

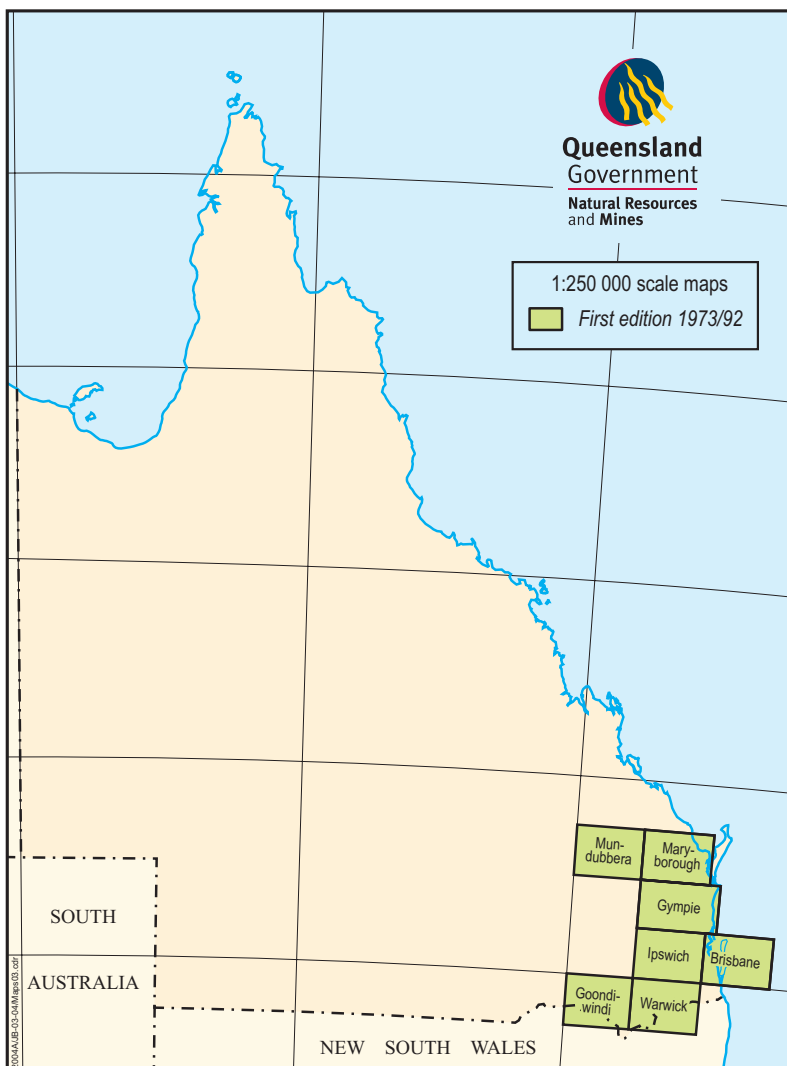
# GOLD OCCURRENCES IN SOUTH-EAST QUEENSLAND

## 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.

### General area covered by this report



Any person or company desirous of obtaining further details in relation to any of the mines, 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.

### *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 or 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 SOUTHERN DISTRICT*

*Pikedale* (32km north-west of Stanthorpe). Records show that the auriferous reefs were small but fairly rich. They were worked by small parties, and were generally abandoned about the 30m level. No general statements can be made regarding future prospects of these mines as the factors leading to their closure are unknown.

Near *Warroo* 32km further west, a gold-bearing lode was exploited to a reported depth of 60m until local smelting became unpayable.

*Texas* (85km by road west of Stanthorpe). The old Silver Spur Mine, 11km east of Texas, produced considerable amounts of silver, lead, gold and copper, the zinc contents remaining in the slag dumps. Existing workings, to 152.5m depth, offer possibilities for further prospecting, but unwatering and reconditioning would be necessary. In recent years interest has been displayed periodically by various mining organizations.

*Warwick Fields*. Warwick (256km by rail or 161km by road south-west from Brisbane) is the base for the following gold fields Talgai (34km west-south-west), Leyburn (45km north-west), Canal Creek (45km south-west), Lucky Valley (19km south-east), Palgrave (34km south-west) and

Thane's Creek (39km west). With the exception of Canal Creek, which was purely an alluvial field, the history and present condition of these old fields are very similar. They have been practically worked out as far as alluvial gold is concerned. In the primary deposits, payable gold values occur in narrow shoots in small fissure veins which could not at the time of working be profitably followed much below 30m. Where there is reason to believe that the shoots were not worked out further prospecting in depth might be justified.

*Moreton District.* The low-grade gold deposit at *Kingston* (24km south of Brisbane) was worked for a number of years by a syndicate, but is now deserted. Gold occurrences near Ormeau (48km south of Brisbane), and Camp Mountain (16km west) do not offer much inducement for further prospecting.

*North Arm* (117km by rail north of Brisbane). The discovery of auriferous quartz reefs in a hitherto unproductive series of volcanic rocks was made in 1929. Company operations were carried on till 1938 within a relatively small area, but all efforts to locate workable auriferous deposits further afield resulted in failure. It is of interest to record that the free gold is so highly alloyed with silver that it is almost white in colour and is associated with the rare mineral *naumannite* (selenide of silver).

*Gympie* (170km by rail north of Brisbane) The highly auriferous reefing area at Gympie was confined to a heavily faulted strip about 3km long by 1km wide. This small area has been responsible for a large proportion of the field's production.

Operations were ultimately continued to depths of considerably over 600m on the Monkland end of the field. The mines of the main belt form an extensive connected group, now filled with water. Owing to the prohibitive expense involved in dewatering and reconditioning these mines, it is doubtful whether any of the connected group of workings can be deemed worthy of further consideration. Since the decline of major mining operations - about 1917, numerous attempts have been made to exploit blocks of shallow ground. Relatively few of these attempts have met with success. For many years production was maintained by cyanidation of old tailings, but this has now ceased.

*Mary Valley* (south from Gympie). Alluvial and surface gold deposits were originally worked on a small scale near *Imbil* (40km by rail from Gympie) and a small production has been won intermittently from quartz veins occupying minor fissures in granite.

*Glastonbury* (13km west of Gympie). Gold-bearing quartz reefs occupying fissures occur in altered sedimentary rocks near a granite contact. They vary in thickness from a few cm to about 1m. The output from the field has not been large. Small-scale operations were formerly conducted by a company which operated a small battery and concentrating plant.

*Yabba Goldfield* (32km north of Kilcoy); also known as the Jimna field. It was essentially an alluvial field, and is credited with rich returns in the early years from deposits on Jimna and Sandy Creeks. Reef-mining followed on a small scale for some years with two plants on the field. A few small reefs carrying fair values have been worked in recent years.

*Kilkivan* (72km by rail and 48km by road west of Gympie). On this old goldfield, restricted but rich shallow alluvial deposits were worked and reefing followed. There has been little gold production for about sixty years, but a few men have been engaged near the town and on the Gold Top provisional field, 8km distant.

Copper deposits were worked to a small extent at an early period at Mount Coora, Mount Clara and Black Snake. Re-opening of an old cupriferous gold lode at Black Snake in 1939 resulted in productive operations, with crushing, tabling, flotation and cyanidation plant on the ground, till 1949. Recently, several deposits in the area have been the subject of Departmental investigation by drilling.

At Tansey Creek near Goomeri, an auriferous formation had been worked to a depth of 87m when work ceased in 1942. Recent dewatering and sampling indicated erratic distribution of values in the bottom workings.

*Marodian Goldfield* (13km north of Kilkivan) Alluvial gold was found on Colo Flats and at Yorkey's Hill. Little work has been done on the field for many years.

*Nanango* (209km by road north-west of Brisbane, and 27km from rail at Kingaroy), Gold deposits near the town, at the Seven-mile diggings (alluvial only) and also at Scrub Paddock (32km north-east) were worked at an early stage in the State's history. The last period of marked activity included an attempt by an English company to work a group of auriferous copper veins at Scrub Paddock. Despite intermittent prospecting over the wide area available, no discoveries of note have since been made. Prospecting of small auriferous reefs and leaders has been carried out near Emu and Possum Creeks in the *Blackbutt* area without marked success. Small deposits of silver-lead and of gold-bismuth have been worked near Mount Langan in the same area.

*Proston*, (116km by rail west of Gympie), Some gold prospecting has been carried out in the Boondooma area, some 32km west of Proston, but nothing of importance has been recorded.

Gold and antimony have been prospected at Glenbar (40km south-west of Maryborough).

*Biggenden* (87km by rail west of Maryborough), A deposit of magnetite at Mount Biggenden was worked intermittently for its gold and bismuth content until 1938.

*Paradise Goldfield* (13km north-west of railway at Degilbo), *Stanton-Harcourt Goldfield* (18km north of Degilbo, and *Mount Shamrock Goldfield* (19km west-north-west of Degilbo). These three small goldfields were worked towards the end of last century. Apart from a small amount of prospecting, little work has been done for many years. A little gold was also won on the *Chowey*, *Mount Steadman* and *Gebangle* fields a few kilometres further west.

In the *Mundubbera* district gold prospecting was formerly carried on at *Dykehead* (29km west) at *Hawkwood* (48km west-south-west) and at the old *Brovinia* diggings (64km south-west of Mundubbera) but no discoveries of significance have been made.

