,047
Do.	Lake View & Star Ltd.	280,000	(b) 2,267,000
Do.	Kalgoorlie Enterprise G.Ms., Ltd.	44,000	78,375
Do.	North Kalgurli (1912) Ltd.	82,500	611,250
Do.	Paringa M. & E. Co. Ltd.	14,488	77,807
Do.	South Kalgurli Consolidated Ltd.	31,250	(c) 836,878
Do.	Various Companies ... ..	...	(d) 15,196,301
Coolgardie	do. do. ... ..	...	379,134
Yilgarn	New Yilgarn	4,811	4,811
Do.	Yellowdine Gold Areas	19,050	19,050
Do.	Various Companies ... ..	...	788,819
Dundas	Blue Bird G.M., N.L.	15,000	125,000
Do.	Norseman G.Ms., N.L.	30,000	383,898
Do.	Various Companies ... ..	...	277,264
		1,059,936	38,067,846

(a) Also £45,091 in bonuses and profit sharing notes in years 1935-36.

(b) Also £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 £55,000 Capital returned in year 1932 by Golden Horseshoe (New) Ltd.

TABLE 7.

Quantity and Value of Minerals, other than Gold, reported to the Mines Department during 1940.

Goldfield District or Mineral Field.	1940.		Increase or Decrease as compared with 1939.	
	Quantity.	Value.	Quantity.	Value.
	Tons.	£A.	Tons.	£A.
	ANTIMONY.			
East Murchison (Wiluna)	264	10,180	— 100	+ 6,946
	ARSENIC.			
East Murchison (Wiluna)	3,332	59,977	+ 1,916	+ 34,489
	ASBESTOS.			
Pilbara (Nullagine)	355	14,200	+ 355	+ 14,200
Outside Proclaimed Goldfield	9	334	— 18	— 764
	BERYL.			
Outside Proclaimed Goldfield	2	16	— 5	— 44
	BISMUTH.			
Outside Proclaimed Goldfield	2	891	+ 1	+ 753
	COPPER.			
Phillips River	14	159	+ 14	+ 159
Northampton	7	46	+ 7	+ 46
Peak Hill	15	152	+ 15	+ 152
	FELSPAR.			
Coolgardie	3,457	6,914	— 85	— 170
Outside Proclaimed Goldfield	48	96	— 202	— 404
	FIRECLAY.			
Outside Proclaimed Goldfield	3,070	1,990	+ 2,240	+ 1,468
	GLAUCONITE.			
Outside Proclaimed Goldfield	200	(a) 4,823	+ 58	+ 4,113
	GYP SUM.			
Yilgarn	1,359	850	+ 1,359	+ 850
Outside Proclaimed Goldfield	11,661	13,232	— 2,679	— 260
	MAGNESITE.			
Coolgardie	257	230	+ 257	+ 230
	MICA.			
Outside Proclaimed Goldfield	lbs. *2,408	311	lbs. + 1,964	+ 115
	PHOSPHATIC GUANO.			
Outside Proclaimed Goldfield	tons. 39	273	tons. + 39	+ 273
	RED OXIDE (FeO₂).			
Pilbara (Nullagine)	238	2,384	+ 96	+ 986
	SCHHEELITE.			
Coolgardie	821	1,960	+ 811	+ 1,932
	TANTALITE.			
Pilbara (Marble Bar)	4	5,471	— 4	— 6,602
Coolgardie	2	2,340	+ 2	+ 2,340
	TIN.			
Pilbara (Marble Bar)	3	547	+ 3	+ 547
Greenbushes	34	4,627	+ 23	+ 3,180
	VERMICULITE.			
East Coolgardie (Bulong)	65	427	+ 35	+ 177
Outside Proclaimed Goldfield	44	330	+ 44	+ 330
	WOLFRAM.			
Outside Proclaimed Goldfield	1	211	+ 1	+ 211

* Includes 1,708 lbs. crude mica, value £11.

(a) Reviewed F.O.B. cost figure accepted.

TABLE 8.

Quantity of Coal raised during 1939 and 1940, estimated Value thereof, Number of Men employed, and Output per Man.

Coalfield.	Year.	Quantity raised.	Estimated Value.	Men Employed.		Quantity Raised.	
				Above ground.	Under-ground.	Per Man employed under-ground.	Per Man employed above and under-ground.
		tons.	£				
Collie	1939	557,535	362,811	155	597	934	741
	1940	539,427	364,500	139	574	940	756

The quantity of coal raised during the year 1940 showed a decrease of 18,108 tons, but the estimated value thereof showed an increase of £1,690; the average number of men employed decreased by 39, whilst the average number of tons raised per man employed increased by 15 tons, when compared with the figures for 1939.

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

TABLE 9.

Total Number and Acreage of Leases, Mineral Claims, and Prospecting Areas held for Mining on 31st December, 1939 and 1940.

Description.	1939.		1940.	
	No.	Acreage.	No.	Acreage.
Gold Mining Leases on Crown Land	1,574	27,037	1,485	24,714
Do. do. on Private Property	4	80	6	99
Mineral Leases on Crown Land	163	38,517	162	38,163
Mineral Claims	115	6,950	127	7,515
Prospecting Areas	1,776	34,786	1,423	30,153
Total	3,632	107,370	3,203	100,644

PART IV.—MEN EMPLOYED.

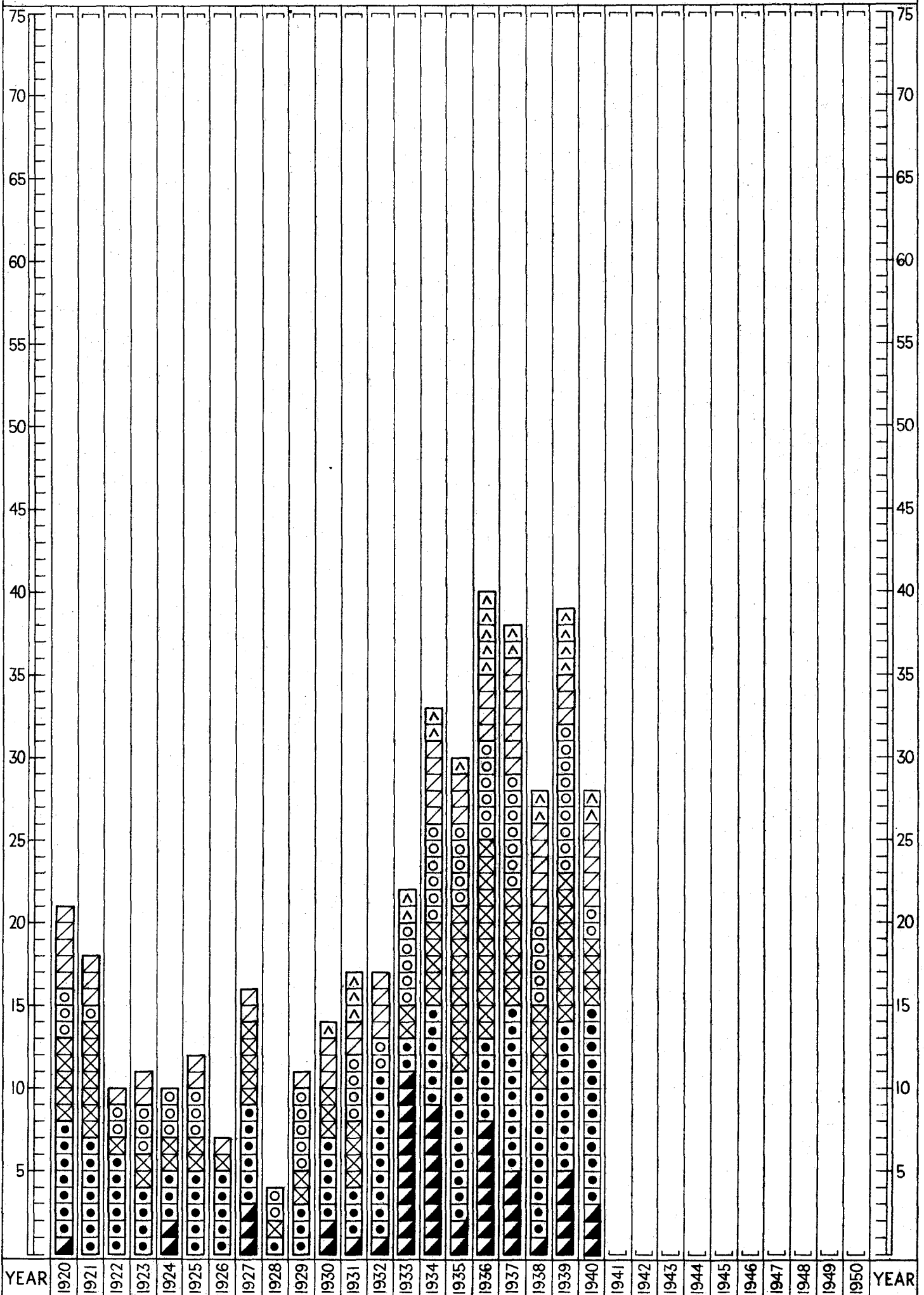
TABLE 10.

Average number of Men reported as engaged in Mining during 1939 and 1940.

Goldfield.	District.	Reef or Lode.		Alluvial.		Total.	
		1939.	1940.	1939.	1940.	1939.	1940.
1. Kimberley ... ..	...	29	40	5	6	34	46
2. Pilbara	Marble Bar	265	204	3	4	268	208
	Nullagine	75	81	4	3	79	84
3. Ashburton ... ..	...	38	54	1	3	39	57
4. Gascoyne ... ..	...	...	...	5	4	5	4
5. Peak Hill ... ..	...	65	55	6	5	71	60
6. East Murchison	Lawlers	215	204	...	...	215	204
	Wiluna	1,184	989	...	...	1,184	989
	Black Range	375	344	...	...	375	344
	Cue	813	908	...	10	815	918
7. Murchison	Meekatharra	204	189	5	5	209	194
	Day Dawn	72	53	3	8	75	61
	Mt. Magnet	553	524	...	...	553	524
8. Yalgoo ... ..	...	306	274	...	...	306	274
	Mt. Morgans	210	225	...	...	210	225
9. Mt. Margaret	Mt. Malcolm	472	496	...	...	472	496
	Mt. Margaret	822	597	...	...	822	597
	Menzies	309	256	14	11	323	287
10. North Coolgardie	Ularring	288	182	10	7	298	189
	Niagara	54	72	...	...	54	72
	Yerilla	148	106	7	4	155	110
11. Broad Arrow ... ..	...	644	507	25	15	669	522
12. North-East Coolgardie	Kanowna	81	79	9	6	90	85
	Kurnalpi	38	32	4	3	42	35
13. East Coolgardie	East Coolgardie	4,356	4,440	35	27	4,391	4,467
	Bulong	74	64	5	4	79	68
14. Coolgardie	Coolgardie	945	1,081	75	70	1,020	1,151
	Kunanalling	309	229	35	30	344	259
15. Yilgarn ... ..	...	908	875	...	...	908	875
16. Dundas ... ..	...	1,008	1,091	...	...	1,008	1,091
17. Phillips River ... ..	...	74	73	...	...	74	73
18. State Generally ... ..	...	27	44	2	...	29	44
Total—Gold Mining		14,961	14,368	255	225	15,216	14,593
MINERALS OTHER THAN GOLD.							
Alunite ... ..	...	...	1	...	...	...	1
Arsenic ... ..	...	10	22	...	...	...	22
Asbestos ... ..	...	26	18	...	...	...	18
Beryl ... ..	...	2	1	...	...	...	1
Bismuth ... ..	...	4	4	...	...	...	4
Coal ... ..	...	752	713	...	...	...	713
Copper ... ..	...	4	2	...	...	...	2
Felspar ... ..	...	16	14	...	...	...	14
Fireclay ... ..	...	4	5	...	...	...	5
Glass Sand ... ..	...	2	2	...	...	...	2
Glauconite ... ..	...	3	3	...	...	...	3
Gypsum ... ..	...	21	21	...	...	...	21
Graphite ... ..	...	...	1	...	...	...	1
Iron ... ..	...	46	26	...	...	...	26
Lead ... ..	...	2	...	...	...	...	...
Magnesite ... ..	...	1	4	...	...	...	4
Mica ... ..	...	5	3	...	...	...	3
Red Ochre ... ..	...	3	2	...	...	...	2
Phosphatic Guana ... ..	...	...	1	...	...	...	1
Potassium aluminium ... ..	...	2	...	...	...	...	...
Scheelite ... ..	...	3	7	...	...	...	7
Tantalite ... ..	...	25	12	...	...	...	12
Tin ... ..	...	50	39	...	...	...	39
Vermiculite ... ..	...	2	5	...	...	...	5
Total—Other Minerals		983	906	...	...	983	906
GRAND TOTAL		15,944	15,274	255	225	16,199	15,499

DIAGRAM OF ACCIDENTS

Showing the number of Deaths, arranged in Six Classes, in the Mines of Western Australia,
from 1920 onwards



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

PART V.—ACCIDENTS.

TABLE 11.

MEN EMPLOYED IN MINES KILLED AND INJURED IN MINING ACCIDENTS
DURING 1939 AND 1940.

A.—According to Locality of Accident.

Goldfield.	Killed.		Injured.		Total Killed and Injured.	
	1939.	1940.	1939.	1940.	1939.	1940.
1. Kimberley ... ..	...	...	...	...	...	...
2. West Kimberley ... ..	...	...	...	...	...	...
3. Pilbara ... ..	...	3	3	4	3	7
4. West Pilbara ... ..	...	...	...	...	...	...
5. Ashburton ... ..	...	...	...	...	...	...
6. Gascoyne ... ..	...	...	...	...	...	...
7. Peak Hill ... ..	...	...	...	1	...	1
8. East Murchison	7	2	156	103	163	105
9. Murchison	9	3	107	101	116	104
10. Yalgoo ... ..	...	1	2	1	2	2
11. Mt. Margaret	3	...	159	108	162	108
12. North Coolgardie	1	...	11	8	12	8
13. North-East Coolgardie ... ..	...	...	...	...	...	...
14. Broad Arrow ... ..	...	...	6	1	6	1
15. East Coolgardie	7	11	494	624	501	635
16. Coolgardie	1	...	16	41	17	41
17. Yilgarn	5	2	21	17	26	19
18. Dundas	5	3	99	127	104	130
19. Phillips River ... ..	...	...	...	1	...	1
MINING DISTRICTS—						
Northampton ... ..	...	...	...	...	...	...
Greenbushes ... ..	...	...	...	...	...	...
Collie	1	3	233	240	234	243
South-West ... ..	...	...	88	26	88	26
Total	39	28	1,395	1,403	1,434	1,431

From the above table it will be seen that the number of fatal accidents for the year 1940 was 28, as against 39 in 1939. The number injured showed an increase of eight. In the report of the State Mining Engineer, published in Division II. of this report, these accidents are classified according to their causes.

B.—According to Causes of Accidents.

Cause.	1939.		1940.		Comparison with 1939.	
	Fatal.	Serious.	Fatal.	Serious.	Fatal.	Serious.
1. Explosives	6	13*	3	11	— 3	— 2
2. Falls of Ground	8	85	12	113†	+ 4	+ 28
3. In Shafts	9	42	4	30	— 5	— 12
4. Miscellaneous Underground	9	906	2	958	— 7	+ 52
5. Surface	3	346‡	5	286§	+ 2	— 60
6. Fumes	4	3	2	5	— 2	+ 2
Total	39	1,395	28	1,403	— 11	+ 8

* Includes 2 serious in Quarries.

† Includes 86 serious in Quarries.

‡ Includes 1 serious in Quarries.

§ Includes 25 serious in Quarries.

Twenty-five fatal accidents occurred on gold mines and three in coal mines.

The death rate per 1,000 men employed at gold mines was 1.71, as against 2.56 in 1939.

PART VI.—STATE AID TO MINING.

1. The number of State Batteries existing at the end of the year was 23 with three leased. From inception to the end of 1940 gold and tin to the value of £11,330,939·54 including Gold Premium estimated at £2,468,920·71 have been received from State plants; 2,480,153·44 tons of auriferous ore have been treated and have produced £8,917,114·93 plus estimated premium by amalgamation; £2,043,372·64 by cyanidation; £265,266·11 by slimes; £10,779·70 from residues; and 81,786 tons of tin ore produced tin to the value of £93,833·96, and, in addition, a sum of £572·2 was recovered from residues.

2. During the year 100,454·75 tons of ore were crushed for 52,413·36 ounces of bullion estimated to contain 44,419·15 ounces of fine gold, equal to 8 dwts. 20 grs. per ton. The average value of tailing produced was 3 dwts. 18 grs., making the average head value 12 dwts. 14 grs. per ton.

Of the tailing produced 48·2 per cent. assayed over 2 dwts. 8 grs. per ton; 45·6 per cent. had an average value of 1 dwts. 9 grs. per ton and 6·2 per cent. contained too much copper to treat.

The estimated value of gold produced was 44,419·15 ounces by amalgamation and 14,411·97 ounces from tailing treatment; a total of 58,831·12 ounces valued at £578,291A.

3. The working expenditure for all plants for the year was £110,013 7s. 10d., and the revenue, including £3,637 13s. 10d. premium account accumulations, £126,632 2s. 5d., which shows a profit of £16,618 14s. 7d. on the year's operations.

4. The capital expenditure since inception of the scheme has been £539,729 17s. 8d.; £404,198 6s. 1d. from General Loan Fund; £93,123 10s. 2d. from Consolidated Revenue Fund; £28,621 13s. 5d. from Assistance to Gold Mining Industry and £13,786 8s. from Commonwealth Assistance to Metalliferous Mining.

5. Head Office expenditure, including insurance under the Workers' Compensation Act, was £7,529 4s. 1d. against £6,313 17s. 9d. for 1939.

The working expenditure from inception to the end of the year exceeds the revenue by £54,381 17s.

GEOLOGICAL SURVEY.

The work of the Geological Survey during the year 1940 is represented by the following reports and summaries, which are published in the Annual Progress Report of the Geological Survey for that year:—

1. The Tale, Magnesite and Vermiculite Deposits of the South-West Division,
2. Mica Mining on Mineral Claim 159H, Morrissey Hill, Yinnietharra Station, Gascoyne River,
3. Bismuth Carbonate Deposits in Pegmatite Dykes on M.C. 195H and P.A. 744H, near Morrissey Hill, Yinnietharra Station, Gascoyne River (Lands Dept. Litho 78/300 S.W. Quadrant),

4. Progress of Work on Mineral Claim 173H, Yinnietharra Station,
5. Notes on Bismuth Deposits on Mineral Claim 191H, Nardoo Creek, Yinnietharra Station,
6. The Geology and Mining Groups of Portion of the Mt. Margaret Goldfield,
7. Copper in the Murchison and Yalgoo Goldfields,
8. Copper Deposits in the Peak Hill Goldfield,
9. Mining Groups in the Yilgarn Goldfield (North of Great Eastern Railway),
10. Evanston Group, Yilgarn Goldfield, with an appendix, Notes on "Platy" and "Massive" Types of Jaspilites from Evanston,
11. Petrological Notes on Some Rocks from the North Yilgarn.

The field officers provided much practical assistance to prospectors and mine owners in the course of their field work, and as usual the Head Office of the Geological Survey continued to meet the numerous requests for information of a very diverse type concerning the natural mineral resources of our State.

ASSISTANCE UNDER MINING DEVELOPMENT ACT, 1902.

The following statement shows the sum advanced during the year, 1940, under this Act:—

	£	s.	d.
1. Advanced in aid of mining work and equipment of mines with machinery	9,600	6	1
2. Subsidies on stone crushed for the public, being amounts paid to owners of plants crushing at fixed rates. Total crushed during the year 3781 tons	543	6	3
3. Providing means of transport, equipment and sustenance for prospectors	29,810	1	7
4. Other assistance granted from the Vote during the year on various matters totalled ..	309	17	3
	£40,263	11	2

The receipts under the Mining Development Act, exclusive of interest payments, amounted to:—

	£	s.	d.
Refund of Advances	2,189	11	11
Sale of Securities	71	0	0
Prospecting Refunds	7,342	1	7
Miscellaneous Refunds	125	13	0
Total receipts for year ..	£9,728	6	6

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 4,685 against 4,572 total for the preceding year, showing an increase after all adjustments of 113 boilers.

Of the total 4,685 useful boilers, 2,655 were out of use at the end of the year; 1,972 thorough, and 150 working inspections were made, and 1,974 certificates were issued.

Permanent condemnations totalled 25 and temporary condemnations 19. There were four conversions. Nine boilers were transferred beyond the jurisdiction of the Act.

The total number of machinery groups registered was 16,101 against 15,711 for the previous year, showing an increase of 390.

Inspections made total 12,538, and 4,577 certificates were granted.

The total miles travelled for the year were 68,436 as against 72,763 miles for the previous year, showing a decrease of 4,327 miles. The average miles travelled per inspection were 4.66 miles as against 5.30 miles per inspection for the previous year.

Three hundred and six applications for engineers' and boiler attendants' Certificates were received and dealt with, and 258 certificates, all classes, were granted as follows:—

Winding Competency (including certificates issued under regulation 40 and section 60)	14
---	----

First Class Competency (including certificates issued under regulations 40 and 45, and sections 60 and 63)	2
Second Class Competency (including certificates issued under regulation 40 and section 60)	27
Third Class Competency (including certificates issued under regulations 40 and 45 and sections 60 and 63 of Act)	30
Locomotive Competency (including certificates issued under regulation 40 and section 60)	8
Traction Competency (including certificates issued under regulation 40 and section 60)	1
Internal Combustion Competency (including certificates issued under regulation 40 and section 60)	83
Crane and Hoist Competency (including certificates issued under regulation 40 and section 60)	3
Boiler Attendants' Competency (including certificates issued under regulation 40 and section 60)	79
Interim	2
Copies	9
Transfers	—
	258

The total revenue from all sources during the year was £9,235 5s. 4d. as against £8,762 3s. 11d. for the previous year, showing an increase of £473 1s. 5d.

The total expenditure for the year was £8,023 1s. 5d. as against £7,533 17s. 4d. for the previous year, showing increase of £489 4s. 1d. Profit on operations for the year was £1,212 3s. 11d.

PART VIII.—SCHOOL OF MINES.

(a) *Kalgoorlie*.—The individual enrolment for 1940 exclusive of Correspondence Course students, reached a maximum of 501, compared with 563 during 1939; a decrease of 62. The Correspondence Course enrolment totalled 39.

In the Public Assay Branch of the School, 629 assays for gold and 83 mineral determinations were carried out for prospectors.

The Metallurgical Laboratory completed 28 investigations into the treatment of ores and mill products for mines confronted with treatment problems.

(b) *Wiluna*.—The maximum enrolment was 100, and the average class enrolment was 119, as compared with 181 for 1939.

(c) *Norseman*.—The maximum enrolment was 177, which was very satisfactory.

General.—Enlistments greatly affected these schools during the year, but on the whole excellent work was done. Every assistance in regard to training Air Force technicians was also rendered, and will be continued. The Commonwealth Government might well make more use of the schools for this and munition training purposes.

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

Periodical examinations of miners was continued by the Commonwealth Department of Health under arrangements similar to those of 1939. All Goldfields except Ashburton, Kimberley, Gascoyne, Phillips River, West Kimberley, and West Pilbara, were visited. Difficulty was experienced during the year in obtaining and retaining medical officers, on account of the call for same by the Military Authorities, and this difficulty will continue during the war.

The number of examinations conducted was 7,299 compared with 6,975 in 1939.

STAFF.

In common with all business institutions, etc., the staff of this Department has been considerably depleted as a result of enlistments. At the time of writing, 25 officers are in the Australian Imperial Forces, the Royal Australian Navy, or the Royal Australian Air Force, while several others have enlisted and await being called up.

Mr. J. F. Lynch, who for some years has been Director of the Schools of Mines, Kalgoorlie, Wiluna, and Norseman, relinquished this position at the end

of the year on account of his forthcoming retirement. His term of office was conspicuously successful, and he was responsible for numerous reforms which increased the efficiency of the schools. He is being succeeded by Dr. B. H. Moore, for many years Principal of the Kalgoorlie School of Mines.

CONCLUSION.

In dealing with the various activities, I have commented only on the principal items. Detailed information is given in the reports of the responsible

officers, published in Divisions II. to IX. of the report.

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

I have, etc.,

A. H. TELFER,

Under Secretary for Mines.

Department of Mines,

Perth, 31st March, 1941.

Division II.

Report of the State Mining Engineer for the Year 1940.

The Under Secretary for Mines.

Sir,—I have the honour to submit for the information of the Hon. the Minister for Mines my report on this branch of the Mines Department for the year 1940.

STAFF.

Inspector James McVee was retired during the year after carrying out the duties of District Inspector of Mines at Collie since September, 1917, and I take this opportunity of recording my appreciation of the valuable and unremitting services rendered by him during his tenure of that office.

Mr. James Gillespie was appointed to the position of District Inspector of Mines, Collie, made vacant by the retirement of Inspector McVee.

Mr. D. Graham, Workmen's Inspector of Mines at Collie, resigned this position in order to accept an appointment as Under Manager on the Griffin Mine. Mr. Graham carried out his duties in a conscientious and capable manner and is to be congratulated on his preferment.

Mr. George Snell was elected Workmen's Inspector of Mines at Collie, filling the vacancy caused by the resignation of Mr. Graham.

The biennial elections for Workmen's Inspectors of Mines made no changes in the staff. Messrs. R. J. Wallis and R. McKerlie (Kalgoorlie), R. McMenemin (Wiluna), T. A. Birch (Leonora), and W. E. Boyce (Cue), were all re-elected.

ACCIDENTS.

Accidents reported to the Department for the year comprised 28 fatal and 1,403 serious accidents (including three fatal and 266 serious on coal mines and quarries). These figures show a decrease of 11 fatal and an increase of eight serious accidents on the previous year.

Of the fatal accidents 25 occurred on gold mines and three on coal mines. Of the 25 victims on gold mines three were prospectors and four were employed on small shows, while the remaining 18 were em-

ployed on the principal mines. There were no fatalities in quarries.

The total number of serious accidents reported on gold mines was 1,137 as compared with 1,074 in 1939, an increase of 63. The average number of men employed on such mines was 14,594 against 15,216 in the previous year. The average accident rate per 1,000 men employed in gold mines was therefore 1.71 for fatal accidents and 77.23 for serious accidents.

On the coal mines the number of serious accidents increased slightly from 233 to 240, while the average number of men employed was 713 as against 752 in 1939.

The total number of fatal accidents on the Goldfields has shown a gratifying improvement, but a somewhat disturbing factor has been introduced in a disproportionately large increase in the number of fatal and serious accidents due to falls of earth. It has been suggested that the influx of new men into the industry may have some bearing on this matter, to which the attention of the Mines Safety Committee has been drawn. Investigations are proceeding and a close watch will be kept on accident returns from this angle.

Table A (p. 24), a segregation of the serious accidents into major and minor injuries, shows a very appreciable reduction in the ratio of major injuries to the total number of serious accidents, which amounted to 12.7%. For the Goldfields the proportion was 13.9%, at Collie 8.7%, while no major injuries were reported as a result of quarrying operations. Corresponding figures for 1939 were 17.9% for the State, 20% for the Goldfields, 11.9% at Collie and 1.1% on quarries.

Finger and hand injuries again amounted to 30% of the total accidents, while feet and toes accounted for another 14%. These figures have been remarkably consistent for the past three years and indicate that serious consideration should be given to protective equipment in the shape of gloves and special boots.

A gratifying reduction is exhibited in head injuries as the wearing of hard hats becomes more general, the figures for 1938, 1939, and 1940 being 91, 60, and 45 respectively.

TABLE A.
SERIOUS ACCIDENTS—1940.

Goldfield.	Major Injuries—Exclusive of Fatal.														Minor Injuries.																					
	Fractures.										Amputations.				Loss of Eye.	Serious Internal.	Hernia.	Dislocations.	Other Major.	Total Major.	Fractures.		Head.	Eyes.	Shoulder.	Arm.	Hand.	Back.	Rib.	Leg.	Foot.	Other Minor.	Total Minor.			
	Head.	Shoulder.	Arm.	Hand.	Spin.	Rib.	Pelvis.	Thigh	Leg.	Ankle.	Foot.	Arm.	Hand.	Finger							Leg.	Foot.												Toe.	Finger.	Toe.
East Coolgardie	1	2	5	1	...	7	...	1	9	1	7	...	...	3	4	...	...	1	2	7	2	...	53	21	14	21	19	15	44	168	74	6	73	78	38	571
Yilgarn	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	3	...	...	...	1	1	3	2	...	4	1	2	14	
Coolgardie	...	1	...	...	...	1	...	...	...	1	1	...	...	2	...	...	...	...	...	...	...	6	1	1	1	1	...	5	7	7	1	5	3	3	35	
Dundas	1	1	...	1	...	...	3	...	2	...	...	2	1	...	...	1	3	1	1	1	18	3	1	3	2	3	12	29	15	2	18	16	5	109
Broad Arrow	1	...	...	...	...	1	
Phillips River	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mt. Margaret	1	1	...	2	...	...	2	1	3	...	...	3	...	...	...	2	...	4	...	1	20	2	1	2	1	3	10	27	12	1	11	10	8	88
North Coolgardie	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	1	3	...	...	1	...	7
East Murchison	1	4	...	1	1	1	1	...	...	...	...	3	...	...	...	...	...	...	...	2	14	6	2	4	1	4	6	26	9	...	6	16	9	89
Murchison	1	...	7	3	...	4	...	2	1	...	2	...	...	5	...	...	...	1	...	2	...	9	37	16	7	...	5	2	4	14	1	1	10	1	3	64
Pilbara	1	...	...	...	...	...	...	...	1	3	...	...	...	...	...	1	...	...	...	...	...	...	1
Peak Hill	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Yalgoo	1	1
South-West Mining District	4	...	10	2	1	6	3	...	26	
Collie Coalfield	1	2	...	5	...	...	1	1	...	...	1	2	1	...	...	...	...	7	...	...	21	2	9	12	13	1	14	63	31	8	33	20	13	219
Total	2	3	17	12	2	21	1	4	17	4	15	...	1	21	6	...	...	6	6	22	4	14	178	51	35	43	46	29	98	349	157	20	166	149	82	1,225

MINES SAFETY COMMITTEE.

This Committee met twice during the year and dealt with the use of safety boots, gloves and mine rescue work.

Tables prepared show that the use of safety boots reduces the number of foot and toe accidents, but there appears to be some difficulty in obtaining uniform quality in boots from the manufacturers.

It may, I think, be stated generally that a vigorous drive is being made for the prevention of accidents

and it would appear that some progress is being made in this direction.

Table 11, showing the locality of all fatal and serious accidents, is forwarded herewith for inclusion in your Annual Report, together with a diagram showing fatal accidents year by year arranged according to their causes.

Table B, hereunder, shows the number of fatal accidents recorded during the past five years and the death rate per 1,000 men employed.

TABLE B.

	1936.	1937.	1938.	1939.	1940.
Fatal accidents to men engaged in mining (exclusive of quarries)	38	38	28	39	28
Total number of men engaged in mining (average) ...	16,652	17,136	16,419	16,199	15,500
Accident death rate per 1,000 men	2.28	2.22	1.70	2.41	1.81
Fatal accidents at quarries	2	...	...	...	...

Following is a brief description of all fatal accidents that occurred during the year.

FATAL ACCIDENTS.

Explosives.

There were three fatal accidents reported under this heading.

Walter Errol Kingsley McLennan, a miner employed by the Youanmi Gold Mines, Limited, on the 1st July was firing a face of 24 holes in a sub-level about 24 feet below the No. 4 Level, when an explosion occurred. He was subsequently found dead at the bottom of an adjoining winze at the No. 5 Level. There was no witness of the accident, but the evidence tends to show that he did not use the cartridge system of firing as required by regulation. This omission cost him his life.

Marshall Broadbent, a shift boss at the Golden Horseshoe Retreatment Plant at Fimiston was the victim of a somewhat inexplicable accident on the 27th March. Part of his duties was to make up rods (capped fuses) used in blasting. He was alone in the capping room when an explosion occurred. On investigation he was found with his head blown off and medical evidence was given to the effect that the explosion must have occurred in the mouth. Any suggestion of suicide was rejected by the jury as entirely foreign to the disposition of the victim and as he had no financial or other troubles. No other details were brought to light at the inquest.

William Edward Kimpton, a machine miner on the Great Boulder Proprietary Gold Mine, Limited, was killed on the 9th October as a result of boring into a misfired hole. His cross-mate on the opposite shift had fired out the face of a drive. A misfire was noted and reported to Kimpton coming on shift. Kimpton did not work on the face during that shift, but on the succeeding day his cross-mate bored nine holes in the face above the broken stone, which had not been

cleared away. Kimpton on the ensuing shift carried on with his boring, still with broken stone against the face, and bored into the misfired hole with fatal results. It is a very dangerous practice to bore into a face partially obscured by broken stone and an addition has been made to Regulation 4 of the Mines Regulation Act, forbidding this practice.

Falls of Earth.

There were twelve fatalities reported in this class.

On the 9th January, Frederick Vollprecht, a shoveller on the Broken Bond Gold Mine at Mt. Magnet, was shovelling in a stope when a piece of mullock fell from the wall about eight feet above him and struck him on the head. He was wearing a safety helmet. He was taken to the Mt. Magnet Hospital suffering from a broken wrist and ankle. He later developed cerebral thrombosis and died on the 31st July. There was no evidence of carelessness or neglect being the cause of this accident.

David Granger, prospector of Nullagine, was working on the 31st January in an open cut, shifting a big rock with a crowbar. As soon as this rock was moved a large slab left the hanging wall and slid down the open cut, squeezing Granger against the footwall in its course, causing injuries, including a fractured pelvis. He was removed to Port Hedland Hospital, where he developed pneumonia and died on the 4th February.

Frederick Maguire and Ljubo Markotich, miners on the Lake View and Star Mine, were engaged on the 19th March in barring down ground in a stope, when a large slab 10-ft. x 8-ft. x 1-ft. thick fell on them. Assistance was available almost immediately, but it was necessary to procure a jack to lift the rock. When extricated they were dead. Both men were experienced miners and there was no evidence of carelessness or neglect.

On the 24th April, James Scala, the owner of a small mine at Yalgoo, was working with an employee

in a stope about 70 feet below the surface. He noticed that the ground was dangerous and sent his mate out of the stope. A fall of ground occurred almost immediately afterwards, as a result of which Scala sustained internal injuries and a fractured pelvis. He died in Yalgoo Hospital on the 1st June.

William Blackford, a machine assistant on the Stockton Colliery, at Collie, on the 17th June was assisting a machine miner to start a new bord off a heading. It was necessary to remove some legs from underneath some slabs supporting the roof. In place of these legs a rail was placed under three slabs and supported by a screw pipe. The support was insufficient and a large piece of rock fell and struck Blackford, inflicting fatal injuries. This accident was due to an error of judgment as to the amount of support necessary.

John Thomas Griffin, a shoveller employed on the Norseman Gold Mine, was killed on the 16th July, by a fall of earth from the back of a stope in which he was working. The back had been barred down after firing and appeared safe to the machine man. There was no evidence of neglect, but it is thought that some lack of judgment may have been shown.

Ivan Radetich, a miner in the employ of the Great Boulder Proprietary, Limited, was barring down some bad ground in a stope on the 6th August. In doing so he pulled out a key piece of stone, releasing a large slab of rock, which fell on him and killed him. An error of judgment, probably due to inexperience, was the cause of this accident.

Arthur Thomas Ware, a miner employed by the Comet Gold Mines, Limited, at Marble Bar, was killed on the 25th September by a fall of earth from the hanging wall in the open cut. It would appear that the grizzley at the top of an ore pass leading from the open cut had become damaged and Ware was attempting to repair it when the fall occurred, inflicting multiple injuries. There was no evidence of neglect or carelessness, although Ware had taken it upon himself to do the necessary repair work without instructions.

Oreste Pezzoli, a prospector working on his prospecting area at Day Dawn, was breaking out a crushing from a pillar left from previous operations. On the 3rd October, when he was working only about 12 feet from the surface, a ton or two of soft schist fell from the hanging wall and buried him, causing death by suffocation.

William Leslie Spinks, a machine miner working on the Lake View South Gold Mine, on the 23rd October was holding a light for his mate to bar down some loose ground preparatory to rigging up in a stope. The mate was barring down what appeared to be a small piece of rock when a large slab came away from the back and fell on Spinks, killing him. Both men were experienced miners and there was no evidence of neglect or carelessness.

Thomas Zappa, a machine miner in the employ of the Co-operative Colliery at Collie, on the 26th November was, with his mate, operating a coal machine, starting to break out a new bord. A large

lump of coal rolled out from the top portion of the face and, striking Zappa, forced him up against a prop. He sustained a fractured pelvis and other internal injuries, which proved fatal.

The accident was entirely unexpected, as the condition of the face was considered safe by all who had seen it.

Shafts.

There were four fatalities reported for the year under this heading.

Joseph Tighe was a braceman employed by Consolidated Gold Areas at Hampton Plains. On the 21st February an overwind had occurred and the winding rope had come out of the sheave. Tighe and his mate lashed the cage to the head frame so that the driver could slacken the rope in order to replace it on the sheave. The chains prevented this and it became necessary to loosen the lashings to allow the cage to be lowered sufficiently to adjust the rope. While Tighe was so engaged the cage got away and the jar broke the main driving wheel of the winding engine. The engine-driver stopped the cage at 160 feet by means of the emergency brake, but Tighe was found to have sustained fatal injuries. The slack of the winding rope should have been taken up prior to unlashings the cage. The accident was due to want of thought on the part of the victim.

William John Stinson, a timberman employed by the Youanmi Gold Mines, on the 2nd April was waiting on the plat for some material to be brought down in the cage. For some unexplained reason, he kneeled on the edge of the plat and was looking down the shaft. Warnings were called to him which he apparently did not hear. He was struck by the descending cage, sustaining a broken neck and was dead when extricated. There appeared to be no special reason why he should have been looking down the shaft, and this is another accident which would have been prevented by a little thought.

William Sheridan met with his death on the 2nd August, apparently while performing a neighbourly action. The owner of a small mine at Warrawoona was away and had asked Sheridan and a mate to collect the windlass and mining gear and place it in safe keeping. The workings consisted of an open cut about 20 feet deep, from the bottom of which was a steep underlay shaft some 80 feet in depth. Sheridan descended the open cut and walked to the mouth of the shaft, where he slipped and fell to the bottom, sustaining fatal injuries.

On the 17th December, Giuseppi Costelletti, a miner employed on the Copperhead Mine at Bullfinch, was riding in a skip and, owing to a defect in the knocker line, gave the signal to pull up instead of to lower. On finding the skip ascending instead of descending, he endeavoured to seize the knocker line whilst the skip was in motion and was crushed between the shaft timber and the skip. The winch driver was not in possession of a certificate entitling him to hoist men, but this was not contributory to the accident, which was directly caused by thoughtlessness on the part of the victim.

Fumes.

Two of the fatalities reported were due to the presence of poisonous fumes.

Francis Arthur Lennon, on the 30th January, descended the shaft of the Happy-go-Lucky Mine at Mt. Monger, about one hour and twenty minutes after firing the face of a drive some 30 feet from the shaft. Compressed air had been blowing in the face during this period. Deceased and mate were attempting to put the suction pipe on the pump when Lennon was overcome by fumes. His mate escaped with difficulty.

A plucky rescue was effected and artificial respiration applied, but Lennon did not respond to it.

Andrew French Irving, a shiftman on the Proprietary Colliery at Collie, was overcome by carbon monoxide gas on the 6th February. As a result of roof pressure in one section of the mine heating occurred and there was a danger of fire. Precautionary work was put in hand to seal off the affected area by means of stoppings, and instructions were issued that no man was to go anywhere in the area unaccompanied. Irving went off alone to get some water. As his lamp was subsequently found on the ground, it was surmised that he had dropped it and been unable to find it again. He then apparently wandered in the dark into the affected area and was overcome by gas. The body was recovered with difficulty by the miners before the arrival of the fire brigade with a Proto life saving apparatus.

Miscellaneous Underground.

There were two fatalities reported under this heading.

On the 12th April, Harry Hylton Lord, an underground ore train driver on the Triton Gold Mine at Reedy was filling trucks from an ore chute and was walking along the side of the train when he fell into a winze used as a mullock pass and dropped a distance of 63 feet, sustaining severe injuries. He was removed to hospital and appeared to be recovering when pneumonia unfortunately supervened and he died a fortnight after the accident. There was a door over the winze which should have been closed, but the evidence did not disclose who left it open. The evidence would suggest that Lord's lamp was not functioning properly at the time.

George Alexander Snow, a trucker employed by the Great Boulder Proprietary, Limited, was engaged on the 28th May in filling a truck with ore from a chinaman chute and was later found buried in broken ore. The chute had hung up and deceased tried to start it running by means of a bar. The ore came away suddenly and caught him before he could step out of the way, inflicting fatal injuries.

Surface.

Of the accidents reported during the year, five were classified in this category.

Joseph Alfred Cragan, a labourer employed by the Paringa Mining and Exploration Company, Limited,

on the 30th January was breaking down slime from a slimes dump, shovelling it into a truck and tipping it down a pass for underground filling. A face of slime had been undercut and deceased and his mate were waiting for it to fall. As it started to move, the mate stepped back, but Cragan was caught and buried. What actually happened is not quite clear, but it is suggested that he may have tripped over his pick. He was dead when extricated.

Alexander Leslie Waters, a labourer on the Blue Bird Mine at Norseman, was the victim of an unfortunate accident. On the 6th March he was assisting in the erection of the battery building. A piece of timber 20 feet long and weighing 78 lbs. was being hoisted by two ropes, one at each end. Waters was standing well clear, as he thought, when the rope farthest from him broke. The board swung down on the remaining rope, striking Waters in its swing and inflicting injuries as a result of which he died four days later. There was no evidence of neglect, but a heavier tackle was recommended for future work of this description.

Edward George Webse, a labourer employed by Norseman Gold Mines, N.L., was working night shift on the picking belt. On the 2nd April, the bracedman, who was in charge of picking operations, left him to make some adjustment to the belt, and during his absence Webse, by some unexplained means, became caught in the belt. His arm was pulled off and was found wedged in the pulley wheel, while his dead body was in the ore bin. He was wearing an overcoat which was not on his body when found. It seems probable that a loose flap of his coat became caught in the moving belt. This Department has from time to time issued warnings against wearing loose clothing whilst working in the vicinity of moving machinery.

Action was taken to make the place safer by the provision of a steel plate over the side idler at the picking station, which would act as a protection from the belt and a support for workmen leaning over it.

Leonard William Coe, a surface hand on the Evanston Gold Mine at Evanston, was assisting in the treatment of zinc slimes with acid on the 28th July. With two other men he was affected by arseniuretted hydrogen gas. They were taken to Southern Cross, where the other two men recovered, but Coe was flown to Perth for treatment, where he died on the 6th August.

Some notes relative to the behaviour of arseniuretted hydrogen are given in an appendix to the Annual Report of the Chemical Branch.

On the 28th December, Walter Hunter, who was employed as a roasterman at the Chaffers plant on the Lake View and Star Mine, became caught in a conveyor belt between the filters and roaster bin and was drawn in between the belt and a large pulley, where he sustained fatal injuries, including a broken neck. There was no witness of the actual accident, but deceased called out and the belt was stopped almost immediately, but too late to save Hunter. There was no evidence of carelessness or neglect.

Table C, hereunder, shows the total number of mineral field in which they occurred and also according to the cause of the accidents. fatal and serious accidents reported to the Department in 1940, classified according to the gold or

TABLE C.

Fatal and Serious Accidents showing the Causes and Districts in which they occurred.

	Explosives.		Falls of Ground.		In Shafts.		Fumes.		Miscellaneous Underground.		Surface.		Total.	
	Fatal.	Seri-ous.	Fatal.	Seri-ous.	Fatal.	Seri-ous.	Fatal.	Seri-ous.	Fatal.	Seri-ous.	Fatal.	Seri-ous.	Fatal.	Seri-ous.
1. East Coolgardie ...	2	3	4	29	1	5	1	5	1	471	2	111	11	624
2. Mt. Margaret	4	...	9	...	...	...	79	...	16	...	108
3. Coolgardie	2	...	2	...	...	...	24	...	13	...	41
4. North Coolgardie...	1	...	...	...	3	...	4	...	8
5. North - East Coolgardie
6. Broad Arrow	1	...	...	...	1
7. Dundas	2	1	17	...	5	...	...	...	81	2	22	3	127
8. Yilgarn	1	1	...	...	...	...	9	1	7	2	17
9. Murchison	3	2	12	...	3	...	...	1	63	...	20	3	101
10. East Murchison ...	1	1	...	9	1	4	...	...	...	52	...	37	2	103
11. Peak Hill	1	...	...	...	...	...	...	...	1
12. Yalgoo	1	1	...	...	...	...	...	...	...	...	...	1	1
13. Northampton
14. Greenbushes
15. South-West	1	...	...	...	...	...	...	...	25	...	26
16. Phillips River	1	...	...	...	...	...	...	...	...	...	...	...	1
17. Collie	2	38	...	...	1	...	...	173	...	29	3	240
18. Pilbara	2	...	1	...	...	...	...	2	...	2	3	4
19. West Pilbara
20. Ashburton
Totals for 1940 ...	3	11	12	113	4	30	2	5	2	958	5	286	28	1,403
Totals for 1939 ...	6	13	8	85	9	42	4	3	9	906	3	346	39	1,395

WINDING MACHINERY ACCIDENTS.

There were nineteen accidents reported during the year involving mining machinery, including two skip derailments, nine overwinds, one broken winding rope and seven miscellaneous accidents.

Skip Derailments.

A piece of stone became lodged between the rail and the leg of the shaft timber, derailing the skip.

A trolley became derailed owing to the displacement of a shaft roller frame, which lifted the back of the trolley sufficiently to cause the derailment. The only resulting damage was the dislodgment of two shaft rollers.

Overwinds.

An overwind occurred as a result of the failure of the solenoid brake caused by unauthorised adjustment. All safety appliances operated and no damage resulted.

An overwind was caused by the reversing lever on the winding engine jumping forward when steam was applied. The rope detached from the safety hook and passed over the sheave and the cage was left suspended by the grippers. There was no damage caused.

An error of judgment on the part of a driver caused an overwind from which no damage resulted.

An overwind, indirectly responsible for a fatal accident, is fully reported on in the section dealing with fatal accidents (Joseph Tighe).

A piece of timber mixed with the ore projected over the side of the skip and was caught under the dump plates at the commencement of the dumping movement of the skip. The rivet in the butterfly was sheared and the full skip brought to rest by the grippers after a drop of about one foot. No damage was caused.

An overwind occurred during the rewinding of the rope on one drum of the winding engine. No brace-man was on duty and the other skip came to the surface without being noticed. The driver immediately applied the brakes and minor damage was done to the skip.

The failure of the overwind gear was responsible for a skip being hauled to the head sheave. The skip was travelling slowly at the time and no damage was done.

An accident involving serious injury to a platman, who was riding in the cage, occurred when the key holding the drive pinion to the drive shaft worked loose and fell out, rendering the main brake useless. The cage went to the sheave and sheared the pin. The grippers functioned properly, but the platman was thrown out and the rope damaged the front part of the winder room.

An overwind occurred when a driver released the brake without giving his engine any steam. The cage fell to the penthouse, while the balance weight went to the thimble. A platman in the cage had a remarkable escape from injury, and only minor damage resulted.

Broken Winding Rope.

A winding rope broke through a cause which was not evident. The grippers functioned and no damage resulted. Two new winding ropes were installed.

Miscellaneous.

On two occasions a cage jambed in the shaft and dislodged some shaft timber. The cause of the jamming was the fact that a full truck moved and apparently overhung the edge of the cage. After the second accident the cage, which was new, was condemned as being too fragile in construction.

A sinking kibble became detached from the hooking device by which it was attached to the hauling rope and crashed from the surface to the bottom of the shaft, where five men were working. A considerable amount of damage was done to the shaft timber, but fortunately the men were able to take shelter and were all uninjured. The cause of the accident is not apparent, but the hooking device has been replaced by shackle and bolt.

A truck of ore was being hoisted in the cage when the drum shaft on the winch broke. The brakes were unable to pull up the falling load, which fell 200 feet. The cage was only slightly damaged. No damage was done to the shaft or rope.

The flange on the drum of a winding engine cracked, being apparently too light in construction. The defective drum was dismantled and repaired and a new end and flange were also cast for the other drum.

An accident resulting in the death of W. J. Stinson is fully reported elsewhere in this report.

Steel being hoisted in a skip caught in shaft timbers, displacing two skids and posts and breaking three bearers. The cause of the accident was the breaking of the fastening belt holding the steel.

ADMINISTRATION.

Amendments of Acts.

Mines Regulation Act, 1906-38.

Regulation 17, re Workmen's Inspectors of Mines. Deletion of clause 5 and insertion of a new clause 5 in lieu. Gazetted 4th October, 1940.

Regulation 4, General rule 48A, re misfires, amended. Gazetted 20th December, 1940.

The Mining Act, 1904.

Regulation 55, clause (1), amended to include vermiculite. Gazetted 4th October, 1940.

Section 157, Part VI., amended to include vermiculite. Gazetted 4th October, 1940.

PROSECUTIONS.

There were ten prosecutions undertaken during the year for breaches of the Mines Regulation Act, 1906-38, and in the following nine cases a conviction was recorded and a fine imposed.

A manager was prosecuted under section 35, General Rule 34, for not providing a ladder or other means of ascent equivalent thereto in a winze in the course of construction so as to ensure a safe means of exit.

A machine miner was prosecuted for a breach of section 59 for endangering his own life and that of another man by his negligence.

A miner was proceeded against for a breach of regulation 7, clause 11, in working underground on a provisional initial certificate and making a false declaration.

Two miners were fined for a breach of regulation 4, General Rule 45a, paragraph 3, in preparing to fire charges with single fuses.

A machine miner was prosecuted under section 59 for failing to bar down bad ground in the stope in which he was operating and also for rigging a stage in an unsafe manner, thereby endangering his own life and that of others.

Three miners were prosecuted under section 59 for continuing to work in an open cut without safety ropes after having been warned that this is a dangerous practice.

A charge against a shift boss, under section 59, of omitting to see that conditions were safe in a winze was dismissed.

UNDERGROUND SUPERVISORS.

Written examinations in Mining and Mining Law were held at various centres on the 21st May and 21st October, 1940, and two tours of the Board of Examiners were conducted in connection with oral examinations.

There were 69 candidates in all who sat for these two examinations, 46 of whom passed and were awarded Certificates of Competency.

A special examination was held for another candidate and a Certificate of Competency granted.

Three reciprocal Certificates of Competency were granted to holders of Mine Managers' Certificates in other States.

Three Certificates of Service were granted to applicants who were employed as underground supervisors at the date of gazettal of regulation 17A.

Three duplicate Certificates of Competency and one Certificate of Service were issued in place of certificates proved to have been lost or destroyed.

Copies of the examination papers set in Mining and Mining Law are attached to this report. (Appendix No. III.).

EXEMPTIONS.

In accordance with the provisions of section 34, subsection 4, of the Mines Regulation Act, 1906-38, 125 certificates were issued exempting the holders from the operation of subsection 1 (b) of the same section, as compared with 163 during 1939.

SUNDAY LABOUR.

Fourteen permits to employ men on Sunday were granted during the year. Details are set out hereunder.

Excepting where otherwise stated, the reason for granting these permits was to save loss of time in subsequent working of the mine.

Twelve men to work one Sunday regrading a main level.

Twelve men to work one Sunday mullocking up a stope.

Two permits for eighteen men to work one Sunday enlarging a main level ore pocket.

Fifteen men to work one Sunday repairing timber on two main levels.

Four men to work night shift raising and lowering timber on account of an acute shortage.

Six men to work day shift installing a new electric winch.

Six men to work day and afternoon shift to cut a drain along a level to bring water under control without interfering with routine operations.

Four men to work one Sunday lowering timber in the shaft.

Ten men to work three Sundays timbering the main shaft.

Six men to work one Sunday lowering timber in the shaft.

Eight men to work one Sunday timbering and plate laying.

Six men to work on Sunday for six months carting ore from outside leases and from railway.

Five men to work one Sunday installing a new air main.

LOANS AND SUBSIDIES.

The following monetary assistance was given to the mining industry:—

	£	s.	d.
Advances towards development work and equipment of mines (Includes Freney Oil)	9,600	6	1
Providing transport and general assistance to prospectors	29,810	1	7
Subsidies paid to privately owned batteries	543	6	3
Miscellaneous expenditure	309	17	3
	<u>£40,263</u>	<u>11</u>	<u>2</u>

The total expenditure was £40,263 11s. 2d. compared with £47,458 18s. 4d. during 1939 and £21,915 17s. 9d. during 1938 (Appendix I.).

No expenditure was incurred during this year on "Advances on Ores."

VENTILATION.

Much attention continues to be paid to this phase of mine operations, and Inspector Brisbane's report is quoted in full.

During the year the ventilation of several mines has been improved by the addition of new ventilating machinery. In four cases new fans have been added to existing systems and two mines have put in fans for the first time.

The principal departmental work for the year has been a detailed survey of the western leases of the Lake View and Star group. All Kalgoorlie mines with fan ventilation, the mines at Norseman, the Triton, Big Bell, and Youanmi have been visited.

The main points of interest are:—

Central Norseman.

A fall of earth blocked the Blue Shaft which was the main return airway. The fan has been shifted to the All Nations Shaft at the north end of the mine.

Kalgoorlie Enterprise.

A fan has been installed on the No. 12 level. The ventilation of the mine is now satisfactory.

Great Boulder.

A new fan for the ventilation of the Hamilton Shaft workings has been installed.

Hannan's North.

A new fan which is a duplicate of the existing one has been placed in service. These fans operate in parallel at the bottom level and the next above it.

Happy Go Lucky.

This mine has been connected to the adjoining Milano for ventilation.

Ivanhoe, Horseshoe, Chaffers and Hannan's Star.

A new fan has been placed on the 3,000 level. This fan draws on the Horseshoe No. 2 Shaft and delivers to No. 3 Lode.

Tindals.

The ventilation of this mine has been improved by further development work.

Triton.

An additional fan has been installed.

Youanmi.

A fan has been installed here.

Dust collectors have been put in at the treatment plants of the Lake View and Star, Kalgoorlie Ore Treatment, and South Kalgoorlie. Similar work is in progress at the Gold Mines of Kalgoorlie, Croesus, and Paringa plants.

The Croesus plant is equipped with an electrical precipitation plant for the removal of dust from the flue gases. There is also provision for the return of the flue gas to the furnace and the ventilation of the furnace is under complete control. Under these conditions there is no escape of fume in the roaster house.

At the Lake View and Star water is put into the cyclone and this not only improves the collection of the dust, but provides for the continuous removal of it through a water seal.

The use of the velometer for the measurement of air velocities has many advantages over the older method. As far as can be judged from practical measurements it is superior in accuracy to the other methods available.

It is also much more portable, much quicker and gives a wide range of readings.

There has been an increase in the number of accidents due to fuming, over those that occurred in 1939. This is probably due to some extent to the enlistment of experienced miners and the transfer of less experienced men to development work. One man lost his life when he descended a shaft to put a suction pipe on a pump. Explosives had been fired in the face of a crosscut about 30 feet from the shaft some hours previously. Another man who descended with him was able to escape.

Thirty-eight other fuming accidents were reported to the Kalgoorlie Office and five of these were serious. Two of the serious accidents occurred in winzes and the serious results of the accidents were increased by other causes. In one case the man fell out of the bucket and in the other the bucket caught in the ladderway.

The report of the Assistant Ventilation Inspector and tabulation of dust counts show a decrease in the average count. The total number of samples taken was 365 and the average count 262 particles per cubic centimetre.

DUST SAMPLING.

Summary of Samples taken during 1940.

Month.	Level.		Development.		Stopping.		Surface.		Number of places showing count of 1000 + p.p.c.c.
	No.	Average Count.	No.	Average Count.	No.	Average Count.	No.	Average Count.	
January ...	28	162	27	293	27	217	...	...	5
February ...	17	190	...	...	...	...	...	...	...
March ...	...	...	14	255	28	316	...	...	1
April ...	15	372	3	504	3	246	...	...	4
May ...	1	470	23	227	15	296	...	...	1
June ...	2	172	27	342	29	205	...	...	5
July ...	4	369	25	293	18	276	...	...	2
August ...	6	119	6	229	2	311	...	...	...
September ...	3	157	5	255	6	277	...	...	...
October ...	2	546	7	206	10	231	...	...	2
November ...	...	...	5	397	7	211	...	...	1
December ...	...	...	...	...	...	...	...	...	...
Total ...	78	229	142	228	145	254	...	...	...

GOLD MINING.

The reported gold production for the State showed a decrease of 33,443 fine ounces on the 1939 output, the figures for 1939 and 1940 being 1,188,286 and 1,154,843 fine ounces respectively.

Owing, however, to an increase in the average price of gold, amounting to approximately 18s. per fine ounce, the value of the gold produced, £12,306,816, exceeded the previous year's total by £712,595, creating a new record.

Another all-time record created was the total tonnage treated for the year, amounting to 4,291,709 tons, an increase of 196,452 on the tonnage treated in 1939.

The average grade of ore treated established another low level record at 5.38 dwts. per ton (recovery) against 5.80 dwts. in the previous year.

The average number of men employed in the industry was 14,594, or 622 less than in 1939.

There was a change over on the mines in July from half monthly to fortnightly pay days and the dates of clean-ups were altered to correspond. As a result, the last fortnight's gold production on many of the mines was not reported until January, which fact is largely responsible for the apparent drop in production. A further factor is the lower grade ore treated as a result of the increased price of gold. Reference to Table G. will show that the great majority of the larger producers treated a considerably reduced grade of ore, thus taking advantage of such factor.

Mines which appreciably increased their tonnage during the year were Great Boulder Proprietary, Big Bell, Gold Mines of Kalgoorlie, Central Norseman, Norseman, Youanmi, Paringa and Tindal's (Consolidated Gold Mines of Coolgardie). On the other hand, Lancefield went out of production altogether as a result of a disastrous earth movement which gradually collapsed the workings, fortunately without loss of life or injury to the miners. Mt. Magnet Mines treated a greatly reduced tonnage of very low grade ore and the future of this company is somewhat doubtful.

To offset these setbacks, five new names have appeared on the list of producers of 5,000 ounces and upwards in Evanston, Phoenix, Consolidated Gold Areas, Spargo's Reward and Morgans Sands Retreatment, making a total of 36 producers in this category. In addition, Croesus Proprietary, a subsidiary of North Kalgurli (1912) Limited, produced over 3,000 ounces in the three and a half months during which it was treating its own ore, thus giving promise of being a major producer in future.

Tables E. and F. showing a classification of the gold output according to the range of production of the various mines, indicate that small mining and prospecting activities have shown no appreciable change during the year.

There were no serious industrial disturbances during the year and no major stoppages of production for other reasons.

Although there are signs that the peak of production may have been reached for the present, there

is no reason to doubt that gold mining will retain its pre-eminent position as the State's major industry for many years. Table D, hereunder, shows the production statistics for the past twelve years.

TABLE D.
Gold Production Statistics.

Year.	Tons Treated. (2,240 lbs.)	Total Gold Yield.	Estimated Value of Yield.	Value of Yield per ton.	Number of Men Employed.	Average Value of Gold per oz., Australian Currency.	Average per ton of Ore.
		fine ozs.	£A.	shillings A.		shillings A.	dwts.
1929 ...	628,400	372,064	1,580,426	50·30	4,108	84·06	11·84
1930 ...	645,344	419,767	1,874,484	58·09	4,234	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	55·38	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

Note.—In this table the figures given are those reported to the Department by the various producers.

TABLE E.

Classification of Gold Output for 1940, by Goldfields and Districts.

Goldfield or District.	Un-classified, Sundry Claims, Alluvial, etc. (fine ozs.)	Under 100 ozs.		100-500 ozs.		500-1,000 ozs.		1,000-2,000 ozs.		2,000-3,000 ozs.		3,000-4,000 ozs.		4,000-5,000 ozs.		5,000-10,000 ozs.		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 (fine ozs.).	No. of Producers.	Gold (fine ozs.).	No. of Producers.	Gold (fine ozs.).	No. of Producers.	Gold (fine ozs.).	No. of Producers.	Gold (fine ozs.).	No. of Producers.	Gold (fine ozs.).	No. of Producers.	Gold (fine ozs.).	No. of Producers.	Gold (fine ozs.).	No. of Producers.	Gold (fine ozs.).	No. of Producers.	Gold (fine ozs.).	No. of Producers.	Gold (fine ozs.).	No. of Producers.	Gold (fine ozs.).	No. of Producers.	Gold (fine ozs.).	No. of Producers.	Gold (fine ozs.).		
Kimberley Goldfield	392	6	110	1	220	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Pilbara Goldfield—																															
Marble Bar	1,932	27	1,040	6	1,558	2	1,522	...	...	...	...	...	...	1	8,027	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Nullagine	770	4	122	6	1,140	1	691	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ashburton Goldfield	200	4	289	1	104	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gascoyne Goldfield	25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Peak Hill Goldfield	533	11	433	3	848	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
East Murchison Goldfield—																															
Lawlers	268	5	234	7	1,658	...	...	...	...	...	...	...	...	...	...	1	11,941	...	...	...	...	...	...	...	...	...	...	...	...	...
Wiluna	348	8	345	6	1,418	1	981	...	...	1	2,690	...	...	...	...	...	...	1	26,735	...	...	...	...	...	1	86,732	...	...	...	...
Black Range	758	10	473	2	407	1	921	...	...	...	...	...	...	...	...	...	...	1	22,569	...	...	...	...	...	...	...	...	...	...	...
Murchison Goldfield—																															
Cue	1,418	12	500	6	1,605	1	885	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Meekatharra	1,533	27	962	9	1,872	4	3,040	1	1,501	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Day Dawn	421	4	141	5	685	1	813	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mt. Magnet	1,988	17	617	12	2,333	3	2,238	2	3,480	3	6,447	...	...	1	4,121	1	9,302	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Yalgoo Goldfield	911	12	549	8	2,066	3	1,577	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mt Margaret Goldfield—																															
Mt. Morgans	1,613	13	503	5	1,249	1	988	...	...	...	...	...	...	...	...	1	5,765	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mt. Malcolm	1,191	13	566	5	1,065	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Mt. Margaret	1,002	12	541	4	1,090	2	1,478	...	...	...	...	...	...	...	...	2	16,995	1	11,690	...	...	...	...	...	...	...	...	...	...	...	...
North Coolgardie Goldfield—																															
Menzies	997	16	538	8	1,853	...	...	2	2,514	...	...	...	...	...	...	1	5,570	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Ularring	524	10	416	7	1,329	4	2,496	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Niagara	304	7	253	2	244	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Yerilla	541	8	357	3	480	1	844	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Broad Arrow Goldfield	2,566	30	859	10	2,490	3	2,033	1	1,113	...	...	...	...	...	...	1	8,330	...	...	...	...	...	...	...	...	...	...	...	...	...	...
North-East Coolgardie Goldfield—																															
Kanowna	605	3	61	2	577	...	...	1	1,093	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kurnalpi	248	2	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
East Coolgardie Goldfield—																															
East Coolgardie	1,480	39	997	12	3,015	2	1,522	2	2,803	...	...	1	3,773	1	4,729	1	7,315	1	16,828	4	91,403	1	36,103	2	93,139	1	97,141	1	165,894	...	...
Bulong	390	6	188	1	114	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Coolgardie Goldfield—																															
Coolgardie	2,074	35	1,080	15	3,064	3	2,079	...	...	...	...	...	...	...	...	2	14,411	1	12,857	...	...	...	...	...	...	...	...	...	...	...	...
Kunanalling	509	1	84	5	1,535	1	989	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Yilgarn Goldfield	1,947	69	2,610	29	6,268	5	3,126	8	11,033	...	...	2	7,177	...	...	2	17,889	1	19,054	...	...	...	...	...	...	...	...	...	...	...	...
Dundas Goldfield	611	14	313	9	1,713	3	2,195	2	3,395	...	...	...	...	...	...	1	5,377	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Phillips River Goldfield	323	5	170	3	870	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
State Generally	244	3	192	1	187	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Totals	28,066	433	15,550	193	43,007	42	30,418	19	26,932	4	9,137	3	10,950	2	8,850	13	99,931	5	72,370	7	166,613	3	101,711	3	137,651	3	237,763	1	165,894	...	...

TABLE F.
Classification of Gold Output, 1936-1940.

Range of Output.	1940.			1939.			1938.			1937.			1936.		
	No. of Producers.	Pro-duction.	Percentage of Total.	No. of Producers.	Pro-duction.	Percentage of Total.	No. of Producers.	Pro-duction.	Percentage of Total.	No. of Producers.	Pro-duction.	Percentage of Total.	No. of Producers.	Pro-duction.	Percentage of Total.
Fine ozs. Over 100,000	1	fine ozs. 165,894	14.4	2	fine ozs. 281,948	23.7	2	fine ozs. 278,010	23.7	2	fine ozs. 280,648	27.9	2	fine ozs. 287,904	33.9
50,000-100,000	3	237,763	20.7	2	149,896	12.6	3	220,109	18.8	2	127,676	12.7	1	72,901	8.6
40,000- 50,000	3	137,651	11.9	2	95,093	8.0	2	86,650	7.4	3	127,969	12.7	2	90,941	10.6
30,000- 40,000	3	101,711	8.8	6	204,218	17.2	4	136,508	11.6	2	65,248	6.5	2	69,139	8.1
20,000- 30,000	7	166,613	14.4	5	124,818	10.5	5	128,267	10.9	3	73,422	7.3	2	49,251	5.8
10,000- 20,000	5	72,370	6.2	5	80,351	6.8	5	72,724	6.2	7	91,354	9.1	4	54,872	6.4
5,000- 10,000	13	99,931	8.7	8	55,115	4.6	9	62,797	5.4	10	66,111	6.6	7	50,541	5.9
4,000- 5,000	2	8,850	0.8	2	8,195	0.7	...	...	...	2	9,813	1.0	...	...	...
3,000- 4,000	3	10,950	0.9	7	24,450	2.1	5	17,093	1.5	...	...	...	1	3,647	0.4
2,000- 3,000	4	9,137	0.8	6	14,120	1.2	7	16,499	1.4	5	12,497	1.2	11	25,052	2.9
1,000- 2,000	19	26,932	2.3	20	29,500	2.5	21	28,195	2.4	27	35,731	3.5	25	36,470	4.3
500- 1,000	42	30,418	2.6	33	23,362	2.0	47	30,176	2.6	30	20,515	2.0	37	25,034	2.9
100- 500	193	43,007	3.7	203	46,358	3.9	202	43,922	3.7	214	46,649	4.6	168	36,725	4.3
Under 100	433	15,550	1.4	429	16,954	1.4	432	18,685	1.6	459	17,351	1.7	547	18,157	2.1
Sundry Claims, P.As., etc.	...	28,066	2.4	...	32,908	2.8	...	33,215	2.8	...	32,325	3.2	...	32,233	3.8
Total	731	1,154,843	100.0	730	1,188,286	100.0	744	1,172,950	100.0	766	1,007,289	100.0	809	852,422	100.0

Note.—Individual producers include private and State Battery treatment plants.

OPERATIONS OF THE PRINCIPAL MINES.

Table G (page 36) shows the names, annual outputs in tonnage treated and fine ounces of gold produced and average yield per ton of ore treated by mines producing 5,000 fine ounces and upwards per annum for the past five years.

Lake View and Star, with 165,894 fine ounces, was the only mine to report a production exceeding 100,000 ounces, although Great Boulder almost reached that figure. Wiluna, with 86,732 ounces, came third, and these again were the only three individual mines to produce more gold than the State Batteries.

There were, inclusive of State Batteries, 36 producers of 5,000 ounces and upwards during the year.

A number of minor producers, not included in this table, are also worthy of note, including the following:—

Pilbara Goldfield—

- (1) Blue Spec (Nullagine), 1,235 tons for 691 ounces. Operations were hampered by water shortage.

East Murchison Goldfield—

- (2) Coolgardie Brilliant, N.L., 9,335 tons for 2,690 ounces.
- (3) Linden (W.A.) Gold, N.L., 3,374 tons for 921 ounces.
- (4) North End (Jonesville), 4,601 tons for 921 ounces.

Murchison Goldfield—

- (5) Fenian (Meekatharra), 5,397 tons for 1,501 ounces.
- (6) Prohibition (Meekatharra), 5,895 tons for 880 ounces.
- (7) Klondyke (Day Dawn), 596 tons for 813 ounces.
- (8) Edward Carson (Mt. Magnet), 2,851 tons for 866 ounces.
- (9) Hesperus Dawn (Mt. Magnet), 327 tons for 664 ounces.
- (10) Black Cat (Mt. Magnet), (Metropolitan Mining and Development Co., Ltd.), 3,356 tons for 2,147 ounces.
- (11) Neptune (Mt. Magnet), 2,057 tons for 708 ounces.
- (12) Saturn (Mt. Magnet), 11,731 tons for 1,927 ounces.
- (13) Swan Bitter (Mt. Magnet), 5,838 tons for 2,000 ounces.
- (14) Moyagee (Mt. Magnet), 1,310 tons for 1,563 ounces.

Mt. Margaret Goldfield—

- (15) North Democrat (Linden), 431 tons for 988 ounces.
- (16) Boomerang (Burtville), 50 tons for 807 ounces.

North Coolgardie Goldfield—

- (17) Mt. Ida Gold Mines, Limited, 2,980 tons for 1,329 ounces.
- (18) New Callion (Davyhurst), 1,582 tons for 516 ounces. Operations hampered by water shortage and insufficient finance.
- (19) Two Chinamen (Morley's Find), 249 tons for 925 ounces, including 320 ounces dollied and specimen gold.

Broad Arrow Goldfield—

- (20) Carbine Gold Mines, N.L., 3,001 tons for 1,113 ounces.

North-East Coolgardie Goldfield—

- (21) Sirdar (Kanowna), 682 tons for 1,093 ounces.

East Coolgardie Goldfield—

- (22) Lake View South, 10,545 tons for 3,773 ounces. Mined and treated by Gold Mines of Kalgoorlie, Limited.
- (23) New Hope (Hampton Plains), 6,166 tons for 969 ounces.
- (24) Villers Bretonneux (Hampton Plains), 2,804 tons for 1,191 ounces.
- (25) Milano (Mt. Monger), 2,925 tons for 4,729 ounces.

Coolgardie Goldfield—

- (26) Carbine, 1,920 tons for 989 ounces.

Dundas Goldfield—

- (27) Norseman Associated, N.L., 9,908 tons for 1,849 ounces.
- (28) Norseman Developments, N.L., 10,065 tons for 1,556 ounces.

Yilgarn Goldfield—

- (29) Mistletoe (Western Mining Corporation, Limited), 1,405 tons for 1,022 ounces.
- (30) Rising Sun, 8,479 tons for 1,426 ounces.
- (31) Newfield Central (Yellowdine Gold Areas), 4,646 tons for 3,909 ounces.
- (32) Sterling Gold Mines, N.L., 4,453 tons for 3,268 ounces.
- (33) Radio, 594 tons for 1,159 ounces.
- (34) Edward's Reward, 2,962 tons for 1,340 ounces.
- (35) Grand National (Nevoria), 13,139 tons for 1,899 ounces.

TABLE G.—MINES PRODUCING 5,000 OUNCES AND UPWARDS PER ANNUM FOR THE PAST FIVE YEARS.

Mine.	1940.			1939.			1938.			1937.			1936.		
	Tons.	Ounces Gold.	Dwt. per Ton.	Tons.	Ounces Gold.	Dwt. per Ton.	Tons.	Ounces Gold.	Dwt. per Ton.	Tons.	Ounces Gold.	Dwt. per Ton.	Tons.	Ounces Gold.	Dwt. per Ton.
Lake View and Star, Ltd.	591,671	165,894	5·61	604,340	171,623	5·68	566,749	172,703	6·09	542,330	167,272	6·17	524,998	174,409	6·64
Great Boulder Pty., Ltd.	417,298	97,141	4·66	358,364	110,325	6·16	276,430	97,232	7·04	188,120	72,478	7·71	166,755	72,901	8·74
Wiluna Gold Mines, Ltd.	583,516	86,732	2·97	581,245	90,169	3·10	594,739	105,307	3·54	599,567	113,376	3·78	557,099	113,495	4·08
State Batteries	100,456	58,831	11·71	101,443	65,803	12·23	108,966	73,253	13·44	102,800	60,033	11·67	102,086	64,619	12·65
Big Bell Mines, Ltd.	466,142	53,390	2·31	447,322	59,727	2·67	400,473	70,537	3·52	85,958	*10,140	*2·36	.....	.....	.....
North Kalgunli (1912), Ltd.	135,957	45,674	6·72	139,205	49,476	7·11	135,135	52,340	7·75	140,468	55,173	7·85	147,197	45,430	6·17
North Kalgunli (Croesus Section)†	17,221	3,065	3·56	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sons of Gwalia, Ltd.	138,162	44,512	6·44	136,114	45,617	6·70	138,203	45,692	6·61	136,522	45,687	6·69	125,260	45,095	7·20
Gold Mines of Kalgoorlie, Ltd.	140,483	44,278	6·30	104,052	34,419	6·62	102,615	36,059	7·03	30,342	16,971	11·15	22,520	16,709	14·85
Boulder Perseverance, Ltd.	111,996	36,103	6·45	114,589	37,681	6·58	111,824	40,958	7·32	110,171	42,221	7·66	97,752	34,392	7·04
Central Norseman Gold Corporation, N.L.	98,799	34,626	7·01	88,313	35,255	7·98	71,117	17,691	4·98	48,896	13,785	5·64	20,203	5,840	5·70
Triton Gold Mines, N.L.	104,525	30,982	5·93	107,201	33,776	6·30	108,878	34,437	6·33	74,388	25,917	6·97	77,757	26,811	6·89
Moonlight Wiluna, Ltd.	106,467	26,735	5·07	95,805	26,816	5·60	132,407	35,972	5·43	95,121	26,375	5·54	.....	.....	.....
Norseman Gold Mines, N.L.	152,289	25,906	3·40	123,404	31,046	5·03	79,250	27,692	7·00	76,069	30,771	8·09	67,860	22,440	6·61
South Kalgunli Consolidated, Ltd.	84,380	22,894	5·43	89,405	24,836	5·56	87,947	25,193	5·73	70,947	21,130	5·96	45,308	14,802	6·53
Youanmi Gold Mines, Ltd.	85,017	22,569	5·31	77,221	20,696	5·36	75,160	20,396	5·43	48,184	11,153	4·63	.....	.....	.....
Parings Mining and Exploration, Ltd.	92,000	21,206	4·61	78,676	18,749	4·77	40,939	9,804	4·79	15,305	6,908	9·14	.....	.....	.....
Kalgoorlie Enterprise, Ltd.	66,424	20,953	6·31	59,336	19,274	6·49	39,594	12,592	6·36	.....	.....	.....	.....	.....	.....
Yellowdine Gold Development, N.L.	46,346	19,054	8·22	47,534	23,703	9·98	47,175	30,041	12·74	44,899	36,958	16·46	27,050	12,842	9·49
Hannan's North (Broken Hill Proprietary, Ltd.)	40,018	16,828	8·41	37,162	17,022	9·16	30,224	12,617	8·35	22,098	10,363	9·38	19,316	8,169	8·46
Consolidated Gold Mines of Coolgardie, Ltd.	69,086	12,857	3·72	43,106	8,764	4·07	.....	.....	.....	.....	.....	.....	.....	.....	.....
Emu Gold Mines, Ltd.	47,050	11,941	5·07	48,452	12,649	5·21	48,370	11,952	4·94	.....	.....	.....	.....	.....	.....
Lancefield (W.A.) Gold Mine, N.L.	49,179	11,690	4·75	128,343	32,041	4·99	101,176	29,612	5·85	113,342	34,477	6·08	104,355	34,747	6·66
Hill 50 Gold Mine, N.L.	26,065	9,802	7·52	24,764	7,912	6·39	24,424	5,569	4·56	23,878	6,689	5·60	.....	.....	.....
Edna May Amalgamated Gold Mines, Ltd.	17,339	9,448	10·89	15,822	5,970	7·55	14,450	5,451	7·54	.....	.....	.....	.....	.....	.....
Cox's Find (Western Mining Corporation, Ltd.)	19,116	9,200	9·63	17,615	12,657	14·37	17,985	17,872	19·87	16,768	14,042	16·75	6,999	6,412	18·32
Evanston Gold Mine	11,352	8,391	14·78	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ora Banda Amalgamated, N.L.	23,775	8,330	7·01	18,955	8,020	8·46	18,730	8,700	9·29	16,495	8,309	10·08	13,193	7,284	11·04
Comet Gold Mines, Ltd.	10,901	8,027	14·73	5,872	5,564	18·95	4,996	6,563	26·27	4,790	6,822	28·48	.....	.....	.....
Gladiator Gold Mines, Ltd.	27,788	7,795	5·61	24,169	6,760	5·49	.....	.....	.....	.....	.....	.....	.....	.....	.....
Phoenix Gold Mines, Ltd.	24,282	7,329	6·03	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Consolidated Gold Areas, N.L.	34,377	7,315	4·26	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spargo's Reward Gold Mines, N.L.	19,815	7,083	7·15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Blue Bird Gold Mines, N.L.	2,667	5,877	44·07	1,169	† 4,004	† 68·50	1,185	† 8,277	† 139·70	.....	.....	.....	.....	.....	.....
First Hit Gold Mine, N.L.	8,065	5,570	13·81	7,949	5,034	12·67	7,794	5,728	14·68	8,377	6,831	16·31	.....	.....	.....
Mt. Magnet Gold Mines, Ltd.	38,452	4,121	2·14	60,019	7,091	2·36	59,671	7,639	2·56	59,580	8,589	2·88	54,760	10,519	3·84
Ingliston Consols Extended	.....	.....	.....	17,107	3,035	3·55	23,385	3,430	2·94	30,815	5,367	3·48	37,204	7,221	3·88
Marvel Loch Gold Development, N.L.	.....	.....	.....	.....	.....	.....	.....	.....	.....	35,533	5,033	2·83	33,008	5,012	3·03
Celebration-Golden Hope	.....	.....	.....	.....	.....	.....	.....	.....	.....	26,988	5,401	4·00	.....	.....	.....
Riverina Gold Mines, Ltd.	.....	.....	.....	2,424	932	7·69	15,812	5,166	6·53	13,822	5,565	8·05	.....	.....	.....
Lady Shenton Gold Mines, N.L.	.....	.....	.....	927	664	14·32	9,295	3,931	8·46	7,623	4,984	13·07	.....	.....	.....
Total	4,008,475	1,012,771	5·05	3,806,345	1,033,106	5·43	3,493,913	1,032,131	5·91	2,781,907	872,079	6·27	2,250,780	729,149	6·48
Other sources (excluding large retreatment plants)	283,133	109,937	7·77	288,912	126,413	8·75	265,807	115,446	8·69	257,701	119,320	9·26	241,254	113,893	9·44
Total (excluding large retreatment plants)...	4,291,608	1,122,708	5·23	4,095,257	1,159,519	5·66	3,759,720	1,147,577	6·10	3,039,608	991,399	6·52	2,492,034	843,042	6·77
Golden Horseshoe Sands Retreatment	.....	26,350	.....	.....	28,767	.....	.....	25,373	.....	.....	15,890	.....	.....	9,380	.....
Morgans Sands Retreatment	.....	5,765	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
GRAND TOTAL	4,291,608	1,154,823	5·38	4,095,257	1,188,286	5·80	3,759,720	1,172,950	6·24	3,039,608	1,007,289	6·64	2,492,034	852,422	6·84

* This figure does not represent the full value of the ore treated, as it neglects the gold absorbed by a new plant and also a considerable quantity of gold in the course of treatment at the end of the year. † Tonnage from Croesus Section is for 3½ months only. Prior to September, ore was treated at Kalgoorlie Ore Treatment plant and was bulked with other North Kalgunli ore. ‡ Blue Bird output is included in State Battery figures and has not been included in the total. The yield shown from this mine is by amalgamation only.

