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THE MINERAL DEPOSITS AND MINING INDUSTRY OF PAPUA

by

H.G. Raggatt & P.B. Nye

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DEPARTMENT OF SUPPLY AND SHIPPING

MINERAL RESOURCES SURVEY

THE MINERAL DEPOSITS AND MINING INDUSTRY OF PAPUA.

Report No. 1943/34.

I. INTRODUCTION

Mineral deposits in Papua include those of gold, copper and manganese and from these there has been produced gold; silver; copper, copper matte and copper ore; manganese ore; osmiridium and platinum. The gold has been obtained from alluvial deposits and lodes and from the copper deposits. Silver has been obtained along with the gold, but no separate record of it has been kept. The copper and manganese ores have been obtained from their respective deposits. The osmiridium and platinum have been won during the mining of the alluvial gold deposits.

A fairly intensive search has been made for petroleum, but there has not been any commercial production.

The total value of the mineral production to 30th June, 1941, is £3,246,353, the detailed production being as follows:-

				£	£
<u>Gold</u>	alluvial & native				
	gold	856,377 oz.	2,670,607)	
	ore	240 tn.	19,844)	2,690,451
<u>Copper</u>	ore	12,132 tn.	164,329)	
	matte	}	15,433 tn.	360,344)	524,673
	blister copper				
<u>Osmiridium</u>	native	971 oz.	24,395	24,395
<u>Manganese</u>	ore	651 tn.	4,938	4,938
<u>Platinum</u>	native	218.75 oz.	1,896	1,896
Total -					3,246,353

II. GOLD

Gold was the first mineral mined in the Territory and has been mined continuously since 1888. The total production to date has been 856,777 oz. (and 240 tons of ore) with a value of £2,690,451 and this latter represents 83 per cent. of the total mineral production of the Territory.

Most of the gold deposits have been alluvial ones and they have been worked by individuals and parties, the methods employed being hydraulic and ground sluicing etc. No large areas of alluvial ground have been found and as a result there has not been any hydraulic sluicing on a large scale or dredging excepting small scale attempts in the Yodda and Lakekamu fields. Only a few lodes have been worked, the principal ones being those on Misima and Woodlark (or Murua) Islands.

E.R. Stanley reported that "the occurrence of reef gold was intimately associated with decomposed porphyrites and diorites impregnated and traversed by quartz veins, themselves carrying gold.

Secondary replacement, both lateral and vertical, have changed the country schists and slates into a soft formation in certain localities, carrying a workable percentage of 5%. Fissure veins, associated with auriferous quartz, are also common in the Woodlark, Gira and Yodda goldfields.

The following are the proclaimed goldfields:-

Louisiade -- In the south-eastern division and including the islands of Misima, Rossel and Sudest. Proclaimed 1889.

Murus -- In the south-eastern division and including the island of Murus or Woodlark. Proclaimed 1898.

Gira -- In northern division. Proclaimed 1898.

Milne Bay -- In eastern division. Proclaimed 1899.

Yodda -- In northern division. Proclaimed 1900.

Keveri -- In eastern division. Proclaimed 1904.

Lakekamu -- In central division. Proclaimed 1909.

Astrolabe -- In central division. Proclaimed 1906.

1. The Louisiade field includes Misima and other islands in the Louisiade Archipelago east of the eastern end of the island of New Guinea. The greater part of the mining has been conducted on Misima Island and most, if not all, of the production has been from that island. Other islands which have been prospected or perhaps worked include Tagula (or Sudest) Island.

Gold was discovered on Misima in 1888 and the field was proclaimed in 1889 and became the first of the Papuan fields. The original discovery was an alluvial deposit and 400 men were working in the year of its discovery. The creek and its tributaries were worked, but no reefs were found.