*Eidsvold Goldfield* (224km by rail from Maryborough). A group of auriferous fissure deposits was extensively worked between 1888 and 1900. An unexpected collapse of the field followed failure of values in the deeper levels of the principal mines. Although the reef formations proved to be persistent in depth subsequent efforts failed to locate workable shoots. Activity since 1906 has been limited to intermittent small-scale operations. On St. John's Creek, 26km south-west of Eidsvold, large quartz lodes have been worked spasmodically for antimony and gold.

*Cracow Goldfield* (95km by road west of Eidsvold). Discovered in 1931, this field for some years has been the only major producer of gold in Queensland, apart from Mount Morgan. Total output of fine gold to the end of 1974 was nearly 19 000kg most of which came from the Golden Plateau

mine. Long narrow ore-shoots in quartz-calcite veins were worked at the Roses Pride and Klondyke mines to depth of 40m and 45m respectively. At Golden Plateau a zone of quartz deposition up to 76m wide and nearly 800m long occurs beneath a sandstone capping. Several irregular tabular ore-shoots have been mined and the lowest productive workings are at the 252m level. Diamond drilling was successful in locating additional ore-shoots within the mine leases.

In the *Bundaberg* district, mining for copper and gold has been carried out extensively at the *Tenningering* field (108km from Bundaberg, with Mount Perry as its centre), and *Boolboonda* field (90km from Bundaberg). Gold reefs have also been worked at *Reid's Creek*. There has been very little mining in recent years although prospecting is being continued by several groups. Lode rutile has been found as shoad in the foothills of Mount Perry and traced to limited outcrops. A little gold has been won from a deposit at *Swindon* (22.5km east of Mount Perry), from which coarse alluvial gold was shed, but there is little prospect of other than small-scale production.

## THE STANTHORPE DISTRICT (GSQ Report 64)

Gold was first discovered at Lord John's Swamp (Lucky Valley Goldfield) in 1852. In 1863 rich but limited alluvial gold was uncovered on Canal Creek. Following close on the Canal Creek discovery were further finds at Talgai (Darkie's Flat – 1863-64), Thane's Creek (1869), Pikedale (1877), Leyburn (1872), and Palgrave (1877). Canal Creek was an alluvial goldfield only, whereas both alluvial gold and reef gold were won from Talgai. Thane's Creek was primarily an area of reef mining; at Pikedale and Leyburn little or no alluvial gold was won. Little is known of the Palgrave field.

The period of principal production was prior to 1905. Attempts at revival of reef mining in the 1930s were only moderately successful, and did not survive for long. Any future prospects appear to lie in further development or known reefs below the old shallow workings.

### LUCKY VALLEY GOLDFIELD

No returns for alluvial gold from this field have been recorded. The gold was won from alluvium in the "valley" and the gullies running into it. At the head of the "valley" a small hill of metasediments carried leaders of quartz showing free gold. A shaft was sunk on these leaders but was abandoned after 9 tons of ore, yielding 12 oz 6 dwt of gold, was recovered. Small quartz reefs have been prospected for gold near Omoral railway siding.

### CANAL CREEK GOLDFIELD

Gold was discovered by a party of seven Frenchmen working a gully 4 miles due north of the old Canal Creek Station. On the eastern side of Canal Creek "excellent" alluvial ground was worked up to the base of the divide, but nothing of any consequence has been discovered on the western side of the creek. The depth of alluvium was reported as ranging from 5 to 12 feet, bottoming on pipe clay. The thickness of the wash varied considerably and it tended to occur as lenses. Archibald estimated that between 1863 and 1887, 20 000 oz of gold had been recovered. Although leaders of auriferous quartz were found along the divide in metasediments on the eastern extremity of the alluvial deposits, there is no record of any attempts to work these finds.

*TALGAI GOLDFIELD*

The Talgai Goldfield, originally known as Darkie's Flat, has supported both alluvial and reef mining with spasmodic workings till recent times. Today, workings are confined to limited gully-raking and occasional attempts at reef mining. The richest alluvial gold was won from Dun's Gully and the head of Gum Flat, 3 miles south of the township of Pratten. The alluvium was rich but patchy and ranged in depth from 2 to 20 feet. The gold was coarse and many nuggets ranging from 1 to 16 oz were unearthed. The largest nugget recorded from the alluvial fields of the Warwick area came from this vicinity. The nugget weighed 55 oz and was found by Mr. H. Gibson in 1895.

Traces of tin were commonly associated with the alluvial gold found on the field, particularly in Dun's Gully and the gullies leading on to Gum Flat; but nowhere was the mineral recorded in commercial quantity. Little trace of it is seen in the country rocks.

Many reefs have been worked on the Talgai field with varying results. Gold occurrence appeared to be patchy. Some early phenomenally rich crushings were reported, and stone treated commonly averaged around 1 oz per ton. However the small average size of the reefs, faulting, and/or shortness of the shoots were inimical to economic development in depth. Jack recorded that the Queensland reef was believed to be the first gold reef to be worked in Queensland. At a depth of 70 feet, 600 oz of gold was recovered from 4 tons of ore. The main ore shoot was lost at depth when intersected by a quartz reef carrying pyrite.

The deposits on the field vary from thin stringers to veins 6 feet across, usually of quartz, within the metamorphics. General strike of the reefs is west to north-north-west, with southerly dip. The largest reefs found on the field have been worked along the spur of Mount Gammie North.

*THANE'S CREEK GOLDFIELD*

Although Thane's Creek Goldfield is not contiguous to Canal Creek, it appears to form an extension of the same belt of auriferous country. In contrast to the workings along Canal Creek, no alluvial gold of any consequence has been found, most of the gold won being derived from reef mining. Lack of suitable crushing and treatment facilities, erratic gold values and faulting of the ore shoots appear to have been the main reasons for the decline of the field. No mine has been developed below about 120 feet, the average depth being about 60 feet.

*PIKEDALE GOLDFIELD*

This field is on the south-eastern extremity of the "gold belt" which extends from Leyburn in the north to Pikedale in the south. Gold production was confined to reef mining. Mineralization was found in both quartz 'dykes' and fissure fillings, strongly faulted in part, and usually carrying pyrite. Occasionally cassiterite was found associated with the gold in some of the mines. The reefs were not very large or very rich and difficulty was encountered with recovery of gold associated with pyrite. No full record of actual production has been found. The country rocks are slate, indurated shale, and greywacke striking north and dipping at high angles. Small dioritic lenses have been found along relict bedding planes of the sediments in some of the mines. Strike of the auriferous deposits varies from east to east-north-east and they have a variable dip.

*LEYBURN GOLDFIELD*

No returns of production are available. The gold is found in dark laminated quartz reefs which tend to form lenses parallel to the general strike of the country rock and pitching at varying angles to the south-east. Gold has shown erratic distribution within the ore shoots; the average value of stone treated rarely exceeded 1 oz per ton. The country rocks are predominantly pink and purple phyllites, slates, and quartzites, which strike approximately N. 130° E. and have vertical dip.

*PALGRAVE GOLDFIELD*

Little is known of the history of the workings of this field. The country rocks are predominantly greywacke and slate striking a few degrees west of north and dipping to the west. Personal communications with old miners who know the field suggest that the ore was of low grade and the mines small.

Failure of the mines of all the goldfields appears to have been caused by the low average grade of the ore, patchy values, faulting, primitive methods of mining and inadequate equipment, lack of suitable crushing and treatment plants, inability to treat the pyritic ore, and high cartage cost.

*Waroo Gold and Copper Mine*

The mine is situated on portion 5, Parish of Waroo, 42 miles by road west of Stanthorpe and 18 miles east of Cobba-da-mana railway siding. The lode was discovered in 1906 and the mine worked spasmodically till 1913. Mineralization was exploited to a depth of 200 feet and for a strike length of approximately 300 feet. Some 2,000 tons of ore was treated on the site either by smelting or by cyanidation for an average yield of 113 oz of gold per ton.

The mineralization occurs in a series of easterly trending indurated shales, and interbedded fine-grained quartzites, with steep southerly dip. The lode varies in width, from a few inches to 4 feet and appears to be conformable with the strike of the metasediments although it cannot be considered to be interbedded with the country rock. Gold values were erratic. Copper mineralization was associated with the gold, but appeared to be uneconomic on its own. In 1931 the mine was reopened for inspection and testing, but activity was short-lived; the gold content of the ore proved to be subeconomic at that time.

Goldfield	Discovered	Present Proclaimed Area (acres)
Lucky Valley	1851	16 000
Talgai	1863	49 220
Canal Creek	1863	13 960
Thane's Creek	1869	11 000
Thane's Creek	1879	
Pikedale	1877	19 200
Leyburn	1872	4780
Palgrave	1897	3226

## THE IPSWICH AND BRISBANE 1 :250 000 SHEET AREAS (GSQ Report 95)

Gold occurs in three different environments:

- (1) associated with quartz reefs in the Neranleigh-Fernvale Beds, Bunya Phyllite, and Maronghi Creek Beds;
- (2) at contact zones between granitic rocks and Palaeozoic basement;
- (3) minor alluvial occurrences from Gold Creek, Brookfield, and near Mount Coot-tha. These are derived by erosion of small lodes in the Palaeozoic Neranleigh-Fernvale Beds and Bunya Phyllite.

The most important mine in the Sheet areas was the Mount Taylor Gold mine at Kingston (m.r. 627567 Brisbane Sheet). Jack described the workings and the production for the period July to November 1898, while Dunstan described gold occurrences near Kingston, and indicated there was a large low grade gold deposit in the area. This deposit was worked from 1932 to 1950 by Kingston (Open Cut) Gold Mines Ltd. The mine was abandoned in 1954 because the recovered grade was too low for profitable operation. Production from 1932 to 1954 was 149 497 tonnes of ore, which yielded 612,303kg gold at an average grade of 4.1 g/tonne.