Table H hereunder shows the development footages reported for the year by the principal gold mines of the State.

TABLE H.

Development Footages reported by Principal Mines for 1940.

Mine.	Shaft Sinking.	Driving.	Cross-cutting.	Rising and Winzing.	Diamond Drilling.	Total.
	feet.	feet.	feet.	feet.	feet.	feet.
PILBARA GOLDFIELD—						
Comet Gold Mines Limited	23	441	76	197	673	1,410
Blue Spec Gold Mine	44	309	24	117	325	819
EAST MURCHISON GOLDFIELD—						
Wiluna Gold Mines, Limited	11	9,805	1,557	3,269	4,705	19,347
Moonlight Wiluna Gold Mines, Limited	129	2,680	110	2,320	3,027	8,266
Youanmi Gold Mines, Limited	184	4,023	1,207	3,359	4,317	13,090
Emu Gold Mines, Limited	134	1,427	512	734	...	2,807
MURCHISON GOLDFIELD—						
Big Bell Mines, Limited ... ..	...	3,412	8,262	3,302	737	15,713
Triton Gold Mines, N.L.	87	3,193	507	1,197	10,664	15,648
Mt. Magnet Gold Mines, Limited ... ..	...	803	152	418	...	1,373
Hill 50 Gold Mine, N.L.	48	611	286	544	1,325	2,814
MOUNT MARGARET GOLDFIELD—						
The Sons of Gwalia, Limited	38	2,192	1,023	1,034	941	5,228
Lancefield (W.A.) Gold Mine, N.L. ... ..	...	1,142	20	638	2,692	4,492
Gladiator Gold Mine, N.L.	61	932	30	280	437	1,740
Cox's Find Gold Mine (Western Mining Corporation Limited) ... ..	...	637	66	777	399	1,879
NORTH COOLGARDIE GOLDFIELD—						
First Hit Gold Mine, N.L.	134	1,172	747	527	...	2,580
Mt. Ida Gold Mines, Limited ... ..	...	838	57	216	...	1,111
BROAD ARROW GOLDFIELD—						
Ora Banda Amalgamated, Limited	134	903	357	446	...	1,840
EAST COOLGARDIE GOLDFIELD—						
Lake View and Star, Limited ... ..	...	20,917	6,376	8,409	15,164	50,866
Great Boulder Proprietary, Limited ... ..	...	23,385	4,027	7,896	26,122	61,430
Kalgoorlie Enterprise, Limited	217	3,103	1,128	875	5,263	10,586
Boulder Perseverance, Limited ... ..	...	4,634	67	2,113	6,417	13,231
Gold Mines of Kalgoorlie, Limited ... ..	...	3,508	1,390	1,513	6,666	13,077
Paringa Mining and Exploration, Limited ... ..	...	3,934	561	934	2,030	7,459
Broken Hill Proprietary, Limited (Hannan's North)	134	2,111	553	1,259	1,083	5,140
North Kalgurli (1912), Limited ... ..	...	8,900	1,866	3,505	9,557	23,828
South Kalgurli Consolidated, Limited ... ..	...	3,244	1,912	873	3,884	9,913
North Kalgurli United, Limited ... ..	...	...	...	...	1,609	1,609
Consolidated Gold Areas, N.L. ... ..	...	989	106	569	...	1,654
New Milano, N.L. ... ..	...	386	30	110	...	526
COOLGARDIE GOLDFIELD—						
Spargo's Reward, N.L.	150	183	124	187	...	644
Consolidated Gold Mines of Coolgardie, Limited	568	293	125	217	...	1,205
Phoenix Gold Mines, Limited	174	1,090	204	505	...	1,973
YILGARN GOLDFIELD—						
Yellowdine Gold Development, Limited	115	705	437	370	5,015	6,642
Edna May Amalgamated, N.L. ... ..	...	1,581	829	513	2,063	4,986
DUNDAS GOLDFIELD—						
Central Norseman Gold Corporation, N.L.	2,122	7,531	1,109	4,111	18,709	33,582
Norseman Gold Mines, N.L.	212	1,858	267	1,263	816	4,416
" " (Iron King) ... ..	...	437	...	97	1,677	2,211
Norseman Developments, N.L.	73	940	28	564	...	1,605
Norseman Associated, N.L.	103	544	136	452	59	1,294
Blue Bird Gold Mines, N.L.	120	918	...	152	...	1,190
PHILLIPS RIVER GOLDFIELD—						
Beryl Gold Mines, Limited ... ..	...	188	22	187	75	472

EAST COOLGARDIE GOLDFIELD.

The production from the East Coolgardie Goldfield was 526,834 fine ounces, or 45.6 per cent. of the total year's yield from the State.

Of the State's 35 producers of 5,000 ounces and upwards, listed in Table G, 11 are situated in this

area, and these mines contributed 507,823 ounces towards the total.

The tonnage treated on this field amounted to 1,772,040 tons, or 41.3 per cent. of the State total, while there were 4,467 men employed, representing 30.6 per cent. of those engaged in the industry. Ton-

nage treated per man employed amounted to 396 tons, against the corresponding State figure of 294 tons per man.

In spite of the record tonnage treated, ore reserves, according to estimates received, appear to be increasing owing to intensive development.

The average value of ore treated showed a further drop to 5.94 dwts. per ton, as compared with 6.5 dwts. during the previous year.

A long period of gold mining prosperity on this field may still be confidently anticipated.

Lake View and Star, Limited, treated 591,671 tons for 165,894 fine ounces of gold, the average recovery per ton being 5.61 dwts.

This is the only mine in the State to produce over 100,000 ounces for the year, although the tonnage and total yield were some 13,000 tons and 5,700 ounces below the record figures established in 1939.

Ore reserves were estimated at 31st March to total 3,854,000 tons valued at 5.39 dwts. per ton, an advance of nearly 200,000 tons on the previous year's estimate.

A brief resume of the year's work is given herewith.

Western Group.

Ivanhoe New Lode.—Stoping was continued from No. 15 to No. 27 level and the levels were extended north and south in average grade ore. No. 27 level was developed and driving carried out on the lode at No. 28 level. Preparations were in hand at the end of the year to crosscut to this lode at the 3,000-ft. level, which will involve 300 feet of crosscutting.

No. 2 Lode.—Little development was done in the Ivanhoe section. Diamond drill holes near the Boulder West lease in sections 7 and 8 at Nos. 16 and 18 levels cut good values, proving northerly extensions of stopes already worked.

No. 3 Lode.—Some development was done in sections 12 and 13 north and stoping was carried out from No. 24 to No. 30 level.

The average tonnage from the Ivanhoe, including ore from development, is about 16,000 tons monthly.

Horseshoe—Chaffers.

No. 4 Lode.—No. 37 level has now been opened up for a length of 1,400 feet and extends 600 feet south of the Chaffers crosscut. The average grade is rather low. Nos. 34, 35, and 37 levels will be extended further north. Drives south have reached the limit of the known shoot, but will probably be driven further later, prospecting for new shoots.

On the No. 25 level, the position for an internal shaft has been fixed at 650 feet west in the crosscut off the main shaft, and excavations for winding engine, ropeway, etc., have been completed.

A service winze will first be sunk to about 300 feet below the No. 27 level and Nos. 2 and 4 lodes will be developed off crosscuts. It will be some time before this work is started.

Stoping was carried out at Nos. 12, 14, 31, 35, and 37 levels.

No. 3 Lode.—At the Chaffers, probable extensions south of the main stopes were picked up from No. 17 to No. 24 level for a length of 400 feet, the average width and grade being six feet and 4½ dwts. respectively.

No. 2 Lode.—Development was continued southward on Nos. 14, 15, 17, and 18 levels, all in good ore, and also on Nos. 32 and 33 levels. At No. 33 level 150 feet of average grade ore was exposed.

The west crosscut at No. 35 level on the Chaffers exposed No. 2 lode and driving will be proceeded with.

Stoping operations took place from the 800-ft. to the 3,200-ft. level.

No. 1 Lode.—Stopes from No. 6 to No. 13 level and from No. 12 to No. 14 level are worked off crosscuts from Horseshoe No. 2 Shaft, which are driven approximately 500 feet at these levels. The average grade approximates 5½ dwts., while widths vary from four to seven feet.

Hannan's Star.

Main Lode.—Developments were continued on Nos. 4, 6, 8, 10, and 12 levels towards the south for approximately 200 feet. Widths of exposures were narrow and values inconsistent.

Stoping of good grade ore was carried out from No. 5 to No. 8 level.

Morrison West Lode.—Developments off the internal shaft at Nos. 18, 20, 22, and 24 levels were in good ore for a length of about 150 feet. Drives are being continued.

On the No. 6 level north a west crosscut exposed good ore over a width of 20 feet.

Ore extraction was maintained from No. 13 to No. 20 level.

Morrison East Lode.—This runs roughly parallel with the Morrison West Lode, with which it junctions in some places while at others they are some 20 feet apart. Some 500 feet of driving was carried out at No. 6 level. The downward extension will be developed later.

The Middle Lode is a narrow vein lying between the Morrison East and main lodes. Some development was done on Nos. 6 and 7 levels and some high grade ore was stoped at No. 5 level.

Eastern Group.

Lake View.—At Nos. 18 and 19 levels about 500 feet of driving was carried out on the east branch of the main lode in fair values, the width of lode being from eight to 10 feet.

Stoping operations took place on the various ore bodies from No. 4 to No. 19 level.

A Remarkable Development.

Possibly the most outstanding ore exposure for many years occurred when a bore-hole from the 2,650-ft. level of the Great Boulder Mine into the Lake View lease intersected some 60 feet of lode, averaging over one ounce per ton. A crosscut confirmed both width and value. It is considered that

this is probably the northerly extension of the Lake View main lode.

Preparations are being made to instal a winder at the No. 23 level and sink a winze to develop this ore.

The position of this lode is given as 700 feet N. and 600 feet W. of Lake View shaft, 100 feet E. of Great Boulder boundary. The depth at which the bore-hole penetrated the ore is 2,670 feet below the Lake View datum and the occurrence is just inside the calc schist near the contact with the quartz dolerite.

Associated Mine.

The main developments took place on the north-east corner of the Associated lease at Nos. 3 and 4 levels. Extensions of the north lode channel have been developed over a length of 200 feet, the width varying from four to 40 feet.

Stoping was confined chiefly to Tetley's and cross lodes.

Plant.

There were some minor additions to the treatment plant. A new thickener and pumps recovered a large quantity of water for further use.

The Chaffers dump retreatment plant was in operation towards the end of the year and is operating satisfactorily. Various equipment was installed at other residue dumps which are being treated at the Associated plant.

A new power unit was added to the power plant and was started up towards the end of the year.

General.

The Jack and Rip replaceable bits were given a trial but were not found to be advantageous in hard country. For soft ground and small prospecting outfits the jackbit is very suitable.

Australian steel is being tried out and, to date, has given every satisfaction.

The consumption of steel has decreased from approximately 120 tons to 80 tons yearly as a result of better heat treatment. End fired furnaces with low pressure air are being used.

Salt Water.

The total amount of salt water pumped for the year from this group of mines was approximately 54,000,000 gallons.

Explosives.

The explosives used for the year totalled 78,263 cases, equal to 1,747 tons.

Lamps.

The use of electric lamps for underground employees will be introduced during the current year. These lamps appear to have given satisfaction where tried out.

Great Boulder Proprietary Gold Mines, Limited, treated 417,298 tons of ore for a return of 97,141

fine ounces. The tonnage exceeded that of the previous year by nearly 60,000 tons, but the grade of ore treated dropped by 1.5 dwts. to an average yield of 4.66 dwts. per ton.

Ore reserves are reported to have been materially increased and although no precise figures are to hand at the time of writing, it is estimated that reserves are now five years ahead of the mill, or over 2,000,000 tons. A run of oxidised gold bearing gravelly material, estimated to contain 67,000 tons of 6 dwts. ore has been partially opened up, values being proved by costeans, pits and small shafts.

The mill ran to capacity during the year and there were no major additions to the plant.

A brief description of the year's work follows.

Hamilton Shaft.

On the Eastern series of ore bodies some trouble has been met with owing to disturbances caused by faulting. Two major strike faults occur dipping east, which are known as faults "A" and "C." These faults are about 100 feet apart and have a considerable throw which makes the stoping of the disturbed bodies very difficult.

Stoping is being carried out below the No. 19 level in ore bodies west of fault "C" and developed off No. 2 winze (internal shaft). These stopes are on levels Nos. 21 to 24, and the ore mined goes to Edward's Shaft bins.

The principal developments above the No. 2 winze were on Nos. 11 and 14 levels, where sections of payable ore were opened up.

Development on lower levels off No. 2 winze were mainly on three new ore bodies, Nos. 16, 17 and 18, occurring on the western side of fault "C." These bodies of ore are related to the series from No. 12 to No. 19 level east of the same fault.

In 500 feet of driving on the 2,650-ft. level two shoots were opened up on No. 17 lode, each for a length of about 115 feet and 5½ to six feet wide, worth 5.7 dwts. and 3.3 dwts. per ton respectively. On No. 18 lode 400 feet of driving was carried out, 280 feet in ore 6½ feet wide carrying 8.5 dwts. and 50 feet in ore five feet wide valued also at 8½ dwts.

No. 17 lode was also developed at Nos. 23, 24 and 25 levels, while at the No. 28 level Nos. 16 and 17 lodes were also opened up, widths and values being encouraging.

Sinking of No. 2 winze is in progress and at the end of the year had reached the 2,857-ft. horizon.

On the western leases, adjoining the Ivanhoe boundary some work was done on the Ivanhoe No. 2 lode from the 1,371-ft. level Ivanhoe workings, good values being opened up. Diamond drilling from the Ivanhoe satisfactorily proved continuity of values down to 1,800 feet. A crosscut is being put out at the 1,800-ft. level at Hamilton shaft to cut the nearest point of this lode, which is expected to increase ore reserves materially, both in tonnage and grade.

Main Shaft.

Good values continued to be developed on a series of east caunter lodes, which extend between the

main lode and the Boulder dyke, and a west caunter lode extending between the main lode and the west boundary. Lengths opened up vary from 100 to 300 feet, widths are from three to five feet and values fair to good.

These caunter veins extend from No. 9 to No. 22 level, below which some hit the dyke and some fade out, while it appears that the west caunter will cross the lease boundary.

Main lode developments from the 1,400 to the 1,850-ft. level were satisfactory.

At the 700-ft. level near the eastern boundary, the "X" lode was driven 600 feet in ore six feet wide assaying 9.3 dwts., while two branches further south were developed for lengths of 120 feet and 350 feet respectively in average ore.

The downward extension of the "X" lode is being developed at Nos. 9 and 11 levels, below which it appears to fade out.

Edwards and Lane Shafts.

Development was carried out at Nos. 6, 8, 14, and 16 levels on Nos. 1 and 2 east lodes. Widths averaged about six feet and values were from 3 to 5 dwts. per ton.

The Lane lode, which extends along the western boundary has been developed on levels Nos. 7 to 10, below which it dips into the Golden Horseshoe ground.

Boulder Perseverance, Limited, treated 111,996 tons for a return of 36,103 fine ounces, the average yield being 6.45 dwts., substantially the same as during the previous year.

No major additions were made to the surface buildings or equipment, but the policy of removing unsightly accumulations and tidying up generally was continued. About 200 young trees were planted along the main roads on the lease which has generally assumed a pleasing appearance.

Underground a vigorous development policy was pursued, and favourable results were obtained on the 700-ft., 1,100-ft., 1,600-ft., and 2,200-ft. levels. A policy of re-sampling old workings, careful geological mapping and diamond drilling was successful in providing information leading to profitable development.

Ore was won from stopes at all levels from the 400-ft. horizon to the 2,200-ft.

Double deck cages were installed in the Main Shaft in place of the single deckers formerly in use.

Gold Mines of Kalgoorlie, Limited, treated 140,483 tons for a return of 44,278 fine ounces of gold, the average yield being 6.02 dwts. per ton. This Company also mined and treated 10,545 tons on behalf of Lake View South Gold Mine, for a recovery of 3,773 ounces.

Ore reserves as estimated at the 31st March, totalled 657,000 tons valued at 5.1 dwts. per ton.

The ore bodies on these leases are somewhat erratic and difficult to follow, and very careful consideration is required in mining them.

The mill worked continuously and there were no major additions either to treatment or power plant. A dust collecting unit is being erected around the cracker and crushing section.

A housing scheme for employees other than the staff was started by this Company during the year, but war conditions interfered with the programme after ten houses had been built and it has been discontinued for the present.

Underground work was carried out as follows:—

Iron Duke.

Stoping on the Hincheliffe shoot was carried out mainly from the open cut, but some was also done above the No. 13 level and in the caunters above No. 7 level. All this work was west of the Main Shaft.

The "C" lode was developed by driving above a fault over the No. 3 level and sinking a winze from No. 3 to No. 5 level. A considerable tonnage of fair grade ore was proved.

"B" lode was also developed by winzing from No. 3 to No. 5 level, proving some medium grade ore.

In No. 4 caunter off "C" lode at the 200-ft. level a drive was advanced 60 feet in ore three feet wide worth 6 dwts., while a winze sunk in this ore to meet a rise from No. 3 level assayed 17 dwts. over 38 inches.

At No. 12 level, 230 feet of driving was done in the Hincheliffe area in ore assaying 9.6 dwts. over the width of the drive. Short winzes and rises proved this to be a flat pitching shoot of limited extent.

Some development was done in payable ore at both the Cygnet and Brownhill leases, while on the Australia lease stoping from the open cut provided about 40 per cent. of the mill ore. Some diamond drilling is in progress on the Australia.

On the Oroya South lease very little development was done, and a little ore was stoped. More ore was developed on the Blue Gap by stoping on Nos. 9 and 10 levels.

No development was done on the Lake View South lease.

South Kalgurli Consolidated, Limited, produced 22,894 fine ounces from the treatment of 84,380 tons of ore, the average yield per ton being 5.43 dwts.

No major plant additions or alterations were made during the year.

The principal developments were on the cross lode at the No. 19 level, where 220 feet of ore eight feet wide and averaging 5 dwts. per ton was exposed. This lode is also exposed at Nos. 15 and 16 levels, while at the No. 16 another cross-lode further south has been opened up for 95 feet in ore six feet wide averaging 13 dwts. per ton. This latter is being explored at the No. 15 level, where values appear to be of the same order although the width is less.

It is probable that the main shaft will be sunk below its present depth of 1,920 feet in order to exploit downward continuations of the cross-lodes.

Ore reserves at the 31st March were estimated at 260,000 tons valued at 5 dwts. per ton.

Paringa Mining and Exploration Company, Limited, increased their tonnage treated to 92,000 for a return of 21,206 fine ounces. The tonnage was some 14,000 tons better than the previous year's output, while gold

production appreciated by about 2,500 fine ounces. The average gold yield was 4.61 dwts. per ton.

This mine has continued to develop well and ore reserves at the end of August were estimated at 462,000 tons worth 4.91 dwts. per ton.

Outside leases acquired, Paringa Extended, Block 45 and North Kalgurli Central, are opening up some interesting ore bodies.

The Brownhill Extended was purchased during the year.

The Greenhill shoot in the Paringa has been proved to continue below the 640-ft. level and development work is being pushed on to locate it at the 800-ft. South Shaft, where it has been pierced by a diamond drill hole.

The plant capacity owing to the completion of recent alterations and extensions is now rated at 100,000 tons per annum.

Costs are shown as 27s. 4d. per ton, 15s. 7d. for mining and 11s. 9d. for treatment.

Mt. Charlotte Leases.—The litigation which was holding up the development of this large and perhaps important ore body was settled during the year and some preparations were commenced with a view to getting the mine into production.

No definite policy appears to have been yet decided upon and no great activity has been apparent.

The Hannan's Reward shaft was unwatered to the No. 4 level and the mine equipped with vertical boiler, compressor and air pump.

At the Charlotte shaft excavations for compressor and hoist are in course of preparation.

North Kalgurli (1912), Limited, treated 153,178 tons for a total recovery of 48,861 fine ounces, the average yield being 6.38 dwts. per ton. These totals include the output from the *Croesus Proprietary*, where a separate plant commenced operations in September. The production figures listed in Table G for *Croesus Proprietary* refer to ore treatment at that plant only. Output treated prior to the opening of the new plant was treated at the Kalgoorlie Ore Treatment plant with other North Kalgurli ore.

North Kalgurli Section.

On the No. 6 level a considerable amount of driving was done off the main east crosscut, exploring the Paringa lode. Exposures generally were low grade, but some patches of better grade ore will be stoped at a future date.

On the No. 9 level some development was done on what is probably the extension in depth of the same ore bodies. One rich patch was encountered, the balance being low grade.

Stoping operations from No. 5 and No. 9 levels supplied ore to the mill.

On the *Union Jack Section* operations were confined to stoping.

Kalgurli Shaft.

Stoping was continued on the N.E.D. lode from No. 4 to No. 11 level. Nos. 13, 14, and 15 levels were

stoped out. Development on this lode below the No. 15 level will be proceeded with at a later date.

The principal development carried out was on the Main Lode at Nos. 13, 14, and 15 levels. This work was in the North Kalgurli lease and development ends are now north of the North Kalgurli Main Shaft. Payable values were exposed as follows:—

No. 13 level: 400 feet, averaging 6 dwts. over 7 feet width.

No. 14 level: 300 feet averaging 7 dwts. over 7 feet.

No. 15 level: 200 feet averaging 7 dwts. over 7 feet.

At the No. 13 level a diamond drill hole, bored east from the northern extremity of the drive, entered ore at 40 feet which averaged 6 dwts. over a width of 12 feet, while at 244 feet high values were encountered which extended over 6 feet. This point is about 100 feet north of the North Kalgurli Main Shaft. Both exposures are in the calc schist.

Further drilling from the No. 15 level is contemplated with a view to exploring the downward extension of the values met.

Croesus Proprietary treated at the new mill 17,221 tons for a fine gold return of 3,065 ounces. The average recovery was 3.56 dwts. per ton, but the actual recoverable grade would be somewhat higher than this on account of plant absorption and gold in circuit at the end of the period.

The new plant started up on the 13th September, and its output was 5,000 tons monthly. It is laid out on the same lines as the plants on other local mines and includes all the latest improvements. The ore passes through cracker, cone crusher, ball mill, float and roast concentrates and cyanide. No tube mills are used, the whole of the reduction taking place in the ball mill.

No development was undertaken below the No. 10 level, where the south drive was advanced 150 feet in ore 12 feet wide averaging 7 dwts. A leading stope is now being taken off and an average value of 5 dwts. has been obtained over 500 feet in length.

On No. 9 level the north drive was advanced 200 feet in 4 dwt. ore. A leading stope is being taken off at the end of the level, which is 150 feet further north than the No. 10 level. The ends of both levels are disturbed by a strike fault with an easterly dip.

The main east crosscut was extended, passing through ore at 50 feet, and at 220 feet east driving was done on a narrow vein averaging 6 dwts. for 200 feet. This appears to be a spur or caunter off the main lode north and is 70 feet away from it.

A diamond drill southward from the south face cut no values.

Stoping is in progress on the main lode.

On the No. 7 level stoping is being carried out on the main lode.

The main east crosscut was advanced 200 feet, but nothing of interest was encountered.

At No. 6 level the main crosscut was extended easterly and cut a new make 50 feet east of the main lode. 250 feet of driving was done on this body. The

north face still shows the shear, while the south end connects with the main lode, suggesting that this is a caunter vein. Stopping operations on this make of ore produced 6 dwts. ore over widths up to 15 feet.

Stopping in 5 dwts. values was carried out on the main lode.

At the No. 5 level a new lode cut in the east crosscut appears to be the same make as that exposed on No. 6 level. It has been opened out for 400 feet in ore averaging 6 dwts. over a width of 10 feet.

Stopping on the main lode produced ore of 4 to 5 dwts. value.

The west vein was driven 350 feet in values varying from 4 to 7 dwts. and fair widths. This vein joins the main lode 750 feet south of the crosscut. This same lode was developed on the No. 4 level, where stopping is being done in ore worth 6 dwts. over a width of 6 feet.

These spur lodes supply a good grade of ore and their relation to the main lode will be more apparent after further development.

A lease on the eastern boundary has been purchased and the shaft unwatered to the 300-ft. horizon. The lode at the 160-ft. level is 300 feet long and 3 feet wide. This has not yet been sampled. The shaft is 500 feet deep and will be put in order and the lease prospected. The results of this work will be awaited with interest.

Broken Hill Proprietary, Limited, continued successful operations in treating 40,018 tons for 16,828 fine ounces of gold. The average yield was 8.41 dwts. per ton.

No major additions or alterations were made to the plant during the year.

The main shaft was advanced 200 feet to a total depth of 1,550 feet and a plat is being cut at this horizon.

At the No. 10 level development at the north end was satisfactory, but going south some very disturbed country was penetrated.

Values generally are maintained, but appear to be somewhat lower than usual on the bottom levels.

Kalgoorlie Enterprise, Limited, in treating 66,424 tons for a total return of 20,953 fine ounces, somewhat increased their output on the previous year's figures, the average grade of ore treated remaining substantially the same.

The Main (Victoria) Shaft was sunk 200 feet to a total depth of 1,814 feet and provision made to break out No. 17 level at the 1,680-ft. horizon.

A new skip loading station was brought into operation below No. 15 level, which has pneumatically controlled undercut doors on the bin discharging into measured hoppers which, in their turn, are discharged into the skips by opening pneumatic doors of the guillotine type.

A new ventilating fan was installed on No. 12 level, the air current downcasting through the main shaft and upcasting through stopes to the surface.

Development was continued on the Greenhill shoot and Perseverance lode at Nos. 12, 13, and 15 levels.

The 2,050-ft. level of Boulder Perseverance, Limited, was extended into the Enterprise lease and the Greenhill shoot developed with favourable results at this horizon.

A mechanical shovel (Gardner-Denver) and an electric locomotive (Little Mancha) are in successful operation.

Mount Menger Area.

This is a district of small, rich mines a number of which during the year have produced parcels of high grade ore. The need for a suitable central milling plant is rather pronounced as practically all the ore is carted to Kalgoorlie for treatment, a distance of 35 miles over a very rough road. The cost of transporting ore such a distance limits the economic value of ore that can be mined, and consequently a considerable tonnage of medium grade ore, which could be economically treated on the spot is left behind and may never be recovered.

The *New Milano Gold Mine* acquired the old Milano and adjoining leases, erected a treatment plant and mined and treated 2,925 tons for the good return of 4,729 fine ounces, the average recovery being 32.33 dwts. per ton. This grade is considerably lower than that mined by the old syndicate, indicating that a quantity of ore which would not pay cartage to Kalgoorlie has been treated at the Company's mill.

A progressive development programme has been carried out, proving the continuation of the ore bodies both in length and depth.

The main shaft was stripped to a depth of 382 feet, the horizon of the No. 4 level, and box timbered for a three compartment shaft, having an inside measurement of 10 feet by four feet. A steel head frame has been erected and the installation of a steam winder was almost complete at the end of the year.

A winze was sunk in the south end of the No. 4 level drive and a south drive was advanced 120 feet on the No. 5 level in ore averaging 2½ ounces per ton.

The treatment plant is being extended and an increase in tonnage treated may be expected in the current year.

Ore reserves at the end of September were estimated at 8,000 tons averaging 15 dwts. per ton. Subsequent development has somewhat increased this figure.

Numerous other small mines are being successfully worked by small parties in this area and a good grade of stone is being broken out and good wages being earned.

HAMPTON PLAINS AREA.

Consolidated Gold Areas, N.L., had their first complete year of production and mined and treated 34,377 tons of ore for a return of 7,315 fine ounces, the average yield being 4.26 dwts. per ton. Included in this total was 1,400 tons of tributers' ore, having a head value of some 12 dwts. per ton.

The principal development carried out consisted in opening up the No. 4 level by drives north and south of the main shaft. The south drive was advanced

some 250 feet in good grade ore which was stripped to a width of 18 feet over the first 100 feet, gradually decreasing to the width of the drive in the south end. The north drive averaged 10 feet in width for 130 feet, but values were lower than in the south drive.

Two winzes were commenced from the No. 4 level. No. 1 south winze reached a depth of 100 feet in good grade ore over most of its depth, while No. 1 north winze was sunk 25 feet in average grade ore.

The country being suitable, shrink stoping has been adopted and there is now a considerable tonnage of broken ore in the stopes.

The present hoist is being replaced by an electrically driven winding engine, the current for which is supplied by an extension of the power line from Celebration.

Mining and milling costs are said to be satisfactory, but the four mile haulage to the Celebration plant, where the ore is treated, is proving costly.

The number of men employed on the mine is 60, while a further 20 are employed at Celebration on the plant.

The *New Hope Mine* at Celebration continued profitably mining low grade oxidised ore and treating at the Huntington mill plant at Feysville. The ore treated amounted to 6,166 tons for a return of 969 fine ounces. Six men are employed underground and three at the mill, and the output per man employed compares very favourably with that for the whole State.

In the *Bulong District* there is nothing of importance to report.

NORTH-EAST COOLGARDIE GOLDFIELD.

There was little of importance to report on this field during the year.

A party of men working the old *Sirdar Gold Mine* have done well, having secured 1,093 fine ounces from 682 tons of ore and sands from old tailings.

Other activities have consisted entirely of prospecting.

BROAD ARROW GOLDFIELD.

Ora Banda Amalgamated, N.L., was again the major producer on this field. Tonnage treated was some 5,000 tons higher than the previous year at 27,775 and gold returns amounted to 8,330 fine ounces, an average yield of 7.01 dwts. per ton.

A normal development programme was carried out during the year. No late estimates of ore reserves are to hand.

The only other mine to produce over 1,000 ounces on this field was *Carbine Gold Mines, N.L.*, which crushed 3,000 tons at the Ora Banda State Battery for a return by amalgamation of 1,113 fine ounces. This mine is now being worked on the 200-ft. level, where the sulphide zone has been reached. Fourteen men are employed.

It is reported that *Ora Banda United* have acquired a plant to treat 5,000 tons per month, but as a number of items were purchased in America, some difficulty is being encountered in getting delivery.

COOLGARDIE GOLDFIELD.

The Coolgardie District showed an increase on the 1939 output of nearly 15,000 fine ounces, the figures for 1939 and 1940 being 20,831 and 35,565 ounces respectively. This gain was principally due to increased production by Consolidated Gold Mines of Coolgardie, Limited, and Spargo's Reward Gold Mine, N.L., and the entry of Phoenix Gold Mines, Limited, into the ranks of the major producers. Prospecting and small mine operations showed a slight increase.

Consolidated Gold Mines of Coolgardie, Limited, treated 69,086 tons for a return of 12,857 fine ounces, the average yield being 3.72 dwts., or .35 dwt. below that for the previous year.

The Tindals Main Shaft was sunk a further 227 feet to a total depth of 845 feet. A plat was cut at the 750-ft. horizon, and a crosscut east intersected Tindals main lode 50 feet from the shaft. The lode was exposed over a width of 7 feet and averaged 4.8 dwts. per ton.

The "F" shaft, the northernmost shaft on the lode, was deepened to connect with No. 2 level, causing a great improvement in the ventilation of the mine. A new timber headframe has been erected on this shaft and a single drum electric winder to haul a one ton skip has been installed. This will materially increase the mine output. The ore above the No. 2 level in this section is 40 feet wide and highly oxidised, and the average value is estimated at 6.8 dwts. per ton. This ore when broken will be hoisted through "F" shaft.

On Nos. 3, 4, and 5 levels the ground has been found suitable for shrink stoping and a change-over from the cut and fill method has been instituted, which is expected to materially reduce working costs.

The plant has been extended and is now capable of handling 7,000 tons per month. Further extensions are in hand with a view to increasing this tonnage to 10,000 tons per month early in 1941. This increased production is expected to still further reduce unit costs.

A new electric winder is being installed at Tindals shaft, which will speed up the haulage.

Ore reserves at 30th June, 1940, were estimated at 400,000 tons valued at 4.4 dwts. per ton.

Phoenix Gold Mines, Limited.—The new plant on this group was completed early in the year and milling operations were commenced in April. Up to the end of the year 24,282 tons had been treated for the recovery of 7,329 fine ounces. The capacity of the plant is rated at 3,500 tons per month, but there were, unfortunately, a number of stoppages due to power failures. These were rectified by the installation of a 275 h.p. diesel engine and low pressure air compressor and the mill is now running satisfactorily.

Development has been pushed forward and the ore reserves have been materially increased by the year's work.

The main shaft has been advanced 175 feet to a total depth of 1,450 feet, at which horizon a plat is being cut.

The reef on the 1,300-ft. level has opened up well and north and south drives from the main crosscut are being pushed ahead.

The 1,150-ft. level has been developed over the full length of the reef and stope preparation is well under way. Values are reported to be good.

Spargo's Reward Gold Mine, N.L., appears to have now overcome the difficulties, mainly financial, against which it has been struggling for some years. The output for 1940 was 7,083 fine ounces from the treatment of 19,815 tons of ore, the average yield being 7.15 dwts. per ton. The mine is now on a sound financial footing and it is anticipated that the dividend stage will soon be reached.

The main shaft was completed to the No. 3 level. A small air shaft was sunk 70 feet, connecting with the No. 1 level at the south end of the mine, and a rise at the north end was connected to the surface by a small shaft. These shafts improved the ventilation and opened up a block at the south end.

The most important development for the year was the location of a considerable body of ore in the footwall of the present workings over a length of 80 feet. This ore is separated from the main body by a narrow strip of low grade material, varying in width from one to six feet, and has increased the stoping width of the lode to 33 feet and the value to over 8 dwts. per ton.

Two winzes were commenced from the No. 3 level, but at a depth of 24 feet, a heavy flow of water, amounting to 13,500 gallons per hour, was encountered, necessitating the provision of a larger pumping plant before sinking can be resumed. This plant has been purchased.

During the period under review, one 220 h.p. Ruston engine, one 750 cub. ft. compressor, one 30,500 gallon steel fuel oil tank and three 5,000 gallon galvanised iron tanks have been installed. A new crushing plant is proposed for the current year.

Owing to the inflow of water, ore reserves have not been appreciably increased during the year, and, at the end of December, were estimated at 15,500 tons of proved ore at 6.9 dwts. per ton and 11,500 tons of probable ore at 7.0 dwts. per ton.

DUNDAS GOLDFIELD.

This goldfield has completed another prosperous year. The total gold production decreased by 3,000 ounces on the figure for 1939, to 74,636 fine ounces, the principal reason for which was the drop in grade of the ore treated at the Norseman Gold Mines, N.L.

Prospecting is still being carried out fairly extensively and statistics indicate increased activity on the part of small mines.

The *Central Norseman Gold Corporation, N.L.*, has now definitely taken the lead as the major producer of the district, and treated 98,799 tons for a return of 34,626 fine ounces. The yield, while just on 1 dwt. lower than in the previous year, is still 7 dwts. per ton, reflecting the value of recent developments.

The vigorous development policy that has characterised the mine was continued and a considerable

tonnage of good grade ore has been proved. Estimated ore reserves at the end of March stood at 345,000 tons valued at 8.3 dwts. per ton and have been increased considerably by the year's work.

The main shaft (Phoenix Shaft) was advanced 402 feet during the year to an inclined depth of 2,600 feet and the 26 level plat was cut.

At the All Nations ventilation shaft, 3,000 feet north of the main shaft, 906 feet of sinking was accomplished to the No. 14 level, the total inclined depth being 1,390 feet. An exhaust fan of 30,000 c.f.m. capacity has been installed at this shaft, affording excellent ventilation.

Mechanical appliances are widely used throughout the mine, including electrically driven scraper hoists for stopes and development ends, electric locomotives and both electric and air-driven fans to ventilate all development ends.

All development to the north from No. 8 to No. 22 level inclusive has exposed some payable ore. Very little payable ore was developed south of the main shaft.

The Ajax shaft was sunk a further 814 feet to a total vertical depth of 1,967 feet. Plats were cut at the 1,055-ft., 1,690-ft. and 1,965-ft. horizons. From the bottom plat, which is equivalent to the No. 22 level, a west crosscut has been put out to the assumed position of the Mararoa reef, 800 feet from the shaft, but the reef was found to be replaced by the quartz porphyry dyke. A drive is being pushed ahead to connect with the No. 22 level workings from the Phoenix shaft.

An extensive diamond drilling programme is in progress from the bottom of the Ajax shaft, the object of which is to endeavour to locate the deeps of the Norseman Mine.

The treatment and power plants have operated successfully during the year, and an additional 420 K.W. Belliss and Morcom diesel electricity generating set has been added.

Some 50 bungalows have been erected for employees and are let at a very reasonable rental.

In my last Annual Report I mentioned the measures taken by this company to ensure a maximum freedom from accidents. It is pleasing to report that the serious accident rate has been very low for the year and that there were no fatal accidents.

Norseman Gold Mines, N.L., in treating 152,289 tons for a total return of 25,906 fine ounces, increased the previous year's tonnage by about 29,000 tons, but the gold won was some 5,000 ounces less due to a drop in grade from 5 to 3.4 dwts. This is largely due to the treatment of a bigger proportion of the lower grade Iron King ore than was included in 1939, but the ore mined from the Norseman mine itself was also considerably lower than in previous years.

Alterations and additions to the plant included completing the installation of No. 3 ball mill and classifier unit, one 100-ft. thickener, an 800-ton fine ore bin for Iron King ore, extensions to coarse ore bins and ramp, chain and bucket sample cutter, extensions to foundry, the addition of a 450 h.p. Belliss and

Morcom diesel engine and 285 k.w. alternator and a complete gas producer unit of 300 h.p. capacity.

Development was not extensive and did not make any appreciable addition to ore reserves.

Iron King Mine.—A total of 55,000 tons of ore, of a head value of about 2 dwts., was treated by the Norseman Gold Mines from this big, low grade ore body consisting of a wide hematite lode which has been opened up and mined over a length of 1,000 feet to a depth of 140 feet.

Three electrically-driven scrapers are in use which have proved very satisfactory and economical.

An ingenious idea has been adopted for scraping ore out of the Queen cut tunnel. A vertical hole, six inches in diameter and 140 feet deep was put down to connect with the bottom of the tunnel. One five-ft. sheave was placed at the top of the hole and another at the bottom, in the tunnel. The tail rope of the scoop was run down this hole, over the sheaves and connected with the scoop and the hoist drum. This makes it unnecessary for men to travel to the bottom of the tunnel, saves wear and tear on the rope and increases the haulage rate.

The estimated ore reserves at the end of October were 348,000 long tons at 2.46 dwts. per ton.

Total cost of mining, transporting three miles and milling this ore is 11s. 4d. per ton.

Mt. Barker Mine (Norseman Associated Gold Mines, N.L.), carried out a fair amount of development during the year with Government assistance, but the results of the development programme failed to disclose any further extension in length or depth of payable ore.

Ore treated totalled 9,908 tons for a return of 1,849 fine ounces, but at the end of the year there appeared to be only a small tonnage left and the life of the mine would seem to be very short.

Northern Star Mine (Norseman Developments, N.L.), was another mine which sought and received Government assistance for development which was fortunately more successful than that carried out at Mt. Barker.

A winze sunk from the No. 5 level in the south drive, 180 feet from the shaft, exposed payable values for a depth of 97 feet. Two winzes in the north drive on this level failed to expose payable ore.

One compartment of the main shaft was sunk to the No. 6 level, a plat cut and a drive pushed south to connect with the payable winze abovementioned. Payable ore was exposed in this drive.

The low grade of this mine, together with the comparative shortness of the shoots of ore, are not indicative of a very long life.

The output for the year was 1,556 fine ounces from 10,065 tons of ore, the average yield being 3.09 dwts. per ton.

Blue Bird Gold Mines, N.L., continued their successful operations, and treated 2,667 tons for 5,877 ounces, an average yield of 44.07 dwts. This return was by amalgamation, the sands being stored for future treatment.

The treatment plant described in my last Annual Report was brought into commission early in the year and leaching vats to treat the tailings are in course of construction.

A steady development programme has been maintained and estimated ore reserves at 30th June stood at 11,500 tons averaging 55 dwts. per ton.

A timber headframe and ore bin have been erected at No. 4 shaft, which is used as the main haulage way and a skip is now used to haul the ore in place of kibbles. A steam winder and larger skips will be installed early in the current year.

This shaft has also been sunk a further 50 feet, making a total inclined depth of 320 feet. The reef at this depth is 20 inches wide and averages 65 dwts. per ton.

Other development work has been satisfactory and a winze is being sunk to connect with the Empress Mine workings, which will provide improved ventilation in both mines.

The continuation of high values in this mine is very pleasing, and the provision of a plant will also allow of the economical treatment of any lower grade ore that might be encountered.

About 60 men are employed on this mine.

Empress Gold Mine.—Encouraged by good values obtained in a diamond drill hole on a continuation of the Blue Bird line of reef, an underlay shaft, dipping 43 degrees east, was sunk to a depth of 400 feet on this company's property.

The reef was cut at an inclined depth of 382 feet. A plat was cut at this horizon and drives put out north and south on the reef. The North Drive was advanced 47 feet in high grade quartz averaging 20 inches in width, while the South Drive was advanced 123 feet to the Blue Bird boundary, encountering short lenses of high grade ore.

A timber headframe has been erected and a small air hoist to haul a 5 cwt. skip has been installed.

Present indications are that this small mine should develop into a producer of high grade ore.

YILGARN GOLDFIELD.

This goldfield has again had a prosperous year, the total gold production exceeding that of the previous year by some 5,500 ounces, the figure reaching 68,454 fine ounces. This result was chiefly due to an increased production of higher grade ore from Edna May Amalgamated and the rapid expansion of the privately owned Evanston Gold Mine.

Prospectors and small mine operators have again been active as will be seen in the Classification of Gold Output (Table E). The three large producers contributed 36,890 ounces to the total, while prospectors and small mines were responsible for 31,564 ounces.

Yellowdine Gold Development, Limited, while keeping up the tonnage, reduced the grade of ore treated by about 1.8 dwt. Tonnage crushed amounted to 46,346 tons for a return of 19,054 fine ounces, the average yield being 8.22 dwts. per ton. The No. 6 level is being driven north and south and average values are about 6½ dwts. per ton.

The main open cut is practically worked out, but in one or two places some small leaders are being followed up.

The new lode, which is to the westward of the main workings, is being worked by open cut.

The number of men employed by this company averages 130.

Edna May Amalgamated, N.L., completed its most successful year to date, mining and treating 17,339 tons for a recovery of 9,448 fine ounces. The average yield was 10.89 dwts. per ton.

A vigorous development policy was carried out and, following the completion of the new shaft and unwatering the bottom level of the old Central Mine, work was concentrated on opening up the known ore bodies on the 426-ft. level and developing the new footwall branch reef discovered on this level immediately prior to the flooding of the old mine. This ore body was also opened up on the 385-ft., 321-ft., and 225-ft. levels and constitutes a large body of payable ore. Attention is now being directed towards opening up this ore body in the oxidised zone.

Main crosscuts were connected to the new shaft at the 225-ft. and 385-ft. levels, which will materially reduce trucking distances.

The sinking of the new shaft will be resumed early in the current year.

A reservation of approximately 250 acres has been granted covering the ore channel to the east and west of the mine and drilling operations are in progress to explore the channel between known ore bodies and the country to the east and west. Results have been sufficiently encouraging to warrant putting in some long crosscuts.

Evanston Gold Mine joined the ranks of the large producers with a recovery of 8,391 fine ounces from the treatment of 11,352 tons of ore. The average yield was 14.78 dwts. per ton. Both tonnage and grade of ore treated were increased considerably on the previous year's operations and the gold output was more than doubled.

This mine is being equipped to increase its output and a new plant has been designed to handle 3,000 tons per month.

No official estimate of ore reserves has been computed, but there would appear to be no cause for uneasiness on this score for some years to come. The ore body is very flat and is being worked on a modified pillar and bord system such as is used in many coal mines, and as long as the pillars are sufficient in number and are left intact, they can be counted as ore reserves and eventually recovered.

The average number of men employed is 45.

Of the smaller mines in the district those meriting special mention are as follows:—

Newfield Central Gold Mine (Yellowdine Gold Areas, N.L.), which crushed 4,646 tons for a return of 3,909 fine ounces, averaging 16.83 dwts. per ton.

This mine employs 22 men.

A diamond drill is operating from the surface testing for the extension of the ore body or for other payable shoots.

Sterling Gold Mines at Marie's Find treated 4,453 tons for 3,268 ounces, averaging 14.68 dwts. per ton. This company employs 36 men and prospects appear satisfactory.

Burbidge Gold Mines, N.L., treated 13,139 tons of ore from the old Grand National Mine for a return of 1,899 fine ounces, the yield being 2.89 dwts. per ton.

Although no estimate of ore reserves has been made public, it is confidently thought that large quantities of low grade ore are available at a low cost, and arrangements are being made to increase the capacity of the plant to 3,000-4,000 tons per month.

The *Rising Sun Mine* realised 1,426 fine ounces from the treatment of 8,479 tons of low grade ore, yielding 3.36 dwts. per ton.

At Edward's Find the *Reward Mine* had a successful year, treating 2,962 tons for a return of 1,340 fine ounces. A winze below the 210-ft. level is down 110 feet and the ore at this point is reported to be 6 feet wide and of an average value of approximately 1 oz. per ton.

This mine employs 17 men.

Milling operations slackened towards the end of the year owing to water shortage.

Ore reserves on this mine are estimated at 10,000 tons, but the average value has not been computed.

The *Radio Gold Mine* at Manxman employs 10 men and stone is being broken above the 500-ft. level. Widths are up to 12 feet and the stone is high grade. The year's output was 594 tons for 1,159 fine ounces.

The *Mistletoe Gold Mine* operated by the Western Mining Corporation, Limited, mined and treated 1,405 tons for a return of 1,022 fine ounces.

Five other small mines contributed between 500 and 1,000 ounces each, while 29 produced from 100 to 500 ounces in this goldfield.

NORTH COOLGARDIE GOLDFIELD.

Yerilla District.

There was increasing activity in this area. Several leases previously held by the Paget Gold Mines were forfeited, and several prospecting parties have been working along the line of lode to the south.

The old Chateau Tanunda leases at Porphyry were taken up, and a treatment plant, consisting of a sluicing plant with counter current decantation was put into operation, re-treating the tailings dump.

At the end of the year the power and treatment plants were in process of overhaul and the recommencement of underground operations is expected to take place early in the current year.

Niagara District.

There were only prospecting activities in this district, although the total gold return was a little higher than during the previous year.

Ularring District.

This district was rather quiet during the year.

The *New Callion Mine*, after producing 516 fine ounces from the treatment of 1,582 tons of ore,

closed down on account of water shortage and insufficient capital.

At *Morley's Find* the returns were considerably less than during the previous year. The total production for the year amounted to 1,792 fine ounces from the treatment of 843 tons of ore, to which must be added 572 ounces of dollied gold and specimens.

The *Two Chinamen* produced 925 ounces (inclusive of 320 ounces of dollied and specimen gold) from the treatment of 249 tons of ore. The previous year's total from this mine was 3,751 fine ounces.

Other activities in the district consisted mainly of prospecting and retreatment of dumps.

Menzies District:

The principal producer in this district was the *First Hit Gold Mine, N.L.*, with a return of 5,570 ounces from the treatment of 8,065 tons. Both tonnage and value of the ore from this mine remain reasonably consistent. Ore reserves are estimated at 23,000 tons, or about three years' supply ahead of production.

The prospects of keeping up the present scale of production appear to be good.

The average number of men employed was 39.

The *Lady Shenton Gold Mines, N.L.*, acquired an option on the old Maranoa Mine, and, having unwatered the old workings, have carried out some winzing and intermediate driving. Trial parcels of the ore obtained from these workings have been forwarded to Kalgoorlie for treatment.

Mt. Ida Gold Mines, Limited, employed 44 men and treated 2,980 tons for a return of 1,329 fine ounces.

This property is at present held under option.

The 300-ft. level was driven 600 feet during the year and a winze sunk below this horizon. Preparations are in hand to sink the shaft to 400 feet.

Values exposed by all developments were satisfactory.

Prospecting activities were comparable with those of 1939.

MOUNT MARGARET GOLDFIELD.

Mount Malcolm District:

The *Sons of Gwalia, Ltd.*, mined and treated 138,162 tons for a return of 44,512 fine ounces, an average recovery of 6.44 dwts. per ton. The output of this mine does not vary appreciably from year to year.

A somewhat serious labour shortage was experienced towards the latter part of the year, due in some measure to the internment of enemy aliens, a number of whom were employed on this mine. Some difficulty has apparently been encountered in replacing these men with other experienced miners.

The development of No. 30 level was continued and the sinking of the internal shaft is proceeding as pilot winzes which will be stripped to the required size. Shaft mullock will be hoisted to the No. 28 level, where it will be disposed of in stopes.

Normal development and mining operations were carried out, and ore reserves are substantially the same as at the end of the previous year.

No new surface plant of importance was constructed or installed during the year.

The average number of men employed was 406.

Leonora Central treated 3,895 tons for a recovery of 481 fine ounces by amalgamation. The sands are reported to contain a considerable amount of recoverable gold.

A company has taken over the operation of this mine and a definite programme has been laid out, which should result in increasing the mine's output.

Prospecting in this area remained about normal and the Reefer Battery at Leonora operated throughout the year.

Mount Margaret District:

The *Lancefield (W.A.), Gold Mine, N.L.*, continued operations on its usual scale until the middle of May, when, owing to an earth movement of the nature of a creep, it was found necessary, in the interests of safety, to cease operations underground.

The gradual shortening of the lode on the lower levels had for some time prior to the closing of this mine been giving some concern, and it is somewhat doubtful whether any but greatly restricted operations would have been possible for any extended period, even had the earth movement not taken place. A diamond drilling campaign subsequent to the closure failed to indicate the probability of profitably continuing operations by means of a new shaft.

The output was 49,179 tons for a return of 11,690 fine ounces.

The closure of this mine is a severe set-back for the district.

Cox's Find Gold Mine, operated by the Western Mining Corporation, produced 9,200 fine ounces from the treatment of 19,116 tons of ore. The tonnage treated was somewhat greater than in previous years, but the grade of the ore has fallen from 14.37 dwts. in 1939 to 9.63 dwts. in 1940.

Ore reserves were estimated at 31st March, 1940, at 41,700 tons valued at 11.6 dwts. per ton.

Development by winzing has reached a depth of 300 feet on the underlay below the No. 6 level, and cross-cutting for values located by diamond drilling was started at the horizon of No. 8 level.

The average number of men employed on this property was 92.

Gladiator Gold Mine Limited, treated 27,788 tons of ore for a return of 7,795 fine ounces.

An internal shaft was sunk from No. 5 level to a vertical depth of 650 feet below the surface, and No. 7 level was broken out at the 636-ft. horizon.

New plant installed during the year included a F.A.5 National diesel engine and a 1,000 cub. ft. compressor.

An electric winder has been received for use on the main shaft and a smaller unit has been procured for the internal shaft.

The results of the year's work have been satisfactory and indicate a successful continuance of operations.

An average of 90 men is employed.

Prospecting generally in this district has continued to be active, and production other than by the major producers shows a slight increase on the figures for the previous year.

The most spectacular of the small producers was the "*Boomerang*," at Burtville, owned by Cable Brothers, which produced 807 fine ounces from a total of 50 tons of ore.

Work on this mine has been spasmodic owing to water difficulties. The shoot of ore is very narrow.

Towards the end of the year a new rich shoot was located westward of the shaft.

Mount Morgans District:

Sands Retreatment, Limited, operating on the old dumps at Morgans, recovered 5,765 fine ounces of gold, employing 25 men. It is reported that sufficient sands remained at the end of the year to carry on for a further period of two months.

Hill End Mine at Murrin continues to produce consistently on a small scale, and also crushes parcels for prospectors. Returns for the year consisted of 170 fine ounces by amalgamation from 900 tons of ore and 293 ounces from the cyanidation of 1,740 tons of tailings.

The *North Democrat* at Linden had a successful year, obtaining 988 fine ounces from the treatment of 421 tons of ore. Work is being carried out at the 200-ft. level, where high values still persist. The mine is equipped with compressor, winch and engine and seven men are employed.

Prospecting is still active, but production from this source has declined somewhat compared with that of the previous year.

PILBARA GOLDFIELD.

Marble Bar District.

Comet Gold Mines, Limited, whose new sulphide treatment plant was brought into operation during the year, considerably increased the output of preceding years. Ore treated totalled 10,901 tons, almost doubling the 1939 figure, producing 8,027 fine ounces of gold, the average yield being 14.73 dwts. per ton.

Development, including that on the McKinnon's section, comprised 23 feet of shaft sinking, 441 feet driving, 76 feet crosscutting, 197 feet rising and winzing and 673 feet diamond drilling.

The following plant was erected on the McKinnon's section:—

Electric winder.

Compressor, 500 cubic feet per minute.

Steel ore bin.

New plant erected on the Comet section was

Ruston Hornsby Diesel engine, type 5 VER.

60 Rabble roaster and 250-ft. stack.

Oliver filter, Merrill-Crow plant and 6 cyanide vats.

A Lodge-Cottrell plant is in course of erection, and a new 10 ton diesel truck was put into service.

McKinnon's section is reported to be developing well, the ore body promising to be both longer and wider than was originally expected.

Apart from the Comet group, activity in the district is confined to prospecting and syndicate shows. Small treatment plants were erected on the old Iron-clad Mine and at North Pole, but operations have been hampered by scarcity of water owing to drought conditions.

At the Bamboo Creek centre activity remains about constant. Reference to Table E will show that two mines produced between 500 and 1,000 ounces, while six others produced from 100 to 500 ounces each. Total production from the district appreciated by 1,600 fine ounces over the figures for 1939.

Nullagine District:

The principal mine operating in this district is the *Blue Spec*, which treated 1,235 tons during the year for a return of 691 fine ounces of gold.

Treatment operations have been seriously curtailed on this mine by water shortage, and the water supply is not yet assured. The company has spent a considerable amount of money in endeavouring by boring to locate a suitable supply, but without conspicuous success to date. If sufficient water for treatment purposes can be located, indications are that a good payable mine should be opened up.

The following development was carried out during the year:—Shaft sinking, 44 feet; driving, 309 feet; crosscutting, 24 feet; winzing and rising, 117 feet, and diamond drilling, 325 feet.

Ore reserves at the end of the year were estimated at 15,000 tons, assaying 17.7 dwts. per ton.

Additions to the plant during the year were:—

- (a) Two 40 H.P. Crossley horizontal twin cylinder diesel engines driving alternators.
- (b) A 20 ton flotation test plant comprising two 5ft. grinding pans, cone classifier, Wilfley pump, 25-ft. primary thickener, surge tank, three Forrester flotation cells, and a 20-ft. tails thickener.

EAST MURCHISON GOLDFIELD.

Wiluna District:

Wiluna Gold Mines, Limited.—While a certain amount of exploratory work has been carried out during the past twelve months, the position as outlined in my last year's report has, unfortunately, shown no improvement. The ore in reserve at March 31st, 1940, was estimated at 1,186,000 tons assaying 3.8 dwts. per ton, including probable ore. No new major ore bodies were developed, but in the Happy Jack area 120,000 tons of new ore was opened up. Elsewhere results are not considered to warrant any expenditure on further exploratory work.

The tonnage treated for the year amounted to 583,516 tons for a return of 86,732 fine ounces. The throughput was some 2,300 tons more than in the preceding year, but the return was 3,437 fine ounces less.

It is estimated that operations on a normal scale will be carried out on this mine until the end of 1941, but factors beyond the control of the management may force an alteration of plans.

A new flotation unit was added during the year for the purpose of handling some 100,000 tons of ore of high antimonial content.

Moonlight Wiluna Gold Mines, Limited, milled 106,467 tons for a return of 26,735 fine ounces. The average yield was 5.02 dwts. per ton, being .58 dwt. below the average for 1939.

On the Lone Hand lode an existing shaft was deepened and a level opened at the 170-ft. horizon in sulphides. The ore, however, was very narrow and the grade too low for profitable working.

Work on the Adelaide South West lode was accelerated during the year and some ore in this area was taken into reserve.

Coolgardie Brilliant, N.L., treated 9,335 tons of ore for a return of 2,690 fine ounces of gold, doubling the previous year's gold output. The yield per ton was 5.76 dwts.

The plant was extended with the object of handling more ore.

This mine contains a small percentage of copper, which shows a tendency to increase with depth, and a Wilfley table has been installed to extract the mineral before cyanidation.

Towards the end of the year some driving south was done on one of the upper levels, proving the extension of the reef in that direction, the length opened up now being some 800 feet. It is also thought to extend further north than the company has worked, but is faulted at the north end of the workings and runs into ground held by the Wiluna Gold Mines, Limited.

The future of this mine appears to hold reasonable promise.

Linden (W.A.) Gold, N.L., treated 3,374 tons for 981 fine ounces, an average yield of 5.82 dwts. per ton, the tonnage treated being less than half of that of the previous year.

Lawlers District:

Emu Gold Mines, Limited, was again the principal producer of this district, treating 47,050 tons for a recovery of 11,941 fine ounces.

Towards the end of the year a strong inflow of water was met with, which will probably restrict production for some time.

An internal shaft was sunk from No. 8 level to the No. 10 horizon, where it will later be connected with projected development.

The main shaft was continued a further lift and a new level broken out at 933 feet.

The average number of men employed was 135.

An unfortunate occurrence early in the year was the destruction of the mine office and store by fire, but new buildings were erected.

At Mt. Sir Samuel, the *Vanguard Mine* worked intermittently, but the battery operated continuously, principally on public crushings.

At the old *Bellevue Mine* the treatment of sands was recommenced by fine grinding and straking. A flotation unit has been acquired for the retreatment of residues. Approximately 15 men are employed on this plant, which has a capacity of 1,500 tons per month. It is proposed to double this output. Results are reported to be quite satisfactory.

Prospecting in this district appears to have fallen off somewhat as compared with recent years.

Black Range District:

The principal producer in this district was again the *Youanmi Gold Mines, Limited*, which treated 85,017 tons of ore for a return of 22,569 fine ounces, the average yield being 5.31 dwts. per ton. This represents an improvement of 7,800 tons and 1,873 ounces over the 1939 figures, the grade remaining approximately the same.

Ore reserves as at 30th June, 1940, were estimated at 192,000 tons proved and probable ore of an average value of 7.1 dwts. per ton.

During the period under review the oxidised section of the plant was completely converted to treat sulphide ore by the addition of another roaster, Cassels filter, dust collector and pumping plant.

At the beginning of the year work was concentrated on the Pollard shaft section of the mine, which has responded well to development. In the main shaft section the No. 8 level was driven under the old workings which extended to the No. 7 level only.

The *North End Mine*, at Jonesville, was the only other mine of special interest in this district, treating 4,601 tons of ore for a return of 921 fine ounces, a recovery of 4 dwts per ton.

MURCHISON GOLDFIELD.

Meekatharra District:

The *Ingliston Consols* ceased operations early in the year after being a consistent producer since the very early days of gold production in the State. A party of sixteen men took a tribute on the mine and are reported to be doing well.

The *Fenian Mine* treated 5,397 tons for 1,501 fine ounces, averaging 5.56 dwts. per ton.

The *Prohibition* mined and treated 5,895 tons of ore for a return of 880 fine ounces, the average yield being 2.98 dwts. per ton.

Three other producers each contributed between 500 and 1,000 ounces, while there were nine producers of from 100 to 500 ounces.

The district generally is very quiet, although a constant supply of ore, much of which is from old mines, is available for treatment at the State Battery.

At Gabanintha a syndicate is erecting a plant for the treatment of cupriferous sands from the old mines. The plant consists of a ball mill, classifier, flotation unit, rotary kiln and cyanide vats, all of which were on the lease at the end of the year, although no power plant was yet acquired. Operations are expected to commence early in the current year.

At Nannine a syndicate, operating on a faulted extension of the old Alladin lode, has opened up a

fairly large body of low grade ore which shows possibilities of developing into a profitable mine.

Cue District:

Big Bell Mines, Limited, milled 466,142 tons of ore for 53,890 fine ounces, the yield being 2.31 dwts. per ton. The low grade of this ore, it is understood, is due to the mining of very low grade dirt from an extension of the open cut, which was not taken into reserve originally, but which it is now found can be mined and treated at a profit.

A total of 40,200 tons of waste overburden was removed from over the hanging wall of the glory holes by the electric dragline.

Approximately 79 per cent. of the total tonnage treated came from the glory holes, the remainder being obtained from underground development.

Underground development for ring drilling was pushed ahead, and a few rings were fired, indicating that the method will be satisfactory.

Water was supplied from the line of wells, a total of twelve pumps operating. An 8-in. diameter wood pipe line was purchased to replace the 6-in. steel main now handling the water from the wells to the main supply tank.

An up-to-date hospital was built and is now in commission. Equipment will include an X-ray plant, operating theatre and eighteen beds in general and private wards.

Triton Gold Mines, N.L., in treating 104,525 tons for a return of 30,982 fine ounces, showed a slight falling off both in tonnage and grade from the preceding two years.

Ore reserves estimated at 31st March, 1940, totalled 329,000 tons at a grade of 6.7 dwts.

Operations on the Perseus section, 6,500 feet south of the main shaft proved disappointing and were abandoned.

The Rand section, north of the main shaft, did not prove as good as was hoped and was salvaged, 1,158 tons being mined and treated.

Equipment was installed for closed circuit crushing in the Symons crusher section of the treatment plant.

During the year this company adopted the practice of custom milling with a rate of payment according to assay value.

Prospecting was active in this district during the year, some 4,400 ounces having been won by prospectors and small mines.

Day Dawn District:

Apart from the *Klondyke Mine*, which produced 813 fine ounces from the treatment of 596 tons of ore, there was only minor activity in this district, which produced some 2,000 ounces all told for the year.

Mt. Magnet District:

Hill 50 Gold Mine, N.L., made a considerable advance on previous years' performances in treating

26,065 tons for a return of 9,802 fine ounces, the average yield being 7.52 dwts. per ton. This return is approximately 1,900 ounces better than that of the previous year.

Ore reserves at 1st June, 1940, were estimated at 182,000 tons proved, worth 6.5 dwts., and probable ore 49,000 tons at 5.75 dwts. This would represent nine years' supply of ore at the present rate of crushing. It has been decided, however, to duplicate the plant and this work is in progress.

A new crushing section was erected during the year, comprising a 200 ton steel ore bin, 20-in. x 10-in. jaw crusher, 2-ft. 4-in. Traylor secondary crusher, 6-ft. x 4-ft. vibrating screens, tramp iron magnet, elevator and the usual motors.

The future of this mine looks very promising at present.

Mt. Magnet Gold Mines, Limited, still retain the doubtful distinction of mining and treating the lowest grade ore mined in the State. The output was 38,452 tons for 4,121 fine ounces, the average yield being 2.14 dwts. per ton.

No shaft sinking, diamond drilling or construction was undertaken during the year, the development completed consisting of 803 feet of driving, 152 feet crosscutting and 318 feet rising and winzing.

During the year, owing to the excessively low grade of the ore available for treatment, consideration was given to closing down. An examination of the mine indicated that somewhat higher values existed on the bottom level and it was decided, with Government assistance, to proceed with the development of another lift, and some outside ore was acquired to keep the mill in operation.

While the future of this mine is still doubtful, there remains a possibility that the development in depth may disclose higher values than those treated in recent years and again place the company on a sound financial footing.

A number of small mines in the Mount Magnet district continue to operate successfully.

The *Black Cat Mine* (Metropolitan Mining and Development Company, Limited) had a successful year, treating 3,356 tons of ore for a total recovery of 2,147 fine ounces, thus yielding 12.79 dwts. per ton. The ore is treated at the State Battery, Boogardie, and the reported yield, therefore, is amalgamated gold only.

The *Edward Carson Mine* which in the past has produced high grade ore, treated 2,851 tons for 866 ounces, a very considerable reduction on past performances. It is considered that the high grade ore in this mine is exhausted and the advisability of ceasing mining operations is under consideration. There is a dump of several thousand tons of sands which can be profitably treated.

The *Swan Bitter Gold Mining Company, Limited*, working the Broken Bond Mine, milled 5,838 tons for 2,000 fine ounces. During the year this company obtained a forfeiture of the old Morning Star lease and are preparing to work it. The Broken Bond was closed down at the end of the year, but this

ground will probably be worked later from the Morning Star shaft.

The *Saturn Mine* provided 11,731 tons of ore during the year, which returned 1,927 fine ounces of gold. Of this total 8,726 tons were treated at the plant of the Mt. Magnet Gold Mines, Limited, and returned 1,305 fine ounces.

The Saturn, during the year, put in a wet crushing plant, replacing the dry crushing unit which had been operating profitably for several years treating laterite ore from an open cut. Unfortunately, the new plant did not prove satisfactory, and, pending reconstruction, arrangements were made to supply ore to the Mt. Magnet Company.

The *Neptune Mine* treated 2,057 tons at its own mill for a return of 708 fine ounces, the yield working out at 6.88 dwts. per ton.

Moyagee Syndicate treated 1,310 tons for 1,563 fine ounces, while *Hesperus Dawn* recovered 664 fine ounces from 327 tons of ore.

The Mount Magnet district generally shows great mining activity, and is one of the most promising in the State for prospecting.

YALGOO GOLDFIELD.

Activity generally on this field is confined to prospecting and a few small mines.

Yalgoo Gold Areas, at Field's Find, kept a five-head mill operating throughout the year. This mine has possibilities, but owing to war conditions has had insufficient capital to carry out the necessary development to speed up production. As a result the mine is barely paying its way.

King Solomon's Mines at Gullewa have been worked intermittently. Big Bell Mines, Limited, took an option over these leases, but although sampling proved a fair run of good values, the option was not exercised. On this mine also development has not been kept ahead of stopping operations. Another option has been taken over this property with the object of working it by more modern methods than have been adopted in the past.

At Payne's Find the mines have had a comparatively poor year, having encountered poor zones, and crushings have been of lower grade than usual.

COAL MINING.

The output of coal from the Collie field again showed a slight falling off in quantity as compared with the previous year, although the value was somewhat higher.

The total production was 539,427 tons valued at £364,499. The tonnage decrease was 18,108 tons, while the value increased to the extent of £1,688 on the 1939 figures.

The average number of men employed increased from 700 to 709, of whom 572 were underground workers while the remaining 137 were employed on the surface.

The individual outputs of the various mines and their respective values are tabulated hereunder:—

	Tons.	Value.
		£
Proprietary	145,532	102,418
Co-operative	97,615	66,262
Cardiff	94,214	59,806
Stockton	119,288	80,581
Total Amalgamated Collieries	456,649	309,067
Griffin	82,778	55,432
Total	539,427	364,499

Boring:

The work of hand boring at the Stockton mine has been continued throughout the year and is being pushed out in the direction of the Proprietary workings. This work is providing valuable information with regard to the coal between these two collieries.

Creep at Proprietary Mine:

In February a serious creep or movement developed in No. 18 District of the Proprietary Mine, spreading rapidly and extending into that part of No. 20 District known as the "Old Men's Cavel," in spite of every effort made to prevent its progress. In its course it crushed the haulage and travelling ways leading to the highly developed sections at the extreme left of Nos. 18 and 20 Districts. When the movement had apparently spent itself, the affected area was sealed off by means of stoppings. Subsequently a fire broke out in No. 22 Section, presumably as a result of movement in the coal, and, in consequence it was found necessary to seal off the remainder of the bottom left hand side of the mine. As it was from this area that the bulk of the mine's output was produced, arrangements had to be made immediately to change over to the right hand workings, Nos. 10, 12, 17, 19, and 21 Districts, and it is from these areas that production has been maintained.

It was intended to re-open Nos. 18 and 20 Districts through the area below that affected by the creep, but the subsequent fire, combined with the fact that the roof fall caused by the creep appears to have let in a considerable quantity of water, has complicated matters and perhaps rendered this impossible. It is therefore proposed to re-open the lost area by driving down from No. 11 District to No. 18 Pilot Headings.

The most serious result of the creep is that, whereas at the end of 1939 there were 123 places on this mine available for working, at the end of 1940 this number was reduced to 60 working places.

A Royal Commission, consisting of the State Mining Engineer, the Assistant State Mining Engineer, and the Government Geologist, was appointed to enquire into the cause of the creep and the steps which might be taken to prevent such occurrences in the future.

The conclusions arrived at by the Commission were that the probable cause of the creep was the unequal distribution of pressure on certain pillars in an area where both floor and roof—particularly the floor—

were weak, the weakness of the latter being probably accentuated by the action of water which had found its way, through porous or fissured strata, under the pillars, thus softening the clay floor of the seam.

Other contributory factors suggested by the evidence were—

- (a) that the pillars were high,
- (b) that the pillars were "on end" in relation to the cleavage, a condition which, according to the weight of evidence, tends towards excessive fretting and the consequent weakening of the pillars; and
- (c) the fact that the affected area was in line with a fault which appears to have had a weakening effect on the strata.

It was considered that once a creep has started, little could be done to prevent its spread, and that there appear to be no reliable indications which might be accepted as warnings of the imminence of a creep, but the following recommendations were made with a view to the prevention of similar occurrences in the future:—

- i. That future operations on the Collie Mines be conducted on a panel system whereby each section of the workings is totally surrounded by a barrier of coal. . . It is felt that, under such system, any creep or fire that might occur would be automatically confined to that particular section of the mine.
- ii. Where possible, all bords should be worked "on the face," i.e., at right angles to the direction of the cleavage or cleat. Where this is not possible they should be worked on the cross. If necessary, through a combination of circumstances to work on the end, larger pillars should be left.
- iii. Where fretting of pillars is observed, such pillars should be strengthened by means of sprags, and in any area where excessive fretting is taking place, consideration should be given to the provision of larger pillars in subsequent workings in that area.
- iv. Large pillars to be left along all tunnels, slants and main haulage ways.
- v. All main travelling roads to be clearly marked and strongly timbered, preferably with chocks.
- vi. No bords should be worked to a greater height than nine feet, except by special permission of the Inspector of Mines.
- vii. Bords should be narrowed in known weak areas and when approaching faults.
- viii. Faults should only be approached in every alternate bord and, where the position of the fault is known beforehand, no cut-through should be constructed which will leave a pillar of less than normal size against the fault. No stripping of faults should be permitted.
- ix. Care should be taken that the width of bords does not exceed eight yards, especially at

the ends, where it should preferably be reduced.

A further Royal Commission was appointed consisting of the same personnel to enquire into the available supplies of native coal in the Collie Coal Field and the development thereof for future requirements.

This Commission recommended a programme of development, including boring, for the Amalgamated Collieries to be spread over a period of five years, which, it is considered will place them in such a position that there will be six years' supply of coal actually developed, while a further four years' supply might reasonably be expected to be indicated by boring.

For the Griffin Mine a programme was recommended for one year which it is considered would open up two years' supply of coal.

The development of the mines generally is not in a satisfactory condition, largely owing to the results of the creep. On both the Proprietary and Co-operative mines it is found necessary to work two shifts in order to fill requirements. On the Stockton development is proceeding satisfactorily, but if any substantial increase in output is desired it will be necessary to alter the haulage arrangements. On both Cardiff and Griffin mines a 20% increase in output could be arranged if necessary or desirable.

Steps have been taken on all the mines to carry out the development recommendations of the Royal Commission, and a new regulation, No. 115A, has been inserted in the Mining Act, 1904-1937, to ensure that steps will in future be taken to maintain the development of these mines in a condition satisfactory to the Mines Department.

At the *Proprietary Mine* the number of working places at the end of the year totalled 60, all being on the right hand side of the Main Tunnel, the bottom left hand workings being sealed off as a result of the creep and subsequent fire.

In Nos. 10 and 12 Districts the coal is becoming lower and the width of a stone band in the seam becoming greater. In No. 19 District a fault has been encountered which has made working more difficult, but in No. 21 Section, where, at the end of the previous year, work was in progress to locate the seam on the opposite side of a fault met, good progress has been made and there are now 13 or 14 working places opened up beyond the line of the fault. Arrangements are being expedited to drive two new dip slants from No. 11 District to connect with No. 18 level and thus re-open the places lost as a result of the creep.

The *Co-operative Mine* has 71 working places available for the production of coal and the east slants off the five Right Dips, as recommended by the Royal Commission, are being rapidly pushed forward. These slants will ultimately connect with a continuation of the Main Dips and when this connection is made the mine should be enabled to produce its required tonnage working one shift. Direct haulage to the surface will be possible when this work is accomplished.

The *Cardiff Mine* has 59 places working and several more standing. No actual development has

been carried out for some considerable time, but development both ahead of the present main workings and on the western side of the mine is envisaged and recommended by the Royal Commission. A comprehensive hand boring programme is also recommended.

At the *Stockton Mine* there are 71 available working places. In the No. 1 Right, or new section of the mine, a fault has cut off the five advancing headings, one of which is the main haulage road for that section. Nothing has yet been done towards grading the haulage road through the fault, but as this area has been well prospected by hand bores, there would be no serious difficulty encountered.

The old portion of the mine, known as 4 Left section, has for some time been showing signs of deterioration due to low coal, but some exploratory work is envisaged in the recommendations of the Royal Commission.

At the *Griffin Mine* 52 working places are available. The position at this mine looks more favourable owing to the opening up of a new section by means of a stone drive through the fault in the section known as 11 Right. Some water trouble was experienced in this section for lack of proper pumping gear, but it is understood that this difficulty has now been overcome. Development in 10 Left section, directly ahead of present workings is proceeding satisfactorily.

MINERALS OTHER THAN GOLD AND COAL.

Antimony Concentrates and Arsenic were again produced at the treatment plant of the Wiluna Gold Mines, Limited, as by-products, the reported output being 284 tons of antimony concentrates valued at £10,180 and 3,332 tons of arsenic worth £59,997.

Asbestos.—The total production reported for the year was 364 tons, wholly consisting of the blue fibre (crocidolite) from the Hamersley Range district. The estimated value of this output was £14,554, or an average of £40 per ton.

Production has been somewhat held up owing to lack of shipping space for the fibre, while operations were also seriously curtailed by an accident to a truck carrying some new plant to the Asbestos, Molybdenum and Tungsten Company's mill. The truck overturned, crashed down a gully and caught fire, and the plant, although not totally destroyed, had to be sent to Perth to be reconditioned.

Further exposures of this valuable mineral have been opened up at a point 100 miles nearer to the port of Roebourne than the original find, the fibre being similar to the excellent quality already being worked and marketed, and contact has been made with American markets. It may now, I think, be reasonably stated that this is one of the world's major asbestos deposits.

An inspection was made during the year of the anthophyllite deposits at Bindi Bindi, which are situated only a little over 100 miles from Perth and easily accessible by rail or road. The quality and length of the fibre is satisfactory for many purposes, and there are indications that the deposits may be extensive. It is proposed to undertake a certain amount of exploratory work in order to prove the

deposits. No work has been done in the past at a greater depth than about 15 or 16 feet.

Bismuth.—Two tons were produced from the Gascoyne area, the estimated value being £891.

Copper Ore.—Small quantities of copper ore and concentrates were produced from Phillips River, Peak Hill, and Northampton districts to a total value of £357.

Mica.—Apart from a parcel of 1,708 tons of crude mica for fine grinding purposes, which was valued at £11,700 lbs. of sheet mica was reported at an estimated value of £300, an average of 8s. 6d. per lb. This production was practically all derived from the Yinnietharra field.

Scheelite.—*Norseman Associated Gold Mines, N.L.*, did a limited amount of development on a scheelite bearing quartz reef at Higginsville, carried out from old workings from which gold and scheelite had been won. A total of 897 tons of scheelite bearing ore was mined and sent to the plant of Norseman Gold Mines, N.L., for treatment, resulting in the production of 7.45 tons of concentrates averaging 71 per cent. WO_3 and 4 ozs. of gold per ton. This result proved the grade of ore body to be too low for profitable working and the mine was abandoned.

Tantalite.—Production of 4 tons from Wodgina and 2 tons from Coolgardie was reported, the total value being £7,811. The demand for this commodity appears to have decreased considerably owing to the war. In 1938, 20 tons were produced, valued at £27,557, which fell to 8 tons worth £12,073 in 1939.

Tin was produced at Greenbushes by the Vulcan Tin Company and Greenbushes Tin, Limited, to the extent of 34 tons, while the Pilbara Goldfield produced another 3 tons. The total value was estimated at £5,174. The quantity and value were 26 tons and £3,727, in excess of the previous year's production.

Vermiculite.—General interest in this useful mineral is increasing rapidly and the year's production amounted to 109 tons, valued at £757. Bulong was responsible for 65 tons of this total, while the remaining 44 tons were obtained from the Young River deposits. The previous year's output was 30 tons.

INCREASE IN ORE MINED WITH IMPROVEMENT IN METHODS.

A steady increase in the tonnage of ore mined per man employed in the Gold Mining Industry has taken place over a period of years. Mr. J. S. Foxall, Assistant State Mining Engineer, who this year was also Chairman of the Perth Division of the Institution of Engineers, drew special attention to this fact in his chairman's address and submitted the following information as evidence of the steady improvement in methods effected by technically trained mining, metallurgical and mechanical engineers:—

In 1897 there were 17,903 men employed in the mining industry in this State, and 415,424 tons of ore were raised and treated, the average yield of which was 28 dwts. The quantity of ore treated per man engaged in the industry amounted to 23 tons only.

In 1903, the year of peak production of gold, 17,329 men treated 2,160,657 tons of 18 dwt. ore

at the rate of 125 tons per man engaged. Due to improved technique and organisation the mining rate had been increased more than five-fold and lower grade ore could be treated at a profit.

In 1913, after a further decade of experience and technical improvement, 13,020 men produced 2,787,361 tons of ore at the rate of 214 tons per man, and the average yield of the ore treated was 9.3 dwts. per ton, about one half of the 1903 grade.

The improvement continued until 1915 with an output of 238 tons per man of 9 dwt. ore. Subsequent to this date there was a gradual decline in the industry caused by rising costs due to unsettled world conditions and aggravated by the enlistment of large numbers of the best workers and mine officials for service in the A.I.F.

The decline in production and rise in the value of ore treated lasted until 1929, when 4,002 men engaged produced 645,344 tons of 13 dwt. ore at the rate of 154 tons per man.

The rise in the price of gold at that time gave a new impetus to the mining industry and intense activity recommenced. Many old mines were reorganised and equipped with the most up-to-date plants, new mines were discovered and prospecting again became active. Lower grade ore was taken into reserve and mined and treated until in 1940, 14,593 men mined 4,291,608 tons, or 294 tons per man, of ore yielding an average of 5.38 dwts per ton. The average value of gold produced per man during 1940 was £A842, compared with £481 in 1903, and £424 in 1913.

CONCLUDING REMARKS.

The gold mining industry has continued to expand and it is gratifying to be able to report that new records have again been established.

In the year 1938 the tonnage of ore treated was 3,039,607 tons, which was a record tonnage up to that date. In 1939 this figure was increased to 4,095,256 and this year was increased again to 4,291,708 tons.