The history of the earlier period of the field is not known, but the field probably remained an alluvial one until 1912 or 1914. The production in 1911-12 was 600 oz. and the total production of the field till 30th June, 1909 and 1912 respectively was:-

	Oz.	£
To 30th June, 1909	19,497	68,961
" " " 1912	20,497	72,461

Although alluvial gold continued to be won in relatively small amounts, the history of the field became one of lode mining. The total production to later periods was:-

	Oz.	£
To 30th June, 1919	42,575	119,030
" " " 1926	138,049	253,557
" " " 1931	152,003	295,530

The Block 10 Misima Gold Mines, N.L., began to operate in 1914 and ceased work in 1922. It worked the Massive lode at Umana and the mine became known as the Umana. The lode worked was apparently the oxidised portion of a large sulphide lode. It was partly due to the proposed treatment of the sulphide ore that the Company ceased operations in 1922. The production by the Company is not known, but judging by the statistics above, it possibly produced about 100,000 oz. of gold bullion.

The Umana mine was subsequently taken over by the Misima Gold Mining Company which operated until 1927-28, its production from 1925-26 being:-

		<u>Ore Treated</u>	<u>Bullion</u>	<u>Value</u>
		Tons	Oz.	£
1925-26	..	11,111	4,351	13,705
1926-27	..	12,571	"	14,217
1927-28	..	3,977	1,038	2,829

The Company was refloated as New Misima Gold Mines Limited and continued operations until 1935, production being as follows:-

		<u>Ore Treated</u>	<u>Bullion</u>	<u>Value</u>
		Tons	Oz.	£
1928-29	..	-	1,029	2,882
1929-30	..	-	2,283	6,584
1930-31	..	10,879	4,599	14,398.9
1931-32	..	-	5,135	25,293.7
1932-33	..	15,038	12,594	28,992
1933-34	..	-	15,630	31,820
1934-35	..	14,762	16,712	37,521.6
			60,082	147,492.2

The Company's operations were exceedingly profitable during, at least, 1934 and 1935 and paid 90 per cent. per annum. In 1935 it sold out to Cuthberts Misima Goldmine Limited and the latter raised the annual amount of ore treated from 15,000 to 40,000 tons and operated till the last available record in 1940-1941, its production being given below:-

		<u>Ore Treated</u>	<u>Bullion</u>	<u>Value</u>
		Tons	Oz.	£
1936-37	..	22,456	21,233	55,264
1937-38	..	-	30,697	72,031
1938-39	..	34,552	31,859	72,768
1939-40	..	-	38,631	77,625
1940-41	..	-	39,658	89,041
			167,978	366,729

Operations were profitable up till 1939 and probably in the later years also.

Other companies conducted testing and developmental work from 1929 onwards and particularly again from 1931. Of these, Gold Mines of Papua Limited was the most important. It was formed in 1933 and carried out considerable developmental work and, according to reports, disclosed a large body of payable ore. At 30th June, 1937, reserves were 400,000 tons including 250,000 tons of oxidised ore with a value of 46/- (Aust.) per ton with gold at 26/18/- (sterling) per fine oz. The operations included the lode on the western fall of Mount Sisa. Production began early in 1938 and was as follows:-

		<u>Ore Treated</u>	<u>Bullion</u>	<u>Value</u>
		Tons	Oz.	£
1937-38	..	-	4,389	3,538
1938-39	..	30,326	26,591	30,755

Production ceased due to a decrease in grade and the unprofitable results. It is reported that although prospecting was carried on until February, 1940, it did not disclose any quantity of profitable ore.

In 1940-41, it was reported that the Gordon's Misima Company was getting plant and also that sluicing was being conducted on Sudest Island.

Active operations were, therefore, in progress in this field up till the latest available report and probably were conducted by Cuthbert's Misima until affected by the proximity of war. It is understood that other prospecting operations were giving favourable results.

2. The Murua field includes Murua or Woodlark Island, 200 miles north-east from the eastern extremity of the island of New Guinea.

Gold was discovered in 1895, a small rich area of alluvial ground yielding 500 oz., and the field was proclaimed in the same year. Reefs were subsequently discovered and production from this source commenced in 1901-02. About 60,000 oz. of alluvial gold were obtained before reef mining began.

In 1905-06, there were three mining centres - Kulumadau, Busai and Karavakum. Five companies were working in that year and produced 8,919 oz. from crushing and cyaniding. In addition, 1,608 oz. of alluvial gold were obtained.