The ore occurs in altered argillite of the Neranleigh-Fernvale Beds. which dip 12° to the south-west. The host rock has been sericitised and replaced by silica. Subsequent fracturing gave criss-crossing white and colourless quartz veins averaging 12mm wide, which contain native gold and limonite. The extent of the ore body was 183 by 122 by 17m. Hall and Carter described the results of testing of the grade of the mine area, while calculations of reserves by Blanchard were 355 755tonnes of grade 5.4 g/ton gold under 250 000 tonnes of overburden.

Gold is associated with quartz reefs of the Neranleigh-Fernvale Beds and Bunya Phyllite. Minor gold occurrences were reported in the Brisbane city area and environs by Ball, and near Pimpama Creek. Jack, Morton, Ball, and Knight described gold from quartz reefs in the Brookfield-Enoggera area, while Reid reported a minor occurrence of gold and arsenopyrite from the headwaters of Banks Creek. Production from the Eclipse, Surprise, Double D, and Mount Aurum Mines at m.r.s 606588, 605596, 605593, 603596 (Ipswich Sheet) was 4kg of fine gold.

At Camp Mountain near Samford, the Mountain Camp mine and the Golden spur mine were investigated by Ball, Connah, and Morton. Gold values from the cellular quartz at the Mountain Camp mines were less than 3 g/tonne, whereas those at Camp Mountain exceeded 7 g/tonne.

A prospect near Beenleigh (m.r. 636559 Brisbane Sheet) contains values of 4.6 to 7.7 g/tonne in a quartz vein in the Neranleigh-Fernvale Beds.

Gold grades generally less than 3 g/tonne were reported by Ridgway from several small prospects in the vicinity of Bunkers Hill, Ravensbourne. These occurrences are associated with a brecciated quartz-kaolinitic vein in the Permian Cressbrook Creek Group.

Gold Occurrences at the contacts of Palaeozoic rocks and later intrusions are reported from Mount Coot-tha (m.r. 612587 Ipswich Sheet, Milford Rocks (m.r. 527643 Ipswich Sheet), Nukinenda (m.r. 526644 Ipswich Sheet), and Alice Creek (near m.r. 526593 Ipswich Sheet).

At the Mount Coot-tha mine, gold averaging 11.3 and 7.3 g/tonne was produced from 0.4 tonnes of ore in 1940. The mineralisation is in foliated Bunya Phyllite at the contact with the Enoggera Granite. Native gold is associated with arsenopyrite, chalcopyrite, and pyrite in irregular pyritic quartz veins and segregations.

At Milford Rocks, schist and quartzite of the Maronghi Creek Beds are intruded by dykes and tongues of Eskdale Granodiorite. Gold is found in small veins in the granite and altered metasediments near the contact. The Nukinenda Gold mine is at the contact of a diorite dyke and quartzite, slates, and cherts of the Maronghi Creek Beds. No vein section of ore greater than 0.9m wide was observed, and although gold values up to 23 g/tonne are locally present, discontinuity of economic grade ore precludes profitable exploitation.

Workings at Alice Creek were situated at the contact of porphyritic dykes and metamorphosed mudstone of the Cressbrook Creek Group at m.r. 526593. The gold, which assayed up to 37 g/tonne to a depth of 11m in the main shaft, occurs in a quartz vein (averaging 30mm wide) in a porphyrite dyke.

## **THE GYMPIE 1:250 000 SHEET AREA (GSQ Report 96)**

In terms of production, gold has been the most important metal mined in the Gympie Sheet area. The Gympie goldfield during its productive period was one of the three major goldfields in Queensland. The other four proclaimed fields in the Gympie Sheet area are the Glastonbury, Nanango, Yabba and Kilkivan fields. Gold was also worked at North Arm and numerous small occurrences are known elsewhere in the Sheet area.

### *Gympie Goldfield*

The Gympie Goldfield covers an area of 310km<sup>2</sup> although the most productive section of the field occupies a belt north of the Mary River within the town area of Gympie, about 6km long and 2km wide. The most comprehensive geological reports on the Gympie goldfield during its productive period are by Rands. Dunstan mapped the goldfield in detail and the results were published in a 36 map atlas. Summary descriptions of the field were prepared by Morton and the Department of Mines. This description of the Gympie goldfield is largely extracted from the latter report.

Rich alluvial gold was discovered by James Nash in September, 1867, and production from reefs began the following year. In 1872 deeper sinking by syndicates demonstrated that ore shoots recurred at lower levels with intermediate barren sections. In the Monkland (southern) end of the field, mining was carried out to depths exceeding 762m.

The West of Scotland shaft reached 964m. Exhaustion of the deposits accompanied by drainage problems caused work in the deep ground to cease in 1925. Since then mining operations have been confined to relatively shallow prospecting and the cyanidation of large accumulations of tailings. Attempts were also made on several occasions to exploit the deep alluvial ground on the Mary River, but with little success.

A neglected portion of the field known as the Great Northern Block referred to by Ball and Reid was tested with disappointing results in the late 1930s. It had previously been worked only in the Great Northern mine between 1903 and 1917 yielding 120kg of bullion.

A few small mines were worked south of the river in the Dawn area. The largest was the Dawn mine which operated from 1869 to 1884 and from 1902 to 1911, the total production for the latter period being approximately 429.3kg bullion. The area was prospected without success in the 1930s).

In the 1890s and early 1900s some gold mining was carried out in the Veteran area 12km north of Gympie. Gold occurred in a reef where it intersected highly altered dykes. An unsuccessful attempt to work the reef was made in the 1930s.

Since 1967 a resurgence of interest in the Gympie goldfield has been shown by the sinking of two shafts and several drill holes. To date there have been no significant results.

The country rocks of the Gympie goldfield consist of Permian marine sediments and volcanics of the Gympie Group. The rocks generally strike north-north-west and dip 20 to 22 east with great uniformity although in some areas (e.g. the Great Northern Block), they are disturbed by faulting.

The gold deposits are a classic example of the influence of wall rock composition on ore deposition. The major control of mineralisation was the intersection of quartz/calcite veins with beds of pyritic carbonaceous shale ('slates') containing graphitic 'floors' within them or 'breaks' immediately above or below them.

Flat-pitching ore shoots occurred in the reefs only where they crossed the carbonaceous beds. The one exception was the New Dawn mine to the south of the river where volcanics formed the country rocks of the auriferous shoots. In the Inglewood dyke, which was gold bearing where replaced by quartz, the shoots closely followed the contact of the dyke with slate.

The favourable beds lie towards the base of the Gympie Group. They occupy four horizons in the Rammutt Formation, a 600m thick sequence of alternating sediments, pyroclastics and some lavas. The most productive 'slate' bed in the Rammutt Formation was the uppermost one (the 'Phoenix or Monkland Slates'). These are approximately 60m thick and are immediately overlain by massive volcanic conglomerate and arenite. The "slates" consist of alternating thick-bedded shale and arenite all of which are carbonaceous.

The next two productive horizons below the "Monkland Slates occur at intervals of 40m and 23m, respectively, and are shale beds 4 to 5m thick. At 183m below these, a few hundred metres of greywacke with lenticular beds of massive shale form the fourth productive horizon.

With few exceptions, the strike of the numerous, parallel, fissure-filling reefs is the same as the country rocks, i.e. north-north-west; but they dip at 60 to 80° west. Many occupy faults and some are, in part, associated with andesite dykes. The reefs generally consist of one or two veins occupying the hanging wall and footwall of the fissure with veinlets occurring between them.

The fissure filling is brecciated country rock, chlorite, and calcite, and the veins are of quartz or quartz and calcite. In favourable horizons, the whole of the fissure filling was auriferous. The richest concentrations occurred where dip faults intersected the veins.

Faulting is of several ages and is usually normal. Numerous, more or less parallel, east striking dip faults (cross-courses) some of which have throws of a few hundred metres, are younger than strike faults which in turn are younger than bedding plane faults. All three sets are younger than the reefs which themselves occupy strike faults. A few dykes also occur in faults in the country rocks. Of these the most notable is the Inglewood dyke which marks the virtual southern limit of the field because of the magnitude of the downthrow on the southern side.

The Permo-Triassic sequence in the Gympie area was probably folded in the Early Triassic with an unconformity at the base of the Keefton Formation representing earth movements at the end of Permian sedimentation. Faults including those occupied by the reefs are tensional and probably post-date the folding. If this is so then the gold was probably introduced in the Middle Triassic. The nearest granitic intrusion to the Gympie reefs is the Woondum Granite, about 5km to the south-east. It is Middle Triassic in age i.e. Phase II of the Gympie Epoch.

Almost all of the gold was in the free state although in some places small amounts of pyrite, galena, sphalerite, chalcopyrite and, locally, hessite were associated with the gold. 'Specimen gold' occurred commonly in extremely rich patches. The richest reefs were the Glanmire, Great Eastern, Columbia, Glasgow, Inglewood, Monkland, New Zealand, Orient, Oriental, Phoenix, Scottish, Smithfield and Victory.

Table A lists lines of reef worked in the various productive mines. In many mines the reefs were not named or identified.

