GOLD OCCURRENCES IN CENTRAL QUEENSLAND

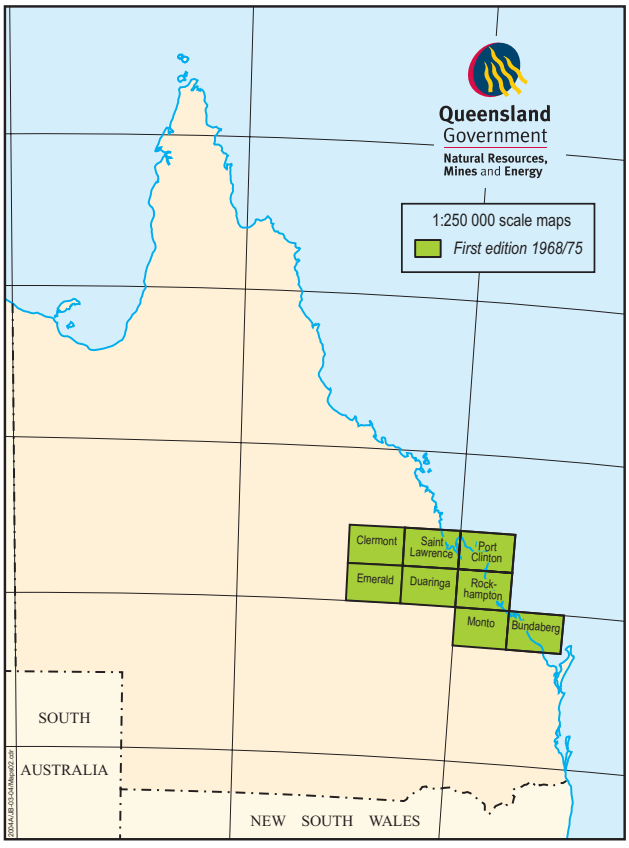
Extract from the Queensland Mining Guide

No attempt is made in this portion of the Mining Guide to deal with the past history of the various mining fields or to describe the many mines being worked in the State. The object rather is to show - both to the individual prospector and to the mining investor - some of the mining possibilities of each of the districts mentioned, passing reference being made to particular mines in certain cases only. Slight reference only has been made to geological features.

The relative importance of deposits and districts mentioned cannot be gauged by the lengths of the references in these notes. On many of the old fields the conditions are well known, or can be ascertained at the main centres. Special attention has been drawn to some of the lesser known fields.

Any person or company desirous of obtaining further details in relation to any of the nines, deposits, or localities referred to should communicate with the Department of Natural Resources, Mines and Energy Brisbane, or with the nearest Warden, Inspector of Mines, or District Geologist.

General area covered by this report



The Reworking of Deposits

The fact that certain ore-bodies were worked years ago and were abandoned does not necessarily imply that such deposits cannot be worked profitably under different conditions. The metal market is always a primary factor in deciding the success or failure of mining ventures. The utilization of modern methods of mining and treatment may bring renewed life to some mines.

Some of the causes of work have been discontinued in mines are:

(1) Want of sufficient capital to explore and develop deposits thoroughly

(2) High cost of transport of ore to treatment works

(3) The premature erection of costly plants at mines before requisite values and quantities of ore have been proved

(4) Failure in prosperous periods to build up a reserve fund for the express purpose of carrying out further developmental work

(5) Exceptional conditions such as drought, flooding and labour difficulties.

Any person wishing to investigate the further possibilities of any worked deposits or desiring to renew in any locality the search for any particular mineral should weigh all the known factors relating to the closure of previous workings. Some of the factors may be gathered from these notes; others can be obtained from official records or from officers of the Department of Mines stationed on the various mining fields.

Fresh Discoveries

Although most of the larger and more obvious outcrops of mineral deposits have been located and tested to some extent there are still possibilities of new discoveries within the metalliferous areas of the State.

The fact that in these notes some localities are mentioned as being worthy of further prospecting does not indicate that the other localities referred to should not also be prospected. The special mention is made only in cases where some of the factors making for success are known.

THE CENTRAL DISTRICT

Gaeta Goldfield (56km by road north-west of Gin Gin). On this small field an auriferous fissure reef was worked in the oxidized zone over a length of 800m, the last year of operations being 1907. The mine was unwatered in 1933 and has since been inspected by various interests, but without active results. Departmental drilling to test below the workings failed to intersect gold values of economic significance.

Rosedale (55km by rail north-west of Bundaberg). Gold occurs at Bellbooth.

Glassford Creek Mining Field (13km west of Many Peaks). The more important gold-copper deposits at this centre were exploited between 1905 and 1907, when a local smelter operated. Production (of an intermittent nature) has since been confined to odd shoots of copper ore, which occasionally carry over 30 g of gold per tonne. Large quantities of cupriferous lode material exist in the vicinity of the main workings, but development work alone would indicate how much of this contains sufficient values in copper, gold, and silver to constitute ore.

Many Peaks (93km by rail south of Gladstone). The large ore-bodies of the Many Peaks mine supplied 508 000 tonnes of heavy sulphide fluxing ores to Mount Morgan between 1910 and 1918. Copper and gold values are probably too low to allow of future exploitation for those metals alone.

Cania and Kroombit Fields (40km by road from Monto). A large quantity of alluvial gold was recovered in the past. Dredging was attempted, but it was not a success. There is little prospecting at the present time.

In the *Gladstone* district there has been considerable gold-mining at *Calliope* (26km from Gladstone), *Barmundoo* and *Rainbow* fields (50 to 60km south-west of Gladstone), *Norton* (Milton) gold field (53km south of Gladstone) *Monal* (68km south of Gladstone), and *Bompa*

(71km south-east of Gladstone). There has been little work in recent years. On each of these fields, alluvial mining gave place to reefing and it seems that, particularly in the case of the Norton field there were treatment difficulties once the oxidized zone was passed. Future activity on these fields will probably depend on the possibility of reworking the old mines with modern methods of treatment. More recently developed was a small gold mine at *Rodd's Peninsula.*

Langmorn Goldfield (west of Gladstone). Numerous reefs were worked for gold, but no great depths have been attained. There has been some activity more recently at Targinie.

