

## Extract from Bureau of Mineral Resources Bulletin No. 135: Igneous and metamorphic rocks of Cape York Peninsula and Torres Strait.

Gold, the most important mineral produced in Cape York Peninsula and Torres Strait, was discovered in the Palmer River in 1872, and later at Coen (1876), in Torres Strait (1894), near Wenlock (1892), at Ebagoola (1900), and finally in the Claudie River in 1933.

Much of the information on the mines and prospects has been obtained from the Queensland Government Mining Journal and the Annual Reports of the Queensland Department of Mines. The production figures were also obtained from the Annual Reports of the Department of Mines.

### *Controls of Mineralization*

The iron and manganese deposits in the Iron Range area occur in regionally metamorphosed iron-rich sediments, which form relatively thin bands in the steeply dipping Sefton Metamorphics.

Most of the gold is associated with quartz lodes and acid dykes related to the granitic rocks of Cape York Peninsula Batholith. Gold and traces of stibnite, arsenopyrite, pyrite, and galena are the only mineralization associated with these granites. A little tin, tungsten, gold, molybdenum, lead, and copper occur in association with the upper Palaeozoic plutonic rocks.

The discontinuous mineralized zone or hydrothermally altered volcanic and intrusive rocks in the southern part of Torres Strait was probably formed immediately after the intrusion of the Upper Carboniferous Badu Granite and porphyritic microgranite. Cassiterite, pyrite, and chalcopyrite occur at Cape York; gold, galena, chalcopyrite, sphalerite, and pyrite on Horn and Possession Islands.

Most of the gold was produced before World War I. Both alluvial and lode gold have been mined. Although some of the reefs were rich, most were small and few sustained mining operations for long. Most of the reefs occur in the granitic rocks or adjacent country rocks, but a few are associated with shear zones. Excluding the Palmer Gold and Mineral Field, the recorded production is about 6843kg of gold. The gold and mineral fields are described in order from south to north; the fields and main mining centres in Cape York Peninsula are shown.

In the Palmer Gold and Mineral Field alluvial gold was first reported from the Palmer River below Palmerville in 1872. The gold-bearing sands in the river and its tributaries were reported to be payable by Mulligan in 1873 and the rush to the field began soon afterwards. The alluvial gold was virtually exhausted by the end of the decade.

A recorded production of 41 488.74 kg is given in Amos & de Keyser (1964), but the true figure was probably about twice as much. Some reef mining was carried out east of the Palmerville Fault, but none is recorded to the west of the fault. Between 1926 and 1936 dredging at Strathleven, Glenroy, and Bonanza west of Palmerville produced 105.75kg of gold, but operations ceased when the recovery grade fell to 4.8g per m<sup>3</sup>. The gold in the Palmer River was probably derived from mineralized reefs in the Hodgkinson Formation.



- ⊗ Petroleum exploration well, abandoned
- W Minor mineral occurrence
- Ag Silver
- As Arsenic
- Au Gold (Au, significant production)
- Bi Bismuth
- Fe Iron
- Ls Limestone
- Mi Mica
- Mn Manganese
- Mo Molybdenum
- Pb Lead
- Sb Antimony
- Si Silica
- Sn Tin
- W Tungsten
- Si Unworked deposit
- Bi? Mineral occurrence uncertain
- ⊗ Prospect, not worked
- ⊗ Mine
- ⊗ Mine, abandoned
- ⊗ Alluvial workings, abandoned
- (pd) Position doubtful

### *Alice River (or Philp) Gold and Mineral Field.*

Gold was discovered in the upper reaches of the Alice River in 1903 by the prospector Dickie. From 1904 to 1909 mining was virtually confined to the Alice Queen and Peninsula King reefs, and since 1917 the field has received little attention. The total recorded production from 1903 to 1917 is 3.3kg of gold from about 2800 tonnes of ore, together with 14kg of alluvial gold. Between 1904 and 1909 the Alice Queen reef produced about 37kg of gold from 1570 tonnes of ore, and the Peninsula King reef about 31.1kg of gold from 632 tonnes of ore.