(A) LINES OF REEFS WORKED IN THE GYMPIE GOLDFIELD

Mine	Line of Reef
Alliance and Sunburst	Hall's, Smithfield
Amalgamated Monkland and Glanmire	Great Eastern
Australasian	Great Eastern, Orient, Smithfield
Black and Party United	March, New Zealand, Annie
Block 1292	Hilton
Brennan's Cal., A., and L. M. Tribute	Caledonian, Lady Mary
Caledonia	Caledonian, Alma
Caledonia and New Zealand Tribute	Caledonian, New Zealand
Old Californian Claims	Hilton
Columbia Consolidated	Columbia
Monkland and Inglewood	Barry's, Glanmire, Monkland
New Zealand P.C	New Zealand, March
2 North New Zealand	Lady Mary
Great New Zealand	New Zealand
1 North Great New Zealand	New Zealand
2 North Great New Zealand	Lady Mary
South New Zealand	New Zealand
1 South New Zealand	New Zealand, Annie, March
South New Zealand Junction	New Zealand, Annie, March, Crown
1 South New Zealand Junction	New Zealand, Junction

Total recorded production to the end of 1971 is given officially as 106 639kg This total includes small returns from the Glastonbury, Kilkivan, Yabba and North Arm fields.

Table B shows production figures for the mines of the Gympie goldfield. A complete analysis of the available figures is not possible since presentation of the returns has not been uniform. The returns of the early periods were compiled by Rands. Subsequent returns were compiled mainly from Annual Reports of the Department of Mines.

The yield was recorded as bullion and usually neither the value of the bullion nor the gold content was given. Thus, no accurate estimate of the silver production of the Gympie goldfield can be made. Since 1870, some 4 572 225 tonnes of ore were crushed for a return of 116 638kg of bullion. This figure does not include alluvial gold or the returns from cyanidation of tailings. It is estimated that the amount of silver produced from the bullion was probably of the order 16 000kg.

TABLE B: PRODUCTION FIGURES OF THE GYMPIE GOLDFIELD

Mine	Period(s) of Production	Ore Crushed (tonnes)
Alliance and Sunburst	1897-99	122
South Alliance	1885-86	402
Amalgamated Monkland and Glanmire	1914-20	153
Australasian	1893-1918	11 397
Black and Party - United	1896-1913	2 307
Block 1292	1911-12	272
Brennan's Cal., Alma and Lady Mary Tribute	1897-99	120
Caledonia (8, 9 and 10S; 3 and 4S; A1ma P.C. Cal. and United 1N. Cal.)	1870-88	2 577
Old Californian Claims (P.C.; 1 and 2N; IS; United)	1870-83	2 310
	1893-98	610

Maximum production was reached in the period 1901-1906. The ten most productive mines are listed below.

Mine	Tonnes crushed	Gold (bullion)kg
Scottish Gympie	1606 325	18773.5
No 2 South Great Eastern	432 893	10 472.6
South Glanmire and Monkland	258 007	6 276.2
1 North Phoenix	214 747	5969.2
North Smithfield	67 732	5563.1
4 North Phoenix	81 342	3 835.6
3 and 4 North Glanmire	55 417	3769.1
1 North Glanmire	86 834	3 003.7
7 and 8 Monkland	57 353	2 909.7
North Glanmire	60 120	2491.4

In the Two Mile area, the Golden Crown was the most productive mine, yielding 1316.8kg bullion from 44 672 tonnes of ore.

Treatment of the Gympie ores was simple and involved battery crushing and amalgamation. Parcels of pyritic concentrates were only occasionally sent to smelters.

Cyanidation was practised on a small scale until 1925, when deep mining ceased. Treatment of the huge accumulations of tailings, which continued until 1955, then became the main source of production.

### *Glastonbury Goldfield*

Gold was discovered in the Glastonbury area in 1885. Until 1888 the bulk of the production came from alluvial workings along Stone Water Creek, after which reef mining became dominant. Early mining was concentrated on the area south of the creek. The King reef was worked in the periods 1917-20 and 1932-49. Some further underground exploration and minor stoping was carried out on the Divine King, and Pioneer reefs in the 1960s.

The highest recorded production for a single year was in 1889 when 20.2kg of bullion was produced from 551 tonnes of ore, in addition to 2.3kg from alluvial mining. Some 18.1kg of gold was extracted from 485 tonnes of ore in 1916. In the last productive period, 1935 to 1950, a total of 541 tonnes of ore yielding 16.3kg of gold were mined from the southern section of the King reef.

Host rocks for the mineralisation are light brown shale and dark grey indurated quartzite dipping south at a low angle and intruded by granodiorite. Gold-bearing quartz reefs occur in both the sediments and granitic rocks of the area. The King reef strike s north to north-west and dips 30° to 40° south-west. Most reefs in the area have a similar attitude. They consist of iron-stained quartz carrying free gold with minor sulphides, principally galena and sphalerite. The reefs are up to 300mm wide in places but break up into veins 50 to 75mm wide. The reef in the Black shaft of the Divine King mine is fault controlled.

### *Kilkivan Goldfield*

The main groups of deposits are near Kilkivan, on the Black Snake plateau, at Gold Top, and near Tansey.

Most production appears to have come from the Rise and Shine reef, 1km east of Kilkivan. A narrow mineralised zone 500m long has been prospected by numerous shafts, pits, and costeans. The country rocks are undifferentiated Palaeozoic greenstone with minor phyllite, chert, and shale, and are cut by andesite dykes which may be related to mineralisation. The arcuate reef strikes from north-west to north and dips steeply. Production was mainly from the oxidised zone to a depth of 20m, where free gold occurred in a quartz-calcite gangue. Below this, primary sulphides are associated with quartz and calcite veining in sheared, brecciated greenstone. Total recorded production is 122.1kg gold, of which 85.9kg were obtained from 1351 tonnes of ore, but records are known to be incomplete. Drilling by the Department of Mines in 1969 showed that the reef persists to depths of 80m, but failed to intersect significant mineralisation.

At Long Tunnel Mountain, 2 to 3km south-east of Kilkivan, at least eight adits were driven to prospect and develop mineralisation exposed in shallow surface workings. Payable ore was

confined to small oreshoots within trachyte and diorite dykes and along their contacts with the country rocks (undifferentiated Palaeozoic slate, phyllite, and serpentinite). Recorded production is 14.0kg gold from 500 tonnes of ore. Alluvial gold was also produced from this area.

The chief gold mine on the Black Snake plateau, the Shamrock, is described in the section on copper. The Black Snake deposit lies in the same feldspar porphyry intrusion as the Shamrock, and consists of a single, vertical, north-east trending vein of quartz and calcite up to 200mm wide containing gold bearing ironstained quartz. At least 150 tonnes of ore were mined, and assayed up to 245 g/tonne gold. The Mariners reef, near the Shamrock, occurs partly within feldspar porphyry and partly within the adjacent metasediments. The reef, which is 260m long, strikes at 355° and is steep dipping. It contains gold, silver, chalcocite, arsenopyrite, pyrite, galena, and stibnite in a quartz gangue. Recorded production is 21.2kg gold bullion from 407 tonnes of ore. A diamond drilling programme carried out by the Department of Mines found no significant mineralisation at Mariners and only low grade material at the Black Snake.

At Gold Top, 7km north-west of Kilkivan, two siliceous reefs occupy subparallel fissures about 30m apart in andesite of the Neara Volcanics. The reefs are up to 1m wide, strike north-easterly, and have steep dips. Ore shoots are small and irregular. Below the water table, gold values decrease, and minor sulphides are present. Between 1911 and 1913, 213 tonnes of ore yielded 8.3kg gold.

The South Burnett gold mine at Tansey, 20km west-north-west of Kilkivan, was described by Denmead. The deposit is in sediments of the Neara Volcanics intruded by trachyte, andesite, and microdiorite dykes. Disseminated pyrite and arsenopyrite with minor sphalerite, galena, tetrahedrite, chalcopyrite, proustite, and gold occur in quartz and quartz-calcite veins in sheared graphitic mudstone. In the 1934-42 period, production totalled 3202 tonnes of ore for a yield of 40.8kg gold and 36.7kg silver. Gold losses in the tailings were high because graphite tended to coat the gold particles and prevent amalgamation. The Department of Mines drilled the deposit in 1967-68, and in 1970 Uranium Consolidated N.L. dewatered the mine and sampled the lower workings. The results of both these investigations indicated that some sections of the lode contain significant gold values, but most of it is very low grade.

Small quantities of gold have been produced from alluvial and reef deposits along Gobongo Creek 25km of Kilkivan.

### *Nanango Goldfield*

The Nanango Goldfield 2km east of Nanango was first worked in the 1880s. Two batteries were erected but the returns from crushings were unsatisfactory. The Gray's Luck gold mine, was sunk to 85m without finding gold in payable amounts. A shaft was sunk about 2km north-east of Nanango in 1935 but because of low values and water problems there was little or no production. The gold is very fine and associated in places with galena or pyrite. No records of production during the early productive years of the field are available.

The country rocks are grey and black shale and siltstone intruded by a felsite dyke varying between 0.3 and 6m in width and dipping westwards at 45°. Most of the gold was found to be restricted to groups of discontinuous quartz veins in the dyke. They are flat-lying and seldom more than 300mm wide.

### *North Arm gold deposits*

These deposits are about 2km north-east of North Arm township. Gold mining commenced in 1930, but the occurrence of fine gold in gullies in the area had long been known. Initial crushings from the Golden Surprise yielded 12.6kg of bullion from 51 tonnes of ore and gave impetus to further mining. In 1932 the Golden Surprise produced 1722 tonnes of ore yielding 83.5kg of bullion. By the end of 1937 when mining ceased, total production amounted to 845.9kg of bullion from 12 050 tonnes of ore and 12 212 tonnes of sands.