In the year 1938 the value of the gold won was £A10,409,928, which was a record up to that date, but in 1939 the value of the gold won was

£A11,594,221 and this year increased again to £A12,698,392 (Mint figure).

The record price of gold of 213.15s. permitted very low grade ore to be profitably mined, with the result that average grade of ore mined, 5.38 dwts. per ton, was the lowest on record.

The tonnage of ore mined per man employed in the gold mining industry was 294, being the highest yet recorded, the previous best being 269 last year.

The Lake View and Star Mine was again the principal producer, followed by the Great Boulder Gold Mine. The names of Phoenix Gold Mines, Consolidated Gold Areas, Spargo's Reward Gold Mine and Evanston Gold Mine were added to the list of mines producing over 5,000 ozs. per annum. Gold Mines of Kalgoorlie, Consolidated Gold Mines of Coolgardie, Edna May Amalgamated Gold Mines and Comet Gold Mine all materially increased their output.

The pre-eminent position of the gold mining industry will be appreciated from the following figures of production which also show a marked improvement in the value of wheat and wool yields:—

	1939	1940
	Value in Australian Currency.	Value in Australian Currency.
	£	£
Gold production ..	11,842,964	12,698,392
Wheat production ..	4,492,004	7,798,128
Wool production ..	2,962,860	4,054,635

I wish again to express my appreciation of the co-operation and high standard of the work performed by the Assistant State Mining Engineer and all Inspectors of Mines.

The Assistant State Mining Engineer was again largely responsible for the compilation of this report and the Inspectors of Mines for supplying much of the information contained in it.

I also wish to express my thanks for the help given by all other members of the Department.

RICHARD C. WILSON,

State Mining Engineer.

APPENDIX No. I.

MINING DEVELOPMENT EXPENDITURE.

Loans Authorised prior to 1940	...	...	...	£	s. d.
Loans Authorised during 1940	...	...	...	271,558	13 6
				12,960	15 6
Total amount authorised	...	...	...	£284,519	9 0

		£	s. d.	£	s. d.			£	s. d.	£	s. d.
To Advances—						By Advances Repaid—					
Prior to 1940	...	236,807	16 3			Prior to 1940	...	58,265	7 8		
During 1940	...	9,600	6 1			During 1940	...	2,189	11 11		
				246,408	2 4					60,454	19 7
						„ Advances Written Off—					
						Prior to 1940	...	151,579	7 3		
						During 1940	...	1,185	9 4		
										152,764	16 7
						„ Advances Outstanding	...	...	...	33,188	6 2
				£246,408	2 4					£246,408	2 4

Advances Outstanding	...	...	...	...	£	s. d.
Interest Outstanding	...	...	...	...	33,188	6 2
					7,310	4 10
Total Outstanding	...	...	...	...	£40,498	11 0
Interest Paid prior to 1940	...	...	...	...	27,297	0 0
Interest Paid during 1940	...	...	...	...	239	11 6
					£27,536	11 6

APPENDIX No. II.

Coal Mines Regulation Act, 1902-1926.

ANNUAL REPORT OF THE BOARD OF EXAMINERS FOR MINE MANAGERS, UNDER-MANAGERS AND OVERMEN.

Office of the State Mining Engineer,
Mines Department,
Perth, 12th March, 1941.

The Under Secretary for Mines:

Sir,

We submit herewith for the information of the Hon. Minister for Mines, the Annual Report of the Board of Examiners for the year 1940.

*Examinations for Certificates.**April Examination:*

One candidate submitted himself for the First Class Examination in April. At the meeting of the Board held on the 9th April, it was decided that the papers warranted a First Class Certificate of Competency being issued to this candidate.

October Examination:

No applications were received for the October examination, and no meeting of the Board was held in that month.

Copies of the papers set for the examination during the year are attached to this report. These papers were exchanged with kindred boards in England and the Eastern States.

We have the honour, etc.,

RICHARD C. WILSON,
State Mining Engineer (Chairman).

F. G. FORMAN,
Government Geologist (Member).

JAMES GILLESPIE,
Inspector of Mines, Collie (Member).

The Coal Mines Regulation Act, 1902-1926.

EXAMINATION FOR FIRST CLASS CERTIFICATE OF COMPETENCY.

Subject: ARITHMETIC.

Wednesday, 3rd April, 1940: 9 a.m. to 11 a.m.

(1) How many gallons of water per minute will be raised by a three-throw ram pump which has rams 12 in. diameter, stroke 18 in., speed 40 revolutions per minute? How much work is done per minute in foot pounds, and what is the horse power of the pump if the lift be 500 ft.?
(Possible Marks, 17.)

(2) The worked area of a level coal seam is found by survey and measurement to be 12.625 acres. The average thickness of the seam throughout the area worked is 62.25 in. If the royalty rate be £42 10s. per foot thick per acre, what amount of royalty will be payable?
What is the equivalent royalty rate per ton? Assume the specific gravity of the seam to be 1.28.
(Possible Marks, 16.)

(3) The output of a group of collieries is 1,665,000 tons per annum. If 3,450 men are employed underground and each works on an average $4\frac{3}{4}$ shifts per week, what is the average output per man per shift? Give your answer in cwt. to the nearest third decimal.
(Possible Marks, 17.)

(4) It is desired in working bord and pillar to leave 68 per cent. of the coal in the pillars. If the bords are 6 yards wide and cut-throughs 5 yards wide with 44 yard centres, what will be the width of the pillar between the bords?
(Possible Marks, 16.)

(5) A safety valve is $2\frac{1}{2}$ in. in diameter. The length of the lever is 20 in. and from the fulcrum to the valve 4 in. If the weight at the end of the lever is 45 lbs., what is the steam pressure per square inch when the valve is at the point of blowing off?
(Possible Marks, 17.)

(6) If the number of bricks in one cub. yard of brickwork be 384, how many bricks will be required to build a square tank 30 ft. x 30 ft. internal measurement with 18 in. brickwork and 5 ft. deep to the top of the concrete foundations?
(Possible Marks, 17.)

Subject: COAL MINES REGULATION ACT, 1902-1926.

Friday, 5th April, 1940: 2 p.m. to 4 p.m.

(1) What are the Regulations regarding the employment of persons in charge of machinery, etc.?
(Possible Marks, 21.)

(2) What does the Act require regarding the opening and abandonment of mines?
(Possible Marks, 21.)

(3) Section 16 of this Act prohibits the use of single shafts, tunnels or outlets. What are the exceptions to these?
(Possible Marks, 22.)

(4) Explosives have to be used on a main haulage road which is dry and dusty. What are the regulations governing such?
(Possible Marks, 21.)

(5) What inspections in and about a colliery have to be made and recorded?
(Possible Marks, 22.)

(6) What are the provisions in the Act relative to the surveying of coal mines?
(Possible Marks, 22.)

(7) What does the Act require regarding sanitation and change houses in coal mines?
(Possible Marks, 21.)

Subject: MINING OF COAL.

Thursday, 4th April, 1940: 10 a.m. to 1 p.m.

(1) Give a short account of the present state of knowledge with regard to the dangers of coal dust and the measures which should be taken to ensure safety.
(Possible Marks, 25.)

(2) A seam of coal is very liable to spontaneous heating. Show by sketch how you would work the seam, and state generally the precautions which should be taken in working.
(Possible Marks, 25.)

(3) Describe clearly what circumstances would influence you in adopting the bord and pillar method working in preference to long-wall. Sketch and describe a bord and pillar lay out of a district to produce 300

tons per shift, the seam being slightly inclined, 7 ft. 6in. thick and 400 yards from the surface, vertical.
(Possible Marks, 25.)

(4) At a depth of 300 yards from the surface there is an isolated area of old workings, full of water, which require to be tapped and drained, the inclination of the seam being 1 in 4. The working levels in the same seam are 80 yards to the dip of the old workings. Sketch and describe how you would approach the old workings to tap and drain off the water.
(Possible Marks, 25.)

(5) Make a sketch of a panel of workings suitable for a seam of coal which is very liable to spontaneous heating. Show the roadways, the barriers, the course of the ventilation, and other details of importance.
(Possible Marks, 25.)

(6) State fully what is likely to occur when working or extracting pillars irregularly under heavy cover.
(Possible Marks, 25.)

(7) Two main inclines dipping 1 in 4, one of which is required for the hauling of coal, are in course of being driven when a faulty belt, assumed to be 50 yards wide, is met with. In which incline would you proceed to prove the coal beyond the belt?
(Possible Marks, 25.)

(8) You have made an inspection of a panel of pillars and formed the opinion that it is essential to urgently seal off this area to subdue spontaneous heating which you have detected. There are three openings. Describe the various steps you would take.
(Possible Marks, 25.)

Subject: VENTILATION AND DANGEROUS GASES.

Friday, 5th April, 1940: 10 a.m. to 1 p.m.

(1) Give a list of the gaseous impurities usually met with in an air current in a mine—place them in the order of their importance. State the properties and physiological effect of each, and how they may be detected.
(Possible Marks, 25.)

(2) A ventilating fan delivering 100,000 cubic feet of air per minute with a water gauge of 4.5 inches is driven by a 2,000 volt three-phase motor, having an efficiency of 85 per cent. and a power factor of 0.8. If the fan efficiency is 72 per cent., calculate the line current supplied to the motor.
(Possible Marks, 25.)

(3) The older types of flame safety lamps, such as the Davy and Clanny, have been superseded by more modern lamps. State why this has occurred, and describe a modern flame safety lamp suitable for use by workmen in a fiery mine, enumerating the points that make for efficiency and safety.
(Possible Marks, 25.)

(4) What are the objects aimed at in making a Ventilation Survey? Give in detail the precautions necessary to secure accurate results.
(Possible Marks, 25.)

(5) 24,000 cubic feet of air per minute are split into three airways, *A*, *B* and *C*. *A* is 1,200 yards long, and *B* and *C* are each 4,800 yards long. How much air will pass through each?
(Possible Marks, 25.)

(6) Discuss the application of auxiliary inbye fans to the ventilation of a large mine with faces extending over a large area. Outline what in your opinion would be ideal conditions for their use.

(7) At a colliery where the shafts are 700 feet deep, the steam-driven fan is badly damaged by an explosion and the return airways are heavily charged with fire-damp. What means would you adopt as a temporary expedient to restore the ventilation to allow exploration and repair work to go on until such time as the fan is repaired?
(Possible Marks, 25.)

(8) In a mine giving off 2,000 cubic feet of CH_4 per minute, the quantity of air entering the mine is 85,000 cubic feet. What is the percentage of gas in the return airway?
(Possible Marks, 25.)

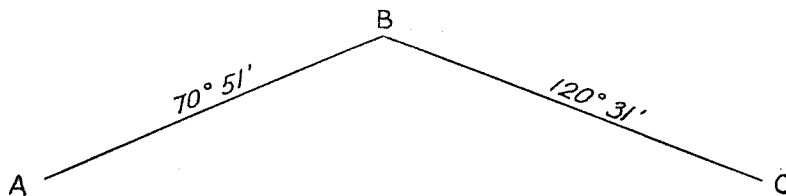
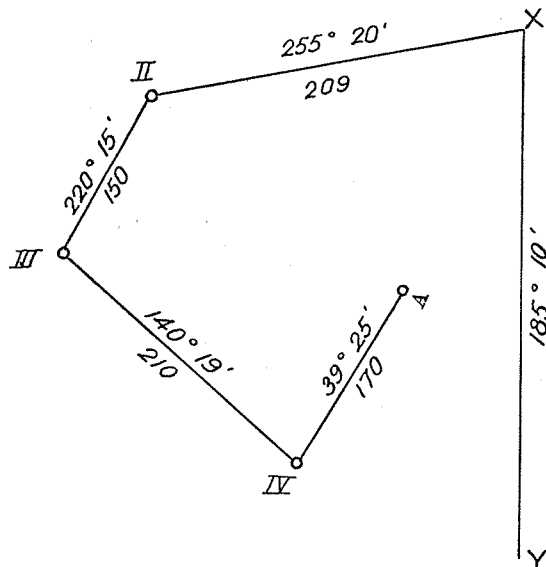
Subject: SURVEYING.

Thursday, 4th April, 1940: 2 p.m. to 5 p.m.

(1) Broadly outline the various steps in the procedure of conducting a traverse with a transit theodolite, starting from a reference line the bearing of which is

known. Include all precautions you would take to ensure accuracy, assuming that the instrument is in normal adjustment. (Possible Marks, 30.)

(2) From the data on the following sketch, calculate the bearing and distance of the working face at A from the nearest point on the lease boundary XY. (Possible Marks, 30.)



(6) State what general type of information is required to be shown on the mine plan of a colliery. (Possible Marks, 20.)

Subject: GEOLOGY.

Wednesday, 3rd April, 1940: 11 a.m. to 1 p.m.

(1) Discuss briefly two theories of origin of coal seams, and indicate what evidence the Collie field offers in support of either. (Possible Marks, 20.)

(2) State what you know about the physical and chemical properties of the coal at present being produced from the various collieries at Collie. (Possible Marks, 20.)

(3) In working a coal seam the thickness and continuity of the coal is frequently found to be affected by natural phenomena. Illustrate by sketches some of these phenomena with which you are familiar. (Possible Marks, 20.)

(4) What effect would a large intrusive dyke of dolerite have on a coal seam? State what geological features would be likely to be present in a field where these dykes were seen to be outcropping in the coal-bearing series. (Possible Marks, 20.)

(5) Briefly describe the following rock types and state their manner of occurrence:—

Granite, sandstone, shale, conglomerate, fire-clay, basalt or dolerite. (Possible Marks, 20.)

Subject: MACHINERY.

Wednesday, 3rd April, 1940: 3 p.m. to 5 p.m.

(1) Describe a switch board and its equipment for controlling a 3-phase alternator (say 1,000 K.W. at 3,300 volts). (Possible Marks, 16.)

(2) Five hundred tons of coal per shift have to be brought up an incline 1,000 yards long, dipping 1 in 7. A balanced double drum direct haulage capable of hauling 20 skips on each rope is installed. Explain (and give sketches) how you would lay the rails at the top of the incline, and discuss in detail the system you

(3) Complete and check the necessary data on the following reproduction of a level-book page to enable a longitudinal section of the traverse to be drawn. Outline the method you would use in the field to check the levels between two bench marks about one mile apart. Draw a longitudinal section and state the scales used. (Possible Marks, 20.)

Back.	Inter.	For.	Rise.	Fall.	Reduced levels.	Distance.	Remarks.
6-10					190	1m. 10chns. 00lks.	Bench mark.
	4-20					11chns. 50lks.	
	3-19					12chns. 00lks.	
	5-27					12chns. 50lks.	
8-01		3-80				13chns. 00lks.	Change.
	2-56					13chns. 50lks.	
	4-72					14chns. 00lks.	
6-14		2-40				14chns. 50lks.	Change.
	3-18					15chns. 00lks.	
	9-12	4-15				15chns. 50lks.	
						16chns. 00lks.	Bench mark.

(4) The same coal seam has been located on a given area in three calyx bores at various depths below the surface. Indicate what information you require in order to be able to determine the strike and dip of the seam, and illustrate by an example how you would do this. (Possible Marks, 30.)

(5) In the sketch below, a curve of 30 chains radius has to be introduced between the traverse lines AB, BC. Compute the distance of the tangent points from the point of intersection at B. Also compute the deflection angle for an arc of one chain and show how to compute the deflection angle for an oddment of 25.5 links. (Possible Marks, 20.)

would use at the top and bottom of the incline so as to get the skips moving again expeditiously. (Possible Marks, 17.)

(3) Enumerate the type of drive available for transmitting power from an electric motor to a fan or a pump or a haulage gear. State the conditions suitable for each type of drive. What is a "Vee" rope drive? (Possible Marks, 17.)

(4) What particulars and data do you expect to find on the name plate of an electrical transformer? What tests would you apply to a transformer to ascertain that it was in good and correct working order? (Possible Marks, 16.)

(5) Describe the action of a centrifugal or turbine multi-stage pump in raising water. What are the various common arrangements of casing of these pumps? State the merits of each design. (Possible Marks, 17.)

(6) Compare underground haulage operated by electrical locomotive and endless and main and tail rope, stating the conditions favourable to each. (Possible Marks, 17.)

APPENDIX No. III.

Mines Regulation Act, 1906-38.

(Regulation 17A.)

EXAMINATION FOR CERTIFICATE OF COMPETENCY AS UNDERGROUND SUPERVISOR.

Subject: MINING.

21st October, 1940.

Time allowed: Three hours.

Six questions only to be answered.

All questions are of equal value.

Note.—Candidates should illustrate with sketches where possible.

1. What do you know about poisonous air (gases, fumes, etc.) which exist in some mines? How are they

formed, and in which places are they likely to accumulate? What precautions are necessary where they are known or suspected to exist and how do you test the air?

2. Name the causes of accidents underground and what you would do to prevent them.

3. How would you construct a timber or timber and steel penthouse in a three compartment shaft? Give the dimensions of the materials used for:—

(a) A shaft to be sunk from 2,000 feet—skips having a total loaded weight of 8 tons being used above the 2,000-ft. level.

(b) A shaft from 500 feet—cages using trucks and having a total loaded weight of 3 tons are used above the 500-ft. level.

4. A winze is to be sunk between two levels 100 feet apart. Give a brief description of all the operations for:—

(a) A vertical winze.

(b) An underlay winze.

5. State what you know about the stoping methods usually adopted in the mines in our goldfields. What class of machines would be used? Give reasons in support. What precautions would you use for the safety of the men employed in the different operations?

6. Give a brief description of a shift boss's daily round, and what you think he should examine at the various places he visits.

7. State the different methods of attaching haulage ropes to kibbles and buckets. Name the methods you prefer, giving reasons in support.

8. A mine is 400 feet deep. Cut and fill stoping is in progress at the 2, 3, and 4 levels. The lode is almost vertical, low grade, and is oxidised above the 100 feet level, 20 feet wide and has 10 feet of valueless overburden. How would you propose stoping the oxidised ore?

cautions to be taken to ensure the safety of the men working in the bottom of the shaft.

3. Describe the advantages and disadvantages of cross bars and vertical bars for rigging machines in development ends. Describe two suitable types of cut and state the circumstances under which you would use either of these cuts. Illustrate the types of cut by means of sketches.

4. Describe two systems of shaft timbering in common use in this State and explain the difference in the method of placing the timber in position in the two cases. How would you replace a skid in a haulage compartment in a close-timbered shaft?

5. Describe fully how you would pick up and re-timber with sets an old level which has fallen in for a distance of 50 feet. How would you take out the last block of ground in stoping by the cut and fill method, up to a level, and keep the level timber in position, assuming that the level is timbered with sets?

6. A winze is to be sunk from one level to another, 100 feet apart. Describe the equipment you would require, how it would be set up and the safety precautions that should be taken. How would you ventilate the winze?

7. How should a stope be worked in soft ground if both walls and back are bad standing?

8. What are the causes of dust underground and how may its production and effects be minimised?

9. A shaft has been sunk to 500 feet and a level has been driven at that horizon on the lode. The shaft is a downcast and the stopes above the 400-ft. level have been filled, but the levels are open and there are also open winzes to the surface. How would you stope out the ore at the 500-ft. level for a length of 100 feet, assuming that the ground is good standing ground and that the stope is to be filled? How would you provide for ventilation of the 500-ft. level and of the stope as it progresses? Illustrate by means of sketches.

Subject: MINING LAW.

21st October, 1940.

Time allowed: One and a half hours.

All questions are on the Mines Regulation Act and Regulations.

All questions are to be answered.

1. Who are responsible for the handling, charging and firing of explosives, and what general rules are laid down about these operations?

2. What do the Act and Regulations lay down about misfires? (They are mentioned in several places.)

3. For safety considerations what is the duty of every man employed in a mine as laid down in the Act?

4. What does the Act provide for the ventilation of mines?

5. What do the Regulations say about men working alone and safety helmets?

6. How is Sunday labour provided for?

Subject: MINING.

21st May, 1940.

Time allowed: Three hours.

Seven questions only to be answered. All questions are of equal value.

Note.—Candidates should illustrate with sketches, where possible.

1. Explain fully, with the aid of sketches, how you would proceed to rescue a man buried in a rill shrink stope.

2. A three compartment shaft is to be sunk from the 2,000-ft. level for a further 500 feet. Describe fully, with sketches, the equipment required and the pre-

Subject: MINING LAW.

21st May, 1940.

Time allowed: One and a half hours.

All questions are to be answered. All questions are of equal value.

1. What precautions should be taken when driving or rising towards old workings containing an accumulation of water?

2. Describe the method of firing laid down in the Mines Regulation Act, 1906-38, in shafts, drives and stopes. When should blasting take place and why? What exceptions may be made?

3. What tests must be applied to a new rope and its attachments used for transporting men? What other tests of ropes and winding gear shall be carried out and at what intervals?

4. What is the prescribed burning rate of safety fuse and what test must be made to determine this rate?

5. What is the maximum allowable speed of cages or skips when raising or lowering men? What safety precaution does the Mines Regulation Act, 1906-38, provide in connection with the raising or lowering of mining material in shafts?

6. Section 43 of the Mines Regulation Act, 1906-38, states that men may not be employed on a Sunday on a mine. Under what conditions does this section now apply?

7. What safety precautions are provided in the Mines Regulation Act, 1906-38, in the following cases:—

(a) Men working alone?

(b) The use of cyanide tailings for filling worked-out ground?

(c) The making and use of primers?

(d) The lighting of fuses?

(e) The transport of explosives to working faces?

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Division III.

Report of the Superintendent of State Batteries.

The Under Secretary for Mines.

I have the honour to submit for the information of the Hon. Minister my report on the operation of State Batteries for the year ending December 31st, 1940.

During the whole period the Empire has been at war it is pleasing to note that to the end of December the incidence of war conditions was slight on the output, expenditure and cost of treatment.

The slight increase to the cost of living has not affected wages appreciably and we have been fortunate in being able to draw on reserves of stores bought before the war.

Naturally, economy has been practised wherever possible, but the full effect of the war effort has not been felt during the year under review and the results for the first three months of this year suggest that we cannot expect to keep up the figures of the last few years, either in tonnage or working surplus.

Notwithstanding a falling off in the last quarter the tonnage crushed was slightly less than 1,000 tons below that handled in the preceding year. The increase in the price of gold since the war has no doubt had an influence in keeping up this tonnage.

The tonnage of tailing treated was approximately that of 1939, and was normal for the tonnage crushed.

A comparison of the tonnages crushed and cyanided for the last two years and the low level year 1928, is as follows:—

	1928	1939	1940
Tons milled	16,271	101,443.75	100,454.75
Tons cyanided	15,474	95,056	94,933.5
Total	31,745	196,499.75	195,388.25

The output since inception is as under:—
Production at Par:

	£
By Amalgamation	7,051,330.40
By Sands	1,440,964.87
By Slimes	265,266.11
By Residues	10,051.29
Total at par	£8,767,612.67
Gold Premium:	
By Amalgamation	1,865,784.53
By Sands	602,407.77
By Residues	728.41
Total Australian Currency	£11,236,533.38
Tons of Tin Ore Milled:	
Production:	
By Black Tin	93,833.96
By Residues	572.20
Total	£11,330,939.54

VALUE OF PRODUCTION.

Two thousand four hundred and forty-one parcels of ore were crushed, an average of 41.15 tons per

parcel. The yield by amalgamation was estimated at 44,419.15 fine ounces and our tailing plants cleaned up bullion containing 14,411.97 fine ounces, or a total of 58,831.12 ounces, worth £A578,291.

The estimated yield is approximately 1,000 ounces less than for 1939 but the value, due to the increase in the price of gold is some £6,000 higher.

VALUE OF ORE PER TON.

The estimated value per ton by amalgamation for the 100,454.75 tons crushed was 8 dwts. 20 grs. per ton and the average tailing value was 3 dwts. 18 grs. per ton making a total head value of 12 dwts. 14 grains.

This figure is very close to the average value for the ore crushed in 1939, the return by amalgamation being the same and the value of the tailing some 5 grs. lower.

Owing to the large tonnage of rich Blue Bird ore crushed at Norseman that centre produced the highest valued ore, 4,917½ tons averaged 38 dwts. 6 grs. per ton. Laverton, with an average of 18 dwts. 10 grs. and Boogardie 17 dwts. per ton also produced high grade ore.

ESTIMATED PERCENTAGE RECOVERY.

The whole of the tailing produced during the year was not treated and 6.2 per cent. contained too much copper to treat but applying the average extraction obtained at our cyanide plants, namely 78.57 per cent., to the average assay value of tailing produced, the estimated extraction is as follows:—

Head Value—12 dwts. 14 grs.	
Recovery by Amalgamation	8 dwts. 20 grs. = 70.2%
Recovery by Tailing	
Treatment	2 dwts. 22.7 grs. = 23.2%
Total Recovered 11 dwts. 18.7 grs. = 93.5%	

RECEIPTS AND EXPENDITURE.

Receipts from all sources, including an amount of £3,637 13s. 10d., balance of premium on account of old accumulations, amounted to £126,632 2s. 5d., and expenditure on working £110,013 7s. 10d., showing a working surplus of £16,618 7s. 10d.

A comparative synopsis appearing later in the report gives details of the revenue and expenditure under the separate headings.

It will be noticed that the milling expenditure and revenue per ton have remained almost stationary whilst tailing expenditure has increased from 8s. 11.1d. to 9s. 2.5d., but this rise has been more than made up by higher tailing revenue due to the increased price of gold.

MILLING.

Excluding two leased and two idle plants, one 20 stamp, seven 10 stamp and eleven 5 stamp batteries were in operation.

The total number of hours these plants were engaged as 5-stamp units as compared with the previous year was as follows:—

	1940.	1939.
Hours run, including stop-pages	123,473	120,271
Hours run, excluding stop-pages	107,699	106,459

The average stamp duty was 4.46 tons per 24 hours as against 4.57 tons for 1939.

Two thousand four hundred and forty-one parcels, averaging 41.15 tons per parcel were crushed, aggregating 100,454.75 tons.

The number of parcels exceeded the previous year's total by 237 when the average tonnage per parcel was 47.86 tons.

Batteries which crushed 5,000 tons, with tonnage shown in parentheses, are Kalgoorlie (15,683.5), Boogardie (9,875.25), Ora Banda (9,616.25), Coolgardie (9,310.5), Cue (9,197.75), Marble Bar (7,072), Meekatharra (6,465) and Paynes Find (5,041).

Boogardie, with the new 10-head operating for the full period, and Cue, which crushed continuously for the first time for some years, showed the greatest increase in tonnage.

Boogardie's total rose from 6,228.75 in 1939 to 9,875.25 and Cue crushed 9,197.75 tons as against 6,778 tons in 1939.

Marble Bar exceeded seven thousand tons for the second year in succession.

COST PER TON.

The milling cost per ton was 13s. 2.4d. as against 13s. 2.8d. in 1939. Comparative detailed costs are as follows:—

	1940.	1939.
	s. d.	s. d.
Wages	6 9.00	6 11.6
Fuel	9.8	10.3
Water	1 0.3	10.6
Stores	1 5.0	1 6.1
Motor Car	2.2	1.6
Repairs and Renewals	1 4.3	1 3.4
Sundry Expenses	1 7.8	1 7.2
	<u>13 2.4</u>	<u>13 2.8</u>

Sundry accounts include Head Office expenditure, Insurance, etc., and are shown later in some detail under the head of Administration.

Reduction in wages, stores and fuel, though small, show considerable economy when the general rise in prices and the difficulty in obtaining skilled labour are considered.

Water cost per ton has increased owing to the phenomenally dry year.

The loss on this section of the work dropped from £20,590 11s. 9d. in 1939 to £18,365 2s. 2d. for the year under review.

TAILING PRODUCED.

Schedule 2, attached, gives particulars of the tailing produced at each battery on a basis of 90 per cent. of the tonnage crushed. Totals are as follows:—

Tailings Purchased and Assaying—	Tons.	Head Value.	Percentage of Total.
		dwts. grs.	
Over 2 dwts.			
8 grs. ...	43,545.25	6 10	48.25
Under 2 dwts.	41,198	1 9	45.64
Refractory ...	5,507	2 14	6.11
			} = 51.75

The high price of gold is reflected in the large percentage of low grade tailing produced. The percentage of tailing assaying over 2 dwts. 8 grs. dropped from 52.80 per cent. in 1939 to 48.25 per cent. for 1940.

The percentage of refractory tailing increased, but most of it was low grade copper tailing produced at Marble Bar, where 3,518.5 tons were segregated. The average value was 1 dwt. 15 grs.

TAILING TREATMENT.

Nineteen tailing plants put through 94,933.5 tons, including 486 tons of sulphides, 580.5 tons on behalf of the Canberra Syndicate at Youanmi and 330 tons of residues.

The head value of the 93,537 tons of clean tailing was 3.924 dwts. and the residue value 0.9 dwts., showing an average theoretical extraction of 77.09 per cent. The actual extraction was slightly higher at 78.57 per cent.

Details of extraction are as follows:—
1940.

Class.	Tons Treated.	Head Value.	Residue Value.	Theoretical Extraction.	Value Called.	Value Recovered.	Surplus.	Actual Extraction.
Clean	93,537	dwts. 3.928	dwts. .900	% 77.09	£ 59,937	£ 60,507	£	%
Slags	...	...	...	...	...	632	1,202	78.57
						61,139	Shortage.	...
Refractory	486	4.550	2.370	47.90	224	217	7	...
Canberra	580.5	4.060	1.190	70.06	353	313	40	62.43
Residues	330	1.590	.795	50.00	56	56	...	50.00
Total	94,933.5	3.924	.909	76.83	60,570	61,725	1,155	...
1939.								
Slags	95,056	4.067	.908	77.67	63,943	63,117	...	...
	...	...	...	...	...	639	...	...
	95,056	4.067	.908	77.67	63,943	63,756	187	...

WORKING COST.

The cost per ton increased from 8s. 11.11d. to 9s. 2d.49d., notwithstanding many economies in the use of stores, etc. This increase is due to the cost of wages which rose from 4s. 4.42d. a ton to 5s. 3.53d., or nearly 1s. per ton.

It is almost impossible to get suitable labour for emptying and filling our vats, and the cost for this class of work has been rising for some years, although not to the extent of the year under review.

As mentioned in my last year's report the high price of gold has made it imperative to exercise more care in the preparation of material and to give this section more supervision and the increase in extraction has justified this action.

At almost all centres appreciable quantities of copper are met when treating the tailing with increased cost for cleaning up and realisation.

Comparative details of the cost of treatment for 1940 and 1939 are as follows:—

	1940		1939	
	s.	d.	s.	d.
Salaries and Wages	5	3.53	4	4.42
Cyanide	..	..	..	..
Lime	..	..	..	..
Water	..	..	..	..
Oil	..	..	..	..
Motor Oil	..	..	..	..
Repairs and Renewals	..	..	..	..
Stores, Administration and General Expenses	2	4.11	2	4.50
	9	2.49	8	11.11

The cost of treatment at Kalgoorlie where 16,480 tons were handled was 7s. 0.5d., with wages costing 3.60 and salaries 0.39 shillings per ton, respectively.

RECEIPTS.

Total receipts, including an amount of £3,637 13s. 10d., a balance in our tailing purchase account from the treatment of old accumulated tailing, were £78,689 17s. 3d. equal to 16s. 6.9d. per ton as against 15s. 5.5d. in the preceding year.

COMPARATIVE SYNOPSIS OF RESULTS AT STATE BATTERIES FOR TWELVE MONTHS ENDED 31st DECEMBER, 1939 AND 1940.

	1939.			1940.		
	Tonnage.	Expenditure per Ton.	Revenue per Ton.	Tonnage.	Expenditure per Ton.	Revenue per Ton.
Milling	101,443.75	s. d. 13 2.8	s. d. 9 4.7	100,454.75	s. d. 13 2.4	s. d. 9 6.5
Tailing Treatment	95,056.00	8 11.1	15 5.5	94,933.5	9 2.5	16 6.9

RECEIPTS AND EXPENDITURE.

	Tonnage.	Expenditure.		Revenue.		Profit.		Loss.	
		£	s. d.	£	s. d.	£	s. d.	£	s. d.
Milling	100,454.75	66,305	7 4	47,940	5 2	..	..	18,365	2 2
Tailing	95,933.5	43,703	14 10	78,689	17 3	34,986	2 5	..	..
Tin Treatment	..	..	4 5 8	..	2 0 0	..	..	..	2 5 8
Less Loss	..	110,013	7 10	126,632	2 5	34,986	2 5	18,367	7 10
Net Profit	..	..	..	..	..	16,618	14 7	..	..

CARTAGE SUBSIDIES.

Comparative figures for the last three years are as follows:—

Year.	Tons Crushed.	State Batteries.			Private Batteries.		Total.
		Tons Claiming Subsidy.	Percentage of Ore Crushed.	Amount Paid.	Tons Claiming Subsidy.	Amount Paid.	
1938	108,966.00	29,599	26.2	£ 12,481 7 7	6,745	£ 2,593 12 7	£ 15,075 0 2
1939	101,443.75	26,965	26.44	10,797 12 6	5,524	1,817 13 2	12,615 5 8
1940	100,454.75	24,517	24.46	9,091 18 6	6,573	1,890 17 3	10,982 15 9

Expenditure was reduced from £12,615 5s. 8d. in 1939 to £10,982 15s. 9d. in 1940.

SCHEDULE No. 6—MILLING AND TIN.

Statement of Receipts and Expenditure for the Year ended 31st December, 1940.

Battery.	Tonnage Crushed.	Expenditure.									Receipts.		Profit.	Loss.
		Management.	Wages.	Stores.	Total Working Expenditure.	Cost per Ton.	Renewals and Repairs.	Sundries.	Gross Expenditure.	Cost per Ton.	Receipts.	Receipts per Ton.		
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	s. d.	£ s. d.	£ s. d.	£ s. d.	s. d.	£ s. d.	s. d.	£ s. d.	£ s. d.
Bamboo Creek	2,382.50	289 0 3	1,263 17 3	466 7 3	2,019 4 9	16 11.4	303 17 2	225 15 8	2,548 17 7	21 4.7	1,273 2 5	10 8.2	....	1,275 15 2
Boogardie	9,875.25	372 7 11	2,180 7 3	982 0 11	3,534 16 1	7 1.9	729 19 10	707 4 6	4,972 0 5	10 0.8	4,728 19 2	9 6.9	....	243 1 3
Coolgardie	9,310.50	653 16 1	2,163 11 1	1,625 0 9	4,442 7 11	9 6.5	521 15 5	800 9 6	5,764 12 10	12 4.5	4,397 16 1	9 5.3	....	1,366 16 9
Cue	9,197.75	281 16 3	2,021 4 9	1,559 7 0	3,862 8 0	8 4.7	636 6 5	666 10 2	5,165 4 7	11 2.7	4,731 0 8	10 3.4	....	434 3 11
Greenbushes (Tin Plant)	....	....	4 5 8	....	4 5 8	....	....	....	4 5 8	....	2 0 0	....	....	2 5 8
Jimble Bar	....	....	....	....	....	....	....	....	....	....	3 0 0	....	3 0 0	....
Kalgoorlie	15,683.50	853 8 0	2,804 3 1	2,823 17 11	6,481 9 0	8 3.1	650 16 4	1,265 12 1	8,397 17 5	10 8.5	6,357 6 3	8 1.2	....	2,040 11 2
Laverton	2,505.50	180 8 1	636 10 4	309 12 11	1,126 11 4	8 11.9	333 6 4	261 1 11	1,720 19 7	13 4.0	1,222 1 0	9 9.0	....	498 18 7
Lake Darlot	....	....	....	....	....	....	....	....	....	....	72 11 6	....	....	21 1 3
Linden	....	....	....	....	....	....	....	....	....	....	138 14 6	....	138 14 6	....
Marble Bar	7,072.00	595 10 7	1,942 2 9	1,190 1 4	3,727 14 8	10 6.5	469 18 4	579 5 8	4,776 18 8	13 6.1	3,511 11 3	9 11.3	....	1,265 7 5
Meeekatharra	6,465.00	262 17 3	2,064 16 9	1,321 13 2	3,649 7 2	11 3.4	225 8 3	473 7 7	4,348 3 0	13 5.4	2,886 4 0	8 11.1	....	1,461 19 0
Mt. Ida	1,734.25	224 14 6	1,042 3 9	477 0 7	1,743 18 10	20 1.3	371 13 2	150 15 5	2,266 7 5	26 1.6	936 3 5	10 9.5	....	1,330 4 0
Mt. Sir Samuel	....	....	....	....	....	....	....	....	....	....	35 19 0	....	35 19 0	....
Mulline	....	....	....	....	....	....	....	....	....	....	52 12 6	....	52 12 6	....
Mulwarrie	....	....	....	....	....	....	....	....	....	....	5 0 0	....	5 0 0	....
Norseman	4,917.50	349 7 0	2,145 1 5	1,227 13 1	3,722 1 6	15 1.6	150 15 9	437 15 0	4,310 12 3	17 6.3	2,592 19 5	10 6.5	....	1,717 12 10
Ora Banda	9,616.25	288 0 3	2,405 3 11	1,866 19 4	4,560 3 6	9 5.8	357 3 9	672 3 0	5,589 10 3	11 7.5	4,434 8 0	9 2.6	....	1,155 2 3
Payne's Find	5,041.75	251 14 10	1,884 15 4	698 6 1	2,834 16 3	11 2.9	368 9 9	412 5 6	3,615 11 6	14 4.1	2,655 16 7	10 6.4	....	959 14 11
Peak Hill	4,879.50	337 9 0	1,476 14 10	529 19 3	2,344 3 1	9 7.3	318 19 4	421 15 6	3,084 17 11	12 7.7	2,063 8 10	8 5.4	....	1,021 9 1
Sandstone	3,835.25	283 2 0	1,319 12 11	469 13 0	2,072 7 11	10 9.6	412 10 11	369 15 8	2,854 14 6	14 10.6	1,930 5 3	10 0.7	....	924 9 3
Warriedar	932.50	68 12 5	365 13 10	140 14 8	575 0 11	12 4.0	82 10 2	87 5 5	744 16 6	15 11.6	438 5 7	9 4.7	....	306 10 11
St. Ives	....	....	38 2 1	....	38 2 1	....	....	1 0 0	39 2 1	....	1 17 0	....	....	37 5 1
Pingin	....	....	....	....	....	....	....	....	....	....	5 0 0	....	5 0 0	....
Wiluna	1,104.75	54 9 0	406 13 5	259 14 0	720 16 5	13 0.5	158 7 4	183 4 2	1,062 7 11	19 2.3	596 16 2	10 9.6	....	465 11 9
Yalgoo	2,189.00	110 16 9	722 11 10	355 16 2	1,189 4 9	10 10.3	152 15 7	156 6 6	1,498 6 10	13 8.2	1,063 19 3	10 1.5	....	434 7 7
Yarri	3,006.25	271 8 0	1,251 8 8	492 0 9	2,014 17 5	13 4.8	474 3 8	343 3 4	2,832 4 5	18 10.1	1,465 9 3	9 8.9	....	1,366 19 2
Yerilla	....	....	....	....	....	....	....	....	....	....	15 0 6	....	15 0 6	....
Youanmi	705.75	87 9 8	291 14 10	58 10 9	437 15 3	12 4.8	106 11 5	74 2 3	618 8 11	17 6.2	324 17 7	9 2.4	....	293 11 4
Total	100,454.76	5,816 7 10	28,430 15 9	16,854 8 11	51,101 12 6	10 2.1	6,825 8 11	8,382 11 7	66,309 13 0	13 2.4	47,942 5 2	9 6.5	255 6 6	18,622 14 4
Total Loss	....	....	....	....	....	....	....	....	....	....	....	....	....	255 6 6

SCHEDULE No. 7—TAILING TREATMENT.

Statement of Receipts and Expenditure for the Year ended 31st December, 1940.

Battery.	Tonnage Treated.	Expenditure.										Receipts.		Profit	Loss.
		Management.	Wages.	Assays.	Stores.	Total Working Expenditure.	Cost per Ton.	Repairs and Renewals.	Sundries.	Gross Expenditure.	Cost per Ton.	Receipts.	Receipts per Ton.		
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	s. d.	£ s. d.	£ s. d.	£ s. d.	s. d.	£ s. d.	s. d.	£ s. d.	£ s. d.
Bamboo Creek	2,856	272 3 4	1,019 4 11	65 17 9	330 2 0	1,687 8 0	11 9·7	65 3 0	165 11 5	1,918 2 5	13 0·9	3,483 19 11	24 4·7	1,565 17 6	£ s. d.
Boogardie	9,728	231 10 1	2,039 0 8	499 0 9	842 1 0	3,611 12 6	7 5·1	105 14 10	515 0 4	4,232 7 8	8 8·4	10,028 16 1	20 7·4	5,796 8 5	.....
Coolgardie	9,134	297 0 6	1,823 9 11	121 5 3	968 4 0	3,209 19 8	7 0·3	13 8 11	493 1 2	3,716 9 9	8 1·6	6,319 10 8	13 10·0	2,603 0 11	.....
Cue	7,130	302 8 1	1,423 16 7	155 6 7	767 13 10	2,649 5 1	7 5·1	38 2 3	358 8 11	3,045 16 3	8 6·5	6,202 9 9	17 4·7	3,156 13 6	.....
Kalgoorlie	16,480	239 19 5	2,739 15 7	335 12 10	1,482 14 7	4,798 2 5	5 9·8	94 13 0	910 3 0	5,802 18 5	7 0·5	11,097 19 11	13 5·6	5,295 1 6	.....
Laverton	1,950	18 5 6	511 16 8	129 10 8	205 17 0	865 9 10	8 10·5	18 6 1	123 0 6	1,006 16 5	10 3·9	1,302 12 3	13 4·3	295 15 10	.....
Marble Bar	4,165	120 19 10	905 4 4	206 2 4	452 5 4	1,684 11 10	8 1·0	81 9 11	205 3 3	1,971 5 0	9 5·5	4,118 15 5	19 9·3	2,147 10 5	.....
Meekatharra	6,983	287 19 8	1,510 0 2	86 16 11	762 11 3	2,647 8 0	7 7·0	48 10 1	374 18 10	3,070 16 11	8 9·5	6,046 3 11	17 3·8	2,975 7 0	.....
Mt. Ida	1,690	42 6 8	434 5 3	263 14 3	250 2 2	990 8 4	11 8·6	102 15 7	100 6 5	1,193 10 4	14 1·5	1,689 9 2	19 11·9	495 13 10	.....
Norseman	5,067	299 18 1	1,298 6 7	145 7 1	605 7 4	2,348 19 1	9 3·2	160 3 5	198 14 7	2,707 17 1	10 8·2	6,428 19 6	25 4·5	3,721 2 5	.....
Ora Banda	8,236·5	288 0 0	1,977 8 8	186 15 9	1,166 17 11	3,619 2 4	8 9·4	81 6 6	458 16 0	4,159 4 10	9 10·2	5,689 0 1	13 9·7	1,529 15 3	.....
Paynes Find	4,931	251 11 8	862 9 0	236 3 4	514 6 1	1,864 10 1	7 6·7	81 18 5	250 17 5	2,197 5 11	8 10·9	2,046 1 1	8 3·6	.....	151 4 10
Peak Hill	3,292	137 3 7	793 13 9	40 19 6	395 13 10	1,367 10 8	8 3·7	76 6 4	222 12 3	1,666 9 3	10 1·5	2,098 9 8	12 8·9	432 0 5	.....
Sandstone	3,726	193 7 9	1,022 16 5	253 15 10	464 12 10	1,934 12 10	10 4·6	11 13 0	163 16 4	2,110 2 2	11 3·9	2,201 15 10	11 9·8	91 13 8	.....
Warriedar	1,230	38 6 3	322 9 1	55 1 9	87 19 6	503 16 7	8 2·3	46 9 1	34 19 10	535 5 6	9 6·5	745 8 6	12 1·4	160 3 0	.....
Wiluna	2,808	161 1 3	707 1 4	121 8 11	285 9 1	1,275 0 7	9 0·9	68 13 6	127 15 4	1,471 9 5	10 5·7	2,246 1 11	16 0·0	774 12 6	.....
Yalgoo	1,972	114 3 0	480 8 1	45 13 4	232 12 1	872 16 6	8 10·2	41 14 3	208 8 8	1,122 19 5	11 4·6	920 16 9	9 4·0	.....	202 2 8
Yarri	2,880	84 16 5	601 18 11	138 7 3	253 4 5	1,078 7 0	7 5·8	26 4 1	162 9 1	1,267 0 2	8 9·5	1,838 16 4	12 9·2	571 16 2	.....
Youanmi	675	6 2 5	162 14 8	62 16 7	106 0 7	337 14 3	10 0·0	90 6 3	29 17 5	437 17 11	13 6·8	546 16 8	16 2·4	88 18 9	.....
Head Office	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,637 13 10	.....	3,637 13 10	.....
Total	94,933·3	3,387 3 6	20,636 0 7	3,149 16 8	10,173 14 10	37,346 15 7	7 10·3	1,252 18 6	5,104 0 9	43,703 14 10	9 2·5	78,689 17 3	16 6·9	35,339 9 11 353 7 6	353 7 6
Total Profit	£34,986 2 5

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SCHEDULE No. 3

Number of Parcels treated, Tons crushed, and Head Value for the Year ended the 31st December, 1940.

No. of Parcels Treated.	Battery.	Tons Crushed.	Yield by Amalgamation, Bullion.	Yield by Amalgamation, Fine Gold.	Gross Contents of Tailings on 100 % (including Refractory).	Total Contents of Ore, Fine Gold.	Average per ton, Fine Gold.	Gross Value per ton, at £4 4s. 11½d. per oz.
			ozs. dwts.	ozs. dwts.	ozs. dwts.	ozs. dwts.	dwts. grs.	£ s. d.
52	Bamboo Creek	2,382.50	1,340 9	1,136 1	674 6	1,810 7	15 5	3 4 7
233	Boogardie	9,875.25	6,823 16	5,783 6	2,618 8	8,401 14	17 0	3 12 2
238	Coolgardie	9,310.50	3,613 6	3,062 4	1,370 2	4,432 6	9 12	2 0 4
260	Cue	9,197.75	5,215 10	4,420 0	1,679 6	6,099 6	13 6	2 16 3
376	Kalgoorlie	15,683.50	5,505 19	4,666 3	2,273 13	6,939 16	8 20	1 17 6
92	Laverton	2,505.50	1,817 6	1,540 2	768 14	2,308 16	18 10	3 18 3
245	Marble Bar	7,072.00	2,694 16	2,283 16	1,675 13	3,959 9	11 5	2 7 7
130	Meekatharra	6,465.00	3,308 3	2,803 11	1,190 14	3,994 5	12 9	2 12 7
58	Mt. Ida	1,734.25	888 8	752 18	296 10	1,049 8	12 2	2 11 4
170	Norseman	4,917.50	8,951 14	7,586 8	1,817 2	9,403 10	38 6	8 2 6
142	Ora Banda	9,616.25	4,283 14	3,630 7	1,531 13	5,162 0	10 18	2 5 8
58	Payne's Find	5,041.75	2,358 2	1,998 9	488 10	2,486 19	9 20	2 1 9
56	Peak Hill	4,879.50	1,006 18	853 6	535 10	1,388 16	5 17	1 4 3
93	Sandstone	3,835.25	1,322 4	1,120 7	582 18	1,703 5	8 21	1 17 8
24	Warriedar	932.50	282 15	239 12	188 2	427 14	9 4	1 18 11
24	Wiluna	1,104.75	224 18	190 12	272 7	462 19	8 9	1 15 7
84	Yalgoo	2,189.00	1,010 7	856 5	392 0	1,248 5	11 10	2 8 6
90	Yarri	3,006.25	1,400 7	1,186 15	373 10	1,560 5	10 9	2 4 1
16	Youanmi	705.75	364 14	309 1	259 10	568 11	16 2	3 8 4
2,441		100,454.75	52,416 6	44,419 3	18,988 8	63,407 11	12 15	2 13 7

Average tons per parcel 41.15.
Average yield by amalgamation per ton (fine gold) 8 dwts. 19.2 grains.
Average value by amalgamation per ton £1 17s. 4d.
Average head value of tailings per ton (fine gold) 3 dwts. 18.7 grains.
Average value of tailings per ton 16s. 1d.

SCHEDULE No. 4.

Direct Purchase of Tailings.

Battery.	Tons Purchased.	Amount Paid for Tailings.	Amount Paid A/c. Premium.
		£ s. d.	£ s. d.
Bamboo Creek	1,611.5	1,230 18 8	2,273 14 1
Boogardie	6,483.25	4,894 6 8	7,763 10 6
Coolgardie	3,920.75	1,357 5 7	2,284 8 8
Cue	3,742.00	2,390 9 11	2,815 13 10
Kalgoorlie	5,461.75	2,451 18 11	3,864 9 6
Laverton	1,538.50	1,460 19 3	1,796 2 2
Marble Bar	2,975.00	3,762 18 9	6,656 8 5
Meekatharra	2,919.00	1,511 18 10	2,665 19 3
Mt. Ida	863.00	320 18 8	679 5 6
Norseman	3,534.25	3,711 2 7	6,983 16 6
Ora Banda	5,619.00	1,662 17 10	1,914 3 1
Payne's Find	508.25	180 18 0	88 7 6
Peak Hill	1,412.25	449 8 2	667 13 5
Sandstone	1,564.75	390 6 0	772 15 7
St. Ives	...	...	5 1 0
Warriedar	104.75	199 2 5	495 12 11
Wiluna	778.50	503 19 9	1,878 9 4
Yalgoo	469.25	201 15 2	328 13 11
Yarri	911.75	301 5 7	355 18 11
Youanmi	339.25	567 15 8	353 8 6
Totals	44,739.75	£27,550 6 5	£44,643 12 7

SCHEDULE No. 5.

Tailings Treatment for 1940.

Battery.	Tonnage.	Yield.	Value.	Premium.	Total.
		fine ozs.	£	£	£
Bamboo Creek	2,856	687.51	2,919.866	3,802.327	6,722.193
Boogardie	9,728	2,276.09	9,667.773	12,634.080	22,301.853
Coolgardie	9,134	955.10	4,056.582	5,334.615	9,391.197
Cue	7,130	1,062.42	4,511.988	5,925.635	10,437.623
Kalgoorlie	16,480	1,735.74	7,371.794	9,680.931	17,052.725
Laverton	1,950	329.41	1,399.349	1,840.228	3,239.577
Marble Bar	4,165	1,312.79	5,575.610	7,322.269	12,897.879
Meekatharra	6,983	1,020.20	4,332.884	5,695.065	10,027.949
Mt. Ida	1,690	260.05	1,104.444	1,451.658	2,556.102
Norseman	5,067	1,733.28	7,361.203	9,525.218	16,886.421
Ora Banda	8,236.5	894.74	3,796.284	4,993.840	8,790.124
Payne's Find	4,931	233.43	991.052	1,303.195	2,294.247
Peak Hill	3,292	317.35	1,332.774	1,754.710	3,087.484
Sandstone	3,726	346.28	1,470.827	1,935.199	3,406.026
Warriedar	1,230	147.01	624.379	819.321	1,443.700
Wiluna	2,808	567.65	2,410.828	3,163.032	5,573.860
Yalgoo	1,972	193.44	821.128	1,086.376	1,907.504
Yarri	2,880	245.23	1,041.516	1,366.199	2,407.715
Youanmi	675	94.25	400.263	520.453	920.716
Totals	94,933.5	14,411.97	£61,190.544	£80,154.351	£141,344.895

SCHEDULE NO. 6—MILLING AND TIN.

Statement of Receipts and Expenditure for the Year ended 31st December, 1940.

Battery.	Tonnage Crushed.	Expenditure.									Receipts.		Profit.	Loss.
		Management.	Wages.	Stores.	Total Working Expenditure.	Cost per Ton.	Renewals and Repairs.	Sundries.	Gross Expenditure.	Cost per Ton.	Receipts.	Receipts per Ton.		
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	s. d.	£ s. d.	£ s. d.	£ s. d.	s. d.	£ s. d.	s. d.	£ s. d.	£ s. d.
Bamboo Creek	2,382.50	289 0 3	1,268 17 3	466 7 3	2,019 4 9	16 11.4	303 17 2	225 15 8	2,548 17 7	21 4.7	1,273 2 5	10 8.2	....	1,275 15 2
Boogardie	9,875.25	372 7 11	2,180 7 3	982 0 11	3,534 16 1	7 1.9	720 19 10	707 4 6	4,972 0 5	10 0.8	4,728 19 2	9 6.9	....	243 1 3
Coolgardie	9,310.50	653 16 1	2,163 11 1	1,625 0 9	4,442 7 11	9 6.5	521 15 5	800 9 6	5,764 12 10	12 4.5	4,397 16 1	9 5.3	....	1,366 16 9
Cue	9,197.75	281 16 3	2,021 4 9	1,559 7 0	3,862 8 0	8 4.7	636 6 5	666 10 2	5,165 4 7	11 2.7	4,731 0 8	10 3.4	....	434 3 11
Greenbushes (Tin Plant)	....	....	4 5 8	....	4 5 8	....	....	....	4 5 8	....	2 0 0	....	....	2 5 8
Jimble Bar	....	....	....	....	....	....	....	....	....	....	3 0 0	....	3 0 0	....
Kalgoorlie	15,683.50	853 8 0	2,804 3 1	2,823 17 11	6,481 9 0	8 3.1	650 16 4	1,265 12 1	8,397 17 5	10 8.5	6,357 6 3	8 1.2	....	2,040 11 2
Laverton	2,505.50	180 8 1	636 10 4	309 12 11	1,126 11 4	8 11.9	333 6 4	261 1 11	1,720 19 7	13 4.0	1,222 1 0	9 9.0	....	498 18 7
Lake Darlot	....	....	....	....	....	....	....	93 12 9	93 12 9	....	72 11 6	....	....	21 1 3
Linden	....	....	....	....	....	....	....	....	....	....	138 14 6	....	138 14 6	....
Marble Bar	7,072.00	505 10 7	1,942 2 9	1,190 1 4	3,727 14 8	10 6.5	469 18 4	579 5 8	4,776 18 8	13 6.1	3,511 11 3	9 11.3	....	1,265 7 5
Meekatharra	6,465.00	262 17 3	2,064 16 9	1,321 13 2	3,649 7 2	11 3.4	225 8 3	473 7 7	4,348 3 0	13 5.4	2,886 4 0	8 11.1	....	1,461 19 0
Mt. Ida	1,734.25	224 14 6	1,042 3 9	477 0 7	1,743 18 10	20 1.3	371 13 2	150 15 5	2,266 7 5	26 1.6	936 3 5	10 9.5	....	1,330 4 0
Mt. Sir Samuel	....	....	....	....	....	....	....	....	....	....	35 19 0	....	35 19 0	....
Mulline	....	....	....	....	....	....	....	....	....	....	52 12 6	....	52 12 6	....
Mulwarrie	....	....	....	....	....	....	....	....	....	....	5 0 0	....	5 0 0	....
Norseman	4,917.50	349 7 0	2,145 1 5	1,227 13 1	3,722 1 6	15 1.6	150 15 9	437 15 0	4,310 12 3	17 6.3	2,592 19 5	10 6.5	....	1,717 12 10
Ora Banda	9,616.25	288 0 3	2,405 3 11	1,866 19 4	4,560 3 6	9 5.8	357 3 9	672 3 0	5,589 10 3	11 7.5	4,434 8 0	9 2.6	....	1,155 2 3
Payne's Find	5,041.75	251 14 10	1,884 15 4	698 6 1	2,834 16 3	11 2.9	368 9 9	412 5 6	3,615 11 6	14 4.1	2,655 16 7	10 6.4	....	959 14 11
Peak Hill	4,879.50	337 9 0	1,476 14 10	529 19 3	2,344 3 1	9 7.3	318 19 4	421 15 6	3,084 17 11	12 7.7	2,063 8 10	8 5.4	....	1,021 9 1
Sandstone	3,835.25	283 2 0	1,319 12 11	469 13 0	2,072 7 11	10 9.6	412 10 11	369 15 8	2,854 14 6	14 10.6	1,930 5 3	10 0.7	....	924 9 3
Warriedar	932.50	68 12 5	365 13 10	140 14 8	575 0 11	12 4.0	82 10 2	87 5 5	744 16 6	15 11.6	438 5 7	9 4.7	....	306 10 11
St. Ives	....	....	38 2 1	....	38 2 1	....	....	1 0 0	39 2 1	....	1 17 0	....	....	37 5 1
Pingin	....	....	....	....	....	....	....	....	....	....	5 0 0	....	5 0 0	....
Wiluna	1,104.75	54 9 0	406 13 5	259 14 0	720 16 5	13 0.5	158 7 4	183 4 2	1,062 7 11	19 2.3	596 16 2	10 9.6	....	465 11 9
Yalgoo	2,189.00	110 16 9	722 11 10	355 16 2	1,189 4 9	10 10.3	152 15 7	156 6 6	1,498 6 10	13 8.2	1,063 19 3	10 1.5	....	434 7 7
Yarri	3,006.25	271 8 0	1,251 8 8	492 0 9	2,014 17 5	13 4.8	474 3 8	343 3 4	2,832 4 5	18 10.1	1,465 9 3	9 8.9	....	1,366 19 2
Yerilla	....	....	....	....	....	....	....	....	....	....	15 0 6	....	15 0 6	....
Youanmi	705.75	87 9 8	291 14 10	58 10 9	437 15 3	12 4.8	106 11 5	74 2 3	618 8 11	17 6.2	324 17 7	9 2.4	....	293 11 4
Total	100,454.78	5,816 7 10	28,430 15 9	16,854 8 11	51,101 12 6	10 2.1	6,825 8 11	8,382 11 7	66,309 13 0	13 2.4	47,942 5 2	9 6.5	255 6 6	18,622 14 4
Total Loss	....	....	....	....	....	....	....	....	....	....	....	....	....	255 6 6

SCHEDULE NO. 7—TAILING TREATMENT.

Statement of Receipts and Expenditure for the Year ended 31st December, 1940.

Battery.	Tonnage Treated.	Expenditure.										Receipts.		Profit	Loss.
		Management.	Wages.	Assays.	Stores.	Total Working Expenditure.	Cost per Ton.	Repairs and Renewals.	Sundries.	Gross Expenditure.	Cost per Ton.	Receipts.	Receipts per Ton.		
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	s. d.	£ s. d.	£ s. d.	£ s. d.	s. d.	£ s. d.	s. d.	£ s. d.	£ s. d.
Bamboo Creek	2,856	272 3 4	1,019 4 11	65 17 9	330 2 0	1,687 8 0	11 9.7	65 3 0	165 11 5	1,918 2 5	13 0.9	3,483 19 11	24 4.7	1,565 17 6	£ s. d.
Boogardie	9,728	231 10 1	2,039 0 8	499 0 9	842 1 0	3,611 12 6	7 5.1	105 14 10	515 0 4	4,232 7 8	8 8.4	10,028 16 1	20 7.4	5,796 8 5	....
Coolgardie	9,134	297 0 6	1,823 9 11	121 5 3	968 4 0	3,209 19 8	7 0.3	13 8 11	493 1 2	3,716 9 9	8 1.6	6,319 10 8	13 10.0	2,603 0 11	....
Cue	7,130	302 8 1	1,423 16 7	155 6 7	767 13 10	2,649 5 1	7 5.1	38 2 3	358 8 11	3,045 16 3	8 6.5	6,202 9 9	17 4.7	3,156 13 6	....
Kalgoorlie	16,480	239 19 5	2,739 15 7	335 12 10	1,482 14 7	4,798 2 5	5 9.8	94 13 0	910 3 0	5,802 18 5	7 0.5	11,097 19 11	13 5.6	5,295 1 6	....
Laverton	1,950	18 5 6	511 16 8	129 10 8	205 17 0	865 9 10	8 10.5	18 6 1	123 0 6	1,006 16 5	10 3.9	1,302 12 3	13 4.3	295 15 10	....
Marble Bar	4,165	120 19 10	905 4 4	206 2 4	452 5 4	1,684 11 10	8 1.0	81 9 11	205 3 3	1,971 5 0	9 5.5	4,118 15 5	19 9.3	2,147 10 5	....
Meekatharra	6,983	287 19 8	1,510 0 2	86 16 11	762 11 3	2,647 8 0	7 7.0	48 10 1	374 18 10	3,070 16 11	8 9.5	6,046 3 11	17 3.3	2,975 7 0	....
Mt. Ida	1,690	42 6 8	434 5 3	263 14 3	250 2 2	990 8 4	11 8.6	102 15 7	100 6 5	1,193 10 4	14 1.5	1,689 9 2	19 11.9	495 13 10	....
Norseman	5,067	299 18 1	1,298 6 7	145 7 1	605 7 4	2,348 19 1	9 3.2	160 3 5	198 14 7	2,707 17 1	10 8.2	6,428 19 6	25 4.5	3,721 2 5	....
Ora Banda	8,236.5	288 0 0	1,977 8 8	186 15 9	1,166 17 11	3,610 2 4	8 9.4	81 6 6	458 16 0	4,159 4 10	9 10.2	5,689 0 1	13 9.7	1,529 15 3	....
Paynes Find	4,931	251 11 8	862 9 0	236 3 4	514 6 1	1,864 10 1	7 6.7	81 18 5	250 17 5	2,197 5 11	8 10.9	2,046 1 1	8 3.6	....	151 4 10
Peak Hill	3,292	137 3 7	793 13 9	40 19 6	395 13 10	1,367 10 8	8 3.7	76 6 4	222 12 3	1,666 9 3	10 1.5	2,098 9 8	12 8.9	432 0 5	....
Sandstone	3,726	193 7 9	1,022 16 5	253 15 10	464 12 10	1,934 12 10	10 4.6	11 13 0	163 16 4	2,110 2 2	11 3.9	2,201 15 10	11 9.8	91 13 8	....
Warriedar	1,230	38 6 3	322 9 1	55 1 9	87 19 6	503 16 7	8 2.3	46 9 1	34 19 10	585 5 6	9 6.5	745 8 6	12 1.4	160 3 0	....
Wiluna	2,808	161 1 3	707 1 4	121 8 11	285 9 1	1,275 0 7	9 0.9	68 13 6	127 15 4	1,471 9 5	10 5.7	2,246 1 11	16 0.0	774 12 6	....
Yalgoo	1,972	114 3 0	480 8 1	45 13 4	232 12 1	872 16 6	8 10.2	41 14 3	208 8 8	1,122 19 5	11 4.6	920 16 9	9 4.0	....	202 2 8
Yarri	2,880	84 16 5	601 18 11	138 7 3	253 4 5	1,078 7 0	7 5.8	26 4 1	162 9 1	1,267 0 2	8 9.5	1,838 16 4	12 9.2	571 16 2	....
Youanmi	675	6 2 5	162 14 8	62 16 7	106 0 7	337 14 3	10 0.0	90 6 3	29 17 5	457 17 11	13 6.8	546 16 8	16 2.4	88 13 9	....
Head Office	....	....	....	....	....	....	....	....	....	....	....	3,637 13 10	....	3,637 13 10	....
Total	94,933.5	3,387 3 6	20,636 0 7	3,149 16 8	10,173 14 10	37,346 15 7	7 10.3	1,252 18 6	5,104 0 9	43,703 14 10	9 2.5	78,689 17 3	16 6.9	35,339 9 11	353 7 6
Total Profit	....	....	....	....	....	....	....	....	....	....	....	....	....	£34,986 2 5	....

SCHEDULE No. 8.

State Battery Statistics from Inception to 31st December, 1910, and from 1st January, 1930, to 31st December, 1940.

Year.	Milling.				Sand and Tailing Treatment.				Slime Treatment.				Tin Treatment.				Gross Profit. †	
	Tons.	Expenditure per ton.	Revenue per ton.	Loss.	Tons.	Expenditure per ton.	Revenue per ton.	Profit.	Tons.	Expenditure per ton.	Revenue per ton.	Loss.	Tons.	Expenditure per ton.	Revenue per ton.	Loss.		
		s. d.	s. d.	£		s. d.	s. d.	£		s. d.	s. d.	£		s. d.	s. d.	£	£	
1899	...	18,806	...	2,827	...	...	...	...	...	...	...	...	...	...	...	...	2,827†	
1900	...	22,675	22 10-1	17 4-5	7,611	...	...	...	...	...	...	...	...	...	...	...	7,611†	
1901	...	26,775	18 0-0	16 6-0	1,983	9,534	16 9-0	...	1,337	...	...	...	...	...	...	...	646†	
1902	...	39,516	14 8-6	14 8-2	169	9,721	22 3-0	...	724	...	...	...	1,170	12 2-0	...	286	269	
1903	...	49,233	13 6-8	12 10-6	1,250	33,369	7 7-0	...	1,442	...	...	...	2,009	8 2-0	...	153	2,539	
1904	...	71,616	14 4-4	12 6-5	6,423	43,251	7 10-0	...	1,448	...	...	...	2,337	8 2-0	...	165	5,141†	
1905	...	85,018	12 4-0	12 2-5	957	54,420	7 3-0	9 8-5	6,689	7,028	12 1-0	...	410	3,697	5 8-0	5 0-3	324	3,342
1906	...	95,831	12 2-0	11 3-8	4,076	65,159	7 4-0	9 2-1	5,549	4,737	11 8-0	12 1-1	2,254*	11,428	4 2-0	4 3-3	156*	2,880
1907	...	95,280	12 6-0	11 4-8	8,724	64,514	6 8-7	9 2-8	6,474	8,220	8 7-6	13 5-5	1,983*	10,496	4 4-4	4 8-8	191*	1,688†
1908	...	95,628	12 1-9	9 3-6	13,669	62,272	6 4-7	8 11-0	8,017	5,818	12 0-9	11 8-0	120	5,573	4 5-2	3 6-3	254	7,278†
1909	...	94,218	11 1-7	9 6-6	7,568	61,032	6 5-8	8 9-7	7,096	16,848	10 0-7	9 6-7	423	5,043	4 8-2	3 7-5	267	1,965†
1910	...	89,278	11 3-3	9 6-6	7,709	43,391	6 2-9	8 6-1	4,903	28,600	8 9-1	9 11-5	1,723*	3,769	5 5-5	3 4-1	401	2,365†
1930	...	29,285-75	15 3-41	9 2-58	6,420	20,344	7 11-16	10 2-3	2,300	...	...	...	...	159	14 5-16	3 4-24	88	6,420†
1931	...	63,428-5	12 8-2	9 7-9	9,677	37,315	6 9-8	11 2-8	8,256	...	...	...	...	...	...	...	16*	1,361†
1932	...	79,745-75	12 6-3	9 9-04	11,068	66,216	6 11-0	14 6-6	25,249	...	...	...	...	...	...	...	26	14,155
1933	...	91,616	11 6-7	9 6-5	9,068	84,151	6 7-3	15 9-7	38,468	...	...	...	...	...	...	...	24	29,375
1934	...	97,454	13 7-3	9 6-3	20,219	94,616	6 9-3	14 2-0	35,442	...	...	...	...	...	...	...	26	15,197
1935	...	108,360	13 9-3	9 6-8	22,739	102,037	7 1-0	13 5-9	32,676	...	...	...	...	...	...	...	26	9,912
1936	...	102,086-25	14 0-2	9 5-1	23,411	110,543	7 9-1	14 11-8	39,919	...	...	...	...	...	...	...	26	16,482
1937	...	102,800	13 5-7	9 2-2	22,032	110,263	7 9-7	13 5-8	31,258	...	...	...	...	...	...	...	24	9,202
1938	...	108,966	12 10-9	9 1-9	20,397	103,175	8 2-1	14 4-7	32,039	...	...	...	...	...	...	...	19	11,612
1939	...	101,443	13 2-8	9 4-7	20,591	95,056	8 11-1	15 5-5	31,033	...	...	...	...	...	...	...	27	10,415
1940	...	100,454-75	13 2-4	9 6-5	18,367	94,933-5	9 2-5	16 6-9	34,986	...	...	...	...	...	...	...	2	16,620

* Profit. † Loss. ‡ Details of Ore Dressing and Residue Treatment not shown, but financial result included in the figure of this column.

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Division IV.

Annual Progress Report of the Geological Survey of Western Australia for the Year ended 31st December, 1940.

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 of the Geological Survey for the year 1940.

STAFF.

There was one staff change during the year. In August the Survey lost the services of Mr. H. A. Ellis, who, at the request of Military Headquarters, Western Command, was released for military duties with the Defence Forces. From August onward the staff consisted of the Government Geologist, three field geologists, a senior typist, a junior clerk and a messenger.

The progress of systematic field work in the Mount Margaret and Yilgarn Goldfields was interrupted during the year to enable the concentration of the field staff on special investigations of industrial minerals, and of those minerals brought into special demand for war requirements.

The principal activities of the professional officers are set out below.

F. G. Forman, Government Geologist:

During January, I inspected the vermiculite deposits at the Young River, east of Ravensthorpe and the barite deposits at Cranbrook.

In February, I visited Collie to inspect the conditions resulting from a "creep" in the Proprietary Colliery, and at the same time took the opportunity to inspect bucket dredging operations at Greenbushes.

During March and April I was engaged principally in activities arising from my membership of two Royal Commissions, one inquiring into a creep at the Collie coalfield, the other inquiring into coal supplies and development in the Collie coalfield. At the end of April I made a second visit to the Greenbushes tinfield on the occasion of an inspection by the Hon. the Minister for Mines.

In May I accompanied the State Mining Engineer to Ravensthorpe to assist in obtaining samples of sulphide ores for experimental purposes connected with a request to the Department for the establishment of a central plant to treat the gold-copper ores from this district. During the later part of May and most of June I was at Koolan Island, Yampi Sound, engaged on work connected with the investigation of iron deposits.

In July I inspected the progress of departmental field work in the northern portion of the Yilgarn Goldfield. A proposed inspection of similar work in progress in the Mount Margaret Goldfield was necessarily abandoned owing to a major breakdown of the only available means of transport.

August and September were occupied mainly by investigation of the bauxitic laterites of the Darling Ranges near Perth, and the phosphate deposits of the Dandaragan district. Early in August I accompanied the other members of the Commission to Collie to discuss, with Amalgamated Collieries, Ltd., matters arising out of the report of the Royal Commission on creep.

During October I visited the Northampton Mining district in order to inquire into the future possibilities for the production of lead and copper in this district. In the same month I inspected the Yinnietarra mica and bismuth areas.

During December I inspected the drilling operations of the Freney Kimberley Oil Company at Nerrima Bore site, West Kimberley.

The remainder of my time during the year was fully occupied by a number of short inspection trips in the vicinity of Perth and with administrative duties in Head Office.

H. A. Ellis, Geologist:

Mr. Ellis was on leave from the beginning of the year until the 23rd January.

In February he made several visits to Greenbushes in connection with bucket dredging operations, in addition to compiling data relative to the tale, magnesite and vermiculite deposits of the State.

Early in March Mr. Ellis commenced field work on the systematic examination of the known tale, magnesite and vermiculite deposits of the south-west part of the State, including magnesite deposits east of Ravensthorpe and vermiculite deposits on the Young River.

In April Mr. Ellis made an examination of the "Famous Blue" gold mining lease and surrounding country at Duketon for departmental purposes.

In July Mr. Ellis examined the bismuth and mica deposits at and near Morrissey Hill on Yinnietarra Station in the Gascoyne River district. Towards the end of the month he was called up for military duties and left the Geological Survey on August 14th.

R. A. Hobson, Geologist:

From January to the middle of April, Mr. Hobson was at Head Office preparing material for the Annual Report; making preparations for continuing field work in the Mount Margaret Goldfield; and attending to other office duties. During this period he took his annual recreation leave.

From April to July he was at Murrin continuing the geological survey of portion of the Mount Margaret Goldfield. This work was stopped at the end of July due to war conditions and Mr. Hobson returned to Perth. The work in the Mount Margaret Goldfield is incomplete.

During August, September and October, Mr. Hobson was engaged on office work associated with the Mount Margaret Goldfield; the object being to leave this work in such a condition that it can be readily continued at some future time. Also during this period he was engaged on computations connected with the iron ore reserves of Koolan Island and made preparations for a trip to the Murchison and Yalgoo Goldfields.

During most of November, he was inspecting copper occurrences in the Murchison and Yalgoo Goldfields.

For the remainder of the year he was at Head Office preparing notes on the copper occurrences inspected during November, and attending to other office duties.

R. S. Matheson, Geologist:

From January to March, Mr. Matheson was engaged in compiling reports on some mines in the Yilgarn Goldfield examined during 1939 field season, proof reading and indexing Bulletin No. 98, and carrying out miscellaneous office work.

Mr. Matheson left Perth to resume the examination of the mines in the northern portion of the Yilgarn Goldfield at the beginning of April, and was continuously engaged on this work until the middle of August. Before returning to Perth, he visited the "Scorpio" and "Green Bird" leases at Marvel Loch to advise the lessees on future prospecting.

From September to the end of October, Mr. Matheson was engaged in writing reports on mines examined during the 1940 field season, and carrying out miscellaneous office work.

In November, Mr. Matheson inspected the copper deposits in the Peak Hill Goldfield and on his return to Perth was employed writing a report on these deposits. He commenced his annual leave on 23rd December.

K. R. Miles, Geologist:

Mr. Miles was engaged for the greater part of the year on various duties necessitating his remaining at Headquarters. From January to late in March he was employed on the completion of reports for the Annual Progress Report; redrafting of plans in connection with his recent field work in the Laverton district, and on other routine office duties.

From the latter end of March to the beginning of May he made a fairly complete overhaul of a large part of the Survey rock and mineral collection. During this time some 14,000 rock and mineral speci-

mens were resorted and repacked into drawers in the museum; while many unwanted specimens were discarded and missing rocks recorded. By this means an enormous amount of space has now been made available for the storage of new specimens such as are continually being brought in from the field.

During the greater part of the remainder of the year Mr. Miles was engaged in petrological work. This work included a fairly detailed petrological report on the rocks of the Mount Margaret Goldfield collected during the 1937-40 field seasons, and numbering some 650 in all, and also a brief petrological examination and identification of the rocks obtained during the re-survey of the northern portion of the Yilgarn Goldfield.

On 1st August he left Perth for Mount Palmer where he was engaged until 21st August on detailed geological mapping of the vicinity of some bore sites on temporary reserves at Heaney's Find and Meier's Find held by Yellowdine Gold Development, Limited.

On his return to Perth, Mr. Miles continued with his petrological work on Mount Margaret and Yilgarn rocks, and other office duties. Towards the close of November he began preparation for the petrological portion of an investigation of the metasomatism of the Corinthian ore body.

Apart from the petrological work mentioned above Mr. Miles has throughout the year carried out numerous petrological determinations and has prepared many brief reports both for departmental purposes and for the general public.

He commenced his annual leave on 30th December.

FIELD TRANSPORT.

I would again draw attention to my remarks in last year's annual report to the difficulties existing in regard to motor transport in the field. These difficulties still exist and in addition during 1940 two serious and expensive delays were caused to field work by the breaking of the chassis on the two older utility trucks. Both these breakages were unavoidable and due to metal fatigue. They involved dislocation of the programme of field work at a critical time, and heavy repair bills.

PUBLICATIONS.

During the year the following publications were issued by this branch:—

Annual Progress Report of the Geological Survey for the year 1939.

Geological Survey Bulletin 98:—The Mining Groups of the Yilgarn Goldfield South of the Great Eastern Railway, Part 1, from Southern Cross Southwards to Marvel Loch, by R. S. Matheson, B.Sc., and R. A. Hobson, B.Sc. (Hons.).

The results of the principal field operations, except where investigations were carried out purely for departmental purposes, are covered by the reports which follow this section.

As a measure of economy a number of this year's reports of investigations have been replaced by brief summaries showing the nature, scope and principal results of the work. The full reports and the plans

which accompany them are available for inspection by the public at the Geological Survey Office, Perth.

I wish to record my appreciation of the excellent manner in which all members of the field and office staff carried out their duties during the year.

F. G. FORMAN,
Government Geologist.

THE TALC, MAGNESITE AND VERMICULITE DEPOSITS OF THE SOUTH-WEST DIVISION.

SUMMARY.

Early in March Mr. Ellis commenced a field investigation of industrial minerals. Preliminary analysis of recorded data suggested that the South-West Division of the State was the most suitable place in which to commence work, and, because the localities of known occurrences of talc, magnesite and vermiculite appeared to be suitably grouped for the most economical work, it was decided in the first place to investigate deposits of these three minerals.

The area covered by the present survey comprises the south-west corner of the State bounded on the north by the Eastern Goldfields railway and on the east by the No. 1 Rabbit Proof Fence which passes through Burracoppin on the Eastern Goldfields railway and meets the south coast about 25 miles east of Hopetoun. Although they lie outside the area described above, the vermiculite deposits of the Young River were included in the programme because of their proximity to other mineral deposits in the Phillips River Goldfield.

Field work was completed at the end of June but owing to unavoidable delays in the laboratory investigation of various samples and Mr. Ellis's transfer to defence duties in August, his reports are at present not completed.

The deposits showing most promise of economic importance are indicated in the following summary.

Talc.—No workable deposits of micaceous talc suitable for the manufacture of the higher grade products such as toilet powders, and no massive steatite of "lava" forms were discovered. There is, however, a good prospect of being able to produce slab soapstone and powdered soapstone for use in industry from a deposit at Glen Lynn, six miles south of Bridgetown. The deposit is entirely undeveloped, but is extensive and of a quality likely to be of commercial importance.

Magnesite.—At Bandalup Creek, 16 miles east of Ravensthorpe on the Esperance road, the weathering of basic dykes, intrusive into quartzites and mica schists, has produced magnesite. In a radius of about three-quarters of a mile from the road crossing over Bandalup Creek, numerous patches of magnesite occur as boulders of varying size, in some places forming almost continuous masses. In places the magnesite was seen to be three to four feet in thickness but the extent of mineral of this thickness cannot be determined in the absence of prospecting pits. The boulders vary from hard nodular to soft cellular and a bulk sample was obtained by picking over an area of about two acres on the south side of the road and west of the creek bed. This sample

(G.S./M42) gave the following result on analysis in the Government Chemical Laboratory:—

Silica, SiO ₂	2.17 per cent.
Iron and Alumina, Fe ₂ O ₃ , Al ₂ O ₃	1.26 per cent.
Magnesia, MgO	39.42 per cent.
Lime, CaO	7.26 per cent.
Carbon dioxide, CO ₂	47.35 per cent.

Vermiculite.—The most promising vermiculite deposit examined was that on Halbert's leases on the Young River situated 64 miles by road east of Ravensthorpe. Numerous samples from these leases have been tested in the Government Chemical Laboratory with promising results. An exhibit prepared by the Government Mineralogist and Analyst, showing the various grades of raw material and the expanded products obtained from them, has been placed on view in the entrance hall of the Mines Department.

The Young River leases are at present held under option by the proprietors of the Perth Modelling Works and are being actively developed. The company has up to the present processed and sold about 10 tons of expanded vermiculite products.

MICA MINING ON MINERAL CLAIM 159H, MORRISSEY HILL, YINNIETHARRA STATION, GASCOYNE RIVER.

(H. A. Ellis, B.Sc., A.O.S.M.)

During a recent trip (July, 1940) to this locality to inspect occurrences of bismuth carbonate on other leases in the district, the writer had the opportunity of inspecting some mica-mining operations on Mineral Claim 159H—a mineral claim of 24 acres recently pegged to include the old open cut on former M.C. 39H, known as the "Mica King" lease, which was reported on by Mr. R. C. Wilson in the Annual Report of the Department of Mines for 1926.

The old open cut is situated less than half a mile south of Morrissey Hill on the northern bank of Morrissey Creek.