Mount Morgan (39km south-southwest of Rockhampton). At Mount Morgan large-scale open-cut mining operations for mamy years provided the States principal production of gold and a substantial contribution to its copper production. The pyrite tailings are a potential source of sulphur.

Struck Oil and *Dee River* (8km from Mount Morgan). Rich deposits were worked in previous years, the Dee River deposits being noted for the size of nuggets obtained. Miners still prospect there occasionally.

Mount Usher (26km south of Rockhampton). Gold was discovered in the alluvial flats towards the head of Gavial Creek and these have been extensively worked above the township of Bouldercombe by prospectors and on a larger scale by dredge to depths up to 10m. The last period of major activity ended in 1945. Quartz mining has been carried on successfully on the Mount Usher Anglo-Saxon, Elsie and Victor lodes. It is possible that further payable reefs or leaders will be found. The area is characterized by rich but small shoots.

Rosewood Goldfield (52km west of Rockhampton) and *Ridgelands* (32km north-west of Rockhampton). These fields have produced much alluvial gold. Very little reefing has been done. There is spasmodic prospecting.

Morinish (56km by road north-west of Rockhampton). On and at the head of Louisa Creek a large quantity of alluvial gold has been obtained. Auriferous reefs have been worked to some extent in recent years at Hunters Gully and Blackfellow's Gully, but operations have now ceased.

Mount Cassidy (72km north-west of Rockhampton). Discovered in 1930. A fair-sized body of low-grade gold ore was proved, but values decreased rapidly at shallow depth. There is scope for prospecting at greater depth.

Mount Chalmers (29.5km by rail north-east of Rockhampton). Reserves of low-grade gold-copper sulphide ore remain in the Mount Chalmers mine, which may be amenable to treatment by modern metallurgical methods. The prospects of the mine, and of the surrounding area, for further production have recently claimed the attention of major mining groups.

Alluvial gold has been worked at New Zealand Gully in the same area.

Cawarral (32km north-east of Rockhampton). A centre where a number of reefs were worked to the sulphide zone. They have long been abandoned. A large amount of gold was previously won from Mount Wheeler a few kilometres away while near Bondoola, 14.5km north of Cawarral small quantities of reef gold have been won.

Canoona Field (48km north of Rockhampton). One of the oldest goldfields in the State, it was essentially an alluvial field. It lies within a belt of serpentinite which extends north-westwards to Princhester and Marlborough. In this belt, deposits of chromite, nickel, magnesite and asbestos (including thin veins of chrysotile) are known, and high-quality chrysoprase is bcing produced, lateritic cover has been investigated for exploitation of its low nickel content.

At *Torilla,* on the Broadsound Peninsula, 64km by road from Kunwarara disconnected sulphide-bearing lenses in small but rather persistent fissure veins have been worked for gold to a maximum depth of 37 m.

Clermont (369km by rail west of Rockhampton) is the centre of what is essentially an alluvial deep lead field. Apart from deposits in the vicinity of the town, the principal areas are McDonald's Flat, Black Ridge, the Springs, Miclere and Apsley. The leads have been worked extensively since their discovery in the eighteen sixties. In more recent years the old Miclere deep leads were the main centre of activity. These have been virtually exhausted in the shallower ground, and the field is now almost deserted. Future prospects are bound up with the economics of exploitation of the deeper group below about 60 m. Reef mining on the field has languished since 1901.

THE BUNDABERG 1:250 000 SHEET AREA (GSQ Report 90)

Gaeta Mining Field

Seven distinct quartz fissure reefs occur within the 3.75km^2 of the Gaeta Mining Field, 42km west-northwest of Gin Gin. The most important of the reefs was the Pioneer, which was worked in the early 1880s, between 1904 and 1906, in 1910, 1912, and the late 1940s. Some smaller reefs in the area have also been prospected. The quartz reefs are steeply dipping and generally strike in a south-easterly to east-south-easterly direction. They occur in a quartz diorite, which probably represents the younger Triassic phase of the composite Permo-Triassic Miriam Vale Granodiorite. Many large xenoliths of hornfelsed sediments of the Curtis Island Group, exposures of pegmatite and granodiorite, and intermediate and acid dykes occur in the general vicinity of the reefs. The mineralisation is post quartz diorite, but probably still Triassic in age.

The Pioneer reef was mined in three main sections up to a maximum depth of 55.5m and a maximum thickness of 60cm. Minor pyrite, pyrrhotite, and chalcopyrite occur in the hanging wall and footwall sections. Gold values ranged from about 54g per tonne in the oxidised part of the reef to a weighted average of 29g per tonne at the 55.5 m level in the Main shaft and 15g per tonne of primary ore in the Miller shaft section in the north-west part of the reef.

Production from the Gaeta area for the period 1880 to 1882 is recorded as 8.43kg of gold from 482 tonnes of ore, but Denmead (1939) suggests that the tonnage mined may have been 1352 tonnes containing an average of 10.7g per tonne, with recovery only about 50 per cent. From 1904 to 1906 the Gaeta Pioneer Mining Company crushed 1923.5 tonnes of ore for 47.9kg of gold, and during the period 1910 to 1912, 35.6 tonnes of ore yielded 529g of gold. Siemon reported that 4064 tonnes of tailings may have been treated in 1932 and another 183 tonnes (for 435g of gold) in 1947. Although attempts were made to mine the Pioneer reef in the late 1940s, they were unsuccessful. A recent programme of diamond drilling carried out by the Mines Department failed to locate any mineralisation of economic grade. The reef was located beneath the known level of workings, but the maximum grade intersected was only 5.5g of gold per tonne and 4.0g of silver per tonne over a true width of 58cm.

