



Northeast Goldfields:

A summary of the Tower Hill, Mathinna and Dans Rivulet Goldfields

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INTRODUCTION

This report summarises the published and publicly available unpublished data regarding the history, gold production, geology and mineralisation in the Tower Hill, Mathinna and Dans Rivulet Goldfields. It also briefly discusses the timing and possible origin of gold mineralisation within the area.

The Tower Hill, Mathinna and Dans Rivulet Goldfields lie on a NNW-trending belt about one kilometre wide and approximately 90 km long from Mangana in the south through Tower Hill, Mathinna, Dans Rivulet, Alberton (Mt Victoria Goldfield), Warrentinna and Forester to Lyndhurst on the north coast (fig. 1). There is probably a small parallel belt through Golconda-Burns Creek. Another small NE-trending belt also occurs east of Gladstone.

There have been many attempts to establish the genesis of the gold mineralisation in northeast Tasmania, but most studies are now considerably dated and have not employed currently available techniques. Consequently the fluid evolution during the formation of auriferous quartz veins is still poorly understood. The causes of the concentrations of gold deposits along the Mangana-Lyndhurst zone, and the controls on areas of rich gold mineralisation within this belt, are also to be established. The review of available geological and geochemical data from the major goldfields in the northeast and north of Tasmania will facilitate the selection of areas which can potentially provide information regarding the relationship between tectonic setting, granite intrusion and the formation of gold-bearing quartz veins through geological and geochemical systematics, petrography, mineragraphy, stable isotopes and fluid inclusion studies. The results may then be utilised for gold exploration in the region.

Acknowledgements

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HISTORY AND PRODUCTION

The Mathinna Goldfield is one of the earliest goldfields discovered in NE Tasmania. Gold was probably discovered in the Mathinna area a few years after the first discovery of gold near Fingal in 1852 (Finucane, 1935). By 1892 most of the presently known gold prospects within the area were discovered and worked downward from surface to shallow depths of less than 30 m, with the exception of a few mines in which the lodes were worked to greater depths (e.g. New Golden Gate Mine). Most of these mines were abandoned before any organised mining development. This was mainly due to:

- (a) thinning or lowering of grades of gold-bearing quartz veins laterally or vertically,
- (b) lack of sufficient capital for proper mining development, and

- (c) displacement and disturbance of quartz veins by faults and shearing (Montgomery, 1892; Twelvetrees, 1907a; Finucane, 1935).

Consequently the goldfields were labelled as being "patchy and unreliable" (Montgomery, 1892).

Extensive but superficial attention has also been paid to the Dans Rivulet Goldfield. According to Hughes (1947), within the goldfield "every square mile has been vigorously prospected, thousands of shallow trenches dug, many adits driven and shallow shafts sunk, but seldom have the depths exceeded a hundred feet or so". It appears that the exploration took place at a very low level and small scale, with consequent low returns. This was blamed on the lack of occurrence of profitable gold shoots, and the goldfield lost its attraction to exploration and mining companies.

Recent exploration activities including those of the Electrolytic Zinc Co. of Aust. (EL 2/59, 1959-1962), Texins (EL 6/68, 1968-1974), ACA Howe Aust. Pty Ltd (EL 31/76, 1977-1986), Tasminex (EL 17/78, 1978-1982), Pegasus Gold Aust. (EL 55/83, 1983-1990), Goldfields Exploration Pty Ltd (EL 17/86, 1986-1988), Australian Anglo American Ltd (EL 22/80, 1980-1982) and Cuttack Mining and Exploration P/L (EL 53/89, 1990-1991) were also unable to apply any techniques to locate undiscovered gold lodes or extensions to the known lodes. Consequently, recommendations regarding diamond drilling programs made by geologists could not be justified by the companies. This was mainly due to the high cost of drilling and the likely existence of small gold lodes within the area. More recent exploration programs have mainly been focused on the mine tailings and some alluvial gold deposits.

To date, about 120 years after initial development, no systematic exploration program has been carried out within the goldfields and there is no geological evidence to suggest that other profitable and relatively large-scale vein type gold deposits such as the New Golden Gate Mine, once Tasmania's most important gold mine, do not exist in the area.