The Quincey and Corvi mine produced 213.2kg of bullion. Other mines included the Golden Surprise Extended, Golden Wonder, Golden Dawn, Hidden Treasure and North Arm Co. Their combined production was only 13.9kg.

The country rocks consist of volcanics of the North Arm Volcanics. Welldefined reefs of hard white quartz occur in a system of roughly parallel fissures striking north-west. With the exception of the Coolum reef which dips 60° south-west. the reefs are vertical. They are generally free from sulphide except where appreciable gold values occur. The ore contained dark bands of finely disseminated naumannite (silver selenide), together with specks of gold and some cerargyrite. Morton tentatively concluded that mineralisation was related to the intrusion of rhyolite dykes during the final stages of volcanicity.

### *Yabba Goldfield (also known as Jimna Goldfield)*

The Yabba goldfield is 10km east-south-east of Jimna. Alluvial gold was first worked from Jimna and Sunday Creeks in the 1860s and later was obtained from terraces adjacent to these streams. Workings extended approximately 6km westwards from the headwaters of Jimna Creek. With the gradual exhaustion of alluvial gold, reef mining contributed more prominently to the output of the field. Mortimer's reef was first worked in 1869. The Empress is possibly an extension of Mortimer's reef and consists of quartz with massive pyrite and minor galena associated with the gold. Production between 1897 and 1900 is recorded as 432 tonnes of ore yielding 13.1kg of gold.

Reef mining was originally recorded in the Mount Rollman area in 1893 and some further activity was reported by Ball. In the 1930s, sporadic mining, both from alluvial and reef workings, was resumed. The Sultana United claim, located south of the old Jimna township, produced a total of 68 tonnes of ore yielding 2.8kg gold between 1940 and 1948. Only very minor activity has been carried out in the area since then.

At Yabba, metasedimentary rocks consisting of slate, phyllite, chert, and arenite have been intruded by granite and contain narrow quartz veins, some of which carry gold. Alluvial deposits marginal to Jimna Creek carry erratic gold values. Reefs occur both in metasediments and in granite although most attention has been concentrated on the latter. Most reefs strike east with the exception of the Empress which has a north-north-east strike. In general, reefs are narrow and low grade and the very hard grade host rock made mining costly.

### *Other areas*

The Barlows Freehold gold mine is about 2km east of Woondum. The main workings are on a reef 150mm wide and dipping 60° west-south-west. East dipping shale of the Triassic Kin Kin Beds forms the country rock. At a two-head battery operated in the mid-1890s, 74 tonnes of ore

were crushed for a return of 0.9kg of gold. Between 1895 and 1906, tributers won 105 tonnes of ore.

The Mount Wonga mine, 1.6m west of Woondum, was originally worked between 1892 and 1894 when 395 tonnes of ore were treated for 6.5kg gold. Two shafts were sunk, each to a depth of 92m. The country rocks consist of indurated shale, conglomerate and sandstone of the Triassic Keefton Formation. According to Dunstan, the gold occurred where the abundant reefs cut andesite dykes.

At the Great Gorge mine, about 13km north-west of Gympie near Curra, a quartz reef 300 to 600mm in width carried between 16 and 31 g/tonne gold. The reef is in slate, shale and quartzite of the Rammutt Formation. Production for 1900-01 totalled 343 tonnes of ore crushed for 3.4kg gold.

Gold was discovered in the Kin Kin area in 1918, but the deposits proved to be unpayable. A gold deposit 6km west of Traveston was prospected in 1885 and 1892. Although initial samples assayed about 70 g/tonne, trial crushings returned only 18 g/tonne gold and the claims were abandoned.

The Borgam workings are on Yabba Creek about 20km west-south-west of Imbil. The reefs were worked in the 1930s. They were somewhat small but values on two were sufficiently high for profitable treatment (24 tonnes crushed for a little: under 92g/tonne gold). The country rocks consist of phyllite and micaceous schist striking north-west and dipping south-west. In the vicinity of the Yours and Mine and McAuliffe's mines the schists are intruded by diorite. The quartz reefs occur near the diorite contact.

Brooks described the Sandy Creek prospect 3km south of the main Borgam workings. Auriferous quartz reefs also carry arsenopyrite and sphalerite with minor chalcopyrite and galena.

Wieland's mine is 5km south-south-west of Imbil near Caseys Gully. Gold was mined from a small flatly-dipping quartz vein in hornblende porphyrite intruding metasediments. The vein contained small rich patches but pinched out at a shallow depth. Recorded production is 0.2kg retorted gold from 2 tonnes of ore.

Alluvial gold was worked on Breakneck Creek, 5km south of Imbil, and narrow reefs in granodiorite were prospected. Between 1928 and 1933, 6.0kg of bullion was extracted from 124 tonnes of ore. Browns Gully, about 2km south-south-east of Imbil, was worked for alluvial gold, and a few flat "leaders" in granodiorite were also prospected.

The O'Doherty mine, 5km by road south-south-west of Kenilworth, never yielded gold in payable quantities. Production from 1930 to 1934 was 0.7kg gold from 30 tonnes of ore.

On the divide between Walli and Chinaman Creeks, about 5km south of Kenilworth, gold occurs in a quartz-calcite reef in fine grained, highly altered, basic volcanics intruded by granitic rocks. The ore shoot had a length of approximately 27m. Individual crushings gave recoveries between 46 and 61 g/tonne gold. Several gold prospects occur about 9km south of Kenilworth in State Forest Reserve 736. At Sawtell's prospect, gold occurs in association with bismuth carbonate and pyrite in a fissure formation. The country rock is fine to medium grained hornblende diorite. Morton reported a small shoot of payable ore, but no production was recorded.

At the Snake Creek prospect, about 2km west of Sawtell's, four flat reefs in granite assayed slightly less than 31 g/tonne gold. They were not large enough to be payable.

Denmead described auriferous, arsenical quartz veins in greisenised granite on Chinaman's Creek about 3km downstream from Sawtell's prospect. Values up to 107 g/tonne were recorded. In the Kidaman Creek area, 8km south-east of Kenilworth, some slightly mineralised veins were prospected, but no payable gold was found. Alluvial gold was worked on Walli and Chinaman Creeks in the early 1900s.

Booloumba, Peter and Bundaroo Creeks, several kilometres east of the Yabba goldfield, were worked for alluvial gold although the effort necessary to locate the small rich pockets generally proved unrewarding. The alluvial flats are small in size and number owing to the steep gradient of the streams. Reef deposits were worked with some success but production figures are not available. The rocks of the area include green slate, phyllite, chloritic schist and quartzite traversed by numerous barren quartz reefs. Auriferous quartz veins occur in a granitic intrusion at the head of Peter Creek.

At the Hollyborne mine, about 2km west of Monsildale homestead, Cameron described the reef as consisting of fairly heavily mineralised quartz carrying pyrite and gold. It strikes at  $035^{\circ}$  and dips nearly vertically between walls of diorite. Assays gave up to 400 g/tonne gold. Gold also occurs in the silver-lead mines of the Monsildale area. Alluvial gold was worked on Squirrel Creek about 11km north-west of Monsildale.

The Seven Mile Diggings are situated near the junction of Yarraman and Cooyar Creeks, about 11km south-east of Nanango. Alluvial gold was worked in the 1890s and up to 700 men were working there at one time. However, no large scale mining of reefs or alluvium was carried out. Morton reported on attempts to revive alluvial mining but the ground was apparently neither extensive nor very rich. The greater part of the alluvial deposits was derived from insignificant veins in granite.

In the Taromeo Creek area about 10km north-north-east of Blackbutt, several shafts were sunk on the Black Diamond, Red Queen, and Lady Mary prospects. Ball reported that copper and silver occur with gold in reefs in granite.

At the Golden Bird prospect, 5km north of Blackbutt, gold occurs in quartz reefs, irregular veins and a chloritic lode which showed traces of cobalt. Gold values rapidly became impoverished with depth. Gold occurs with bismuth and silver in the Mount Langan area (see Bismuth). Ball reported on the discovery of gold at Nukinenda, 10km south-south-east of Blackbutt. The veins exposed were very small but rich.

At the head of Oppossum Creek, about 11km south-south-west of Benarkin, gold occurs in two distinct reef systems in fine-grained hornblende diorite. Denmead considered that reserves of payable ore were small. About 6km north-north-east of Yarraman, gold occurs at the base of Tertiary sediments capping Permo-Triassic granodiorite. Denmead regarded the grade and thickness of the wash as too low to be worked profitably.

On the Golden Gull prospect near Mount Powers, 10km east of Nanango, a decomposed dyke cutting steeply dipping slate and quartzite is cross-veined over a width of 5m by quartz.

The Golden Spur mine is at the head of Mortimer Creek in the Manumbar area, north-east of Nanango. Morton described the deposit as a fissure type, the walls being parallel to the schistosity of the enclosing schists. Above the water table the reef which averages 300mm in width is composed of iron gossan, quartz and some pyrite. Assays gave about 15 g/tonne gold.

In the 1860s and 1880s gold was mined from Moonarrumbia Creek and German's Gully on what was known as the Scrub Paddock diggings, 31km north-east of Nanango. Rands reported that nuggets as large as 400g were found. Gold was also produced from the Gooroomjan Creek copper mines in the same area.