Total production up to different periods is given below:-

		oz.	£
To 30th June, 1909	..	122,100	425,048
" " " 1912	..	150,000	523,251
" " " 1919	..	189,300	676,449
" " " 1926	..	200,300	693,105
" " " 1931	..	206,000	712,956

This table shows a decreasing average annual production from approximately 9,000 to 1,300 oz.

The most important company was the Kulumadau Gold Mining Company which worked from 1903 till 1922, but complete records of production are not available. The Woodlark Queen Proprietary Company worked from 1901 to 1907. Several other but smaller companies also operated from 1904.

Many companies, syndicates and parties worked after 1923, but all appeared short-lived and production was small. The Woodlark King Gold Mining Company Limited was apparently one of the most successful and operated from 1904 until 1928-29.

During 1934-35 and 1935-36, a search was made for dredging areas, but without result.

From 1933-34 to 1938-39, the sand and slimes dumps from previous battery operations, and not already cyanided, were investigated and cyanided for their gold content. The only production figures are 1,279 oz. from 8,254 tons from the Woodlark King dumps and 317 oz. from 13,619 tons from Busai dumps.

No information is recorded since 1938-39. It would appear that the alluvial deposits have been depleted and that the profitable parts of the known lodes and reefs have been extracted.

3. The Gira goldfield is situated on the headwaters of the Gira River which flows north-easterly into the Pacific Ocean, 20 miles south-east from Morobe. The upper part of the field was known as the Aikora. All the gold obtained was from alluvial deposits, but no detailed information is available.

The total production to 30th June, 1931, is 67,680 oz. valued at \$255,113. Except for 191 oz. in 1911-32, there has been no later recorded production. The greater part of the above production occurred before June, 1909, to which date it was 60,622 oz. From its proclamation in 1898, the average annual rate of production was approximately 6,000 oz. - this agrees with the only available figure prior to 1909, viz. 6,000 oz. in 1905-06.

The earlier history is not available, but since 1925-26 the field has been worked by a few individuals. Two companies - The Gira River Sluicing Company in 1926-27 and the Aikora Gold Sluicing Syndicate in 1929-31 - attempted hydraulic sluicing operations but with little success. Dredging claims were taken up in 1925-26, 1929-30 and 1931-32. The Gira River was tested by scout drilling in 1932-33 with unsuccessful results. But the plant could not reach the bedrock and the results are, therefore, not conclusive. Further testing for dredging was done in 1938-9, but progress results did not disclose any great values.

Judging by production figures, the alluvial ground for working by individuals would appear to be more or less depleted. During recent years only one or two men appear to have been working. Some testing has been conducted in the search for dredging areas, but was not successful.

4. The Milne Bay field is situated around the head of Milne Bay and Mullen's Harbour at the eastern end of the Island of New Guinea.

Its early history is not available, but its production for 1905-06 was stated to be 1,000 oz., and in 1907 it was reported to be declining. Its total estimated production up till 1908-09 was 13,612 oz. and to 1925-26 was 14,230 oz. so that little production took place during that period. There was no production between 1925-26 and 1930-31. Apparently the gold was obtained from alluvial deposits.

A slight revival occurred in 1930-31 and later years and attempts were made to work reefs, dredging and alluvial areas. A treatment plant was erected on one lease by 1932-33 and crushing was reported to be commencing. However, in 1934-35, the Samarai Gold Development Company, M.L., transferred its leases, but the operations were not sufficiently successful. In 1937-38, the Juno and Louise mines were operating and the treatment plant on the latter at Oura Oura was re-organised. Three mines were operating on a small scale in 1938-39, but there is no later record of working although such may have continued. The only recorded production during the above period was for 1938-39.

		<u>Ore Treated</u>	<u>Bullion</u>	<u>Value</u>
		Tons	Oz.	£
Rough Ridge Mine	..	1,301	771	6,268
Juno & Jumbo "	..	320	110	552

During the same period, alluvial mining was continued, particularly by natives, but the production was not recorded.

It would appear that the alluvial deposits have been more or less depleted and that the reefs tested have not yielded sufficient quantities of ore to make successful mines.