The Mathinna Goldfield had the highest officially recorded gold production in the area of 8.265 t (288,986 oz) in the period 1880 to 1932 (Montgomery, 1892; Twelvetrees, 1907a, 1914; Finucane, 1935). From this 7.197 t (253,865 oz) was produced from the Golden Gate Mine and 0.312 t (10,997 oz) from the Tasmanian Consols Mine (Tables 1, 2). However the true production may have been higher, as Twelvetrees (1914) reported from "official returns" a total gold production of 8.805 to 9.072 t (300,000-320,000 oz) from the Mathinna Goldfield until 1914. The Dans Rivulet goldfield produced at least 140 kg (4938 oz) of gold in the period 1888 to 1906 (Table 3) (Hughes, 1947; Twelvetrees, 1907a). The only recorded gold production from Tower Hill was 0.12 kg obtained from the Sunbeam Mine (Table 1).

There are no records of alluvial gold production from the Mathinna, Dans Rivulet and Tower Hill Goldfields, probably because (according to local residents) the fields were mostly worked by the Chinese who did not keep any gold production records. However the potential for the

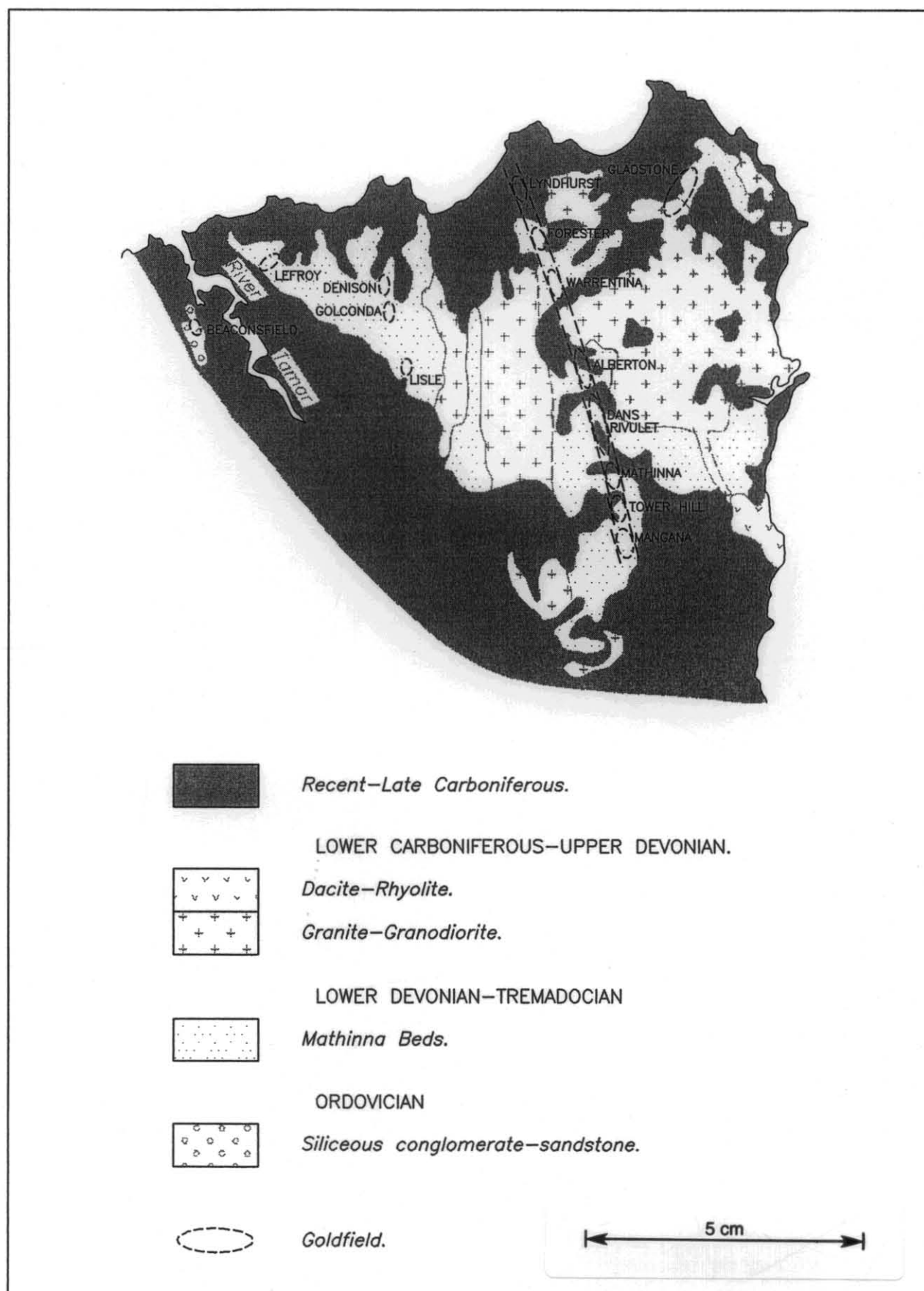


Figure 1
Location of goldfields, northeast Tasmania

Table 1

Gold production, Mathinna and Tower Hill Goldfields (Finucane, 1935)