The two reefs lie within 1.5km of each other on a north-north-westerly line. The Alice Queen mine in the north is in a vertical quartz reef between 1 and 2m wide and over 100m long (Cameron, 1906). Of the two shafts, the southerly was 34m deep in 1906. The quartz from the mullock dump contains small grains of pyrite and stibnite. Felsite dykes trending south-southeast cut the altered Kintore Adamellite to the west of the workings. The Peninsula King reef is 0.5 to 1m wide. In 1906 several shallow shafts had been sunk along the line of the reef.

In the *Potallah Creek Provisional Gold Field* only one reef, the Perseverance, has been recorded. It is situated in fine-grained schist of the Holroyd Metamorphics about 1km west of a stock of Kintore Adamellite. According to Cameron the reef trends north and is 75cm wide at a depth of 12m. The only recorded production is 18.26kg of gold from 593 tonnes of ore in 1903-04. A shaft was sunk at Potallah Creek in 1946; the reef at a depth of 33m is reported to have been 2m wide with a grade of 15.6g of gold per tonne.

Jensen recorded a small number of gold occurrences in the Potallah Creek area. Production of 0.16kg of gold is recorded from Olain Creek in 1914 (probably O'Lane Creek, 13km north-north-west of the Potallah Creek shaft).

### *Hamilton Gold and Mineral Field*

A small rush followed the discovery of gold by Dickie at Ebagooola early in 1900. Gold was found farther south near the Lukin River in the following year. Peak production was reached in the first year when about 470g of gold, 342kg from alluvials, was recorded. Mining virtually ceased during World War 1 and has been sporadic since. Total production from 1900 to 1951 was 291.58kg, made up of 1371.63kg of reef gold from 34196 tonnes of ore, 682.41kg of alluvial gold, and 237.54kg from the treatment of 19 256 tonnes of tailings.

Mining at Ebagooola was centred about the old townsite. The Yarraden mining area, about 15km south-southeast of Ebagooola, extends for 8km from the Lukin River southwards to Spion Kop; it does not include Yarraden homestead. Gold occurs principally in numerous quartz reefs.

Ball reported that the reefs in the Ebagooola area trend roughly north along the contact between the 'older' granite (Kintore Adamellite), which he considered to be metamorphosed, and the schist and gneiss to the east (Coen Metamorphics). He believed that the reefs were related to the 'newer' granite (Flyspeck Granodiorite); in the Yarraden area the reefs occur within the Flyspeck Granodiorite. In the Ebagooola area quartz occurs as leaders, veins, or compound reefs.

The leaders are up to 15cm wide and occur mainly in shrinkage cracks in the granite. Although they are of limited length or depth, and are seldom rich in gold, most of the alluvial deposits were probably derived from them. True fissure reefs, such as the Caledonia and All Nations reefs,

occupy shears along the contact between the metamorphic and granitic rocks. The compound fissure veins are associated with acid dykes, or with beds of quartzite, such as the May Queen reef.

The water-table is generally at a depth of less than 20m in the dry season, and consequently sulphides such as pyrite, arsenopyrite, galena, and stibnite are found almost at the surface. Mining was generally not profitable at grades below 47g of gold per tonne.

The most productive workings in the Ebagoola area were the Caledonia, Hamilton King, May Queen, Hit or Miss, Violet, Hidden Treasure, All Nations, and Golden Treasure.

In the Yarraden area the two most important reefs were the Golden King and Savannah. According to Cameron, the Golden King reef trends roughly north, dips vertically, and ranges from 15 to 40cm wide; it was worked over a length in excess of 300m to a maximum depth of 65m. Mining was almost continuous between 1901 and 1915, and was resumed in 1917 and 1921.

Recorded production is 239.84kg of gold from 7699 tonnes of ore. The Savannah reef lies about 500m east of the Golden King and dips steeply west. It is more than 30m long with a steep southerly plunge. Mining was carried out to a depth of at least 38m. Between 1901 and 1907 and in 1912 a total of 2761 tonnes of ore yielded 156.51kg of gold. Attempts to reopen the mine in 1939-40 were unsuccessful.

Gold Production at Ebagoola, 1902-12\*  
(from Annual Report of the Department of Mines, Queensland)

<i>Reef</i>	<i>Ore (tonnes)</i>	<i>Gold (kg)</i>
Caledonia	3438	102.40
*Hamilton King	2230	113.90
May Queen	2054	80.68
Hit or Miss	1089	67.09
Hidden Treasure	1538	47.71
All Nations	502	38.01
Golden Treasure	1000	35.61
Violet	782	49.64

\*Minor production in 1930s included.