GEOLOGY.

The mica occurs as a well defined vein up to three feet thick situated at or near the hanging wall of a coarse-grained pegmatite dyke intrusive into straight banded gneisses and biotite-muscovite-tourmaline schists which strike a little north of west and dip at 40° to 50° southwards.

The dyke can be seen to be at least 20 feet thick in some places, and contains irregular-shaped concentrations of mica irregularly distributed in it, apart from the well defined mica concentration on or near the hanging wall.

The economic possibilities of the deposit are governed by the uni-mineral concentration of mica in a defined part of the dyke, and the quality of the mica confined thereto.

The books of mica average about 9 inches by 6 inches by 4 to 5 inches thick and are enclosed in a feldspar matrix which constituted less than 40 per cent. of the vein structure in the existing faces (July, 1940).

MINING OPERATIONS.

The syndicate at present operating the claim is carrying out its work under the direction of a Mr. Spargo in whose name the claim is pegged.

The old open cut appeared to have reached a maximum depth of some 30 feet on the underlay, over about 60 or 70 feet of the length of the outcrop of the mica vein on the hanging wall of the pegmatite dyke.

The new workings consist of a vertical shaft commenced at the junction of the mica vein with the hanging wall at the western end of the old open cut, and sunk for a vertical depth of 40 feet through the pegmatite dyke into the footwall country for a few feet only.

A crosscut through the dyke for 20 feet to the south met the mica vein near the hanging wall, and drives of 26 feet east and 20 feet west had been driven on the mica at the time of inspection (July, 1940). Both faces were in mica, and the deposit was being mined exactly as if it were a gold-bearing quartz reef. A round of eight holes was being bored in each working face, the holes being kept in the mica deposit, and full charges of explosives fired in each round.

This is a most unusual method of mining for mica and obviously is a very wasteful one, particularly when the schistose nature of the walls permits of the use of better methods. The mica is heavily iron stained, the books being quite opaque as the result of a series of iron oxide inclusions arranged on a linear pattern intersecting at 60° and 120°.

Some of the books are penetrated by acicular tourmaline or quartz crystals, and many of them have flat, thin accumulations of what appears to be secondary silica between the laminae.

The prospects of the mica becoming cleaner in depth can be summarised as follows:—

- (a) Iron oxide films which produce the variegated patches of colour in the mica at present being mined will become less frequent.
- (b) The thin crusts of secondary silica between the laminae will disappear.
- (c) The linear inclusions arranged on the crystallographic pattern will persist, these being, in all probability, developed at the same time as the mica crystallised from the parent magma.

The mine is equipped with a 15 h.p. Rushton Hornsby crude oil engine, small C.P. compressor and receiver, geared friction winch and rock drills fitted with Riley bits. The mica is trimmed only on the mine, a hand guillotine being used for this purpose.

The owners claim that they have a profitable market for their comparatively low grade product, and prospects of obtaining considerable quantities of stained mica of otherwise good quality are good, as the mica vein outcrops through the soil for some 200 feet westwards from the shaft, and the present workings are at 40 feet vertical depth only and confined to the western 20 feet of this length.

Good grade stained mica still persists in the vein on the hanging wall at the bottom of the old open cut, and if the relative proportion of mica to matrix as is exposed in the faces being worked at present persists in future development work, the quantity of mica won per ton of formation mined will be relatively high for mica mining operations.

REPORT ON BISMUTH CARBONATE DEPOSITS IN PEGMATITE DYKES ON M.C. 195H, AND P.A. 744H, NEAR MORRISSEY HILL, YINNIETHARRA STATION, GASCOYNE RIVER.

(Lands Dept., Litho. 78/300 S.W. Quadrant.)

H. A. Ellis, B.Sc., A.O.S.M.

Mineral Claim 195H.

LOCALITY.

This claim is registered in the name of Messrs. Hassell and Roe, has an area of 30 acres, and is situated on the south side of Morrissey Creek about three quarters of a mile south 30° east of Morrissey Hill. Morrissey Hill is a low but prominent quartz capped hill situated on gently undulating country, some eight miles due north of Yinnietharra Station Homestead, the latter being built on the north bank of the Gascoyne river. The Morrissey Hill locality is reached in 12 miles by station road, first in a general direction of N.20° E. for eight miles and then westerly for four miles.

GENERAL GEOLOGY.

A prominent series of straight banded gneisses and biotite-muscovite-tourmaline schists with a regional strike approaching to east and west and dipping at moderate to steep angles to the south outcrops frequently in the locality.

Intrusive into this series are numerous very coarse grained pegmatite dykes, quartz reefs, greisen dykes and massive granite. The pegmatites are both concordantly and transgressively intrusive into the schists and gneiss and are noteworthy for the particularly large crystalline development of the component minerals, mica and feldspar. Some large crystals of tourmaline and beryl occur in the dykes, being frequently associated with the quartz segregations. There is also a tendency for the formation of almost mono-mineralic concentrations, e.g., masses of mica, feldspar or quartz, and occasionally tourmaline.

THE BISMUTH CARBONATE OCCURRENCE.

Towards the north-western corner of the lease, a roughly oval shaped pegmatite mass some 200 feet long in an east and west direction and some 100 feet thick in a north and south direction is intrusive into biotite-muscovite-tourmaline schist, and forms a quartz-capped hill some 60 to 70 feet high immediately on the south bank of Morrissey Creek.

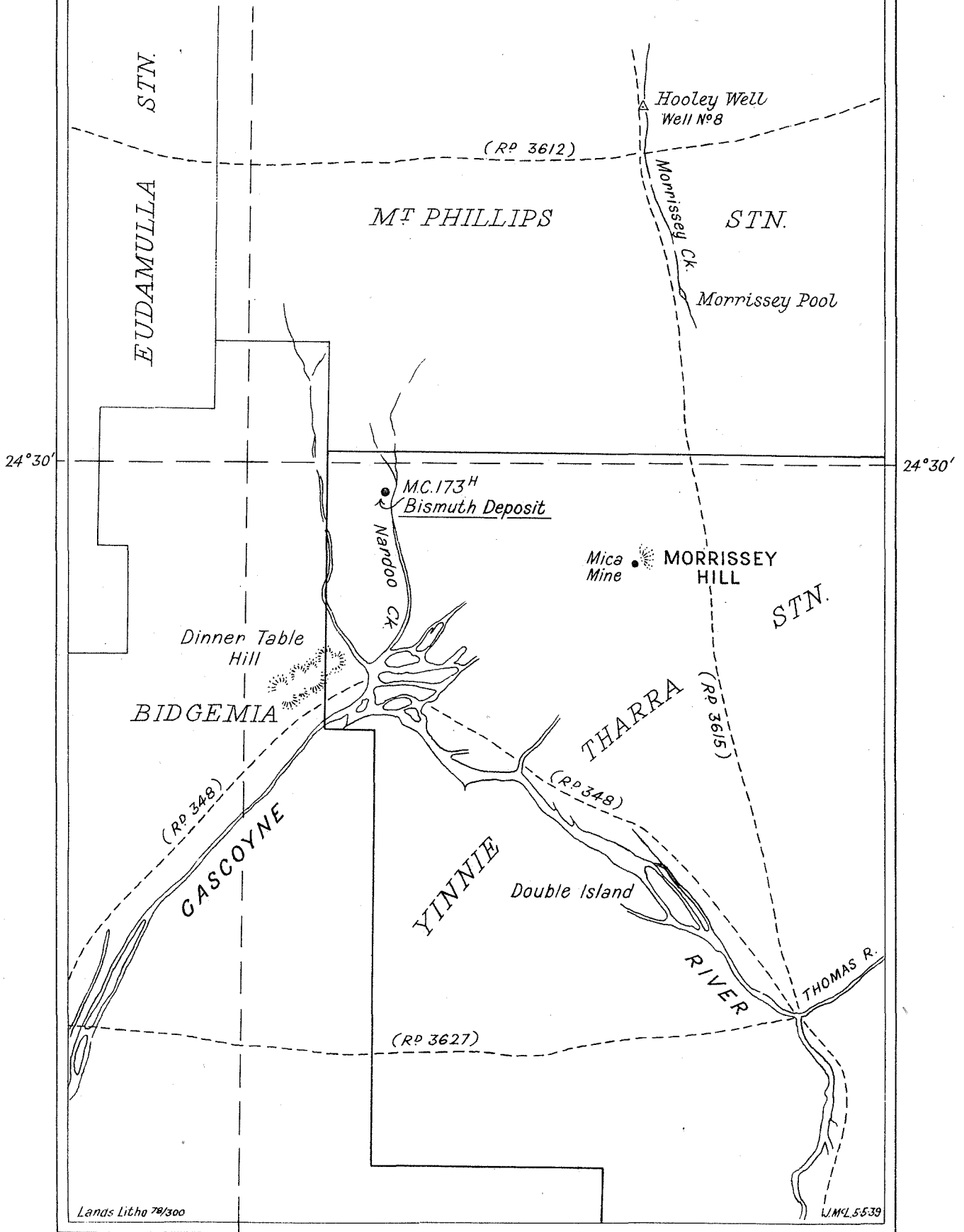
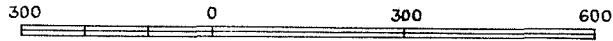
Quartz concentrations occur mainly on the southern edge of the mass and the rest of it is a typical very coarse grained pegmatite.

Small pieces of angular eluvial bismuth carbonate were found on the northern, western and southern slopes of the small hill, and a well defined run of eluvial was located on the northern slope, which when followed upwards lead to the location of a patch of bismuth carbonate with intergrown clear glassy quartz of about 400 lbs. weight *in situ* in the pegmatite dyke. The pegmatite surrounding the concentration consists mainly of feldspar with a small proportion of fine, scaly green mica, and the feldspar near the bismuth carbonate mass appears to be partially kaolinised.

The excavation from which the bismuth ore was dug was about six feet long by three feet wide by three feet deep when inspected on the 21st July,

PLAN SHOWING
LOCALITY OF BISMUTH DEPOSIT
YINNIE THARRA STATION

Scale 300 chains to an inch



116° 0'

1940, and a small oval shaped patch of partially kaolinised felspar some nine inches across was visible in the bottom of the hole. No bismuth ore was noticed, and beyond this slight kaolinisation of the felspar there was no mineralogical or structural guide as to possible location of any other concentration of bismuth ore.

Another very much smaller concentration of a few pounds weight only was reported to have been located near the quartz concentration on the southern side of the mass near the crest of the hill. The shallow excavation did not reveal the true nature of that part of the dyke in which this ore was found.

Still another very small concentration of bismuth carbonate was located on the northern fall near the top of the hill, this time in massive white and glassy quartz. The shallow excavation did not reveal any evidence leading to the possible occurrence of further ore.

PROSPECTS OF DEVELOPMENT.

The position at the time of inspection (21st July, 1940), was that the concentrations of bismuth carbonate located by surface prospecting methods (visual examinations and panning) had been recovered from shallow excavations, and that in no instance was there a sure structural or mineralogical guide as to the possible location of more ore.

A plant consisting of an oil engine, compressor and rock drill was on the way to the claim, and preparations were being made to install the plant.

The cumulative evidence gathered from the manner of occurrence of this elusive mineral in this claim and P.A. 744H, situated near Morrissey Hill, and Mineral Claims 173H and 191H situated some eight miles further westwards, is that the bismuth ore is a pegmatitic mineral deposited primarily as a sulphide (bismuthinite) forming an accessory mineral to the mica, felspar and quartz of the pegmatite.

Its manner of occurrence can be best likened, perhaps, to the sporadic distribution of, say, the currants in a currant bun, to use a simple comparison, and the geological probability of the occurrence of other patches of unpredictable dimensions near those already found is such as to make almost certain, in the absence of extreme good fortune, the mining of large quantities of barren dyke without encountering more ore.

This peculiarity of occurrence also makes it almost immaterial, in the absence of structural or mineralogical guides, in what direction in the dyke exploratory work is undertaken.

There is, perhaps, one slightly encouraging feature about the pegmatite dykes of the Morrissey Hill locality which has a bearing on the occurrence of possible concentrations of bismuth ore, and that is the tendency in the dykes for the formation of almost uni-mineral masses such as the mica veins of the mica leases, the irregular shaped masses of almost pure felspar, of mica, or tourmaline or quartz, or the large beryl crystals occasionally two feet across, sometimes seen.

The 400 lb. patch of bismuth carbonate and quartz already found may be regarded as one of these uni-

mineral masses, but the metallic mineral contents of pegmatite dykes are notoriously erratic in distribution in whatever part of the world they are found, although in some cases there is a tendency for these minerals to be situated in certain portions of the dykes such as marginally, or at dyke intersections.

The future development of this deposit depends on the location of new concentrations of bismuth ore by a prospecting campaign which cannot be guided by the usual mineralogical and structural indications associated with deposits of many other minerals, and which is also a campaign in which more than the usual amount of prospectors' good fortune will be needed on account of the irregular manner of occurrence of the bismuth ore.

It was suggested to the owners that the sinking of shallow shafts on the spots where the patches of bismuth ore were found *in situ*, and lateral prospecting in any direction for short distances from the shafts, was perhaps as intelligent a way as any other of searching for more ore. A sharp watch should be kept for mineralogical or structural indicators in these operations, and from the results of three or four of these excavations, evidence about the manner of occurrence of the mineral sufficiently conclusive to decide whether or not a continued search is warranted would be obtained.

P.A. 744H.

This prospecting area of 48 acres is situated about 1½ miles N.N.W. of Morrissey Hill in similar country geologically to that in the vicinity of Mineral Claim 195H.

Near the western end of a particularly coarse-grained pegmatite dyke forming a low ridge on this prospecting area, there is a considerable development of greisen dykes as well as many concentrations of quartz as large irregular lenses.

A small occurrence of bismuth carbonate was located in partially kaolinised felspar in a small mixed patch of greisen and pegmatite. A small shallow excavation some three feet deep still shows traces of bismuth carbonate and yellow bismuth oxide in one wall, which is mainly kaolinised felspar with some fine scales of a greenish coloured mica. The greisen and pegmatite are more decomposed in the vicinity of this excavation than is usually the case in this district, and further burrowing in a lateral direction and vertically is warranted here.

The same conditions as apply to the manner of occurrence of the bismuth carbonate and the means of prospecting the dyke on Mineral Claim 195H are applicable here.

There are some particularly large beryl crystals lying about on the surface of this prospecting area, and a thin quartz lens with associated copper carbonate stains in a biotite-muscovite-tourmaline schist occurs in one place. This copper occurrence is of mineralogical interest only, and has no commercial prospects.

Crystals of green tourmaline were found on the surface of the ground close to the pegmatite dykes, but those seen were too fractured to be of value as gem stones.

PROGRESS OF WORK ON MINERAL CLAIM
173H, YINNIETHARRA STATION.

(H. A. Ellis, B.Sc., A.O.S.M.)

This was the first mineral claim pegged for bismuth in the Morrissey Hill locality and was visited and inspected by H. A. Ellis in April, 1939. The report is published in the Annual Progress Report of the Geological Survey for 1939.

At the time of the inspection the claim was under option to a Perth syndicate of business men and was being worked by the owners, Messrs. Thompson and Hodges, as employees of the syndicate.

The recommendation was made to the principals of the syndicate that the best procedure was to work out all the possible eluvial and alluvial ground, and not to attempt the mining of the pegmatite dyke. Apparently the option was surrendered before this was done, as the original holders are still in possession of the claim.

During the option period, up to the time of inspection—April, 1939, some 800 lbs. of eluvial bismuth carbonate was reported to the syndicate, and since then, some three tons of bismuth carbonate mostly eluvial, has been obtained from the claim.

A considerable number of shallow excavations best described mainly as horizontal burrowings in the dyke hill, and costeans, trenches and shallow shafts, but in the main representing a considerable expenditure of labour and explosives, have been dug chiefly on the southern fall of the ridge near the crest and particularly at the eastern end. These were made in the pegmatite in search of bismuth ore, and according to the owners resulted in the finding of very little ore. They were mainly started at or near places where a small area of a square yard or so of the surface contained sharply angular bismuth carbonate.

The net result of all of these openings was to prove the original contention of the writer, that mining the dyke was unpayable, as there was no structural or mineralogical guide to the position of the next patch of bismuth ore.

A careful inspection of the claim leads one to believe that the bulk of the bismuth carbonate so far obtained from this claim has been won from the repeated sieving of the eluvium covering less than a square chain in area on the southern fall at the eastern end of the hill.

Natives have been freely used in these sieving operations, and no doubt their peculiar adaptability to surface prospecting has been in no small measure responsible for the quantity so far won.

Unless further patches of eluvial or alluvial bismuth carbonate are located on the lease, the production from this area will cease when the present small eluvial patch is worked out.

NOTES ON BISMUTH DEPOSITS ON MINERAL
CLAIM 191H, NARDOO CREEK, YINNIETHARRA STATION.

(H. A. Ellis, B.Sc., A.O.S.M.)

Mineral Claim 191H of 100 acres is apparently Mineral Claim 175H of 179 acres re-pegged to a smaller area confined to the eastern portion of M.C. 175H as originally pegged.

The claim adjoins M.C. 173H (Thompson & Co.) to the west, and takes in part of the western end of

the ridge of pegmatite which comprises the main asset on M.C. 173H. Faulty pegging of M.C. 173H in the first instance left this portion of the bismuth carbonate bearing pegmatite dyke included in M.C. 173H out of that claim, and after some trouble Stuart & Co. were able to include it in M.C. 191H.

Close to the eastern boundary of the claim immediately west of the cairn, and at the foot of the ridge on the western end of which the cairn is built, the owners found a small patch of eluvial bismuth carbonate on the surface of the weathered coarse-grained pegmatite dyke.

A shaft was commenced on the spot with the intention of "sinking to the bismuth lode." At the time of inspection, 19th July, 1940, the shaft was down 35 feet in fresh, coarse-grained pegmatite, and in all some 50 lbs. of carbonate ore, including the 30 lbs. of eluvial first found at the shaft site, had been located in three small concentrations some 10 feet or so apart in the shaft.

The dyke here dips to the south at about 60°, and strikes a little north of east. The footwall country and part of the dyke had been exposed in a N.-S. costean some six feet deep and 60 feet long excavated prior to the sinking of the shaft. No ore was found in this costean.

The country rock on the footwall is a partially decomposed biotite-muscovite-tourmaline schist, and the hanging wall country is not exposed, being covered by alluvium.

No mineralogical or structural indications exist which point to the likely position of more bismuth ore, and the dyke, which is itself the bismuth lode, consists mainly of large felspar and stained mica crystals with some quartz.

The nature of the mineral occurrence was explained to the prospectors who were working under the syndicate's instructions, and if it was desired to continue the search for large bismuth ore concentrations, they were advised to crosscut to the south and drive to the east since they were instructed to crosscut and drive. These directions would keep the working definitely in the dyke at least, though with no predictable chance of success.

Some 15 chains N.W. of the shaft, a quartz concentration in a pegmatite mass on a ridge was being opened up on no definite indication except the finding in the vicinity of a few small pieces of eluvial bismuth carbonate.

THE GEOLOGY AND MINING GROUPS OF
PORTION OF THE MT. MARGARET GOLD-
FIELD.

(R. A. Hobson, B.Sc. (Hons.))

SUMMARY.

In October, 1937, a commencement was made at Beria to re-examine a portion of the Mt. Margaret Goldfield. This survey was continued by the writer and his colleagues until August, 1940, when work was suspended due to war conditions, before the completion of the mapping over the area it had been proposed to examine. Progress reports have already appeared in the Annual Report for the years 1937, 1938, and 1939. During the 1940 field season Mr. Miles was absent from the field due to the lack of transport, and the writer's attention was confined to

the examination of mining groups. Mining groups at Pike's Hollow, Pennyweight Point, Yundamindera, Redcastle and Murrin were examined and reports on these centres have been compiled. Mr. Miles has petrologically examined some 600 specimens collected since the commencement of the survey.

Since 1937 broad geological mapping, on a scale of 80 chains to an inch, has been carried out over an area which covers approximately the eastern halves of Lands Department Lithos 43/300 and 52/300 and also a small portion of 44/300. The area mapped includes the towns of Murrin, Morgans

and Laverton and extends north to include the old townsites at Erlistoun and Duketon, east to include Burtville, and south to include Wilga, Trig. Station and the old Yundamindera Townsite. The 80-chain mapping has been supplemented by mapping on a scale of 20 or 40 chains to an inch over quite appreciable areas. In addition to this 25 mining groups have been mapped since 1937 on a scale of five chains to an inch. Underground workings have been examined and where necessary mapped.

The following rock classification table summarises the general geological information now available:—

CLASSIFICATION OF ROCKS FROM PORTION OF THE MT. MARGARET GOLDFIELD.

Age.	Description.	Notes.
Recent to Sub-recent	Soil, alluvium, siliceous and ferruginous laterite, grits and conglomerates	
Age unknown	Glacial erratics	
Pre-Cambrian ...	Intrusives— Lamprophyres Dolerites Granite, gneiss, porphyries, porphyrites, pegmatites, aplites, barren and auriferous quartz reefs Medium and coarse-grained amphibolites and epidiorites Ultra basic rocks Flow rocks and sediments— Intermediate and basic lavas and pyroclastics, erosion sediments, including conglomerates and jaspilites	These are believed to be post folding in age, but granitic rocks intruded in part before the end of the period of folding. Relative ages not known; also age relative to folding not known, but may be pre-folding sills. The auriferous series. Pebbles occurring in conglomerates include granitic rocks and amphibolite (one specimen). No other evidence of two ages of granite.

Although outcrops are too poor to enable a precise figure to be given it appears likely that the proportion of sediments to flow rocks in the auriferous series is as high as 50% and may even be higher. Outcrops are too poor to enable these two rock types to be mapped over any extent of country. The only bed which can be traced for any distance is the jaspilite—all outcrops of which have been carefully mapped. More information about the general geology is to be found in the writer's complete progress report, and in Mr. Miles's petrological notes. Problems remaining to be solved and localities where more mapping may solve these problems are also indicated. Reference is also made in the writer's report to previous reports, which outline the broad structure of the area or give information about mining groups. It is believed that the broad geological structure has been satisfactorily worked out, and it is shown that the mining centres of Laverton, Morgans and Murrin are not associated with a major crossfold. No minor crossfold or other minor structural feature is apparent in the vicinity of Laverton and Morgans, but it would seem to be desirable to review the mapping at these centres before finally leaving the area. The mapping in the vicinity of Murrin is not yet complete.

COPPER IN THE MURCHISON AND YALGOO GOLDFIELDS.

(R. A. Hobson, B.Sc. (Hons.))

SUMMARY.

During November, the writer inspected all the known occurrences of copper in the Murchison and

Yalgoo Goldfields. No copper is being mined at the present time and all the old workings are inaccessible. Information about the size and nature of the ore bodies is therefore very incomplete. Descriptions of some of the old workings are to be found in Mines Department publications. At some places information can be obtained from prospectors, who have been resident in the district for a long time, while at other places the only information available is such as can be obtained from an inspection of the ore paddocks or the dumps, and from the general distribution of the shafts.

The total production from the Murchison Goldfield is 1,024 tons from which 139.69 tons of copper have been produced. In the Yalgoo Goldfield 69.9 tons of ore have yielded 7.48 tons of copper.

The following types of ore body are recognised:—

- A. Quartz reefs and lodes worked primarily for gold, but containing some copper.
Production: Murchison Goldfield, 75.34 tons copper; Yalgoo Goldfield, —.
- B. Quartz reefs worked primarily for copper, but may contain some gold.
Production: Murchison Goldfield, 7.78 tons copper; Yalgoo Goldfield, 2.08 tons copper.
- C. Ore bodies which consist in the oxidized zone of limonite and copper carbonates.
Production: Murchison Goldfield, 45.5 tons copper; Yalgoo Goldfield, —.
- D. Narrow seams and irregular bunches of malachite in weathered country rock,

which may be either schistose or massive. Narrow quartz veins may be present and the malachite may be associated with these.

Production: Murchison Goldfield, 1.41 tons; Yalgoo Goldfield, —.

E. Sulphide ore bodies (chalcocite) in the oxidized zone.

Production: Murchison Goldfield, not known; Yalgoo Goldfield, —.

Auriferous quartz reefs containing less than 1% copper are of very frequent occurrence and many small gold mines have closed down because the sands contained too much copper for cyanidation. In some auriferous reefs the copper minerals are concentrated into scattered rich patches, which have been mined for copper. These constitute ore bodies of type A above. More than half the total production of the Murchison Goldfield has come from ore bodies of this type occurring in the immediate vicinity of Gabanintha townsite. The largest production from any one mine is 45.5 tons of copper from "Lady Alma," M.L. 4N at Gabanintha, where ore bodies of type C have been worked. In all 139.69 tons of copper have been produced at Gabanintha. Ore bodies of type B have produced small quantities of copper at Holden's Find, Day Dawn, Twin Peaks and Mt. Gibson. The only production from ore bodies of type D is 1.41 tons of copper from Yaloginda. Sulphide ore bodies (type E) were worked during 1898 or 1899 at Day Dawn, but no record is available of the copper produced.

The ore bodies have all been small and there are no indications at the surface, suggesting the existence of larger ore bodies. While further prospecting may reveal new ore bodies it is unlikely that any of these will be large enough to warrant the erection of a treatment plant. This being so, ore must be shipped away outside the State for treatment and costs will be high. For Gabanintha it is estimated that 17% of copper is required to cover transport and treatment costs and that for Day Dawn 15% copper is required to cover the same charges. These percentages are based on an assumed price for copper of £A75 per ton and are for parcels of not less than 10 tons. The ore has been assumed to contain no impurities, which would render it liable to penalty charges.

Prospecting in the vicinity of Gabanintha and Day Dawn and possibly also in the vicinity of M.L. 66 (30 miles N.N.W. of Cue) might reveal some new ore bodies, which are likely to be small and scattered.

THE COPPER DEPOSITS OF THE PEAK HILL GOLDFIELD.

(R. S. Matheson, B.Sc.)

SUMMARY.

During November, 1940, the writer inspected the principal copper deposits in the Peak Hill Goldfield, which are situated at Ilgarari, Kumarina, Bulloo Downs and Truman's Find. A complete examination of the deposits was not attempted, as the object of the investigations was to find out in the shortest

possible time, the nature of the deposits and whether or not large quantities of copper ore could be expected from them.

At the time of inspection the only activity in the area was at Truman's Find, where two copper lodes were being prospected, and, with the exception of a few shallow pot holes, these were the only accessible workings. The information in this report is therefore mainly based on observations made at the surface, but some details concerning the underground workings have been obtained from previous reports published by the Geological Survey.

The official records show that to the 31st July, 1940, the Peak Hill Goldfield produced 355.40 long tons of metallic copper, valued at £A32,364, by the treatment of 1,030.10 long tons of ore. Approximately 88% of the copper came from mines at Ilgarari and Kumarina.

Except at Kumarina, where the host rocks of some of the lodes are considered to belong to the Warrawoona Series, all the copper deposits occur in rocks of Nullagine age. All the lodes are situated in steeply dipping fissures, and consist of a mixture of cellular quartz, kaolin and a little limonite, which is impregnated with copper minerals. Small ore shoots occur erratically in the lode channels, and they have been mined to water level (25 to 50 feet vertical depth) in several places. The main ore minerals are *chalcocite* and *malachite*, which are present in the form of small lenses, bunches and seams, but associated with them are minor quantities of *chryso-colla*, *azurite*, *cuprite*, and *tenorite*. *Chalcopyrite* was also observed in one of the shaft dumps at Kumarina. Strong neutralising agents, although not abundant, are associated with the lodes, and *calcite* has been detected in specimens of ore from Ilgarari, Kumarina and Truman's Find.

The chalcocite appears to be of secondary origin, and its occurrence in the lodes between the surface and ground water level suggests that an acceleration in the rate of erosion has occurred in the district. The chalcocite is expected to gradually disappear at depth, and chalcopyrite become the principal copper mineral in the lodes. It is unlikely that lode material from the primary sulphide zone would be payable under existing conditions.

With the price of metallic copper at its present figure of approximately £A75 per long ton, it has been estimated that ore forwarded for treatment must have a metallic copper content of about 30% to cover mining, transport and smelting charges and yield a small margin of profit. Transport charges are a big item in these overhead costs, as parcels of ore have to be forwarded to Port Kembla (New South Wales), for treatment. Selective mining of the lodes underground and hand picking of the ore at the surface is necessary to retain a metallic copper content of not less than 30%.

In conclusion, the only production which can reasonably be expected from the district in the immediate future, is that from small and infrequent parcels of ore, but the production would be augmented if prospecting along the following lines was successful.

(1) As mining of the main ore bodies has almost everywhere been discontinued in the vicinity of ground water level before the primary sulphides were

encountered, deeper prospecting for a possible extension of the secondary sulphide zone is warranted.

(2) As the lodes at Truman's Find are similar in character to those already mined in the district, a continuance of prospecting at this centre is recommended.

(3) All the lodes mined in the district have strong indications of copper at the surface, and none of the limonite gossans without copper stains or the cellular quartz reefs without copper stains or indigenous limonite, which frequently occur on the strike of the cupriferous lodes, have yet been investigated. These gossans may represent the leached outcrops of copper lodes, and at least one of each of these two types of gossan should be prospected.

MINING GROUPS IN THE YILGARN GOLDFIELD.

(North of the Great Eastern Railway.)

(R. S. Matheson, B.Sc.)

SUMMARY.

The detailed investigations of the mining groups in this area were continued during 1940, and brought to conclusion in August. Reports accompanied by maps and plans have been compiled to cover the following groups, which are all situated in the Jackson Belt.

Evanston Group	Athlone Group
Broadbent's Find	Jackson Group
Rainy Rocks Group	Millar's Find
Diemel's Find	Allen's Find
Yarbu Group	Riedel's Find
Clampton Group	Boondine Group
Bullseye Group	Burgoose Group
Die Hardy (Olby Rocks) Group	
Atkinson's Find (Butcher Bird Group)	

As a result of these investigations it was found that the following areas in the Jackson Belt offer the best scope for future prospecting.

(a) The belt of greenstone country, which runs in a north-easterly direction from Diemel's Find, is lithologically and structurally favourable for ore deposition. It is about 10 miles wide and about 30 miles long, and contains numerous horizons of jaspilite. Ore bodies are most likely to be found within or in proximity to the bands of jaspilite, which have a platy structure, particularly where they show local deviations in strike from the general strike of the country. In recent years, discoveries have been made in this belt of greenstone at Evanston, Broadbent's Find and Rainy Rocks.

(b) Prospecting is warranted along the greenstone-granite contact, which runs north from Jackson through Clampton, particularly due west of existing mining groups.

(c) The Manning and Bungalbin Ranges were not visited by the writer, but from what information is available it appears that prospecting may be done to advantage in these areas.

Although no work on the general geology of the Jackson Belt has been carried out, the detailed mapping around Marda suggests that the sediments, which have been correlated with the Kurrawang

Series by Honman*, are really two series, one of which belongs to the Yilgarn System and the other of recent age.

Since the completion of the fieldwork for the re-survey of the mining groups in the northern portion of the Yilgarn Goldfield, Mr. K. R. Miles has made a petrological examination of the rocks collected in the area, and has compiled a report† on the more interesting types.

EVANSTON GROUP.

YILGARN GOLDFIELD.

(R. S. Matheson, B.Sc.)

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GENERAL INFORMATION.

The Evanston leases are situated on a prominent ridge approximately 17 miles north-east of Pigeon Rocks.

The main road to the group is from Bullfinch, and it passes through Glasse's Well, Marda, and the Die Hardy Ranges, but the centre can also be reached by a track which branches off the Pigeon Rocks-Menzies road about 20 miles from Pigeon Rocks. The Menzies road is used when mining material or ore is being transported between Kalgoorlie and Evanston, as it is the shortest route between the two centres.

Acting on the advice of a sandalwooder named Evans, the first prospecting area at the group was pegged by Walters on the 22nd February, 1937, and the discovery was followed by a mild rush. Shortly afterwards the Western Mining Corporation acquired an option over the main holdings, but as this option was subsequently surrendered, it is assumed that the results of their prospecting campaign were not encouraging. Development work since that time however, has proved Evanston to be one of the most important discoveries in recent years.

At the time of inspection (April-May, 1940) the main activity was on the Ridge Bros. Property, and this syndicate held the following leases:—“Evanston” G.M.L. 3868; “Ridges” G.M.L. 3891; “Blue Peter” G.M.L. 3895; “Mac Bean” G.M.L. 3887; “Ryans” G.M.L. 3894; “Evanston East” G.M.L. 3870; “Goldies” G.M.L. 3888; “Harbour Lights” G.M.L. 3912; “McCourt” G.M.L. 3886; “Evanston South East” G.M.L. 3879; “Evanston South West Central”

*Honman, C. S., G. S. W. A. Bull, No. 71, pp. 161-165.

†See p. 86.

G.M.L. 3878; "Evanston North West Central" G.M.L. 3877 and P.A. 5048.

The only other leases in existence were the "Evanston North" G.M.L. 3869 and the "Everett" G.M.L. 3890. The latter lease has since been acquired by the Ridge Bros. and renamed the "Four B's" G.M.L. 3963.

Water for mining purposes is obtained from a bore situated about 1½ miles south of the main mine. The bore is equipped with a pump, engine and overhead tank, so that the water can be conveniently obtained. It is reported that the bore is 132 feet deep, and that ground water level is at 122 feet. This bore is said to be capable of supplying 10,000 gallons of stock water per day.

Water for domestic purposes is carted from Pigeon Rocks a distance of 22 miles by road. The supply is a soakage well equipped with a windmill and tank. The quality and the supply are good, but the equipment is badly in need of replacement. It is understood that the Water Supply Department are

considering the provision of a domestic water supply closer to Evanston than Pigeon Rocks.

The vegetation in the vicinity of Evanston consists of a mixture of mallee and mulga, which, apart from a few patches of tall mulga, is quite unsuitable for mining purposes. The Ridge Bros. obtain their supplies of mining timber (salmon and gimlet) from south of Marda, about 40 miles distant.

On the Ridge Bros. mine a 5-head battery, with grinding pans*, a cyanidation plant and filter presses, is in operation, but it is not available for public crushings.

The nearest public battery is the Butcher Bird Battery at Marda, where a 5-head mill and a cyanidation plant are available. This battery is about 34 miles from Evanston.

The official records show that to the 31st July, 1940, the Evanston Group of mines has treated 18,412.54 long tons of ore for the recovery of 11,020.93 fine ozs. of gold. The production data for the individual leases are given in the following table.

PRODUCTION OF GOLD FROM EVANSTON GROUP TO 31st JULY, 1940.

Number of Lease.	Name of Lease.	Dollied and Specimens.	Ore Treated.	Gold Therefrom.	Grade.
		fine ozs.	long tons.	fine ozs.	fine ozs. per ton.
3895	Blue Peter ... ..	...	1,288.00	285.84	0.22
3868	Evanston ... ..	...	14,378.30	9,375.09	0.65
3870	Evanston East ... ..	...	34.00	13.59	0.39
3869	Evanston North ... ..	...	1,439.99	997.48	0.69
3888	Goldies ... ..	...	200.00	43.15	0.21
3912	Harbour Lights ... ..	...	337.00	80.38	0.23
3890	Everett ... ..	...	300.00	142.49	0.47
3963	Four B's ... ..	...	12.00	7.83	0.65
	Sundry Claims ... ..	...	423.25	75.08	0.17
	Total ... ..	...	18,412.54	11,020.93	0.59

GENERAL GEOLOGY.

The leases are situated on a prominent ridge, occurring in a previously unmapped belt of greenstone country. The belt is 1¼ miles wide, and is composed of metamorphosed, interbedded, greenstones and jaspilites, which have been contorted, and intruded by garnetiferous pegmatite dykes and barren quartz reefs. To the north-west and south-east the rocks grade into biotite gneiss, which is believed to be of replacement origin. The general strike of the country is N. 50° E. and the dip varies from 20-60° N.W. Due to folding however, some local south-westerly dips are met with in the area mapped (Plate II.). The rocks are presumed to be of Pre-Cambrian age.

Greenstones.—The greenstones are represented by fine to coarse grained amphibolite schists. The schistosity is strongly developed and because of its parallelism in strike and dip to the jaspilite horizons, it is believed to be more or less coincident with the bedding. A vertical north-west jointing is also present in the rocks, and this is attributed to the forces producing the set of folds, which have northwest-southeast axes. The writer is of the opinion that the greenstones are metamorphosed, basic sediments, but it has been suggested to him by the Government Geologist that they may have originally been basic lavas. Until the mode of origin of these rocks is definitely established, they will be referred to as

basic schists. The greenstones are fairly fresh throughout the area, except in proximity to the barren quartz reefs, where they are bleached and silicified. They also show a biotitic alteration near the lode channels.

Jaspilites.—Two main zones of jaspilite, each made up of several bands, occur in the area. All the jaspilites are the brown ferruginous variety, but two distinct types are present. The jaspilites of the northern zone are a platy type, which are only gently folded, while those of the southern zone are a massive type, and they are highly contorted. All the ore bodies so far discovered at Evanston, occur in proximity to the northern zone of jaspilite, which is believed to have been more favourable to gold deposition than the southern zone, because of its distinctive characteristics.

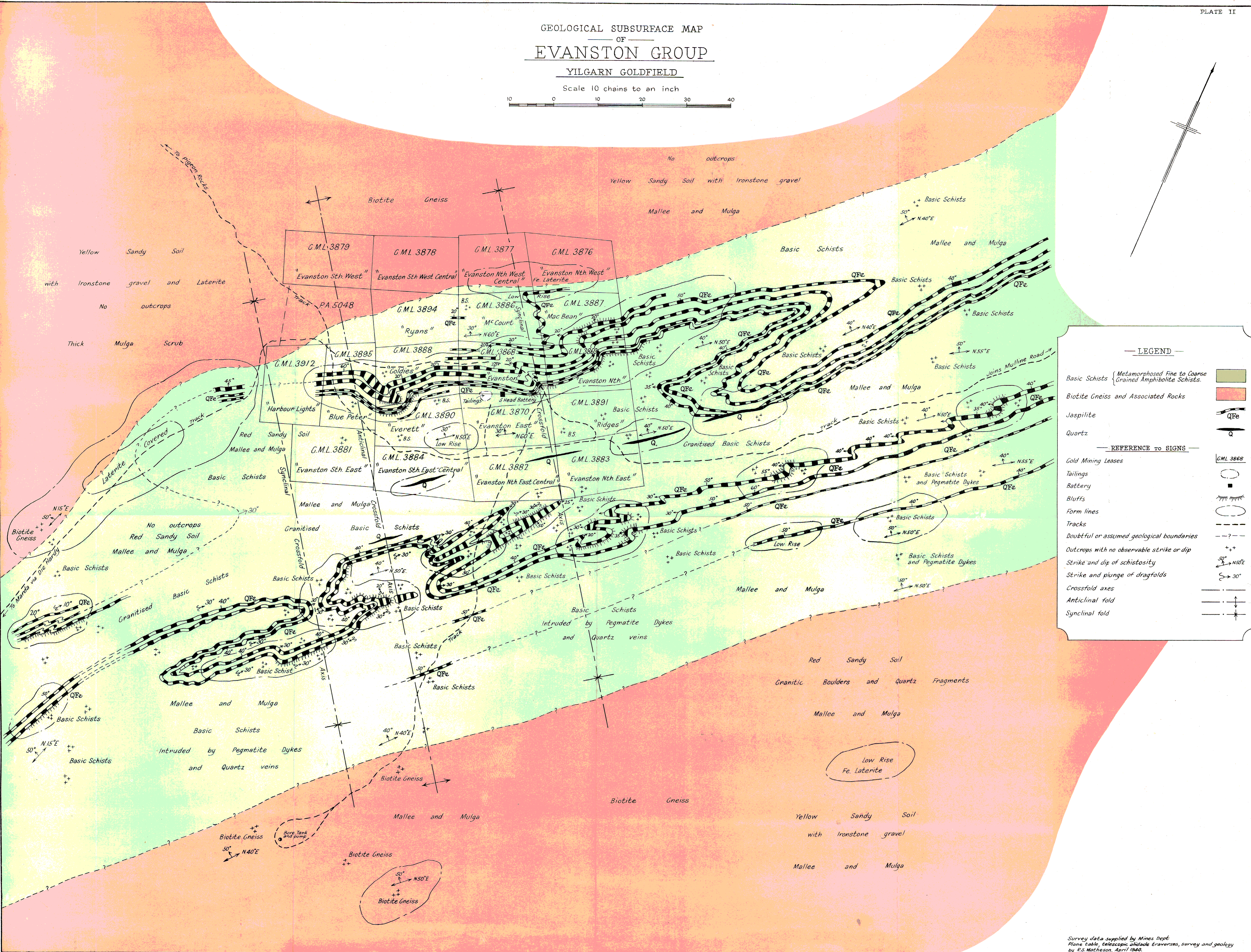
To the writer's knowledge, all the main ore bodies in the Yilgarn Goldfield, occurring within or in proximity to jaspilites, are associated with the platy type. When the massive type is auriferous, it is associated with small, rich shoots, which live only to shallow depths. It is not known whether the two types of jaspilite owe their origin to differences in original composition, or to differences in the intensity of metamorphism, but they certainly have an economic significance.

*Since the inspection was made a ball mill has been installed.

†Refer to Appendix by K. R. Miles, p. 85.

GEOLOGICAL SUBSURFACE MAP OF EVANSTON GROUP YILGARN GOLDFIELD

Scale 10 chains to an inch



— LEGEND —

- Basic Schists (Metamorphosed Fine to Coarse Grained Amphibolite Schists.)
- Biotite Gneiss and Associated Rocks
- Jaspilite
- Quartz

— REFERENCE TO SIGNS —

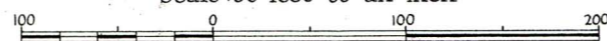
- Gold Mining Leases
- Tailings
- Battery
- Bluffs
- Form lines
- Tracks
- Doubtful or assumed geological boundaries
- Outcrops with no observable strike or dip
- Strike and dip of schistosity
- Strike and plunge of dragfolds
- Crossfold axes
- Anticlinal fold
- Synclinal fold

Survey data supplied by Mines Dept.
Plane table, telescopic alidade traverses, survey and geology
by R.S. Matheson, April 1940.

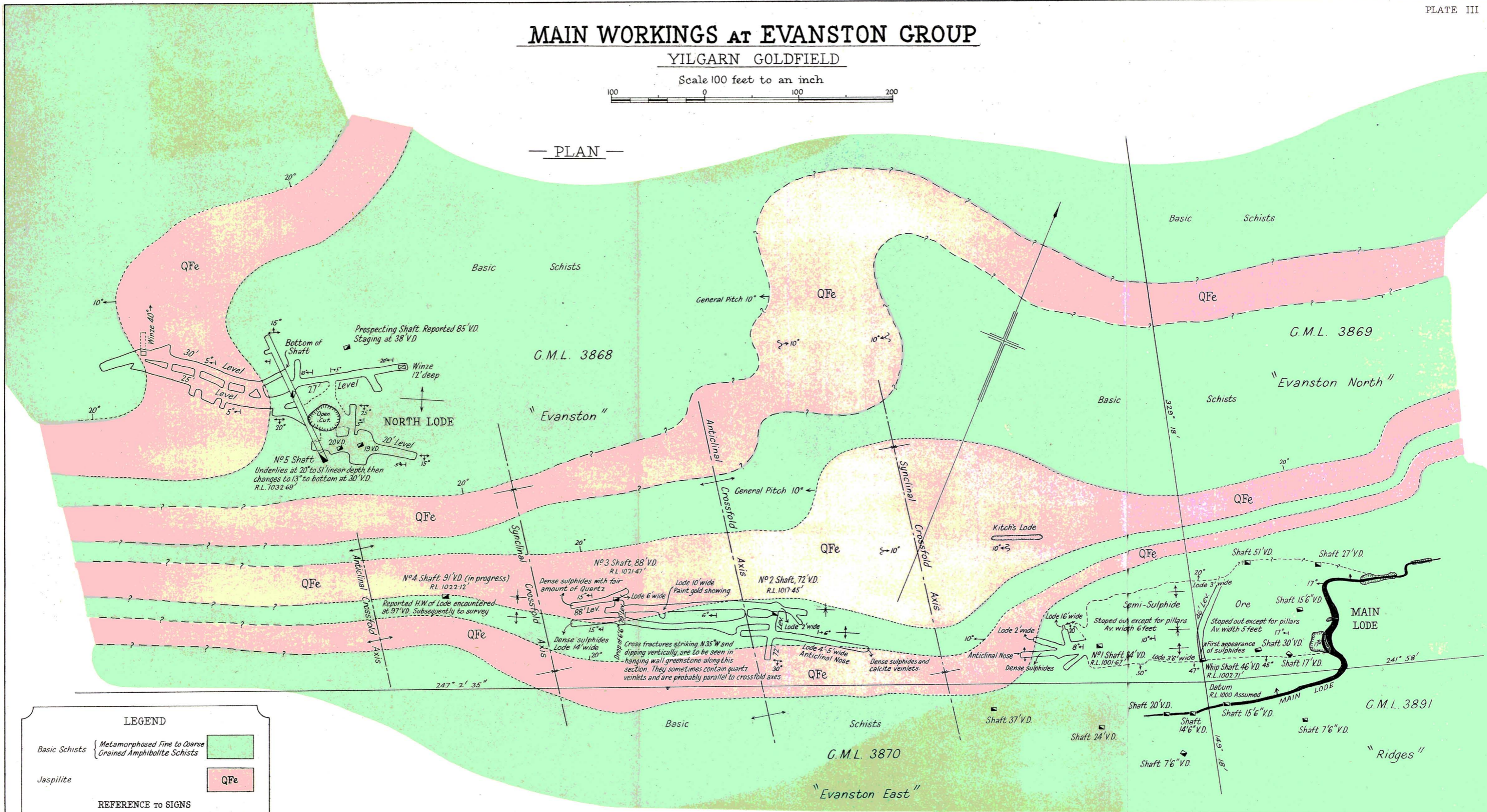
MAIN WORKINGS AT EVANSTON GROUP

YILGARN GOLDFIELD

Scale 100 feet to an inch



— PLAN —



LEGEND

Basic Schists { Metamorphosed Fine to Coarse Grained Amphibolite Schists }

Jaspilite

QFe

REFERENCE TO SIGNS

Gold Mining Leases G.M.L. 3868

Open Cuts

Shafts

Winzes

Anticlinal Folds

Synclinal Folds

Crossfold Axes

Strike and Plunge of Dragfolds $\searrow 10^\circ$

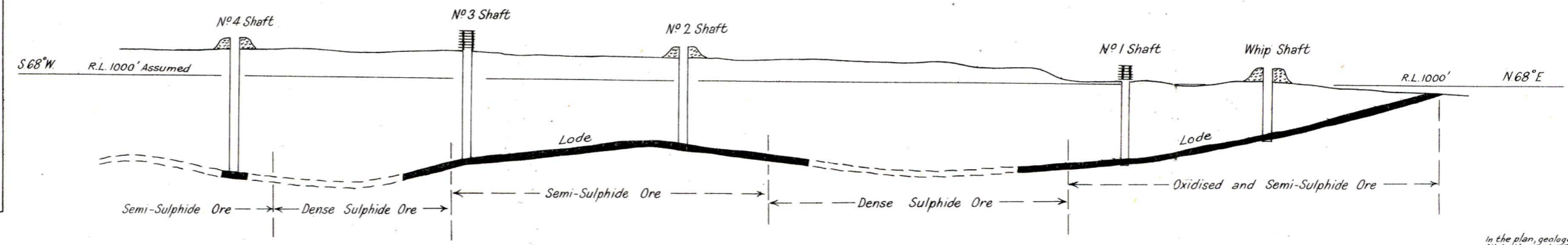
Dip $\perp 20^\circ$

Pitch $\rightarrow 10^\circ$

Observed Geological Boundaries

Doubtful or Assumed Geological Boundaries

— DIAGRAMMATIC CROSS SECTION DOWN PITCH OF MAIN LODE —



In the plan, geology is at the surface. All depths and levels taken from ground level. Survey and geology by F.S. Matheson Aug. 1940.

Biotite Gneiss.—Most of this country is covered by sandy soil or ferruginous laterite, but the gneissosity of the few outcrops that were seen, showed a parallelism to the general strike and dip of the greenstone country. The gneiss is believed to have been formed by the granitisation of pre-existing basic schists.

Pegmatites.—No pegmatite dykes are met with in the workings, their occurrence being confined to the margins of the greenstone belt. The barren quartz reefs probably belong to this period of intrusion, which is presumed to be of post-gold age.

GEOLOGICAL STRUCTURE.

As regional geological mapping did not fall within the scope of the writer's investigations, it is impossible to give more than a suggestion concerning the position of Evanston with relation to the major structure. All that can be said, is that the Evanston belt appears to be a north-easterly extension of portion of the Die Hardy Ranges, and the attitude of the rocks is suggestive of it being on the nose of a north-westerly pitching anticline.

More information is available concerning the minor geological structure at Evanston however, and by reference to the geological map (Plate II.), it will be seen to be very interesting. Two sets of folds are present in the rocks, one of which has west-southwest axes, and the other north-west axes. The northern zone of jaspilite is folded into the form of a broad syncline of the northwest-southeast set and the leases are situated on the axis of this fold. This fold is not simple however, but contains several smaller folds, the presence of which is indicated by the folding in the southern zone of jaspilite. Folds of this type cause reversals in pitch of folds belonging to the west-southwest set, and because of this they can be conveniently referred to as crossfolds. It is believed that the presence of two sets of folds which intersect one another, is one of the factors essential for ore deposition, and it localises deposition in the favourable host rocks. The importance of folding in two directions during ore deposition, is suspected to be due to the opposing forces forming channels suitable for the entry of gold-bearing solutions, and also closed structures where the ascending solutions are trapped. The successful application of these forces is probably limited to certain rock types, and at Evanston, the northern zone of jaspilite and the country in its immediate vicinity have been the favourable host rocks.

Further information concerning geological structure and its relation to ore deposition is given in a later section of this report.

THE MINES.

RIDGE BROS. SYNDICATE.

As has been pointed out previously, this Syndicate held twelve leases and one prospecting area at the time of inspection (April-May, 1940), but mining operations were confined to the "Evanston" G.M.L. 3868.

To 31st July, 1940, 9375·09 fine ozs. of gold were produced from this lease by the treatment of 14,378·30 long tons of ore. The production recorded from the other leases* took place prior to their acquisition by

the Syndicate, which hopes to resume operations on them at some later date.

The Ore Bodies.—Two different types of ore body are being mined on the main lease, namely a jaspilite lode, and a siliceous, carbonated lode, and these can be conveniently referred to as the North and Main Lodes respectively. Only jaspilite lodes have so far been disclosed on the remainder of the Syndicate's holdings.

Main Lode.—The Main Lode consists of a highly carbonated mixture of quartz and bleached basic schists, which has a high gold content. Zones, which are heavily mineralised with sulphides, occur at intervals in the lode at depth, and as this ore is not amenable to battery treatment, selective mining of oxidised and semi-sulphide ore is at present being carried out. The lode outcrops on G.M.L. 3869, which is not held by the Syndicate, but it passes into their ground at a shallow depth.

As will be seen from the Plan of Workings (Plate III.), the lode occurs in greenstone country in a dragfold which pitches very flatly west-southwest. Ore deposition has been greatest around the anticlinal nose of this dragfold, and mining operations have been more or less confined to this shoot. The shoot has been opened up at intervals to about 960 feet down the dip, and due to the remarkably flat dip the shoot is only about 100 feet from the surface in the deepest workings.

From the outcrop to 265 feet down the dip, the shoot has been stoped out, except for pillars, over an average length of 80 feet, and an average width of six feet. Between this section and the deepest workings, the lode thickens and the average width is 8-10 feet, but so far the shoot has only been proved over an average length of 50 feet. No systematic stoping has yet been done in these deeper workings, as development work is providing sufficient ore for immediate requirements.

Apart from the main shoot, some mining has been done to a shallow depth, between the line of shafts on the southern limb of the Main Lode, and the production from these workings is that recorded for G.M.L. 3870.

North Lode.—This ore body consists of a mixture of jaspilite lode material and quartz stringers, which occurs at the nose of a broad anticline, pitching flatly west-southwest. The limits of this shoot are not yet clearly defined, but the extent of the work done on it can be seen on Plate III. The Lode has not been worked from the outcrop, but work commenced on it at 12 feet V.D. from the surface, where it was encountered in prospecting shafts. The outcrop of this lode is believed to be folded jaspilite, east-northeast of the workings. The lode is oxidised, and no signs of carbonation or sulphide mineralisation have been met with in the workings. The management report that this ore body has produced £10,000 worth of gold.

Mineral Associations.—At depth the Main Lode is heavily mineralised with sulphides, and specimens of the ore have been collected by the writer, and submitted to the Government Mineralogist and Analyst for mineral determination. The results are not yet

*Refer to Production Table, p. 82.

to hand, but some information concerning the mineral content is available from investigations which have been carried out on this ore by Dr. F. L. Stillwell.

The main constituents are *arsenopyrite* and *pyrite*, but small amounts of *marcasite*, *pyrrhotite*, *chalcopyrite*, *enargite*, *covellite*, *chalcocite*, and *sphalerite* are also present. The sulphides occur in very dense seams and are also disseminated through the ore body. At present, the dense sulphides are confined to the sections of the lode in synclinal crossfolds, but at depth, where the processes of oxidation are ineffective, the lode may also be heavily mineralised with sulphides on the anticlinal crossfolds.

There is a close association between gold and arsenopyrite, and roasting will be necessary in the treatment of this ore. The recovery of *arsenic* should be considered when treating this ore, as arsenopyrite is very abundant.

Minerals, such as *iron oxides* and *scorodite*, which are decomposition products of the sulphides, occur in the oxidised and semi-sulphide zones.

Of the non-metallic minerals associated with the lode, *calcite* is by far the most abundant, but *fluorite* and *apatite* have also been recorded.

Structural Control of Ore Deposition.—The accompanying plans show that two sets of folds occur in the area, one of which has west-southwest axes and the other north-west axes. Ore deposition has been confined to folds of the first set, and the other set (crossfolds) has caused variations in the width of the lodes.

The Main and North Lodes occur in parallel dragfolds belonging to the west-southwest set, and the bulk of the evidence points to their axial planes having a vertical or steep south-southeast dip, but there is some suggestion that the dip of the axial planes may be at a low angle to the south-southeast. The crossfolding has taken place on a vertical plane, however, and this fact is borne out by the occurrence of vertical joints in the country rocks, which have a northwesterly strike.

The folds containing the ore bodies are by no means simple folds, but have numerous minor flexures on them and these cause variations in the thickness of the lode. The lode is thicker on the anticlinal flexures than on the synclinal flexures, and thinnest on the limbs, but other variations in thickness are caused by the crossfolding. On the axes of anticlinal crossfolds a thickening of the lode may be expected to occur on the minor anticlines, and a thinning in the minor synclines, while the reverse would be the case on the axes of synclinal crossfolds. Where a thinning of the lode occurs, the shoot may lengthen. Mining operations have shown that this control of width by folding has actually occurred.

Mode of Ore Deposition.—The Main Lode is believed to have been formed by metasomatic replacement, at the nose of a dragfold, in a structurally weak zone, which has offered free circulation to gold bearing solutions, presumably from a granitic magma. Subsequent to primary mineralisation secondary enrichment of the ore body took place, which is indicated by the frequent occurrence of paint gold in secondary jasper seams in the oxidised ore. The North Lode occurs in a similar structure, but the ore body has been formed, rather by the mechanical in-

jection of auriferous quartz veins into fractures in the jaspilite, than by replacement. The jaspilite lode material associated with the quartz veins is believed to be mainly of secondary origin.

Diamond Drilling.—During their prospecting campaign, the Western Mining Corporation put down seventeen bores to determine the limits of the Main Lode. The results of the diamond drilling have kindly been made available, but the writer has not yet had time to examine this information. Details of this diamond drilling will be published at a later date.

Conclusions and Recommendations.

1. There is no obvious reason why the Main Lode should not live to some considerable depth, but values and width are expected to show a slight decrease below ground water level, due to the cessation of the processes of secondary enrichment. Sulphides are expected to be uniformly distributed through the lode at depth. Owing to the flat attitude of the ore body however, it may be several hundred feet down the dip before ground water level is encountered, and patches of oxidised ore disappear entirely.

The prospects of the North Lode are not so promising, and the persistence of the ore body below ground water level will depend on the abundance of quartz veins. Mining will be confined to their immediate vicinity, as they contain the primary gold and the jaspilite lode material is mainly of secondary origin. In this case also, because of the flat pitch of the ore body, secondary enrichment may extend for several hundred feet down the dip from the present workings. All the jaspilite lodes at Evanston have similar prospects.

2. Prospecting for parallel ore bodies is warranted in the dragfolded portions of the other jaspilite horizons on the main lease. A small amount of ore has already been mined from one of these horizons in what are known as Kitch's workings, and this horizon in particular should be prospected.

There is also a possibility that parallel ore bodies may exist in the greenstone country on the footwall side of the Main Lode.

3. The prospects of locating further ore bodies along the strike are very favourable.

Some mining has already been done on ore shoots occurring in the folded portions of the jaspilites on G.M.L.'s 3888, 3895, and 3890, but there was no activity at the time of inspection. Now that the structural control of ore deposition is better understood however, further prospecting of these shoots is warranted.

There is a strong likelihood of an ore body similar to the Main Lode occurring in this fold, on the footwall side of the main jaspilite horizons. The ore body should be similarly situated with relation to the jaspilites, as the Main Lode is to the jaspilites on G.M.L. 3868.

4. By reference to the Plan of the Workings (Plate III.), it will be seen that the synclinal portion of the Main Lode has not been investigated. Prospecting of this section should not be neglected, because while indications may point to only a short length for the shoot, values on the other hand may

be high. The best place to prospect the synclinal trough would be on one of the synclinal crossfold axes, where the shoot should attain its maximum width.

5. Some small, rich shoots may be disclosed in the crossfolds on the southern jaspilite zone, but it is unlikely that any large ore bodies will be encountered.

6. With regard to general recommendations for prospecting in the vicinity of Evanston, the greenstone complex a few miles to the north is worthy of attention. Further details are given in the report on Broadbent's Find.

“EVANSTON NORTH” G.M.L. 3869.

As will be seen from the accompanying plans, the ore body consists of the upper 140 feet of the Main Lode, which passes, at that depth, into the property of the Ridge Bros. Syndicate. Mining has been mainly confined to the anticlinal portion of the ore body, but some ore has also been won from the northern limb of the fold. On the limb however, the lode formation dwindles away to an unpayable width at a short distance from the main shoot. The ore body consisted entirely of oxidised and semi-sulphide ore, and it was almost stoped out at the time of inspection. The oxidised ore was treated at the Three Boys Battery, Southern Cross, and the semi-sulphide ore was forwarded to Kalgoorlie for treatment. Full information concerning the nature, mode of origin, and attitude of the ore body is contained in the section of this report describing the Ridge Bros. Syndicate.

The official records show that, to 31st July, 1940, this lease has produced 997.48 fine ozs. of gold by the treatment of 1,440 long tons of ore.

Recommendations.

1. There is a possibility of obtaining a short shoot of rich ore in the trough of the synclinal portion of the Main Lode, which so far has not been investigated.

2. The best place for prospecting on this lease however, is the sharp fold in the country, occurring near the north corner of the lease. Both jaspilite lodes, and a lode similar to the Main Lode, may occur in this fold, and they are expected to show a parallelism in attitude to the known ore bodies. The two most southerly horizons of jaspilite, in particular, warrant prospecting, and the Main Lode type of ore body should be looked for in the greenstone country stratigraphically below them.

“EVERETT” G.M.L. 3890.

The ore body on this lease consists of jaspilite lode material and quartz stringers, occurring in a fold which pitches flatly west-southwest, but the shoot passes into G.M.L. 3888 at a shallow depth.

Shortly after the inspection the lease was acquired by the Ridge Bros., and renamed the “Four B’s” G.M.L. 3963.

To 31st July, 1940, the total production from this ground was 150.32 fine ozs. of gold from the treatment of 312 long tons of ore.

Prospecting in the greenstone country on this lease is recommended, as an ore body similar to the Main Lode very likely exists.

APPENDIX.

NOTES ON “PLATY” AND “MASSIVE” TYPES OF JASPILITES FROM EVANSTON.

(K. R. Miles, B.Sc. (Hons.))

Mr. Matheson has distinguished two types of jaspilite in the Evanston District—the first a “*platy*” type which is usually only gently folded and the second a “*massive*” variety which is frequently highly contorted. He attributes considerable economic significance to the distinction between the two varieties as he believes that all the main ore bodies occurring within jaspilites in the Yilgarn Goldfield are associated with the former rather than the latter type. He considers that auriferous bodies in jaspilites of the massive type are characterised by small rich shoots which live only to shallow depths.

The following are petrographical notes on specimens of the two types from Evanston collected by Mr. Matheson himself.

(a) *Massive Type*.—Specimen 2/2244.

Dense fine-grained, evenly banded rock consisting of alternate layers of black, fine-grained metallic iron ore and dense fine yellow-brown siliceous material, ranging from about .01 inch to .1 inch in width. The iron ore is but feebly magnetic or completely non-magnetic and grinds to a dark red-brown powder—hence it is probably made up predominantly of *hematite*.

In thin section the iron-ore bands consist of fairly closely packed, fine-grained aggregates of subhedral to euhedral *hematite* surrounded by and interlocked with grains of clear *quartz*. Different bands vary slightly in granularity. The alternating siliceous bands consist essentially of an interlocking mosaic of fine *quartz* scattered with separate crystals of iron ore, and containing oriented stringers of reddish opaque fibres (limonite or goethite) associated with frequent patches of brownish isotropic colloform *silica* (opaline). These fibres evidently represent decomposed relicts of an iron silicate mineral—probably *gruneritic amphibole*. Here and there are recognisable crystal laths now completely replaced by opal. In these quartzite bands are also occasional narrow zones of very fine microcrystalline *chert*, and stringers of opaline silica can also be seen occasionally cutting transversely across the siliceous bands and entering into some of the coarser iron ore bands.

Evidently this rock has suffered only slight thermal metamorphism—sufficient for only partial recrystallisation and the formation of minor amounts of gruneritic amphibole from reaction between the siliceous and ferruginous layers. Probably entirely as a result of surface weathering this amphibole has later been decomposed into hydrated iron oxide (limonite) and silica, now seen as secondary opal.

(b) *Platy Type*.—Specimen 2/2246.

This specimen is rather weathered. It consists essentially of bands of fine fibrous to acicular *amphibole* weathered to yellowish brown colour and associated with some fine grained *quartz*, alternating

with narrow layers of very fine granulated black iron ore. This iron ore when powdered is black and fairly strongly magnetic and is predominantly *magnetite*. In hand specimen the banding is fairly even and fine but is rather masked by the presence of several cross-fractures filled by dense brown *cherty limonite* containing tiny veinlets of *opaline silica*.

Thin section shows the *amphibole* in masses of crystals in broad bands usually enclosing layers of granular iron ore, and separated by bands of fine iron stained *quartzite*. The amphibole is more or less completely altered into amorphous masses of red *limonite* and light straw-coloured *opaline* pseudomorphs. Here and there less altered crystal plates show the form birefringence, twinning, extinction, and other optical properties, of the iron-rich *grunerite*. It has obviously been formed by reaction between the original black iron ore bands with the adjacent silica. In some portions of the slice the iron ore layers have been almost entirely replaced by amphibole.

This "platy" rock appears to have had essentially the same original composition and form as the "massive" type. The chief difference between the two types appears to be in the far greater development of the grunerite in the former. This indicates that the "platy" rock has reached a higher grade of metamorphism, i.e., has suffered far more complete recrystallisation at higher and more sustained temperatures than the "massive" type. The general structure and random orientation of the amphibole in the former rock indicates predominant contact or "thermal" metamorphism.

Differences in physical condition particularly of surface specimens of these two types are probably due mainly to this mineral difference. The presence of layers of softer and more easily decomposable amphibole probably tends to make the whole rock less resistant to weathering and to give it a more noticeable "platy" structure. Assuming that the rocks were thermally metamorphosed prior to folding it is possible that the amphibole-rich types would shear and become slip faulted, rather than minutely contorted as in the case of the more homogeneous "massive" banded quartz-iron ore rock. Whether or not these physical differences would have any effect upon the capacity of the rock to act as a host for auriferous ore-bodies is a matter for considerably more investigation than has been carried out at present.

SUMMARY OF PETROLOGICAL NOTES ON SOME ROCKS FROM THE YILGARN GOLDFIELD.

(North of the Great Eastern Railway.)

(K. R. Miles, B.Sc. (Hons.))

During a petrological examination of rocks collected by Messrs. Matheson and Ellis in the course of the North Yilgarn re-survey a number of interesting and unusual rock types were noticed and detailed petrographic descriptions of these have been made. They include:—(a) a suite of Basic Gneisses from Wither's Find, (b) some Ultrabasic Rocks, (c) an interesting Olivine Dolerite from Newfield and (d) some Metamorphosed Sediments.

(a) The Basic Gneisses range from re-crystallised amphibolites or basic granulite gneisses to fairly acid gneisses in which original amphibole is metasomatically replaced by biotite and the whole rock has suffered an addition of pegmatitic quartz and feldspar. These represent so-called "granitised" greenstones.

(b) The Ultrabasic rocks. Apart from the anthophyllite rock of the South Yilgarn* and an occurrence of carbonated ultrabasics in the Mt. Jackson District† there has been no previous recognition of ultrabasic rocks as a unit of the greenstone series in the North Yilgarn. Specimens described recently include Serpentine derived from olivine-rich peridotites, carbonated serpentines from the Bullfinch District, and an Olivine-Tremolite-Serpentine Rock from Westonia.

(c) The Olivine Dolerite from Newfield is interesting in that it represents the first record of an under-saturated younger basic intrusive in the Yilgarn Goldfield. The more common type is an augite dolerite or quartz-augite dolerite typical of the saturated or over saturated younger dolerite magma of the Darling Range.

(d) The Metamorphosed Sediments described in this report include a Chiastolite Slate from north of Pigeon Rocks—a new locality—and an Andalusite-Kyanite-Quartz-Schist from the sedimentary series near Eenuin. This rock is of interest in that it is identical in structure and mineral composition with specimens from Mt. Leonora in the Mt. Margaret Goldfield. Finally a special type of metamorphosed sediment is a Magnetite-Grunerite Schist from south of Koolyanobbing Trig. This rock is formed by recrystallisation under high temperatures of an original banded ferruginous quartzite or jaspilite bed.

* G. S. W. A. Bull. No. 97, p. 78, etc.

† G. S. W. A. Bull. No. 71, pp. 153-4.

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Division V.

Annual Report of the Director of the Schools of Mines of W.A. for the Year 1940.

The Under Secretary for Mines.

I forward hereunder my annual report for 1940.

1. *Kalgoorlie School of Mines:*

The number of students enrolled was as follows:—
Individual enrolments:—501; Class enrolments:—
1,090 First Term, 703 Second Term, 528 Third Term,
773 Average; Correspondence Class Enrolments:—39.

Compared with 1939 these enrolments show a decrease of 62, 112, and 35 respectively. Enrolments and class attendances were adversely affected by enlistment and compulsory military training, particularly in the second and third terms. Fees received, exclusive of Metallurgical Laboratory and Correspondence Class fees amounted to £765 9s. 9d.

Staff.—In consequence of the return to duty of Mr. G. S. Compton, Lecturer in Geology and Mining, whose services had been made available to Spargo's Reward Gold Mine for the past three years, Mr. K. A. Beatson retired from that position which he had occupied with satisfaction to the school during the whole of Mr. Compton's absence.

Unfortunately Mr. Compton's services were again lost to the School in June when he was called up for Military Service for the duration of the war. His classes were carried on competently by part-time instructors to whom the thanks of the school are due for their assistance in continuing the work of the Department.

The classes in Geology, Mineralogy, Petrology, and Mining and Economic Geology were at first conducted by Mr. H. G. Higgins, B.Sc., and subsequently by Mr. W. S. Winzar, B.E., both of whom gave excellent service.

The class in Mining I. was conducted by Mr. L. C. Olive, Inspector of Mines, and that in Mining II. by Mr. T. H. Thompson, B.E. These instructors also carried on the Correspondence Classes in the respective subjects.

As the period of Mr. Compton's absence is indefinite and any system of part-time instruction is not satisfactory, steps are being taken to fill the position of lecturer in Geology and Mining by the appointment of a full-time acting lecturer in those subjects.

After eight years in the position of Registrar, Mr. R. V. Lawson was transferred to Muresk Agricultural College and his position was filled by the appointment of Mr. G. M. Lumb who had previously held the position before being transferred to the Mines Department, Perth.

Mr. H. J. Jessup who had held the position of caretaker and laboratory assistant since the foundation of the school at Coolgardie in 1902 retired at the end of January and his place was filled by the

appointment of Mr. E. A. Edwards who had for six years ably filled the position of cleaner.

Royal Australian Air Force.—Early in the year accommodation was made available at the school for the use of No. 4 Mobile Recruiting Centre and the principal was co-opted as a member of the board for the examination of applicants for enlistment in the Air Force.

Subsequently, a pre-selection committee was formed in Kalgoorlie to examine applicants for enlistment and to make recommendations to the Recruiting Centre in Perth. The principal and Messrs. Meredyth, Johns, and Parker were members of this committee.

In order to assist in the training of Air Force Reservists prior to their being called up the members of the staff voluntarily conducted classes in Mathematics, Physics, Chemistry, Mechanics, Heat and Engines, Fitting and Turning, and Air Navigation.

Correspondence Classes.—Correspondence classes were continued in Mining I., Mine Sampling, Mining II., Ore Dressing, Assaying I., Metallurgy I. An attempt was made to form new correspondence classes in other subjects but the response was not sufficiently encouraging to justify the expense of conducting these additional classes.

The enrolments during the year in the correspondence classes were as follows:—

Mining I.	18
Mine Sampling	3
Mining II.	3
Ore Dressing	3
Assaying I.	12
Metallurgy I.	2
Surveying I.	2
Fitting and Turning I.	2

Trade Apprentices' Classes.—Day classes for apprentices to the Electrical Trade were formed during 1939 and continued this year under Mr. E. N. Johns.

In addition day classes for apprentices to the Engineering Trade were formed during 1940 under Mr. Parker.

The attendance at these classes was as follows:—

Electrical Apprentices	14
Engineering Apprentices	44

These classes which the apprentices attend in their employers' time are compulsory but the majority of these apprentices also attend the regular evening course classes at the school.

Revenue.—The revenue during the school year, not including Metallurgical Laboratory and Correspondence Class fees has been £784 5s. 9d.

The revenue from investigations conducted in the Metallurgical Laboratory amounted to £186, which has been paid into the Metallurgical Laboratory Trust Fund to meet maintenance and incidental expenditure in connection with the laboratory.

Public Assay Department.—The number of free assays and mineral determinations carried out for prospectors during the year was as follows:—

Assays for gold and other metals ..	629
Mineral determinations	83

This work has been carried out by members of the staff of the school and has been of great assistance to prospectors who also receive much assistance and advice regarding their mining and treatment problems.

Metallurgical Laboratory.—During the year 29 applications for investigations into the metallurgical treatment of ores and mill products were received, 28 of which were completed and reports were issued on all completed investigations.

One application from the South India Gold Prospecting Co., Ltd. for an investigation of the treatment of ore from some auriferous lodes which had not been worked since 1875 was accepted, with the approval of the Commonwealth Council for Scientific and Industrial Research, but as the ore samples did not reach the school until just before the vacation and the company required a report urgently, it was necessary to transfer the application to the Metallurgical Laboratory of the Melbourne University which is also controlled by the Commonwealth Council for Scientific and Industrial Research.

The fact that this and other applications for investigations have from time to time been received from companies operating outside the State and the Commonwealth indicates the appreciation of this work by operating companies.

In addition to the investigations into the treatment of ores, etc., carried out at the request of owners of mines, residue dumps, etc., an investigation has been conducted into the precipitating action of charcoal on gold-copper cyanide solutions, the results of which will shortly be published and should clarify ideas held by different authorities.

In connection with the investigational work of the laboratory, 1045 assays for gold and silver have been carried out, as well as 389 chemical analyses, not including routine tests on cyanide solutions, etc.

The total revenue received in the form of fees for investigations amounted to £186, which has been paid into the Metallurgical Laboratory Trust Fund.

Extension of the laboratory is urgently necessary in order to provide a special dry-crushing section, accommodation for special equipment, and office facilities for the staff.

The joint control of the laboratory by the Mines Department of W.A. and the Commonwealth Council for Scientific and Industrial Research has continued and it is gratifying to record that the Federal Government has again made available a grant which will enable this system to be continued for a further five-year period.

In previous reports attention has been drawn to the necessity for the appointment by the Mines Department of a qualified officer whose duties would

consist in visiting small operators for the purpose of assisting them with their treatment problems. This need is again stressed by the principal, who, on each of his periodical visits to the mining centres of the State as a member of the Board of Examiners for Underground Supervisor's Certificates of Competency has been approached by the operators of small crushing and treatment plants to help them out of difficulties which have arisen in their work. A personal visit by a qualified officer is worth very much more to these men than even a necessarily hurried visit by the principal or an attempt to elucidate their problems by correspondence.

All equipment is in excellent condition.

Buildings.—The walls and ceilings of the chemical laboratories were painted white during the year with a resultant increase in the efficiency of lighting of these laboratories. The classrooms and offices of the rest of the main building would be greatly improved if these rooms were similarly painted.

Completion of the re-organisation of the electric lighting of the rooms of the main building has not yet been placed in hand and this a matter which should be undertaken in conjunction with the suggested whitening of the walls and ceilings.

Employment of Students.—During this year the demand for trained men to fill technical positions on mines in this and other States has exceeded the supply of men available and sufficiently qualified to undertake the work offering. Many positions of responsibility have been filled by students of the School of Mines in this State and in addition several graduates and students have obtained responsible and highly remunerative technical positions with companies operating in Malaya, Fiji, and New Guinea. This continued demand for men trained in the school indicates the value placed on the work of the school by mining companies not only in Western Australia but also in other States and outside Australia.

Scholarships.—During the year the W.A. Students' Association established a Students' Association Scholarship of the value of fifteen pounds to be awarded annually to the part-time student over twenty-one years of age who obtains the highest aggregate marks in any three course subjects at the annual examinations.

An effort is being made to obtain an extension of the scope of the Mining and Metallurgical Bursaries awarded by the Australian Mines and Metals Association (Inc.). These bursaries are at present available only for University students who intend to take the degree of Bachelor of Engineering in Mining but the Board of Trustees is being asked to extend the scope of these bursaries so as to throw them open to students of the School of Mines as well as the University.

2. *Wiluna School of Mines:*

The total number of enrolments for the three terms was 357 as compared with 540 for the previous year, a drop of 183. The average class enrolment was 119, a drop of 61, as compared with figures for 1939. Class enrolments were as follows:—

	1940.	1939.
1st term	149	201
2nd term	111	176
3rd term	97	163

The number of individual students enrolled for the various classes was as follows:—

	1940.	1939.
1st term	100	117
2nd term	76	104
3rd term	69	93

The average for 1940 was 82 as compared with 105 for 1939.

In 1940 no classes in assaying, engineering, chemistry, geology, metallurgy, electrical work, ore dressing, and petrology were held. This was due to the fact that not enough enrolments were received to justify classes in these subjects. On the other hand new classes were conducted in Chemistry I., Drawing II., Mineralogy and Surveying II. If sufficient students do not enrol in 1941 in mathematics, surveying and mechanical drawing for the separate classes, it will be necessary to amalgamate classes.

Staff.—During the year Mr. V. Hawtin, Lecturer in Drawing, vacated his position to take up an appointment at Cockatoo Dockyard. His place was taken by Mr. C. E. Lyford of Wiluna Gold Mines, Limited. Mr. N. Scarff, an ex-student of the Kalgoorlie School replaced Mr. R. C. Simpson, who left the district for Kalgoorlie, as Lecturer in Surveying I. and II.

Examinations.—The percentage of passes was 72% which compares unfavourably with 85% in 1939.

Fees.—Fees collected amounted to £140 12s. 6d., a decrease of £79 1s. 6d.

Advisory Committee.—Monthly meetings to the number of nine were held during the year. Mr. A. Leitch was elected to fill the vacancy caused by the departure of Mr. G. Speer.

General.—During the year the school received a large number of mineral specimens from the University. These were of great benefit.

Prospects for 1941 are not bright owing to the state of the mining industry and the departure of potential students for enlistment in the R.A.A.F. and other forces.

3. Norseman School of Mines:

Enrolments.—After a preliminary term at the end of 1939, the School of Mines, Norseman, opened in 1940 with an enrolment of 121 distributed among ten classes as under:—

Fitting and Turning	13
Internal Combustion Engines	15
Engine Driving	15
Elementary Mathematics	12
Preparatory Mathematics	18
Preparatory Chemistry	7
Preparatory Mechanical Drawing	21
Mining I.	9
Surveying I.	6
Preparatory Physics	5

At the beginning of the second term a class in Preparatory Geology was formed with an enrolment of seven.

A number of students joined later in the year bringing the total number of enrolments to 177.

Enlistments and removals accounted for a large number of defections—one class Preparatory Physics having to close at the end of the second term—the total enrolment being reduced to 80. The average enrolment for the year was 103. The average attendance for the year was 84.

Fees.—Amount received £103 5s. An amount of £57 was received in the preliminary term in 1939.

Staff.—War service created difficulties in staffing resulting in fitting and turning, preparatory mechanical drawing, and preparatory physics classes each having a change of instructor, and Mining I. having two changes.

Mr. Gilbert Foxcroft the officer-in-charge of the classes resigned at the end of the year. Mr. Foxcroft did excellent work during the time he was connected with the classes.

Accommodation.—The difficulty of finding satisfactory accommodation which causes classes to be held in six different and widely separated buildings, led the Advisory Board to approach the Government with a request that a building be provided.

After careful consideration the Hon. Minister for Mines replied that as the present is not considered an opportune time for expenditure of this nature it cannot be provided.

The school is indebted to the Dundas Road Board, the St. John Ambulance Association and the Norseman Gold Mine for the use of rooms granted them, and to the latter particularly for the use of plant, rooms and machinery.

General.—The Advisory Board has initiated a publicity scheme, having prepared and printed for free distribution, one thousand copies of a "Students' Guide" which sets forward the facilities and advantages offered by the School of Mines and details courses and fees.

The board is indebted to the Dundas Road Board for meeting the expense of printing.

The school has had a satisfactory commencement and increased enrolments are anticipated.

4. Conclusion:

There is every likelihood of a decrease in numbers at Kalgoorlie and Wiluna in 1941 and an increase at Norseman. The position will be carefully watched and adjustments in classes and staffs made as required.

J. F. LYNCH,
Director, School of Mines.

Division VI.

Annual Report of Inspection of Machinery Branch of the Mines Department for the Year 1940.

OPERATIONS UNDER THE INSPECTION OF MACHINERY ACT, 1921; ANNUAL REPORT OF THE CHIEF INSPECTOR OF MACHINERY AND CHAIRMAN OF THE BOARD OF EXAMINERS FOR ENGINE-DRIVERS, FOR THE YEAR ENDED 31st DECEMBER, 1940, 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 on the administration of the Inspection of Machinery Act, 1921, for the year ended 31st December, 1940.