Deposit	Ore* (tonne)	Gold* (kg)
Welcome Stranger	-	-
Enterprise	10	0.93
New Golden Gate Mine	304 158	7 197.10
Tasmanian Consols (North Golden Gate)	34 236	311.76
South Golden Gate	-	-
Caledonian	-	-
New Eldorado (prior to 1886)	508	?
	579	26.22
Horseshoe	89	1.43
Gladstone	71	1.12
Miner's Dream	208	12.29
Old Boys	242	2.14
Volunteer Mine	~9 000	72.79
Volunteer Consolidated	1 788	35.79
Yellow Boy	213	2.41
Chester and Murray	2.5	0.03
	?	2.55
City of Hobart	?	596
Pride of Hills	91	?
	15	0.23
Scott and Pickett	93	1.07?
Mountaineer	-	-
Jubilee	56	1.67
Sunbeam (Tower Hill Goldfield)	12	0.12
Total		8 265.73

* Recorded or quoted values

Table 2

Gold production, New Golden Gate Mine (Finucane, 1935)

Period	Ore (quartz) (tonne)	Gold (kg)
to 1881	406	3.923
1881-1912	284 351	6 650.992
1913	?	31.612
1914	1 565	29.23
1915	2 171	78.643
1916	?	43.177
1917	551	9.157
	1 016 (tailings)	28.350
1918	1 298	28.520
1919	1 405	40.881
	7 (pyrite)	2.296
1920	985	17.792
1921	?	15.829
1922	1 439	22.748
1923	2 139	26.564
	Other sources	8.420
1924	?	44.550
1925	?	15.125
1926	1 609	41.986
1927	?	49.882
1928	265	6.070
	2 956 (tailings)	8.300
1929	213	
	1 172 (tailings)	10.892
1930	260	4.488
	333 (sands)	1.604
1931	260	4.488
1932	?	1.050
Total		7 197.10 (253 865.10 oz)

occurrence of significant alluvial deposits in Black Horse Gully, Long Gully Creek, and in the Dans Rivulet and South Esk River Valleys was recognised long before 1870 (see fig. 3 for locations). According to Twelvetees (1907a) small nuggets up to 6 to 8 grams were common in the early days of mining and a piece weighing 120 grams was also found in the Black Horse Gully and Long Gully Creek areas. A boring program was carried out at the mouth of Black Horse Gully prior to 1906 (Twelvetees, 1907a); this program consisted of 87 holes drilled at about 20 m intervals along lines 160 to 200 m apart. The average yield

was about one gram of gold per cubic metre over an average depth of two metres for the area.

Later work on the alluvial deposits in the Black Horse Gully, Long Gully Creek, and north and east of the South Esk River (e.g. Turner, 1972) indicated that the distribution of gold grains was erratic and below the grades mentioned by Twelvetees (1907a). It should be emphasised that the majority of past programs were not carried out systematically, and estimated reserves may not reflect the true values. Some small alluvial mines are presently

Table 3**Gold production, Dans Rivulet Goldfield**

Deposit	Ore* (tonne)	Gold* (kg)
Golden Horseshoe	1 836	6.357
City of Melbourne	?	1.701
	13	0.623
	25	0.184
New Golden King	1 904	37.705
Mabel	120	2.154
Revenue	418	2.962
O'Briens	1 341	39.6
Starlight	?	17–22
King Edward	235	9.157
Carnegie	102	1.552
Havelock	885	16.83
Strickland	7 (minimum)	0.522
Una	3 (minimum)	0.595
Total		≈140

* Recorded or quoted values

operating in the areas near O'Briens Creek and in Black Horse Gully.

SUMMARY OF REGIONAL GEOLOGY

by R. H. FINDLAY

The linear Mangana–Alberton–Warrentinna–Lyndhurst Goldfield occurs within the probably Silurian to Devonian part of the Mathinna Beds of NE Tasmania. These rocks consist of an apparently monotonous sequence of interbedded, fine- to medium-grained, commonly graded quartz-rich sandstone beds and pelites. These rocks are intruded by I and S type granitoids ranging in age from Late Devonian to Early Carboniferous (fig. 2). The younger granitoids contain fluorite, topaz and apatite, and are extensively mineralised in tin and tungsten. These rocks are overlain unconformably by possibly Carboniferous and the Permo-Triassic sedimentary rocks of the Parmeener Supergroup which contain sills of Jurassic dolerite. Subsequent Tertiary volcanism has produced isolated but extensive basaltic lava flows, some of which in the Alberton–New River region interdigitate with sediments of inferred Tertiary age. All rock units are overlain unconformably and mainly in valleys by Pleistocene–Recent sedimentary deposits.