Other areas

Some small mines and prospects occur within the Miriam Vale Granodiorite and in Palaeozoic sediments and volcanics adjacent to their contact with the granodiorite. None of these is of economic importance. All are of restricted lateral and vertical extent and are associated with small quartz fissure lodes or veins. From south to north they are:

Garson's gold mines are located 8km northwest of Gin Gill in sheared argillaceous sediments of the Biggenden Beds. Two leases were held over this area in the 1930s. The main reef of quartz and calcite strikes 220° and dips 50° south-east; it is strongly faulted and apparently cuts out at 15.2 m depth. Trial crushings totalling 44.7 tonnes yielded 674g of gold; the battery sands assayed at between 9 and 11g of gold per tonne. No further production is recorded.

The Mount Bania gold prospect is located 31km west-north-west of Gin Gin; it is also known as the "Red Streak". Gold occurs together with pyrite in altered ('gossanous') and irregularly shaped masses of porphyritic granophyre in Miriam Vale Granodiorite. Some areas were reported to contain 23g of gold per tonne, but assays generally showed less than 5g of gold per tonne. Trial crushings in 1935 yielded 200g of gold from 39.6 tonnes of ore. The irregular and patchy nature of the mineralisation reduces the economic potential of this deposit. Traces of molybdenite and a copper silicate were reported to occur in thin quartz veins in the area.

The Tararan gold prospect is located near the Bruce Highway 22km north-west of Gin Gin. Very thin, north-west-striking veins or partings of quartz occur in biotite schist developed in the Curtis Island Group 40m from its contact with the Miriam Vale Granodiorite. No production is recorded although 300 to 375g of specimen gold were collected.

The Cherry Bell prospect is located 18km north-west of Gin Gin. An 8 to 25cm quartz vein of approximately 24m length in biotite granite averaged only 7.8gm of gold per tonne. A trial crushing of 3 tonnes in 1933 assayed 18.4 g of gold per tonne. No production is recorded.

The Busy Bee prospect is located about 5km north of the Cherry Bell. Denmead reported that of several quartz veins in altered sediments, lavas, and granite in the area, only one is gold bearing Assays of 13.5g of gold and 3.1g of silver per tonne were considered far from encouraging.

The Bell Booth mine (also called Curd' s prospect), is located near the Busy Bee. Auriferous veins striking 120° with vertical dip occur in a small body of granite up to 300m from its contact with the altered sediments. A sample yielded 9.2g of gold and 3.1g of silver per tonne. No production is recorded from either of these prospects.

Low gold values are recorded from an area about 8km north-north-west of Rosedale.

In the far north of the Sheet area the Jackass mine is located on a quartz fissure reef in poorly exposed Miriam Vale Granodiorite, 25km north of Miriam Vale. The reef and an associated ironstone leader strike about 275° and dip an average of 60° south. The fissure ranges in width from a few centimetres to up to 2.7 m. Stillwell described the ore as comprising quartz, calcite, chlorite, and pyrite, with very minor quantities of arsenopyrite, chalcopyrite, sphalerite, galena, tetrahedrite, native bismuth, and gold. The gold occurs both free in the quartz and in the chalcopyrite and pyrite. The reef was mined in 1939 and in the period 1948 to 1953. The grade of ore worked varied considerably up to a maximum of 47.5g of gold per tonne. A representative sample of sulphide ore assayed 44.8 g of gold per tonne. Production in 1939 is recorded as 62g of

gold from 2.5 tonnes of ore, but between 1948 and 1953 a total of 309.23 tonnes of ore from two shafts working a 27m long ore shoot to a depth of 14.6m yielded 10.3255kg of gold and 1.3250kg of bullion.

THE MONTO 1:250 000 SHEET AREA (GSQ Report 46)

The main centres of past production in the Monto Sheet area have been Glassford, Many Peaks and Mount Cannindah (copper); Calliope, Milton (Norton), Monal and Cania (gold). The deposits were worked during the latter part of the nineteenth century and the early twentieth century. Active mining in the area has virtually ceased, and the only recent production has been from the precipitation of copper from the mine waters at Mount Cannindah. Much of the sheet area has been investigated by mining companies, but, to date, no major mining developments have taken place.

The more important deposits are described under the Gold and/or Mineral Field in which they are located. Minor gold and base-metal occurrences which have not been worked beyond the prospect stage are listed, but not described.

Mineralization is restricted to the Palaeozoic rocks, and to the Upper Permian and Lower Triassic granitic rocks.

Cold mineralization in both granitic and sedimentary units, occurs in narrow veins, composed of quartz, or quartz and calcite, and is accompanied by abundant sulphide mineralization (pyrite, arsenopyrite, chalcopyrite). The relatively small size of the "reefs", combined with their refractory nature, were, and still are, major difficulties in development.

BARMUNDOO (TABLELANDS) GOLDFIELD

The Barmundoo Goldfield. 253 square miles in area, was proclaimed in 1894, following the discovery of gold in the Tablelands area in 1887.

Access to the area is by road from the Biloela-Gladstone road, by way of station tracks. The Tableland area lies between the headwaters of Dan Dan Creek and Crimean Creek.

Gold was won from both alluvial and reef deposits. The reefs are narrow, and consist of sulphide-bearing quartz veins in a granodiorite stock. The oxidized and gossanous portions of the reefs were quickly worked out, and the refractory sulphide ores were not suitable for treating on the field. Transport difficulties further complicated the exploitation of the deposits since access roads to the area are subject to flooding in wet weather.

The alluvial deposits derived from the reefs were of small size, and are considered to be worked out.

The most recent period of activity was between 1930 and 1940. Several inspections were made by departmental geologists, but prospects were generally poor. Small gold occurrences are known elsewhere within the goldfield area, but are not of commercial importance.

The rock in which the reefs occur is granodioritic in composition, and fresh material is difficult to obtain The mass is probably related to the Galloway Plains Tonalite.

The Barmundoo Goldfield is not considered to offer any potential for future development on a large scale.

CANIA GOLDFIELD

Gold was discovered near Cania in 1870 and the Cania Goldfield was first proclaimed in 1871. It now has an area of 85½ square miles. Both alluvial and lode deposits were worked, but most of the production was from the alluvial deposits.

Access is by road from Monto to the site of the former township of Cania.

The history of the Cania Goldfield was reviewed in 1934 by Illidge.