The number of boilers and group of machinery inspected during 1940 again showed an increase over the previous year. The number of accidents caused by boilers or machinery which were reported and inquired into increased by seven, but the number of fatal accidents was one less than in 1939. All of the seven accidents, three of which were fatal, which were recorded in districts worked from the Kalgoorlie office, occurred on mines and are also included in my report on the Mining Industry.

The financial result of the year's work was again good, the credit balance being £1,212 3s. 11d.

R. C. WILSON,
Chief Inspector of Machinery.

SECTION I.

Inspection of Boilers, New Construction, Maintenance, etc.

The total number of registered boilers (including various types of unfired pressure vessels, such as steam jacketed pans, sterilisers, digesters, vulcanisers, air and gas receivers, montejués, etc.) which, according to records, were fit for use on 31st December, 1940, was 4,685, compared with 4,572, on 31st December, 1939, an increase of 113.

The total number of boilers added to the register during the year 1940 was 151, as compared with 193 for the year 1939. Of the boilers added to the register, five were second-hand boilers previously registered in other Australian States, one which had previously been condemned was reconditioned and brought into use again, and 145 were new registrations. Return No. 1 shows the number of each type of boiler registered during the year, the place of origin, also the number of each type constructed in Western Australia.

The number of boilers removed from the register during 1940 was 38, or 16 more than during 1939.

Of these, four are now used for purposes which make them exempt from inspection, 25 were permanently condemned, five were transferred out of this State and four to other departments in this State.

The number of thorough inspections increased by 67, compared with a decrease of seven in 1939, and was 384 more than the year 1930, or an increase of over 24% in ten years.

Inspections made under steam, for which separate reports were submitted, numbered 150 or 22 less than during 1939.

There were 69 more boiler certificates and 48 fewer repair notices issued than in 1939.

Return No. 1.—Showing Classification of Types of New Boiler Registrations for the Year ended 31st December, 1940.

Types.	Total.
Vertical Stationary	2
Vertical Multitubular Stationary	1
Vertical Patent Tubular	6
Return Multitubular Stationary Underfired	8
Water Tube	12
Digester	4
Saddle Back	15
Air Receiver	47
Vulcaniser	9
Steam Jacketed Vessel	17
Steriliser	23
Ideal	1
	145
Imported from United Kingdom	13
" " Eastern States	33
" " Unknown Sources	14
Made in the State of Western Australia*	85
	145
*Return Multitubular Stationary Underfired	8
Water Tube	12
Vertical Stationary	2
Vertical Patent Tubular	6
Air Receiver	29
Steriliser	18
Steam Jacketed Vessel	5
Vulcaniser	1
Digester	4
	85

Return No. 2.—Showing Classification of Various Types of Useful Boilers in Proclaimed Districts on 31st December, 1940.

Types of Boilers.	Districts worked from Perth.	Districts worked from Kalgoorlie.	Unproclaimed Areas.	Totals.	
				1940.	1939.
Lancashire	39	60	...	99	98
Cornish	102	486	...	588	599
Semi-Cornish	11	37	...	48	47
Vert. Stat.	290	357	...	647	648
" Port.	64	15	...	79	81
" Mult. Stat.	40	26	...	66	70
" " Port.	19	3	...	22	26
" Pat. Tubular	49	...	...	49	49
Loco. Rect. Firebox Stat.	80	65	...	145	144
" " " Port.	246	70	...	316	315
" Circ. " "	139	9	...	148	148
Locomotive " "	74	43	...	117	118
Water Tube	196	123	...	319	307
Return Mult. Underfired Stat.	143	65	...	208	206
Return Mult. Underfired Port. ....	...	8	...	8	8
Return Mult. Int. Fired Stat.	38	13	...	51	52
Return Mult. Int. Fired Port.	2	...	...	2	2
Egg-ended and other types not elsewhere specified	139	17	56	212	163
Digesters	108	5	...	113	111
Air Receivers	451	432	...	883	844
Gas " "	7	...	...	7	5
Vulcanisers	269	11	...	280	271
Steam Jacketed Vessels	267	11	...	278	260
Total Registrations useful boilers	2,773	1,856	56	4,685	4,572
Total boilers out of use, 31st December, 1940	1,270	1,385	...	2,655	2,617

Return No. 3.—Showing Operations in Proclaimed Districts during Year ended 31st December, 1940.

(BOILERS ONLY.)

—	Districts worked from Perth.	Districts worked from Kalgoorlie.	Unproclaimed Areas.	Totals.	
				1940.	1939.
Total number of useful boilers registered	2,773	1,856	56	4,685	4,572
New boilers registered during year	130	15	...	145	189
Boilers reinstated	1	...	...	1	2
" converted ....	...	4	...	4	5
Boilers inspected—					
Thorough	1,505	467	...	1,972	1,905
Working	147	3	...	150	172
Boilers condemned during year—					
Temporarily	18	1	...	19	31
Permanently	25	...	...	25	16
Boilers sent to other States during year	5	...	...	5	2
Boilers sent from other States during year	5	...	...	5	1
Transferred to other Departments	4	...	...	4	...
Transferred from other Departments ....	...	...	...	...	1
Number of Notices for Repairs issued during year	496	34	...	530	578
No. of Certificates issued, including those issued under Section 30 during year	1,503	471	...	1,974	1,905

New Construction.

Of the 13 boilers imported from the United Kingdom, nine were air receivers, three steam jacketed vessels, and one sectional boiler. With the exception of the two vertical stationary and one underfired multi-tubular, the steam boilers built in this State were small boilers of all welded construction.

A new copper electrically heated boiler for an autoclave, size 2 ft. 9 in. x 1 ft. 1 in. which had been manufactured in Melbourne, had to be condemned on account of defective workmanship, and a new one was built by a local firm.

SECTION II.

Explosions and Interesting Defects.

Both flue tubes of a Lancashire boiler collapsed owing to shortage of water. This boiler is 27 ft. 6 in. x 7 ft. 6 in. and was built by Galloways Ltd. in 1901 for a working pressure of 120 lbs. per square inch. The original flues had been replaced in 1910, and the first three and the last section of each flue were again renewed in 1927, but the boiler was not used from 1917 until 1930 when it was erected at the works where the accident happened. The boiler was not fired in the usual manner, but had a double brick furnace built in front of the face plate, in which step grates were fitted for burning the fine powdery waste from the sandalwood oil extraction plant, which was fed into the top of each furnace.

The boiler flues were $\frac{1}{2}$ in. thick by 36 inches outside diameter and 33 inches from centre to centre of the Adamson rings. A fusible plug was fitted in the centre of the third section of each flue, but they both failed to act because they had been incorrectly filled after the last inspection, which had been made about two months before the flues collapsed.

The working pressure was only 85 lbs. per square inch solely because that was the working pressure of the steam jacketed pans, etc., to which the boiler was supplying steam, as the owners preferred not to install a reducing valve.

The boiler attendant was very hazy as to what actually happened, and the other persons who were on the premises during the night shift, either were not near the boiler or did not have sufficient knowledge of boilers to throw much light on the causes which led up to the mishap.

As far as can be ascertained, the water level was low when the feed pump was first started shortly after the fires were lit about 10.30 p.m. on Sunday, and owing to the water hammer which occurred in the internal feed pipe each time the feed pump was started, the fireman worked the boiler from about 11 p.m. to 5 a.m. the next morning, without putting in any appreciable quantity of water. He was working under difficulties owing to part of the firing platform and the electric light wiring having been destroyed by fire during the day, and because of a very strong wind the hurricane lamp which was the sole light available was blown out each time he tried to see the water level in the gauge on the exposed side of the boiler. It is surmised that both gauges were shut off, because the fireman said there was still nearly a full glass showing when the flues collapsed at about 5.30 p.m. It is obvious from the photographs reproduced at the end of the report, that the water level was then approximately half way down the flue.

It will be seen from illustration 1 that although there are extensive bulges in the first section of each flue, the second section of both flues and the third section of the left flue are practically intact, but the third, fourth, fifth, sixth, and seventh sections of the right flue and the fourth and fifth sections of the left flue are badly distorted, particularly the fourth, fifth, and sixth sections of the right flue which have completely collapsed, including the Adamson rings. This can best be seen in illustration 2, and the right hand side of illustration 3 which shows an end view of each flue when cut through close to the Adamson ring.

Two fractures in the Adamson rings can be seen in illustration 2, but there are others at the bottom of the folds both in the rings and in the flue flanges which cannot be seen in the photographs. These fractures allowed the pressure to escape, and enveloped the boiler in steam, while some water ran out of the flues at the front end, but with the exception of the collapsed flues, no other damage was done.

The three photographs demonstrate the value of Adamson rings, because plain flues almost invariably tear at the circumferential lap seams when overheated.

Two new flues have been fitted and the boiler should give many years further satisfactory service.

A most unusual defect was found in a vertical stationary boiler. The shell crown and firebox crown were both dished, and the uptake was flanged at each end to meet the shell and firebox crown. The inspector found that the uptake was cracked almost through the plate close to the top flange for the full circumference. The uptake was cut off about four inches above the flange to the firebox crown and a new top portion was butt welded to the lower part of the original uptake, and attached to the shell crown by a flanged ring riveted to the uptake and the outside of the shell crown.

A new front plate in a Lancashire boiler was found to be badly grooved at the bottom close to the right bottom gusset stay after only five months' work, and the bolts attaching the gusset plate to the front end plate angles were found to be slack. These bolts were removed, the holes reamed out and turned bolts fitted. The boiler was again inspected after 12 months' further work but the grooving had not increased in extent or depth. This case shows how rapidly a boiler can be damaged by stress corrosion.

A locomotive portable rectangular firebox boiler in which the firebox crown was supported by transverse girders, the ends of which rested on angle irons riveted to the sides of the firebox outer casing plate, developed a crack in the casing plate immediately below the angle iron on one side. As the outer casing plate showed other defects as well, it was renewed, and new fore and aft crown stay girders, with their ends supported on the firebox tube plate and fire-hole end plate, were fitted.

SECTION III.

Inspection of Machinery.

The number of groups of useful machinery on the register was 390 more than at the end of 1939, and 7,588 more than at the end of 1930, an increase of over 89% in ten years.

The number of groups of machinery inspected during the year 1940 was 907 more than 1939 or an increase of nearly 7.8%, and 5,875 more than during 1930, or an increase of over 88% in ten years.

The number of passenger lifts increased by five, but the number of goods lifts decreased by two making the net increase three. The number of passenger lifts has increased by 67 since 1930 or 54.5% in ten years.

Return No. 4.—Showing Classification according to Motive Power of Groups of Machinery in use or likely to be used in Proclaimed Districts and which were on the Register during the Year ended 31st December, 1940.

Classification.	Districts worked from Perth.	Districts worked from Kalgoolie.	Totals.	
			1940.	1939.
No. of Groups driven by steam engines	562	527	1,089	1,084
No. of Groups driven by oil engines	1,944	771	2,715	2,572
No. of Groups driven by gas engines	87	186	273	256
No. of Groups driven by compressed air	2	59	61	60
No. of Groups driven by electric motors	8,483	3,475	11,958	11,733
No. of Groups driven by hydraulic pressure	5	...	5	6
	11,083	5,018	16,101	15,711

Return No. 5.—Showing Operations in Proclaimed Districts during Year ended 31st December, 1940.

(MACHINERY ONLY.)

—	Districts worked from Perth.	Districts worked from Kalgoolie.	Totals.	
			1940.	1939.
Total registrations useful machinery	11,083	5,018	16,101	15,711
Total inspections made	9,299	3,239	12,538	11,631
Certificates (bearing fees)	3,873	625	4,498	4,217
Certificates (Steam without fees)	74	5	79	76
No. of extension certificates issued under Section 42 of Act	...	...	...	...
Notices issued (Machinery Dangerous)	471	22	493	456

Return No. 6.—Showing Classification of Lifts on 31st December, 1940.

Type.	How Driven.	Totals.	
		1940.	1939.
Passenger	Electrically driven	189	184
	Hydraulically driven	1	1
Goods	Electrically driven	103	105
	Hydraulically driven	3	3
	Belt driven	4	4
		300	297

Accidents to Machinery.

A belt driven hydro extractor of the self balancing pivot under belt driven type, was shattered through the bursting of the basket, portions of the machine being scattered in all directions. Luckily there were only four persons in the room at the time of the accident; two were uninjured, one was thrown to the ground and received slight injury to his left hand, and the fourth man was badly injured, his left wrist and hip bone being fractured and his left hip and thigh severely lacerated, necessitating three months' hospital treatment. The machine although more than 16 years old, had not been used very much as it was situated in the laundry of a quarantine station. The basket was 30 inches diameter of $\frac{1}{8}$ in. thick copper plate perforated by $\frac{1}{4}$ in. holes at $\frac{7}{8}$ in. vertical pitch. There were two vertical lapped seams which were brazed, and four $\frac{1}{4}$ in. x $\frac{1}{4}$ in. copper supporting bands at about 3 in. pitch. The bottom of the basket was a cast brass disc to which it was riveted, and a cast brass ring was riveted to the top. At the time of the accident, the machine was loaded with 35 single sheets which was about one half the normal load, the speed was slightly less

than usual, the machine was running without vibration, and the water had stopped running from the drain. The attendant was approaching to stop it, when the machine collapsed and he was hit by some portion of it. The basket failed on each side at the brazed seam, one half remaining partly attached to the bottom disc; the other half was completely detached, as was also the top ring. The vertical spindle was bent and the outer cast iron casing with its supports was shattered and scattered in all directions. The photographs at the end of this report show the wrecked machine and also all the scattered parts collected together.

A peculiar accident happened to a belt driven goods lift, which had been in use for about 40 years. The car and counter weight were each carried by a single $\frac{5}{8}$ in. steel rope. The lift serves the basement and three floors, and at the time of the accident the car was at the top floor, and loaded with cartons of insulating cork weighing 60 lbs. each, but the exact number on the car is not known. Probably it was considerably more than 13, which would weigh 7 cwt. the authorised maximum load. It is assumed that the car was loaded unevenly, because when the storeman tried to lower the car it moved about six inches and then stopped. He then switched off the current and unloaded five or six cartons. The motor was again started by means of the switch in the car, and the control rope pulled over to raise the car back to the top floor, but it did not move. The storeman then altered the position of some of the cartons and while he was doing this, the lift started and dropped some distance before the rope pulled out of the clamps. Apparently when he tried to lower the cage a fair amount of slack rope was paid out, but this would not be apparent from the car because the hoisting gear is in the basement. Although the rope must have been slack the grippers did not act owing to the drag due to the weight of the rope itself, and they did not come into action until the rope was detached and then only sufficiently to break the fall. Some of the cartons were dislodged and one or more caught at the first floor. One of these fell on the storeman and injured his back as he was getting out of the lift at the basement. Unfortunately the counterweight was sufficiently heavy to rotate the winding gear and it descended to the basement winding up the slack car rope so it was impossible to say how far the car dropped before the rope pulled out of the clamps, but the storeman said that he noticed a distinct check about half way down.

SECTION IV.

Prosecutions under the Act.

The manager of a gold mining company was prosecuted for working machinery which had not been inspected and for which certificates were not in force. As the machinery had not been formally handed over by the erecting firm, only a nominal fine was inflicted.

SECTION V.

Accidents to Persons.

The return No. 7 below includes only accidents with fatal results and those causing the injured person to be incapacitated for two weeks or more. Accidents caused by machinery on timber mills or

timber holdings which are subject to the provisions of the Timber Industry Regulation Act of 1926, are not included. All the accidents reported in the districts controlled from Kalgoorlie office occurred on mines, and are therefore also included in the report of the State Mining Engineer on the mining industry.

The total number of personal injuries was seven more than during 1939, but the number of fatal accidents was one less.

Nearly all of these accidents could have been avoided if the injured person had used reasonable care.

Return No. 7.—Showing Persons Killed or Injured by Boiler and Machinery Accidents in Proclaimed Districts during the Year ended 31st December, 1940.

Numbers within brackets denote fatal accidents.

Class of Machinery.	Districts worked from Perth.	Districts worked from Kalgoorlie.	Total.
Metal Working—			
Wire Drawing	1	...	1
Sawmilling and Woodworking—			
Circular Saw	2	...	2
Buzzer	2	...	2
General—			
Shafting	1	2	3
Belting	1	2 (1)	3 (1)
Guillotine	1	...	1
Mincing Machine	2	...	2
Conveyor ... ..	...	1 (1)	1 (1)
Chaffcutter	1	...	1
Agitator Driving Wheels ... ..	...	1	1
Scalding	4	...	4
Stamping Machine	1	...	1
Goods Lift	1	...	1
Printing Machine	1	...	1
Winding Engine ... ..	...	1 (1)	1 (1)
Winding Engine Rope	1	...	1
Gas Producer	1	...	1
Drum Sander	1	...	1
Corner Staying Machine	1	...	1
Hydro Extractor	1	...	1
Crusher	1	...	1
	24	7 (3)	31 (3)

Return No. 7A.—Showing a Classification of Serious and Fatal Accidents into Nature of Injuries Received for the Year ended 31st December, 1940.

	Area.		Remarks.
	Districts Worked from Perth.	Districts Worked from Kalgoorlie.	
Serious—			
Hand	1	...	There were 13 amputations in finger accidents and 1 in foot accidents.
Finger	13	3	
Leg	8	...	
Foot	1	...	
Chest	1	...	
Back	2	...	
Stomach	1	...	
Other Major	2	1	
Total	24	4	
Total, Serious	28		
Fatal—			
Neck ... ..	...	1	
Arm ... ..	...	1	
Head ... ..	...	1	
Total ... ..	...	3	
Total, Fatal...	3		

SECTION VI.

Engine-drivers' Examinations, etc.

The total number of certificates granted during 1940 was 258 which was 29 less than for the previous year, making the fifth consecutive year showing a decrease in the number of certificates granted, but the number granted was 74% greater than the total granted during 1930. The Board of Examiners dealt with 306 applications for certificates during the year.

Examinations were held as follows:—Perth, 4; Kalgoorlie, 4; Meekatharra, 1; Mt. Magnet, 2; and Bunbury, 1. Examinations were held at all advertised centres except Leonora and Cue.

The board was engaged for 12 days conducting examinations, 25 days in travelling and 28 days correcting examination papers, dealing with applications and other matters in connection with engine-drivers' certificates.

I deeply regret having to record the death of Mr. James Breydon which occurred on 22nd November, 1940. He had been a member of the board since its inception, a period of 35 years.

Return No. 8.—Showing Total Number of Engine Drivers' and Boiler Attendants' Certificates (all Classes) Granted in 1940 compared with 1939.

	Number Granted.	
	1940.	1939.
Winding Competency, including certificates issued under Regulation 40 and Section 60 of the Act ...	14	27
First Class Competency, including certificates issued under Regulations 40 and 45 and Sections 60 and 63 of the Act ...	2	8
Second Class Competency, including certificates issued under Regulation 40 and Section 60 of the Act ...	27	28
Third Class Competency, including certificates issued under Regulations 40 and 45 and Sections 60 and 63 of the Act ...	30	54
Locomotive Competency, including certificates issued under Regulation 40 and Section 60 of the Act ...	8	5
Traction Competency, including certificates issued under Regulation 40 and Section 60 of the Act ...	1	...
Internal Combustion Competency, including certificates issued under Regulation 40 and Section 60 of the Act ...	83	80
Crane and Hoist Competency, including certificates issued under Regulation 40 and Section 60 of the Act ...	3	10
Boiler Attendant Competency, including certificates issued under Regulation 40 and Section 60 of the Act ...	79	71
Interim ...	2	1
Copies ...	9	2
Transfer ...	...	1
	258	287

SECTION VII.

General, Staff, Revenue and Expenditure, Mileage, etc.

General.—The gazettal of the Electricity Act Regulations has filled a long felt want as provision is made for the appointment of inspectors and for the inspection of electrical installations.

Staff.—The vacancy caused by an inspector being called up for duty with the Naval Department on the outbreak of war was filled early in January, by the temporary appointment of an inspector for the duration of the war.

In addition to nine weeks balance of long service leave which was commenced by an inspector in November, 1939, an aggregate of 21 weeks was lost through sick leave which was granted to four inspectors during the year, so that for two-thirds of the year the work had to be performed by seven instead of eight inspectors.

Revenue and Expenditure.—The revenue increased by £473 1s. 5d., and the expenditure increased by £489 4s. 1d., as compared with 1939. The profit was £16 0s. 8d. less than in 1939. The increase of expenditure under the heading of salaries was again solely due to grade increases received by officers who had not reached the maximum of their classification.

Return No. 9.—Showing Revenue and Expenditure for Year ended 31st December, 1940.

	REVENUE.		1940.		1939.	
	£	s. d.	£	s. d.	£	s. d.
Fees for Boiler Inspection ...	2,757	19 0	2,737	13 6		
Fees for Machinery Inspection ...	6,080	0 9	5,516	10 4		
Engine Drivers' Fees ...	345	17 6	402	19 0		
Incidentals ...	51	8 1	105	1 1		
Increase—£473 1s. 5d..	9,235	5 4	8,762	3 11		

	EXPENDITURE.		1940.		1939.	
	£	s. d.	£	s. d.	£	s. d.
Salaries ...	6,283	7 8	5,967	11 7		
Incidentals ...	1,660	0 1	1,465	17 10		
Engine Drivers ...	79	13 8	100	7 11		
Increase—£489 4s. 1d..	8,023	1 5	7,533	17 4		

Profit—£1,212 3s. 11d.

Mileage.—It will be seen from No. 10 that the number of miles travelled by road has been reduced by 6,429. This is due to every endeavour having been made to save unnecessary travelling by car so as to save petrol. The air miles were travelled by the inspector who made the inspection of the Wyndham Meat Works. This showed a considerable saving in time, and allowed the inspector to devote more time to the inspection, because when the visit was made by boat the time available was limited to the three days from the arrival of the boat at Wyndham. This was not sufficient for the amount of work involved.

Amendments to the Act.—During the year a bill to amend the Inspection of Machinery Act, 1921, was again introduced, but it met the same fate as its predecessors, being defeated in the Legislative Council.

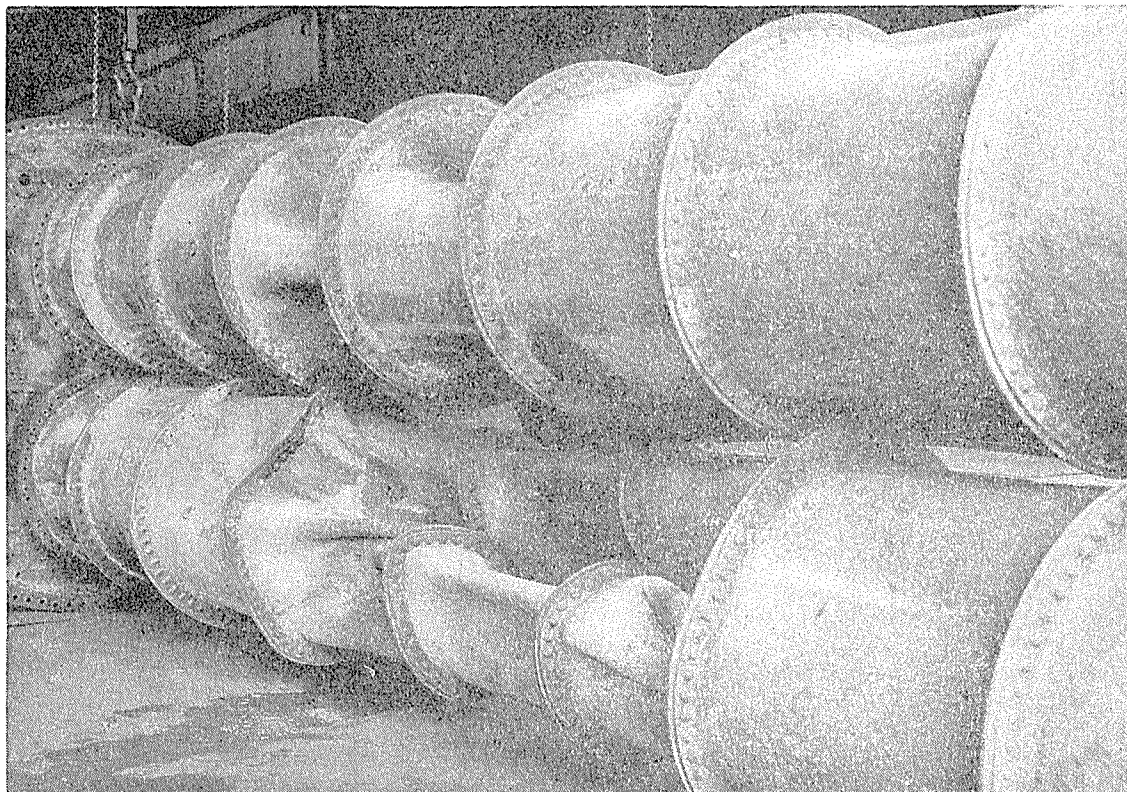
I wish sincerely to thank all those who helped in achieving the satisfactory results attained during the year. Valuable assistance was freely given by officers in other departments in this State and by officers of the Commonwealth.

In particular I desire to thank all the officers of this branch and other branches of the Mines Department for their courtesy and assistance.

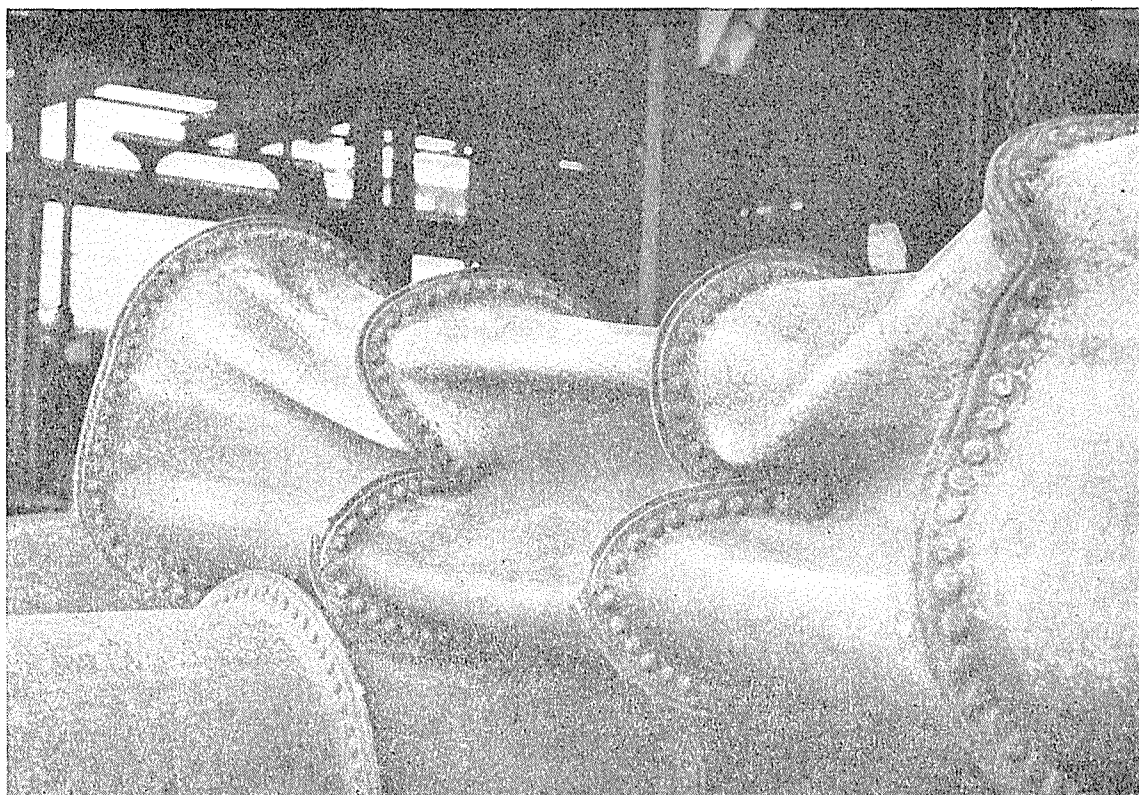
G. MOORE,
Deputy Chief Inspector of Machinery.

Return No. 10.—Showing Distances Travelled, Number of Inspections made and Average Miles Travelled per Inspection for Year ended 31st December, 1940.

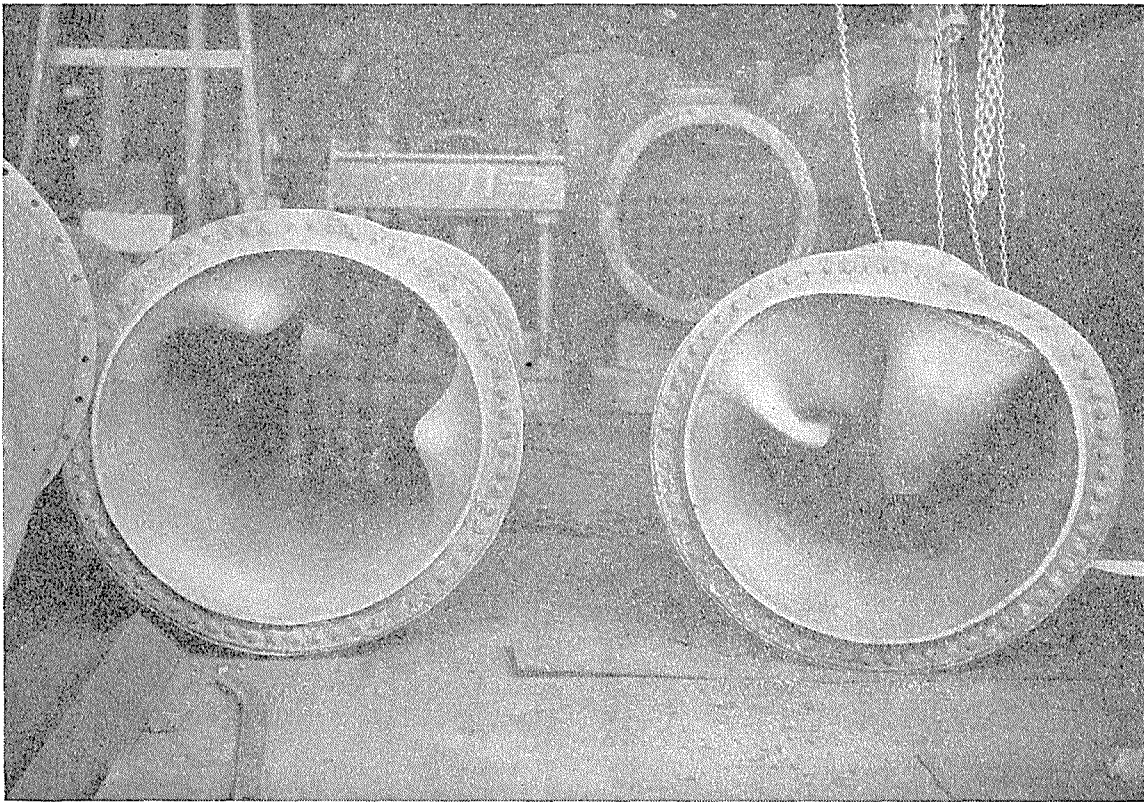
Areas Traversed.	Air Miles.			Rail Miles.			Road Miles.			Water Miles.			Total Miles.			Total Number of Inspections.			Average Miles per Inspection.		
	1940.	As compared with 1939.		1940.	As compared with 1939.		1940.	As compared with 1939.		1940.	As compared with 1939.		1940.	As compared with 1939.		1940.	As compared with 1939.		1940.	As compared with 1939.	
		Increase.	Decrease.		Increase.	Decrease.		Increase.	Decrease.		Increase.	Decrease.		Increase.	Decrease.		Increase.	Decrease.			
Districts worked from Perth	3,806	3,806	...	913	...	1,694	43,492	...	3,855	10	...	10	48,221	...	1,753	10,951	821	...	4.40	...	.53
Districts worked from Kalgoorlie ... ..	...	...	...	...	...	...	20,215	...	2,574	...	...	...	20,215	...	2,574	3,709	131	...	5.45	...	.91
Totals	3,806	3,806	...	913	...	1,694	63,707	...	6,429	10	...	10	68,436	...	4,327	14,660	952	...	4.66	= Average all Districts, 1940.	
																			5.30	= Average all Districts, 1939.	
Increases or Decreases	...	Increase 3,806		...	Decrease 1,694		...	Decrease 6,429		...	Decrease 10		...	Decrease 4,327		...	Increase 952		...	= Average Decrease .64 miles per inspection	



Collapsed flues of Lancashire boiler. The front end plate can be seen at the left.



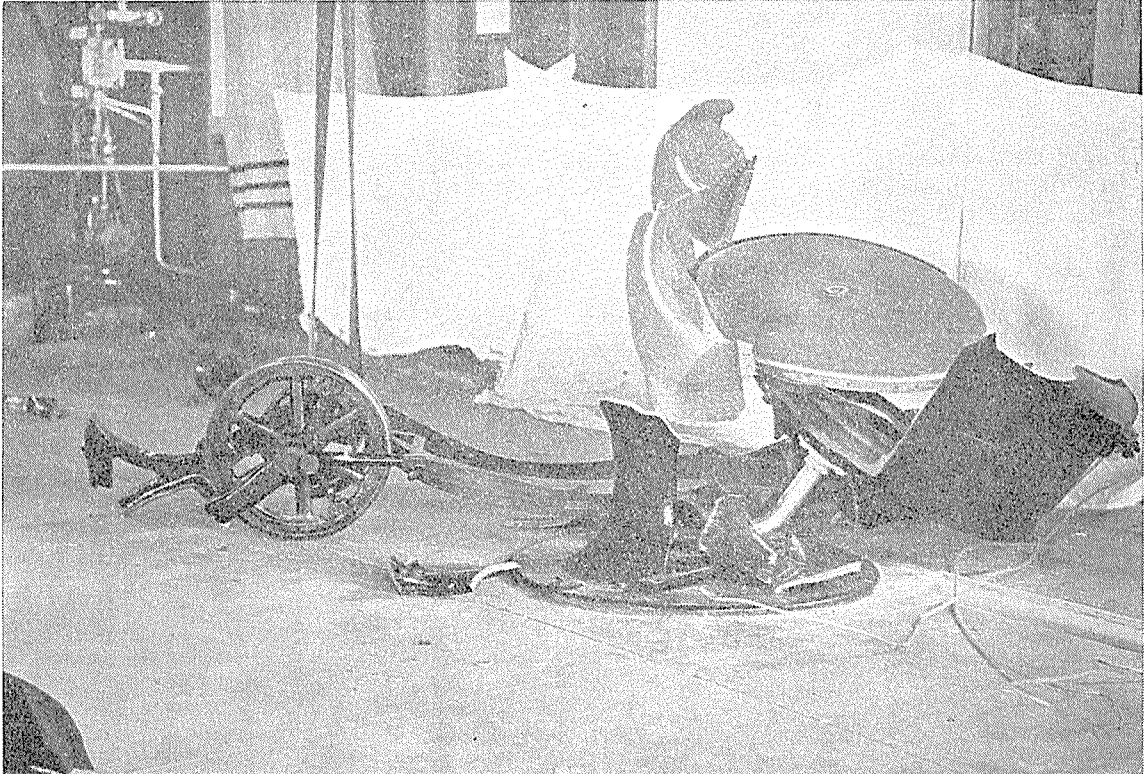
From left to right, sections 6, 5, and 4, of the right flue.



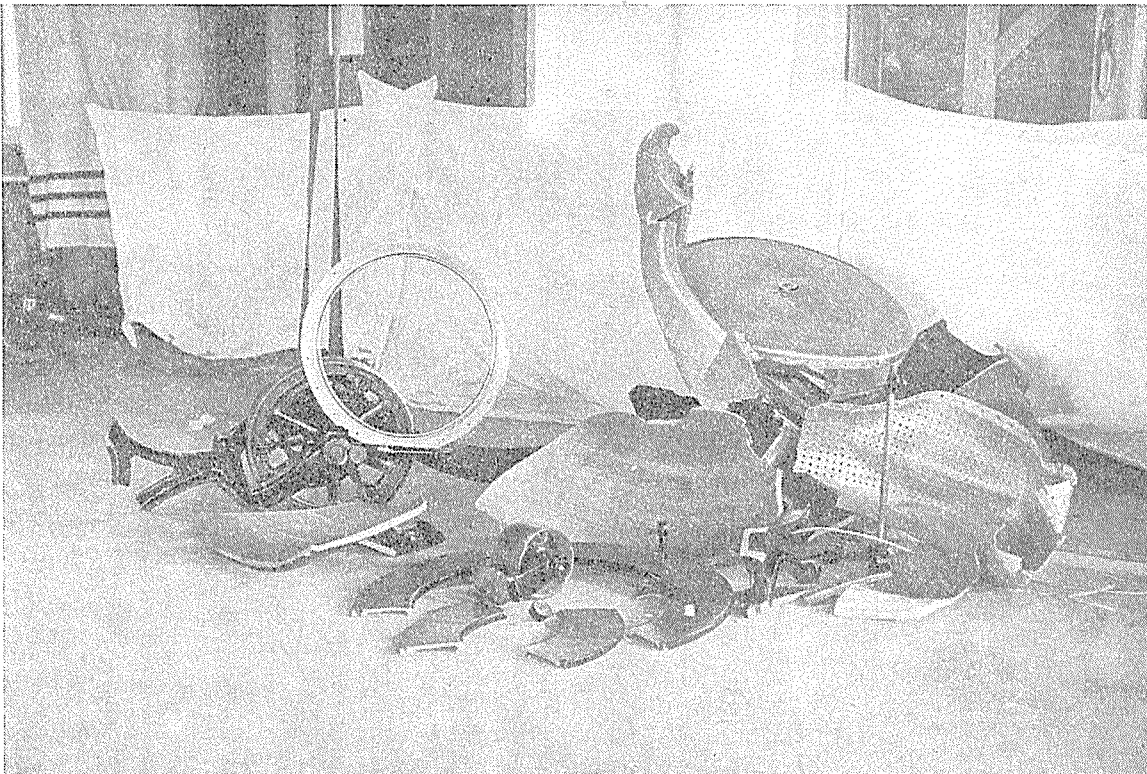
Left, section 5 of left flue looking towards the front end.
Right, section 6 of left flue looking towards the front end.



Wrecked hydro extractor before scattered parts had been collected.



Wrecked hydro extractor before scattered parts had been collected.



Wreckage of hydro extractor collected together.

Division VII.

Annual Report of the Chemical Branch, Mines Department, for the Year 1940.

The Under Secretary for Mines.

I have the honour to present for the information of the Hon. Minister, my report for the year 1940.

Staff.—The position of Assistant Government Analyst rendered vacant by my promotion to the position of Government Mineralogist and Analyst has not yet been filled. This office carried the duties of deputy to the head of the Branch and the delay in filling the position has placed a heavier burden on my position than that carried by my predecessor. The additional demands for technical advice and the rapidly expanding activities of the Laboratory justify the immediate appointment of a professional officer to relieve me of some of the duties attached to my position.

Several changes were made in the staff during the year.

The vacancy created by the re-allocation of duties in the Mineral Section was filled by the promotion of Mr. J. N. A. Grace, A.W.A.S.M., A.A.C.I., to the position of Supervising Chemist on 14th November, 1940.

Mr. G. E. M. Dean, who was seconded to the State A.R.P. Committee in September, 1939, resumed duty for a few months. He took over military duties as Gas Officer in July for the duration of the war. His position was filled temporarily by the transfer of Mr. T. Haug from the Engineering Division of the Department of Works.

Mr. F. W. Steel, A.A.C.I., commenced duty in October as a temporary chemist for special work on oils for the Plant Engineer.

Mr. G. A. Greaves, B.Sc., A.A.C.I., temporary chemist on Iron Ore Survey investigations, resigned on 6th September, 1940, to take a permanent position in the Government Railways Laboratory.

At the request of State A.R.P. Committee, Mr. J. C. Hood, A.A.C.I., attended the Special Course at the School of Military Engineering, held at Liverpool, N.S.W., on 26th August to 31st August, 1940, for training in the use of explosives, demolition and bomb disposal.

Accommodation.—The work of the Laboratory still continues to be seriously hampered by the lack of suitable accommodation and the constant shaking and rattling throughout the building caused by the adjacent hospital machines.

Plans have now been prepared by the Principal Architect for a new Laboratory to provide the necessary facilities to meet our immediate requirements and allow for limited expansion. Funds have been set aside by the Government for the erection of the building on unoccupied Government land with frontages to Hay street, Plain street, and Adelaide terrace, at the east end of the City. Tests carried out by the Engineering Department of the University have shown the site to be reasonably free from vibration. Ample land has been made available for future buildings and the necessary ground space.

Equipment.—Much damage has been done to the fine instruments and equipment by the continued rattling. Replacements which are very costly, will be extremely difficult to obtain owing to war conditions.

The amount provided for the financial year for the purchase of chemicals, books and apparatus was £1,250, an increase of £241 over that expended under these items during the previous year.

Library.—There is an urgent need for adequate modern literature on subjects associated with the industrial expansion of the State. More funds will have to be provided for the purchase of books and journals in order that the staff may be acquainted with the latest developments so that they will be in a position to deal with constant demands for technical advice, required in connection with the establishment of industries new to this State.

Functions of the Branch.—As predicted in my last Annual Report, the work and functions of the Branch have been considerably widened and now cover many investigations into new processes involving the application of chemistry, mineralogy, and physics. This is largely due to the policy of the Department of Industry to assist already established industries to expand and improve their products. In regard to the latter, however, it is impossible, with the present staff and equipment, to deal satisfactorily with the many problems submitted.

Official Committees.—Meetings of the following Committees to which I have been appointed in my official capacity have been regularly attended.

- Advisory Committee, Foods and Drugs.
- Advisory Committee, Metropolitan Water Supply and Sewerage.
- Technical Committee on Industrial Development.
- Minerals Development Committee, Mines Department.
- Oils Committee of the Government Tender Board.
- Producer Gas Coordinating Committee.
- State Committee of the Council of Scientific and Industrial Research.
- Sulphur Panel, Department of Industries.
- Phosphate Panel, Department of Industries.
- Iron and Steel Panel, Department of Industries.
- Asbestos Panel, Department of Industries.
- Mica Panel, Department of Industries.
- Vermiculite Panel, Department of Industries.

No meetings of the State Standards Testing Committee were held during the year.

Not only does the preparation for and attendance at the abovementioned meetings take up a lot of my time, but they are responsible for an increased demand on the Laboratory for analytical and investigatory work on raw materials.

Nature of Work Done.—In addition to dealing with the 9,124 samples registered for investigation, which is an increase of 2,555 over the figures for the previous year, much time was devoted by members of the staff to enquiries of a technical nature received from Government Departments and the Public. All of this work was performed under very difficult and trying conditions owing to poor accommodation, lack of equipment and the difficulty in obtaining supplies of suitable reagents, etc. It is due only to the special effort and whole-hearted co-operation of all members of the staff that it was possible to deal with all the samples listed below.

Unfortunately, owing to lack of staff, it has not been possible to devote very much attention to obtaining detailed information regarding the chemical and physical properties of our natural resources. The absence of this fundamental information has seriously retarded the efforts now being made to establish new industries in this State. It is hoped, therefore, that the necessary personnel and facilities will soon be provided to enable this Branch to devote more attention to matters of this nature.

At the request of the Department of the Army, this Laboratory has carried out a continuous test for poisons of water during the whole time ships proceeding overseas were taking on their supplies. This has necessitated a member of the chemical staff being constantly on duty, day and night, during the whole period water was being taken on board, this in some cases covering a period of several days.

Although this work is outside the normal activities of this Branch, it was first arranged that those members working after usual office hours should be allowed equivalent time off. As this arrangement seriously disorganised laboratory work, it was decided that those officers working after hours should receive payment for their services, the cost to be defrayed by the Department of the Army.

At the request of The Department of the Army, periodical chemical tests of samples of foodstuffs taken from deliveries to the Western Command have been carried out. This work, which is performed without charge, has enabled us to gain some useful information regarding the quality of certain foodstuffs, both local and imported.

In connection with the Australian Survey of the properties of butter, a comprehensive examination of monthly samples of butters representative of the products of a number of local butter factories was commenced in January. It was arranged that the investigation should continue for two years, the samples to be collected by the Department of Agriculture and the results of the analyses forwarded through that Department to the Commonwealth Government.

The chemical survey of the principal fruits used in commercial jam making and in the preparation of citrus fruit juice drinks was continued as opportunity offered, during the year. The results obtained to date are given in Appendix I. These figures should prove of great value to those industries concerned in their uses.

In order to determine the composition of the air in the Proprietary Mine at Collie, following the death of a miner who was overcome by fumes, Mr. J. C. Hood was instructed to proceed to Collie to collect samples for analysis. One sample collected a fortnight after the accident, from approximately six

feet from where the body was found, showed carbon monoxide, 0.074; carbon dioxide, 1.04; methane, 0.34, and oxygen, 18.35%.

From 4th April to 28th May, 1940, Mr. J. C. Hood was engaged, in association with the Chief Inspector of Explosives, on an investigation into the composition of the air in various mines at Kalgoorlie after firing explosives with and without the use of a proprietary preparation, said to neutralise acidic toxic gases when placed with the explosive charge. It was found that the neutraliser did not remove nitrous fumes completely and in the majority of cases the concentration was in excess of 0.001 per cent. It was also noted that with and without the use of the neutraliser, dangerous concentrations of carbon monoxide are formed, which require the usual ventilation precautions.

On two occasions Mr. H. E. Hill was deputed to examine ships' holds for the presence of noxious gases or vapours and to give evidence thereon, before the Industrial Board of Reference, in cases of stoppage of work on this account by workers engaged in unloading cargo. In one case casks containing formalin had leaked in the hold and given rise to an accumulation of formaldehyde vapour and of paraformaldehyde which was also giving off formaldehyde. In the second case there was a similar leakage and also a small amount of sulphur dioxide present, due to slight leaks from cylinders of liquid sulphur dioxide carried with other cargo.

The samples received are classified in the accompanying table:—

Table showing Source and Allocation of Samples for 1940.

Source, Department, etc.	Section 1. Foods, Drugs, and Toxicology.	Section 2. Mineralogy and Geo- chemistry.	Section 3. Agriculture and Water Supply.
Mines—			
Minister for Mines .....	....	1	....
Under Secretary .....	....	51	....
Chemical Laboratory	46	11	2
State Mining Engineer	19	159	....
Geological Survey .....	....	169	....
State Batteries	21	1,457	1
Explosive Branch	94	2	....
Health—			
Commissioner of Public Health	133	4	2
Hospitals	49	....	....
Treasury—			
Government Stores and Tender Board	68	....	....
Police—			
Criminal Investigation Branch	6	....	....
Coroner's Inquests, etc.	92	....	....
Liquor Inspection Branch	4	....	....
Agriculture	112	2	795
Industrial Development	1	22	2
Works and Labour	491	13	141
Factories	3	....	....
State Insurance	5	....	....
Metropolitan Water Supply	447	2	1,894
Forests	6	61	258
State Saw Mills .....	....	....	3
Chief Secretary's .....	....	....	2
Commissioner of Native Affairs	1	....	....
Education	2	....	....
Premier's	3	....	....
Lands and Surveys .....	....	....	3
Railways	19	....	....
Commonwealth—			
Works Department .....	....	2	....
Department of the Army	250	....	583
Council for Scientific and Industrial Research	3	....	....
Iron Ore Survey .....	....	855	....
Local Governing Bodies	19	....	4
Public Pay	15	43	253
Public Free	5	410	2
Total	1,914	3,264	3,946
Grand Total	9,124		

The following tables show the nature and sources of the samples entered in the Registers.

Mines Department:—2,033 samples:

—	Minister and Under Secretary.	State Mining Engineer's Branch.	Geological Survey Branch.	State Batteries Branch.	Explosive Branch.
Assay weights	57	...
Air	...	14	...	...	92
Aluminium ores	8	...	...
Barite	...	1	1	...	...
Gold ores	2	150	32	...	...
Gold tailings	...	1	...	1,388	...
Gold bullion	1	...
Gold slag	2	...
Copper ores	...	1	7	1	...
Gases	2
Iron ores	49	...	...	...	...
Lubricating oils	5	3	...
Limestones	22	...
Limes
Miscellaneous minerals	1	4	56	...	...
Miscellaneous	...	1	1	3	2
Mica	...	1	...	...	...
Magnesite	3	...	...
Manganese ore	1	...	...
Rocks	29	...	...
Tin ores	4	...	...
Tungsten ores	...	1	...	...	...
Titanium ores	5	1	...
Talc	17	...	...
Vermiculite	1	...
Waters	...	4	...	...	...

In addition to the above, the following materials were examined by this Branch:—Fruits (fresh) 36, cordials 1, air 5, gases 2, charcoal 2, vermiculite 2, mica 1, water 1, gold ores 1, miscellaneous minerals 5, and miscellaneous 3.

Department of Public Health:—188 samples:

—	Commissioner of Public Health.	Hospitals.
Bacon	8	...
Cordials	1	...
Honey	1	...
Milk, fresh	2	...
Milk, malted	5	...
Milk, human	18	...
Oils, edible	2	...
Tomato products	10	...
Ethers	3	39
Medicinal preparations	3	1
Human toxicology	2	2
Urines	23	4
Waters	19	3
Dangerous drugs	13	...
Paints, dusts, etc.	18	...
Hair and nails	2	...
Calculus	1	...
Soap	1	...
Sulphur dioxide	1	...
Sewerage	1	...
Soil	1	...
Miscellaneous	4	...

Premier's Department:—Three samples:

Bleaching powder, three.

Department of Agriculture:—909 samples:

—	Stock Branch.	Dairy Branch.	Botany and Horticulture.	Research Branch.	Wheat Branch.
Animal bones	16	...	...	...	...
Animal toxicology	12	...	...	...	...
Butter	...	38	...	...	...
Blackberry roots	...	...	2	...	...
Copper ores	1	...	...	...	...
Cattle dips	30	...	...	...	...
Cereals	...	...	...	6	51
Flours	...	...	...	...	6
Fertilisers	...	...	...	3	12
Honey	...	...	1	...	...
Lupin seeds	7	...	...	11	...
Miscellaneous	1	...	1	1	1
Plants	...	...	1	...	...
Plant leaves and cuttings	...	...	9	39	...
Pasture grasses	...	445	...	78	...
Potatoes	...	...	...	20	...
Soils	...	...	...	102	...
Tallow	...	...	...	1	...
Waters	9	...	...	6	...

Police Department:—102 samples:

—	Criminal Investigation Branch.	Coroners' Inquests.	Liquors Inspection Branch.
Dangerous drugs	1	...	...
Abortifacients	2	...	...
Animal toxicology	2	...	...
Human toxicology	...	92	...
Spirits	...	...	1
Wines	1	...	3

Forests Department:—325 samples:

Charcoal	..	..	..	..	58
Jarrah ash	..	..	..	..	3
Pines	..	..	..	..	4
Soil	..	..	..	..	189
Tanning materials	..	..	..	..	2
Timbers	..	..	..	..	67
Waters	..	..	..	..	2

Department of Labour and Employment:—Eight samples:

—	State Insurance.	Factories Branch.	
Urines	5
Paints	3

TREASURY DEPARTMENT:

Government Stores and Tender Board:—68 samples:

Disinfectants	..	..	..	..	4
Insecticides	..	..	..	..	6
Limes	..	..	..	..	6
Medicinal preparations	..	..	..	..	26
Oil, edible	..	..	..	..	1
Oils, lubricating	..	..	..	..	9
Pickles, Chutney, Sauces	..	..	..	..	3
Rope	..	..	..	..	7
Soap	..	..	..	..	1
Starch	..	..	..	..	4
Vinegar	..	..	..	..	1

Metropolitan Water Supply, Sewerage and Drainage Department:—2,343 samples:

Clays	..	..	..	..	2
Sewage	..	..	..	..	1,605
Sewer gas	..	..	..	..	116
Sand	..	..	..	..	4
Trade wastes	..	..	..	..	3
Waters	..	..	..	..	491
Waters, ocean	..	..	..	..	122

Department of Industrial Development:—25 samples:

Charcoal	..	..	..	..	5
Clays	..	..	..	..	3
Iron ore	..	..	..	..	1
Limestone	..	..	..	..	1
Mushrooms, canned	..	..	..	..	1
Minerals	..	..	..	..	5
Miscellaneous	..	..	..	..	3
Manganese ore	..	..	..	..	1
Rocks	..	..	..	..	2
Sands	..	..	..	..	1
Waters	..	..	..	..	2

Department of Works and Labour:—645 samples:

Carbon deposits	10
Jetty sheeting	2
Lime	1
Lubricating oils	80
Miscellaneous	13
Piston rings	400
Waters	139

State Saw Mills:—Three samples:

Waters	3
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Chief Secretary's Department:—Two samples:

Waters	2
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Department of Education:—Two samples:

Waters	2
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Railways Department:—19 samples:

Urine	19
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Department of Native Affairs:—One sample:

Peanuts	1
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Lands and Surveys Department:—Three samples:

Waters	3
----------------	---

Local Governing Bodies:—23 samples:

Animal toxicology	1
Foodstuffs	1
Milk, fresh	17
Waters	4

Commonwealth Departments:—1,694 samples:

	Works.	Army.	C.S.I.R.	Iron Ore Survey.
Bread	3	...	...
Butter	2	...	...
Cocoa	1	...	...
Coffee	2	...	...
Condiments and spices	4	...	...
Cornflour	2	...	...
Tinned fruits	3	...	...
Fruits, dried	1	...	...
Flour	1	...	...
Insecticides	3	...
Iron ores	855
Jams	4	...	...
Jelly crystals	1	...	...
Lime	1	...	...
Milk, fresh	2	...	...
Milk, dried	2	...	...
Pickles and sauces	4	...	...
Rocks	2	...	...	...
Sausages	3	...	...
Tea	3	...	...
Vinegar	3	...	...
Waters	1	791	...	...

Public Pay:—311 samples:

Asbestos	1	Toxicology:	
Barite	1	Medicine	1
Copper ores	2	Foods	3
Coal	2	Water	1
Clay	1	Vomit	1
Fertilisers	7	Rock	1
Gold ores	6	Soil	2
Gold tailings	14	Tantalum ores	2
Gold prills	3	Tin ore	1
Insecticide	1	Tungsten ores	5
Minerals	2	Urine	5
Miscellaneous	1	Assay Weights	1
Molasses	1	Waters	245
Pelt	1		

Foods:

The number of samples examined was 171. Forty-one (41) of these were a variety of foodstuffs submitted at intervals by the Commonwealth Department of the Army, for testing as to compliance with the Food and Drug Regulations. Thirty-eight (38) samples of butter were examined in batches at monthly intervals for the Australian Butter Survey instituted by the Council for Scientific and Industrial Research. Thirty-six (36) samples of fruits were analysed in continuation of the survey of the chemical composition of the principal fruits used for jam-making and fruit juice drinks in W.A. Twenty-nine (29) samples of food received from the Department of Public Health and 18 from local governing bodies were examined for compliance with the Food and Drug Regulations. The following table summarises the results with some of the foods examined in this respect:—

Foodstuffs.	No. of Samples Received.	No. below Standard.	Remarks.
Bacon	8	2	Excessive nitrate.
Bread	3	...	...
Pickles, sauces, etc.	4	...	...
Tomato pulp, etc.	8	3	Excessive arsenic.
Spices and condiments	3	...	...
Jam	4	2	Soluble solids below commercial standard.
Milk	21	7	Added water; skimming and in two cases reconstituted milk.
Edible oils	3	...	...
Sausages	3	...	...
Tea	3	...	...
Vinegar	4	1	Below standard in acid.

Public Free:—417 samples.

Asbestos	5	Lead ores	4
Aluminium ore	1	Miscellaneous	15
Alunite	8	Mica	4
Barite	2	Magnesite	4
Charcoal	1	Manganese ore	1
Clays	4	Molybdenum ore	1
Copper ores	12	Opal	1
Coal	1	Ochres and pigments	12
Chromite	1	Rocks	36
Cobalt ore	1	Sands	7
Crucibles	1	Salt	1
Felspar	2	Tantalum ores	3
Fullers Earth	1	Tin	1
Fertiliser	1	Tungsten ore	1
Gold ores	111	Talc	4
Graphite	9	Titanium ores	4
Gypsum	3	Vermiculite	11
Iron	6	Waters	2
Limestones	2	Minerals	133

The following results were obtained in the case of two samples of milk suspected of being made with dried milk powder:—

Lab. No.	7375.	7376.
	%	%
Total solids	18.65	14.52
Fat	5.10	4.55
Solids not fat	13.55	9.97
Ash	1.20	0.86
Protein	5.30	3.81
Lactose	6.08	5.29
Freezing point °C.	— 0.891	— 0.614
Evanson's test for reconstituted milk	Positive	Positive

Analysts: J. C. Hood and H. Sedgman.

The samples both tasted unlike fresh cow's milk, but distinctly of dried milk. They were reported as consisting of or adulterated by the addition of reconstituted milk, i.e., dried or condensed milk mixed with water.

Drugs and Medicines:

In all eighty-nine (89) samples of drugs and medicines were examined. Forty-two (42) of these were others tested for compliance with the British Pharmacopoeia limit for peroxides. Thirty-six (36) samples of various medical preparations were examined, chiefly as to compliance with the B.P. or B.P.C. formulae and for suitability for use in Government Hospitals. Twenty-five (25) of these were from the deliveries of one contractor whose supplies had been proving unsatisfactory; 13 of them failed to pass.

Thirteen samples of preparations of dangerous drugs such as morphine, heroin, codeine and cocaine were examined in connection with defalcations by an officer concerned with their distribution. Other samples included two supposed abortifacients and one cattle medicine.

Toxicology and Industrial Hygiene:

In all nine hundred and eight-five (985) samples were examined under the headings of the several branches of toxicology. Exhibits and specimens in connection with human poisoning cases numbered 102. The number of cases was 34. The poisons found were as follow:—Strychnine 9 cases, phenolic disinfectants 4, cyanide 3, nicotine 3, barbiturates 2, sodium nitroprusside 1, ink 1. In eleven (11) cases negative results were obtained. Most of these analyses were in connection with coroners' inquests and evidence was given in court in a number of cases by Mr. H. E. Hill or Mr. F. J. Malloch.

One thousand, two hundred and thirty-three (1,233) samples of water were tested for poisons.

The case of sodium nitroprusside poisoning occurred as the result of an employee of a private hospital deliberately taking portion of the contents of a bottle containing that substance which was used for the testing of urine for acetone.

Mr. H. E. Hill, A.I.C., A.A.C.I., Supervising Chemist and Toxicologist, who personally conducted the examination of the exhibits, reports as follows:—

"The deceased was no doubt influenced by the label 'Poison' on the bottle and not by the name of the substance on the label, which was practically obliterated. The toxicity of sodium nitroprusside to guinea pigs per os as compared with that of potassium cyanide was determined by the Assistant Veterinary Pathologist in the Department of Agriculture. It was found that the average lethal dose of sodium nitroprusside is approximately five-twentieths of a grain for a guinea pig, and of potassium cyanide four-twentieths of a grain. Hence there is only a slight difference between the toxicities of the two substances. Death, however, takes place more slowly with animals poisoned with sodium nitroprusside than with potassium cyanide. As the usual method of distillation from acidified solution for cyanides results in very incomplete recovery of the cyanogen radicle some work has been done with the object of finding a better method. Some success has been met with and it is hoped to publish the results elsewhere."

Industrial toxicology accounted for 212 samples. These were:—Air 111, gases 4, paints, lacquers, pigments, and other paint materials and paint removers 21, urine, hair, and nails 58, waters 18. Ninety-two

(92) of the samples of air were analysed at Kalgoorlie to ascertain the extent of the presence of nitrous fumes in mine air after blasting operations, and to determine the efficacy or otherwise of a patented "neutraliser" or "anti-fume bullet." Fourteen (14) samples of air were taken in a Collie mine to be examined for carbon monoxide, subsequent to the death of a miner following a "creep" in one of the coal mines.

Seven (7) samples of air and gas were taken from charcoal kilns at Dwellingup and analysed for carbon monoxide, carbon dioxide, and oxygen. Following this a report was made on the risks of "gassing" of workers engaged in burning charcoal in various types of kilns. As a sequel to this, workers are to be informed of the precautionary measures which should be taken in this connection.

The paint materials were examined for toxic constituents, such as lead-containing pigments and volatile solvents which might be injurious to painters using them. Most of the urines and the hair and nails were examined in connection with a medical survey of painters or for lead or arsenic.

Fifteen (15) specimens of stomach contents, viscera, etc., were received in connection with cases of real or supposed animal poisoning.

Waters:

Of the one thousand eight hundred and twenty-four (1,824) samples received, the Engineer for Metropolitan Water Supply submitted 613, included in these were 122 ocean waters collected near the effluent ocean outfall sewer; these will be dealt with under sewage. The balance of the samples comprised water from reservoirs and streams supplying the Metropolitan area, also seepage water from the Canning Dam. The Engineers from the Department of Works and Labour sent in 137 samples; of these 50 came from country supplies and were examined as to their suitability for domestic supplies or as stock waters. A survey of streams and brooks was commenced during the year by the above Department and 72 samples of water have been received up to date for analysis. The quarterly samples from Mundaring Reservoir, Mt. Charlotte Reservoir, and the water as received in Kalgoorlie from these sources totalled 15. These waters were of good potable quality. Two samples of sea water from North-West ports were also received. Waters tested for the Department of the Army at Fremantle totalled 785. Samples were also sent in from Jandakot (1), Narrogin (1), Cocos Island (4). The Commonwealth Works Director submitted one sample of water from the Forrest aerodrome as to the suitability for drinking and boiler purposes. Farmers, graziers, and market gardeners sent in 215 samples taken from bores, wells, dams, streams, and soaks. These were principally for stock and irrigation purposes. A number of them were found to be too saline to be used for any purpose. The balance of the samples were received from various other Government Departments and private sources. The composition of the various hills waters supplying the Metropolitan area are given in Appendix IV.

Soils:

The Plant Nutrition Officer, Department of Agriculture submitted 102 of the 294 samples received for examination; 52 of these were in connection with stalling of clover experiments. Chemical analysis, including exchangeable cations, was required. A soil

survey of the tobacco soils at Manjimup, by the above Department resulted in 45 samples being received for mechanical and chemical analysis, also exchangeable cations. Two (2) soils were received for the determination of copper, and three (3) others from farms for chemical analysis. The Forests Department submitted 189 soil samples for partial chemical analysis; these were taken from pine plantations at Wilga, Greenbushes, Hester, Tallanalla, Applecross, Gnan-gara, Wonnerup, Stirling, Ludlow, Myalup, and Mundaring. The Department of Health sent in one sample for porosity and permeability test; this was in connection with the Narrogin Drainage Scheme. The balance of the samples came from private sources.

Fertilisers:

Of the twelve (12) official samples submitted by the Inspector of Fertilisers, 10 complied with the Regulations under the Act, the balance being deficient in potash content. Although the registered figure for potash was 9.0 per cent. in each case, one contained 7.66 per cent. and the other 6.90 per cent.

Two samples of fowl manure examined during the year proved to be of poor quality due to the presence of a considerable amount of inorganic material (sand and soil). The analytical figures obtained were:—

	1.	2.
	%	%
Moisture	7.20	8.41
Ash *	48.94	64.06
Nitrogen, N	2.76	.85
Lime, CaO	3.56	2.44
Phosphoric oxide, P ₂ O ₅	2.28	1.08
Potash, K ₂ O ... ..	.93	.69

* The ash contained a large amount of material insoluble in acid.

No. 2 sample contained some duck manure.

Four (4) samples of cave manure from Gingin were of little commercial value as fertilisers. They contained:—

	1.	2.	3.	4.
	%	%	%	%
Phosphoric oxide, P ₂ O ₅	0.35	1.00	0.22	0.15
Nitrogen, N	0.22	0.32	0.10	0.17
Insoluble in acid	75.00	47.00	75.00	82.00

Pasture, etc.:

Included under this heading are 523 pasture grasses; 16 samples of plant material and 20 samples of potato material comprising 10 of peel and 10 of pulp. These samples were submitted by the Plant Nutrition Officer and The Agrostologist of the Department of Agriculture. Of the pasture grasses 370 were monthly cuttings from experimental blocks under irrigation at Harvey for dry weight at 80° C. After drying, composite samples were made from each treatment for chemical analysis; these totalled 80. Seventy-three (73) samples of pasture, green oats, capeweed and subterranean clover were submitted in connection with mineral deficiency (minor elements) experiments; these were examined principally for copper and manganese. Leaves from potato, maize, and tomato plants (16 samples) taken from control and copper treated plants were also examined for copper. The potato samples (20) were for partial chemical analysis, including the determination of the copper and manganese contents.

Timber:

In order to obtain information regarding the ash content and the composition of the ash from Jarrah, Karri, and Wandoo, the Conservator of Forests

arranged for the collection of a series of samples of the timbers available in a number of local timber yards. In order to ensure that the material would be representative of the individual types 67 separate samples of dressed timber were collected. These were carefully cleaned from any adhering dust and the moisture content of each sample determined. The individual types were then segregated and the whole of the material of each type bulked for the determination of the ash content and an analysis of the ash.

The results obtained were:—

	Jarrah.	Karri.	Wandoo.
	%	%	%
Ash on timber dried at 100° C. ...	0.015	0.213	0.397
Analysis of Ash:			
SiO ₂	2.6	.51	.20
Al ₂ O ₃	2.62	<i>Nil</i>	.05
Fe ₂ O ₃ ... ..	.65	.20	.18
Mn ₂ O ₄ ... ..	.23	.13	2.06
CaO	27.48	32.51	51.95
MgO	16.40	34.45	15.37
K ₂ O	3.06	1.63	.29
Na ₂ O	15.29	1.73	.83
H ₂ O ±	2.25	2.50	1.50
TiO ₂ ... ..	.04	Trace	.01
CO ₂	12.48	22.42	24.12
P ₂ O ₅	2.12	2.84	.26
SO ₃	13.91	1.48	3.61
BaO ... ..	.32	—	<i>Nil</i>
CaO ... ..	.17	.02*	.01*
ZnO	Present*	Present*	Present*
Cl	<i>Nil</i>	.34	.13
	99.62	100.76	100.57
Less O = Cl ₂ ... ..	...	.07	.03
		100.69	100.54

Analysts: C. R. Le Mesurier J. N. A. Grace.

* Micro-chemical determination.

Charcoal:

Restriction in the use of liquid fuel was largely responsible for a rapid increase in the production of charcoal mainly for use in mobile producer gas units. Of the sixty-six (66) samples examined, 58 were from the Forests Department.

Three (3) samples of charcoal produced by a local charcoal burner gave the following results on examination in this Laboratory.

	Wandoo.	Red Gum.	Jarrah.
	%	%	%
Proximate analysis:			
Moisture	2.79	3.86	3.03
Volatile hydrocarbons	17.37	21.61	10.84
Fixed carbon	78.62	73.03	85.77
Ash	1.22	1.50	.36
Calorific value, B.T.U.	13405	12954	14015

Cereals:

All of the samples received were forwarded by the Department of Agriculture (Wheat Branch 51 samples, Plant Nutrition Officer 6 samples). Of these thirty-three (33) were Royal Show wheat samples for the estimation of protein content and the determination of the Pelschenke value.

A sample of the 1939-40 season f.a.o. wheat examined for quality gave the following results:—

	%
Moisture (1 hr. at 130° C.)	9.63
Ash *	1.34
Protein (N x 5.83)*	10.04
Pelschenke Time Factor	37 minutes
Specific Protein Quality	3.7

* Expressed on standard moisture basis of 13.5 %.

Two samples of shrivelled wheats examined for their nutritive value gave the results shown hereunder. Figures for f.a.q. wheats are included for comparison.

	Shrivelled Wheat Grain.		
	F.A.Q. 1939-1940.	"A."	"B."
	%	%	%
Moisture	9.96	10.88	10.96
Protein (N x 5.83) ...	10.16	9.68	9.44
Petroleum ether extract	1.29	1.48	1.79
Total ash	1.47	2.18	1.72
Fibre (crude)	2.50	3.58	2.78
Carbohydrates (by difference)	74.62	72.20	73.31

The nutritive value of nine samples of oats, five of barley and one f.a.q. wheat was also determined with the results shown in Appendix 2.

In addition the copper, manganese and zinc were determined in six wheat samples from the minor elements experiments conducted at the Wongan Hills Research Station in 1938.

Lubricating Oils, etc.:

Altogether ninety-two (92) samples of lubricating oil were received, 80 of which were in connection with an investigation being carried out by the Plant Engineer, Public Works Department, into the effects on the engines and the crank case oil, of running motor vehicles on producer gas. In the same connection 400 piston rings and 10 carbon deposits were weighed.

Sewage and Sewer Gas:

Control samples from the sewage treatment works totalled 1,605. Determinations of hydrogen sulphide in sewer gas totalled 116. One sample of effluent from an hotel at Collie, sent in by the Health Department was an extremely bad sample. As mentioned, under "Water," 122 samples of ocean water collected on the following dates:—9th January, 46 samples; 1st August, 12 samples; 10th September, 17 samples; and 5th November, 48 samples; in the vicinity of the effluent outfall sewer from the Subiaco and Swanbourne treatment works, were examined and no chemical evidence of pollution could be detected along the beaches.

Lupin Seeds:

Eleven samples of lupin seeds from the Wongan Hills Agricultural Research Station were examined for alkaloids in connection with the attempts by the Department of Agriculture to breed lupins for fodder which are harmless to farm animals. One sample, obtained from the ordinary yellow lupin was shown by a grading microchemical test to contain considerably more alkaloid than seeds of the German sweet lupin.

The nutritive value for stock was determined on seven samples of lupin seeds grown from local and imported seeds received from the Animal Nutrition Officer, Department of Agriculture. The results obtained are given in Appendix 3.

Vine Leaves, Apple Leaves, and Currant Cuttings:

Eight (8) samples of vine leaves from control and copper treated vines were submitted by the Plant Nutrition Officer, Department of Agriculture for copper determination. The Fruit Branch of the same

Department sent in nine samples of apple leaves, taken from control and treated trees, for manganese determination. The Plant Nutrition Officer also submitted one sample of currant cuttings for analysis to determine the amount of minerals returned to the soil when they are ashed. The figures obtained were:—

	Currant Cuttings.	
	%	
Moisture	4.39	
Ash	2.49	
P	0.11	
K ... ..	.43	
Ca ... ..	.53	
Mg ... ..	.20	

Trade Wastes:

Three (3) samples were submitted by the Engineer for Metropolitan Water Supply, Sewerage and Drainage for examination as to their detrimental effect on the cement sewer pipes.

Copper:

Five hundred and eighty (580) samples were assayed for copper. Of these five hundred and thirty-nine (539) were State Batteries tailings samples, the determination of the copper content being required for the purpose of allowing for its effect on the extraction of gold by cyanidation. The copper content of several ores was determined for their use in mixing with fertilisers to be applied to copper deficient soils. Twelve (12) ores were assayed for copper under the free assay regulations.

Gold:

One thousand seven hundred and eleven (1,711) samples were entered as gold ores, this being an increase of 194 over the previous year. The State Mining Engineer submitted 151 gold ores against 18 for the previous year. The State Batteries Branch forwarded 1,334 samples of tailings for check and umpire assay, the latter totalling 191. Only one hundred and eleven (111) samples were assayed for gold under the free assay regulations.

Magnesite:

Seven samples of magnesite were examined. Large quantities of this mineral are known to occur at Bulong, Ravensthorpe and Coolgardie. Two samples recently collected from Scahill's magnesite leases, Camel Paddocks, Coolgardie, were analysed with the following results:—

	No. 1 Hard.	No. 2 Soft.
	%	%
SiO ₂	1.15	.19
MgO	43.42	47.17
CaO	3.87	.06
CO ₂	49.21	51.45
Cl ... ..	.03	.22

Magnesite similar to "No. 2 Soft," with low lime and silica content would be suitable for use in the manufacture of magnesium refractories, cements, and cupels used in gold assaying.

Iron:

In connection with the Commonwealth Survey of iron ores 826 samples were assayed for iron, 632 of these being from Koolan Island and Irvine Island, Yampi, and 194 from Koolyanobbing. In addition, the Koolan and Irvine Island samples were grouped, 29 group samples being analysed for iron, silicon, water, titanium, phosphorus and sulphur.

Ochres and Oxides:

Twelve (12) samples of natural ochres and oxides were examined. Most of these were dull colours or contained too much siliceous material and would require levigation before use. Of interest were two samples said to have been obtained three miles west of Northam. A partial analysis of these gave the following figures:—

		"Dark red oxide."	"Yellow ochre."
		%	%
Fe ₂ O ₃	...	71.17	66.57
SiO ₂	...	11.12	10.00

Both of these produce a fairly bright "red oxide" pigment on roasting and form paints of great density with oil.

Talc:

Four (4) samples of talc rocks were reported upon. The examinations were carried out to determine the nature of the rocks, their mineral composition and

possible commercial uses. Results proved that two of them would be suitable for certain purposes. One was a typical massive soapstone suitable for use in the production of talc both as a powder and in block form in which a good white colour is not essential. The other was a foliated talc rock which could be used in block form after burning.

Vermiculite:

Thirty (30) samples were entered to be tested for vermiculite. Vermiculite is a general term applied to a number of micaceous minerals, all of them hydrated silicates. The characteristic feature of vermiculite is its extraordinary expansion on heating. All that is necessary to prepare it from the raw material is to heat it to between 900 and 1100° C. for a few seconds and then rapidly cool. Ten (10) samples from Halbert's main vermiculite lode, Young River, were examined for commercial value by grading and exfoliation.

The results of two of these tests are given below:—

Screen Size.	Natural Material.			Exfoliated Product.			Colour.
	Yield of Grade. %	Gross Weight. Lbs. per c. ft.	Total Air Space.	Gross Volume Increase.	Gross Weight. Lbs. per c. ft.	Total Air Space.	
No. 4—							
— 1/2" + 1/4" ...	8.7	57.2	61.4	12	4.3	98	Silver to golden brown on face, brown on edge.
— 1/4" + 1/8" ...	16.5	50.4	66.4	10½	4.5	98	
— 1/8" + 1/16" ...	30.8	54.9	62.9	10	4.9	97	
— 1/16" + 30 mesh ...	24.2	53.0	64.2	7	6.9	96	
— 30 + 60 "	11.8	48.8	67.0	4½	9.4	95	
— 60 + 90 "	2.4	54.9	62.9	2.2/3	17.8	90	
— 90 mesh ...	5.6						
		Impure			Not exfoliated		
No. 6—							
— 1/2" + 1/4" ...	24.4	45.3	69.4	15½	2.5	99	Light colour silver white on face, light brown on edge.
— 1/4" + 1/8" ...	34.7	49.3	66.7	10½	3.8	98	
— 1/8" + 1/16" ...	20.1	48.8	67.0	9	4.6	98	
— 1/16" + 30 mesh ...	13.5	50.0	66.2	7½	5.7	97	
— 30 + 60 "	4.3	51.8	60.8	7	6.1	96	
— 60 + 90 "	1.4	46.4	68.6	3½	10.4	94	
— 90 mesh ...	1.8						
		Impure			Not exfoliated		

The coarser grades of both these samples are very light when expanded and they appear to be fairly strong. They would be suitable for use as thermal and acoustic insulating material.

Alunite:

Renewed interest in the alunite deposits of this State has followed from a shortage of potash salts due to war conditions. Eight (8) samples were received, five from the Kanowna district and three from Lake Chandler, Campion.

Barite:

Five (5) samples of barite were received. A bulk sample from Sukey Hill, 1½ miles East of Cranbrook was analysed.

Partial Analysis:	%
BaO	63.61
SO ₃	32.71
SiO ₂	3.32
Fe ₂ O ₃	.045
CO ₂	Nil
Pb	Nil

This material would be suitable for use as a filler and to give weight in paper and rubber goods, and for adding to pigments in the manufacture of paints.

Laterite and Bauxite:

Although over large areas the hills of the Darling Range are capped with laterite carrying at least 35 per cent. soda soluble alumina, no systematic sampling by boring of these areas has yet been undertaken.

Nine samples were received, eight being from the Geological Survey Branch. Partial analysis of three samples containing total alumina in excess of 40% are given below:—

	Sawyer's Valley. %	Beechina Hill. %	Beechina Hill. %
Al ₂ O ₃ total	49.23	43.26	44.36
Al ₂ O ₃ soluble in soda solution	45.72	36.59	40.73
Fe ₂ O ₃	9.76	20.46	13.30
TiO ₂	.67	2.67	1.53
SiO ₂	12.34	9.91	14.87

Miscellaneous:

Forrest Statue.—Following a request from the King's Park Board, an examination of the Forrest Statue was made. One large area and numerous small patches of brown staining were visible from the ground. On closer examination they were found

to be patches of rust surrounding small iron pegs or rods. These had already rusted to a depth of $\frac{1}{2}$ inch in some cases. It was recommended that the iron be drilled out and the bore holes filled with bronze.

Copper Calorifier Coil.—A calorifier coil from the Children's Hospital was examined. The whole outer surface of the tube was deeply pitted and severe corrosion had taken place on the underside. A chemical analysis did not show the presence of any injurious impurity in the metal. The extreme corrosion of the lower surface of the tube suggested that the attack was due to the bubbles of air derived from air in the water adhering to the surface of the metal. Re-design of the vessel of de-aeration of the water before use was suggested.

Comparison of Mabor, Magnolox and Cupex for Cupels.—Half gram lots of fine gold, wrapped in lead foil were cupelled under similar conditions in cupels made from Mabor, Magnolox, and Cupex. The average gold losses were:—

Cupel.	Absorption Loss. %	Other Loss. %	Total Loss. %
Mabor ... ..	.120	.056	.176
Magnolox ... ..	.142	.104	.246
Cupex ... ..	.116	.088	.204

These losses would have very little effect on assay results of ordinary gold ores; the appropriate corrections would, of course, be necessary for bullion assays. The number of cupels of equal size which can be made from five pounds was found to be as follows:—

Mabor.	Magnolox.	Cupex.
30	26	31

Mineral Notes:

Beraunite (hydrous phosphate of iron).—From the lower part of the phosphate beds at a locality known as the Caves, situated about $2\frac{1}{2}$ miles east of Yandan Hill, Dandaragan district. The mineral occurs as radiating fibres in irregular veins and in stellate form giving a botryoidal appearance. The colour ranges from Russet to Dark Olive, with a silky lustre. Specific gravity, 2.95.

Analysis:				
Insoluble in acid—				%
SiO ₂	...	...	...	1.88
Not SiO ₂	...	...	...	.03
Acid soluble—				
Al ₂ O ₃	...	...	...	.43
Fe ₂ O ₃	...	...	...	51.11
Na ₂ O	...	...	...	.58
K ₂ O	...	...	...	.12
P ₂ O ₅	...	...	...	27.24
H ₂ O	...	...	...	15.60
CaO, MgO, SO ₃ , Cl	...	...	...	Nil
				99.99

Analyst: C. R. LeMesurier.

This is the first recorded finding of Beraunite in this State.

Chloritoid (silicate of iron, aluminium and hydrogen).—On the mainland immediately adjacent to Little Whirlpool Pass in the Buccaneer Archipelago and occurring as porphyroblasts in metamorphic schists, associated with almandine garnet, ilmenite and quartz.

Chromite.—Two small specimens were received from three miles south of Byro Station Homestead near Mardagee Pool. Chromite has not previously been reported from this area.

Carnelian.—A reddish variety of chalcedony (silica) from Sandstone district compares very favourably with specimens in the Perth Museum which represent the material suitable for cutting into carnelian ornaments.

Apatite.—A specimen of light green apatite from Yinnietharra was received from the Government Geologist for determination. This piece measured $2\frac{1}{2}$ in. x 1 in. x $\frac{1}{2}$ in.