## THE MARYBOROUGH 1 :250 000 SHEET AREA

### *MOUNT PERRY AREA*

Mineralization in the Mount Perry area is known in the Boolboonda No 1 Goldfield, Boolboonda No.2 (Wonbah) Gold and Mineral Field, Tenningering (Mount Perry) Mineral Field and the Reid Creek Goldfield. Several prospects have also been worked outside these gazetted Fields.

### MINERAL PRODUCTION -MOUNT PERRY AREA

Interval	Gold (oz)	Silver (oz)
pre-1885	no figures	-
1885-89	"	-
1890-94	"	-
1895-99	"	525
1900-04	5,878	211,400
1905-09	15,258	404,234
1910-14	4,336	151,651
1915-19	176	17,822
1920-24	19	3,683
1925-29	5	214

### *History*

Copper mineralization was discovered in 1867, and this led immediately to the working of the Mount Perry Lode by the Mount Perry Copper Company. In 1879 gold reefs were discovered in the Reid's Creek area, 4 miles south-west of Mount Perry, but it is likely that some local alluvial gold had been won prior to this discovery. This area was systematically developed in 1881. In 1881 the Royal Standard and All Nations reefs were worked in the Boolboonda area.

Molybdenum-mineralization was discovered by accident at Wonbah in 1884, when quartz pipe material was quarried by the Railways Department for use as track ballast.

Mining in the area received an impetus in 1901 with the floating of the Queensland Copper Company Limited, which purchased 160 acres of mineral freehold, including the Mount Perry Lode and reduction plant. Other properties were subsequently acquired, e.g. the Normanby Freehold and the New Moonta Mine at Boolboonda. This successful company employed 400 men and many independent miners sold their ore to it.

## *Gold*

The lodes of the Mount Perry area, which were worked primarily for copper were also the largest producers of gold; auriferous lodes were also prospected in the Reid's Creek Goldfield, Swindon Lease, and the Perry Goldfield.

The Reid's Creek Goldfield covers 25 square miles on the eastern side of Reid's Creek, about 4 miles south-west of Mount Perry. Most of the lodes are almost vertical; the more important are the "Arsenic Lode", Welcome Reef, and Caledonian Reef. Several other small prospects included two parallel reefs about ½ mile south of the Welcome Reef. The "Arsenic Lode", about 4½ miles south-south-west of Mount Perry, consists of sheared aplitic granite with small vugs of quartz and ferruginous gossan, commonly carrying scorodite. Black oxides of manganese stain the lode. Gold values, which are closely associated with the scorodite, are restricted in the lode. Only selective mining could make the lode payable.

The Welcome Reef, 3½ miles south-south-west of Mount Perry, was first worked in 1881. The ore was predominantly pyritic, which made the recovery of gold less than that suggested by assay. The width of the lode decreased rapidly in depth from 3 feet at the surface. At least 1252oz of gold bullion have been produced from the mine. The Caledonian Reef, south-west of the Welcome Reef, is 2 to 3 feet wide. It consists of arsenopyrite and pyrite in a quartz-calcite gangue. Gold is very fine grained and a high tailings loss was sustained. Other associated mines include the Mullocky Leader (immediately to the west of the Caledonian) and Shultz Shaft (on an offshoot of the Welcome Reef), about ½ mile south of the Welcome Reef lie two parallel reefs, which consist of sheared granite up to 6 feet wide. They are slightly silicified. The ore is pyritic with a little sphalerite; the gangue consists of calcite, quartz, and kaolinized feldspar.

The Swindon Lease is about 14 miles south-south-east of Mount Perry. The mineralization, which was discovered in 1947, occurs within a sequence of tuffaceous rocks which dips at 30° to the north; the volcanics are probably part of the Aranbanga Beds. Gold values were recorded from zones containing siliceous limonite which is dispersed throughout tuff. The area of economic interest is approximately 380 feet by 300 feet. In 1952 the more promising leases were taken up by the Mount Rawdon Gold Mining Company. These include the Falcon, Dawn, Day Dawn, Rainbow, and Sunrise. Other leases were the Blind Man, Rio, Tail End, Summit, and Delia. Total production from the area was 745 tons of ore, which yielded 192oz gold. The area was abandoned in 1953.

Several prospecting shafts were sunk in the Perry Goldfield, 18 miles west of Mount Perry, after its discovery in 1900. A small rush took place in 1902, but the area has never been regarded as a good prospect. The country rock consists of steeply dipping foliated schists with interbeds of lenticular limestone. These rocks are part of the Biggenden Beds. They are intruded by granite of Triassic age. Gold occurred erratically in lenticular quartz veins up to 10 feet wide and 66 feet long. Shafts on the field included the Painkiller, Glenister, Southern Extended, and Childers Retreat. Gold values ranged up to 9dwt 9gr/ton, silver values to 5dwt 8gr/ton. Traces of copper and molybdenum are recorded.

## *BIGGENDEN AREA*

For the purposes of this report, mines within a 25 mile radius of Biggenden are referred to the Biggenden area. Gazetted mineral fields within this area are the Paradise Goldfield, Mount Shamrock Goldfield, Chowey Goldfield, and the Stanton Harcourt Goldfield. However, some

mineralized centres in the area are located outside these gazetted fields. The Biggenden area has produced gold, bismuth, silver and some zinc, lead, copper, limestone, and ironstone.

### *History*

Some of the earliest prospecting was done about 1870 on the Chowey Goldfield, and about 1874 in the Mount Havilah area. Unfortunately, records of the activity prior to 1885 are not available. Mining activity in the area was greatest in the period 1886-1902 and by 1920 most of the fields were deserted. In 1966 the Biggenden Bismuth Mine was reopened by Commercial Minerals Pty Ltd as a magnetite mine. At the present time mineral exploration in the area has been revived; several companies are engaged in the search for metals, particularly copper and zinc.

### *Gold*

Auriferous lodes were worked at the Paradise Goldfield, Stanton Harcourt Goldfield, Mount Shamrock Goldfield, Chowey Goldfield, Gebangle, and the Young Australian Gold Mine.

The Paradise Goldfield, covering an area of 13 square miles, is on the southern side of the Burnett River, 8 miles north-west of Degilbo. Payable gold was discovered in 1889, and the goldfield was gazetted in 1890. By 1895 the field was almost deserted, owing mainly to the impoverishment of the reefs in depth.

Approximately 15 lines of reefs were worked. In general these were very thin, severely faulted, and rarely carried more than loz/ton gold. The main ore-bearing fissures have an easterly trend. Lode material consisted of bluish quartz containing finely disseminated pyrite, together with larger grains of pyrite and rare particles of galena and sphalerite.

Gold occurred as a very fine, regular dissemination in the quartz, which is probably why no alluvial deposits were discovered. The country rock consists of altered sediments of the Biggenden Beds. These include sandstone, siliceous slate, schist, and contorted lenses of limestone. In the Paradise P.C. shaft the country rock is quartz feldspar porphyry. Between 1890 and 1901, 11,511 oz of gold were recovered from the Paradise Goldfield.

The Stanton Harcourt Goldfield is 11 miles north of Degilbo and 17 miles south-south-west of Childers. Alluvial gold was discovered in 1885. Rands reported that a few small leaders were being prospected, but the workings were dominantly alluvial. By 1901 the field was deserted. The goldfield is on altered sedimentary rocks of the Biggenden Beds. These are overlain by small outliers of the Aranbanga Beds, which in this area are intermediate to basic pyroclastics and flows. To the east, the Biggenden Beds are intruded by the Triassic Broomfield Granite, and to the north-west by the Triassic Tawah Granodiorite. Most of the alluvial workings were in the catchment area of Stony Creek, a tributary of Tawah Creek which flows into the Burnett River. Most of the prospected reefs are within a mile of the junction of Slimy Gully and Stony Gully. Ball (1901) reported that these reefs were very poor. Samples of ore assayed in 1901 gave the following results:

#### **PRODUCTION - BIGGENDEN AREA**

<b>Interval</b>	<b>Gold (oz)</b>
pre-1885	no figures
1885-89	9043
1890-94	17 067
1895-99	5648
1900-04	7456
1905-09	3312
1910-14	1028
1915-19	803
1920-24	44
1925-29	14

Federal Claim	-3oz 14dwt 11gr/ton gold; 18dwt 7gr/ton silver
Commonwealth Claim	-3dwt 6gr /ton gold; 2dwt 14gr /ton silver

The Mount Shamrock Goldfield is 5½ miles north-west of Degilbo. The principal mining centres were Mount Shamrock, Mount Ophir, and Mount Melville.

Gold was discovered at Mount Shamrock in 1886. Here, shales and siltstones which are part of the Biggenden Beds are intruded by a dyke of diorite 45 feet thick. This dyke occupies a fault dipping 30° E. The diorite and sediments are faulted; some of these fault planes are invaded by acid dykes. Thin acid dykes are probably contemporaneous with the Triassic Aranbanga Beds, which form outliers in the area. In the vicinity of Mount Shamrock, the Aranbanga Beds have been removed by erosion, but a volcanic vent filled with agglomerate is exposed. Fragments in the agglomerate are mainly mudstone, diorite, and acid volcanic rock. The agglomerate, shale, diorite, and acid dykes were all gold-bearing. The gold occurred in small veins consisting of varying amounts of arsenopyrite, pyrite, native bismuth, bismuthinite, joseite, chalcopyrite and sphalerite; calcite and quartz were the gangue minerals. Where bismuth minerals or arsenopyrite occurred, gold values were high; where sphalerite occurred, gold values were lower. From 1886 to 1907, 34,419 tons of ore yielded gold to the value of \$226,688.