5. The Yodda goldfield is situated near the Yodda River to the north-east of Port Moresby. The proclaimed field includes a large tract of country between the Owen Stanley Ranges and the north-east coast.

The field was worked for its alluvial deposits and the greater part of the production was obtained in the earlier years. The detailed history is not known, but up till 1908-09 the production was 68,240 oz. with a value of £255,450, the production for 1905-06 being given as 6,000 oz. At the 30th June, 1931, the production was 76,832 oz., valued at £287,128. The rate of production had, therefore, been considerably reduced and it would appear that the easily worked deposits were becoming depleted. From 1925-26 until 1934-35 the field was almost deserted and the production negligible.

In 1932-33, boring operations were carried out on possible dredging areas and in 1934 the Yodda Goldfields Limited Company was formed to work ground on the Upper Mambare River. The plant was transported to the field by air and production began in 1934-35. The Company apparently worked continuously till 1940-41. Complete records of production are not available, but the following indicate the scope of operations:-

		<u>Gold</u> Oz.	<u>Value</u> £
1937-38	..	-	7,480
1938-39	..	1,297	0,047
1939-40	..	1,498	22,053
1940-41	..	865	6,925

A dividend was paid in 1938-39. The Company bored the ground (probably in 1938) with the following results:-

<u>Amount</u>	<u>Value per C.Yd.</u>	<u>Total Value</u>
76,100 c.yds.	4/-	£15,220
135,000 " "	2/-	£13,500
20,000 " "	2/6	£2,500
133,000 " "	4/-	£26,600
<u>364,100 c.yds.</u>		<u>£57,820</u>

During 1938-39, the amount treated was 34,766 cubic yards so that the above reserves represented 10 years of working. However, in 1940-41 the Manager reported "that, although values won during the year were fair there are indications that the gold is petering out" and "if no further payable ground is found, the prospect for 1941-42 is anything but bright".

Although the Company held dredging claims, it is not known if the operations were those of dredging. In any case, the Company apparently changed to sluicing operations in 1938.

It is reported that a second company - the Yodda Prospecting Syndicate - was working in 1940-41. Its production was 425 oz. valued at £3,600.

6. The Keveri field is situated near Mount Suckling on the main range and about 100 miles east from Port Moresby. Access was gained from Cloudy Bay on the south coast.

The field was proclaimed in 1904 and by 1908-09 the production was 3,770 oz., and by 1925-26 was 4,770 oz. There has not been any recorded production since the latter date. A small amount of prospecting and mining was possibly carried out after 1930-31, and in 1934-35 a possible dredging area was tested, but the results are not known.

It would appear that the alluvial deposits were of small extent and quickly worked out.

7. The Lakekamu field is situated in the upper reaches of the Lakekamu River and its tributaries near the border of Papua and about 130 miles north-north-west of Port Moresby. It was proclaimed in 1909 and its area extended in 1931.

As in other fields, the greater part of the production came from the first few years' working. In 1911-12, 6,500 oz. were produced and the total to that period was 17,000 oz. The totals to later periods were:-

		Oz.	£
To 1918-19	..	34,892	30,952
1925-26	..	37,170	38,822
1930-31	..	37,425	38,834

Although there was only a small production after 1925-26, prospecting and testing operations were actively conducted. Several reefs were discovered in 1930-31, but any development work must have given unfavourable results. An almost continuous search for dredging ground was conducted. Interested companies included Tinar Gold Mining Company Limited, Papua Gold Syndicate and Tiviri Gold Dredging Company Limited. The latter appears to have been the only one to reach the production stage. It operated a small bucket dredge for at least two years (1933-34 and 1934-35) and expected to reach the dividend stage, but no information is available. By 1935-36, the activity decreased as testing did not appear to give sufficiently satisfactory results. It cannot be said, however, as to whether the testing was sufficient and satisfactory.

In 1932, B. Dunstan reported that the future of the field depended on:-

1. Hydraulic sluicing of the gravels previously hand-worked by parties and of any unworked areas.
2. Examination of glacial conglomerate to determine if it is the source of the gold.
3. The prospecting and testing of the Upper Tiviri River for dredging areas.