Other reefs of importance in the Yarraden area were; the Lukin King with a total production between 1901 and 1926 of 63.73kg of gold from 1631 tonnes of ore, the Gold Mount which yielded 2.99kg of gold from 781 tonnes of ore between 1901 and 1921, and the Hiaki (or Haikai) which produced 39.22kg of gold from 1622 tonnes of ore between 1909 and 1918.

Alluvial mining was mainly restricted to the Ebagoola area and most of the production was before 1910. The gold was coarse, and was derived mainly from eluvial deposits shed from nearby reefs and leaders.

The *Coen Gold and Mineral Field* was proclaimed over an area of 95km<sup>2</sup> in 1892 and enlarged to 480km<sup>2</sup> in 1898. Alluvial gold was discovered at Coen in 1876 and in 1878 there was a small rush from the Palmer River, but few miners stayed more than two weeks and the workings were

abandoned in the same year. In 1880 Chinese miners attempted to work the alluvium without success.

In 1885 land was taken up for mining silver, and machinery was erected in 1886, but productive reef mining did not start until 1892. Between 1893 and 1899, 16689 tonnes of ore crushed at Coen yielded 888.1kg of gold. Ball visited the field in 1900 and recorded mining activity at Coen town, at The Springs 15km to the south-east, and at Klondyke 13km north-east of The Springs. According to Ball the reefs are from several centimetres to 1.5m thick, and generally trend north-west to north, with a steep dip. Most of them are fissure veins composed of quartz, but a few consist of siliceous slate; some of the poorer reefs contain pyrite or arsenopyrite.

The most successful mine was the Great Northern. About 1km south-east of Coen township; it has produced about three-quarters of the gold won from the field. Other productive reefs near Coen, which were mined mainly before 1900, were the Daisy, Hanging Rock, Homeward Bound, Lankelly, Long Tunnel, Trafalgar, and Wilson reefs. Between 1894 and 1899 the Great Northern mine yielded 230.85kg of gold with a high silver content from 4394 tonnes of ore. In 1900 activity at Coen came almost to a standstill when the Hamilton goldfield was opened, but gold continued to be won at Coen for many years, mainly from the Great Northern and from the treatment of tailings with cyanide.

The total recorded production of reef gold at Coen from 1892 to 1916 was about 2333kg, of which 2172.86kg came from the Great Northern mine, including 412.4kg from the treatment of 20 000 tonnes of tailings and mullock. The total amount of ore recorded between 1812 and 1916 was 28 185 tonnes, of which 26 234 tonnes came from the Great Northern mine. After 1910 production fell off rapidly, and in 1914 only 7 tonnes of ore was mined.

The Great Northern mine was reported to have been worked to a depth of 150m, but little work was done at that depth. The north end of the No.4 level, somewhere below 54m, was reported in 1909 to be 78m from the shaft. The reefs in the lower levels ranged in width from 75cm to 1.2m. After 1909 production came from small rich leaders in the hangingwall and footwall above the No.3 level possibly at 54m. Little is known of the mine after 1914, but attempts were made to reopen it as late as 1949.

Mining was carried out at The Springs, 15km south-east of Coen, from the early 1890s to about 1901. The main reefs were the Westralia, where 455 tonnes of ore were crushed for 19.56kg of gold in 1901, the Goolha Goolha, the Rothwell, and the Sirdar, where 207 tonnes of ore produced 13.41kg of gold between 1898 and 1901. This part of the Coen Field was abandoned during the rush to the Hamilton goldfield in 1900 and 1901.

At the Klondyke, 13km north-east of The Springs, the Springfield reef yielded about 40kg of gold from 366 tonnes of ore between 1898 and 1902. The Klondyke lodes trend roughly north and occur in schist and gneiss of the Coen Metamorphics near their contact with the Lankelly Adamellite.