Structural geology of goldfield

The auriferous quartz veins of the goldfield are hosted by the Mathinna Beds. These rocks are folded about generally northwest-trending axes to form both small-scale and kilometre-scale chevron folds with axial plane cleavage; in the pelitic beds this takes the form of a slaty cleavage and in sandstone beds a cleavage which may be very weak or may attain the 2A textural grade of Bishop (1972). Although the cleavage appears statistically to be axial planar, at one locality it transects a fold hinge at an angle of 25°.

According to the orientation of the bedding/cleavage intersection lineations, the fold axes plunge shallowly to as much as 40–50° northwest or southeast. This may be primary, be due to transection of fold hinges by the cleavage on a scale more extensive than identified, or may be locally due to the effect of granite emplacement. Alternatively, as a northeast-trending structure cut by the cleavage is known in the South Esk Valley, the variation in orientation of the intersection lineation may be due to earlier folding.

As mapped according to form lines, the folds in the Mathinna Beds change shape within the fold stack and multiply-hinged folds may give rise to single-hinged chevron folds, or vice versa. Limb thrusts have been observed locally and extensional veining is common in the sandstone beds of fold limbs. Given the style of folding, hinge collapse structure and extensional quartz fractures and quartz reefs at fold hinges may be expected (Ramsay, 1974) although the nature of the exposures is generally too limited to demonstrate this.

A subsequent deformation has produced regional megakinking about steep, northeast-trending kink planes (Goscombe and Findlay, 1989) as well the production of numerous steeply-dipping kink bands with both sinistral and dextral geometries. The sinistral kink bands tend to trend north to northeast, while the dextral bands trend east to the southeast. The age relationships between these variably-oriented kink bands have not been determined, although it is thought that the sinistral kinks and the megakinks formed in response to north–northwest to north-directed compression (Goscombe and Findlay, 1989).

Quartz veining and small-scale faulting are common, but the full details of these structures are unresolved. As outlined above, some quartz veins were produced during folding, and given the style of folding particularly complex vein arrays may be expected at fold hinges. Other thin quartz veins follow northeast-trending joints which appear to postdate folding, and statistically are oblique by about 10–15° to the northeast-trending sinistral kink bands. Other veinlets accompany some post-fold kink bands; some planar quartz veins follow the regional cleavage; other quartz veins are boudinaged or isoclinally folded within the plane-parallel cleavage in some pelitic units; quartz veins containing arsenopyrite and gold follow post-fold faults.