It is not known how far the above recommendations were carried out, but it appears likely that much search was conducted in connection with the third one.

No information is available after 1937-38 and any operations must have been on a small scale.

III. COPPER.

The production has been 12,132 tons of ores and 15,433 tons of matte and blister copper, with a value of £24,673. This value places it second on the list of mineral production.

Two mineral fields have been worked almost entirely for copper - the Sideia and the Astrobe fields.

1. The Sideia field includes Sideia or Basilisk Island, a small island situated immediately east of the south-eastern end of the Island of New Guinea. It was proclaimed in 1915, but after a short

period of prospecting with unsatisfactory results was abandoned.

2. The Astrolabe field is situated on the southern side of the Laloki River to the east of Port Moresby. Access is gained by the Port Moresby - Rouna Falls Road, the distance being 15 to 17 miles. Copper ore was discovered some years prior to 1906, but prospecting began and the field was proclaimed in the latter year. The export of copper ore began in 1906 and continued until 1922, some 12,132 tons being exported in that period, the greatest annual export being 2,700 tons in 1921-22. Most of this ore probably came from the Dubuna mine.

A company - New Guinea Copper Mines Limited - acquired most of the properties in 1922, erected a smelter at Bootless Inlet and continued operations until 1925-26. The Dubuna mine was connected with the smelter by 7 miles of $3\frac{1}{2}$ foot railway and the Laloki mine with the railway by $3\frac{1}{2}$ miles of aerial ropeway. The Company produced 9,040 tons of matte and also 261.5 tons of blister copper. Fires in the mines, difficulties regarding plant and the low price of copper contributed to the cessation of operations.

There was only a very small output of copper ore from 1927-28 to 1937-38.

Mandated Alluvials, N.L., acquired the properties and smelting began in April, 1938. Up to, and including 1940-41, some 1,200 tons of matte were exported. The total of the 1939-40 and 1940-41 production was 925 tons and it contained 235.21 tons of copper, 4,436 oz. of gold and 16,521 oz. of silver, with an estimated total value of £62,080. Ore treated up to the end of 1940 consisted of 14,178 tons from the Sapphire - Moresby King and 4,394 tons from the Laloki mine.

During 1941, the possibility of increasing production was considered by the Commonwealth Copper and Danute Committees. However, the Pacific position prevented any action being taken and there has not been any mining and smelting since 1941.

The ore deposits are lenticular bodies of dense pyritic ore (pyrite, pyrrhotite and marcasite) with chalcopyrite as the primary copper mineral and small amounts of galena and sphalerite. The Laloki body is the largest, the maximum dimensions at the adit level being 450 feet long and 90 feet wide while the body is exposed over a vertical depth of 160 feet. Other bodies are the Sapphire - Moresby King, Dubuna, Sapphire King, Federal and Flag.

Ore reserves were given by Dr. W. E. Fisher at the end of 1941 as follows:-

	<u>Amount</u> Tons	<u>Copper Content</u>	<u>Gold Content</u> Oz. per Ton.
Laloki Mine ..	265,000	4.57	4.13 or 3.07
Sapphire - Proved.	A few hundred.		-
Moresby King Mines. Probable.	9,000	1.7	10
		(Based on production)	

As recently as February, 1943, the Department of the Army refused permission for the re-commencement of operations.

IV. MANGANESE.

Manganese ore has been known to occur for many years, but mining did not commence until 1937-38 and export of the ore began in 1938-39. Since then production increased steadily until 1940-41 in which year 402 tons were exported. The advent of war with Japan affected operations for a short period, but mining is still being conducted.

The deposit being mined is in the Rigo area, situated 40 miles south-east from Port Moresby. In this area and within a radius of 10 miles of the anchorage of Kappa Kappa, at least six deposits are known. This product has been shipped to Australia and used in the manufacture of dry batteries.

Little information is available about the Rigo deposits, but in 1923, H.R. Stanley stated that the manganese deposits were fringes to the hematite deposits (the latter may be the oxidised portions of sulphide bodies). It is not known if this description applies to the bodies recently worked.