From seven miles south of Ravensthorpe, a sample of basic pegmatite was received. This consisted of an inter-growth of apatite and hornblende. The apatite occurs in large crystals, up to $1\frac{1}{2}$ in. long by $\frac{1}{2}$ in. across, and constitutes an appreciable portion of the rock.

Andalusite.—Crystals of andalusite, associated with some kyanite were noted in a metamorphic schist from the mainland, adjacent to Little Whirlpool Pass, Kimberley.

Kyanite.—Kyanite was present in the form of prismatic crystals up to 1 in. in length in a sample said to have come from Hamersley Beach.

Kaolin.—A soft white rock from Indee Station proved to be an almost pure kaolin.

Garnet.—Andradite garnet occurs in a specimen from the Corinthian Gold Mine, associated with pyrite, pyrrhotite and a small amount of molybdenite.

Publications:

The following scientific papers were published by members of the staff:—

- H. Bowley: "The Ceramic Resources of South Western Australia." Pres. Ad., Jour. Royal Soc., W.A., 26.
- B. L. Southern (with L. J. H. Teakle and S. J. Stokes): "Soil Survey of the Lakes District, W.A." Jour. Agric., W.A., 17.
- A. G. Turton (with L. J. H. Teakle and G. L. Throssell): "Experiments on Copper Deficient Land at Dandaragan, W.A." Jour. Agric., W.A., 17.

The assistance rendered by Messrs. H. E. Hill, A. J. Hoare and J. N. A. Grace in the preparation of this report is duly acknowledged.

H. BOWLEY, F.A.C.I.,

Government Mineralogist and Analyst.

Perth, 29th May, 1941.

APPENDIX 1.
APRICOTS—ELEVEN SAMPLES.

(1) *Locality, Soil and Cultivation, etc. :*

Lab. No.	Variety.	Locality.	Soil.	Conditions of Cultivation.	Stone-free Fruit. %	Stones. %	Condition of Fruit.
5936	Newcastle Early	Armadale	Medium grey sandy loam	No manure or cultivation	91.2	8.8	Just ripe.
5937	Do.	Gosnells	Grey light sandy loam overlying gravel	Well manured and cultivated	90.5	9.5	Not ripe—some what hard.
5938	Do.	do.	Red brown gravelly loam overlying clay	Well manured and cultivated	91.4	8.6	Almost ripe—some hard.
5939	Do.	do.	Grey sand overlying yellow clay sub-soil	Well manured, cultivated and pruned	91.8	8.2	Fully ripe.
6285	Do.	do.	Rough gravelly loam, good clay sub-soil	Well manured and cultivated	91.0	9.0	All ripe.
6286	Do.	do.	Gravelly with good clay sub-soil	Well manured and cultivated	90.7	9.3	Unevenly ripened, some green.
6287	Do.	do.	Rough gravelly soil with very little clay	Well manured with "Orchard K"	91.3	8.7	Evenly ripened.
6373	Royal	do.	Gravelly loam overlying clay	Well manured and cultivated	93.4	6.6	Just ripe.
6374	Cullin's Early	do.	Gravelly loam-good clay sub-soil	Well cultivated; a little stable manure	92.8	7.2	Fully ripe.
6448	Do.	do.	Red clay loam	Super., ammonia, potash	93.1	6.9	Barely ripe.
6449	Camden Superb.	do.	Rough gravelly loam overlying clay	Super., ammonia, potash	92.0	8.0	Barely ripe.

(2) *Analysis of Stone-free (edible) portion, with extreme and average compositions.*

(Methods used are substantially those of the British Association of Research for Cocoa, Chocolate, Sugar Confectionery and Jam Trades (See Analyst 56, 1931, 35.)

Lab. No.	Insoluble Solids (Fibre, etc.).	Soluble Solids.	Total Solids.	Total Sugars calculated as Invert Sugar.	Acid calculated as Crystallised Citric.	Pectin, as Crude Calcium Pectate.	Ash.	Total Alkalinity (Mils. N/10 HCl per 100g.).
5936	1.5	17.4	18.9	11.9	2.0	1.5	0.68	90.0
5937	1.4	13.6	15.0	7.4	2.2	1.1	0.74	89.9
5938	1.3	15.3	16.6	9.0	2.1	1.2	0.76	89.6
5939	1.4	15.3	16.7	9.2	2.0	1.2	0.79	96.9
6285	1.5	15.8	17.3	9.1	2.3	1.2	0.84	106.1
6286	1.5	15.8	17.3	8.5	2.4	1.2	0.80	99.6
6287	1.5	15.9	17.4	9.4	2.2	1.1	0.86	111.0
6373	1.5	15.3	16.8	10.0	1.5	1.0	0.71	90.0
6374	1.5	17.3	18.8	11.7	2.2	1.1	0.67	85.4
6448	1.4	15.5	16.9	8.6	2.3	1.0	0.72	89.8
6449	1.5	15.0	16.5	9.0	2.2	1.1	0.58	76.5
Highest	1.5	17.4	18.9	11.9	2.4	1.5	0.86	111.0
Lowest	1.3	13.6	15.0	7.4	1.5	1.0	0.58	76.5
Mean	1.46	15.65	17.11	9.44	2.13	1.16	0.74	93.2

PLUMS—TWENTY-THREE SAMPLES.

(1) *Locality, Soil, Cultivation, etc. :*

Lab. No.	Variety.	Locality.	Soil.	Conditions of Cultivation.	Stone-free Fruit.	Stones.	Condition of Fruit.
6444	Wilson	Pickering Brook	Gravelly	K. manure	96.3	3.7	Nearly ripe.
6445	Santa Rosa	Kelmescott	Light sandy loam overlying gravel	Powl manure and super.	97.0	3.0	Hard—unripe.
6446	Beauty	Pickering Brook	Gravelly	K. manure	96.5	3.5	Some hard.
6447	Beauty	Kelmescott	Gravelly loam	Potash, ammonia and super.	96.4	3.6	Mostly hard and unripe.
599	Satsuma	Bedfordale	Gravelly loam	4.5 cwt. Orchard K. per acre	98.0	2.0	Not quite ripe.
600	Wickson	Bedfordale	Gravelly loam	4.5 cwt. Orchard K. per acre	97.6	2.4	Not quite ripe.
601	Delaware	Kelmescott	Sandy	Powl manure	97.5	2.5	Not quite ripe.
602	Satsuma	Kelmescott	.....	2 cwt. Orchard K. per acre	97.3	2.7	Not quite ripe.
821	Satsuma	Armadale	Sandy topsoil, clay sub-soil	Super., sulphate of ammonia, potash every 2 years; Blood and bone 5 lbs. per tree	98.2	1.8	Just ripe.
822	Delaware	Bedfordale	Gravelly loam	.....	97.8	2.2	Just ripe.
823	Narrabeen	Kelmescott	Heavy red clay	Cover crop lupins, super. 2 cwt., sulphate of ammonia 2 cwt., potash 1½ cwt. per acre	98.5	1.5	Fully ripe.
824	Delaware	Kelmescott	Heavy red clay	.....	96.1	3.9	Unripe.
825	Narrabeen	Kelmescott	Heavy red clay	2 cwt. Orchard K. per acre	98.3	1.7	A few ripe.
976	Danson	Parkerville	Gravelly loam	4 cwt. K. per acre	94.4	5.6	Hard and unripe.
977	President	Parkerville	Light gravelly loam	5 cwt. K., 2 cwt. super. per acre	95.1	4.9	Hard and unripe.
978	Black Diamond	Kelmescott	Heavy clay loam	3 cwt. super. per acre	94.0	6.0	Hard and unripe.
979	President	Bedfordale	Gravelly loam	5 cwt. K. per care	93.6	6.4	Hard and unripe.
980	Kelsey	Bedfordale	Heavy clay loam	5 cwt. K. per acre	98.0	2.0	Hard and unripe.
981	Narrabeen	Pickering Brook	Good red loam	Manured with K.	98.5	1.5	Hard and unripe.
982	Kelsey	Pickering Brook	Good red loam	Manured with K.	98.1	1.9	Hard and unripe.
1749	Paterson's	Kelmescott	Gravelly clay loam	Well cultivated and manured with general N.P.K.	98.0	2.0	Hard and unripe.
1750	Ruby Blood	Kelmescott	Gravelly clay	K. manure	98.2	1.8	Unripe.
1751	Ruby Blood	Pickering Brook	Good red alluvial soil	Potato manure E.	97.9	2.1	Unripe.

PLUMS—continued.

(2) Analysis of Stone-free (edible) portion with extreme and average compositions.

(Methods used are substantially those of the British Association of Research for Cocoa, Chocolate, Sugar Confectionery and Jam Trades—See Analyst 56, 1931, 35).

Lab. No.	Insoluble Solids.	Soluble Solids.	Total Solids.	Total Sugars calculated as Invert Sugar.	Acid calculated as Crystalline Citric Acid.	Pectin as Crude Calcium Pectate.	Ash.	Total Alkalinity of Ash in mls. of N/10 HCl per 100 g.
	%	%	%	%	%	%	%	
6444	0.9	13.1	14.0	8.1	1.5	0.7	0.39	48.6
6445	0.9	12.3	13.2	6.5	2.1	0.7	0.36	41.9
6446	0.8	11.0	11.8	6.3	2.1	0.6	0.37	41.0
6447	0.8	12.2	13.0	7.2	2.3	0.7	0.37	40.2
599	1.3	14.1	15.4	8.3	1.4	0.7	0.34	42.6
600	1.0	12.3	13.3	7.1	1.3	0.7	0.40	47.5
601	1.4	16.0	17.4	9.0	1.2	0.9	0.44	54.8
602	1.3	17.1	18.4	9.8	1.2	0.8	0.44	50.3
821	1.1	15.9	17.0	9.8	1.3	0.8	0.39	48.7
822	1.1	15.1	16.2	9.5	1.3	1.0	0.41	53.3
823	1.1	14.4	15.5	8.9	1.2	0.9	0.36	46.1
824	1.1	12.9	14.0	7.5	1.2	0.8	0.39	51.7
825	1.2	16.3	17.5	10.1	1.1	1.0	0.38	49.6
976	1.4	19.3	20.7	9.5	2.5	1.6	0.53	68.6
977	1.4	19.3	20.7	9.2	1.5	1.4	0.55	66.0
978	1.4	21.9	23.3	11.7	2.7	1.2	0.55	66.6
979	1.7	18.3	20.0	9.2	1.5	1.5	0.51	64.8
980	0.7	14.7	15.4	8.4	1.4	0.7	0.51	60.8
981	1.3	15.5	16.8	9.8	1.0	0.9	0.38	44.8
982	1.2	13.9	15.1	8.2	1.2	0.8	0.43	50.3
1749	1.3	14.3	15.6	8.1	1.6	0.8	0.40	42.7
1750	1.1	16.2	17.3	9.2	1.3	0.8	0.49	49.4
1751	1.1	14.9	16.0	9.0	1.2	0.8	0.45	49.1
Highest	1.7	21.9	23.3	11.7	2.7	1.6	0.55	68.6
Lowest	0.7	11.0	11.8	6.3	1.0	0.6	0.34	40.2
Mean	1.2	15.3	16.4	8.7	1.5	0.9	0.43	51.3

ORANGES—15 SAMPLES.

(1) Locality, cultivation, soil, etc.

Lab. No.	Variety.	Locality.	Soil.	Conditions of cultivation.	Flavour.	Average weight of 1 fruit (grams)	Average volume of juice of 1 fruit (mills)
6443/39	Late Valencia	Pickering Brook	Deep black loam	No manure or cultivation	Tart	160	68
4812/40	Joppa	Maddington	Grey loam	Blood and bone, potash	No pronounced flavour	143	50
5522	Joppa	Pickering Brook	Brown sandy loam	Well cultivated, "K" mixture	Moderately sweet, fair flavour	158	69
4813	Jaffa	Maddington	Light grey sandy loam	Very little manure	No pronounced flavour	98	38
4814	Jaffa	Gosnells	Red brown loam	Special K and Blood and bone	Tart	113	46
4845	Jaffa	Gosnells	Heavy red loam	Orchard manure, irrigated	Slightly tart	125	55
4815	Navel	Maddington	Grey sandy loam	No manure for 2 years, fair irrigation	Very sweet	165	50
4816	Navel	Gosnells	Grey sandy loam	Well cultivated and manured, irrigated	Fairly sweet	179	73
4817	Navel	Gosnells	Red brown loam	Well cultivated, manured and irrigated	Fairly sweet	173	59
4842	Navel	Gosnells	Heavy red loam overlying clay	Orchard manure	Sweet	169	73
4843	Navel	Gosnells	Medium red brown loam (deep)	Orchard manure	Sweet, slightly tart	171	72
4844	Navel	Armadale	Light sandy loam on red clay	General manure	Sweet, slightly tart	286	122
5519	Navel	Pickering Brook	Yellow brown sandy loam	Well cultivated, unmanured, not irrigated	Moderately sweet. Not strong flavour	170	73
5520	Navel	Kelmscott	Heavy red loam	Well cultivated, manured and irrigated	Sweet, full flavour	156	74
5521	Navel	Carmel	Red loam	Well cultivated, manured and irrigated	Moderately sweet, fair flavour	143	57

ORANGES—continued.

(2) Analysis of Juice, strained through linen 45 threads to the inch, with extreme and average compositions for Navel Oranges only :

Lab. No.	Specific Gravity 15.5°C.	Total Solids.	Invert Sugar.	Sucrose.	Acid calculated as anhydrous citric acid.	Protein N x 6.25.	Ash.	Alkalinity of Asb (mils. N/10 HCl per 100 ml.).	Formol titration (mils. N/10 NaOH per 100 ml.).
Late Valencia— 6443	1.042	% w/v.	% w/v. 3.05	% w/v. 4.64	% w/v. 0.87	0.61	% w/v. 0.41	45.0	12.6
Joppa— 4812	1.046	11.0	4.9	3.4	1.5	0.53	0.35	47.6	17.2
5522	1.041	10.4	3.6	4.1	1.3	0.45	0.34	47.6	13.2
Jaffa— 4813	1.049	12.1	5.0	4.5	1.5	0.31	0.29	43.6	10.0
4814	1.049	12.0	4.5	4.3	1.9	0.57	0.37	52.4	17.2
4845	1.052	12.9	5.0	4.7	1.8	0.52	0.41	56.8	14.0
Navel— 4815	1.067	17.1	6.8	7.2	1.2	0.82	0.35	42.0	19.2
4816	1.055	13.6	5.3	5.8	1.3	0.74	0.37	47.8	22.8
4817	1.057	14.2	5.6	5.8	1.3	0.64	0.39	51.4	16.8
4842	1.056	14.4	6.1	5.5	1.1	0.57	0.35	47.2	14.8
4843	1.055	13.7	5.7	4.9	1.6	0.61	0.36	45.4	15.6
4844	1.058	14.0	5.2	5.9	1.3	0.50	0.48	64.2	12.8
5519	1.053	13.5	5.0	5.6	1.2	0.52	0.37	48.8	12.4
5520	1.057	13.7	6.1	5.6	1.2	0.57	0.33	46.0	12.8
5521	1.050	12.9	5.0	4.9	1.1	0.62	0.37	50.2	14.4
Highest	1.067	17.1	6.8	7.2	1.6	0.82	0.48	64.2	22.8
Lowest	1.050	12.9	5.0	4.9	1.1	0.50	0.33	42.0	12.4
Mean	1.056	14.12	5.64	5.60	1.26	0.62	0.37	49.2	15.7

APPENDIX 2.

Cereals for Nutritive Value.

		Marks.							
1. Wheat :	1939-40 f.a.q. standard.	9. Oats :	Mulga—Clipped.						
2. Barley :	Feed Grade 4.	10. "	Mulga—Unclipped.						
3. "	Feed Grade 4A.	11. "	Algerian Clipped.						
4. "	Feed Grade Black.	12. "	Sample from certified shipment.						
5. Oats :	Wongan—Clipped.	13. "	Burt's Early.						
6. "	Wongan—Unclipped.	14. Barley :	Clipped.						
7. "	Guyra—Clipped.	15. "	Unclipped.						
8. "	Guyra—Heavy unclipped.								
Result of Analysis :—									
Sample	...	1	2	3	4	5	6	7	
		%	%	%	%	%	%	%	%
Moisture	...	9.96	10.00	10.05	10.77	8.88	9.19	9.13	
Ash	...	1.47	1.97	2.03	1.50	2.90	2.94	3.00	
Protein (N x 5.83)	...	10.16	8.28	7.71	13.38	10.20	10.16	8.78	
Crude fibre	...	2.50	6.41	6.36	2.14	9.98	10.52	9.17	
Petroleum ether extract	...	1.29	1.50	1.48	1.50	5.74	5.53	4.26	
Nitrogen-free extract	...	74.62	71.84	72.37	70.71	62.30	61.66	65.66	
Unit value (Guthrie)	...	87.68	83.50	83.41	87.47	85.42	84.26	84.03	
Sample	...	8	9	10	11	12	13	14	15
		%	%	%	%	%	%	%	%
Moisture	...	9.20	9.00	8.86	8.33	9.19	8.86	10.67	10.26
Ash	...	3.32	2.52	2.61	3.10	3.06	3.69	1.71	1.82
Protein (N x 5.83)	...	8.12	9.67	9.96	7.30	7.51	7.88	7.49	7.41
Crude fibre	...	10.15	9.12	9.44	12.05	12.63	10.87	5.38	6.08
Petroleum ether extract	...	4.40	3.83	3.75	5.35	5.08	4.66	1.20	1.17
Nitrogen-free extract	...	64.81	65.86	65.38	63.87	62.53	64.04	73.55	73.26
Unit value (Guthrie)	...	82.83	84.15	83.78	83.21	81.47	82.41	83.74	83.30

APPENDIX 3.

Lupin Seeds for Nutritive Value.

Marks.

90. *Lupinus luteus*. Sweet yellow lupin. Imported from Germany, 1939.
 235. *Lupinus angustipolius*. N.Z. Blue lupin, 1939. Seed grown at Upper Swan.
 265. *Lupinus luteus*. Sweet Yellow. 1939 seed from University Institute of Agriculture.
 286. *Lupinus varius*. 1939 seed from Forest Grove.
 294. *Lupinus angustipolius*. N.Z. Blue lupin. Grown at Maida Vale, 1939, from imported N.Z. seed.
 327. *Lupinus varius* from Wongan Hills Research Station, 1939 seed.
 328. *Lupinus varius*. Commercial seed, 1939 grown.

Result of Analysis :—

Lab. No. ...	4921	4922	4923	4924	4925	4926	4927
No. ...	90	235	265	286	294	327	328
	%	%	%	%	%	%	%
Moisture ...	8.84	10.36	8.97	10.17	9.88	7.64	9.25
Protein (N × 6.25) ...	38.85	34.21	41.04	31.89	30.36	31.46	28.83
Ether extract ...	3.58	3.05	3.38	2.13	3.88	2.40	2.50
Crude fibre ...	14.99	12.60	15.00	19.84	12.46	17.80	17.23
Ash ...	4.72	2.47	3.41	2.56	2.42	2.83	3.11
Nitrogen-free extract ...	29.02	37.31	28.20	33.41	41.00	37.87	39.08
Calcium (Ca) ...	.240	.170	.180	.090	.135	.115	.130
Phosphorus (P) ...	.825	.284	.407	.273	.223	.295	.490

APPENDIX 4.

Complete Analyses of Hills Waters Supplying the Metropolitan Area.

Samples taken.

Constituent.	13-12-40 Wungong Pipehead.	13-12-40 Churchman's Brook.	16-12-40 Canning Dam.	16-12-40 Victoria Reservoir.
	Grains per gallon.			
Cl ⁻ ...	6.88	5.41	8.72	14.50
CO ₃ ⁻63	.47	.95	.68
SO ₄ ⁻55	.42	.59	1.15
NO ₃ ⁻11	.05	.13	.04
Fe ₂ O ₃ + Al ₂ O ₃ ...	Tr.	Tr.	Tr.	Tr.
SiO ₂ ...	Nil	Nil	Tr.	Nil
Mg ⁺⁺54	.58	.60	1.01
Ca ⁺⁺72	.53	.53	.48
Na ⁺ ...	3.48	2.42	4.21	6.89
K ⁺08	.08	.14	.12
Assumed Combination :—				
CaCO ₃ ...	1.01	.77	1.31	1.14
MgCO ₃ ...	...	...	.22	...
CaSO ₄ ...	.78	.59	...	.07
MgSO ₄ ...	...	...	.74	1.38
NaNO ₃ ...	.15	.07	.18	.06
CaCl ₂ ...	.26	.12	...	...
MgCl ₂ ...	2.12	2.27	1.53	2.86
NaCl ...	8.35	5.96	11.73	19.30
KCl ...	.14	.14	.25	.25
Al ₂ O ₃ , Fe ₂ O ₃ ...	Tr.	Tr.	Tr.	Tr.
SiO ₂ ...	Nil	Nil	Tr.	Nil
Total ...	12.81	9.92	15.96	25.06
Reaction, pH = ...	8.4	7.0	7.2	7.3
Total Hardness ...	4.05	3.70	3.80	5.34
Total Mg ...	.54	.58	.60	1.01

Trace (Tr.) represents < .01 grains per gallon.

Division VIII.

Annual Report of the Chief Inspector of Explosives for the Year 1940.

The Under Secretary for Mines.

I have the honour to submit for the information of the Honourable Minister for Mines in compliance with section 45 of the Explosives Act, 1895, my report on the working of the branch for the year 1940.

The quantity of explosives imported into the State during the year is shown in the Table No. 1 and Table No. 2 gives a comparison of the quantities imported during the past five years.

The importations it will be noted constitute a record for any year since the commencement of goldmining in Western Australia.

TABLE No 1.

Importation of explosives into Western Australia during 1940.		lbs.
Gelatine Dynamite .. .. .	.. .. .	1,720,150
Gelignite .. .. .	.. .. .	5,236,050
Permitted Explosives .. .. .	.. .. .	250,050
Powder (blasting and pellet) .. .. .	.. .. .	92,300
Total		7,298,550
Detonators: Number		3,203,200
Fuse Safety: Yards		8,815,200

TABLE No. 2.

Explosives.	1936.	1937.	1938.	1939.	1940.
	lbs.	lbs.	lbs.	lbs.	lbs.
Gelignite	1,007,050	1,800,900	1,907,600	2,307,750	5,236,050
Gelatine Dynamite	2,457,450	2,930,650	2,748,950	2,651,850	1,720,150
Permitted Explosives	70,300	105,550	267,400	145,950	250,050
Powder (Blasting and Pellet)	151,250	120,250	319,250	112,550	92,300
Detonators: Number	2,673,000	3,860,000	4,872,000	4,417,000	3,203,200
Fuse: Yards	6,926,400	7,449,600	7,346,000	8,952,000	8,815,200

The quantity of explosives used in the different classes of industry during the years 1939 and 1940 is given.

	1939.		1940.	
	Lbs. Used.	Percentage of Total.	Lbs. Used.	Percentage of Total.
Gold mining	5,407,474	93.40	6,121,550	94.92
Agricultural and land clearing	28,500	.40	17,550	.27
Government Departments—Water Supply, Railways, Public Works	89,450	1.55	83,300	1.29
Quarrying	167,850	2.90	131,250	2.03
Coal mining	60,550	1.05	77,900	1.1
Lead and other base metals	35,550	.61	23,000	.36
	5,889,375	...	6,454,550	...

With a view of determining the chemical stability of the explosives arriving in and stored in the State, the following tests have been made.

Heat tests	2,945
Fuse tests	761
Velocity of detonation	32
Fireworks, tests of	37
Chemical analyses	96
Miscellaneous	12
Tests of detonators	17

These tests showed that the explosives on arrival and during storage were stable and there was no evidence of any chemical deterioration.

There has been no increase in the storage accommodation at Woodman's Point during the year, but the question of larger storage in Kalgoorlie has been under consideration.

Owing to the bad condition of the jetty attached to the Explosives Reserve, the Harbour Trust have reconstructed the entire jetty during the year, which has been built on concrete piles, and there should be no further expense for many years to come in the maintenance of this structure.

During the year an investigation was carried out into the composition of the gases given off from the

explosives when fired in mining practice in mines at Kalgoorlie. The information obtained bears out the fact that on firing any gelatinous nitro-glycerine compounds varying quantities of deleterious gases are generated.

During this investigation a so-called neutraliser of the oxides of nitrogen gases was fully tried out, and the conclusion arrived at, indicated that the only safe and efficient method of dispersing the deleterious gases from explosives is by their displacement by compressed air or other efficient means of ventilation.

The following licenses for the storage of explosives were issued during the year:—

Magazines on Government Reserves	59
Magazines used by Government	—
Departments and on private property	126
Store Licenses	128
Fireworks Licenses	240
Importation Licenses	2

All the magazines and stores licensed under the Act have been visited and inspections made at least once during the year, and it is pleasing to note that it was not necessary to take proceedings for any breaches of the Act or Regulations, but it was found that the following explosives had to be destroyed through their being in a condition which may have led to an accident either by chemical deterioration or other causes.

Date.	Place.	Kind.	Reason for destruction.
9-2-40	Manjimup	5 lbs. Gelignite	Owing to having absorbed moisture
8-3-40	Fremantle	150 Detonators	Found buried in the earth
7-5-40	do.	50 lbs. Gelignite	Owing to having absorbed moisture
25-6-40	do.	150 lbs. Gelignite	Owing to chemical deterioration
27-6-40	Perth	20 lbs. Gelignite	do. do. do.
2-7-40	Fremantle	5 lbs. Gelignite	Owing to having absorbed moisture
14-10-40	Dalwallinu	20 lbs. Gelignite	Chemical deterioration
		10 lbs. Blasting Powder	Absorption of moisture
7-12-40	Denmark	5 lbs. Gelignite	Owing to having absorbed moisture
9-12-40	Manjimup	10 lbs. Gelignite	Owing to chemical deterioration
11-12-40	Balingup	5 lbs. Gelignite	Owing to having absorbed moisture
14-12-40	Harvey	5 lbs. Gelignite	do. do. do.
17-12-40	Fremantle	10 lbs. Gelignite	Owing to chemical deterioration
19-12-40	do.	5 lbs. Gelignite	Sent in by Police found in possession of Alien

The entire staff have throughout the year given loyal and energetic service which has enabled the work of the branch to be carried out efficiently, thus assuring the maximum of safety which was the inten-

7th April, 1941.

tion when providing an Act to control the storage of explosives.

T. N. KIRTON,
Chief Inspector of Explosives.

Division IX.

Annual Report of the Chairman Miner's Phthisis Board and Superintendent Mine Workers' Relief Act for the Year 1940.

The Under Secretary for Mines.

I have the honour to submit for the information of the Hon. Minister for Mines my report upon this branch of the Mines Department for the year 1940.

The Commonwealth Department of Health, under arrangements similar to those of 1939 continued throughout the year the periodical examination of mine workers. This work is continuously carried on by the Commonwealth Health Laboratory at Kalgoorlie and by a mobile laboratory which visits the centres in the various goldfields. The mobile unit takes nearly two years to complete a circuit. The only goldfields not visited were the Ashburton, Kimberley, Gascoyne, Phillips River, West Kimberley and West Pilbara which are all remote and contain few mine workers.

Examinations conducted under the Mine Workers' Relief Act during the year totalled 7,299 compared with 6,975 last year. More men would have been examined if the mobile unit had been in continuous operation but on two occasions new medical officers had to be obtained to replace officers who had enlisted. It is becoming increasingly difficult to secure suitable medical men.

The results of the examinations for 1940, together with those for previous examinations, are shown in the table annexed hereto. A graph is also attached to illustrate the trend of the examinations since their inception. In explanation of these figures I desire to make the following comments.

Normals, etc.—These number 96·218 per cent. of the men examined and include men having first class lives or suffering from pneumoconiosis only. The figure for 1939 was 95·63 per cent.

Early Silicosis.—Although there are 256 men with this complaint only 12 represent new cases for the year. In all the early silicosis cases represent 3·521 per cent. of the men examined compared with 4·04 per cent. last year.

Advanced Silicosis.—Of the 11 cases reported 10 were men who advanced from early silicosis during the year. The number (11) represents ·151 per cent. of the men examined compared with ·14 per cent. last year.

Silicosis plus Tuberculosis.—These four cases compare with 11 in 1939. The percentage decreased from ·16 per cent. to ·055 per cent.

Tuberculosis only.—Tuberculosis only is not an industrial disease although the sufferers are compensated under the Act. These men are removed from

the mines to prevent the spread of the infection. There were four men (·055 per cent.) reported compared with two men (·03 per cent.) in 1939.

General.—The continued decrease in the incidence of disease is very pleasing. The percentage of diseased miners is now so low that there is not likely to be much, if any, further improvement. Future figures should be fairly constant.

During the year the following legislation affecting the Mine Workers' Relief Act was passed.

1. Mine Workers' Relief (War Service) Act, 1940.

This Act made special provision for the protection of the rights and interests of mine workers engaged in war service.

2. Mine Workers' Relief (Payments Authorisation) Act, 1940.

Provision was made in this Act for the payment to six named widows of the payment of the total sum of £186 17s. 11d., to which they were morally, but not legally, entitled. Payment was made during the year and this Act has now no further legal effect.

3. Mine Workers' Relief Act Amendment Act, 1940.

Various minor adjustments to the principal Act were incorporated herein. Contributions to the fund were arranged on a fortnightly basis in keeping with the new method of paying wages under the Award. The benefits were made slightly more extensive than hitherto.

Examinations conducted under the Mines Regulation Act, 1906, totalled 2,937. (This number was in addition to the 7,299 men examined under the Mine Workers' Relief Act.) Last year the examinations totalled 2,301.

The 2,937 men comprised 2,071 new applicants for the initial certificate and 866 re-examinees for the initial certificate. The particulars of these examinations are set out below:—

New Applicants.		
Normal	.. .. .	1,944
Pneumoconiosis	.. .. .	91
Early silicosis	.. .. .	5
Advanced silicosis	.. .. .	—
Query tuberculosis	.. .. .	20
Tuberculosis	.. .. .	2
Pneumoconiosis plus query tuberculosis	.. .. .	—
Pneumoconiosis plus tuberculosis	.. .. .	—
Early silicosis plus query tuberculosis	.. .. .	2
Early silicosis plus tuberculosis	.. .. .	2
Advanced silicosis plus query tuberculosis	.. .. .	—
Advanced silicosis plus tuberculosis	.. .. .	—
Other conditions	.. .. .	5
Total	.. .. .	2,071

Of the above applicants for admission to the industry 1,944 received the initial certificate (Form No. 2), one received a temporary rejection certificate (Form No. 3), eight received rejection certificates (Form No. 4), 30 received re-admission certificates (Form No. 6), 86 received special certificates (Form No. 9), one received a prohibition certificate (Form No. 13), and one did not receive a certificate. Thus of 2,071 applicants, 1,944 were eligible for employment anywhere on a mine, 116 were eligible for surface employment and 11 were not eligible for any work on a mine.

There is no information available to show how many of these new applicants actually entered the industry.

Re-Examinations.		
Normal	.. .. .	644
Pneumoconiosis	.. .. .	149
Early silicosis	.. .. .	29
Advanced silicosis	.. .. .	2
Query tuberculosis	.. .. .	33
Tuberculosis	.. .. .	—
Pneumoconiosis plus query tuberculosis	.. .. .	1
Pneumoconiosis plus tuberculosis	.. .. .	—
Early silicosis plus query tuberculosis	.. .. .	—
Early silicosis plus tuberculosis	.. .. .	5
Advanced silicosis plus query tuberculosis	.. .. .	—
Advanced silicosis plus tuberculosis	.. .. .	—
Other conditions	.. .. .	3
Total	.. .. .	866

These men had been examined previously and some were engaged in the industry prior to this examination. Six hundred and forty-four received initial certificates (Form No. 2), six received rejection certificates (Form No. 4), 80 received re-admission certificates (Form No. 6), 135 received special certificates (Form No. 9), and one received a prohibition certificate (Form No. 10). Thus, of 866 re-examinees 644 were eligible for employment anywhere on a mine, 215 were eligible for surface employment and seven were not eligible for employment on a mine. There is no information available to show how many of these men are actually engaged in the industry.

Grouping the two sets of figures discloses that the following certificates were issued under the Mines Regulation Act, 1906.

Initial Certificates (Form No. 2)	.. .. .	2,588
Temporary Rejection Certificates (Form No. 3)	.. .. .	1
Rejection Certificates (Form No. 4)	.. .. .	14
Re-admission Certificates (Form No. 6)	.. .. .	110
Special Certificates (Form No. 9)	.. .. .	221
Prohibition Certificates (Form No. 10)	.. .. .	1
Prohibition Certificates (Form No. 13)	.. .. .	1
No Certificate	.. .. .	1
Total	.. .. .	2,937

Miners' Phthisis Board.

Deaths of beneficiaries and the attainment of the age of 16 years by some of the dependent children slightly reduced the amount of compensation paid during the year.

E. J. R. HOGG,
Chairman Miner's Phthisis Board,
and
Superintendent Mine Workers' Relief Act.

20th March, 1941.

TABLE SHOWING RESULTS OF PERIODICAL EXAMINATION OF MINE WORKERS FROM INCEPTION OF EXAMINATIONS (1925) TO 31ST DECEMBER, 1940.

First Examination (1925-26).			Per cent.
Normals, etc.	.. .. .	3,239	= 80.5
Silicosis Early	.. .. .	459	= 11.4
Silicosis Advanced	.. .. .	183	= 4.5
Silicosis plus Tuberculosis	.. .. .	131	= 3.3
Tuberculosis only	.. .. .	11	= .3
Total number of men examined	.. .. .	4,023	= 100.00

Second Examination (1927).			Per cent.
Normals, etc.—			
Previously reported as Normals, etc.	.. .. .	2,290	
New cases (i.e., cases examined for the first time)	.. .. .	826	
		3,116	= 83.6
Silicosis Early—			
Previously reported as Early	.. .. .	348	
New cases	.. .. .	33	
		381	= 10.2
Silicosis Advanced—			
Previously reported as Advanced	.. .. .	85	
New cases	.. .. .	8	
		93	= 2.5
Silicosis plus Tuberculosis—			
Previously reported as Normals, etc.	.. .. .	13	
Previously reported as Silicosis Early	.. .. .	27	
Previously reported as Silicosis Advanced	.. .. .	62	
New cases	.. .. .	26	
		128	= 3.4
Tuberculosis only	.. .. .	10	= .3
Total number of men examined	.. .. .	3,728	= 100.0

Third Examination (1928).			Per cent.
Normals, etc.—			
Previously reported as Normals, etc.	.. .. .	2,738	
New cases	.. .. .	239	
		2,977	= 85.5
Silicosis Early—			
Previously reported as Normals, etc.	.. .. .	47	
Previously reported as Silicosis Early	.. .. .	303	
New cases	.. .. .	12	
		362	= 10.4
Silicosis Advanced—			
Previously reported as Normals, etc.	.. .. .	1	
Previously reported as Silicosis Early	.. .. .	16	
Previously reported as Silicosis Advanced	.. .. .	79	
New cases	.. .. .	2	
		98	= 2.8
Silicosis plus Tuberculosis—			
Previously reported as Normals, etc.	.. .. .	10	
Previously reported as Silicosis Early	.. .. .	14	
Previously reported as Silicosis Advanced	.. .. .	10	
New cases	.. .. .	8	
		42	= 1.2
Tuberculosis only—			
Previously reported as Normals, etc.	.. .. .	3	
New case	.. .. .	1	
		4	= .1
Total number of men examined	.. .. .	3,483	= 100.0

Fourth Examination (1929).			Per cent.
Normals, etc.—			
Previously reported as Normals, etc.	.. .. .	2,099	
New cases	.. .. .	21	
		2,120	= 81.9
Silicosis Early—			
Previously reported as Normals, etc.	.. .. .	100	
Previously reported as Silicosis Early	.. .. .	224	
New cases	.. .. .	2	
		326	= 12.6
Silicosis Advanced—			
Previously reported as Silicosis Early	.. .. .	34	
Previously reported as Silicosis Advanced	.. .. .	60	
		94	= 3.6
Silicosis plus Tuberculosis—			
Previously reported as Normals, etc.	.. .. .	8	
Previously reported as Silicosis Early	.. .. .	14	
Previously reported as Silicosis Advanced	.. .. .	19	
		41	= 1.6
Tuberculosis only—			
Previously reported as Normal, etc.	.. .. .	7	
		7	= .3
Total number of men examined	.. .. .	2,588	= 100.0

PERIODICAL EXAMINATION OF MINE WORKERS—*continued.*

Fifth Examination (1930).		Per cent.
Normals, etc.—		
Previously reported as Normals, etc.	2,751	
New cases	34	
	2,785 =	81.9
Silicosis Early—		
Previously reported as Normals, etc.	133	
Previously reported as Silicosis Early	247	
New cases	3	
	383 =	11.3
Silicosis Advanced—		
Previously reported as Silicosis Early	22	
Previously reported as Silicosis Advanced	43	
New cases	2	
	67 =	2.0
Silicosis plus Tuberculosis—		
Previously reported as Normals, etc.	6	
Previously reported as Silicosis Early	60	
Previously reported as Silicosis Advanced	46	
New cases	2	
	114 =	3.3
Tuberculosis only—		
Previously reported as Normals, etc.	47	
New cases	3	
	50 =	1.5
Total number of men examined	3,399 =	100.0

Sixth Examination (1931).		Per cent.
Normals, etc.—		
Previously reported as Normals, etc.	2,530	
	2,530 =	84.0
Silicosis Early—		
Previously reported as Normals, etc.	94	
Previously reported as Silicosis Early	252	
	346 =	11.5
Silicosis Advanced—		
Previously reported as Silicosis Early	18	
Previously reported as Silicosis Advanced	35	
	53 =	1.8
Silicosis plus Tuberculosis—		
Previously reported as Normals, etc.	4	
Previously reported as Silicosis Early	35	
Previously reported as Silicosis Advanced	19	
	58 =	1.9
Tuberculosis only—		
Previously reported as Normals, etc.	25	
	25 =	.8
Total number of men examined	3,012 =	100.0

Seventh Examination (1932).		Per cent.
Normals, etc.	3,835	89.5
Silicosis Early—		
Previously reported as Normals, etc.	35	
Previously reported as Silicosis Early	338	
	373 =	8.7
Silicosis Advanced—		
Previously reported as Silicosis Early	6	
Previously reported as Silicosis Advanced	47	
	53 =	1.2
Silicosis plus Tuberculosis—		
Previously reported as Normals, etc.	3	
Previously reported as Silicosis Early	9	
Previously reported as Silicosis Advanced	4	
	16 =	.4
Tuberculosis only—		
Previously reported as Normals, etc.	8	
	8 =	.2
Total number of men examined	4,285 =	100.0

Eighth Examination (1933).		Per cent.
Normals, etc.	2,920	86.5
Silicosis Early—		
Previously reported as Normals, etc.	57	
Previously reported as Silicosis Early	322	
	379 =	11.2
Silicosis Advanced—		
Previously reported as Normals, etc.	1	
Previously reported as Silicosis Early	15	
Previously reported as Silicosis Advanced	44	
	60 =	1.8
Silicosis plus Tuberculosis—		
Previously reported as Normals, etc.	2	
Previously reported as Silicosis Early	9	
Previously reported as Silicosis Advanced	4	
	15 =	.4
Tuberculosis only—		
Previously reported as Normals, etc.	3	
	3 =	.1
Total number of men examined	3,377 =	100.0

PERIODICAL EXAMINATION OF MINE WORKERS—*continued.*

Ninth Examination (1934).		Per cent.
Normals, etc.	5,140	92.4
Silicosis Early—		
Previously reported as Normals, etc.	54	
Previously reported as Silicosis Early	315	
	369 =	6.6
Silicosis Advanced—		
Previously reported as Normals, etc.	1	
Previously reported as Silicosis Early	24	
Previously reported as Silicosis Advanced	12	
	37 =	.7
Silicosis plus Tuberculosis—		
Previously reported as Normals, etc.	6	
Previously reported as Silicosis Advanced	6	
	12 =	.2
Tuberculosis only—		
Previously reported as Normals, etc.	5	
	5 =	.1
Total number of men examined	5,563 =	100.0

Tenth Examination (1935).		Per cent.
Normals, etc.	4,437	92.3
Silicosis Early—		
Previously reported as Normals, etc.	35	
Previously reported as Silicosis Early	303	
	338 =	7.0
Silicosis Advanced—		
Previously reported as Silicosis Early	24	
Previously reported as Silicosis Advanced	2	
	26 =	.6
Silicosis plus Tuberculosis—		
Previously reported as Silicosis Early	5	
	5 =	.1
Tuberculosis only—		
Previously reported as Normals, etc.	2	
	2 =	.0
Total number of men examined	4,808 =	100.0

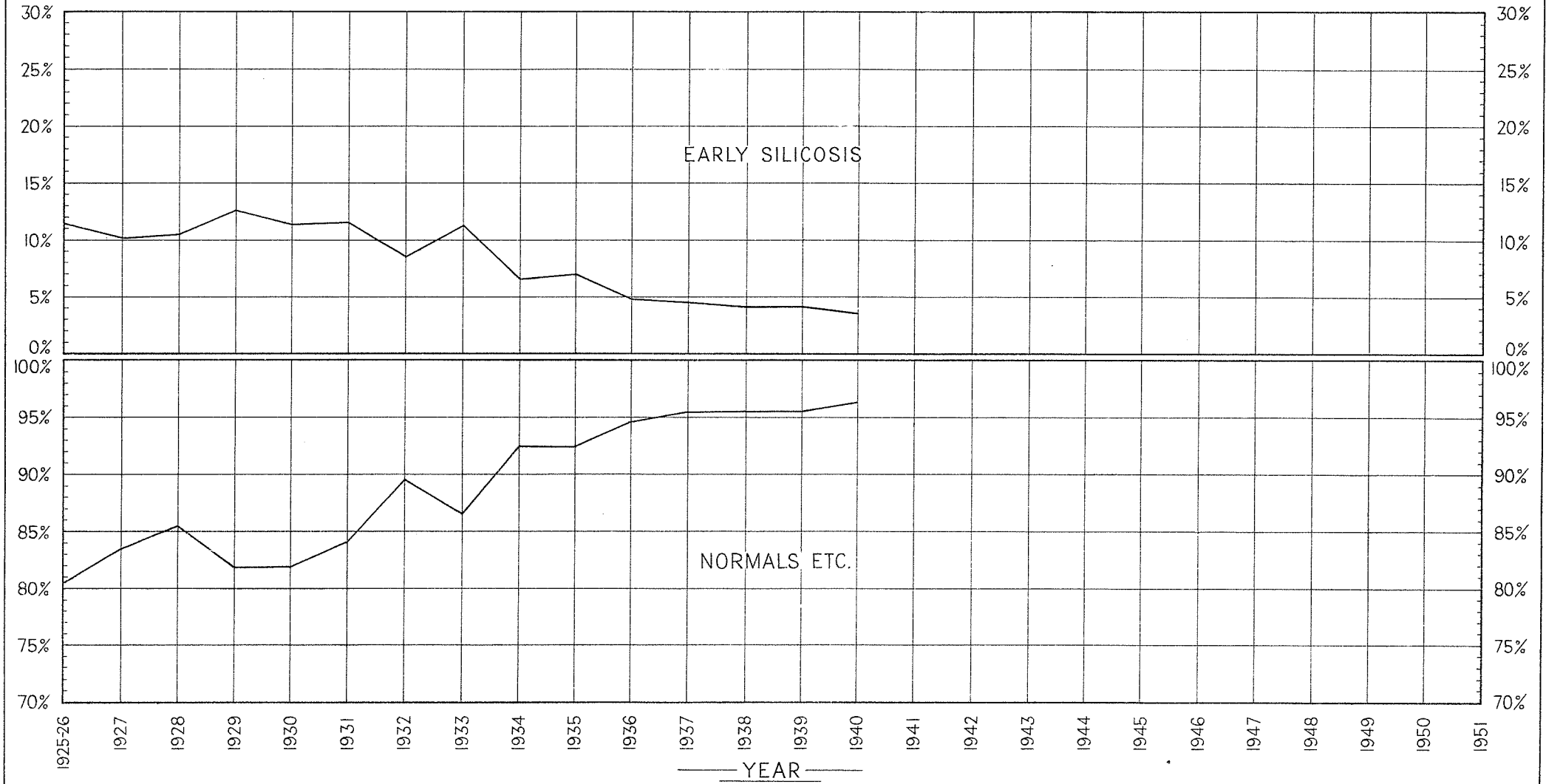
Eleventh Examination (1936).		Per cent.
Normals, etc.	6,972	94.7
Silicosis Early—		
Previously reported as Normals, etc.	29	
Previously reported as Silicosis Early	323	
	352 =	4.8
(Note.—Of the 352 cases of Early Silicosis reported, 23 were already suffering from Early Silicosis and 4 from Pneumoconiosis when re-admitted to the industry on the Re-Admission Certificate under Regulation 7 of the Mines Regulation Act, 1906.)		
Silicosis Advanced—		
Previously reported as Normals, etc.	1	
Previously reported as Silicosis Early	15	
Previously reported as Silicosis Advanced	4	
	20 =	.3
Silicosis plus Tuberculosis—		
Previously reported as Normals, etc.	3	
Previously reported as Silicosis Early	8	
	11 =	.1
Tuberculosis only	8	.1
	8 =	.1
Total number of men examined	7,363 =	100.0

Twelfth Examination (1937).		Per cent.
Normals, etc.	7,487	95.4
Silicosis Early—		
Previously reported as Normals, etc.	15	
Previously reported as Silicosis Early	319	
	334 =	4.3
(Note.—Of the 334 cases of Early Silicosis reported, 37 were already suffering from Early Silicosis when re-admitted to the industry on the Re-Admission Certificate under Regulation 7 of the Mines Regulation Act, 1906.)		
Silicosis Advanced—		
Previously reported as Silicosis Early	14	
Previously reported as Silicosis Advanced	4	
	18 =	.2
Silicosis plus Tuberculosis—		
Previously reported as Normals, etc.	1	
Previously reported as Silicosis Early	10	
	11 =	.1
Tuberculosis only	2	.0
	2 =	.0
Total number of men examined	7,852 =	100.0

PERIODICAL EXAMINATION OF MINE WORKERS

GRAPH N°1

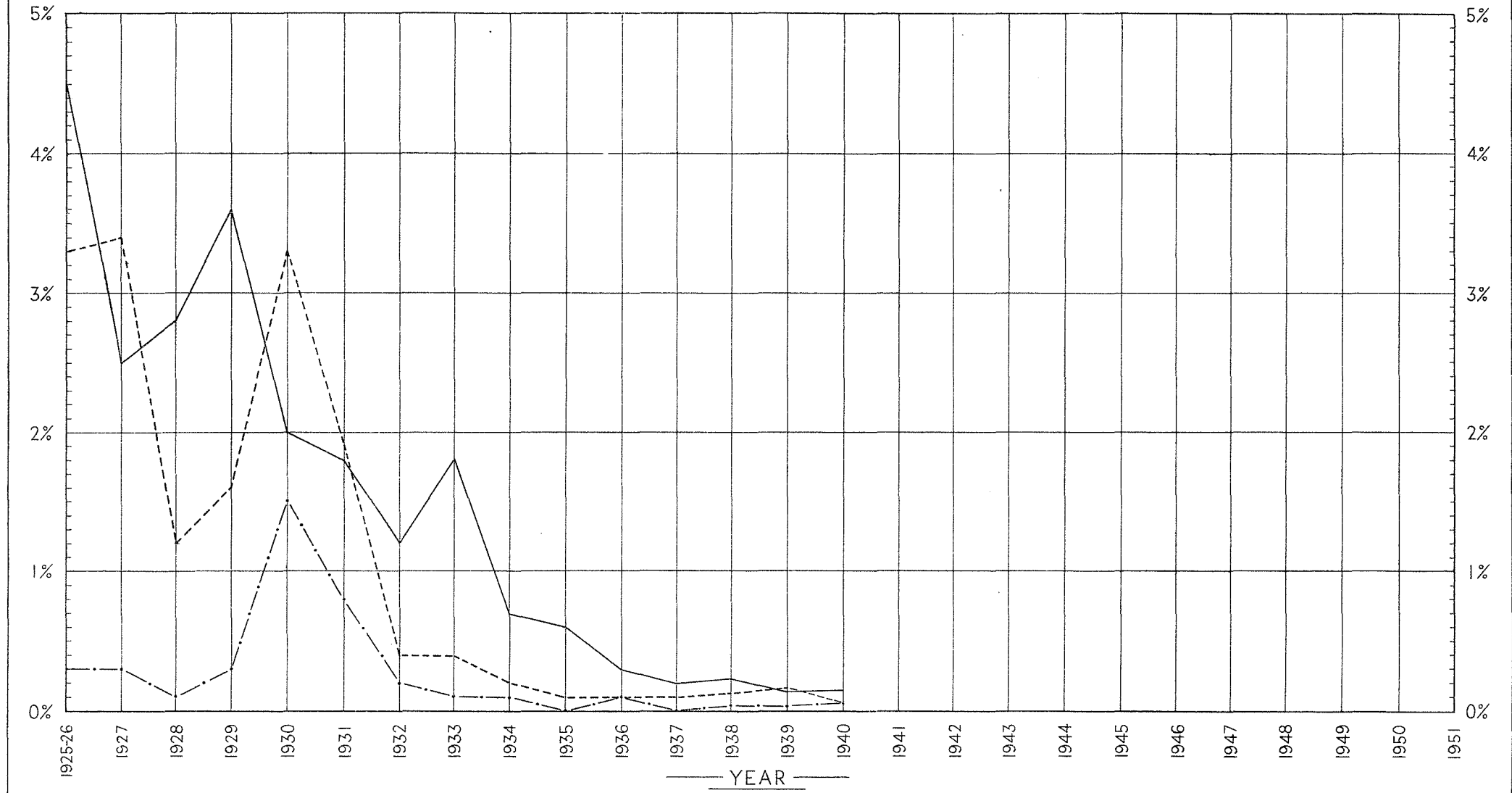
Showing Percentages of Normals and Early Silicotics, from 1925-26 onwards



PERIODICAL EXAMINATION OF MINE WORKERS

GRAPH N°2

Showing Percentages of Silicosis Advanced, Silicosis plus Tuberculosis and Tuberculosis only, from 1925-26 onwards



Silicosis Advanced —————

Silicosis Plus Tuberculosis - - - - -

Tuberculosis Only · - - - -

PERIODICAL EXAMINATION OF MINE WORKERS—*continued.*

<i>Thirteenth Examination (1938).</i>		Per cent.
Normals, etc.	6,833	95.68
Silicosis Early—		
Previously reported as Normals, etc.	13	
Previously reported as Silicosis Early	266	
	279	3.91
<small>(Note.—Of the 279 cases of Early Silicosis reported, 32 were already suffering from Early Silicosis and 4 from Pneumoconiosis when re-admitted to the industry on Re-Admission Certificates under Regulation 7 of the Mines Regulation Act, 1906.)</small>		
Silicosis Advanced—		
Previously reported as Silicosis Early	15	
Previously reported as Silicosis Advanced	2	
	17	.24
Silicosis plus Tuberculosis—		
Previously reported as Normal, etc.	1	
Previously reported as Silicosis Early	8	
	9	.13
Tuberculosis Only—		
Previously reported as Normal, etc.	3	
	3	.04
Total number of men examined	7,141	100.00
 <i>Fourteenth Examination (1939).</i>		
		Per cent.
Normals, etc.	6,670	95.63
Silicosis Early—		
Previously reported as Normal, etc.	18	
Previously reported as Silicosis Early	264	
	282	4.04
<small>(Note.—Of the 282 cases of Early Silicosis reported, 28 were already suffering from Early Silicosis and 1 from Pneumoconiosis when re-admitted to the industry on Re-Admission Certificates under Regulation 7 of the Mines Regulation Act, 1906.)</small>		
Silicosis Advanced—		
Previously reported as Silicosis Early	7	
Previously reported as Silicosis Advanced	3	
	10	.14
Silicosis plus Tuberculosis—		
Previously reported as Normal, etc.	1	
Previously reported as Silicosis Early	9	
Previously reported as Silicosis Advanced	1	
	11	.16
Tuberculosis Only—		
Previously reported as Normal, etc.	2	
	2	.03
Total number of men examined	6,975	100.00

PERIODICAL EXAMINATION OF MINE WORKERS—*continued.*

<i>Fifteenth Examination (1940).</i>		Per cent.
Normals, etc.	7,023	96.218
Silicosis Early—		
Previously reported as Normal, etc.	12	
Previously reported as Silicosis Early	245	
	257	3.521
<small>(Note.—Of the 257 cases of Early Silicosis reported, 23 were suffering from Early Silicosis and 12 from Pneumoconiosis when re-admitted to the industry on Re-Admission Certificates under Regulation 7 of the Mines Regulation Act, 1906.)</small>		
Silicosis Advanced—		
Previously reported as Silicosis Early	10	
Previously reported as Silicosis Advanced	1	
	11	.151
Silicosis plus Tuberculosis—		
Previously reported as Silicosis Early	4	
	4	.055
Tuberculosis Only—		
Previously reported as Normal, etc.	4	
	4	.055
Total number of men examined	7,299	100.00

Men employed in the outlying districts were not examined during 1929 or 1931; only those employed in Kalgoorlie and surrounding district being examined. The increase in numbers diagnosed as Early Silicosis and Tuberculosis in 1930 was due to the improved plant and radiographic technique.

Only new miners and those whose previous diagnoses warranted review were examined in the outlying districts during 1933.

MINING STATISTICS TO 31st DECEMBER, 1940.

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TABLE I.

PRODUCTION OF GOLD AND SILVER FROM ALL SOURCES, SHOWING IN FINE OUNCES THE OUTPUT AS REPORTED TO THE MINES DEPARTMENT DURING 1940, 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.)

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1940.					TOTAL PRODUCTION.						
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.		
			Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.		
Kimberley Goldfield.														
Brockman	109	Mt. Bradley	...	...	67.00	11.04	...	...	...	67.00	11.04	...
		Voided leases and sundry claims	...	7.62	...	13.92	...	7.62	7.62	3,829.75	32,76.32	...		
Hall's Creek	...	do. do. do.	...	...	...	...	...	...	...	527.55	554.58	...
Mt. Dockrell	107	Erin-go-bragh	...	...	27.00	14.12	...	...	...	27.00	26.14	...
	95	Irish Lass	...	...	33.00	7.43	...	...	13.66	217.00	205.71	...
	103	Old Mac	...	...	41.00	33.33	...	...	...	235.70	179.66	...
	85	Western Lead	...	...	...	...	...	...	...	100.00	42.75	93.00
		Voided leases and sundry claims	...	...	88.00	28.03	...	...	20.03	352.00	684.80	...
Ruby Creek	98	Goliath	...	...	36.20	41.98	...	...	...	43.70	50.99	...
	97	Ruby Queen	...	...	410.00	220.48	...	...	...	1,227.25	714.83	...
	(108)	Shortt's Hope	...	...	50.00	3.09	...	...	...	50.00	3.09	...
	100	St. Lawrence	...	...	...	...	...	...	...	10.00	11.32	...
	96	West and Left	...	...	...	...	...	...	...	10.00	5.30	...
		Voided leases and sundry claims	...	...	6.50	6.18	...	...	...	12,906.75	9,612.40	...
The Mary	...	do. do. do.	...	...	16.75	29.47	...	...	...	415.75	239.50	...
The Panton	...	do. do. do.	...	...	3.15	3.00	...	...	...	40.85	156.71	...
		<i>From Goldfield generally:—</i>												
		Reported by Banks and Gold Dealers	238.80	63.21	6,734.44	63.21	.75	1.54	...	
		Totals	238.80	70.83	778.60	412.07	...	6,742.06	104.52	20,061.05	15,776.68	93.00

Pilbara Goldfield.

MARBLE BAR DISTRICT.

Bamboo Creek	856	Bulletin	...	...	213.00	69.11	...	...	5.05	2,515.00	797.93	...
	850	Federation	...	...	177.00	78.28	...	...	...	498.00	604.29	...
	866, 901	Greater Bonnie Doon (1935), Limited	...	...	...	...	...	...	...	2,530.00	1,043.86	...
	866	(Bonnie Doon)	...	...	...	...	...	...	...	204.00	78.03	...
	707	Kitchener	...	...	265.00	214.61	...	...	...	8,930.00	13,232.67	...
	1010	Mickey	...	...	45.00	8.77	...	...	...	794.00	148.97	...
	1041	Mickey Extended	...	...	117.00	18.96	...	...	...	117.00	18.96	...

	740, 794, etc. ...	Mt. Prophecy Leases ... ..	...	...	687-00	419-32	...	...	...	7,507-50	7,738-17	...
	740 ...	(Mt. Prophecy) ... ..	...	...	...	...	...	...	1-11	1,040-50	1,898-07	...
	794 ...	(Perseverance) ... ..	...	...	...	...	...	...	...	290-50	584-21	...
	817 ...	Prince Charlie ... ..	...	...	65-50	92-04	...	...	3-68	1,689-25	2,880-09	...
	907 ...	Princess May ... ..	...	...	151-50	41-21	...	...	4-87	555-75	312-84	...
	865 ...	Queen ... ..	...	...	162-00	50-50	...	...	...	1,088-00	520-76	...
	924 ...	True Blue ... ..	...	...	147-50	8-10	...	...	...	603-50	44-84	...
		Voided leases ... ..	...	...	...	...	...	13-54	545-85	16,331-10	24,832-40	...
		Sundry claims ... ..	...	...	352-00	61-72	...	8-97	307-83	4,545-35	2,833-18	...
Boodalyerrie ...		Voided leases and sundry claims ... ..	...	...	...	...	...	...	299-33	120-25	587-86	...
Lalla Rookh ...	(1036) ...	Lalla Rookh ... ..	...	...	14-00	3-53	...	...	...	14-00	3-53	...
		Voided leases and sundry claims ... ..	...	...	...	...	...	...	4-78	11,541-00	12,367-89	574-01
Marble Bar	1038 ...	Charity ... ..	...	...	56-50	45-73	...	...	...	56-50	45-73	...
	927, etc. ...	Comet Gold Mines, Ltd. ... ..	...	...	10,901-00	8,027-48	...	...	...	26,559-25	26,975-19	...
	1019 ...	(Alethia) ... ..	...	...	104-25	1-81	...	...	...	586-75	23-70	...
	930, etc. ...	Prior to transfer to present holders ... ..	...	...	...	...	...	...	...	1,609-00	1,211-72	...
	854 ...	Coongan Star ... ..	...	...	62-00	58-35	...	...	...	1,129-00	2,093-72	...
	(1029) ...	Guba ... ..	...	...	7-50	1-73	...	...	...	14-00	8-27	...
	912 ...	Homeward Bound ... ..	...	...	1,231-25	596-83	...	...	...	3,178-75	1,812-44	...
	(914) ...	Jo Jo ... ..	...	...	69-25	22-03	...	...	...	536-25	321-78	...
	926 ...	Leviathan ... ..	...	...	478-75	125-02	...	4-60	2,139-50	690-43	...	
	929, 1023, 1024	Ora Banda South Mines, N.L. ... ..	...	...	666-00	271-29	...	...	...	666-00	271-29	...
	929 ...	(Tassy Queen) ... ..	...	...	...	109-11	...	...	...	2,323-50	1,534-75	...
	845, 869 ...	Outward Bound leases ... ..	...	...	307-00	95-27	...	...	...	1,744-30	890-34	...
	845 ...	(Outward Bound) ... ..	...	...	...	...	...	...	...	1,543-50	1,873-91	...
	869 ...	(Outward Bound East) ... ..	...	...	...	...	...	...	...	30-00	26-79	...
	909 ...	Stray Shot ... ..	...	...	51-00	75-72	...	...	...	211-50	175-35	...
	844, 851 ...	Viking leases ... ..	...	...	19-50	18-28	...	...	...	1,245-75	936-38	...
	844 ...	(Anglo-French) ... ..	...	...	...	...	...	...	...	467-00	706-25	...
	851 ...	(Viking) ... ..	...	...	...	...	...	...	...	34-50	45-52	...
	1001 ...	White Hill ... ..	...	1-73	665-00	119-10	...	1-73	873-75	166-04	...	
		Voided leases ... ..	...	...	...	...	...	...	187-35	23,708-70	29,102-21	...
		Sundry claims ... ..	...	64	1,711-25	496-98	...	65-71	174-84	17,550-14	11,502-25	...
North Pole ...	1040 ...	Normay ... ..	...	...	49-00	23-54	...	...	...	49-00	23-54	...
		Voided leases and sundry claims ... ..	...	...	238-00	118-33	...	...	...	876-75	626-32	...
North Shaw ...		do. do. do. ... ..	...	...	29-25	12-24	...	10-37	567-06	1,252-20	1,118-01	...
Pilgangoora ...		Voided leases ... ..	...	...	...	...	...	16-65	...	2,255-00	403-60	...
		Sundry claims ... ..	...	...	...	...	...	161-08	8-13	481-60	146-39	...
Sharks ...	868 ...	Mount Ada ... ..	...	...	128-75	62-62	...	...	...	1,269-00	1,408-06	...
		Voided leases ... ..	...	...	...	...	...	...	...	78-00	222-02	...
		Sundry claims ... ..	...	...	8-00	7-59	...	162-10	34-73	1,021-75	1,472-27	...
Talga ...	(1032) ...	Black Cat ... ..	...	1-41	114-50	18-55	...	...	1-41	278-50	50-49	...
		Voided leases and sundry claims ... ..	...	...	23-50	9-98	...	64-70	171-48	3,478-15	3,203-70	...
Tambourah ...		do. do. do. ... ..	...	5-58	854-00	546-05	...	89-52	361-26	4,531-25	4,112-42	...
Warrawoona ...	1046 ...	Klondyke Queen ... ..	...	...	105-00	11-81	...	...	...	105-00	11-81	...
	(1037) ...	Klondyke Queen ... ..	...	...	599-00	57-10	...	...	...	599-00	57-10	...
		Voided leases and sundry claims ... ..	...	...	417-50	109-43	...	70-98	603-97	15,968-59	22,208-72	...
Western Shaw ...		do. do. do. ... ..	...	...	...	...	...	22-34	67-47	1,294-00	1,039-29	...

TABLE I.—Production of Gold and Silver from all sources, etc.—continued.

PILBARA GOLDFIELD—continued.
MARBLE BAR DISTRICT—continued.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1940.					TOTAL PRODUCTION.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.
Wyman's Well ...	1002, 1003 ...	Copenhagen leases ... ..	...	...	524.50	27.77	...	...	...	524.50	27.77	...
	1002	(Copenhagen) ... ..	...	...	...	...	...	...	...	1,046.75	42.87	...
	1045	Duchess of Kent ... ..	...	...	44.75	31.39	...	...	...	44.75	31.39	...
	1021	Rising Moon ... ..	...	...	78.25	3.20	...	...	...	269.75	19.51	...
	1013	Trump ... ..	...	...	480.50	88.80	...	...	...	812.75	160.25	...
		Voided leases and sundry claims	.21	4.28	885.75	325.60	...	1.14	91.21	2,960.40	2,193.58	...
Yandicoogina ...	...	do. do. do.	...	...	25.00	29.15	...	4.32	380.65	3,724.95	6,849.70	...
		<i>From District generally:—</i>										
		Sundry Parcels treated at:										
		Bamboo Creek State Battery ... ..	...	...	...	*406.92	42.23	...	...	...	*8,107.49	156.08
		Marble Bar State Battery ... ..	...	...	...	*924.56	...	...	...	12.00	*6,942.49	...
		Ironclad Battery ... ..	...	...	...	*23.81	...	...	...	...	*237.71	...
		Various Works ... ..	...	...	...	...	...	...	...	237.95	*1,391.56	...
		Reported by Banks and Gold Dealers	95.00	...	...	...	...	13,898.73	435.76	...	...	...
		Totals	95.21	13.64	23,332.00	13,969.32	42.23	14,590.15	4,264.05	190,293.93	213,050.67	730.69

NULLAGINE DISTRICT.

Eastern Creek ...	268L	Doherty's Reward ... ..	...	...	121.00	123.14	...	...	...	175.50	228.35	...
	251L	Rose ... ..	...	...	20.00	13.56	...	...	...	111.00	88.52	...
	253L	Shamrock ... ..	...	...	...	...	...	...	...	72.00	59.11	...
		Voided leases and sundry claims	...	...	36.10	82.65	...	...	20.93	5,818.60	10,373.28	28.67
Elsie ... ..	...	do. do. do.	...	...	...	...	...	...	...	630.50	1,781.57	...
McPhee's Creek ...	...	do. do. do.	...	...	42.50	24.64	...	...	...	247.00	335.01	...
Middle Creek ...	230L	All Nations ... ..	...	...	608.00	140.68	...	...	...	768.75	200.88	...
	260L	All Nations North ... ..	...	...	92.00	26.60	...	...	...	1,425.00	434.67	...
	229L	Barton ... ..	...	...	...	...	...	1.22	...	47.50	37.76	...
	231L, etc. ...	Blue Spec leases ... ..	...	...	1,235.00	691.40	...	...	...	2,204.50	1,466.54	...
	258L	Junction ... ..	...	...	...	...	...	...	...	27.50	4.24	...
	247L	Hopetown North ... ..	...	...	77.00	22.79	...	...	...	213.00	51.43	...
	267L	Little Wonder ... ..	...	...	763.00	157.93	...	...	...	1,847.00	367.76	...
		Voided leases and sundry claims	...	...	294.00	108.54	...	...	...	12,043.40	10,723.65	...

Mosquito Creek ...	234L ...	Alrema ...	...	...	...	...	...	...	...	139-00	32-98	...
	235L ...	Beatrice ...	...	...	...	...	...	...	43	390-00	129-70	...
	236L ...	Western ...	...	...	...	...	...	...	...	31-00	9-62	...
		Voided leases and sundry claims	...	...	40-00	40-49	...	1-07	190-13	10,972-74	16,314-09	...
Nullagine ...	252L ...	Marjie ...	...	...	692-50	184-29	...	...	...	830-00	550-07	...
	270L ...	Valentine ...	...	...	115-00	57-81	...	...	...	115-00	57-81	...
		Voided leases and sundry claims	50-04	...	267-50	107-37	...	260-68	243-75	12,345-05	21,335-27	...
Twenty-mile Sandy	256L ...	Bill Jim ...	...	...	...	...	...	...	...	387-00	193-21	...
	(269L) ...	Sunday Mine ...	...	...	44-00	104-04	...	...	...	84-00	169-01	...
		Voided leases and sundry claims	...	...	392-00	150-97	...	33-10	33-70	10,338-95	12,974-00	...
<i>From District generally :-</i>												
Sundry Parcels treated at :												
		Greig's Cyanide Plant ...	...	...	...	...	...	...	...	...	*110-34	...
		Simpson's Cyanide Plant (Twenty-mile Sandy)	...	...	...	*429-71	...	...	...	...	*752-99	...
		Various Works ...	...	...	...	...	...	...	...	112-50	*6,218-62	...
		Reported by Banks and Gold Dealers	205-20	...	...	...	...	8,950-20	97-45	...	24-77	...
		Totals ...	255-24	...	4,839-60	2,466-61	...	9,246-27	586-39	61,376-49	85,025-25	28-67

Ashburton Goldfield.

Belvedere ...	(40), (41) ...	Belvedere leases ...	...	...	333-00	70-04	18-39	...	9-88	1,560-00	421-74	92-07
Dead Finish ...	48 ...	Big Sarah ...	...	...	47-50	104-16	...	...	...	47-50	104-16	...
	47 ...	Star of the West ...	...	...	150-00	98-07	...	...	...	150-00	98-07	...
	(45) ...	Star of the West ...	...	...	74-00	26-57	...	...	...	152-00	56-07	...
		Sundry claims ...	...	...	40-00	77-67	...	...	11-89	75-75	231-77	...
Melrose ...	43, 44 ...	Melrose leases ...	...	...	187-00	93-70	89-60	...	...	187-00	93-70	89-60
	43 ...	(Melrose) ...	...	...	...	...	...	...	...	1,667-00	313-43	90-16
		Voided leases and sundry claims	...	...	53-00	23-77	50	12-41	21-88	1,278-50	631-96	6-97
Mt. Edith ...		Sundry claims ...	...	...	...	...	...	...	5-00	3-97	...	
Mt. Mortimer ...		do. ...	...	...	...	...	364-63	315-64	44-50	40-25	74-47	
Uaroo ...		Voided leases ...	...	...	...	...	...	...	...	...	7,713-22	
<i>From Goldfield generally :-</i>												
		Reported by Banks and Gold Dealers	68-20	30-51	...	...	...	8,730-52	47-10	...	7-12	...
		Totals ...	68-20	30-51	884-50	493-98	108-49	9,107-56	406-39	5,167-25	2,002-24	8,066-49

Gascoyne Goldfield

Bangemall ...		Voided leases and sundry claims	...	...	...	...	...	88-97	39-77	387-00	517-29	...
<i>From Goldfield generally :-</i>												
		Reported by Banks and Gold Dealers	24-94	...	...	...	...	588-55	1-80	...	...	...
		Totals ...	24-94	...	...	...	...	677-52	41-57	387-00	517-29	...

TABLE I.—Production of Gold and Silver from all sources, etc.—continued.

Peak Hill Goldfield.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1940.					TOTAL PRODUCTION.						
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.		
			Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.		
Egerton	556P	Pegasus Voided leases and sundry claims	...	...	143·00 48·00	285·55 8·87	...	...	...	...	715·00 6,509·02	1,722·70 3,605·14	...
Horseshoe	560P	Labourchere Range Voided leases and sundry claims	...	...	325·75 1,022·75	57·79 225·78	...	...	...	...	325·75 2,285·93	57·79 2,566·94	... 2·00
Jimblebar ... ..	...	do. do. do.	...	...	...	...	...	...	...	...	13·79 238·70	8,574·30	3,136·11 58
Mt. Fraser ... ..	...	do. do. do.	...	...	...	...	...	...	...	...	88·28 40·61	790·25	662·10
Mt. Seabrook ... ..	...	do. do. do.	...	...	108·00	30·31	...	...	...	...	5·05	1,619·35	1,196·77
Peak Hill	512P	Atlantic ... ..	...	...	148·00	12·73	...	...	...	...	...	3,467·00	435·09
	510P	Atlantic North ... ..	...	...	387·00	32·54	...	...	...	...	...	1,221·00	375·81
	552P	Bobby Dazzler ... ..	...	...	57·00	42·02	...	...	...	63	...	367·50	198·94
	507P	Central ... ..	...	...	125·00	6·59	...	...	...	...	...	6,883·00	422·37
	511P	Commercial ... ..	...	...	...	...	...	...	...	...	...	2,702·75	470·23
	448P	Evening Star ... ..	...	...	24·00	17·09	...	...	...	...	70·17	6,873·00	4,803·52
	514P	Jasper Bar ... ..	...	...	117·00	42·36	...	...	...	...	10·40	1,455·25	897·44
	553P	Morning Star ... ..	...	4·43	510·00	80·87	...	...	...	4·43	1,748·25	227·62	...
	508P	Mount Pleasant ... ..	...	...	147·00	23·67	...	...	...	...	...	1,148·00	382·98
	506P	No. 1 North ... ..	...	...	624·00	81·78	...	...	...	...	...	5,657·70	1,180·26
	492P	North Star ... ..	...	...	531·00	31·67	...	...	...	23·20	69·63	11,600·50	1,795·93
		Voided leases and sundry claims	...	9·96	774·00	179·54	67·16	1,108·74	534,561·18	248,169·23	2,285·63
Ravelstone ... ..	...	do. do. do.	...	...	...	...	...	...	...	...	101·64	4,773·45	3,400·85
Wilgeena ... ..	...	do. do. do.	...	...	...	...	...	...	...	...	23·54	128·50	146·79
Wilthorpe ... ..	...	do. do. do.	...	...	...	...	...	...	...	...	...	136·00	46·64
Yowereena ... ..	...	do. do. do.	...	...	...	...	...	...	...	...	...	136·75	239·62
<i>From Goldfield generally :—</i>														
Sundry parcels treated at :														
State Battery, Peak Hill ... ..			...	...	...	...	*273·87	...	...	3·05	15·00	*5,829·09	...
Smith's Cyanide Plant ... ..			...	...	...	...	*288·13	...	...	...	...	...	*644·58
Various Works ... ..			...	...	...	...	...	...	...	...	30·00	*5,661·37	23·12
Reported by Banks and Gold Dealers			78·30	...	...	...	...	...	2,738·45	443·21	...	...	...
Totals			78·30	14·39	5,091·50	1,721·16	...	3,258·99	4,965·83	608,724·43	288,275·91	2,311·33		

East Murchison Goldfield.

LAWLERS DISTRICT.

Kathleen Valley ...	1330	Beth-Heno ... ..	...	...	258·00	107·53	...	...	...	326·00	190·54	...
	1332	Mossbecker ... ..	...	...	1,272·00	158·57	...	...	...	1,552·00	206·33	...
	1331	Mt. Pascoe South ... ..	...	...	...	...	...	...	...	31·50	9·47	...
	1321	Yellow Aster ... ..	...	...	...	...	...	...	...	209·00	90·01	...
		Voided leases and sundry claims	...	...	189·00	77·06	...	14·37	670·88	81,652·25	49,781·11	...
Lawlers	1336	Caroline East ... ..	...	...	48·00	27·41	...	...	...	48·00	27·41	...
	1236, 1240, etc.	Emu Gold Mines Ltd. ... ..	...	...	47,050·00	11,940·60	270·00	...	...	153,674·00	33,818·01	434·00
	1236-40-49 ...	Prior to transfer to present holders	...	...	...	...	...	13·02	...	168·50	1,216·93	...
	1323	Mate's Lease ... ..	...	...	207·00	68·56	...	...	...	298·00	108·67	...
	1317	Tallon Doon ... ..	...	...	32·00	13·80	...	...	...	201·00	111·78	...
	1337	Vivien ... ..	...	...	58·00	32·40	...	...	...	58·00	32·40	...
		Voided leases and sundry claims	...	7·47	850·50	268·83	...	395·85	1,079·17	1,299,078·20	499,423·01	14,619·27	
Sir Samuel ...	1333	Vanguard ... ..	...	...	1,162·00	135·79	...	...	...	1,162·00	135·79	...
		Voided leases and sundry claims	...	3·47	348·00	142·85	...	53·89	423·99	279,877·30	145,474·01	10,227·52	
<i>From District generally:—</i>													
Sundry parcels treated at:													
		State Battery, Sir Samuel	...	...	...	...	...	...	...	53·50	*2,209·16	...
		King's Cyanide Plant	...	2·35	...	*113·70	...	...	2·35	...	*176·33	...
		McPherson's Cyanide Plant	...	...	...	*329·39	...	2·12	...	12·03	*4,224·85	...
		Dower & Maund's Cyanide Plant	...	...	...	*91·61	...	...	...	...	*650·37	...
		Vanguard Cyanide Plant	...	...	3·00	*295·38	...	...	...	3·00	*538·56	...
		Westralia T.T. Plant	...	...	...	*243·10	...	...	...	...	*246·53	...
		Various Works	...	...	...	...	...	...	...	1,699·50	*25,141·69	936·09
		Reported by Banks and Gold Dealers	...	40·31	...	...	...	6,352·93	101·09	...	9·84	...
		Totals	43·78	10·74	51,477·50	14,046·58	270·00	6,832·18	2,277·48	1,820,103·83	768,822·80	26,216·83

WILUNA DISTRICT.

Coles	628J	Blackadder ... ..	...	...	...	...	...	...	...	928·50	399·25	...
	639J	Pay Day ... ..	...	...	93·25	13·94	...	...	...	177·25	27·01	...
		Voided leases and sundry claims	...	12·77	235·75	70·13	...	...	12·77	4,132·25	1,515·39	...
Corboys	(659J)	Ida ... ..	...	...	226·00	55·47	...	...	...	306·00	86·15	...
	435J	Old Toscana ... ..	...	...	75·00	35·50	...	...	...	660·00	491·89	...
	627J	Vinaurum ... ..	...	...	569·00	157·60	...	...	...	2,079·00	1,672·74	...
	433J, 434J ...	Waratah leases ... ..	...	...	120·04	57·95	...	...	...	428·04	291·57	...
	433J, 434J ...	(Waratah G.Ms., Ltd., N.L.)	...	...	...	...	...	...	...	359·00	587·92	...
		Voided leases and sundry claims	...	...	198·00	51·19	...	17·36	1·25	13,355·60	9,176·00	5·00
Gum Creek ...		do. do. do.	...	...	...	...	...	20·75	1·36	1,759·25	716·62	...
Mt. Eureka ...		do. do. do.	...	...	...	...	...	...	...	926·00	644·92	...
Mt. Keith ...		do. do. do.	...	7·79	179·75	55·17	...	4·81	271·83	24,114·50	16,023·42	...
New England ...	661J	Simms' Find ... ..	...	...	177·00	194·86	...	...	...	177·00	194·86	...
		Voided leases and sundry claims	...	...	169·00	69·20	...	5·74	101·48	9,092·00	5,719·12	...

TABLE I.—Production of Gold and Silver from all sources, etc.—continued

EAST MURCHISON GOLDFIELD—continued.

WILUNA DISTRICT—continued.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1940.					TOTAL PRODUCTION.					
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	
			Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.	
Wiluna	660J	Black Swan	...	...	62·00	67·99	...	...	...	62·00	67·99	...
	631J	Brilliant Reduced	...	...	355·00	36·13	...	...	...	1,282·25	191·69	...
	552J	Coolgardie Brilliant, N.L.	...	...	9,335·00	2,689·75	...	...	...	9,335·00	2,689·75	...
	552J	Prior to transfer to present holders	...	...	600·00	197·34	...	...	...	7,257·00	2,202·75	12·40
	607J, 663J	Linden (W.A.) Gold, N.L.	...	...	3,374·00	980·91	...	...	...	19,714·00	5,559·78	...
	607J	Prior to transfer to present holders	...	...	...	...	...	...	...	1,156·75	655·83	...
	10J, 37J, etc.	Moonlight Wiluna G.Ms., Ltd.	...	...	106,466·83	26,734·81	1,017·00	...	...	433,411·52	117,051·40	1,017·00
	10J, 37J, etc.	Prior to transfer to present holders	...	...	...	...	...	...	...	36,975·50	14,174·75	...
	630J	North Brilliant Reduced	...	...	479·00	262·52	...	...	...	2,525·25	795·55	...
	625J	Palmer's Puzzle	...	...	142·75	18·35	...	...	...	780·50	203·75	...
	6J, etc.	Wiluna Gold Mines, Ltd.	...	...	583,516·00	86,732·00	...	...	...	4,869,337·00	1,017,521·80	1,213·99
	6J, etc.	Prior to transfer to present holders	...	...	...	...	...	...	...	341,730·57	133,457·92	89·32
		Voided leases and sundry claims	709·50	91·85	105·39	790·55	160,667·05	88,478·38	124·33
		<i>From District generally:—</i>											
		Sundry parcels treated:											
		State Battery, Wiluna	...	...	...	*98·93	...	...	...	592·00	*21,502·53	218·70
		Blackadder Battery	...	...	...	*46·26	...	...	...	...	*46·26	...
		Toscana Cyanide Plant	...	...	...	*232·12	...	...	...	...	*2,179·48	...
		Waratah Cyanide Plant	...	...	...	*278·63	...	...	...	...	*278·63	...
		Various Works	...	...	...	...	...	...	...	...	*1,237·68	12·68
		Reported by Banks and Gold Dealers	...	...	...	...	...	...	39·83	53·81	...	2·53
		Totals	...	20·56	707,082·87	119,228·60	1,029·40	193·88	1,233·05	5,943,320·78	1,445,845·31	2,693·42	

BLACK RANGE DISTRICT.