The deposits were worked in a most desultory way; periods of intense activity alternated with periods of complete inactivity.

Several attempts were made to work the alluvial deposits by dredging, the first in 1900. This venture was abandoned in 1901 because of operational difficulties and poor returns. The 'wash' contains large boulders, above the payable material, and cost of removing the boulders was excessive.

Further dredging was attempted in 1934-1935, but was not successful. Since 1945, further attempts to work alluvials have met with little success, and the field was idle at the time of writing this report.

Lode deposits were worked to shallow depths, since sulphides are present in the unoxidized portions of the reefs. Quartz is the principal gangue mineral. Gold occurred in small "patches" of rich ore, in barren material. The lodes are narrow, and are difficult to work because of these irregular values. The most recent underground work was carried out between 1933 and 1944, when several reefs were worked. Ore was crushed at batteries on the field, but no cyanidation plant was used. Considerable losses of gold occurred in tailings.

Production details for the Cania Goldfield are incomplete, since much of the production of alluvial gold in the nineteenth century was not recorded.

The field is not considered to offer any potential for future production on a large scale.

A minor occurrence of galena at Mount Prospect is within the area of the Cania Goldfield. The galena occurs in veins in the Wingfield Adamellite. The occurrence is not considered to be of any commercial interest.

MILTON (NORTON) GOLDFIELD

Gold was discovered on Norton Creek by Williams and Lett in 1871. The Milton (Norton) Goldfield, 26 square miles in area, was proclaimed in 1879.

The mines are situated near Norton Creek, approximately 5 miles upstream from its junction with the Boyne River. Access is by vehicle track from the Gladstone-Many Peaks road.

At the time of Rands' inspection of the field, several reefs were being mined. Shafts had been sunk to nearly 400 feet in both the 'Advancer' and "Who'd-ha' thought-it", and others were more than 100 feet deep. Hall inspected the mines in 1906, and his report includes detailed descriptions of the workings and a map showing the location of the individual deposits.

Almost the entire production of the Norton Goldfield has been from the reefs. Gold occurred in 'compound veins' or "formations", consisting of altered granitic rocks, veined and impregnated with secondary minerals. Quartz and calcite are the principal gangue minerals. Sulphide minerals are present in the veins below the water table, and their presence caused considerable difficulty in the extraction of the gold and silver. Ball records the presence of pyrite, sphalerite (blende), chalcopyrite, arsenopyrite (mispickel), galena and marcasite in the ores. The reefs occur in a grey granodiorite, an extension of the Miriam Vale Granodiorite, separated from the main part of the intrusion by a younger body of Castletower Granite.

Production figures for the field are incomplete, but Ball lists principal crushings and returns for the period 1878-1905, amounting to 16, 630 ozs of gold. The Annual Report of the Department of Mines for 1890 records a production of 2, 328 ozs. in addition to Ball's total. It is probable, then, that the total production exceeded 20, 000 ozs. Silver is present in most of the reefs.

This field is considered to offer some possibilities for further exploration and development, since metallurgical problems in gold extraction were the principal cause of closure of the mines. However, the existing price of gold is too low to inspire interest in this and other small fields.

Ball reported that attempts had been made to treat the ore by roasting and chlorination, without success. The possibility of treating the complex ores by flotation has not been investigated.

MONAL GOLDFIELD

This goldfield has an area of 104 square miles, the principal centre of activity being Mount Hector.

Access to the area is by way of secondary roads and station tracks from the Monto-Many Peaks road. There has been very little activity in the area since 1946.

Most of the gold was obtained from sulphide-bearing quartz veins in rocks of the Crana Beds. which were worked in several places. Principal mines were the Lady Griffiths, Mount Forrest, Trident, Great Eastern, Southern Cross and United Rise.

Gold production from the Monal Goldfield is approximately 20, 000 ozs. Shepherd stated that recorded production from Monal over the period 1891-1904 was 19,000 ozs.

Reid reported the occurrence of scheelite in rocks of the Glassford Complex, approximately 4½ miles from Littlemore. This is within the Monal Goldfield.

The Monal Goldfield is considered to be of little further potential, because of the small size of the individual reefs. The possibility of small-scale operations is not discounted, and any further prospecting in the area should be directed to the contact between the Glassford Complex and its country rocks.

MOUNT RAINBOW GOLDFIELD

The Mount Rainbow Goldfield has an area of 14 square miles. It includes Mount Buckland and Specimen Hill at the headwaters of Collards Creek. Access is by track from the Biloela -Gladstone road, Cameron visited the workings and described the local geological features.

The deposits occur in deep leads beneath Tertiary basic lavas, and as reefs within the Galloway Plains Tonalite. The reefs are narrow, and contain arsenical sulphides. Production from the field is of the order of 8,000 ozs. (Annual Reports of the Department of Mines).

There has been little activity on the field for many years, and it is not being worked at present. It is not considered to offer any potential as a major gold producer in the future.

GLASSFORD CREEK MINERAL FIELD

The Glassford Creek Mineral Field includes two centres of former mining activity, Glassford and Many Peaks. The field, which has an area of 97 square miles, was proclaimed in 1900, and includes the former Bompa Goldfield.

Glassford

The deposits were first discovered in 1893, and copper mining commenced in 1899, after unsuccessful attempts to mine silver and gold.

Glassford township (now abandoned) was situated on Coppermine Creek, 14 miles by road from Many Peaks. Access, for four-wheel drive vehicles only, is from the Many Peaks -Monto road. The track follows the course of Coppermine Creek, and was a major difficulty in the exploitation of the deposits.

The deposits were first worked by the Bompa Syndicate, from 1899 to 1903. This syndicate had failed in its attempts to smelt the ore when the Glassford Creek Copper Mining Company commenced its operations in 1905. This company was unable to work the deposits at a profit, due to a combination of factors including transport difficulties, 1ack of sufficient sulphide ores. and a fall in metal prices in 1907. Minor development work was continued until 1910. Small parcels of ore were produced between 1915 and 1918, and from 1932 until 1945, although none of this ore was smelted at Glassford. There has been no production since 1945.