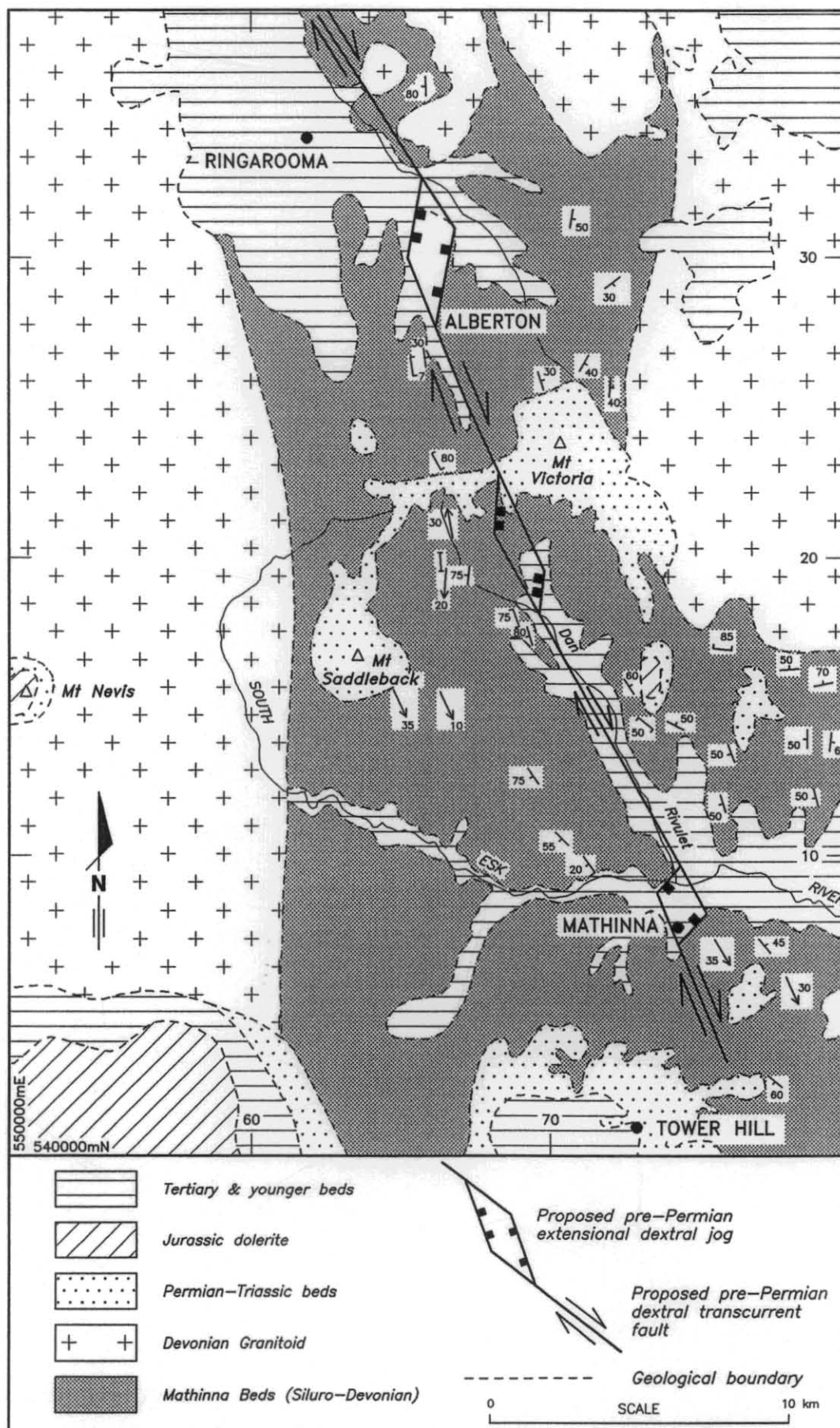


Figure 2

Simplified geology of Tower Hill — Ringarooma area, showing proposed pre-Permian extensional dextral jog and dextral transcurrent fault.

Structural control of gold mineralisation

Hills (1923) suggested that the gold mineralisation was controlled by folding related to a west-dipping thrust fault which he postulated would crop out west of Mt Victoria. He envisaged the lodes as restricted to the crest and limbs of an anticline in the upper thrust plate; one group of lodes was seen as restricted to crestal fissures, whereas the lodes in the limbs were supposed to occur in conjugate fracture systems related to the folding. No evidence has been found supporting this, and the Hills' thrust has not been confirmed.

Powell (1991) has also discussed the probable relationship between thrusting and gold mineralisation in the Beaconsfield and Lefroy Goldfields. At present it is not possible to correlate the thrusts discussed by Powell (1991) with structures in the Alberton–Mangana Lineament, although in view of the work by Powell and Baillie (in press) there is a clear need for structural analysis of the region between the Lefroy and Alberton–Mangana goldfields.

An alternative view presented here is that the mineralisation in the Mangana–Alberton goldfield may be caused by wrench faulting. It is emphasised that no obvious major wrench faults have been found. This idea is based on:

- (1) the orientation of topographic lineaments between Mathinna and Mangana, the upper part of Dans Rivulet and Mathinna, and that formed by the Alberton Valley;
- (2) the consistently restricted orientations of known gold lodes; and
- (3) the offsets between the goldfields (fig. 2).

The topographic lineaments are here interpreted as following either major faults, or preferably broad fault zones in which the strain has been taken up in a broad zone on numerous minor faults. Each topographic lineament jogs right, and if formed as a dextral wrench system would produce extensional jogs at Mathinna, the head of the Dans Rivulet, and at the northern end of the Alberton Valley. The Main Slide Lode at Mathinna may be interpreted as having formed as an extensional structure in such a system; likewise, the lodes in the northern end of the Alberton Valley. No data are known of such extensional structures in the alluvium-covered part of the Dans Rivulet where an extensional jog is inferred.

The offsets between the Alberton, Dans Rivulet and Mathinna goldfields have been noted by Threader (1967), who proposed their offset on E-trending dextral wrench faults. These offsets are also consistent with the idea that the goldfields formed in extensional jogs in a dextral wrench system.

Finally, the restricted orientations of the gold lodes indicate that they follow faults related to such dextral shearing; given the proposed orientation of the proposed dextral faults, the gold lodes pick out what may be interpreted as a Riedel shear pattern related to such

faulting. It is re-emphasised that this model needs further detailed field analysis before it can be proved.