Barrambie	972B, 976B	Scheelite leases	...	...	98·00	97·62	...	...	...	336·00	399·42	...
	972B	(Scheelite)	...	...	...	...	...	...	...	105·50	108·88	...
	976B	(Scheelite North)	...	...	...	...	...	...	...	92·75	92·83	...
		Voided leases and sundry claims	...	...	77·25	35·88	...	5·07	190·59	18,179·47	17,108·64	125·60
Bellchambers	1051B	Bellchambers	...	...	571·00	179·75	...	...	...	1,831·25	867·86	...
		Voided leases and sundry claims	...	...	46·25	10·39	...	...	111·80	934·77	769·89	...
Birrigrin	...	do. do. do.	...	4·52	...	...	...	...	1,000·60	14,530·48	16,324·31	...
Curran's Find	...	do. do. do.	...	...	64·00	10·60	...	18·24	252·27	9,395·00	3,941·48	...
Erroll's	...	do. do. do.	...	...	...	...	...	20·70	551·40	15,135·25	9,924·37	...

Hancock's	1050B ...	Duke of Windsor ...	...	...	201.00	88.43	...	...	...	503.00	279.07	...
	1071B ...	Eclipse ...	...	...	71.50	42.10	...	...	...	71.50	42.10	...
	(1070B)	Hill View ...	...	...	66.75	24.75	...	...	...	125.25	101.14	...
		Voided leases and sundry claims	...	...	605.50	200.51	...	4.21	6,652.56	39,813.50	36,024.93	55.72
Maninga Marley	...	do. do. do.	...	...	20.00	13.40	...	...	353.36	63,904.88	50,258.68	22.55
Montagu	967B, 998B	North End leases	...	...	4,601.00	501.45	...	...	...	29,586.45	4,279.29	...
		Voided leases and sundry claims	...	...	261.00	55.98	...	...	171.26	44,624.25	19,998.37	...
Nungarra	1072B	Wirraminna	...	...	233.75	37.16	...	...	...	377.50	53.72	...
		Voided leases and sundry claims	...	...	220.50	56.22	...	76.21	2,410.40	17,339.40	7,862.50	...
Sandstone	959B, etc.	Atlas Gold Mines, Ltd.	...	...	602.00	94.07	...	...	...	799.00	143.52	...
	959B	Prior to transfer to present holders	...	...	...	...	...	...	136.06	537.75	686.59	...
	958B	Lady Mary	...	...	77.50	75.47	...	...	...	4,056.75	3,757.39	...
	1069B	Sonny Boy	...	...	51.00	3.24	...	...	...	60.50	6.15	...
		Voided leases and sundry claims	...	36.25	668.25	125.09	...	45.92	5,036.78	706,718.47	450,361.75	11,754.22	
Youanme	1046B	Camberra	...	...	588.50	227.42	...	...	...	1,401.00	434.89	...
	960B, etc.	Youanmi G.Ms., Ltd.	...	...	85,017.40	22,569.36	973.34	...	...	293,227.20	76,236.62	3,920.54
	960B	(Youanme)	...	...	...	...	...	...	...	38.50	3.91	...
		Voided leases and sundry claims	...	...	388.75	205.04	...	1.43	145.71	365,191.33	178,690.85	4,608.55
<i>From District generally:—</i>													
Sundry parcels treated at:													
		North End Cyanide Plant	...	...	...	*419.16	...	...	...	...	*4,424.01	...
		Parkinson's Cyanide Plant	...	...	...	*6.67	...	...	...	...	*179.80	...
		State Battery, Sandstone	...	...	10.00	3.60	...	...	...	266.00	*20,407.45	59.53
		State Battery, Youanme	...	...	...	...	...	...	...	40.00	*5,106.99	...
		Various Works	...	...	...	...	...	...	...	37.00	*6,325.89	...
		Reported by Banks and Gold Dealers	...	3.32	...	...	...	1,441.69	50.84	...	20.38	...
Totals				3.32	40.77	94,540.90	25,083.56	973.34	1,613.47	17,063.63	1,629,259.70	915,223.67	20,546.71

Murchison Goldfield.

CUE DISTRICT.

Big Bell	2050 etc.	Big Bell Mines Ltd.	...	...	466,142.00	53,889.92	16,410.88	...	...	1,399,895.00	194,294.49	65,472.22
	2050	(Little Bell)	...	...	...	...	...	...	4.49	579.75	60.95	...
	2203	Paraliser	...	...	156.00	173.79	...	...	...	274.75	278.83	...
		Sundry claims	...	...	171.25	187.21	...	...	6.32	254.50	251.84	...
Cuddingwarra	2225	Gypsum	...	...	90.00	24.78	...	...	...	90.00	24.78	...
		Voided leases and sundry claims	...	9.93	503.25	123.35	...	19.56	487.03	109,631.50	60,669.98	109.71
Cue	2186	Desert Flower	...	...	44.25	49.00	...	...	...	113.00	73.91	...
	2182	Desert Gold	...	...	9.75	22.76	...	...	...	107.25	76.11	...
	2208	Dunedin	...	39.27	81.00	40.01	...	39.27	...	101.50	50.32	...
	2224	Monte Carlo	...	...	15.50	19.96	...	...	...	15.50	19.96	...
	(2211)	Treasure	...	...	63.50	33.65	...	...	9.69	152.00	56.64	...
	2084	Trovato di Pietro	...	...	203.25	132.53	...	...	1.77	2,140.50	1,241.40	...
		Voided leases and sundry claims	...	16.87	2,098.25	448.61	...	243.57	1,405.81	322,848.63	236,130.79	66.63
Eelya	...	do. do. do.	...	...	9.00	3.78	...	...	110.64	1,911.90	2,551.19	...

TABLE I.—Production of Gold and Silver from all sources, etc.—continued.

MURCHISON GOLDFIELD—continued.

CUE DISTRICT—continued.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1940.					TOTAL PRODUCTION.						
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.		
			Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.		
Mindoolah	2209, etc. 2212	Mindoolah Mines Limited Two Reef Voided leases and sundry claims	...	...	17.25 568.00 83.75	11.59 496.13 15.75	...	...	...	17.25 1,103.50 10,899.35	11.59 672.74 6,942.59	...	...	42.97
Reedy	(2092) 1977, etc. 1977, etc. 2071, 2191	Culculli North Triton Gold Mines, N.L. Prior to transfer to present holders Western Gold Mines, N.L. Voided leases and sundry claims	...	...	...	64.29 30,981.91 ...	1.22 3,030.74 ...	1.46	...	1,006.75 495,056.00 14,492.50 1,570.00 9,313.48	1,311.74 159,155.22 7,073.36 339.92 10,768.57	1.22 14,814.53 5.00	...	...
Tuckabianna	2130 2218	Garibaldi Vienna Voided leases and sundry claims	...	...	...	...	...	...	...	45.22 270.38 64.60 14,552.60	541.79 169.90 8,129.91	...	...	...
Tuckanarra	2079 2200	Batchelor Blue Peter Voided leases and sundry claims	...	...	...	...	...	2.88	...	59.80 275.21 3,832.27 28,555.70	366.10 498.71 32,058.30	...	...	172.77
Weld Range	2183	Joy Long Voided leases and sundry claims	...	...	246.25	61.84	...	...	...	580.75 1,694.25	213.37 1,236.95	...	...	...
		<i>From District generally:—</i> Sundry parcels treated at:	...	...	...	...	...	...	...	...	...	...	...	...
		State Battery, Cue	...	...	...	*885.05	...	...	...	12.75	*15,573.53	91.93	...	...
		State Battery, Tuckanarra	...	...	...	*90.69	...	...	...	518.50	*5,475.32	...	...	...
		Various Works	...	...	...	...	...	...	...	6,925.52	*29,375.96	1,147.77	...	...
		Reported by Banks and Gold Dealers	112.09	...	...	1.78	...	...	3,091.67	90.73	20.60	...	...	...
		Totals	168.23	30.58	577,614.02	89,081.40	19,442.84	3,725.01	7,308.67	2,425,301.26	775,717.36	81,924.75	...	...

MEEKATHARRA DISTRICT.

Abbotts	1868N (1726N) 1869N	Moonlight Murchison King Sunlight Voided leases and sundry claims	...	...	74.75 ...	24.84 2.32 42.30 94.33	...	...	...	74.75 373.25 100.75 39,850.87	24.84 869.76 42.30 40,032.11	...	...	...
Burnakura	(1846N) 1849N	Empire New Alliance Voided leases and sundry claims	...	...	...	78 81.38 19.41	...	...	...	8.16 261.00 88.75 39,935.75	46.55 88.85 31,294.84	...	...	26.90

Chesterfield	...	do.	do.	do.	...	...	15.50	7.46	...	29.02	461.95	7,712.56	8,181.59	.80
Gabanintha	1854N ...	Golden Star	...	...	...	...	70.50	161.75	...	...	...	70.50	161.75	...
	1844N ...	Mab	...	...	...	...	189.00	45.47	...	...	...	498.50	121.89	...
	1725N ...	New Brew	...	...	...	...	111.35	101.29	...	...	...	704.10	848.54	...
		Voided leases and sundry claims	...	...	...	...	249.75	237.11	...	28.57	176.54	25,998.75	15,783.16	815.57
Garden Gully	1719N ...	Sabbath	...	...	...	...	...	...	...	...	...	351.50	381.87	...
		Voided leases and sundry claims	...	...	...	...	73.25	26.38	...	26.36	82.42	32,641.51	23,099.43	1,102.59
Gum Creek	...	do.	do.	do.	...	...	37.50	21.49	...	29.64	176.82	4,620.33	4,456.76	...
Holden's	1551N ...	New Waterloo	...	...	...	...	...	30.63	...	...	.99	1,468.00	918.92	...
		Voided leases and sundry claims	...	...	...	...	...	...	...	164.95	67.07	17,018.15	6,680.75	...
Jillawarra	1871N ...	Werribie	...	...	1.99	...	47.75	80.05	...	...	1.99	47.75	80.05	...
		Voided leases and sundry claims	...	...	...	...	32.50	98.45	...	173.02	1,284.72	1,835.80	3,132.21	...
Meeka Pools	...	do.	do.	do.	...	...	...	...	...	...	2.84	345.15	287.65	...
Meekatharra	1861N ...	Adele May	...	...	...	...	...	1.87	...	...	...	...	1.87	...
	1855N ...	Commodore	...	...	...	...	338.75	82.91	...	...	...	386.50	108.85	...
	1862N ...	Danube	...	...	...	...	300.25	30.62	...	...	...	300.25	30.62	...
	477N ...	Fenian	...	...	...	...	5,397.00	1,501.04	...	...	...	14,228.75	19,790.26	...
	477N, 814N	Fenian leases	...	...	...	...	...	...	...	...	...	313,485.94	254,989.70	...
	1859N ...	Halcyon	...	...	...	...	53.75	22.33	...	...	...	53.75	22.33	...
	(1857N)	Halcyon Extended	...	...	...	...	61.00	11.56	...	...	...	61.00	11.56	...
	1466N ...	Haveluck	...	...	...	...	346.50	114.69	...	...	...	2,556.05	1,873.87	...
	1559N ...	Ingliston	...	...	...	...	404.00	385.40	...	...	25.32	1,542.30	1,249.11	...
	1542N, (1566N), (1575N)	Ingliston Albert's leases	...	...	...	...	6.75	4.89	...	...	...	2,983.70	1,283.06	...
	475N, etc.	Ingliston Consols Extended leases	...	...	...	...	865.00	211.78	...	...	...	872,956.22	355,972.33	...
	475N ...	Prior to transfer to present holders	...	...	...	...	...	...	...	...	...	1,536.25	4,248.25	...
	1539N, 1863N	Ingliston South Gold Development, N.L.	...	...	...	...	366.50	330.80	...	...	...	799.50	1,230.72	...
	1539N ...	Prior to transfer to present holders	...	...	...	...	...	...	...	...	...	16,274.61	12,815.17	...
	(1858N)	Lucky Hit	...	...	4.46	...	...	...	...	...	4.46	...	...	...
	533N ...	Marmont	...	...	...	...	1,096.50	547.32	...	...	51.03	58,769.45	42,249.38	...
	580N ...	Marmont Extended	...	...	...	...	67.75	50.08	...	...	...	1,615.20	1,531.82	...
	580N, (888N)	Marmont Extended leases	...	...	...	...	...	...	...	...	...	152.00	129.61	...
	1576N, 1547N	Meekatharra Central Gold, N.L.	...	...	...	...	373.00	264.46	...	...	5.29	4,368.00	2,198.32	...
	1576N, 1547N...	Prior to transfer to present holders	...	...	...	...	...	...	...	...	11.06	2,951.42	5,198.33	...
	1633N ...	Mickey Doolan	...	...	...	...	29.75	38.13	...	...	...	29.75	38.13	...
	1577N ...	Mopoke	...	...	...	...	...	...	...	...	...	934.25	204.47	...
	1860N ...	New Gwalia	...	...	...	...	22.75	28.34	...	...	...	421.75	56.44	...
	1800N ...	Peter Pan	...	...	...	...	119.75	10.02	...	...	...	948.00	88.46	...
	1571N ...	Phar Lap	...	...	...	...	218.25	124.30	...	...	...	4,163.00	2,696.78	...
	1529, etc.	Prohibition G.M. Co., N.L.	...	...	...	...	5,895.00	880.04	11.83	...	...	14,064.25	2,457.49	11.83
	1529N ...	Prior to transfer to present holders	...	...	...	...	...	...	...	...	...	29,422.00	4,971.30	...
		Voided leases and sundry claims	...	...	14.84	...	1,192.50	217.60	...	233.59	1,861.28	390,256.77	209,233.60	2,454.74
Mistletoe	...	do.	do.	do.	...	...	...	...	...	123.29	1,072.09	436.75	488.24	...
Mt. Maitland	...	do.	do.	do.	...	...	72.00	15.49	...	...	...	508.75	320.97	...
Munara Gully	1866N ...	Young Australia	...	...	...	...	115.75	70.28	...	...	...	115.75	70.28	...
		Voided leases and sundry claims	...	...	...	...	50.00	4.23	...	...	34.23	14,177.50	6,863.39	...

TABLE I.—Production of Gold and Silver from all sources, etc.—continued.

MURCHISON GOLDFIELD—continued.

MEEKATHARRA DISTRICT—continued.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1940.					TOTAL PRODUCTION.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.
Namine	1872N	Blue Pedro ... ..	...	...	664.00	178.17	...	...	...	664.00	178.17	...
	1564N, 1585N ...	Aladdin G.Ms., Ltd. ... ..	...	...	...	...	...	...	15,901.50	2,320.63	...	
	1564N	Prior to transfer to present holders	...	...	...	...	...	...	3,914.10	457.70	...	
	1580N	Caledonian ... ..	...	...	34.75	26.87	...	...	333.85	226.25	...	
	1867N	Welcome ... ..	...	16.61	2.00	13.28	...	...	16.61	2.00	13.28	
		Voided leases and sundry claims	...	226.04	350.25	102.76	...	152.27	1,970.42	99,400.15	74,073.59	167.45
Quinns	(1634N, etc.), TA 24N	Quinns G.Ms., Ltd. ... ..	...	...	...	62.75	...	...	503.00	165.81	...	
		Voided leases and sundry claims	...	...	52.75	12.67	...	22.37	2,476.15	36,683.08	16,015.22	90.70
Ruby Well ... ..	...	do. do. do.	...	...	...	...	...	1,015.87	452.85	7,957.25	4,671.29	...
Stake Well ... ..	...	do. do. do.	...	...	6.25	4.87	...	31.91	234.85	22,327.60	10,141.38	...
Star of the East ... ..	...	do. do. do.	...	...	...	...	...	...	...	27,371.62	20,400.37	...
Yaloginda	1853N	Bluebird ... ..	...	...	2,086.00	687.88	...	...	...	3,126.00	807.23	...
	1851N	Edenhope ... ..	...	...	44.75	44.16	...	...	127.77	213.50	221.50	...
	1807N	Rocklee ... ..	...	...	51.25	13.83	...	...	3.50	276.00	115.91	...
		Voided leases and sundry claims	...	...	988.75	191.12	...	80.92	2,418.10	36,824.46	18,413.17	8.68
	<i>From District generally:—</i>											
	Sundry parcels treated at:											
		State Battery, Meekatharra ... ..	...	...	...	*924.30	...	...	...	68.50	*20,401.08	19.00
		Gabanintha Gold Recovery Works ... ..	...	...	...	*75.59	...	...	...	...	*162.22	...
		Threadgold's Cyanide Plant ... ..	...	...	...	*44.52	...	...	...	...	*44.52	...
		Various Works ... ..	...	...	...	...	...	...	...	172.75	*6,317.85	342.17
		Reported by Banks and Gold Dealers	212.92	35.82	...	...	...	11,836.69	170.04	...	12.81	...
		Totals	212.92	315.69	23,033.10	8,406.39	11.83	13,985.50	16,579.32	2,180,236.49	1,244,118.51	5,040.73

DAY DAWN DISTRICT.

Day Dawn	653D	Cooc ... ..	...	...	241.50	118.10	...	...	...	241.50	118.10	...
	652D	Crene D'Or ... ..	...	...	63.50	27.04	...	...	...	63.50	27.04	...
	647D	Klondike ... ..	...	...	596.03	813.49	...	...	86.96	1,328.53	1,471.99	...
	639D	Lone Hand ... ..	...	...	289.00	182.82	...	...	7.06	1,799.50	1,908.97	...
	573D	Mountain View ... ..	...	...	84.25	54.24	...	...	94.05	1,655.28	1,547.60	...
	576D	New Fingall ... ..	...	...	744.50	134.69	...	6.12	6.84	2,535.25	936.04	...
	654D	Parisian ... ..	...	...	442.50	133.16	...	...	...	442.50	133.16	...
		Voided leases and sundry claims	...	1.13	...	728.25	139.52	...	219.14	1,103.22	1,928,611.04	1,226,880.94	169,210.44

Lake Austin	649D	...	...	New Golconda Mines, N.L.	...	...	29.30	116.49	...	...	529.30	280.40	...
				Voided leases and sundry claims	...	...	148.55	127.02	...	660.99	3,962.69	39,023.34	51,766.30	
Mainland	...	...	...	do. do. do.	...	...	56.25	20.59	...	16.87	4,039.61	8,573.57	25,665.89
Pinnacles	...	...	...	do. do. do.	...	26	651.00	119.15	...	48.19	1,659.52	21,845.82	11,301.46
<i>From District generally:—</i>																
Sundry parcels treated at:																
				Heine's Cyanide Plant	...	...	...	*39.36	...	...	...	*225.75	...
				Various Works	...	...	...	...	...	16.61	940.75	1,741.97	...
				Reported by Banks and Gold Dealers	...	33.30	...	...	...	1,961.16	33.02	...	...	
Totals					34.69	...	4,074.63	2,025.67	...	2,912.47	11,009.58	2,007,589.88	1,324,006.38	169,210.44

MOUNT MAGNET DISTRICT.

Jimbulyer	1407M	...	...	Big Head	...	...	20.25	7.41	...	...	...	20.25	7.41	...
	1399M	...	...	Elk	...	...	352.60	117.27	...	...	...	352.60	117.27	...
	1401M	...	...	Gold Bug	...	...	6.50	21.75	...	...	...	6.50	21.75	...
	1365M	...	...	Pan-tomine	...	...	46.50	35.34	...	...	2.32	197.25	147.73	...
				Voided leases and sundry claims	...	2.31	219.20	179.05	...	18.45	109.57	881.70	671.76	...
Lennonville	1405M	...	...	Banker	...	...	42.25	54.05	...	...	...	42.25	54.05	...
	1308M	...	...	Empress	...	...	100.00	24.85	...	...	...	385.00	143.95	...
	1379M	...	...	Galtee Moore	...	...	1,256.00	268.03	...	...	...	2,208.00	503.34	...
	1378M	...	...	Gambier Lass	...	...	147.00	41.63	...	...	5.85	222.00	74.07	...
	1396M	...	...	Lady Audrey	...	...	217.25	86.73	...	...	...	325.75	154.46	...
	1374M	...	...	Souvenir	...	2.67	50.00	95.02	...	...	2.67	96.75	196.81	...
				Voided leases and sundry claims	...	...	399.00	209.25	...	19.14	3,318.40	156,278.07	130,097.80	458.82
Mt. Magnet	1382M	...	...	Corona	...	...	483.65	169.65	...	...	...	1,072.65	456.13	...
	1400M	...	...	Dead Man's Hill	...	...	145.85	15.61	...	...	...	145.85	15.61	...
	1394M	...	...	Eclipse	...	...	348.00	464.12	...	...	6.53	348.00	464.12	...
	1255M, 1367M	...	...	Edward Carson leases	...	...	2,851.00	866.13	...	...	...	13,536.50	9,958.08	...
	1367M	...	...	Edward Carson West	...	...	...	...	...	...	...	127.25	35.91	...
	1286M	...	...	Evening Star	...	...	959.75	118.10	...	...	36.37	1,541.07	985.23	...
	1383M	...	...	Hall Mark	...	73	6.75	8.96	...	...	10.57	29.25	20.13	...
	1287M	...	...	Havelock	...	...	1,149.00	190.37	...	...	11.05	3,021.50	628.96	...
	1320M	...	...	Hesperus Dawn	...	...	327.25	663.91	...	...	56.49	374.25	719.53	...
	1395M	...	...	Hidden Treasure	...	...	118.00	69.94	...	...	...	184.50	158.72	...
	1282M, etc.	...	...	Hill 50 G.M., N.L.	...	...	26,065.00	9,801.66	...	...	...	103,471.90	31,242.04	10.93
	1361M	...	...	Jupiter	...	83	74.75	12.95	...	...	83	223.00	73.57	...
	(1377M)	...	...	Little Friend	...	...	6.50	5.14	...	...	30.09	29.25	51.45	...
	1339M	...	...	Mars	...	...	549.25	127.74	...	...	...	1,778.75	333.62	...
	1334M, etc.	...	...	Metropolitan Mining & Development Co., Ltd.	...	...	3,356.35	2,147.19	...	...	...	6,247.20	4,451.60	...
	1334M	...	...	Prior to transfer to present holders	...	...	...	...	...	...	2.12	878.05	942.19	...
	1381M	...	...	Mortomoro	...	...	43.75	7.71	...	...	26.86	113.00	54.42	...
	1215M	...	...	Mt. Magnet Gold Mines, Ltd.	...	...	38,452.00	4,120.69	38.94	...	...	325,045.00	46,670.90	126.85
	1215M, 1254M	...	...	Prior to transfer to present holders	...	...	...	...	...	...	45.00	25,715.03	12,176.93	...
	1246M	...	...	Neptune	...	...	2,057.00	707.92	...	...	829.41	4,695.65	2,698.40	...
	1404M	...	...	Poverty Pot	...	...	129.75	26.56	...	...	...	129.75	26.56	...
	1403M	...	...	Poverty King	...	...	...	284.12	...	...	...	...	284.12	...
	1393M	...	...	Ready Money	...	...	14.25	3.42	...	...	3.22	14.25	3.42	...
	1281M, 1372M, 1380M (1392M)	...	...	Saturn leases	...	99.32	11,731.00	1,827.70	...	...	101.24	20,024.00	3,524.66	...
				Sovereign	...	113.26	...	6.97	...	...	154.61	...	6.97	...

TABLE I.—Production of Gold and Silver from all sources, etc.—continued

MURCHISON GOLDFIELD—continued.

MOUNT MAGNET DISTRICT—continued.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1940.					TOTAL PRODUCTION.					
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	
			Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.	
	1251M, etc. ...	Swan Bitter G.M. Co., N.L. ...	...	...	5,858·00	2,000·15	...	...	15·25	8,822·00	3,076·73	...
	1251M ...	Prior to transfer to present holders	...	...	...	...	...	...	320·12	6,081·25	3,180·61	...
	1322M ...	Three Boys ...	...	62·32	98·25	173·52	...	...	216·58	310·53	599·38	...
	1388M ...	Top-not ...	...	...	176·00	121·02	...	...	...	220·00	174·38	...
	1357M ...	Wind Bag ...	...	...	447·25	72·61	...	...	...	1,231·25	729·18	...
		Voided leases and sundry claims	...	07	484·48	4,692·90	950·01	...	149·89	11,244·04	439,539·85	246,174·20	714·36
Mt. Magnet East ...	...	do. do. do.	...	...	...	...	...	63·29	801·75	5,940·53	3,240·04	...
Moyagee ...	1355M, 1398M ...	Moyagee leases ...	...	...	620·00	693·97	61·32	...	...	620·00	693·97	61·32
	1355M ...	Moyagee ...	...	...	690·00	869·38	120·80	...	...	2,547·50	4,198·30	347·04
	1401M ...	Moyagee Light ...	...	18·51	3·75	5·47	...	...	18·51	3·75	5·47	...
		Voided leases and sundry claims	...	27·18	...	...	...	2·83	162·18	6,540·10	9,185·43	...
Paynesville ...	...	do. do. do.	...	2·89	...	...	...	3·36	2,141·06	1,319·34	2,468·92	...
Winjangoo ...	...	do. do. do.	...	...	54·03	22·41	...	·99	415·20	150·78	109·30	...
		<i>From District generally :—</i>											
		Sundry Parcels treated at :											
		State Battery, Boogardie ...	...	...	...	*2,300·31	...	...	...	125·26	*30,464·70	...
		Welcome Cyanide Plant ...	...	...	...	*117·11	...	...	...	...	*555·69	...
		Various Works ...	...	...	...	...	...	...	...	43·06	*17,427·01	1·00
		Reported by Banks and Gold Dealers ...	87·57	6·47	...	...	...	2,122·65	67·42	...	12·38	...
		Totals ...	87·64	824·19	104,365·63	30,112·90	221·06	2,380·60	20,155·31	1,143,257·02	570,469·36	1,720·32	

Yalgoo Goldfield.

Bilberatha ...	1139 ...	Blaney's Gold Mine ...	...	32·39	223·00	226·56	...	...	32·39	1,066·00	959·86	...
	1167 ...	Picata Joker ...	...	...	376·00	120·97	...	...	...	583·00	197·64	...
		Voided leases and sundry claims	...	...	128·00	32·41	...	...	6·64	3,576·05	1,642·31	...
Carlaminda ...	(1095) ...	Reliance ...	...	...	187·50	39·08	...	1·28	3·39	1,109·25	337·70	...
		Voided leases and sundry claims	...	...	19·00	6·83	...	...	...	2,303·82	1,123·14	3·30
Field's Find ...	907 ...	Brown's Reward ...	...	...	...	...	...	...	...	300·00	75·91	...
	907, etc. ...	Brown's Reward leases ...	...	...	...	...	...	...	...	4,540·55	3,800·16	...
	1119 ...	Field's Find Central West ...	...	...	2,142·00	562·07	31·68	...	...	2,207·50	570·27	31·68
	1116 ...	Field's Find No. 2 South ...	...	...	...	...	...	...	...	160·50	20·77	...
	1115 ...	Rose Marie ...	...	...	108·00	70·21	...	...	...	1,656·00	762·59	...
		Voided leases and sundry claims	...	·91	192·00	24·91	...	5·77	393·70	43,374·55	28,946·59	...

Goodingnow	1144	...	Adeline	...	...	...	67.50	23.86	...	...	...	110.00	40.93	...
	1063	...	Ark	...	...	...	129.50	60.81	...	...	...	507.75	238.60	...
	1102	...	Astor	...	...	...	943.50	504.77	...	...	...	3,258.25	1,840.00	...
	1025	...	Carnation	...	...	...	1,307.75	525.31	...	...	...	11,561.30	8,573.41	...
	1049	...	Lake View	...	...	...	...	...	...	...	...	3,260.00	1,633.09	...
	1121	...	Lake View West	...	...	...	...	...	...	...	...	32.50	4.62	...
	1175	...	Marigold	...	...	...	921.00	425.78	...	...	...	921.00	425.78	...
	1169	...	Marraposa	...	...	...	120.50	37.39	...	...	...	249.00	126.97	...
	1090	...	Orchid	...	...	...	1,324.50	408.62	...	...	...	8,983.00	4,653.19	...
	1145	...	Oversight	...	...	...	229.35	57.79	...	...	...	416.10	137.59	...
	1085	...	Sweet William	2.97	695.00	230.43	...
				Voided leases and sundry claims	...	...	104.00	31.07	...	299.23	441.70	41,985.56	43,279.13	...
	Gullewa	(1096, etc.)	...	King Solomon's Mines, Ltd.	650.00	163.01	5,130.10	2,101.25	26.49
		1047	...	Mugga King	1,145.00	394.40	28.85	6,984.50	2,183.48	41.47
(1065)		...	Shenandoah	...	...	...	55.00	7.27	...	...	10.51	1,885.00	620.76	...
			Voided leases and sundry claims	...	...	...	196.50	34.56	...	...	171.23	27,850.25	17,155.67	...
Kirkalucka	...	do.	do.	do.	...	13.65	...	...	...	17.79	307.30	167.23	...	
Messenger's Patch	1010, 1011	...	Gnow's Nest leases	...	...	...	910.00	150.39	...	...	13.89	2,833.75	2,041.68	...
			Voided leases and sundry claims	...	...	...	25.50	6.86	...	463.12	655.78	38,401.11	26,837.24	1,083.01
Mt. Farmer	...	do.	do.	do.	...	63.15	13.61	...	...	...	520.65	183.14	...	
Mt. Gibson	...	do.	do.	do.	...	90.50	37.51	...	...	51.16	1,457.60	1,271.09	...	
Ninghan	...	do.	do.	do.	...	...	...	...	...	...	334.75	124.69	...	
Noongal	1137	...	City of Melbourne	...	...	...	364.00	96.15	...	...	...	1,658.50	783.62	...
	1168	...	Noongal	...	...	...	224.00	47.64	...	...	...	424.00	140.34	...
	953	...	Revival	...	...	...	663.50	76.38	...	...	...	3,356.75	1,247.83	...
			Voided leases and sundry claims	...	...	...	879.50	480.39	...	42.81	336.65	12,973.55	6,551.23	...
Nyounda	...	do.	do.	do.	...	2.48	96.25	29.68	...	241.60	985.75	348.51	...		
Pinyalling	...	do.	do.	do.	...	6.43	295.75	73.47	...	226.14	3,534.60	1,492.03	...		
Retaliation	1046	...	Alma May	...	...	...	...	...	...	...	...	1,108.25	481.85	...
			Voided leases and sundry claims	...	...	...	52.50	6.12	...	...	...	3,998.25	1,415.56	...
Rothsay	(1013, etc.)	...	Rothsay Gold Mines, N.L.	...	...	...	92.00	17.03	...	...	...	30,715.00	6,993.05	...
	(1013, etc.)	...	Prior to transfer to present holders	...	...	...	...	...	...	...	...	415.50	176.15	...
			Voided leases and sundry claims	...	...	...	230.50	64.32	...	...	...	15,476.25	6,044.28	...
Wadgingarra	...	do.	do.	do.	...	40.00	8.65	...	...	...	2,822.41	1,210.46	...	
Warda Warra	...	do.	do.	do.	...	...	...	...	...	...	11,694.25	6,231.91	...	
Warriedar	...	do.	do.	do.	...	36.00	5.76	...	...	2.84	22,400.35	6,493.98	7.30	
Yalgoo	...	do.	do.	do.	...	70.50	14.20	...	...	26.79	8,889.75	10,962.28	...	

TABLE I.—Production of Gold and Silver from all sources, etc.—continued.

YALGOO GOLDFIELD—continued.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1940.					TOTAL PRODUCTION.					
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	
			Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.	
Yuin	...	Voided leases and sundry claims	...	...	...	...	...	...	...	131·82	68,475·00	27,976·10	130·13
		<i>From Goldfield generally:—</i>											
		Sundry parcels treated at:											
		Revival Cyanide Plant	...	...	...	...	...	...	...	...	...	*574·60	...
		State Battery, Payne's Find	...	...	...	*145·41	...	...	...	...	38·50	*3,756·32	...
		State Battery, Warriedar	...	...	...	...	...	...	...	...	...	*6,227·55	...
		State Battery, Yalgoo	...	...	...	...	...	...	...	...	...	*881·67	...
		Shenandoah Cyanide Plant	...	...	...	...	...	...	...	...	...	*252·73	...
		Various Works	...	...	...	...	...	...	9·42	...	664·00	*2,131·66	26·67
		Reported by Banks and Gold Dealers	13·28	...	...	...	...	...	891·79	46·63	...	...	...
		Totals	13·66	58·10	14,703·25	5,031·25	60·53	1,713·42	2,814·40	408,192·35	244,680·62	1,350·05	

Mt. Margaret Goldfield.

MOUNT MORGANS DISTRICT.

Australia United	...	Voided leases and sundry claims	...	...	13·25	22·51	...	...	2,492·61	17,214·19	25,515·45	1·76
Eucalyptus	527F	Bar Twenty	...	...	63·50	61·63	...	...	...	63·50	61·63	...
		Voided leases and sundry claims	...	55·94	418·55	324·86	...	...	3,440·68	3,077·90	4,571·68	...
Linden	522F	Ailsa	...	...	68·00	16·78	...	...	...	194·00	97·95	...
	525F	Alawar	...	...	96·00	30·36	...	...	...	96·00	30·36	...
	528F	Blue Peter	...	...	19·00	6·92	...	...	...	19·00	6·92	...
	508F	Coronation	...	...	53·00	159·00	...	...	...	211·25	2,208·27	...
	524F	Cuckoo Hawke	...	...	77·00	41·46	...	...	...	77·00	41·46	...
	517F	Dunn's Reward	...	...	19·50	32·95	...	10·97	...	39·50	108·05	...
	494F	Local Lady	...	...	98·00	94·92	...	...	...	578·50	302·82	...
	521F	North Democrat	...	...	421·50	987·86	...	...	...	512·25	1,169·58	...
		Voided leases and sundry claims	...	...	1,111·50	571·80	...	127·10	732·51	72,873·16	53,765·68	·68
Mt. Margaret	526F	Uplift	...	...	125·00	22·32	...	...	...	125·00	22·32	...
	M.A. 12F	Mt. Margaret Mission Station	...	52·04	...	2·31	...	110·44	18·87	403·00	130·38	...
		Voided leases and sundry claims	...	2·62	515·25	91·88	...	25·59	102·12	10,392·74	5,906·50	12·55
Mt. Morgans	399F, etc.	Morgans Gold Mines, Ltd.	...	...	129·75	*5,764·78	...	...	...	503·55	*10,571·47	...
		Prior to transfer to present holders	...	...	...	...	...	...	16·66	779,578·43	354,225·86	5,552·63
	501F	V's United	...	...	...	...	...	...	...	68·75	28·44	...
		Voided leases and sundry claims	13·68	...	314·50	156·53	...	52·42	509·12	64,433·57	37,414·56	77·86
Murrin	395F	Arthur Rymer	...	...	...	...	...	...	8·42	3,826·25	736·22	...
	482F	Hill End	...	...	794·00	148·09	...	...	...	3,521·75	1,537·79	...
	(518F)	Vindicator	...	...	8·00	8·21	...	...	...	94·00	171·17	...
		Voided leases and sundry claims	...	...	439·00	225·77	...	61·58	736·31	135,091·70	105,651·93	29·60

Redcastle ...	523F ...	Try Again ...	...	291.25	45.06	...	...	...	291.25	45.06	...
		Voided leases and sundry claims	...	124.00	51.91	...	4.49	550.38	4,592.02	4,555.54	...		
Yundamindera ...	510F ...	Landed at Last ...	...	960.00	177.58	...	...	...	3,432.00	526.17	...
	509F ...	New Golden Treasure ...	2.97	125.00	49.47	...	...	22.83	765.00	289.13	...
	520F ...	Trouble ...	...	65.00	37.26	...	...	7.63	132.50	186.24	...
		Voided leases and sundry claims	...	83.50	23.98	...	3.01	338.99	78,439.70	52,805.78	5.82		
<i>From District generally:—</i>													
Sundry Parcels treated at:													
		Hill End Cyanide Plant ...	...	...	*155.79	...	...	...	...	*500.26	...
		State Battery, Linden ...	...	...	*434.90	...	...	9.16	263.29	*8,686.63	...
		Rymer's Cyanide Plant ...	...	...	*172.72	...	...	...	...	*1,145.71	...
		Various Works ...	...	...	...	...	...	...	1,257.81	*5,238.32	99.97
		Reported by Banks and Gold Dealers	37.98	31.87	...	...	2,721.61	101.65	10.30	56.69	...
Totals			...	103.70	93.40	6,433.05	9,919.61	...	3,106.24	9,098.91	1,182,178.86	678,312.02	5,780.87

MOUNT MALCOLM DISTRICT.

Cardinia ...	1769c ...	Black Chief ...	...	224.00	43.46	...	...	...	284.00	52.87	...
	1770c ...	Rangoon ...	...	1,270.00	129.90	...	...	...	2,214.00	232.09	...
		Voided leases and sundry claims	...	79.50	63.66	...	18.12	1,711.49	2,688.24	4,061.08	...
Diorite ...	1787c ...	Innit ...	100.42	60.00	11.08	...	...	100.42	60.00	11.08	...
	1786c ...	Puzzle ...	...	56.00	64.62	...	...	...	56.00	64.62	...
		Voided leases and sundry claims	60.74	523.25	309.04	...	11.21	1,126.14	39,006.58	36,233.76	24.05
Dodger's Well ...		do. do. do.	...	...	...	...	.95	86.22	2,813.55	2,840.75	...
Lake Darlot ...	(1772c) ...	Afrikander ...	...	30.00	9.33	...	...	...	448.00	86.78	...
	1784c ...	British King West ...	...	104.00	96.22	...	...	...	104.00	96.22	...
	1791c ...	Weebo North ...	...	94.00	19.20	...	...	...	94.00	19.20	...
		Voided leases and sundry claims	6.75	208.00	43.54	...	67.68	5,039.88	74,163.80	54,456.45	2.60
Leonora ...	(1777c) ...	Forrest ...	...	603.00	49.69	...	...	...	1,153.00	131.25	...
	1754c ...	Gold Blocks ...	...	192.00	45.13	3.35	...	...	959.00	441.39	3.35
	1594c ...	Leonora Central G.M. Co., N.L.	...	3,895.00	479.95	...	...	...	7,470.00	719.30	...
	1788c ...	Little Gwalia ...	...	85.00	2.31	...	...	...	85.00	2.31	...
	(1701c) ...	New Year Gift ...	...	40.00	1.41	...	...	...	124.50	9.30	...
	807c, etc.	Sons of Gwalia, Ltd.	...	138,162.00	44,511.99	3,695.77	...	...	4,635,177.67	1,956,237.56	134,910.16
		Prior to transfer to present holders	...	...	...	...	...	...	109,081.00	55,989.21	8.66
	1557c ...	Tower Hill ...	...	114.00	14.06	...	...	.58	329.55	96.85	...
		Voided leases and sundry claims	...	1,579.50	281.10	...	30.31	2,195.41	179,058.50	99,198.94	10.71
Malcolm ...		do. do. do.	...	138.00	40.19	...	5.75	80.46	66,876.00	50,149.67	...
Mertondale ...		do. do. do.	...	394.20	63.38	...	1.82	85.74	91,634.41	63,087.54	1,497.58
Mt. Clifford ...	1725c ...	Bannockburn ...	...	248.00	96.12	...	...	9.61	1,630.50	588.83	...
		Voided leases and sundry claims	58.67	306.60	147.38	...	53.98	1,965.39	12,209.66	19,119.28	...
Pig Well ...		do. do. do.	...	...	...	...	...	34.61	16,483.97	15,902.04	63.68
Randwick ...	1753c ...	Lady Doris ...	...	117.00	19.73	...	...	...	380.00	83.07	...
	(1760c) ...	Mighty Splash ...	...	220.00	111.40	...	...	...	1,470.00	832.66	...
		Voided leases and sundry claims	...	87.00	17.38	...	66.57	403.51	10,606.29	9,995.45	...
Webster's ...		do. do. do.	...	12.00	5.46	...	67.14	670.62	24,394.70	15,862.00	...

TABLE I.—Production of Gold and Silver from all sources, etc.—continued.

MT. MARGARET GOLDFIELD—continued.

MOUNT MALCOLM DISTRICT—continued.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1940.					TOTAL PRODUCTION.						
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.		
			Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.		
Wilson's Creek	Voided leases and sundry claims	...	...	...	...	...	...	...	...	...	...	...	...
Wilson's Patch	do. do. do.	...	...	13.50	6.18	...	4.68	149.95	30,383.26	14,421.55	1.05	...	...
		<i>From District generally:—</i>												
		Sundry parcels treated at:												
		Park & Hunt's Cyanide Plant ...	...	...	...	*97.54	...	...	...	...	*908.86	...	...	...
		Reefer Cyanide Plant ...	...	...	...	*233.31	...	...	...	...	*1,516.49	22.38	...	...
		State Battery Reserve, Darlot ...	...	...	...	*54.06	...	...	...	...	*54.06	...	...	...
		Various Works ...	...	...	...	...	...	...	...	789.50	*20,984.71	123.15	...	...
		Reported by Bank and Gold Dealers ...	...	...	...	...	...	...	3,312.66	226.35	9.50	41.57	...	...
		Totals ...	30.22	226.58	148,855.55	47,077.35	3,699.12	3,641.57	13,890.62	5,312,896.68	2,424,958.18	136,667.37	...	...

MOUNT MARGARET DISTRICT.

Burtville ...	2446T ...	Boomerang ...	...	...	50.50	807.32	...	...	...	50.50	807.32	...	...	...
	2138T ...	Nil Desperandum ...	...	...	30.50	57.02	...	...	5.30	1,289.62	2,860.96	...	...	...
	1940T ...	Nulli Secundus ...	...	...	383.00	130.57	...	...	...	666.75	280.54	...	...	...
	2412T ...	Sailor Prince ...	...	...	...	...	...	...	...	467.25	89.16	...	...	...
		Voided leases and sundry claims	...	75	52.50	101.22	...	4.94	622.07	74,800.84	109,431.18	275.27	...	...
Duketon ...	2436T ...	Acacia ...	...	...	60.00	19.50	...	...	...	60.00	19.50	...	...	...
	2401T ...	Famous Blue ...	...	...	92.00	20.75	...	...	...	92.00	20.75	...	...	...
	2449T ...	Mulga Queen ...	...	...	51.00	21.32	...	...	...	51.00	21.32	...	...	...
		Voided leases and sundry claims	...	43.32	550.90	430.58	2.53	3.54	3,547.77	33,220.12	23,836.86	29.76	...	...
Eagle's Nest ...	...	do. do. do.	...	...	...	...	...	11.45	601.44	1,460.50	1,536.74	...	...	...
Erlistoun ...	2141T ...	King of Creation G.Ms., Ltd. ...	...	...	...	...	...	...	...	6,358.00	1,288.92	11.00	...	...
		Prior to transfer to present holders	...	...	...	...	...	...	...	13,723.00	3,199.66	...	...	...
	2402T ...	Midas ...	...	...	36.75	16.11	...	...	...	543.00	278.11	...	...	...
	2411T ...	Victory ...	...	...	55.00	72.00	...	...	...	203.75	140.15	...	...	...
	2421T ...	Victory Extended ...	...	196.79	11.98	263.65	...	10.07	352.44	37.98	449.77	...	...	...
	2345T, etc. ...	Western Mining Corporation, Ltd. ...	...	...	19,116.00	9,200.49	630.75	...	...	78,483.00	60,183.86	3,233.60	...	...
	2345T ...	Prior to transfer to present holders	...	...	...	...	...	...	...	119.25	140.97	...	...	...
		Voided leases and sundry claims	...	7.77	207.75	115.78	...	1,181.65	176.86	33,912.51	22,533.69	...	...	...
Euro ...	...	do. do. do.	...	...	43.50	12.40	...	...	111.66	92,972.00	38,328.10	...	...	...
Laverton ...	2216T ...	Beria Main Lode ...	...	...	2,895.10	611.09	...	...	...	6,020.35	1,126.96	...	...	...
	2408T, etc. ...	Gladiator Gold Mines, Ltd. ...	...	...	27,788.00	7,794.98	...	...	...	55,585.00	15,055.50	...	...	...

	2454T	Golden Gordon ... ..	...	...	34.50	18.41	...	...	...	34.50	18.41	...
	2433T	Ida H Extended	8.30	...	...	...	...	8.30	...	18.50	8.78	...
	2229T	Ida H ... ..	...	...	133.50	180.62	...	...	...	287.50	206.57	...
	2229T, (2230T)	Ida H leases ... ..	...	...	...	...	...	...	...	2,683.75	379.62	...
	2221T, etc. ...	Lancefield (W.A.) Gold Mines, N.L. ...	...	...	49,179.00	11,690.13	366.20	...	...	558,440.00	161,621.29	366.20
		Prior to transfer to present holders	...	...	...	...	...	...	...	941,424.98	360,139.22	51,882.27
	2382T, etc. ...	Pinnacles leases ... ..	...	...	...	...	...	...	...	114.75	16.66	...
	2450T	South Lancefield Extended ... ..	...	...	286.50	64.89	...	...	...	286.50	64.89	...
	2447T	Waste of Time ... ..	...	...	62.25	84.88	...	...	...	62.25	84.88	...
	2443T	White Horse ... ..	...	...	54.50	65.37	...	...	...	85.00	94.37	...
		Voided leases and sundry claims	...	20.32	545.00	196.21	...	230.47	3,474.62	475,876.69	270,258.97	4,674.69
Mt. Barnicoat ...	2254T	Ulalla ... ..	...	...	...	86.56	...	...	...	392.50	92.44	...
		Voided leases and sundry claims	...	...	29.00	...	...	...	...	2,298.00	1,202.24	...
Mt. Shenton ...	...	do. do. do.	...	...	...	...	...	...	...	294.25	236.32	...
	<i>From District generally:—</i>											
	Sundry parcels treated at:											
		Craiggiemore Cyanide Works ... ..	...	...	...	...	...	...	...	...	*629.72	...
		G. E. Grey's Cyanide Plant ... ..	...	...	...	*318.40	...	...	...	...	*5,079.67	...
		Hootanui Battery ... ..	...	...	...	...	...	...	...	2.50	*36.60	...
		Mulga Queen Cyanide Plant ... ..	...	...	...	*28.97	...	...	...	...	*28.97	...
		Mary Mac Cyanide Plant ... ..	...	...	...	...	...	...	...	...	*1,688.26	...
		State Battery, Laverton ... ..	...	...	...	*65.44	...	...	...	97.50	*5,690.04	15.64
		Various Works ... ..	...	...	...	*3.36	...	...	...	157.00	*9,925.10	...
		Reported by Banks and Gold Dealers	37.82	2.34	...	...	...	2,451.91	98.84	...	12.06	...
		Totals	46.87	270.54	101,748.73	32,478.28	999.48	3,902.33	8,991.00	2,382,672.59	1,099,145.10	60,488.43

North Coolgardie Goldfield.

MENZIES DISTRICT.

Comet Vale ...	5590z	King of the Hills ... ..	...	...	...	...	...	...	...	...	7.08	...
	5591z	Post Town ... ..	...	...	...	...	...	...	...	21.00	4.88	...
	5217z	Sand Queen Gladstone Mines, N.L. ...	...	...	...	*425.18	...	...	...	42,096.75	14,550.58	6.45
		Prior to transfer to present holders	...	...	...	...	...	...	...	75,754.50	59,007.25	1,505.65
		Voided leases and sundry claims	...	...	28.00	6.17	...	...	459.93	150,248.88	120,234.93	3,839.28
Goongarrie ...	...	do. do. do.	...	2.33	31.75	119.55	...	47.40	3,308.90	29,562.06	20,467.20	...
Menzies ...	5703z	Aspacia ... ..	...	...	248.00	431.84	...	...	...	248.00	431.84	...
	5543z	Black Swan ... ..	...	...	111.50	128.54	...	...	...	876.63	999.80	9.08
	5704z	Coronation ... ..	...	...	97.00	41.39	...	...	...	97.00	41.39	...
	5694z	Dark Horse ... ..	...	...	38.00	106.06	...	...	...	72.50	277.25	...
	5511z, etc. ...	First Hit G.M. (1934), N.L. ... ..	...	...	8,065.00	5,570.13	1,496.42	...	...	37,531.20	27,088.57	4,909.13
		Prior to transfer to present holders	...	...	...	...	...	...	...	1,672.75	4,687.69	...
	5542z	Good Block lease ... ..	...	...	54.50	129.18	...	...	7.32	1,374.00	1,534.13	...
	(5696z)	Goodenough ... ..	...	...	28.00	9.89	...	...	...	53.00	23.93	...
	5549z	Lady Harriet ... ..	...	...	32.00	14.19	...	...	...	253.00	78.37	...
	(5689z)	Lady Harriet North ... ..	...	...	16.00	5.97	...	...	...	209.50	82.61	...
	5706z	Lady Shenton Gold Mines (1934), N.L.	...	...	113.34	42.40	...	...	...	24,422.49	13,268.74	2,223.96
	5705z	Maranoa ... ..	...	...	59.00	22.48	...	...	...	59.00	22.48	...
	5520z	Mignonette ... ..	...	...	...	...	...	...	...	168.50	209.47	...
	5697z	New Florence ... ..	...	...	71.00	32.90	...	...	...	146.50	82.60	...
	(5666z)	Spion Kopp ... ..	...	...	88.00	46.51	...	...	...	343.75	219.41	...
	5663z	Springfield ... ..	...	...	10.00	3.94	...	...	...	102.00	34.52	...
	5484z	Warrior ... ..	...	...	204.00	98.57	...	...	...	2,484.00	1,142.15	...
		Prior to transfer to present holder	...	...	...	...	...	...	...	...	285.96	132.77
	5531z	Woolgar Gold Mines, Ltd. ... ..	...	...	42.00	8.85	...	...	...	42.00	8.85	...
		Prior to transfer to present holders	...	...	...	...	...	...	...	151.50	174.25	...
		Voided leases and sundry claims	...	19.96	464.00	352.11	...	94.17	1,668.35	931,831.49	731,277.22	12,131.12

TABLE I.—Production of Gold and Silver from all sources, etc.—continued.

NORTH COOLGARDIE GOLDFIELD—continued.

MENZIES DISTRICT—continued.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1940.					TOTAL PRODUCTION.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.
Mt. Ida	5658z	Carida ... ..	...	...	4.00	20.48	...	...	...	277.95	361.69	...
	5668z	Federation ... ..	...	...	44.50	21.05	...	...	...	219.50	309.81	...
	5708z	Mighbee ... ..	...	...	13.25	52.12	...	...	...	13.25	52.12	...
	5551z, etc. ...	Mt. Ida Gold Mines, Ltd. ...	...	...	2,980.00	1,328.66	125.41	...	...	8,355.50	3,758.04	156.47
		Prior to transfer to present holders	...	...	...	...	...	...	...	1,512.75	737.95	...
	5707z	Quin Hill ... ..	...	...	303.00	70.08	...	...	...	303.00	70.08	...
	(5651z)	Temora ... ..	...	...	242.50	31.06	...	...	...	1,350.25	399.73	...
	Voided leases and sundry claims	...	1.52	1,046.83	491.72	.12	48.14	144.89	80,710.88	78,636.55	106.75	
Twin Hills ... ..	...	do. do. do.	...	...	...	...	...	...	612.60	632.76	...	
	<i>From District generally:—</i>											
	Sundry parcels treated at:											
		Blaxell's Cyanide Plant ... ..	...	...	...	*141.27	23.89	...	...	...	*141.27	23.89
		Gold Tailings, Ltd.'s, Cyanide Plant ... ..	...	...	...	*187.87	5.33	...	...	...	*187.87	5.33
		Lady Harriet Cyanide Plant ... ..	...	...	...	*1,170.84	...	...	...	279.50	*13,329.67	30.00
		Menzies Consolidated Cyanide Plant ... ..	...	...	...	*303.34	...	...	...	...	*2,241.76	...
		Teasdale's Cyanide Plant ... ..	...	...	...	*23.92	...	...	...	...	*23.92	...
		Mt. Ida State Battery ... ..	...	...	...	...	...	...	...	1,866.25	5,370.61	...
		Various Works ... ..	...	...	...	...	...	...	...	2,512.30	*33,988.69	1,813.40
		Reported by Banks and Gold Dealers	9.59	.21	...	...	...	1,369.52	379.06	35.00	7.72	...
		Totals	9.59	24.02	14,435.17	11,438.26	1,651.17	1,559.23	5,968.45	1,398,156.69	1,136,340.20	26,760.51

ULARRING DISTRICT.

Davyhurst	1051v	Golden Pole ... ..	...	...	...	...	...	...	...	741.09	242.21	...
	(1098v)	Golden Rod ... ..	...	...	25.00	4.99	...	...	...	201.00	59.67	...
	1102v	Lights of Israel ... ..	...	...	...	...	...	...	...	100.00	40.82	...
	1077v	Makai ... ..	...	...	380.00	65.91	...	...	...	1,660.00	493.11	...
	1016v	New Callion ... ..	...	...	1,582.00	515.81	...	...	...	5,293.30	1,926.98	119.67
	1033v	Waihi ... ..	...	...	21.75	6.86	...	...	...	174.25	50.99	5.33
		Voided leases and sundry claims	...	...	527.00	115.82	...	2.93	182.40	170,462.17	129,260.91	5,403.14
Morley's	1101v	Emerald ... ..	...	...	46.00	93.22	...	...	...	102.00	178.41	...
	1094v	First Hit ... ..	...	...	59.75	512.07	...	...	...	197.75	939.73	...
	1108v	Golden Cockatoo ... ..	...	...	13.00	18.13	...	...	...	13.00	18.13	...
	(1088v)	Golden Cockatoo ... ..	...	7.32	...	...	...	...	29.31	4.00	75.22	...
	1109v	Hilltop ... ..	...	...	92.00	80.72	...	...	...	92.00	80.72	...
	1081v	Mabel Gertrude ... ..	...	...	98.00	119.10	...	...	...	244.00	291.77	...
	(1080v)	Morning Glory ... ..	...	...	17.00	38.14	...	...	10.50	102.50	283.09	...

	1089v ...	Paramount ...	...	...	204·00	244·47	...	...	...	566·50	705·60	...
	1078v ...	Rabbit ...	...	234·73	6·00	48·11	...	...	265·66	155·50	440·48	...
	1074v ...	Two Chinamen ...	...	320·33	249·00	604·89	...	...	3,396·73	704·50	2,643·91	...
		Voided leases and sundry claims	...	10·01	58·00	32·94	...	2·16	999·94	1,257·75	2,268·81	...	
Mulline ...	1107v ...	Ajax West ...	...	...	78·50	163·66	...	...	...	149·25	339·04	...
	1079v ...	Larne Pride ...	...	...	110·00	158·35	...	...	...	519·00	316·74	...
	1068v, etc.	Riverina Gold Mines, Ltd. ...	...	...	...	...	...	...	...	32,058·00	11,662·42	...
		Voided leases and sundry claims	...	...	592·00	288·82	...	...	446·70	112,062·11	111,123·36	531·44
Mulwarrie ...	1084v ...	Oakley ...	...	...	194·00	130·71	...	...	...	460·00	345·30	...
		Voided leases and sundry claims	...	35·64	32·00	26·60	...	...	423·61	21,768·01	28,449·76	38·47
Ularring ...	(1083v)	Red Leaf ...	...	...	...	*14·10	...	...	...	342·00	259·79	...
		Voided leases and sundry claims	...	...	20·00	8·54	...	...	563·34	10,101·10	13,957·45	...
<i>From District generally:—</i>													
Sundry parcels treated at:													
		State Battery, Mulline ...	...	...	...	*230·63	...	...	...	639·99	*16,386·80	...
		State Battery, Mulwarrie ...	...	...	...	*21·04	...	...	...	613·18	*6,366·37	...
		Waihi-Golden Pole Cyanide Plant ...	...	...	...	*535·73	...	...	...	...	*837·31	...
		Golden Pole Cyanide Plant ...	...	...	...	...	...	...	...	...	*3,585·82	...
		Waihi Cyanide Plant ...	...	...	...	...	...	...	...	...	*1,446·42	...
		Young Australia Cyanide Plant ...	...	...	10·00	*73·49	...	...	...	10·00	*254·19	...
		Various Works ...	...	...	...	...	...	...	15·82	205·15	816·79	...
		Reported by Banks and Gold Dealers ...	...	·45	3·49	...	...	97·21	61·09	100·00	22·67	...
		Totals	·45	611·52	4,415·00	4,152·85	...	102·30	6,395·10	361,099·10	336,170·79	6,098·05

NIAGARA DISTRICT.

Desdemona ...		Voided leases and sundry claims	...	...	210·00	22·20	...	...	16·11	11,939·45	8,436·52	12·04
Kookynie ...	911g ...	Cosmopolitan South ...	...	...	135·00	103·26	...	...	...	135·00	103·26	...
	908g ...	Lucky Dollar ...	...	...	95·00	15·12	...	...	...	95·00	15·12	...
	810g, 811g ...	Two D's leases ...	...	...	320·00	67·02	...	...	...	2,250·00	976·66	...
		Voided leases and sundry claims	...	...	316·50	97·01	...	60·09	447·14	748,651·01	398,589·11	5,375·97
Niagara ...	906g ...	Batavia ...	...	...	45·00	8·11	...	...	...	45·00	8·11	...
	910g ...	May ...	...	...	99·50	19·41	...	...	...	99·50	19·41	...
	909g ...	Nell ...	...	...	183·00	51·72	...	...	...	183·00	51·72	...
		Voided leases and sundry claims	...	...	209·00	66·67	...	28·10	201·76	98,584·66	59,833·08	...
Tampa ...	902g ...	Grafter ...	...	...	10·00	3·43	...	...	...	10·00	3·43	...
		Voided leases and sundry claims	...	·84	623·00	113·13	...	32·60	322·60	57,715·90	27,049·47	174·24	
<i>From District generally:—</i>													
Sundry parcels treated at:													
		Grafter Battery ...	...	...	...	*89·27	...	...	...	...	*99·76	...
		Owen & Party's Cyanide Plant ...	...	...	...	*141·05	...	...	...	...	*191·96	...
		Various Works ...	...	...	...	...	...	...	...	1,220·50	*15,930·32	41·17
		Reported by Banks and Gold Dealers ...	...	2·31	...	...	...	1,580·97	823·66	...	63·53	...
		Totals	2·31	·84	2,246·00	797·40	...	1,701·76	1,811·27	920,929·02	511,371·46	5,603·42

TABLE I.—Production of Gold and Silver from all sources, etc.—continued.

NORTH COOLGARDIE GOLDFIELD—continued.

YERILLA DISTRICT.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1940.					TOTAL PRODUCTION.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.
Edjudina	1122R	Paget Gold Mines of Edjudina, Ltd. ... Prior to transfer to present holders Voided leases and sundry claims	...	...	...	...	...	...	...	841.50	187.51	...
			...	...	...	...	...	...	...	738.75	559.80	...
			...	...	196.00	92.58	...	...	45.33	40,660.28	47,336.46	37.79
Patricia	1080R, 1081R	Kimberley Oil Options, N.L. Voided leases and sundry claims	...	...	40.00	138.01	...	...	...	4,115.25	5,383.55	25.40
			...	...	...	...	...	...	...	78.25	30.61	...
Pingin	(1206R)	Ajax Voided leases and sundry claims	...	...	307.00	35.68	...	...	...	2,632.50	369.37	...
			...	...	89.50	31.68	...	...	203.20	20,366.39	13,782.70	...
Yarri	(1189R)	East West Gold Reefs ... ..	...	...	14.50	4.75	...	...	...	334.25	186.00	...
	1126R	(Edjudina Gold Mining Co., N.L.) ... Prior to transfer to present holders	...	...	...	844.11	48.44	...	...	30,220.00	5,177.26	496.96
	1211R	Margaret ... ..	...	...	237.25	61.99	...	...	...	124.50	38.89	...
	1216R	Wallaby ... ..	...	...	12.50	3.83	...	...	...	237.25	61.99	...
	1210R	Wallaby Central Voided leases and sundry claims	...	...	524.00	84.38	...	...	...	12.50	3.83	...
			...	...	877.20	222.72	...	7.17	92.88	54,724.05	25,511.01	2.00
Yerilla ... ..	...	do. do. do.	...	...	...	...	...	19.30	3,138.05	18,843.51	14,243.38	13.93
Yilgangie	1212R	Melody Mine ... ..	...	...	72.00	52.67	...	...	...	72.00	52.67	...
	1194R	Yilgangie King ... ..	...	...	113.00	68.96	...	...	...	422.25	273.08	...
	1176R	Yilgangie Queen Voided leases and sundry claims	...	...	254.00	160.18	...	...	...	1,172.75	1,777.61	...
			...	...	425.00	189.34	...	121.67	97.52	3,270.80	2,095.94	...
		<i>From District generally:—</i>										
		Sundry Parcels treated at:										
		Yarri State Battery ... ..	...	...	...	*182.29	...	...	...	271.50	*6,993.68	3.50
		Yerilla State Battery ... ..	...	...	...	*43.52	...	...	...	...	*43.52	...
		Various Works ... ..	...	...	...	...	...	2.17	...	642.25	*6,049.24	...
		Reported by Banks and Gold Dealers	5.09	...	...	...	...	1,158.79	160.08	...	1.56	...
		Totals	5.09	...	3,161.95	2,216.69	48.44	1,309.10	3,737.91	180,508.53	130,311.69	579.58

Broad Arrow Goldfield.

Bardoc	2102w	Despatch ... ..	...	...	37.00	19.27	...	...	...	414.50	137.55	...
	2198w	Ellen Pearce ... ..	...	...	314.25	272.14	...	...	...	314.25	272.14	...
	2171w	Eureka ... ..	...	...	24.00	7.51	...	...	...	54.00	35.51	...
	(2183w)	Nathan ... ..	...	...	15.50	2.70	...	...	...	30.50	58.60	...
	2200w	Two Up ... ..	...	...	108.00	30.41	...	...	...	108.00	30.41	...

	2079w ...	Wycheproof ...			580.00	219.65			12.02	2,408.00	952.17	
	2199w ...	Zorastrian ...			624.00	76.30				624.00	76.30	
		Voided leases and sundry claims		7.23	1,969.28	576.15		54.95	3,499.63	93,056.12	60,489.52	203.60
Black Flag	2190w ...	Bell Bird ...		1.55	46.25	11.39			1.55	75.00	15.46	
	2149w ...	Carbine Gold Mines, N.L. ...			3,001.00	1,112.70				3,001.00	1,112.70	
		Prior to transfer to present holders			661.25	497.15				1,507.00	1,160.87	
	2128w ...	King Edward ...			15.00	13.01			1.22	77.25	60.29	
	2204w ...	Rocky Bluff ...			18.00	9.63				18.00	9.63	
		Voided leases and sundry claims			193.75	115.08		740.73	616.09	49,304.25	29,539.27	
Broad Arrow	2126w ...	Bulletin Extended ...		1.22	70.00	4.83			1.22	325.00	36.76	
	2039w ...	Golden Arrow ...			464.50	102.58				3,635.50	496.76	
	2202w ...	Golden Crown ...			21.00	4.18				21.00	4.18	
	(2184w)	Golden Crown ...			20.00	6.86				80.00	40.28	
	1955w ...	Grace Darling ...		1.67	522.00	238.02			1.67	2,592.75	1,877.80	
	2148w ...	Lady-Betty ...			88.00	18.99				280.80	52.03	
	2174w ...	Mona ...			6.50	18.53			28.33	42.50	109.57	
	(2165w)	Monte Carlo ...			88.00	64.56				360.00	249.99	
	1771w ...	North Duke ...							1,533.79	192.80	628.42	
	1933w ...	Oversight Tara United ...			260.00	41.90			1,144.69	661.54	877.41	
	2201w ...	Tom Cat ...			17.00	25.94				17.00	25.94	
	2187w ...	West Duke ...			27.75	25.48				42.75	42.26	
		Voided leases and sundry claims	7.93	72.06	2,103.00	714.24	.11	1,076.14	9,820.68	164,636.74	124,976.02	20.34
Canegrass		do. do. do.							255.32	1,346.02	951.12	
Carnage		do. do. do.			15.25	5.83		176.04	665.74	4,162.83	3,028.43	
Cashman's	2189w ...	Lady Evelyn ...			16.25	16.39			19.15	16.25	16.39	
		Voided leases and sundry claims			46.25	11.05		67.51	834.16	9,130.92	7,383.62	
Christmas Reef	(2167w)	High Rock ...			44.75	8.96			29.39	44.75	8.96	
	(2194w)	Magpie ...			22.25	4.27				22.25	4.27	
	2175w ...	New Mexico ...			43.25	82.06				87.25	116.70	
		Voided leases and sundry claims			177.25	29.39			270.50	3,106.61	2,333.65	
Fenbark	(2186w)	Fenbark ...			358.00	51.14				408.00	57.24	
	2188w ...	Golden Penny ...			834.00	92.07				1,219.00	123.61	
		Voided leases and sundry claims			52.50	11.35			53.07	4,928.02	2,713.69	
Grant's Patch	1962w, etc.	Ora Banda Amalgamated Mines, N.L. ...			23,775.00	8,330.00				91,148.00	40,642.88	175.00
		Prior to transfer to present holders								12,424.50	9,540.07	
		Voided leases and sundry claims			399.50	203.07			594.12	18,437.39	6,511.13	
Ora Banda	1336w ...	Associated Northern Ora Banda, N.L. ...								2,727.50	406.53	4.87
		Prior to transfer to present holders								315,958.95	123,252.22	1,664.70
	1943w, etc.	Ora Banda United Mines, Ltd. ...								2,182.25	74.80	
		Prior to transfer to present holders								76,612.22	14,630.93	
		Voided leases and sundry claims			910.10	249.21			990.02	35,313.85	16,249.46	
Paddington	2122w ...	George and Mary ...			120.00	16.08				903.40	151.21	
	(2192w)	Blue Duck ...			60.00	3.75				60.00	3.75	
	(2182w)	Koala ...			35.00	1.92				393.50	39.38	
	2196w ...	Little Nugget ...			126.00	68.54				126.00	68.54	
	2114w ...	Lone Oak ...			63.00	46.68		8.58		309.50	241.67	
	2105w ...	Minnie Palmer ...			1,016.50	86.05				6,490.50	428.23	
	2170w ...	Mt. Corlac ...		14.50	538.50	98.67			29.10	932.00	240.08	
		Voided leases and sundry claims			252.50	127.34		7,271.88	706.45	191,553.89	91,294.04	18.96

TABLE I.—Production of Gold and Silver from all sources, etc.—continued.

BROAD ARROW GOLDFIELD—continued.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1940.					TOTAL PRODUCTION.									
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.					
			Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.					
Riche's Find	2129w	Western Mining Corporation, Ltd. Prior to transfer to present holders Voided leases and sundry claims	...	...	762.25	225.02	1.40	...	...	6,733.25	4,263.73	71.36	
			...	...	...	...	...	...	...	328.75	640.11	...
			...	1.37	146.80	102.33	...	...	142.13	1,366.64	1,853.46	...			
Siberia	2197w	Only Hope Voided leases and sundry claims	...	...	337.75	33.39	...	...	...	337.75	33.39	...
			...	31.30	426.25	86.33	...	290.13	3,750.61	47,784.26	43,575.36	...					
Smithfield	2193w (2139w)	King of Kings Mountain Maid Voided leases and sundry claims	...	...	130.25	42.40	...	...	...	130.25	42.40	...
			...	...	311.00	106.05	...	...	...	1,041.21	368.69	...
			...	5.12	336.00	95.17	...	...	103.20	3,247.34	1,072.18	...			
<i>From Goldfield generally:—</i>																	
Sundry parcels treated at:																	
		Brealey's Cyanide Plant	...	...	...	*876.37	474.07	...	...	...	*876.37	474.07
		Black Flag Cyanide Plant	...	...	...	...	...	...	...	20.00	*2,143.63	...
		Bulletin Cyanide Plant	...	...	...	*148.93	...	...	...	...	*180.69	...
		Golden Arrow Cyanide Plant	...	...	...	*488.37	...	...	...	...	*1,623.17	...
		Minnie Palmer Cyanide Plant	...	...	...	*479.73	...	...	...	...	*1,707.13	...
		Pearce's Cyanide Plant	...	...	...	*245.16	...	...	...	...	*1,465.87	...
		State Battery, Ora Banda	...	...	25.00	*422.73	...	...	...	105.05	*13,681.53	...
		Zoroastrian Cyanide Plant	...	...	...	*7.26	...	...	...	...	*7.26	...
		Various Works	...	...	...	...	...	2,275.66	1.24	16,854.02	*39,640.63	1,875.77
		Reported by Banks and Gold Dealers	...	...	...	...	...	9,759.58	96.95	57.43	84.54	...
		Totals	76.85	136.13	42,876.18	17,177.26	475.58	21,721.20	25,202.04	1,181,931.55	657,140.58	4,508.67

North-East Coolgardie Goldfield.

KANOWNA DISTRICT.

Gindalbie	1540x (1536x)	Lady Betty Melton Voided leases and sundry claims	...	239.20	60.75	212.11	...	...	239.20	60.75	212.11	...
			...	...	...	1.37	...	...	...	464.50	74.15	...
			...	2.14	121.25	47.22	...	...	733.86	48,068.05	42,072.05	38.31
Gordon	1532x	Sirdar Voided leases and sundry claims	...	...	682.00	1,092.66	...	...	...	1,884.25	1,878.71	...
			...	...	224.50	42.36	...	...	767.26	50,565.73	17,681.68	...
Kalpini	...	do. do. do.	...	...	41.75	28.86	...	24.70	288.40	14,821.50	7,668.67	.07
Kanowna	...	do. do. do.	1.03	6.78	1,713.75	318.19	...	120.69	6,634.71	707,705.62	390,920.45	2,483.74
Mulgarrie	...	do. do. do.	...	...	...	...	...	...	1,233.41	8,164.01	4,829.38	...

Six Mile ... ..	...	do.	do.	do.	...	...	118·50	20·06	...	...	1,649·77	1,213·75	981·26	...
<i>From District generally:—</i>																
Sundry parcels treated at:																
								* 17·84						*2,125·92	...	
								*126·10						*974·76	...	
														*49·53	...	
								*41·75						*41·75	...	
										330·42	867·52	158,919·05	*149,600·38	...		
										105,726·09	34·55	·50	97·44	...		
							138·18	...	...	...	...	...	...	...
							Totals	...	...	...	...	...	...	...
							139·21	248·12	2,962·50	1,948·52	...	106,201·90	12,448·68	991,867·71	619,208·24	2,522·12

KURNALPI DISTRICT.

Jubilee ... ..	...	Voided leases and sundry claims	...	...	41·75	14·30	...	25·57	158·65	3,332·25	1,973·56	...	
Kurnalpi ... ..	...	do.	do.	do.	14·25	5·62	15·75	9·69	688·79	3,701·79	8,243·12	5,928·92	6·27		
Mulgabbie	450k	Ernbill ... ..	...	...	...	8·00	5·19	...	...	263·48	64·00	206·83	...
		Voided leases and sundry claims	1·56	95·75	110·00	85·00	...	8·06	3,564·95	1,194·20	9,695·63	4·95				
<i>From District generally:—</i>																
Sundry parcels treated at:																
								*·64			45·00	*195·48	...			
											56·50	*193·15	...			
										12,068·25	67·53	2·35	...			
							22·95	...	...	...	...	...	...
							Totals	...	...	...	...	...	...
							38·76	101·37	175·50	114·82	...	12,790·67	7,756·40	12,935·07	18,195·92	11·22

East Coolgardie Goldfield.

EAST COOLGARDIE DISTRICT

Binduli	5917E	Belle of Kalgoorlie	23·00	2·76	23·00	2·76	...
		Voided leases and sundry claims	...	...	169·75	27·39	...	...	13·01	4,670·37	1,599·57	...
Boorara	5486E	Olympian ... ..	...	...	95·25	56·32	...	...	...	717·25	542·28	...
		Voided leases and sundry claims	...	5·05	148·27	60·56	...	·49	553·77	309,446·16	173,181·09	408·36	
Boulder	5862E	Albert Adventure ... ..	...	...	226·25	35·11	...	...	...	1,265·00	245·88	...
	5630E	Argennum ... ..	...	...	96·50	22·44	...	...	...	245·50	51·83	...
	5540E, etc.	B.A.N.Z. Mines, Limited ... ..	...	...	183·00	51·86	...	...	...	491·25	172·73	...
	5465E	Birthday Gift ... ..	...	...	349·25	59·42	...	...	...	5,050·39	1,345·58	...
	5690E	Boulder Perseverance, Ltd. ... ..	...	...	111,995·97	36,102·78	13,915·41	...	...	1,351,052·18	642,912·65	177,798·89
		Prior to transfer to present holders	...	...	...	...	...	...	...	3,306,942·88	1,841,159·00	203,821·43
	5472E	Golden Key ... ..	...	·41	12·25	2·98	...	18·27	19·72	309·00	123·17	...
	5692E, etc.	Gold Mines of Kalgoorlie, Ltd. ... ..	...	...	140,482·75	44,277·68	16,099·22	...	...	406,068·86	150,333·84	51,499·02
		Prior to transfer to present holders	...	...	...	...	...	...	545·23	527,790·53	568,643·05	4,844·50
	5696E (9E), etc.	Great Boulder Proprietary G.Ms., Ltd. ... ..	...	...	417,298·14	97,141·04	49,634·07	...	1·53	6,208,604·97	4,325,118·99	647,925·72
	5845E	Happy Returns ... ..	...	...	...	...	...	...	...	135·00	42·44	...
	5345E, etc.	Kalgoorlie Enterprise Mines, Ltd. ... ..	...	...	66,423·70	20,953·07	2,845·73	...	...	173,273·48	55,788·93	6,082·00
		Prior to transfer to present holders	...	...	...	...	...	...	...	15,320·68	8,957·01	...
	5708E (15E), etc.	Lake View and Star Limited ... ..	...	...	591,670·75	165,893·98	11,672·15	...	...	4,940,665·30	1,746,014·50	106,838·50
		Prior to transfer to present holders	...	...	...	...	...	...	8·49	15,792,500·38	9,149,223·80	1,348,055·82
	5159E	Lake View South (G.M.K.) Ltd. ... ..	...	...	10,545·00	3,773·11	...	...	...	35,413·38	13,766·67	...
	5700E (22E), etc.	North Kalgurli (1912), Ltd. ... ..	...	70·85	135,957·49	45,673·78	21,753·39	...	111·55	1,089,221·53	406,715·33	81,438·86

TABLE I.—Production of Gold and Silver from all sources, etc.—continued.

EAST COOLGARDIE GOLDFIELD—continued.

EAST COOLGARDIE DISTRICT—continued.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1940.					TOTAL PRODUCTION.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.
Boulder— <i>continued</i>	5700E (22E), etc.	North Kalgurli (1912), Ltd., Croesus Pty. Group	...	51·20	17,221·00	3,064·98	...	...	51·20	17,221·00	3,064·98	...
	5891E ...	(New Croesus) ...	...	...	95·50	19·39	...	...	...	193·00	48·74	...
	5700E (22E), etc.	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.	...	...	9·75	1·56	...	...	...	4,661·51	928·18	232·93
		Prior to transfer to present holders	...	...	...	...	...	...	...	131·74	76·74	...
	5539E ...	Oroya East ...	...	...	123·25	20·57	...	...	...	681·75	89·12	...
	5853E ...	Paringa Junction ...	...	...	155·75	12·29	...	...	...	174·75	22·61	...
	5854E ...	Paringa Junction, North ...	...	...	25·50	2·51	...	...	...	60·50	10·64	...
	5855E ...	Paringa Junction South ...	...	...	1,087·50	147·88	...	...	...	1,676·00	242·24	...
	5456E, etc.	Paringa Mining & Exploration Co. Ltd.	...	...	92,000·00	21,205·61	966·00	...	...	234,377·06	59,754·62	2,880·31
	5556E ...	(Brown Hill Extended) ...	...	...	86·00	9·05	...	...	...	638·00	74·44	...
	5716E ...	(Two B's) ...	...	...	10·75	2·27	...	...	...	645·52	180·88	...
	5456E, etc.	Prior to transfer to present holders	...	...	...	...	...	...	...	52,670·76	23,503·73	...
	5808E, etc.	South Kalgurli Consolidated Ltd.	...	...	84,380·00	22,894·05	...	...	...	2,057,841·25	858,800·33	15,071·52
		Prior to transfer to present holders	...	...	...	...	...	...	...	1,344,254·70	531,792·77	17,722·97
	5466E ...	South Star ...	...	60·45	862·25	393·33	...	...	110·05	2,239·18	970·57	...
		Prior to transfer to present holders	...	...	...	...	...	...	...	5·22	1,835·75	748·78
		Voided leases and sundry claims	...	...	18·75	4·02	...	134·48	12,199·55	631,525·33	476,546·53	6·83
Cutter's Luck ...	...	Sundry claims ...	7·67	235·49	27·75	65·53	...	7·67	355·94	677·90	300·78	...
Feysville ...	...	Voided leases and sundry claims	...	28·05	146·09	41·69	...	...	292·18	1,577·15	990·22	...
Hampton Plains	P.P.L. 9 ...	Celebration G.M. Co., N.L.	...	...	...	...	...	...	...	61,399·75	15,206·00	...
	P.P.L. 86 ...	Golden Hope, N.L.	...	...	...	...	...	...	...	5,964·00	2,006·14	...
	P.P.L. 1 ...	Consolidated Gold Areas	...	...	34,377·40	7,314·52	624·46	...	...	78,624·93	22,307·26	1,263·26
	P.P.L. 252 ...	Mount Martin ...	...	...	...	...	...	...	...	14,953·75	5,574·11	...
	P.P.L. 279 ...	Mutooroo ...	...	...	596·36	176·18	...	...	...	6,151·88	1,087·26	...
	P.P.L. 277 ...	New Hope ...	...	...	6,166·30	969·18	...	...	...	46,263·55	9,031·06	...
	P.P.L. 81 ...	Villers Brettaneaux ...	...	...	2,803·84	1,191·16	...	...	...	3,562·02	1,435·55	...
		Voided leases and sundry claims	...	...	834·25	120·73	...	4,568·30	234·83	94,020·85	29,021·03	69·60
Kalgoorlie ...	5735E ...	" Bonnie Lass " ...	...	...	...	...	...	...	...	167·00	47·53	...
	5449E, etc.	Broken Hill Proprietary Co. Ltd.	...	...	40,018·00	16,828·46	...	...	3·99	192,236·01	82,648·83	1,843·28
		Prior to transfer to present holders	...	...	...	...	...	...	...	1,027·75	166·81	...
	5531E ...	Cassidy's Hill ...	...	...	...	...	...	...	...	243·50	135·04	...
	5564E, etc.	Charity leases ...	...	...	...	...	...	...	...	127·75	26·23	...
	5867E ...	Concord ...	...	5·06	135·00	31·89	...	...	5·06	153·00	36·99	...
	5839E ...	Coronation ...	...	...	...	...	...	...	...	40·00	9·03	...
	5913E ...	Devon Consuls ...	...	5·11	404·83	124·01	...	...	5·11	404·83	124·01	...
	5510E ...	Golden Dream ...	...	...	...	...	...	...	...	361·74	103·34	...
	5737E ...	Golden Mile Channel ...	...	...	437·75	42·51	...	...	...	2,431·00	193·69	...