The ores are of contact-metasomatic type, and they occur associated with skarns, developed from rocks of the Caswell Creek Group. Tile skarns occur as roof pendants within the Glassford Complex, within a short distance of its contact with the sediments. Garnet and magnetite are the principal gangue minerals in the primary ore; the magnetite has altered to hematite in the oxidized zones. Copper minerals present are chalcopyrite, bornite and chalcocite; other sulphides present are sphalerite and galena. Gold and silver are associated with the copper mineralization.

The principal workings were the Blue Bag and the Lady Inez, which lay at the north and south, respectively, of a line of workings which extends for more than a mile. Ball described the workings and general geology, and Shepherd described the workings during the last period of operations in the area. Workings at both the “Blue Bag” and “Lady Inez ” consist of open cuts in the oxidized (surface) deposits, with several shafts and drives to work below the open cuts.

Production amounted to 18.116 tons of ore, for a yield of 724 tons of copper, 2.540 oz. of gold and 23.250 oz. of silver. Shepherd (1942) stated that reserves of up to 20,000 tons of 3 percent ore could be present in the Blue Bag area and up to 200,000 ton; of 2.3 percent ore in the Lady Inez area. The iron oxide minerals are not considered to be potential producers of iron ores.

MOUNT JACOB (BOMPA) GOLD MINES

A small group of gold workings is situated in the foothills of the Bobby Range, on the headwaters of the Boyne River. No present vehicle access is known, and the mines were not visited during the recent mapping.

The mines were first worked in 1889 and had been virtually worked out by 1905. Illidge reviewed the history of the field to that time, listing a production of approximately 9,400 ozs of gold. The deposits have not been worked since 1924, and are not considered to be of potential interest, since they are small, and mineralization is patchy.

The area in which the mines are situated is mapped as Castletower Granite, on air photo interpretation. No other mineralization is known in this mass.

MOUNT CANNINDAH MINERAL FIELD

This field, of 2¼ square miles, was proclaimed in 1892. It is situated on Cabbage Tree Creek, in the Dawes Range, and is 12 miles south –south-west of Many Peaks.

Access is by vehicle track from the Many Peaks-Monto road, near Kalpowar.

The area was first prospected for gold; copper deposits were discovered after work had commenced on the alluvial gold deposits in Cabbage Tree Creek. Rands described the early activity of the area in both gold and copper mining. Ball described the general geology and the workings of the Mount Cannindah Copper Mine. He presented a detailed chronological table of development of the mine up to 1914.

Minor gold occurrences are: Glandore, Monal (Eastern Star), Maxwelton, Mount Blowhard Yarrol

ROCKHAMPTON and PORT CLINTON 1:250 000 SHEET AREAS (GSQ Report 38)

Nine proclaimed Goldfields lie within the Rockhampton and Port Clinton Sheet areas, and gold occurrences are discussed for each field. Some gold mines were located outside proclaimed fields. In each field the initial discovery was of alluvial gold, and reef mining developed subsequently. Although some of the reefs were very rich, most were small and few sustained mining operations for long periods.

Most occurred in granitic rocks or in the country rocks adjacent to the granitic rocks. These reefs are associated with intrusive rocks of at least four ages, viz. Middle Devonian, late Lower Permian, late Upper Permian, and possibly Cretaceous. Gold near Mount Wheeler may be associated with the Upper Cretaceous plug forming Mount Wheeler. However in some places, notably Mount Chalmers there is no obvious source for the gold or control of mineralization.

Canoona Goldfield

The first gold rush in Queensland occurred at Canoona, 25 miles north-west of Rockhampton, where gold was discovered along Bonnie Doon Creek in 1858. Several thousand people rushed to the area, and the gold was rapidly worked out. Approximately 40, 000 oz of gold were produced to 1860, but there was very little production thereafter. Few reefs were subsequently found in this area.

Dunstan stated that the Britannia Mine, located just north of Mona Vale Homestead, worked a quartz reef which contained pyrite, chalcopyrite, galena, and sphalerite The gold content was reported to be 6 oz/ton, but no production figures are recorded.

The Oaks View Mine, located on Oaks View Hill, about 11 miles north of Canoona, was described by Ball. Gold was discovered here in 1903, and mining began in 1904. The gold, which was very irregular in its distribution, occurred in quartz veinlets forming a boxwork in a fissure in serpentinite. This fissure was possibly a fault zone. Recorded gold production, including treatment of tailings, to 1912 when operations ceased, was 4694 oz.

Reid described an unusual, gold occurrence in serpentinite, 1 mile south-west of Canoona Railway Station. Here 75 oz of gold were found as slugs up to 10 oz in weight in a fissure in serpentinite However no further discoveries were reported.

Reid also described the Satan workings, 7 miles from Canoona. These were on a white quartz vein containing some patches of pyrite, in fine-grained sediments intruded by andesite and quartz porphyry dykes. However the gold content was very low, and very little gold appears to have been produced.

Alluvial gold was discovered at Morinish, 35 miles west of Rockhampton, in 1866. The gold was very patchy in its distribution, and reef mining soon became dominant.

Jack described the Welcome Reef as quartz containing pyrite, arsenopyrite, and minor galena and sphalerite, in fine-grained greywacke. This appears to have been the main mine in the area. The only production figures recorded are for 1899 and 1900 when 3.965 tons of tailings were treated for 2, 636 oz of gold. The Alliance Mine is recorded by Dunstan as having worked a quartz reef containing native copper, redruthite, tenorite and other copper ores. Recorded production from this mine from 1889 to 1904 is 1883 oz of gold from 3,128 tons of ore, and 845 oz of gold from tailings. The Mount Morinish Mine produced 1 029 oz of gold from 1, 076 tons of ore from 1889 to 1906. Dunstan described the Mary Florence Reef on Blackfellow's Gully as a quartz reef containing chalcopyrite, galena, and spalerite. No production from this reef is recorded.