The deposit from which the recent production has been obtained is the Gomai-Golo deposit, situated about six miles north-east of Kappa Kappa. It is stated that six separate outcrops have been found and that on testing and development the bodies proved to be very small. Four of these small bodies have already been exhausted and mining is proceeding on the remaining two. The outer portion of the bodies consists of low grade ore and the inner portion of the high grade ore.

Other outcrops are Kinibu-Wainu (said to be worked out), Maite-Golo, Doa-Wagi and Ara-Bada. The Maite-Golo outcrop is stated to be a large one and similar to the Gomai-Golo deposit. The other deposits are low grade.

The ore exported is pyrolusite and is stated to have a content of 86 per cent. MnO_2 .

In view of the reported nature of the deposits and the lack of extensive testing and development, known reserves must necessarily be very small. It is probable, however, that production at past rates (up to 400 or 600 tons per annum) might continue for a few years.

Production of ore would be greatly appreciated by Australian users of battery grade manganese as it is one of the few sources of that grade in Australia and its territories.

V. OSMIRIDIUM.

Osmiridium is a native alloy of osmium, iridium and other metals of the platinum group and has been found in small quantities in almost every alluvial goldfield in Papua. At first, little notice was taken of it and it was not marketed until about 1919.

The total production to date is 971 oz. with a value of \$24,397. Of this production the greater part (about 730 oz.) were produced between 1919-20 and 1924-25. Since 1931-32 the greatest annual production was 8.5 oz. in 1934-35.

The available official reports do not indicate where the osmiridium was obtained, but it was probably mainly from the Gira and Yodda goldfields to the east, north-east and east of Port Moresby. Some was produced from the Lakehamu field. It was shed from the serpentine and peridotites occurring in the Owen Stanley Ranges in those regions. These rocks are present in the headwaters

of the Waria River and at intervals to the south-east at the following places:-

The headwaters of the Gira, Yodda and Kumusi Rivers, Mungoni River and Milne Bay.

It is impossible to give any idea of reserves of osmiridium in any unworked goldfields, but judging by past production, they would be small.

No deposits of osmiridium in the serpentine rock or alluvial deposits with sufficient osmiridium to work solely for that mineral have been discovered.

VI. PLATINUM.

Small quantities of native platinum have been exported since 1933-34 and the total recorded exports are 218.75 oz. with a value of £1,896. The greater part of this was exported in 1933-34 and 1934-35 and the most recently recorded production was 5 oz. in 1940-41.

Available publications do not give the fields from which the platinum was obtained. However, the production followed a reported platinum boom near Milne Bay in 1932-33 and has probably come from the gold deposits in that field.

The platinum would almost certainly be shed from the peridotites and serpentines occurring on the southern side of Milne Bay.

It is impossible to give any idea of reserves in the above type of deposit, but judging by past production they would be very small.

No deposits of platinum in the parent rock, or of alluvial deposits with sufficient platinum to work for that metal alone, have been discovered.

VII. PETROLEUM.

Surface indications of the occurrence of oil are common in many parts of New Guinea, and small quantities of oil have been recovered by boring at Upoia (Vailala River) in Papua and at Matapau in the Mandated Territory.

In point of time, prospecting operations for petroleum in New Guinea fall into four divisions which overlap each other to some extent:

1. By Commonwealth Government prior to the transfer of control to the Anglo-Persian Oil Co.Ltd., 1912-1920. Expenditure:- £131,035.
2. By Anglo-Persian Oil Co.Ltd., as agents for Commonwealth Government, 1920-June, 1925. Expenditure:- £227,256.
3. By private companies from July, 1923 onwards. Amount expended unknown, but very great.
4. Second expedition as under (2), 1927-1929.

5. 1936-1942. In 1936 the conditions under which prospecting for petroleum could be done in Papua and New Guinea were made more liberal. As a result prospecting activities greatly increased. The principal companies engaged have been the Australasian Petroleum Company, Island Exploration Company, Papuan Oil Development Limited. Smaller companies include Oil Search Ltd. (interests later taken over by Australasian Petroleum Company), Oriomo Oil Company, Papuan Apinaipi Petroleum Company Limited.