(5512E) ...	Golden Mile North ...	...	19.50	1.87	...	...	...	522.00	100.38	...
(5903E) ...	Golden Pheasant ...	...	35.00	9.86	...	...	...	84.25	17.18	...
4548E, etc. ...	(Hannans Hill Amalgamated, Ltd.) ...	...	...	...	...	...	...	766.75	211.31	...
	Prior to transfer to present holders	...	...	...	...	...	5.72	47,525.85	13,719.48	...
5519E ...	Hannan's Enterprise ...	...	...	...	...	...	...	362.00	79.80	...
5665E ...	Jolly Bill ...	...	...	...	...	...	...	35.50	3.64	...
5878E ...	Lady May ...	...	449.25	66.98	...	...	...	633.25	98.59	...
5549E ...	Maritana Hill ...	...	...	...	...	...	...	381.50	42.12	...
5437E ...	North End Extended ...	20.26	12.50	10.42	...	...	484.45	209.30	328.49	...
5852E ...	Pedestal ...	...	373.75	65.18	...	...	...	1,209.75	362.02	...
5468E ...	Phar Lap ...	...	...	...	...	...	...	352.25	294.15	...
5415E ...	Return ...	...	110.75	7.61	...	...	5.64	3,298.50	484.87	...
	Voided leases and sundry claims	1.63	736.95	95.50	...	474.89	10,432.89	1,019,968.29	419,623.86	44,017.12	
Wombola ...	Big Bull ...	...	388.50	346.43	...	...	...	796.83	1,352.39	...
	Caledonian ...	...	502.25	553.18	...	...	...	1,572.50	1,269.45	...
	Daisy ...	...	647.00	263.95	...	...	...	2,419.00	2,618.87	...
	Everly ...	...	...	...	...	...	...	23.00	6.66	...
	Hammer & Drill ...	...	147.50	18.12	...	...	...	147.50	18.12	...
	Haoma ...	...	934.00	454.35	...	...	...	2,520.25	2,078.30	...
	Happy-go-Lucky ...	...	200.25	114.80	...	...	...	967.00	735.74	...
	Inverness ...	...	147.50	28.50	...	...	...	545.75	149.74	...
	Jersey ...	...	7.00	2.00	...	...	...	7.00	2.00	...
	Lady Dorothea ...	12	313.25	111.75	...	...	12	830.05	251.05	...
	Launa Doone ...	...	22.00	15.85	...	...	...	22.00	15.85	...
	Loganberry ...	3.13	170.50	52.87	...	...	3.13	170.50	52.87	...
	Lurgan ...	69	74.75	64.34	...	...	69	525.00	272.70	...
	Maranoa ...	...	388.75	182.39	...	...	7.23	1,541.00	699.69	...
	New Milano, No Liability	...	2,204.00	2,757.07	31.34	...	...	2,204.00	2,757.07	31.34
	(Milano)	...	721.00	1,971.56	...	...	...	4,012.75	11,676.72	...
	(Leslie)	...	...	...	...	...	...	602.00	939.10	...
	M.L.S.	...	107.50	41.68	...	...	...	1,381.50	762.05	...
	Pauline ...	...	97.25	50.76	...	...	...	198.25	237.61	...
	Pericles G.M., Ltd.	...	228.00	52.17	...	...	358.11	4,681.03	19,303.16	...
	Rainbow ...	...	224.00	30.36	...	...	...	224.00	30.36	...
	Reggio ...	...	334.75	38.00	...	...	...	925.00	284.10	...
	Tangney ...	...	12.00	4.46	...	...	...	12.00	4.46	...
	Transvaal ...	...	24.00	3.90	...	...	...	193.75	64.54	...
	Twenty Grand ...	...	88.00	20.66	...	...	...	578.75	380.29	...
	Wombola ...	...	23.50	5.27	...	...	...	43.50	18.56	...
	Xmas Flat ...	...	...	...	...	...	...	330.25	264.74	...
	Voided leases and sundry claims	4.19	1,612.00	459.34	...	...	2,283.77	31,441.31	26,685.67	...
<i>From District generally:—</i>											
	Sundry claims	...	...	...	...	11,014.57	465.61	5,440.46	2,541.10	...
	Sundry parcels treated at:	...	...	...	...	...	...	10.50	*31.43	...
	Cavalier's Treatment Works	...	10.50	4.76	...	...	...	...	*1,538.16	1,507.65
	Prior to transfer to present holders	...	...	...	...	...	...	...	*203,547.82	129,197.23
	Golden Horseshoe (New), Limited	...	...	*26,349.99	32,463.26	...	...	...	*813.57	...
	Mt. Monger Cyanide Plant	...	...	*4.45	...	...	...	14.00	*2,251.20	2.00
	New Kalgoorlie, N.L., Cyanide Plant	...	...	*339.56	...	...	...	375.50	*520.01	...
	Pericles Cyanide Plant	...	...	*295.02	...	...	...	...	*149.38	...
	Polkinghorne's Cyanide Plant	...	...	*1.66	...	...	...	...	184.95	*16,757.42
	Kalgoorlie State Battery	...	64.35	*1,611.69	...	...	...	...	*260,631.31	12,604.81
	Various Works	...	...	...	...	384.36	64.70	40,673.27	1,153.68	...
	Reported by Banks and Gold Dealers	184.49	26.16	94.00	106.45	16,210.06	9,263.24	275.59	...	...
	Totals	192.16	517.85	1,769,226.69	525,432.41	150,005.03	32,857.08	37,895.82	44,230,098.19	25,027,391.95	2,952,788.98

TABLE I.—Production of Gold and Silver from all sources, etc.—continued.

EAST COOLGARDIE GOLDFIELD—continued.

BULONG DISTRICT.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1940.					TOTAL PRODUCTION.					
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	
			Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.	
Balagundi	...	Voided leases and sundry claims	...	...	...	...	...	3.51	2,670.52	1,767.44	1,929.90	12.92
Bulong	1311Y	Blue Quartz	...	...	158.00	56.98	...	...	...	158.00	56.98	...
	1308Y	Southern Cross	...	...	388.75	55.45	...	...	1.30	1,104.75	156.52	...
		Voided leases and sundry claims	...	...	678.00	135.38	...	1,763.40	10,013.84	117,294.03	102,255.47	...
Majestic	...	do. do. do.	...	...	...	...	...	62.33	214.58	3,211.99	1,583.94	...
Morelands	...	Sundry claims	...	...	24.00	5.20	...	...	.13	183.00	58.51	...
Mt. Monger	...	Voided leases and sundry claims	...	...	...	...	...	215.60	2,771.39	1,816.90	1,564.58	...
Randall's	1313Y	Flora Dora	...	...	232.31	113.91	...	...	...	232.31	113.91	...
	1312Y	Lady Agnes	...	...	170.00	33.97	...	...	...	170.00	33.97	...
		Voided leases and sundry claims	...	2.67	766.25	179.19	...	20.70	66.87	36,391.35	11,801.02	...	
Taurus	(1309Y)	Great Ophir	...	...	67.50	18.50	...	...	...	67.50	18.50	...
		Voided leases and sundry claims	...	...	225.85	50.57	...	114.75	55.58	4,093.20	1,905.84	...
Trans Find	P.P.L. 308	Dawn of Hope	...	...	103.25	16.46	...	...	...	2.87	670.25	258.47
		Voided leases and sundry claims	...	...	...	...	...	...	5.93	1,660.92	1,173.22	...
<i>From District generally:—</i>													
Sundry parcels treated at:													
Davis' Cyanide Plant (Randall's)			...	...	...	*7.20	...	...	...	...	*14.91	...
Davis' Cyanide Plant (Bulong)			...	...	...	...	...	...	...	...	*311.05	...
Van Trip's Cyanide Plant			...	...	...	...	...	...	...	...	*9.15	...
Various Works			...	...	...	...	...	...	...	6,102.15	6,340.27	...
Reported by Banks and Gold Dealers			16.80	...	...	...	...	25,156.74	67.61	.01	28.44	...
Totals			16.80	2.67	2,813.91	672.81	...	27,337.03	15,879.62	174,923.80	129,614.65	12.92	

Coolgardie Goldfield.

COOLGARDIE DISTRICT.

Bonnievale	5596	Jenny Wren	...	...	254.00	133.08	4.17	...	128.86	350.00	364.00	4.17
	4600	Melva Maie	...	...	130.50	103.39	...	...	...	1,436.50	2,945.74	...
		Prior to transfer to present holders	...	...	...	...	...	...	...	614.50	1,099.21	11.63
	5321	Westralia Extended	...	...	7.00	3.78	...	...	...	155.50	34.11	...
	Voided leases and sundry claims	...	5.41	260.50	100.85	...	...	183.69	358,198.77	193,156.44	...	
Bullabulling	...	do. do. do.	...	...	...	...	...	5.21	15.98	2,085.07	1,226.67	...

Burbanks ...	5605 ...	Burbanks Deeps ...	...	...	35.00	13.05	...	...	...	66.00	48.72	...
	5263 ...	Lord Bobs ...	...	...	161.50	21.52	...	...	8.59	1,667.50	654.09	...
	5443 ...	New Gift ...	...	...	53.00	13.65	...	...	.59	458.50	158.05	...
	5614 ...	Resurrection ...	...	...	182.00	29.86	...	...	...	260.00	43.63	...
	5250 ...	Vice Regal ...	...	...	477.00	92.91	...	...	1.91	3,691.00	1,150.74	...
	5454 ...	Westraad ...	...	...	...	...	...	...	...	28.00	7.96	...
		Voided leases and sundry claims	...	6.64	644.00	152.07	...	69.95	822.57	426,760.31	312,005.74	521.06
Cave Rocks ...	(5604) ...	Squeaker ...	...	...	149.75	72.38	...	...	...	499.55	214.28	...
	5642 ...	Squeaker ...	...	...	188.00	55.57	...	...	...	188.00	55.57	...
		Voided leases and sundry claims	...	...	101.25	20.65	...	...	50.00	4,328.25	845.67	...
Coolgardie ...	5637 ...	Caledonia ...	...	7.30	...	...	...	...	7.30	420.00	69.25	...
	5297, etc.	Consolidated Gold Mines of Coolgardie, Ltd.	...	...	69,085.70	12,857.28	1,213.71	...	...	112,266.70	21,644.59	2,092.37
		Prior to transfer to present holders.	...	...	...	...	...	...	4.55	1,946.35	547.45	3.22
	5585 ...	Gleasons ...	...	...	177.00	66.04	...	...	.60	513.00	190.66	...
	5638 ...	Grey's Hill ...	...	...	31.00	34.05	...	...	...	31.00	34.05	...
	5577 ...	Iron Duke ...	...	...	182.00	89.86	...	...	...	424.00	401.37	...
	5644 ...	June ...	...	...	34.00	8.25	...	...	...	34.00	8.25	...
	5598 ...	King Solomon ...	...	...	222.00	34.58	...	2.69	...	339.00	56.92	...
	5590 ...	Lady Grace ...	...	...	75.50	16.56	...	...	...	541.50	183.49	...
	5606 ...	Lucky Star ...	...	...	201.00	28.55	...	...	...	618.00	123.97	...
	5622 ...	Lucky Hit ...	...	...	177.00	66.83	...	...	...	177.00	66.83	66.83
	(5522) ...	Lucky Hit ...	...	5.03	67.00	20.98	...	...	5.03	67.00	20.98	...
	5239, etc.	Phoenix Gold Mines, Ltd.	...	...	24,282.00	7,329.36	...	...	...	25,213.00	7,532.22	2.54
		Prior to transfer to present holders	...	...	...	...	...	...	...	167.56	237.80	...
5225 ...	Queen Extended ...	...	...	33.00	2.75	...	...	...	63.83	747.15	300.84	...
	Voided leases and sundry claims	...	202.01	3,011.75	549.49	...	1,500.84	7,188.35	629,239.06	348,274.10	.96	
Eundynie ...	(5589) ...	Brilliant Gold Mine ...	...	...	...	*15.85	...	...	...	138.00	78.65	...
	5624 ...	Eundynie ...	...	...	32.00	54.78	...	...	...	32.00	54.78	...
		Voided leases and sundry claims	32.00	9.8192	26.27	32,189.39	16,656.15	1.75
Gibraltar ...	5217 ...	Lloyd George ...	...	4.00	1,364.00	576.90	...	...	18.69	5,163.88	3,199.26	...
		Voided leases and sundry claims	...	...	61.50	39.48	...	1.39	66.04	34,619.95	17,661.11	...
Gnarlbine ...		do. do. do.	...	...	15.00	3.86	...	...	18.85	3,859.35	1,824.03	...
Hampton Plains	P.P.L. 119 ...	Golden Eagle ...	...	...	490.00	198.63	...	...	7.63	2,512.59	2,415.26	...
	Bl. 59, Loc. 315	Malvern Star ...	...	...	16.00	10.14	...	...	...	16.00	10.14	...
	Bl. 59, Loc. 316	Surprise G.M. ...	...	...	1,143.00	633.49	...	...	...	1,297.00	784.54	...
		Voided leases and sundry claims	...	8.13	112.50	46.64	...	...	534.84	10,264.50	8,581.75	...
Higginsville ...	5616 ...	Milesi Deeps ...	...	...	6.75	1.50	...	...	...	6.75	1.50	...
	(5496, etc.)	Norseman Associated Gold Mines, N.L.	...	...	86.25	24.11	24.00	...	...	86.25	24.11	24.00
		Prior to transfer to present holders	...	...	...	...	...	...	...	881.00	147.22	...
	5293, (5526) ...	"Two Boys" leases ...	...	...	515.00	114.50	...	...	...	7,168.00	3,260.44	...
	Voided leases and sundry claims	...	5.49	142.75	94.83	...	...	402.07	39,825.68	18,490.31	134.79	
Larkinville ...	5236 ...	Ground Lark ...	...	3.14	51.00	51.72	...	...	9.07	1,949.91	3,142.45	...
	(5612) ...	Record ...	...	...	17.00	4.31	...	...	...	17.00	4.31	...
		Voided leases and sundry claims	...	21.08	82.03	85.18	...	22.77	161.43	396.53	624.39	...
Logan's Find ...	(5618) ...	Frankson ...	...	...	30.00	1.98	...	...	...	30.00	1.98	...
	5324, etc.	Spargo's Reward G.M. (1935), N.L.	...	...	19,815.00	7,082.50	...	...	...	57,683.00	14,030.63	...
		Voided leases and sundry claims	...	87.32	147.25	84.90	...	...	96.73	2,581.96	1,204.95	...

TABLE I.—Production of Gold and Silver from all sources, etc.—continued.

COOLGARDIE GOLDFIELD—continued.

COOLGARDIE DISTRICT—continued.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1940.					TOTAL PRODUCTION.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.
Londonderry	...	Voided leases and sundry claims	...	...	21·00	15·52	...	...	131·85	32,780·02	23,015·44	...
Mungari	...	do. do. do.	...	26·66	154·18	70·68	...	1·77	152·19	1,816·44	735·62	...
Paris	5311, etc.	Lister's G.M.	...	...	1,145·00	393·19	...	...	...	7,022·00	3,352·02	...
	5500	(Paris Central)	...	...	...	...	...	...	...	113·00	24·16	...
	5530	(Paris Extended)	...	...	...	...	...	...	...	463·00	209·47	...
	5514	Paris	...	...	54·00	25·54	...	...	...	389·00	174·56	...
		Voided leases and sundry claims	...	...	...	...	...	...	4·30	2,037·25	501·81	...
Red Hill	...	do. do. do.	...	...	11·25	4·08	...	30·16	1,641·92	42,103·92	31,775·12	...
Ryan's Find	...	do. do. do.	...	...	...	...	...	...	·44	155·85	380·35	...
St. Ives	5593	Catherine	...	...	23·00	60·03	...	...	37·13	79·90	133·60	...
	5617, etc.	Ives Reward leases	...	...	630·00	144·17	...	...	...	630·00	144·17	...
	5617	(Rivette)	...	...	150·00	28·91	...	...	...	150·00	28·91	...
	(5619)	Victory	...	...	91·25	10·91	...	...	...	91·25	10·91	...
		Voided leases and sundry claims	...	...	...	...	...	273·15	1,049·98	41,166·87	16,778·73	...
Wannaway	(5610)	Try Again	...	...	30·00	5·31	...	...	...	196·75	79·11	...
		Voided leases and sundry claims	...	8·01	34·25	55·16	...	...	194·21	2,718·02	2,119·21	...
Widgiemooltha	(5332)	Banquet	...	...	23·50	14·09	...	...	20·74	441·80	332·69	...
	5576	Cardiff Castle	...	...	1,875·00	265·24	...	...	...	2,237·25	329·62	...
	5451	Host Group	...	...	637·50	157·02	...	...	...	1,284·25	328·48	...
		Voided leases and sundry claims	1·24	19·00	519·00	175·17	...	55·26	1,489·53	27,645·11	14,962·87	·17
		<i>From District generally:—</i>										
		Sundry Parcels treated at:										
		Australian Machinery and Investment Company's Cyanide Plant	...	...	...	*478·51	...	...	...	...	*2,057·64	86·31
		Coolgardie State Battery	...	...	...	*865·00	...	...	...	771·01	*28,218·72	9·65
		Collins Cyanide Plant	...	...	...	*127·47	...	...	...	...	*127·47	...
		Frank's Cyanide Plant	...	...	...	*267·50	...	...	...	...	*1,103·67	...
		Imperial Cyanide Plant	...	...	...	...	...	...	...	26·00	*340·76	...
		Irwin's Cyanide Plant	...	...	...	*152·79	...	...	...	...	*346·07	...
		James' Cyanide Plant	...	...	...	*122·33	...	...	...	...	*440·83	...
		Lister's Cyanide Plant	...	...	...	...	...	...	...	...	*77·64	...
		Parry's Cyanide Plant	...	...	...	*247·08	...	...	...	...	*1,307·10	...
		Prior's Cyanide Plant	...	...	...	*8·24	...	...	...	...	*8·24	...
		Widgiemooltha Cyanide Plant	...	...	...	*160·90	...	...	...	...	*977·51	...
		Various Works	...	...	...	...	...	7·75	...	3,871·61	*23,664·90	223·06
		Reported by Banks and Gold Dealers	170·13	2·25	...	4·85	...	14,397·04	712·01	38·25	61·31	...
		Totals	171·37	411·47	130,200·41	34,981·39	1,241·88	16,368·90	15,260·51	1,942,479·06	1,140,050·06	3,115·68

KUNANALLING DISTRICT.

Carbine	970s	Carbine ... ..	...	...	1,919.75	988.99	...	...	...	...	11,431.75	6,115.75	...
	970s	Carbine leases ... ..	...	...	...	...	...	...	...	687.98	51,991.86	39,862.25	...
	1012s	Homeward Bound Gold Mines, N.L. ... ..	...	...	2,887.00	449.64	...	...	...	...	12,260.00	1,204.29	...
		Voided leases and sundry claims	...	...	283.00	97.37	...	136.08	93.96	12,875.53	5,831.34	...	...
Chadwin	999s	Magdala ... ..	...	...	843.00	277.28	...	...	...	1,530.50	572.03	...	...
		Voided leases and sundry claims	...	...	410.75	126.51	...	14.28	53.82	6,141.85	5,444.27	2.50	...
Dunnsville		do. do. do. ... ..	...	1.53	226.75	77.89	...	2.82	1,749.29	19,688.66	10,261.87	...	...
Jourdie Hills		do. do. do. ... ..	...	...	46.00	15.07	1.05	1.86	67.81	29,658.49	20,212.89	29.50	...
Kintore	(961s), (1004s)	Gold Fields Australian Development Co.	12.04	1.14	...	163.00	...	12.04	1.14	6,205.50	6,021.54	677.88	...
	902s	New Haven ... ..	...	...	296.00	83.76	...	...	...	2,528.50	951.55	...	...
		Voided leases and sundry claims	...	...	108.75	30.62	...	118.57	259.24	47,544.27	34,081.37	...	...
Kunanalling	919s	Eureka ... ..	...	...	...	...	...	...	...	1,209.00	*918.24	...	...
	987s	Premier ... ..	.23	...	824.00	447.30	...	.23	...	1,626.00	776.58	...	...
	919s, 987s	(Eureka leases) ... ..	...	...	...	...	...	...	...	7,172.50	6,288.07	12.78	...
	913s	Golden Bounty Syndicate, Ltd. ... ..	...	...	270.00	184.10	.29	...	...	1,007.50	702.34	.29	...
		Prior to transfer to present holders	...	...	...	...	...	...	...	2,946.19	1,730.36	8.86	...
	988s	Premier North ... ..	...	...	...	...	...	...	...	170.00	139.04	...	...
		Voided leases and sundry claims	1.91	...	276.75	147.71	...	302.43	2,500.66	124,899.29	96,551.71	18.84	...
Kundana		do. do. do. ... ..	...	...	...	...	...	...	...	770.25	102.75	...	...
		<i>From District generally:—</i>	...	...	...	...	...	...	...	...	...	...	...
		Sundry Parcels treated at various Works ... ..	...	...	...	...	...	42.23	...	1,782.26	*5,061.33	...	...
		Reported by Banks and Gold Dealers	11.30	...	...	...	...	772.79	17.93	...	2.38	...	...
		Totals	25.48	2.67	8,391.75	3,089.24	1.34	1,403.33	5,431.83	343,439.90	242,831.95	750.65	...

Yilgarn Goldfield.

Blackborne's		Voided leases and sundry claims	...	...	...	...	...	...	...	1,623.00	415.96	...	...
Bullfinch	3345, etc.	Copperhead ... ..	...	...	...	...	...	...	...	6,834.32	1,944.70	...	...
	3378	Copperhead Deepes ... ..	...	...	986.00	178.25	...	...	...	13,554.65	4,102.83	...	...
	3337, 3458	Easter Gift leases ... ..	...	...	...	...	...	...	...	1,550.00	455.87	...	...
		Prior to transfer to present holders	...	...	...	...	...	48.03	3,594.26	1,169.82	...	...	...
	3400, etc.	Frances May ... ..	...	...	325.00	60.14	...	7.74	8,573.55	3,323.14	...	...	...
	3397	Goldfinch ... ..	...	...	78.00	33.25	...	6.73	5,822.03	2,472.17	...	...	...
	4011	Irene ... ..	...	...	22.00	24.57	...	...	22.00	24.57	...	...	...
	3980	Peter Pan ... ..	...	...	174.00	219.51	...	...	174.00	219.51	...	...	...
	4009	Reynold's Find ... ..	...	...	153.00	65.72	...	...	153.00	65.72	...	...	...
	3350	Rising Sun ... ..	...	...	8,479.00	1,426.05	...	2.30	25,094.53	8,845.76	...	...	...
	(3825)	Western Mining Corporation ... ..	...	...	1,405.00	1,022.37	...	...	2,574.00	2,219.94	...	...	...
		Prior to transfer to present holders	...	...	...	...	...	...	...	2,113.00	1,518.43	...	...
		Voided leases and sundry claims	...	7.93	459.00	258.89	...	8.47	45.95	491,504.82	184,969.21	27,958.41	...
Corinthian	3398	Corinthian ... ..	...	...	...	*102.86	...	...	...	7,383.75	*2,646.02	...	...
	3425	Corinthian North ... ..	...	...	1,406.00	640.00	...	...	...	5,357.00	2,574.78	...	...
	3415	Deliverance ... ..	...	...	590.00	586.87	...	...	...	2,268.40	2,683.80	...	...
	36pp	Lochlee ... ..	...	...	84.00	70.52	...	...	...	104.00	156.96	...	...
		Voided leases and sundry claims	...	...	13.50	16.05	...	...	.68	135,955.35	30,368.92	...	...

TABLE I.—Production of Gold and Silver from all sources, etc.—continued.

YILGARN GOLDFIELD—continued.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1940.					TOTAL PRODUCTION.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.
Euenin	4021	Birthday Extended ... ..	...	159·55	10·00	54·45	...	...	159·55	10·00	54·45	...
	(3871)	Euenin Daisy ... ..	...	...	12·00	7·47	...	...	...	113·00	77·51	...
	3982	Helio ... ..	...	...	43·50	39·78	...	...	...	43·50	39·78	...
	3986	Sunset ... ..	...	15·19	12·00	27·31	...	...	15·19	12·00	27·31	...
	3893	Trump ... ..	...	...	65·50	28·73	...	...	...	265·50	178·78	...
	3936, etc. ...	Yellowdine Gold Areas, N.L. ... ..	...	...	4,646·00	3,909·36	...	...	...	4,846·00	4,214·17	...
		Prior to transfer to present holders Voided leases and sundry claims	...	...	...	...	...	...	...	281·00	418·04	...
		...	1·69	174·50	151·74	...	...	54·38	2,551·66	2,296·30	...	
Evanston	3895	Blue Peter ... ..	...	...	...	...	...	...	1,288·00	285·84	...	
	3868	Evanston ... ..	...	...	11,352·00	8,391·21	...	...	19,762·30	13,050·31	...	
	3870	Evanston East ... ..	...	...	...	...	...	...	34·00	13·59	...	
	3869	Evanston North ... ..	...	...	231·00	121·08	...	...	1,475·99	1,003·87	...	
	3888	Goldies ... ..	...	...	...	...	...	...	200·00	43·15	...	
	3997	Gravel Pit ... ..	...	7·33	35·80	43·25	...	...	7·33	35·80	43·25	...
	3912	Harbour Lights ... ..	...	...	...	...	...	...	...	337·00	80·38	...
	Voided leases and sundry claims	...	4·98	88·35	37·77	...	...	4·98	815·35	283·98	...	
Forrestonia	do. do. do.	...	...	...	...	...	...	...	1,557·00	439·93	...	
Golden Valley	3575	Great Bingin ... ..	...	...	4,453·00	3,267·88	...	...	...	8,626·00	6,121·97	...
	3573	Marie's Find ... ..	...	...	...	...	...	...	...	742·00	353·15	...
	3822	Queen Marie ... ..	...	...	...	...	...	...	...	180·50	164·83	...
	3971	Margeurite ... ..	...	...	38·00	62·37	...	...	...	38·00	62·37	...
	3972	North Radio ... ..	...	5·21	54·00	50·93	...	...	5·21	54·00	50·93	...
	2994, etc. ...	Radio leases ... ..	...	...	594·00	*1,159·31	...	...	2·70	13,946·30	35,028·42	7·43
	3248, etc. ...	Radio Deeps leases ... ..	...	...	257·00	130·24	...	...	...	5,249·58	6,135·24	...
	3993	Stumpy Doodle ... ..	...	...	9·00	14·12	...	...	...	9·00	14·12	...
	Voided leases and sundry claims	...	1·40	133·00	58·87	...	...	4·58	82·93	16,107·61	14,749·40	2·00
Greenmount	3996	Lucky Dip ... ..	...	...	76·00	13·04	...	...	...	76·00	13·04	...
		Voided leases and sundry claims	275·50	50·70	46·45	25·89	126,929·22	32,181·32	944·50
Holleton	3923	Holleton East ... ..	...	...	300·00	25·96	...	...	...	1,344·00	138·48	...
	3312, etc. ...	North End leases ... ..	...	...	29·50	14·84	...	...	...	38,275·00	11,719·12	...
		Voided leases and sundry claims	...	...	29·00	2·78	...	...	13·08	4,684·80	1,649·03	31·79
Hope's Hill	4024	Jean Rose Extended ... ..	...	...	303·50	19·23	...	...	...	303·50	19·23	...
	3414	Pilot ... ..	...	...	1,979·12	219·06	...	...	...	17,912·12	2,803·19	...
		Voided leases and sundry claims	...	12·55	382·50	66·38	18·67	108·14	136,008·07	37,581·67	1·00
Kennyville	(3667)	Battler Gold Mine ... ..	...	...	630·00	98·49	...	...	...	5,888·00	1,385·16	...
	3506	Cornishman ... ..	...	...	...	...	...	...	...	92·00	16·10	...

	3432, 3664	...	Coronation Gold Mining Co., Ltd.	...	...	421.50	140.41	...	...	...	1,103.50	227.13	...
			Prior to transfer to present holder	...	...	...	...	...	...	...	8,037.50	3,240.27	...
	3766	...	Golden Arrow	...	...	50.00	6.48	...	...	...	315.00	81.67	...
	3845	...	Rainbow	...	...	390.00	57.26	...	...	...	1,613.00	215.96	...
	3875	...	Victoria	...	...	270.00	232.99	...	63	...	2,142.00	565.80	63
			Voided leases and sundry claims	...	...	164.00	17.48	...	...	23.82	42,060.63	17,589.52	59
Koolyanobbing	...	...	do. do. do.	...	...	54.00	3.45	...	...	26	2,287.05	1,109.74	...
Marvel Loch	3468, etc.	...	Anglo-Australian & General Investment Trust Ltd.	...	...	3,061.00	437.04	...	37	...	3,061.00	437.04	37
			Prior to transfer to present holders	...	...	...	...	...	...	...	1,409.00	117.84	...
	(3918)	...	Blanket	...	...	45.00	7.51	...	...	...	1,081.00	288.58	...
	3393	...	Bohemia	...	...	107.00	5.77	...	...	...	4,423.50	1,833.96	...
	(3675)	...	Christmas Gift	...	7.61	36.00	4.93	...	...	84.17	496.00	832.12	...
	3957	...	Comet	...	...	605.00	297.04	6.85	...	...	792.00	457.60	6.85
	13PP	...	Cricket	...	...	50.00	22.66	...	...	...	1,455.00	866.90	...
	3966	...	Donovan's Find	...	...	38.05	6.84	...	...	...	90.05	11.62	...
	4014	...	Doris	...	...	11.00	9.95	...	...	...	11.00	9.95	...
	3942, 3943	...	Edward's Reward Leases (Edward's Reward)	...	...	2,962.00	1,340.47	...	...	...	7,523.50	3,848.15	...
	3942	...	(Sunshine)	...	...	...	...	...	...	...	2,080.00	2,016.32	...
	3943	...	Evelyn Molly	...	...	911.00	103.20	...	...	...	3,866.00	2,384.79	...
	3947	...	Firelight	...	...	798.00	137.18	...	...	...	1,036.00	223.36	...
	3962	...	Four Threes	...	...	141.00	126.50	...	...	...	1,324.00	240.81	...
	3917	...	Frances Firness	...	...	1,869.00	559.81	...	...	...	187.00	619.83	...
	3724	...	Ganymedes	...	4.55	587.00	88.72	...	...	164.56	5,839.00	2,817.34	...
	3824	...	Geelong	...	...	19.00	2.45	...	...	...	3,629.00	1,836.51	...
	3941	...	Golden Cube	...	...	248.00	77.23	...	...	18.39	330.50	54.60	...
	3683	...	Grand National	...	...	13,139.00	1,899.35	...	...	...	750.00	387.60	...
	3987	...	Green Bird	...	...	10.00	14.54	...	...	...	13,139.00	1,899.35	...
	3999	...	Ireland	...	...	40.00	3.61	...	...	...	10.00	14.54	...
	3958	...	Kurrajong	...	...	2,347.00	617.94	...	...	...	100.00	11.55	...
	3718	...	Lady Luck	...	...	56.00	8.82	...	...	1.32	8,109.00	3,074.34	...
	(33PP)	...	Lenodo leases	...	...	183.00	31.97	...	...	...	331.00	177.44	...
	3431, etc.	...	Prior to transfer to present holders	...	...	...	...	...	...	...	3,725.00	723.66	...
	3413	...	Marvel Loch	...	...	345.00	84.31	...	...	...	1,056.00	177.67	...
	3423, etc.	...	Marvel Loch Gold Development, N.L.	...	...	3,732.00	361.82	...	...	...	3,087.00	639.98	...
			Prior to transfer to present holders	...	...	...	...	...	...	...	87,533.10	12,622.22	1,239.90
	3856	...	Marvel Loch North	...	...	249.00	33.87	...	...	...	1,185.00	215.67	...
	3914	...	May	...	...	106.00	17.97	...	...	...	1,604.00	249.36	...
	3837	...	Maydo	...	...	55.00	25.57	...	...	...	145.00	45.86	...
	3459	...	May Queen	...	...	...	*51.22	...	...	...	224.00	141.38	...
	3835	...	Mountain King	...	...	292.00	99.71	...	...	...	3,738.00	*6,908.87	...
	3970	...	Mountain Queen	...	...	312.00	57.08	...	...	...	1,479.00	805.70	...
	3390, etc.	...	N.G.M. Ltd.	...	...	...	...	...	...	...	312.00	57.08	...
			Prior to transfer to present holders	...	...	...	...	...	...	...	500.00	45.61	50
	3404	...	New Yilgarn G.M., N.L.	...	...	62.00	*491.77	...	...	...	2,675.00	459.60	...
			Prior to transfer to present holder	...	...	...	...	...	...	...	8,832.40	4,715.95	355.32
	3908	...	North Comet	...	...	235.00	30.93	...	...	...	2,302.30	1,309.21	95.53
	4017	...	Outsider	...	...	95.00	22.85	...	...	...	821.00	118.33	...
	3989	...	Salvation	...	...	108.00	33.75	...	...	...	95.00	22.85	...
	3960	...	Scorpio	...	...	135.00	50.92	...	...	15.62	108.00	33.75	...
	3988	...	Treasury	...	...	146.00	11.97	...	...	...	224.00	226.88	...
	4006	...	Union Jack	...	...	606.00	115.98	...	...	...	146.00	11.97	...
			Voided leases and sundry claims	...	...	1,328.00	338.38	...	11.35	222.75	606.00	115.98	...
				...	...	...	...	...	...	...	528,087.70	160,355.86	773.58

TABLE I.—Production of Gold and Silver from all sources, etc.—continued.

YILGARN GOLDFIELD—continued.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1940.					TOTAL PRODUCTION.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.
Mt. Jackson	(3961) ...	Allen's Find ...	...	·39	236·00	97·37	...	...	·39	236·00	97·37	...
	3930 ...	Bulls Eye ...	...	...	51·00	14·56	...	...	...	455·00	71·34	·06
	3449 ...	Die Hardy ...	...	...	38·00	60·97	...	...	...	365·50	343·86	...
	3931 ...	Dolly Pot Hill ...	...	10·12	163·00	46·87	2·09	...	10·12	448·00	198·63	2·09
	(3940) ...	Golden Reef ...	...	...	71·00	5·35	...	...	...	135·00	23·64	...
	3859 ...	Great Unknown ...	...	...	94·00	198·71	...	...	...	549·00	491·25	...
	3418 ...	Clamp's Central ...	...	...	289·50	201·29	...	...	...	1,232·50	632·20	...
	4005 ...	Prior to transfer to present holder	...	...	...	...	...	...	...	7,224·00	6,457·63	6·34
		Tiger Show ...	...	10·99	113·00	121·75	...	...	10·99	113·00	121·75	...
		Voided leases and sundry claims	...	...	287·00	109·66	...	6·44	195·97	52,141·88	34,506·54	2,306·02
Mt. Palmer	3544 ...	Yellowdine Gold Development Ltd. ...	...	...	46,346·00	19,054·25	...	...	...	216,999·50	125,701·14	...
		Prior to transfer to present holder	...	...	...	...	...	...	...	1,564·65	2,540·71	...
		Voided leases and sundry claims	...	...	25·00	7·84	...	1,643·48	18·19	369·00	354·57	...
Mt. Rankin	3555 ...	No Trumps ...	...	...	549·37	185·43	...	...	...	4,930·37	760·79	...
		Voided leases and sundry claims	...	...	...	...	...	3·84	5·20	987·00	239·76	...
Parker's Range	(3967) ...	Alpha ...	...	...	44·00	14·06	...	...	...	63·00	35·17	...
	(3956) ...	Black Cat ...	...	...	55·00	9·04	...	...	...	130·00	10·85	...
	3520 ...	Centenary ...	...	...	404·00	41·83	...	...	...	1,571·00	437·18	...
	3460 ...	Fortuna Lease ...	...	...	318·00	80·50	...	...	...	1,660·00	438·69	...
	3959 ...	Kookaburra ...	...	...	201·00	54·61	...	...	3·45	383·00	113·27	...
	3671 ...	Mundy Hills 1 ...	...	...	199·00	36·02	...	...	...	1,468·00	310·43	...
	4000 ...	Olga ...	...	...	18·00	45·31	...	...	...	18·00	45·31	...
	2801 ...	Scot's Greys ...	...	...	35·00	5·23	...	...	...	1,942·00	676·47	...
	(3815) ...	Spring Hill No. 5 ...	...	...	40·00	6·39	...	...	...	2,238·00	505·44	...
	3969 ...	White Horseshoe ...	...	...	469·50	356·41	22·39	...	...	504·60	417·95	24·97
		Voided leases and sundry claims	...	12·10	743·50	250·52	·04	7·01	139·10	53,008·50	27,475·48	·53
Southern Cross	4004 ...	Excelsior ...	...	...	267·00	72·88	...	...	...	267·00	72·88	...
	4018 ...	Fraser's ...	...	...	286·00	37·24	...	...	...	286·00	37·24	...
	(3990) ...	Fraser's ...	...	...	10·00	13·86	...	...	...	10·00	13·86	...
	3862 ...	Fraser's Central ...	...	...	306·00	96·75	...	...	...	306·00	96·75	...
	3862, etc. ...	(Southern Cross United Mines Ltd.) ...	...	...	...	...	...	...	...	13,053·50	1,457·53	...
	4010 ...	Lord Cardigan ...	...	...	236·00	32·22	...	...	...	236·00	32·22	...
	3944 ...	Nil Desperandum ...	...	...	382·00	54·31	...	...	...	657·00	110·54	...
	3473 ...	Queen Anne ...	...	...	610·00	65·99	...	...	...	2,682·50	399·51	...
	3444, etc. ...	Three Boys Gold Mines Limited ...	...	...	2,792·00	287·65	1·26	...	...	2,792·00	287·65	1·26
	3444 ...	(Three Boys) ...	...	...	2,219·50	312·68	...	...	...	4,180·00	727·75	...
	3934 ...	(Three Boys North) ...	...	...	61·00	9·26	...	...	...	106·00	14·66	...
	3981 ...	(Three Kings) ...	...	...	40·00	3·10	...	...	...	104·00	10·01	...
	3444, etc. ...	(Yellowdine Options, N.L.) ...	...	...	...	...	...	...	...	8,074·25	2,000·29	...
		Voided leases and sundry claims	...	35·43	1·60	698·05	203·26	...	58·40	893·01	442,980·34	215,141·52	364·41

Westonia ...	(3556) ...	Contemptible ...	...	...	10.00	6.04	...	...	...	101.75	78.72	...
	3308, etc.	Edna May (W.A.) Amalgamated G.Ms., N.L.	...	...	17,339.00	9,447.68	857.86	...	...	52,071.00	22,339.87	1,800.47
	4023 ...	Prior to transfer to present holders	...	...	...	...	...	...	...	4,092.00	2,867.26	...
		Greenfinch ...	...	...	173.00	206.91	...	...	...	173.00	206.91	...
		Voided leases and sundry claims	...	...	280.50	142.42	...	9.51	69.02	449,181.65	316,860.75	21.78
<i>From Goldfields generally :-</i>												
Sundry parcels treated at:												
		Battler Cyanide Plant ...	...	...	...	*60.84	...	...	...	...	*660.12	...
		Butcher Bird Cyanide Plant ...	...	...	4.50	*169.05	...	...	...	4.50	*2,847.30	...
		Centenary Cyanide Plant ...	...	...	...	*79.88	...	...	...	...	*392.85	...
		Copperhead Cyanide Plant ...	...	...	...	*1,313.77	...	...	...	...	*14,109.22	...
		Coronation G.M. Co's. Cyanide Plant ...	...	...	...	*22.52	...	...	...	...	*254.93	...
		Evelyn Molly Cyanide Plant ...	...	...	...	*138.53	...	...	...	...	*335.24	...
		Gold's Cyanide Plant ...	...	...	...	*26.50	...	...	...	...	*26.50	...
		Holleton Cyanide Plant ...	...	...	...	*55.19	47.11	...	...	...	*276.39	47.11
		Howlett's Cyanide Plant ...	...	...	...	*1,488.39	...	...	...	110.00	*11,990.27	...
		Invermay Cyanide Plant ...	...	...	...	*74.56	3.57	...	...	...	*437.61	3.57
		North End Cyanide Plant ...	...	...	...	*210.97	...	...	...	...	*3,829.86	...
		Pilot Cyanide Plant ...	...	...	...	*275.18	...	...	...	...	*3,584.29	...
		Queen Ann Cyanide Plant ...	...	...	...	*51.88	...	...	...	...	*51.88	...
		Radio Deeps Cyanide Plant ...	...	...	...	*101.16	...	...	...	...	*1,180.43	...
		Rainbow Cyanide Plant ...	...	...	...	*134.57	...	...	...	...	*194.59	...
		Scot's Grey's Cyanide Plant ...	...	...	...	*17.42	...	...	...	...	*922.45	...
		Three Boys' Cyanide Plant ...	...	...	...	*840.85	...	...	...	...	*993.33	...
		Triumph Cyanide Plant ...	...	...	...	*32.67	...	...	...	...	*795.77	...
		Wesley's Hope's Hill Cyanide Plant ...	...	...	...	*141.97	...	...	...	...	*631.14	...
		Wesley's Marvel Loch Cyanide Plant ...	...	...	...	...	...	...	...	...	*188.65	...
		Southern Cross Tailings Treatment Syndicate ...	...	...	...	*47.66	...	...	...	...	*58.47	...
		Various Works ...	...	...	...	...	...	...	...	156.78	*50,554.69	36.54
		Reported by Banks and Gold Dealers ...	1.38	1.20	...	1.61	...	305.99	59.51	...	7.74	...
Totals			54.34	246.86	153,311.24	68,142.49	943.04	2,129.43	2,521.41	3,223,827.96	1,520,498.25	36,034.42

Dundas Goldfield.

Buldania ...	...	Voided leases and sundry claims	...	...	172.75	54.24	...	...	39.55	2,072.07	1,533.42	...
Dundas ...	1550 ...	May Bell ...	...	2.47	754.00	104.12	154.60	1.88	2.47	1,341.50	219.64	154.60
		Voided leases and sundry claims	...	...	144.25	77.91	.03	.76	389.82	5,922.48	2,963.14	.03
Norseman ...	1596 ...	Abbotshall ...	...	...	1,017.20	348.30	533.00	...	...	1,017.20	348.30	533.00
	1382 ...	Blue Bird Gold Mines, N.L. ...	...	...	2,667.00	5,877.36	160.17	...	1,663.32	5,614.00	18,342.76	160.17
		Prior to transfer to present holders	...	...	...	...	...	...	...	864.25	1,277.32	...
	1468 ...	Bronzewing ...	...	...	140.00	167.60	5.01	...	...	140.00	167.60	5.01
	(1581) ...	Bull Ant ...	...	6.99	...	...	...	...	50.20	78.00	111.92	...
	1319, etc.	Central Norseman Gold Corporation, N.L.	...	...	98,799.00	34,626.17	27,735.26	...	...	327,428.50	106,197.71	148,986.70
	1386 ...	(Valkyrie South Extended) ...	...	...	15.25	5.68	...	...	...	15.25	5.68	...
	1319, etc.	Prior to transfer to present holders	...	...	...	...	...	...	...	19,487.58	14,657.87	2,305.45
	1452 ...	Cumberland Central ...	...	...	37.00	8.20	.19	...	...	258.75	67.64	.19
	1462 ...	Cumberland Central West ...	...	...	...	...	...	...	...	118.00	36.75	...
	1364 ...	Lady Mary ...	...	...	...	...	...	...	...	99.00	15.45	...
	1560, etc.	Groundlark Gold Mines, N.L. ...	...	...	1,314.00	558.48	30.00	...	...	1,314.00	558.48	30.00
		Prior to transfer to present holders	...	...	...	...	...	...	...	629.00	238.51	...
	1603 ...	Narracoorte ...	...	...	993.00	133.30	207.00	...	...	993.00	133.30	207.00
	(1583) ...	New Moon ...	...	...	7.65	2.53	.24	...	...	20.65	7.59	.24

TABLE I.—Production of Gold and Silver from all sources, etc.—continued.

DUNDAS GOLDFIELD—continued.

MINING CENTRE.	NUMBER OF LEASE.	REGISTERED NAME OF COMPANY OR LEASE.	TOTAL FOR 1940.					TOTAL PRODUCTION.				
			Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.	Alluvial.	Dollied and Specimens.	Ore treated.	Gold therefrom.	Silver.
			Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.
Norseman—contd.	1490, etc.	Norseman Associated G.Ms., N.L.	...	...	9,908.00	1,849.50	2,855.00	...	...	14,986.00	2,627.50	4,056.00
		Prior to transfer to present holders	...	...	...	...	...	...	...	83.25	23.47	...
	1453, etc.	Norseman Developments, N.L.	...	...	10,065.00	1,555.50	2,377.00	...	...	33,188.00	6,779.50	11,417.00
		Prior to transfer to present holders	...	...	...	...	...	...	...	40.50	9.68	...
	1315, etc.	Norseman Gold Mines, N.L.	...	...	152,289.00	25,906.30	39,833.00	...	...	559,126.00	165,306.45	216,847.54
		Prior to transfer to present holders	...	...	...	...	...	...	...	2,656.75	669.38	...
	1588	O.K.	...	...	...	...	...	...	...	19.75	4.96	...
	1590	O.K. East	...	21.36	31.50	10.62	2.12	...	21.36	31.50	10.62	2.12
	1422	Onkaparinga	...	...	195.50	112.71	3.62	...	...	843.00	1,396.98	3.62
	1530	Second Try	...	4.37	66.00	11.62	.09	...	4.37	151.75	37.72	.09
	1613	Stella May	...	...	36.50	34.76	...	...	...	36.50	34.76	...
	1516	Surprise	...	...	172.50	40.40	...	...	7.20	214.50	92.95	...
	(1567)	Trump	...	...	23.75	4.67	...	...	...	50.25	8.54	...
	1524	Valhalla	...	...	2,218.00	724.03	394.14	...	...	3,062.50	1,119.44	411.56
	1594	Walkover	...	...	50.00	8.00	12.00	...	...	50.00	8.00	12.00
	(1592)	Wheel of Fortune	...	...	12.50	4.75	...	...	...	12.50	4.75	...
	1612	White Reef	...	...	92.75	39.46	.26	...	...	92.75	39.46	.26
		Voided leases and sundry claims	...	57.54	1,399.25	393.10	42.16	1,033.42	13,811.64	925,398.53	602,571.83	35,831.45
Peninsula ...	1616	Day Dawn	...	...	52.00	85.01	2.43	...	...	52.00	85.01	2.43
	(1582)	Peninsula	...	2.06	82.50	21.75	...	...	6.68	236.00	100.13	...
	1597	Peninsula North	...	...	91.00	186.53	6.03	...	...	91.00	186.53	6.03
		Voided leases and sundry claims	...	...	45.75	13.19	...	...	17.61	8,761.14	5,348.86	...
		From Goldfield generally:	...	...	...	...	...	...	...	...	...	...
		Sundry parcels treated at:	...	...	...	...	...	...	...	...	...	...
		Davies Cyanide Plant	...	...	...	*274.21	4.80	...	...	...	*1,210.58	117.96
		Hill's Cyanide Plant	...	...	...	*101.44	...	...	...	...	*237.75	...
		Princess Royal Cyanide Plant	...	...	...	*282.20	280.99	...	...	...	*1,460.77	1,157.05
		State Battery, Norseman	...	...	...	*912.53	...	...	...	405.39	*20,088.42	885.41
		Various Works	...	...	...	...	...	...	54.52	483.14	*11,204.88	706.24
		Reported by Banks and Gold Dealers	...	5.08	...	...	...	1,175.63	41.03	47.50	11.43	...
		Totals	...	94.79	282,892.60	74,536.17	74,639.14	2,211.69	16,109.77	1,917,533.43	967,563.43	423,839.15

Phillips River Goldfield.

Hatter's Hill ...	...	Voided leases and sundry claims	...	...	534.00	117.17	...	74.91	26.07	6,484.65	3,659.49	1.25
Kundip ...	249, etc.	Beryl Gold Mines, Ltd.	...	...	1,315.00	393.88	18.41	...	...	2,365.00	864.01	33.78
	258	Harbour View	...	...	275.00	78.16	3.80	...	...	275.00	78.16	3.80
	247	Little Mary	...	...	1,784.50	208.53	...	...	...	10,119.50	1,014.81	...
	M.L. 370	North Harbour View	...	...	...	...	...	...	...	35.27	†22.16	...
		Voided leases and sundry claims	...	1.65	416.30	132.43	37.54	203.55	629.01	76,639.49	†58,801.74	†3,860.22

Mt. Desmond	...	do.	do.	do.	...	...	...	...	...	...	1.40	9.00	†3,938.27	†6,942.60
Ravensthorpe	(255) ...	Charmaine ...	...	...	...	...	33.00	13.63	...	...	...	202.80	98.12	...
	14PP ...	Floater Gold Mine	...	...	...	...	11.50	11.68	...	...	...	37.50	19.50	...
		Voided leases and sundry claims	...	...	...	1.08	240.00	69.24	...	163.96	149.48	31,318.82	†29,064.20	†4,425.19
West River	...	do.	do.	do.	...	...	...	...	...	...	...	...	†13.63	†34.50
<i>From Goldfield generally:</i>															
Sundry parcels treated at:															
		Cordingup Cyanide Plant	...	...	...	...	...	*267.35	4.36	...	...	...	*352.86	4.36
		Floater Cyanide Works	...	...	...	...	...	...	...	...	...	12.00	*229.11	...
		Daw and Toleman's Cyanide Plant	...	...	...	...	...	*11.11	...	...	...	...	*306.87	...
		Kundip Cyanide Plant	...	...	...	...	...	...	...	...	...	...	*1.73	...
		Maori Queen Cyanide Plant	...	...	...	...	...	*56.01	...	...	...	...	*597.71	...
		Various Works	...	...	...	...	...	...	...	...	...	...	*1,327.74	493.66
		Reported by Banks and Gold Dealers	...	...	...	.84	...	...	...	162.26	11.47	...	...	...
		Totals	2.49	1.08	4,609.30	1,359.19	64.11	604.68	817.43	127,499.03	100,390.11	15,799.36

Outside Proclaimed Goldfield.

Burracoppin	...	Voided leases and sundry claims	...	...	...	...	...	...	...	...	...	1,083.60	920.35	...
Donnybrook	...	do.	do.	do.	13.61	4.46	...	...	...	65.67	42.29	1,732.80	831.94	15.18
Jimperding	45PP ...	Hillsdale	...	...	...	...	364.75	61.83	...	...	...	364.75	61.83	...
Roebourne	5PP ...	Shaw's Shaft	...	...	...	...	90.00	79.71	3.42	...	...	246.00	283.94	16.61
	68H and 70H ...	Corderoy Mines, Limited	...	...	...	...	760.50	136.55	...	...	...	760.50	136.55	...
		Voided leases and sundry claims	...	...	7.75	...	119.00	58.34	...	222.44	182.18	20,313.46	22,399.12	1,331.07
		Reported by Banks and Gold Dealers	...	...	44.27	10.98	...	...	...	6,043.77	170.45	103.50	228.32	...
<i>From State generally:</i>														
Sundry parcels treated at:														
		Fremantle Smelting Works	...	...	...	...	...	*49.81	...	...	...	...	*1,800.68	1,109.06
		Weerianna Cyanide Works	...	...	...	...	...	...	...	...	...	...	*69.55	...
		Various Works	...	...	...	...	...	...	...	...	...	27.00	*7,128.29	30,412.67
		Sundry specimens	...	...	...	...	...	...	...	4.24	56.85	...	...	...
		Voided leases and sundry claims	...	...	...	...	1.00	2.49	...	245.45	14.13	201.60	43.58	...
		Reported by Banks and Gold Dealers	...	...	62.59	30.84	...	...	...	717.65	791.38	...	211.66	59.99
		Totals	...	...	128.22	46.28	1,335.25	388.73	3.42	7,299.22	1,257.28	24,833.21	34,115.81	32,944.58

† Includes Gold and Silver from smelted copper ore.

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 1940,

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 lbs.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240 lbs.).	Fine ozs.	Fine ozs.	Fine ozs.
Kimberley ...	...	...	...	...	...	...	...	238.80	70.83	778.60	412.07	721.70	...
Pilbara ...	Marble Bar ...	95.21	13.64	23,332.00	13,969.32	14,078.17	42.23	} 350.45	} 13.64	} 28,171.60	} 16,435.93	} 16,800.02	} 42.23
	Nullagine ...	255.24	...	4,839.60	2,466.61	2,721.85	...						
Ashburton ...	...	...	...	...	...	...	...	68.20	30.51	884.50	493.98	592.69	108.49
Gascoyne ...	...	...	...	...	...	...	...	24.94	...	...	...	24.94	...
Peak Hill ...	...	...	...	...	...	...	...	78.30	14.39	5,091.50	1,721.16	1,813.85	...
East Murchison ...	Lawlers ...	43.78	10.74	51,477.50	14,046.58	14,101.10	270.00	} 47.10	} 72.07	} 853,101.27	} 158,358.74	} 158,477.91	} 2,272.74
	Wiluna ...	...	20.56	707,082.87	119,228.60	119,249.16	10,29.40						
	Black Range ...	3.32	40.77	94,540.90	25,083.56	25,127.65	973.34						
Murchison ...	Cue ...	168.23	30.58	577,614.02	89,081.40	89,280.21	19,442.84	} 503.48	} 1,170.46	} 709,087.38	} 129,626.36	} 131,300.30	} 19,675.73
	Meekatharra ...	212.92	315.69	23,033.10	8,406.39	8,935.00	11.83						
	Day Dawn ...	34.69	...	4,074.63	2,025.67	2,060.36	...						
	Mt. Magnet ...	87.64	824.19	104,365.63	30,112.90	31,024.73	221.06	} 13.66	} 58.10	} 14,703.25	} 5,031.25	} 5,103.01	} 60.53
Yalgoo ...	...	...	...	...	...	...	...
Mt. Margaret ...	Mt. Morgans ...	103.70	93.40	6,433.05	9,919.61	10,116.71	...						
	Mt. Malcolm ...	30.22	226.58	148,855.55	47,077.35	47,334.15	3,699.12	} 180.79	} 590.52	} 257,037.33	} 89,475.24	} 90,246.55	} 4,698.60
	Mt. Margaret...	46.87	270.54	101,748.73	32,478.28	32,795.69	999.48						
North Coolgardie ...	Menzies ...	9.59	24.02	14,435.17	11,438.26	11,471.87	1,651.17						
	Ularring ...	.45	611.52	4,415.00	4,152.85	4,764.82	...	} 17.44	} 636.38	} 24,258.12	} 18,605.20	} 19,259.02	} 1,699.61
	Niagara ...	2.31	.84	2,246.00	797.40	800.55	...						
	Yerilla ...	5.09	...	3,161.95	2,216.69	2,221.78	48.44						
Broad Arrow ...	...	...	...	...	...	...	...	76.85	136.13	42,676.18	17,177.26	17,390.24	475.58
N.E. Coolgardie ...	Kanowna ...	139.21	248.12	2,962.50	1,948.52	2,335.85	...	} 177.97	} 349.49	} 3,138.00	} 2,063.34	} 2,590.80	} ...
	Kurnalpi ...	38.76	101.37	175.50	114.82	254.95	...						
East Coolgardie ...	East Coolgardie	192.16	517.85	1,769,226.69	525,432.41	526,142.42	150,005.03	} 208.96	} 520.52	} 1,772,040.60	} 526,105.22	} 526,834.70	} 150,005.03
	Bulong ...	16.80	2.67	2,813.91	672.81	692.28	...						
Coolgardie ...	Coolgardie ...	171.37	411.47	130,200.41	34,981.39	35,564.23	1,241.88	} 196.85	} 414.14	} 138,592.16	} 38,070.63	} 38,681.62	} 1,243.22
	Kunanalling ...	25.48	2.67	8,391.75	3,089.24	3,117.39	1.34						
Yilgarn ...	...	...	...	...	...	...	...	54.34	246.86	153,311.24	68,142.49	68,443.69	943.04
Dundas ...	...	...	...	...	...	...	...	5.08	94.79	282,892.60	74,536.17	74,636.04	74,639.14
Phillips River ...	...	...	...	...	...	...	...	2.49	1.08	4,609.30	1,359.19	1,362.76	64.11
Outside Proclaimed Goldfields ...	...	...	...	...	...	...	...	128.22	46.28	1,335.25	388.73	563.23	3.42
		...	...	...	...	...	...	2,373.92	4,466.19	4,291,708.88	1,148,002.96	1,154,843.07	255,931.47

TABLE III.

RETURN SHOWING TOTAL PRODUCTION REPORTED TO THE MINES DEPARTMENT, AND RESPECTIVE DISTRICTS AND GOLDFIELDS FROM WHENCE DERIVED, TO 31ST DECEMBER, 1940.

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 (2,240lbs.).	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Fine ozs.	Tons (2,240lbs.).	Fine ozs.	Fine ozs.	Fine ozs.
Kimberley ...	...	...	...	...	...	...	...	6,742.06	104.52	20,061.05	15,776.68	22,623.26	93.00
Pilbara ...	Marble Bar ...	14,590.15	4,264.05	190,293.93	213,050.67	231,904.87	730.09	} 23,836.42	} 4,850.44	} 251,670.42	} 298,075.92	} 326,762.78	} 758.76
	Nullagine ...	9,246.27	586.39	61,376.49	85,025.25	94,857.91	28.67						
Ashburton ...	...	...	...	...	...	...	...	} 9,107.56	} 406.39	} 5,167.25	} 2,002.24	} 11,516.19	} 8,066.49
Gascoyne ...	...	...	...	...	...	...	677.52						
Peak Hill ...	...	...	...	...	...	...	...	} 3,258.99	} 4,965.83	} 603,724.43	} 288,275.91	} 296,500.73	} 2,311.33
East Murchison ...	Lawlers ...	6,832.18	2,332.88	1,823,883.83	772,124.99	781,290.05	26,216.88						
	Wiluna ...	193.88	1,177.65	5,939,540.78	1,442,543.12	1,443,914.65	2,693.42	} 8,639.53	} 20,574.16	} 9,392,684.31	} 3,129,891.78	} 3,159,105.47	} 49,457.01
	Black Range ...	1,613.47	17,063.63	1,629,259.70	915,223.67	933,900.77	20,546.71						
Murchison ...	Cue ...	3,725.01	7,308.67	2,425,301.26	775,717.36	786,751.04	81,924.75	} 23,003.58	} 55,052.88	} 7,756,384.65	} 3,914,311.61	} 3,992,368.07	} 257,896.24
	Meekatharra ...	13,985.50	16,579.32	2,180,236.49	1,244,118.51	1,274,683.33	5,040.73						
	Day Dawn ...	2,912.47	11,009.58	2,007,589.88	1,324,006.38	1,337,923.43	169,210.44	} 1,713.42	} 2,814.40	} 408,192.35	} 244,680.62	} 249,208.44	} 1,350.05
	Mt. Magnet ...	2,380.60	20,155.31	1,143,257.02	570,469.36	593,005.27	1,720.32						
Yalgoo ...	...	...	...	...	...	...	...	} 10,650.14	} 31,980.53	} 8,877,748.13	} 4,202,415.30	} 4,245,045.97	} 202,936.67
Mt. Margaret ...	Mt. Morgans ...	3,106.24	9,098.91	1,182,178.86	678,312.02	690,517.17	5,780.87						
	Mt. Malcolm ...	3,641.57	13,890.62	5,312,896.68	2,424,958.18	2,442,490.37	136,667.37	} 4,672.39	} 17,912.73	} 2,860,693.34	} 2,114,194.14	} 2,136,779.26	} 39,041.56
	Mt. Margaret...	3,902.33	8,991.00	2,382,672.59	1,099,145.10	1,112,038.43	60,488.43						
North Coolgardie ...	Menzies ...	1,559.23	5,968.45	1,398,156.69	1,136,340.20	1,143,867.88	26,760.51	} 21,721.20	} 25,202.04	} 1,181,931.55	} 657,140.58	} 704,063.82	} 4,508.57
	Ularring ...	102.30	6,395.10	361,099.10	336,170.79	342,668.19	6,098.05						
	Niagara ...	1,701.76	1,811.27	920,929.02	511,371.46	514,889.49	5,603.42	} 118,992.57	} 20,205.08	} 1,004,802.78	} 637,404.16	} 776,601.81	} 2,533.34
	Yerilla ...	1,309.10	3,737.91	180,508.53	130,311.69	135,358.70	579.58						
Broad Arrow ...	...	...	...	...	...	...	...	} 60,194.11	} 53,775.44	} 44,405,021.99	} 25,157,006.60	} 25,270,976.15	} 2,952,801.90
N.E. Coolgardie ...	Kanowna ...	106,201.90	12,448.68	991,867.71	619,208.24	737,858.82	2,522.12						
	Kurnalpi ...	12,790.67	7,756.40	12,935.07	18,195.92	38,742.99	11.22	} 17,772.23	} 20,692.34	} 2,285,918.96	} 1,382,882.01	} 1,421,346.58	} 3,866.33
East Coolgardie ...	East Coolgardie	32,857.08	37,895.82	44,230,098.19	25,027,391.95	25,098,144.85	2,952,788.98						
	Bulong ...	27,337.03	15,879.62	174,923.80	129,614.65	172,831.30	12.92	} 2,129.43	} 2,521.41	} 3,223,827.96	} 1,520,498.25	} 1,525,149.09	} 36,034.42
Coolgardie ...	Coolgardie ...	16,368.90	15,260.51	1,942,479.06	1,140,050.06	1,171,679.47	3,115.68						
	Kunanalling ...	1,403.33	5,431.83	343,439.90	242,831.95	249,667.11	750.65	} 2,211.69	} 16,109.77	} 1,917,533.43	} 967,563.43	} 985,884.89	} 423,839.15
Yilgarn ...	...	...	...	...	...	...	...
Dundas ...	...	...	...	...	...	...	...	} 604.68	} 817.43	} 127,499.03	} 100,390.11	} 101,812.22	} 15,799.35
Phillips River ...	...	...	...	...	...	...	...
Outside Proclaimed Goldfields ...	...	...	...	...	...	...	...	} 7,299.22	} 1,257.28	} 24,833.21	} 34,115.81	} 42,672.31	} 32,944.55
						
		...	...	...	...	...	...	323,226.74	279,284.24	84,348,081.84	44,667,142.44	45,269,653.42	4,034,238.86

* By-product from treatment of auriferous ore, with exception of yield from Ashburton G.F. and outside Proclaimed Goldfield.

TABLE IV.

TOTAL OUTPUT OF GOLD (BULLION AND CONCENTRATES ENTERED FOR EXPORT AND GOLD RECEIVED AT THE ROYAL MINT, PERTH), FROM 1ST JANUARY, 1836, TO 31ST DECEMBER, 1940; 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 1938	22,422.06	9,308.73	31,730.79	147,302.43	208,996.44	356,298.87
1938	...	789.03	789.03	6.22	14,672.11	14,678.33
1939	...	823.84	823.84	47.36	17,143.60	17,190.96
1940	...	767.82	767.82	...	19,164.69	19,164.69
Total	22,422.06	11,689.42	34,111.48	147,356.01	259,976.84	407,332.85
	(a) WEST PILBARA.			ASHBURTON.		
Prior to 1938	4,351.11	26,760.61	31,111.72	4,104.96	3,127.96	7,232.92
1938	...	...	...	...	342.55	342.55
1939	...	...	...	...	924.08	924.08
1940	...	...	...	...	716.86	716.86
Total	4,351.11	26,760.61	31,111.72	4,104.96	5,112.45	9,217.41
	(b) GASCOYNE.			(c) PEAK HILL.		
Prior to 1938	304.55	988.07	1,292.62	41,102.62	195,726.78	234,829.40
1938	...	10.72	10.72	...	1,777.79	1,777.79
1939	...	38.96	38.96	...	1,638.92	1,638.92
1940	...	23.50	23.50	...	1,483.74	1,483.88
Total	304.55	1,061.25	1,365.80	41,102.76	200,627.23	241,729.99
	EAST MURCHISON.			MURCHISON.		
Prior to 1938	234,063.82	2,169,702.28	2,403,766.10	1,513,002.03	2,333,661.67	3,846,663.70
1938	2,497.92	154,036.79	156,534.71	33,623.15	119,543.65	153,166.80
1939	4,566.11	141,301.92	145,868.03	23,507.54	115,162.86	138,670.40
1940	4,249.40	135,235.82	139,485.22	834.90	133,094.08	133,929.98
Total	245,377.25	2,600,276.81	2,845,654.06	1,570,967.62	2,701,462.26	4,272,429.88
	(d) YALGOO.			(e) MT. MARGARET.		
Prior to 1938	11,659.95	152,903.50	164,563.45	632,478.05	3,221,888.45	3,854,366.50
1938	943.00	13,549.90	14,492.90	19,186.81	78,426.81	97,613.62
1939	903.00	7,827.79	8,730.79	13,634.40	94,303.91	108,438.31
1940	...	5,749.11	5,749.11	11,920.81	71,974.46	83,895.27
Total	13,505.95	175,073.77	188,579.72	677,220.07	3,467,093.63	4,144,313.70
	(f) NORTH COOLGARDIE.			(g) BROAD ARROW.		
Prior to 1938	262,602.50	1,841,749.41	2,104,351.91	122,129.36	310,885.88	433,015.24
1938	48.83	32,548.83	32,597.66	66.53	21,652.86	21,719.39
1939	124.33	23,887.79	24,012.12	33.96	20,379.58	20,413.54
1940	211.62	23,331.75	23,543.37	71.47	22,171.68	22,243.15
Total	262,987.28	1,921,517.78	2,184,505.06	122,301.32	375,090.00	497,391.32
	(f) NORTH-EAST COOLGARDIE.			(f) EAST COOLGARDIE.		
Prior to 1938	235,763.31	450,724.32	686,487.63	6,837,022.22	17,740,498.08	24,977,520.30
1938	25.02	1,407.23	1,432.25	38,659.63	479,408.02	518,067.65
1939	8.00	1,184.43	1,192.43	36,968.29	548,187.12	585,155.41
1940	10.29	746.57	756.86	53,037.94	538,917.99	591,955.93
Total	235,806.62	454,062.55	689,869.17	6,965,688.08	19,707,011.21	26,672,699.29
	(h) COOLGARDIE.			YILGARN.		
Prior to 1938	662,070.02	965,582.80	1,627,652.82	216,480.22	1,182,328.80	1,398,809.02
1938	117.79	19,135.20	19,252.99	5.45	66,120.73	66,126.18
1939	112.04	25,963.53	26,075.57	144.70	61,728.24	61,872.94
1940	185.83	40,136.71	40,322.54	299.17	63,192.45	63,491.62
Total	662,485.68	1,050,818.24	1,713,303.92	216,929.54	1,373,370.22	1,590,299.76
	(i) DUNDAS.			(j) PHILLIPS RIVER.		
Prior to 1938	131,707.47	770,673.62	902,381.09	40,195.24	53,325.45	93,520.69
1938	18,228.02	47,272.26	65,500.28	...	2,013.44	2,013.44
1939	18,137.02	51,071.06	69,208.08	218.66	2,309.83	2,528.49
1940	304.54	60,263.49	60,568.03	155.12	1,261.98	1,417.10
Total	168,377.05	929,280.43	1,097,657.48	40,569.02	58,910.70	99,479.72
	¶ DONNYBROOK.			OUTSIDE PROCLAIMED GOLDFIELD.		
Prior to 1938	282.21	557.53	839.74	18,424.64	28,688.68	47,113.32
1938	...	...	...	210.01	1,464.89	1,674.90
1939	...	...	...	334.47	1,120.30	1,454.77
1940	...	...	...	399.24	1,567.38	1,966.62
Total	282.21	557.53	839.74	19,368.36	32,841.25	52,209.61

a Prior to 1st May, 1898, included with Pilbara and abolished 12th July, 1929. 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 State generally. ¶ 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.

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	923,686·96	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	651,338·35	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
Total	11,421,509·18	35,357,549·03	46,779,058·21	239,958,528

The total par value of the above production is estimated at £198,704,771 6s. 11d., whilst premiums received on sales of gold during 1920-1924 and 1930-1940 amounted to approximately £41,253,757, making an estimated total of £239,958,528. The bonus paid under the Commonwealth Bounty Act, 1930, was £161,448, bringing the gross estimated value of gold won up to £A240,119,976.

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 1940, AND PREVIOUS YEARS.

Period.	ANTIMONY.								FELSPAR.		GLAUCONITE.				
	E. Murchison Goldfield.		Pilbara Goldfield.		State generally.		Total.		Coolgardie Goldfield.		State generally.				
	Tons.*	Value.*	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.			
Prior to 1937....	.....	£	.....	£	21	£	491	21	£	8,097	£	16,090	1,302	£	6,510
1937	562	9,196	3	39	.....	.....	.....	565	9,235	2,900	5,801	165	825	.....	.....
1938	339	3,859	.....	.....	.....	.....	.....	339	3,859	2,873	5,746	183	915	.....	.....
1939	364	3,234	.....	.....	.....	.....	.....	364	3,234	(a) 3,792	(a) 7,584	142	710	.....	.....
1940	264	10,180	.....	.....	.....	.....	.....	264	10,180	(b) 3,505	(b) 7,010	200	(c) 4,823	.....	.....
Total	1,529	26,469	3	39	21	491	1,553	26,999	21,167	42,231	1,893	13,783	.....	.....	.....

* By-product from Moonlight Wiluna G.Ms.

(a) Includes 250 tons valued at £500 from State generally.
(b) Includes 48 tons valued at £96 from State generally.
(c) Reviewed F.O.B. cost figure accepted.

Period.	ASBESTOS.								GYPSUM.					
	Ashburton Goldfield.		Pilbara Goldfield.		State generally.		Total.		Yilgarn Goldfield.		State generally.		Total.	
	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.
Prior to 1937....	2	£ 180	1,194	£ 54,403	1,116	£ 25,740	2,312	£ 80,334	7,185	£ 7,185	46,500	£ 64,552	53,685	£ 71,737
1937	8	770	20	1,180	14	408	42	2,358	479	594	8,594	9,330	9,073	9,809
1938 .....	.....	.....	67	2,871	54	2,443	121	5,314	2,296	2,296	11,139	10,113	13,429	12,409
1939 .....	.....	.....	1	202	*32	*1,118	33	1,320	.....	.....	14,340	13,492	14,340	13,492
1940 .....	.....	.....	355	14,200	9	334	364	14,534	1,359	850	11,661	13,232	13,020	14,082
Total	10	959	1,637	72,856	1,225	30,045	2,872	103,850	11,319	10,810	92,227	110,719	103,547	121,529

* Includes 5 tons valued at £20 from East Coolgardie.

Period.	TIN.											
	Pilbara Goldfield—Marble Bar District.				Greenbushes Mineral Field.				Total.			
	Quantity.			Value.	Quantity.			Value.	Quantity.			Value.
	Lode.	Stream.	Total.		Lode.	Stream.	Total.		Lode.	Stream.	Total.	
	tons.	tons.	tons.	£	tons.	tons.	tons.	£	tons.	tons.	tons.	£
Prior to 1937	372.62	5,516.35	5,888.97	544,399	350.96	10,796.88	11,147.84	971,207	*724.18	*16,318.10	*17,042.28	1,516,027
1937 .....	.....	2.77	2.77	500	27.09	24.19	51.28	7,098	27.09	26.96	54.05	7,598
1938 .....	.....	.60	.60	75	41.25	10.65	51.90	6,253	41.25	11.25	52.50	6,328
1939 .....	.....	.....	.....	.....	10.78	.....	10.78	1,447	10.78	.....	10.78	1,447
1940 .....	.....	2.95	2.95	547	32.90	.65	33.55	4,627	32.90	3.60	36.50	5,174
Total	372.62	5,522.67	5,895.29	545,521	462.98	10,832.37	11,295.35	890,632	836.20	16,359.91	17,196.11	1,536,574

* Includes 4.72 tons, value £360; 15 tons, value £15; and .60 tons, value £46, the produce of Cue and Coolgardie Districts and Yilgarn Goldfield respectively.

Period.	TANTALITE.											
	Northampton Mineral Field.		State generally.		Total.		*ARSENIC.		COAL.			
Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	
Prior to 1937	32.84	160.67	193.51	39,843	.....	3.94	3.94	2,009	32.84	164.61	197.45	41,852
1937	19.66	.....	19.66	29,011	.....	.....	.....	.....	19.66	.....	19.66	29,011
1938	19.71	.....	19.71	27,557	.....	.....	.....	.....	19.71	.....	19.71	27,557
1939	8.28	.....	8.28	12,073	.....	.....	.....	.....	8.28	.....	8.28	12,073
1940	3.82	.....	3.82	5,471	.....	.....	.....	.....	*6.32	.....	6.32	7,811
Total	84.31	160.67	244.98	113,955	.....	3.94	3.94	2,009	*86.81	164.61	251.42	118,304

* Includes 2.50 tons valued at £2,340 from Coolgardie.

Period.	LEAD ORE.						*ARSENIC.		COAL.	
	Northampton Mineral Field.		State generally.		Total.		Wiluna District.		Collie Coalfield.	
	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.
Prior to 1937	410,202	£ 1,272,369	107	£ 1,529	410,309	£ 1,273,898	12,130	£ 218,334	12,153,990	£ 8,427,208
1937	6,163	7,248	.....	.....	6,163	7,248	2,054	36,972	553,510	340,444
1938	350	590	.....	.....	350	590	3,999	71,982	604,732	375,082
1939 .....	.....	.....	.....	.....	.....	.....	1,416	25,488	557,535	382,811
1940 .....	.....	.....	.....	.....	.....	.....	3,332	59,977	539,427	304,500
Total	416,715	1,280,207	107	1,529	416,822	1,281,736	22,931	412,753	14,974,254	9,870,045

* By-product from Ore treated by Wiluna G.Ms., Ltd.

TABLE VI.—Minerals other than Gold—continued.

Period.	COPPER ORE.													
	West Kimberley Goldfield.		Pilbara Goldfield.				West Pilbara Goldfield.		Ashburton Goldfield.		Peak Hill Goldfield.		East Murchison Goldfield.	
			Marble Bar District.		Nullagine District.								Lawlers District.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Prior to 1937	tons. 109	£ 1,709	tons. 33	£ 386	tons. 14	£ 480	tons. 82,745	£ 748,482	tons. 351	£ 6,408	tons. 1,015	£ 32,212	tons. 238	£ 4,364
1937	....	....	....	....	....	....	....	....	....	....	....	....	....	....
1938	....	....	....	....	....	....	....	....	....	....	....	....	....	....
1939	....	....	....	....	....	....	....	....	1	23	....	....	....	....
1940	....	....	....	....	....	....	....	....	....	....	15	152	....	....
Total	109	1,709	33	386	14	480	82,745	748,482	352	6,431	1,030	32,364	238	4,364

Period.	COPPER ORE—continued.									
	Murchison Goldfield.		Yalgoo Goldfield.		Northampton Mineral field.		Yandanooka Mineral field.		Mt. Margaret Goldfield.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Prior to 1937	tons. 1,024	£ 11,236	tons. 39	£ 413	tons. 24,019	£ 119,451	tons. 172	£ 1,889	tons. 47,861	£ 230,846
1937	....	....	....	....	....	....	....	....	....	....
1938	....	....	....	....	....	....	....	....	....	....
1939	....	....	....	....	....	....	....	....	....	....
1940	....	....	....	....	7	46	....	....	....	....
Total	1,024	11,236	39	413	24,026	119,497	172	1,889	47,861	230,846

Period.	COPPER ORE—continued.										LIMESTONE.							
	North Coolgardie Goldfield.		East Coolgardie Goldfield.		Phillips River Goldfield.		State generally.		Total.		Murchison Goldfield.		Yilgarn Goldfield.		State generally.		Total.	
	Menzies District.		E. Coolgardie District.								Cue District.							
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Previous to 1937	tons. 6	£ 51	tons. 51	£ 330	tons. 95,727	£ 588,115	tons. 19	£ 249	tons. 253,423	£ 1,746,621	tons. 298	£ 772	tons. 2,548	£ 1,607	tons. 90,859	£ 15,911	tons. 93,705	£ 18,290
1937	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
1938	....	....	....	....	2	85	3	161	5	246	....	....	....	....	....	....	....	....
1939	....	....	....	....	....	....	....	....	1	23	....	....	....	....	....	....	....	....
1940	....	....	....	....	14	159	....	....	36	357	....	....	....	....	....	....	....	....
Total	6	51	51	330	95,743	588,359	22	410	253,465	1,747,247	298	772	2,548	1,607	90,859	15,911	93,705	18,290

Period.	IRONSTONE.								DIAMONDS.		EMERALDS.		MAGNESITE.		MANGANESE.	
	West Pilbara Goldfield.		E. Coolgardie GF.		State generally.		Total.		Pilbara Goldfield.		Murchison Goldfield.		East Coolgardie Goldfield.		Peak Hill Goldfield.	
			E. Coolgardie D.						Nullagine District.		Cue District.		Bulong District.			
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Previous to 1937	tons. 100	£ 300	tons. 450	£ 247	tons. 57,280	£ 36,148	tons. 57,830	£ 36,695	carats.	£ 24	carats, cut and rough. 18,373	£ 1,609	tons. 825	£ 1,053	tons. 77	£ 436
1937	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
1938	....	....	....	....	....	....	....	....	....	....	....	....	*10	*12	....	....
1939	....	....	....	....	....	....	....	....	....	....	....	....	*257	*230	....	....
1940	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Total	100	300	450	247	57,280	36,148	57,830	36,695	....	24	18,373	1,609	1,092	1,295	77	436

* From Coolgardie Goldfield.

TABLE VI.—Minerals other than Gold—continued.

Period.	SILVER LEAD ORE.						TUNGSTEN ORES.											
	Pilbara Goldfield.		Ashburton Goldfield.		Total.		WOLFRAM.		SCHEELITE.									
	Marble Bar District.						State generally.		North Coolgardie Gf.		Broad Arrow Goldfield.		Coolgardie Gf.		Dundas Goldfield.		Total.	
			Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.			Quantity.	Value.				
tons.	£	tons.	£	tons.	£	tons.	£	tons.	£	tons.	£	tons.	£	tons.	£	tons.	£	
Previous to 1937	195	3,658	2,974	35,796	3,169	39,454	265·89	1,295	407	942	3	175	86	155	·4	10	*496·78	1,282
1937	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1938	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1939	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1940	.....	.....	.....	.....	.....	.....	1·50	211	.....	10	28	.....	.....	.....	.....	.....	.....	10·00
1940	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	820·80	1,960	.....	.....	.....	820·80
Total	195	3,658	2,974	35,796	3,169	39,454	267·39	1,506	417	970	3	175	906·80	2,115	·4	10	1,327·58	3,270

*Adjusted from previous issue.

Period.	FIRECLAY.				BERYL.		BISMUTH ORE.		GADOLINITE.		
	Collie Mf.		State Generally.		State Generally.		State Generally.		Pilbara Goldfields.		
	Marble Bar District.										
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	
tons.	£	tons.	£	tons.	£	tons.	£	tons.	£		
Previous to 1937	1,051	738	.....	.....	.....	.....	.....	.....	.....	1	112
1937	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1938	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1939	.....	.....	830	522	.....	7	60	*·45	138	.....	.....
1940	.....	.....	3,070	1,990	.....	2	16	1·90	891	.....	.....
Total	1,051	738	3,900	2,512	.....	9	76	2·35	1,029	1	112

NOTE.—As the collection of Statistics of Minerals other than Gold commenced during 1939, the total production from the different localities can only be approximately estimated by the Customs Records.

* Adjusted from previous issue.