Gold has also been produced from deep leads in Hunter's Gully. The gold occurs in wash of probable Cretaceous age up to 13 feet thick. The wash consists of pebbles of chert, shale, and quartz, and rare cobbles of igneous rocks up to 6 inches in diameter, set in a cemented gritty matrix containing magnetite and ilmenite grains. Only the basal two feet of the wash contained gold. There were no defined gutters and the gold was very patchy in its distribution. The conglomerate unconformably overlies indurated Lower Carboniferous shale, and is overlain by green unctuous clay containing coaly laminae, which in turn is overlain by Cretaceous basalt. The first recorded production was in 1909 and 1910, when 80 oz of gold were produced from 91 tons of wash. Mining recommenced in 1935, and up to 1939 a further 914 oz of gold were produced from 811 tons of wash. A further 221 oz were produced from 1939 to 1946.

Ridgelands Goldfield

Gold was discovered at Ridgelands in 1866. Some of the patches of alluvial gold were very rich. Reef mining did not become very important because the water level was rapidly reached and the mines were then abandoned. Very little information on the geology of these mines or their production has been recorded. Dunstan records the Morning Star Mine as working a quartz reef 2 feet wide, which assayed 2 oz /ton gold.

Rosewood Goldfield

Gold was discovered here in 1867. Several nuggets up to 100 oz in weight were found, but after the rich alluvial patches were worked out, the field rapidly became deserted. Some reef mining was done but little information on the geology of these reefs is recorded. Dunstan records the Caledonia Reef as quartz containing pyrite and chalcopyrite, and the Great Northern Copper Mine as working a quartz reef containing chalcopyrite and copper oxides.

Langmorn Goldfield

The Langmorn Goldfield covers a large area extending from Targinie west to the Dee Range, and embraces the Raglan, Mount Larcom and Targinie fields. The Raglan field was discovered in 1867. The reserve covers an area of 4 square miles immediately west of Raglan, but most of the alluvial gold was found outside this reserve. The most important reef was the Duke of Brittany which was described by Rands. This reef, situated about ¼ mile west of Raglan, consisted of ferruginous quartz, and assayed about ½oz /ton gold. About 1,000 oz of gold were obtained from the mouth of a tunnel driven to intersect this reef. Rands described several other reefs from this area, but production from these is not known.

The Mount Bennett Mine is situated about 14 miles south of Raglan This mine was worked from 1901 to 1904, when 1,099 oz of gold were obtained from 2, 972 tons of ore, and 602 oz were recovered from tailings. The mine closed down in 1904, and subsequent attempts to reopen the mine have been unsuccessful.

At Mount Raglan, 6 miles to the east, a large body of quartz was reported to assay from 3 to 8 dwt/ton gold. A company was formed in 1901 to work this lode, but no production is recorded, and the lode was apparently unpayable. Samples taken by the Geological Survey of Queensland in 1946 assayed from trace to 2 dwts/ton gold.

The Mount Turrett Reef is within ½ mile of Mount Raglan. The reef is at least 50 yards long and 8 to 10 feet wide, and was stated to be more highly mineralized than the Mount Raglan Reef. There is no production recorded from this reef.

The Duke of York Mine is situated on Nine Mile Creek, a tributary of Langmorn Creek. It was first worked in 1901, and until 1913 had produced 2,286 oz of gold from 1.637 tons of ore, with 1.281 oz of gold recovered from the tailings.

Numerous small mines near Targinie have been worked at times since the original discovery in 1900. The reefs have been described by Cameron and Reid with some additional references given in Dunstan. Cameron described reefs up to 5 feet wide, but with a very erratic gold distribution, although rich shoots were present in places Reid described numerous small narrow quartz veins in granite and the hornfelsed country rocks assaying 1 to 3 oz/ton gold. Dunstan recorded

garnet-epidote rock at the contact, containing copper and manganese mineralisation. Production from this area appears to have been small.

The total recorded gold production from the Langmorn Goldfield from 1893 is 19.566 oz.

Cawarral Goldfield

(a) Mount Wheeler

Alluvial gold was discovered on the spurs of Mount Wheeler, a trachyte plug intruding serpentinite, in 1868. Several nuggets were found, the largest being 247 oz. After 1870 several mines were developed on quartz reefs in the serpentinite. The most consistent producer was the Annie Mine situated about 1 mile south of Mount Wheeler, which worked a pyritic quartz reef. Recorded production for the period 1890 to 1908 is 7.441 oz of gold from 6,791 tons of ore, and 860 oz from the tailings. The Galawa Mine located near Mount Wheeler, worked a north-east trending reef in serpentinite. Gold production from 1881 to 1892 was 2,973 oz from 1.342 tons of ore, with 366 oz recovered from tailings from 1897 to 1899. The Helena Mine worked a quartz reef up to 4 feet wide, which contained veins of sphalerite and galena. Gold production from 1895 to 1907 was 3.225 oz from 7, 710 tons of ore, and 2, 230 oz recovered from tailings. The Last Chance Mine produced 3.356 oz of gold from 2, 707 tons of ore between 1891 and 1895, and 779 oz from tailings in 1897.

The total recorded production from the Mount Wheeler area between 1881 and 1922 was 26, 502 oz of gold from 40, 568 tons of ore.

(b) New Zealand Gully

Gold was discovered in New Zealand Gully, 5 miles south of Cawarral, in 1868, and the area was worked for over 30 years. The gold was of very poor grade as it contained a very high percentage of silver.

Recorded production from the area is small. The North Star Mine worked a quartz reef up to 4 feet wide in acid crystal tuff. The reef contained some pyrite and galena.

(c) Mount Chalmers

The most important mine in the Cawarral Goldfield was the Mount Chalmers Mine located about 4 miles south of Cawarral. The first company formed to work the ore body began operations in 1891, but results were poor and work ceased. The Mount Chalmers Copper Mining Company was formed in 1896, but treated only 432 tons of 5 percent copper ore to 1899, when operations were again abandoned. The Great Fitzroy Gold and Copper Mines Limited began large scale mining of the ore body in 1907. From 1908 to 1914, 9.723 tons of copper were produced. Attempts to reopen the mine after World War I were unsuccessful. However in 1942 and 1943 Mount Morgan Limited produced 313 tons of copper and 1.242 oz of gold from the mine.