The Australasian Petroleum Company, the Island Exploration Company and the Papuan Oil Development Limited (especially the former) have made very extensive detailed geological surveys, based on air photographs. They have also done some geophysical work and scout drilling in Papua. Several of the concessions held by these companies have been abandoned after geological examination.

As a result of its investigations the Australasian Petroleum Company selected a site for a deep test at Kariava on the Vailala River. When drilling operations ceased on 10th January, 1942, this well had reached a depth of 5,117 feet. Some small gas showings were obtained in this well but the results generally are considered rather discouraging.

This Company is reported to have expended more than £1,000,000.

Three wells designed as tests have been drilled at Oiapu by the Papuan Apinaipi Petroleum Company. The first was located too far off the axis of the structure and drilling was suspended at a depth of 2,769 feet. The second was located at the southern end of the structure and was abandoned in volcanic rocks at a depth of 1,844 feet. The third test was located on local closure on an anticlinal axis at the north end of the structure. When operations ceased at Oiapu on the 31st December, 1942, this well had reached a depth of 1,844 feet and was in volcanics. It is still not known whether these volcanics are intrusives or interbedded extrusives. Future policy with regard to drilling in this locality largely depends on this problem being solved.

It has, so far, not been demonstrated that there is an oilfield anywhere in Papua or New Guinea. A considerable amount of field work and some drilling has been done, but operations are still in the prospecting stage.

VIII. COAL.

The coal seams of Papua are described by E.R. Stanley as follows:-

"Seams of coal occur in the Tertiary formations of the Gulf, Delta, and North-Eastern Divisions. They are lignitic in character, are associated with the petroleum beds, and contain up to 24 per cent. of moisture. Many of the seams attain a reasonable thickness, but are situated in the remote hinterland, thus rendering it impossible to be even considered a commercially workable brown coal. Large blocks of hard, glistening coal have been reported from the Upper Kikori, which may be Mesozoic, as rocks of that age are known to exist in the area".

H. G. Raggatt.
DIRECTOR

Canberra, A.C.T.
17th August, 1943.

P. B. Nye.
ASSISTANT DIRECTOR.

- MINERAL PRODUCTION - PAPUA -
(From 1928 based on export figures)