The workings at Coen and The Springs lie within or adjacent to the Coen Shear Zone. The zone extends for about 27km south-east of Coen and lies largely within the Lankelly Adamellite and along its southwest margin. The schistose sheared adamellite contains a little pyrite and arsenopyrite. Quartz reefs are common along the shear zones, and in the south they are up to 5km long and 100m wide. Most of the mullock dump at the Great Northern mine, which lies in the shear zone, consists of a breccia composed of fragments of silicified granite set in a matrix of

white quartz; the country rock is sheared Lankelly Adamellite. The quartz and gold were probably deposited from hydrothermal fluids introduced after the rocks were sheared.

In the *Blue Mountains*, 40km north of Coen, which are not included in the Coen Gold and Mineral Field, gold was mined from some time before 1934 until 1951. The gold occurs in narrow quartz veins in granite. The total recorded production in 1935, 1938-46, and 1948-51 is 33.53kg of gold from 950 tonnes of ore; of this 17.5kg from 593 tonnes came from mines operated by Blue Mountains Gold N.L., principally the Golden Ladder and the Convict. One of the other major producers was the Yarraman mine. No mines were operating in 1967.

A small number of leases have been held in recent years in the *Leo Creek* area, 30km north-east of Coen, but no production is recorded. In the Nullumbidgee area a few kilometres to the north 3.5 tonnes of ore yielded 0.40kg of gold.

The small *Lochinvar Provisional Goldfield* on Tadpole Creek, about 18km southwest of Coen, is situated in Kintore Adamellite. The only recorded production is 2.2kg of gold from 50 tonnes of ore in 1904.

#### *Rocky River Gold and Mineral Field*

Alluvial gold was discovered in the Rocky River, 32km north-east of Coen, in 1893 by Lakeland. Reef mining began on Neville Creek (location unknown) in 1896 and the field was proclaimed in 1897. Between 1896 and 1901, 951 tonnes of ore yielded 142.64kg of gold. Interest waned in 1901 following the discovery of the Hamilton goldfield, but it revived for a short time in 1910 and 1911 when 57 tonnes of ore yielded 877kg of gold. Jack noted that only four people lived on the field in 1914, and there were no returns that year. No mines were located in 1967.

#### *Hayes Creek Provisional Gold Field.*

Jack recorded traces of gold in Hayes Creek, 60km northeast of Coen, during his 1880 expedition, and the area was later visited by Dickie and Campbell during a prospecting journey to Lloyd Bay in 1907. Shepherd records that the Hayes Creek field was discovered in 1909, but this probably refers to the start of reef mining on the Golden Gate claim.

Production has been small and spasmodic. In 1909 production from the Golden Gate claim was 37 tonnes of ore which yielded 6.81 kg of gold and a further 1.71 kg on cyanidation. In 1911 production from the field was 3.18 kg of gold from 21 tonnes of ore. Production in 1914 was 1.14kg of reef gold and 0.37kg of alluvial gold. The field was deserted in 1915. Some prospecting continued until 1938, and between 1938 and 1942 some 150 tonnes of ore were crushed for a yield of about 6kg of gold. In the early 1950s small parcels of ore are reported to have yielded between 80 and 120g of gold to the tonne, and one 4-tonne crushing returned 0.2kg of 850-fine gold.

Shepherd noted four sets of workings at the main centre at Buthen Buthen. At the Theodore lease a quartz reef between 30 and 35cm wide was exposed for 65m, with a strike of 140 and dip of 47 to the south-west; the reef contained a little pyrite and arsenopyrite. The 20cm reef on the Diana Lease contained pyrite and a little free gold; on the Campbell and Buthen Buthen leases Shepherd saw only shallow trenches and small shafts. At Companimano Creek, 6km south-south-west of Buthen Buthen, a quartz reef 90cm to 1.2m wide contained gold, galena, pyrite, and arsenopyrite.

The reefs in the Hayes Creek field are situated in a northerly trending shear zone in Kintore Adamellite; the valleys of the Lockhart and Nesbit Rivers follow this zone.

In 1964 the valley of the Nesbit River between Buthen Buthen and Kampanjinbano (Companimano?) Creek was investigated as an alluvial gold prospect, and an almost enclosed basin on Leo Creek, 8km southwest of its junction with the Nesbit River, was also tested, but little gold was found.