Total ore production from the mine is 428.000 tons which yielded 10,059 tons of copper, 51.022 oz of gold and 181.027 oz of silver.

The ore body was first described by Dunstan and the most recent description is that of Fisher & Owen. They describe it as the more highly mineralized part of a large mass of silicified rock

which had resulted from the metasomatic replacement of sheared andesitic breccia, following the emplacement of dykes of varying compositions, but prior to the intrusion of olivine dolerite dykes and sills. The ore body is a lens, whose major diameters are 150 feet, 400 feet, and 700 feet. Mineralization appears to have been controlled to some extent by faults, dykes, and changes in rock type. Barite is a common gangue mineral. Secondary enrichment was insignificant. The copper/gold ratio decreased markedly with depth, and there was a rapid decrease in the grade of ore below 300 feet. Reserves were estimated at about half a million tons of ore averaging 2.75 percent copper and 2.25 dwt/ton gold, but it was considered that much of this would be difficult to extract.

At Mount Warminster to the north of Mount Chalmers, disseminated mineralization of chalcopyrite, tenorite, cerussite, cuprite, sphalerite, and other copper ores is present. Little if any ore appears to have been mined.

Mount Morgan Goldfield

(a) Gavial Creek

Gold was discovered near the headwaters of Gavial Creek in 1865, and in the following year about 2000 people were working the field. However it was rapidly deserted.

The Hector Reef, the first reef worked in Queensland, is located in this part of the field. This is described by Dunstan as a quartz reef containing gold, chalcopyrite, pyrite, pyrrhotite, and traces of nickel. The country rock is gabbro. Work at the mine began in 1866, and the first crushing was made in 1867. Early production from the mine was not recorded, but between 1890 and 1913, 3, 279 tons of ore were crushed for a yield of 3,599 oz of gold. This excludes the yield for 1903 when 2, 260 tons of ore were crushed, but no yield is given. Treatment of tailings from 1899 to 1904 yielded 3, 933 oz of gold.

Jack described several reefs-near Bouldercombe. These were all quartz reefs up to 6 inches thick, in breccia zones up to 4 feet wide, in granitic rocks. The reefs contained gold, chalcopyrite, pyrite and sometimes sphalerite. They generally assayed less than 1 oz/ton gold. Production from these mines is not recorded, but was presumably small. Jack also described small reefs in sedimentary rocks to the north-east of Bouldercombe.

The Hidden Star Mine is situated about ½ mile from the Hector Mine. It was first worked in 1934, Denmead described two reefs consisting of vitreous or porcellaneous quartz containing biotite, garnet, and chlorite, which had replaced altered slates and limestone along bedding planes close to their contact with a granodiorite to the west. From 1934 to 1936, 1,187 oz of gold were obtained from 2, 692 tons of ore, and a further 150 oz were recovered from tailings in 1936. Similar smaller mines in this area were described by Denmead and Reid.

Several attempts have been made to work the alluvium along Gavial Creek using dredges. However the coarseness of the gravel and lack of water have made such operations difficult. The first attempt was in 1901 and 1902, when the Lord Roberts United Gold Dredger produced 231 oz of gold. However the operations were uneconomic, and the dredging ceased.

Between 1934 and 1938, the Crocodile Creek Gold Dredging Company treated 251, 000 cubic yards of alluvium for a yield of 2.352 oz of gold. This company was liquidated in 1938, and the

machinery was purchased by the Resarf Gold Dredging Company. This new company obtained 1,408 oz of gold from 175,000 cubic yards of gravel, from 1938 to 1944.

(b) Mount Morgan

Gold was known from the Mount Morgan area prior to 1882, but in that year the Morgan Brothers recognized an ore body and formed a syndicate to work it. In 1886 a registered company, the Mount Morgan Gold Milling Company, was formed to work the mine. Initially only gold was produced, but copper production began in 1902 following its discovery in the lower workings. The gossan on the ore body, which was up to 300 feet thick, contained the greatest enrichment of supergene gold found in mining. Operations were successful until after World War I, when the fall in the price of copper and rising mining costs made economic mining difficult. In 1925 the underground workings were gutted by fire, and the mine was flooded to control the fire. The company went into voluntary liquidation in 1927. This company had treated 9,307,000 tons of ore for 5,345,000 oz of gold and 140,000 tons of copper.

Ulam Goldfield

Gold was discovered here in 1893, and the field was described by Maitland. Most of the mining was done in a small area 4 miles south of Marmor.

Maitland described the country rocks as steeply-dipping slate, shale and limestone having a general north-south strike, and intruded by diorite. Although reefs occurred in both the country rock and the diorite, the best values were obtained from those in the diorite. The reefs consisted of milky quartz containing some arsenopyrite and pyrite, and in places galena. Pyrite-bearing dykes which cut the reefs were generally associated with the best gold values.

The field was worked in numerous claims, but most returns were disappointing. The main producer on the field was the Queenslander Claim, which from 1894 to 1905 produced 1,393 oz of gold.

Stanwell Goldfield

This goldfield was gazetted in 1889, but little information on the field is available. The only mine of any importance appears to have been the Native Cat, which worked a pyritic quartz reef. However production figures are not known.

Gold has also been mined at Westwood to the west of the Stanwell Goldfield. The Westwood Gold Mine was described by Reid (1936b). Here sedimentary rocks have been mineralized within the contact zone of a doleritic dyke. The ore consists of arsenopyrite and quartz carrying gold. About 225 tons of ore have yielded between 100 and 150 oz of gold.

Small amounts of alluvial and reef gold have been obtained from creeks west of Wowan, notably Bottle Tree Creek.

Torilla District

Gold deposits in this area have been described by Reid and Ridgway. The most important mine was the Jubilee Mine, situated about 1 mile south-west of Pine Mountain. The country rock is muscovite-biotite-quartz schist intruded by small acid and basic dykes. The gold occurs in small

discontinuous quartz lenses averaging 6 inches, but up to 24 inches in width, in an east -west trending crushed zone in schist. Below the oxidized gossan the sulphide ore consists of sphalerite, pyrite, and some chalcopyrite.