GEOPHYSICS

The earliest geophysical work including airborne magnetic and EM surveys was carried out in 1959, and covered an area between Mangana and north of Mathinna (Hancock, 1959). The survey discovered several weak anomalies, although these were not followed up by systematic ground checking and consequently their significance remains unknown.

In 1969 an airborne gamma ray spectrometer survey was flown over the Dans Rivulet–Mathinna–Tower Hill area (Rattigan, 1969). Some anomalies were indicated in and around Mathinna. However the flight lines could not be located accurately on maps and the locations of high readings remains doubtful.

In 1972 a 13.5 km reconnaissance VLF survey was undertaken over the areas with known faults, gold and sulphide mineralisation in the Mathinna area (Turner, 1972). The survey consisted of nine scout lines which were spaced one to two kilometres apart, and readings were taken at 15 to 30 m intervals. Several anomalies were indicated and some were supported by geological data. However the main aim was only to examine whether a VLF survey would show any response to gold mineralisation in the area. One of the main problems was the conductivity of the pyritic slates and shale of the country rocks, which was probably comparable to or even higher than that of the mineralised lodes containing an average of 1.5% sulphides. Consequently the anomalies could not be reliably related to mineralisation.

A detailed combined VLF and IP survey in the Jubilee mine area in 1972–73 (fig. 3) discovered numerous anomalies, but only a few were considered to be significant. Based on geological, geochemical and IP anomalies, two costeans were dug within the area. Chip sampling of the costeans showed only very low gold concentrations of less than 0.1 g/t. The IP anomaly was interpreted to indicate the occurrence of a conductor at depth, and in this sense the costeaning neither denied nor proved the reliability of the geophysical data. Follow-up drilling was not undertaken. (For details see Turner, 1974).

Bishop (1981) discussed different geophysical methods that may be useful in detecting gold-bearing quartz veins. Nine samples from quartz veins and their country rocks were collected from the Mathinna Goldfield for measurement of density, magnetic susceptibility, resistivity and IP effects. However no convincing result in differentiating auriferous quartz veins from their country rocks was obtained.

An experimental ground magnetic survey in the Tower Hill area was undertaken in 1989 and indicated that the method may be useful in defining the quartz veins and possibly differentiating mineralised from unmineralised ground (Leaman, 1989). The technique was considered to be the only known method that responds to changes

in lithological and possibly alteration patterns within the Mathinna Beds, and it can also be undertaken easily and cheaply over large areas.

The most recent geophysical study included a high resolution helicopter aeromagnetic survey flown over the Mangana–Mathinna area at a line spacing of 150 m with a 400 m tie line spacing (Leaman, 1990). The survey indicated subtle, systematic variations in the magnetic fields occurring in the Mathinna Beds which can be related to the fracture systems, bedding or other large-scale structures. Several lineaments were identified, with the most prominent showing a NNW-SSE trend. However the relative significance of these features could not be defined. The survey could not consistently relate the magnetic data to areas of known mineralisation. It did show that airborne and detailed surface magnetic surveys can be correlated (e.g. in the Tower Hill area).

DRILLING

Diamond drilling coverage for the Tower Hill, Mathinna and Dans Rivulet Goldfields consists of only eleven holes, all of which were drilled by the Department of Mines at the Enterprise, O'Briens and New Golden Gate mines and in the Rosedale Flat area (fig. 3, table 4). In 1928, a 174 m deep hole was drilled in the Enterprise mine area to test the northern extension of some auriferous quartz veins. Several "quartz formation", "bands of quartz" and a "mineralised quartzite" were intersected below 33 metres. A few samples from the quartz formation and quartzite gave "poor" gold content. However no systematic sampling of the drill core appears to have been done (Nye, 1927; Finucane, 1935). Three holes were drilled in the O'Briens Mine area, with two of the holes intersecting mineralised quartz intervals (fig. 4, Hughes, 1954). Mineralisation intersected in one of the two drill holes was only 60 cm wide, whereas the

other hole intersected approximately 5 m of rocks averaging 11 g/t gold at about 42 m below the surface.

In 1962 two more holes were drilled to depths of 155 m and 112 m in the Carnegie–Starlight Mine area (fig. 4, Threader, 1963a). The purpose was to test the extent of the Carnegie lode to the west, the Starlight lode to the east, and also to examine the possibility of the occurrence of a more significant auriferous shoot at the intersection of the two lodes. However the lodes were not intersected and only "nil or traces" of gold were reported from analysed samples.

Between 1962 and 1966 three holes were drilled at the New Golden Gate Mine to study the possible occurrence of extensions of the mineralised lodes to the north and south of the mine and to test the mineralisation of the main shear zone at depth (Threader, 1962; 1965; 1966). The depths of the drill holes were between 112 m, 203 m and 313 metres. Only "nil to trace" of gold was reported from the quartz veins intersected by the drill holes.