#### *Wenlock Gold and Mineral Field.*

Gold was discovered in 1892 at Retreat Creek, a tributary of the Batavia (Wenlock) River and later at the site of Bairdville. Further prospecting, mainly between 1905 and 1911, disclosed several small alluvial deposits at Downs Gully, Choc-a-block Creek, and other nearby sites. The amount of gold produced up to 1910 has been estimated at 93 kg.

In 1910 an aboriginal prospector named Pluto located a large lead at the base of the Mesozoic sediments overlying the Kintore Adamellite; the locality became known as Plutoville and was rushed by miners from Coen and Ebagoola. According to Fisher the early workings covered an area of about 350m<sup>2</sup>, and consisted of shallow alluvium and small reefs, which were worked to a maximum depth of 5m. Morton mentioned a shallow lead of cemented wash with rich gutters at the workings. Total recorded production from Plutoville is estimated at 190kg of gold.

The Main Leader about 5km north-east of Plutoville was discovered in 1922. It consists of a narrow quartz reef with payable gold for over 300m along strike. The discovery became known as Lower Camp and later as Wenlock. Fisher described the Main Leader as a north-westerly trending fissure reef, with a few cymoid loops, which dips at 60° to the south in the north and 35° in the south. In the south it is cut by the Main Reef, a quartz reef over 6m wide.

The average width of the Main Leader is 20cm, and its walls are slickensided. It contains free gold to a depth of at least 100m, or about 30m below the water-table. Connah stated that the Main Leader is composed of quartz with a distinctive white and blue banding, and ranges in thickness from 2 to 45cm. Short rich shoots with a northerly pitch are common, and coarse particles of gold are evenly distributed in the reef, with a few rich local concentrations. Fisher estimated the average grade at about 50g of gold per tonne.

The Main Leader occurs in Kintore Adamellite and is overlain by Mesozoic sediments and alluvium. The deep leads at the base of the Mesozoic sediments on the west side of the Main Leader also contain gold. Connah found that the main deep lead was a narrow rich gutter which spread out into a wide drainage channel trending west-south-west.

He has suggested that the extension of the channel beyond the workings is down thrown by a fault trending south-east. This may be the continuation of a post-Cretaceous south-easterly trending fault, downthrown to the west, which was mapped in 1967, 13km south-east of Wenlock. Total production from Lower Camp is estimated at 1089kg.

The Wenlock field was deserted during World War II. The claims along the Main Leader were amalgamated in 1946, but operations ceased again in 1952, partly as a result of flooding in 1950. Prospectors have continued to be active around the field, and in 1964-65 it is reported that 87.09 kg of gold were obtained from 2 tonnes of picked specimen stone.

Gold was first produced from the *Claudie River Gold and Mineral Field* in 1933, the field was proclaimed in 1936. The gold was mined at Iron Range, Scrubby Creek, and Packers Creek. Shepherd (1939) gives the total production from 1935 to June 1938 as 17 331kg of gold from 6104 tonnes of ore and 1067 tonnes of tailings. Iron Range produced 13 421kg from 3753 tonnes of ore, Scrubby Creek 33.65kg from 1984 tonnes of ore and 1067 tonnes of tailings, and Packers Creek 544kg from 376 tonnes.

The largest reef, Gordons 'Iron Range', yielded 1084kg of gold from 2568 tonnes of ore. The average yield from the rest of the field was 162g per tonne. The field closed in 1942 for the duration of the war. A little mining was carried out after 1945, and between 1950 and 1953 the Cape York Development Co. attempted without success to develop a few of the mines at Iron Range. Total recorded production from the field between 1934 and 1942 is 333.12kg of gold from 17100 tonnes of ore and 3221 tonnes of tailings. Production since the War has been small, but a little gold is still obtained from a mine at Packers Creek.

At Iron Range the gold occurs in quartz veins and lodes in schist of the Sefton Metamorphics, while at Scrubby Creek and Packers Creek the gold-bearing lodes and veins are in the Weymouth Granite. At Iron Range, the deposits are large but low grade in the iron-bearing schist, but small and rich in the adjacent iron-free schist (eg. the Iron Range reef); the reefs occur along fault lines in the schists.