The geology of the Mount Shamrock area also applies to Mount Ophir (¾ mile north-north-west of Mount Shamrock) and Mount Melville (on the opposite side of Didcot Creek to Mount Shamrock). Dunstan described both peaks as volcanic necks. Ridgway reported that mineralized veins at Mount Ophir, although rich in part, were too small to be worked profitably, and that the mining of all mineralized zones including rich veins would not be economic since the overall yield would be very low. Production figures are not available for Mount Ophir and Mount Melville.

In 1870, the Chowey Goldfield, 3 miles north of Didcot, was prospected, but the field was abandoned by 1886. Here the Triassic Chowey Granite intrudes the Biggenden Beds. At the contact, the granite is syenitic. The Chowey reefs consisted of large masses of white quartz with molybdenite and free gold in association. Production of gold was very small.

The Gebangle reefs, about 6 miles west-north-west of Mount Shamrock, were prospected about 1886; by 1890 the field was abandoned. The country rocks are mudstone and siltstone of the Biggenden Beds, intruded by fine-grained acid dykes, all in part overlain by very small outliers of agglomerate of the Aranbanga Beds. The agglomerate contains angular fragments of shale, slate, quartz and acid volcanic rock; it contains up to 20 per cent pyrite. A little fine gold was obtained on crushing, but most of the values were present in the pyrite.

The Young Australian Gold Mine is 5 miles north-east of Biggenden. The area was prospected before 1901. The country rock consists of altered sediments (Biggenden Beds) intruded by small dykes of aplite and feldspar porphyry. In general, the reef dips to the south-east and ranges in thickness from 2 to 15 inches. It consists of purplish massive quartz with enclosed fragments of pyritic slate and appears to be formed by the silicification of a crush zone. Ball (1903b) reported that a crushing test on 20 tons of ore indicated gold values of 3oz/ton.

Sporadic gold mineralization has been reported from the Walla Range area, 3½ miles south-west of Coalstoun Lakes. Brooks reported on the Seven Sisters Gold Prospect, Coalstoun Lakes. Exploration work is continuing on the prospect. Gold mineralization in the Walla Range area is

probably genetically related to movement on the Perry Fault; a silicified fault breccia intruded by small aplitic bosses and dykes forms the Walla Range.

### *MARODIAN AREA*

The gazetted mineral fields in this area are the Marodian Goldfield, Yorkey's (Provisional) Goldfield, and Glenbar Gold and Mineral Field. Several mineralized centres referred to the Marodian area are outside these fields. The area has produced gold, copper, and silver.

### *History*

The earliest recorded mining activity took place in 1867 at the Colo Mine area. This mine was subsequently incorporated in the Marodian Goldfield, which was gazetted in 1876. Other early exploration occurred about 1872 when several freeholds were taken up in the Calgoa area. No reports on mining activity at this time are available. From 1905 to 1911 a small mining boom occurred at Calgoa, but no further work was done from 1911 until 1963, when the Lug-e-nor was re-opened.

In 1894 the provisional Yorkey's Goldfield was gazetted.

Sporadic mining activity continued in the Marodian area until the 1940s, but production was low. The only operating mine at the present time is the Lug-e-nor Copper Mine at Calgoa.

### *Gold*

The more important auriferous lodes were worked at the Marodian Goldfield, Yorkey's (Provisional) Goldfield, Munna Mine, Mount Melanie, Mount Scougall and the XYZ Mine. Several other gold prospects were associated with some of these centres.

The Marodian Goldfield has an area of 22 square miles and is at the heads of Calgoa, Sandy and Running Creeks, 24 miles south of Brooweena. Alluvial workings at Cola, in the extreme north-east corner of the goldfield, 2½ miles west-north-west of the confluence of Munna and Running Creeks, were operated about 1867. The wash, at depths of 6 to 25 feet was probably derived from leaders in diorite. The alluvial ground was soon worked out and no reef was located. A shaft sunk in 1895 penetrated weathered diorite and small quartz veins. A crushing test on 10 tons of ore yielded over 1oz/ton gold, but values dropped very quickly in depth. The lode material was composed of sugary quartz with iron and manganese staining. The unweathered diorite was very jointed and silicified; sulphides were present on joint planes.

Three quarters of a mile to the east of the Colo workings is the small Three Bells gold mine, which has not been worked since 1890. Ball reported that the mine was on a granite dyke which intruded slate.

Yorkey's (Provisional) Goldfield of 80 acres, on the left bank of Running Creek, 9¼ miles north of Kilkivan, was proclaimed in 1894. Gold was discovered in the area in 1892. After 1898 several small mines were operating on the field. In this area, the country rock is mainly diorite which intrudes fine grained sediments (Biggenden Beds). Yorkey's Surprise, on diorite, exploited a lode ranging in thickness from 2 to 6 inches. Lode material consisted of quartz carrying stibnite, pyrite, and gold. From 1894 to 1902, 2, 176 tons of ore yielded 1, 499oz of gold. The Zealandia operating on similar ground to Yorkey's Surprise, to 1901 yielded an average of 18dwt/ton gold from 400

tons of ore. The Triad, adjacent to Yorkey's Surprise, operated on vein material with an average thickness of 8 inches; values were up to 3oz/ton gold. The country rock is diorite. To June, 1902 the Triad produced 428oz gold from 434 tons of ore. The Waratah lease, north of the Triad, exploited ore with a matrix of carbonates of calcium and magnesium. Here the diorite was auriferous within 2 feet of the reef, but values were subeconomic. In other small leases in the area, galena and sphalerite occur in the lodes in accessory amounts.

Ball reported on gold mineralization at the Munna Mine, 3½ miles north-west of "Marodian". The mine was first worked as a copper prospect, but later a gold-bearing leader 1 inch thick was exploited. Operations ceased after 1900. The country rocks are altered limestone and mudstone (Biggenden Beds); they are intruded by Triassic granite.

The Mount Melanie Mine, 10 miles north-north-west of "Marodian", is 1 mile west of the Glenbar Gold and Mineral Field. The area was worked for gold some time before 1914 but no activity is recorded after 1933. Official records report that 239oz of gold were produced.

Gold and antimony mineralization occurs at the contact between a small intrusion of diorite and sediments of the Biggenden Beds. Other workings associated with Mount Melanie were the Dawn and Mount Ruby.

Gold mineralization is recorded from the Mount Scougall Mine, 2 miles south-east of the Mount Melanie Mine. A reef was worked in 1952 and again in 1961, but no record of gold production is available except for 20oz in 1961. The country rock consists of a small boss of granodiorite which intrudes the Biggenden Beds.

The XYZ Mine is 2 miles south-west of the Mount Scougall Mine. Morton recognized at least ten quartz veins, nine of which outcrop over a distance of 300 feet across the strike. They varied in thickness from 1 inch to 1 foot. The ore consisted of iron-stained quartz with traces of galena and pyrite. The country rock is biotite granite which intrudes mudstone (Biggenden Beds). The lode was found by Morton to postdate the granite and to transect the igneous contact. A sample of the better lode material assayed in 1920 indicated 2dwt 9gr /ton gold and 9dwt/ ton silver. No production figures are available.

#### *GAYNDAH AREA*

Very little mineralization is known in the Gayndah area. This is probably due to the fact that the Gayndah Block is here almost completely covered by the Triassic Aranbanga Beds, which are younger than the granites to the west of the Perry Fault. However, gold has been reported 5 miles south of Gayndah at Scotland Hills.

#### *History*

The area at Scotland Hills was prospected in 1904. The ore was found to contain sub-economic values of gold and the area was subsequently abandoned.

#### *Gold*

Gold mineralization at Scotland Hills was found to be associated with blocky limonite and turgite which formed residual deposits on top of a hill. These deposits may be up to 50 feet thick. Assays revealed that gold and silver were present only in trace amounts.

## CORDALBA AREA

Mining activity is recorded to the north-west of Cordalba on the southern side of the Burnett River. The area has been a small producer of gold and silver.

### *History*

No official records are available prior to 1933, but it is reported that the Wild Irishman Mine was worked as early as 1883. Mount Ideal, near Cordalba, was prospected about 1895. Most mining activity took place in the 1930s.

### Gold

Gold mineralization is recorded from three mines - Wild Irishman, Bull Ant, and Mount Ideal. The Wild Irishman Mine, 13 miles north-west of Cordalba, was first worked about 1883, but was soon abandoned. The lease was taken up again in 1933. The country rock consists of very altered, sheared sediments (Biggenden Beds) with quartz veins, intruded by aplite and granite of probable Permian to Triassic age. The intrusive rocks are sheared. Discontinuous reefs consist of vitreous quartz with minor iron oxide and arsenopyrite. They range in thickness from 18 inches to 2 feet. The reef system is parallel to the Electra Fault and appears to be cut off in depth by a parallel fault. In 1934, 80 tons of ore yielded 51.2oz of gold.

The Bull Ant Mine, 11 miles north-west of Cordalba, was prospected in the late 1890s. The reef consists of quartz and iron oxide; the country rock is sheared sediments (Biggenden Beds) with quartz veins. The mine is on a very wide shear zone. Low gold and silver values are recorded.