In the Rosedale Flat area (fig. 3) two drill holes were drilled to test the gold mineralisation and to obtain more information regarding the geological structures affecting the gold mineralisation at depth (Threader, 1987). The drill holes were 514 m and 423 m deep. A shearing zone was observed which was confined in a 200 m lutite sequence and no significant mineralised zones were intersected. Minor sulphide mineralisation was intersected in both drill holes. Core samples containing sulphides and quartz veins were analysed for As, Cu, Pb, Sn, W, Zn and S. Eight samples with anomalous sulphur contents were analysed for Au, but all showed very low gold grade with the highest value being 0.05 g/t. However cassiterite was observed in all sludge to 100 m in one of the drill holes located on the western side of the valley (DDH Dans Rivulet No. 1, see Threader, 1987 for details). As no cassiterite-bearing

Table 4
Summary of diamond drilling in the Mathinna and Dans Rivulet Goldfields

DDH No.	Co-ordinate/location	Total depth (m)	Goldfield	Year	Reference
GG1	Golden Gate Mine	131	Mathinna	1962	Threader, 1962
GG2	Golden Gate Mine	203	Mathinna	1964–1965	Threader, 1965
GG3	Golden Gate Mine	313	Mathinna	1965–1966	Threader, 1966
	Enterprise Mine	174	Mathinna	1927	Nye, 1927 Finucane, 1935
No. 1	O'Briens Mine	57	Dans Rivulet	1954	Hughes, 1954
No. 2	O'Briens Mine	78	Dans Rivulet	1954	Hughes, 1954
No. 3	O'Briens Mine	49	Dans Rivulet	1954	Hughes, 1954
No. 1	Carnegie Mine	155	Dans Rivulet	1962	Threader, 1962
No. 2	Carnegie Mine	112	Dans Rivulet	1962	Threader, 1962
Dans Rivulet No. 1 (Rosedale Flat)	572 291 mE 5 412 961 mN	423	Dans Rivulet	1985	Threader, 1987
Dans Rivulet No. 2	572 602 mE 5 413 068 mN	514	Dans Rivulet	1986	Threader, 1987

veins were intersected, it was concluded that the cassiterite came from the six metre thick alluvium. Based on this assumption the cassiterite concentration in the alluvium would be 160 g/m^3 .

A project of reverse circulation drilling, consisting of 13 holes totalling 597 m, was undertaken in the Tower Hill–Sunbeam area in 1980 (Morrison, 1990). Six of the drill holes encountered gold grading between 0.17 to 3.11 g/t over 2 to 5 m intervals, with the best interval being 2.9 g/t over three metres in the Sunbeam area.

GEOCHEMISTRY

The area has been covered with some soil, stream sediment and rock chip sampling.

The early regional stream sediment survey was rather erratic within the area and the results were not considered to be significant (Rattigan, 1969; Turner, 1972). In some cases the samples were analysed only for base metals and Ag (e.g. Turner, 1972).

Some of the lode deposits in the Dans Rivulet Goldfield were also mapped and sampled by Mitchell (1980). It was concluded that the lode deposits exhibit erratic distribution in terms of width and gold grade, and any further development required a major diamond-drilling program which was not justified at the time.

Another reconnaissance stream geochemical survey in the hills flanking the South Esk River in the Mathinna area showed some Pb, Zn, Cu, and As anomalies which can be indicative of gold-quartz mineralisation within the area, as the gold mineralisation is commonly associated with sulphides (Mellor, 1982). Gold and tin anomalies were also observed (e.g. in Evercreech Rivulet), but the weak anomalies and the unknown source of the gold did not justify a further sampling program.

Seventy-three soil samples were collected from lines 200 m apart in the Tower Hill Goldfield and analysed for Au and As (Morrison, 1989). The gold contents were mostly <50 ppb with the exception of a few samples with grades up to 230 ppb. Arsenic contents were mainly below 50 ppb. Considering the low contents of gold and arsenic, any interpretations regarding the relationship between these two elements may not be reliable.

In terms of rock chip sampling, some 400 quartz samples from veins and dumps were taken from old gold mines in the Mathinna and Tower Hill Goldfields (Daly, 1981). Most of the the samples were pulverised and examined for visible gold using a magnifying glass. Some samples contained visible gold grains. Only 20 samples were fire assayed for gold. The values were around 1 g/t with the exception of two samples from the Miners Dream and Twilight Mines which contained around 7 g/t gold.