Mining commenced in 1935, and initially an attempt was made to treat the ore at the mine using a small mill. After 1937 the ore was sent to Mount Morgan for treatment. Production ceased in 1950. Total production from the mine was 2,143 oz of gold from 1,855 tons of ore.

Other mines in the area include the Waratah Mine near the Jubilee Mine and the Southern Cross Mine situated in granite about 4 miles south-south-east of Pine Mountain. Production from these mines appears to have been small.

THE DUARINGA and ST LAWRENCE 1:250 000 SHEET AREAS (BMR Report 121)

Gold was discovered at Yatton, 7 miles east-south-east of Croydon homestead, around 1880, and about 5000 ounces of gold was estimated to have been won by gully-raking before the field was proclaimed in 1386. Recorded production since then has been negligible, and the field was abandoned by 1391. Jack described the field, and referred to 'dioritic country rock intersected by dykes of silicated felsite'.The gold occurs as flakes associated with quartz, calcite, and siderite in brecciated zones within the diorite.

Gold also occurs in quartz veins cutting volcanics of the Carmila Beds in the Salt Hill area 9 miles north-northeast of Saint Lawrence. The only production recorded is 7 ounces of gold in 1950.

Gold was discovered in the Mount Cassidy area in the northeast of the Duaringa Sheet area in 1930. The gold is associated with an aplite dyke in Silurian-Devonian volcanics and sediments. None was mined.

Gold diggings are present in the Rannes Beds west of Grantleigh Siding in the east of the Duaringa Sheet area. Production figures are not available for that area.

THE EMERALD 1:250 000 SHEET AREA (BMR Report 68)

Some alluvial gold has been found in the sapphire wash and also in the present streams. Gravelly and sandy wash below a thin basalt flow at Basalt Hill was once worked for gold.

At Mount Clifford, described by Dunstan and Morton, gold was mined intermittently from 1896 to 1902 and again intermittently for a few years after 1926 but it appears that very little gold has been produced. The gold occurred in hydrothermally-altered slates caught up in a diorite intrusion and also in veins in the diorite. This area was first worked for silver in lodes associated with bornite, hematite, azurite, and malachite. The oxidized ores are in all cases highly ferruginous.

THE CLERMONT 1:250 000 SHEET AREA (BMR Report 66)

Gold was first discovered in the Clermont District in 1861 near Peak Downs. The discovery triggered one of Queensland's major gold rushes, and by 1862 important early producers near the town extended from McDonalds Flat in the south to Hurley's Lead in the north. The Peak Downs Copper Lode was discovered during the early digging for gold. It is apparent that the Clermont

Gold Field was one of the major producers of alluvial gold in Queensland. Later finds were at Miclere, Black Ridge, and The Springs. Although no records are available for the period up to 1877, it is considered from old Mining Warden reports and other sources that the peak production occurred in this period. From 1878 to 1901 the Clermont Gold Field produced gold valued at £711.000, and in 1904 nearly 6900 ounces were produced from the Field. After 1904 production declined steadily, but the discovery of new leads on a false bottom at Miclere in 1931 revived the field. According to files of the Geological Survey of Queensland this new find netted 40,000 oz of gold in the ensuing 25 years Most of the shafts are now filled with water and have been abandoned. The only current production is by fossickers working the old dumps and the Recent alluvium; returns are small.

The gold occurs in four environments: quartz reefs in the Anakie Metamorphics; Permian alluvial deposits; (?)Tertiary alluvial deposits beneath the basalt; and Recent alluvial deposits. Dunstan (1902) also records Tertiary leads above the basalt; he also regarded some of the leads at Miclere and Black Ridge as Cretaceous because of their position below a hard siliceous billy, but these leads are probably Tertiary. Dunstan describes over 25 reefs in the area, but reef gold production was subsidiary to that from the deep lead working So for the period 1878 to 1901, reef gold amounted to 9900 oz. but deep lead production was 175,500 oz. Most of the production since 1877 has come from the Permian deep leads.

Presumably the gold in the deep leads was derived from auriferous quartz reefs in the Anakie Metamorphics, although the quartz reefs now cropping out are mostly barren. Distribution of the gold in the leads in patchy, but appears to be controlled by small faults and quartz veins in the bedrock. These veins are barren, but because of their resistance formed bars across the watercourses and acted as riffles. Small displacements on the faults similarly formed gutters in which gold accumulated. The gold rarely occurs in boulders in the conglomerate, but is mainly in the cementing material. The false bottom at Miclere is probably a Tertiary lead; the conglomerate wash overlies shaly interbeds and the accumulation is controlled by irregularities in the surface acting as gutters.

The shallower ground of the false bottom has probably been worked out at Miclere, but elsewhere many shafts could not reach the deeper Permian leads because of flooding. Gold probably remains in much of the So-called Wet-Ground around the Springs Lead. Water also caused considerable difficulties at the Deep Creek Lead, the Wild Cat Lead, and Chinaman’s Flat, all south of Clermont. A re-assessment of many of these diggings in the light of modern pumping equipment may prove worthwhile.

Gold has been reported from the gossan of the Peak Downs Copper Lode at values from 2 to 35 dwt/ton.

Since the 1960 field season, unpublished records of mineralization near Fletchers Awl, north-east of Clermont, have been located in the files of the Geological Survey of Queensland. Gold, copper, and silver were mined during 1914-15 from claims about 1½ miles west-south-west of Fletchers Awl. Values were generally low, but assays of gold up to 3 oz to the ton, silver up to 10 oz to the ton, and copper up to 27% were obtained. The country rock is not stated. The geology of this area is complex and consists of gneissic rocks, Devonian-Carboniferous sediments and volcanics, Permian sediments, and Tertiary volcanics. Mineralization is presumed to have occurred in the gneissic rocks which are provisionally assigned to the Anakie Metamorphics. The possibility cannot be overlooked however that the mineralization occurred in the Devonian-Carboniferous volcanics.