YEAR	GOLD				PLATINUM		OSMIRIDIUM		COPPER			MANGANESE ORE	
	BULLION AND NATIVE GOLD		GOLD ORE						ORE	MATTE			
	Quantity Ozs.	Value £	Quantity Tons	Value £	Quantity Ozs.	Value £	Quantity Ozs.	Value £	Quantity Tons	Quantity Tons	Value £	Quantity Tons	Value £
1888-1889	3,850	14,387	-	-	-	-	-	-	-	-	-	-	-
1889-1890	3,470	12,440	-	-	-	-	-	-	-	-	-	-	-
1890-1891	2,426	8,371	-	-	-	-	-	-	-	-	-	-	-
1891-1892	1,235	4,322	-	-	-	-	-	-	-	-	-	-	-
1892-1893	1,200	4,500	-	-	-	-	-	-	-	-	-	-	-
1893-1894	1,128	3,906	-	-	-	-	-	-	-	-	-	-	-
1894-1895	728	2,565	-	-	-	-	-	-	-	-	-	-	-
1895-1896	12,840	45,000	-	-	-	-	-	-	-	-	-	-	-
1896-1897	20,860	73,085	-	-	-	-	-	-	-	-	-	-	-
1897-1898	15,822	56,682	-	-	-	-	-	-	-	-	-	-	-
1898-1899	17,550	64,425	-	-	-	-	-	-	-	-	-	-	-
1899-1900	24,450	89,075	-	-	-	-	-	-	-	-	-	-	-
1900-1901	21,703	79,060	-	-	-	-	-	-	-	-	-	-	-
1901-1902	20,873	76,047	-	-	-	-	-	-	-	-	-	-	-
1902-1903	24,048	87,545	-	-	-	-	-	-	-	-	-	-	-
1903-1904	23,380	84,930	-	-	-	-	-	-	-	-	-	-	-
1904-1905	22,729	82,736	-	-	-	-	-	-	-	-	-	-	-
1905-1906	24,227	87,869	-	-	-	-	-	-	-	-	-	-	-
1906-1907	16,103	58,886	-	-	-	-	-	-	137	-	4,098	-	-
1907-1908	14,557	51,024	-	-	-	-	-	-	176	-	2,479	-	-
1908-1909	14,710	51,108	-	-	-	-	-	-	67	-	1,340	-	-
1909-1910	16,151	60,181	-	-	-	-	-	-	72	-	1,439	-	-
1910-1911	18,497	68,803	-	-	-	-	-	-	403	-	12,386	-	-
1911-1912	17,047	60,628	-	-	-	-	-	-	594	-	9,681	-	-
1912-1913	18,247	64,115	-	-	-	-	-	-	1,285	-	18,997	-	-
1913-1914	14,666	50,110	-	-	-	-	-	-	1,150	-	19,733	-	-
1914-1915	15,290	51,221	-	-	-	-	-	-	695	-	5,606	-	-
1915-1916	10,930	43,248	-	-	-	-	-	-	1,156	-	19,051	-	-
1916-1917	9,678	37,988	-	-	-	-	-	-	2,096	-	40,883	-	-
1917-1918	12,168	33,512	-	-	-	-	-	-	1,112	-	11,572	-	-
1918-1919	11,769	26,641	-	-	-	-	-	-	224	-	1,613	-	-
1919-1920	11,751	21,757	-	-	-	-	88.5	2,930	10	-	107	-	-
1920-1921	13,232	18,478	-	-	-	-	208	6,245	255	-	1,830	-	-
1921-1922	52,704	58,615	-	-	-	-	56	959	2,700	-	13,514	-	-
1922-1923	17,033	22,494	-	-	-	-	145	2,790	-	1	14	-	-
1923-1924	2,166	6,702	3	30	-	-	119	3,533	-	8	120	-	-
1924-1925	4,947	17,642	1	200	-	-	116	3,630	-	2,069	41,674	-	-
1925-1926	7,746	27,134	4.45	580	-	-	50	1,500	-	11,466	201,732	-	-
1926-1927	8,140	26,124	6	856	-	-	26	430	-	582	35,799	-	-
1927-1928	2,408	7,240	6	820	-	-	36.5	550	-	16	208	-	-
1928-1929	2,287	6,767	3	137	-	-	28.75	375	-	-	-	-	-
1929-1930	3,634	10,632	1.75	606	-	-	28.75	500	-	8.25	194	-	-
1930-1931	6,923	22,440	1.25	146	-	-	46.75	700	-	-	-	-	-
1931-1932	8,574	34,338	4.75	475	-	-	.75	12	-	1.5	60	-	-
1932-1933	15,268	45,383	3	1,008	-	-	-	-	-	-	-	-	-
1933-1934	19,496	45,933	7.25	1,111	96	794	-	-	-	2.25	70	-	-
1934-1935	21,732	68,922	4.25	1,108	46	318	8.5	112	-	-	-	-	-
1935-1936	26,199	81,034	1	751	21	171	-	-	-	2	10	-	-
1936-1937	33,580	87,003	28.25	4,772	8	94	5	59	-	-	-	-	-
1937-1938	41,308	108,141	52	1,597	41.25	413	3.5	40	-	44.5	2,300	-	-
1938-1939	64,622	150,198	67.5	1,905	1.5	51	4	30	-	307.5	34,655	54	314
1939-1940	46,239	135,879	46.25	3,742	-	-	-	-	-	517.75	37,510	194.75	1,380
1940-1941	14,056*	133,341	-	-	5	55	-	-	-	407.25	5,999	402.25	3,244
TOTAL:	856,377	2,670,607	240.65	19,844	218.75	1,896	971	24,395	12,132	15,433	524,673	651	4,938

* Export figure used from 1928-

* As given in statement of exports Ann.Rep.Territory of Papua; possibly misprint for 44,056.

ø As shown in statement of exports; either value or quantity incorrect.