South-east of Iron Range some of the reefs are parallel to the schistosity and others have components both along and across the schistosity; short ore shoots occur where the reefs intersect. North of Iron Range the lodes, such as the Peninsula Hope and Northern Queen, are composed of crushed sericite schist with quartz stringers. Broadhurst & Rayner suggested that in the primary zone the ore shoots will prove to be lenses of silicified schist impregnated with sulphides, chiefly arsenopyrite.

Rayner noted the discovery of a wide body of sulphide ore on the Peninsula Hope lease at Iron Range, and a CSIRO report on the treatment of arsenical gold ore from the Peninsula Hope mine gave the head assay of the ore as 18.2g of gold, 1.8g of silver, 4.4% arsenic, 20.7% iron, 9.79% sulphur, and less than 0.05% copper. The sulphides are arsenopyrite and pyrite, with some altered pyrrhotite and traces of chalcopyrite, sphalerite, and gold.

The gold and sulphide minerals at Iron Range may have been introduced by the Kintore Adamellite, as elsewhere in Cape York Peninsula, or by the Weymouth Granite.

Gold was discovered in the *Possession Island Gold and Mineral Field* in Torres Strait in 1896, and production began in 1897; Jackson described the mines he visited in 1901. All the workings are near the north-west coast, east and north-east of the monument to Captain Cook. Mining was carried on until 1906 when the leases were abandoned. Attempts were made to reopen the workings in 1919, and again in 1934-35, but without success.

Recorded production between 1897 and 1905 is 155.42kg of gold from 7245 tonnes of ore, including some returns for the Horn Island Gold and Mineral Field. Four tonnes of ore yielded 0.09kg of gold in 1919.

Jackson noted that the main workings were located on two almost vertical reefs about 230m apart, which trend south-south-east. The reefs consist of quartz veins, up to several centimetres thick, in a matrix of fractured and altered welded tuft; the veins contain a small quantity of sulphide

minerals. Jackson also noted several shafts and small cuts, and records that a sample of ore, composed of vein quartz with galena and pyrite, assayed 57.95 g of gold and 33.9g of silver to the tonne.

Copper-staining associated with limonite has been noted in the chloritized and silicified welded tuff northeast and southwest of the abandoned workings. Northeast of the workings some galena and pyrite have been observed in joints.

Alluvial gold was discovered in the eastern part of Horn Island in 1894 and the *Horn Island Gold and Mineral Field* was proclaimed the same year. Reef mining began in 1895 or 1896 in an area of about 0.5km<sup>2</sup>, 1km inland from the east coast.

The mines are situated in altered and silicified porphyritic microgranite to the south of a stretch of sandy alluvium. Recorded production is 31.07kg of alluvial gold between 1894 and 1896, and 176.67kg of gold from 16 904 tonnes of ore between 1896 and 1900. The recovery of gold declined sharply in 1900, and by 1901 the field was almost deserted.

Most of the reefs are steeply dipping and trend east-southeast or southeast. They consist of closely spaced quartz veins in altered microgranite. Sulphide minerals were found in many of the reefs only 3m below the surface. Pyrite and galena are the most common sulphides, but some of the reefs also contain sphalerite and two contain chalcopyrite. The average yield decreased from 30g per tonne in 1896 to 20g per tonne in 1900. Sporadic production continued on a small scale until 1919, and prospecting went on at intervals until 1966.

Australian Selection Pty Ltd drilled three holes to depths of about 75m in 1963, but did not consider the prospect payable; an ore concentrate assayed in 1961 yielded 750g of gold and 440g of silver per tonne. In 1965 overburden was removed and 120m<sup>3</sup> of alluvium were taken for sampling but the results are not known.

A visit to the mines in 1968 revealed a large open cut, probably on the Welcome reef, about 100m long by 50m across, and a smaller open cut, in the vicinity of the Dead Cat claim, with a timbered shaft in the bottom. In the smaller open cut the porphyritic microgranite is yellowish green and intensely altered; it is cut and silicified by numerous quartz veins. The altered rock contains small patches of sulphide minerals. In the larger pit the microgranite is less altered and contains fewer quartz veins; the sulphide minerals occur in small veins. Pyrite and galena are common, and chalcopyrite and a little wolfram(?) were also observed.

Elsewhere, minor amounts of gold are reported to have been won on Hammond Island between 1907 and 1909, and possibly until 1919, and on Thursday Island in the 1930s.