Mount Ideal Mine is on the west bank of Woocoo Creek, 2 miles south-west of Cordalba. The reef was probably worked about 1895. The country rock consists of altered sediments (Brooweena Formation) containing masses and veinlets of quartz with pyrite, arsenopyrite, and a little gold. Mineralization is confined to a faulted area of 40 feet by 100 feet. Gold values were found to be associated with siliceous material which formed only a small part of the mineralized zone. No workable ore bodies were located.

## THE MUNDUBBERA 1:250 000 SHEET AREA

Three proclaimed mining fields and one provisional mining field lie within the Sheet area. Gold was also found in a number of other areas and some gold deposits were located outside proclaimed fields. Most of the gold was mined from reefs; however, alluvial gold was won from the Hungry Hill -McKonkey Creek -Coonambula area. Except for the lodes of the Cracow area, virtually all the gold occurrences are associated with the granitic rocks of the Permo-Triassic Rawbelle Batholith.

The auriferous quartz reefs occur in these rocks or in the adjacent country rocks. They are largely confined to the eastern and south-eastern parts of the batholith and the nearby Eidsvold Complex. The reefs occur in the less acidic phases, which may represent the oldest parts of the batholith. They do not appear to occur in any preferred structural orientation. Many of the reefs in hornfelsed country rocks are associated with acid or intermediate dykes and occur relatively near the contact with the batholith. Except for the Cracow lodes, the mineralization has been of minor importance.

### *Cracow Mining Field*

Payable gold was discovered in 1931 by C. Lambert and partners, working under an incentive from the Government. Several mining companies operated the field and gold was won from the Golden Plateau, Golden Mile, Roma North, Roses Pride, Golden West, Dawn, Lambert's Surprise, Revival, and Klondyke. All but one mine had closed by the end of 1951. The Golden Plateau mine, operated continuously by Golden Plateau N.L. since 1933, is the only major producer and for many years Golden Plateau and Mount Morgan have been the only important gold producers in Queensland.

The total production to the end of 1972 was 1 453 144 tonnes of ore milled for a yield of 18314.33kg of gold and 19 036.29kg of silver. Average grade is approximately 12.9 per tonne. Annual production figures are listed in the table.

The gold deposits occur in andesitic volcanics of the Lower Permian Camboon Andesite. The regional strike is north-north-west and the dip 25° west. The volcanics unconformably overlie acid volcanics of the Carboniferous Torsdale Beds which are intruded further to the east by Upper Carboniferous granitic rocks and the Permo-Triassic Rawbelle Batholith. The unconformity is exposed approximately 4km east of the Golden Plateau mine. Rhyolite dykes are associated with some of the gold mineralization; the remainder is localised by fault zones. The age of the dykes and the faulting is not known; however, a Late Permian to Early Triassic age of mineralization is considered most likely.

Although several small lodes have been worked on the Cracow field, gold deposition was confined mainly to the Golden Plateau lode system which Brooks (1965) considered to form a faulted link between the White Hope lode on the west and the Golden Mile lode on the east.

Within the Golden Plateau lode, irregular tabular ore shoots have been mined discontinuously over a length of 693m, a width of up to 15m. and to a depth of 252.5m. The lode system is terminated abruptly on the west by the north-north-west striking Golconda Fault and on the east by a fault of similar strike. These faults were probably initiated prior to ore deposition, but post-ore movement has also taken place.

The gold occurs as gold-silver alloy in a quartz gangue. Primary gold is seldom visible to the naked eye, even in high grade ore. Small quantities of sphalerite, chalcopyrite, pyrite, galena, bornite, and hessite are present.

The Golden Plateau lode is regarded as a hydrothermal replacement deposit. The mineral assemblage and gold fineness suggest that ore deposition took place near the base of the epithermal zone. Ore deposition seems to have been controlled by faults, and in many places appears to be related to rhyolite dykes. Brooks notes that nearly all ore shoots have one wall defined by a fault plane or fault zone. In the eastern section of the mine, ore shoots often occur adjacent to a rhyolite dyke, or they may be confined between a fault and a rhyolite dyke. The mineralization is Post-Lower Permian (Camboon Andesite) and pre-Jurassic (Precipice Sandstone).

Between 1960 and 1971 diamond drilling by the Queensland Department of Mines on behalf of Golden Plateau N. L. resulted in the discovery of a major oreshoot in the Golden Plateau area and the proving of depth extensions of the main Roses Pride oreshoot. This major oreshoot has been the principal contributor to the production of gold and silver from the Golden Plateau mine since

1965. In 1969 Golden Plateau N. L. deepened the Roses Pride main shaft and drove a level a distance of 208.5m at a depth of 74m to follow up drilling results. In view of the marginal grade of the ore the company did not proceed with production.

#### Gold and silver production from Cracow Mining Field

Period	Ore (tonnes)	Gold (kg)
1932-36	121 181	2 884.01
1937-41	361 165	4 087.84
1942-46	140 598	1 082.93
1947-51	118 270	1 008.10
1952-56	136 943	2 140.39
1957-61	172 387	2 343.44
1962	34 480	419.77
1963	33 956	428.45
1964	35 184	422.07

#### *Eidsvold Mining Field*

Gold was discovered in the Eidsvold area in 1858, but early activity was spasmodic. The first prospectors claim was taken out in late 1886 over an area of land near the workings at Eidsvold head station on the north bank of the Burnett River. Initially, the mining activity was centred on Mount Rose (later Eidsvold) and Craven Town, 5.6km south-west of Mount Rose on the Burnett River. The Eidsvold Goldfield, which included an area of 28.5km centred on Eidsvold, was proclaimed in 1887.

Gold was mined continuously in the field from 1887 to 1914, with the peak production in the period 1893 to 1900. The maximum gold produced in one year was 426.80kg in 1892. With the discovery of payable gold at Cracow in 1931, interest in the Eidsvold field was renewed, and gold was mined intermittently until 1950. The total recorded production between 1886 and 1950 is 3011.91kg of gold from 90 025 tonnes of ore.

The mineralization occurs in the granitic rocks of the Upper Permian to Lower Triassic Eidsvold Complex and in isolated areas within adjacent Lower Permian(?) hornfelsed sediments and volcanics of the Nogo Beds. The gold occurs in quartz reefs. Hydrothermal solutions from the reefs have resulted in the kaolinization of feldspars up to a few metres from the contacts.

The main reefs, Mount Rose, Stockman or Lady Augusta, Craven, and Maid of Erin, are all located in the Mount Rose area, just west of Eidsvold. Rands noted that the majority of reefs strike north-west to north-north-west and dip easterly at angles from 20° to 45°. The reefs consist of quartz and minor associated pyrite, chalcopyrite, and sphalerite (Maid of Erin reef), stibnite and cassiterite (Stockman reef), galena (All Nations reef), molybdenite (Moonlight reef), and arsenopyrite.

The Mount Rose reef strikes east-north-east and dips 25° south-easterly. Rands reported the reef to average 75 cm in width, and consist of layered quartz, and interbedded clayey material, with the best gold occurring in the quartz.

The Lady Augusta or Stockman reef strikes north-west and dips 22° north-east, with the principal part of the reef dipping 65°. Rands noted that the Empress Shaft on the Lady Augusta reef line was sunk to 247m, cutting through the probable extension of the Mount Rose reef at a depth of 119m. The Lady Augusta reef averaged 9 cm in width, but varied at depth from 15 to 20 cm. Generally, the gold occurs in hanging wall leaders in association with quartz and calcite. Rands also noted the occurrence of massive stibnite in a shaft south-east of the Augusta mine (523m due south of the court house and 91m north-east of the outcrop of the Lady Augusta reef).

Rands reported that the north-west-striking and shallow dipping Craven reef has a thickness of 18 to 20 cm and an average gold content of 122g per tonne. The Maid of Erin reef strikes north-west with a north-easterly dip and is approximately 1.2m wide. It contains little quartz and occurs at the contact between granite and diorite. The Lady Minerva reef, striking north-east and dipping approximately 27° south-east has an average width of 8 cm in the underlie shaft. Rands described the Lady Rose reef, which outcrops 362m north of the outcrop of the Mount Rose reef, as a 30 cm wide quartz vein with copper staining in an altered granitic formation within the granite.

During the early years of development of the Eidsvold field, prospecting parties discovered gold occurrences in several adjacent areas. The Queen Bee and Mount Jones prospecting claims were granted in 1887 for areas on the Burnett River, approximately 14.5km north of Eidsvold head station. Considerable development was undertaken, but the only recorded production was that for 1889 when a crushing of 10.16 tonnes of ore yielded 1.41kg of gold.

The Lady Amy claim, approximately 1.2km west of Eidsvold, was located on the line of a fissure in granite marked by a white kaolinized band striking 80° and dipping 15 south. In contact with this kaolinized band is a brown limonitic band up to 1.8m thick, which contains little quartz, but hosts the gold mineralization. A sample from the south-easterly dipping gold bearing formation yielded 4g of gold per tonne.

### *St John Creek Mining Field*

Gold was discovered at St John Creek in 1888. This discovery, at first in alluvium and later in reefs, produced a drift in population from the dwindling Craven Town areas to the St John Creek area. The 5km<sup>2</sup> goldfield situated 26km south-west of Eidsvold, was gazetted in 1890. Few reports on the area exist. The two main mines on the field, Perseverance and Burnett Squatter, were worked intermittently between 1888 and 1937. The total recorded production from the field since 1888 is 313.03kg of gold from 15 669 tonnes of ore milled. Peak production was achieved in 1890 when 98.35kg of gold were obtained from milling 7574 tonnes of ore.