Sixty-eight composite samples from the Tower Hill Goldfield from areas with a high concentration of quartz veins and visible sulphides were also analysed for gold. Eighteen samples showed gold grades above 0.1 g/t and eight samples contained more than 1 g/t gold. Most of

the samples with relatively high Au contents were collected from old mine dumps (Morrison, 1989).

Other rock chip sampling from known mineralised areas in the Dans Rivulet Goldfield also indicated relatively low or erratic gold contents, and the results did not justify any further exploration programs (Mitchell, 1980, Nolan, 1990).

Between 1989 and 1990 a reconnaissance regional rock chip and stream sediment sampling program was undertaken for the most of the NE Goldfields (Randell, 1991). The rock chip samples taken from the Mathinna–Dans Rivulet area showed low gold contents of less than 0.1 ppm, and the results did not warrant any further work. Three sites from the Mathinna area showed anomalous gold values of up to 8.6 ppm and 1.9 ppm respectively from the panned and sieved stream sediment samples.

GOLD MINERALISATION

Primary

Gold mineralisation occurs in quartz veins hosted by the metasediments of the Mathinna Beds. The country rocks are folded around NNW-trending axes with a strong NW-trending cleavage dipping south. Gold mineralisation occurs within a 500 m wide zone which has been affected by tight folding and strong axial surface shears. The Tower Hill, Mathinna and Dans Rivulet Goldfields occupy some 20 km of the 90 km long, NW-trending belt extending from near Fingal in the south to near Lyndhurst on the north coast.

Folding of the Mathinna Beds around a NNW-trending axis caused formation of extensional fractures filled with quartz in fold limbs and hinges during folding. Small-scale faulting is also common within the area, although the full details regarding the relationships between the formation of different quartz veins, including the auriferous veins, and the folding and faulting within the area are still unresolved.

The locations of gold deposits within the Mathinna, Tower Hill and Dans Rivulet Goldfields are shown in Figures 3 and 4, and are briefly described in Appendix 1. In general there are several quartz vein types of possibly different generations including:

- (a) thin quartz veins following NE-trending joints,
- (b) veinlets accompanying formation of some post-fold kink bands,
- (c) planar quartz veins following the regional cleavage,
- (d) quartz veins which are boudinaged or isoclinally folded within the plane-parallel cleavage in some pelitic units,
- (e) quartz veins occurring alongside faults, and

- (f) quartz veins which may contain sulphides and follow post-fold faults.

The following is a summary of gold mineralisation in the Tower Hill, Dans Rivulet and Mathinna Goldfields. These fields have been described by many workers including Montgomery (1892), Twelvetrees (1907a; 1907b), Finucane (1935), Hughes (1947), Threader (1967), Turner (1972), Daly (1981), Mconie (1983), and Summons (1984).

The quartz veins vary greatly in thickness from a few centimetres to about 10 m, and in length from less than 5 m to over 300 metres. However the majority of the veins are less than one metre wide and between 30 to 60 m long. The maximum recorded vertical extent of the quartz veins is about 336 m at the New Golden Gate Mine in the Mathinna Goldfield, but most of the quartz veins have been worked to only about 30 to 40 m below the surface.

The strikes and dips of the veins also vary widely and may not show any consistent relationship with bedding or cleavage in the Mathinna Beds. However it appears that the orientation of veins within each small area is rather consistent, and in the Dans Rivulet Goldfield the majority of the economically significant quartz veins exhibit an E-W strike (fig. 3). Underground observations of the Main and Loane's reefs in the New Golden Gate Mine (Montgomery, 1892) indicate that NNE-trending lodes were the thickest and also richest in gold content, whereas NW-trending quartz veins were thinner and lower in gold content. The quartz veins are mainly hosted by slates in the Dans Rivulet and Mathinna Goldfields whereas in the Tower Hill area numerous small and irregular quartz veins are concentrated in a NW-trending quartzite unit.

Gold in quartz veins is mostly associated with minor (less than 1 to 2%) sulphides, particularly arsenopyrite and pyrite, with less common galena, sphalerite and chalcopyrite. Gold occurs as free grains in quartz or as inclusions in sulphides, mainly arsenopyrite and pyrite. The quartz is commonly massive, coarse to fine-grained crystalline aggregates, vitreous to dense, and varies in colour from white to grey-blue. The bluish tinge is due to the occurrence of fine inclusions of sulphides in the quartz.

There are insufficient data regarding the grades of all the different mines. The ore shoots were mostly small, probably in the range of 100 to 1000 tonnes, with the exception of the major gold producing mine, the New Golden Gate which was between 60 000 and 80 000 tonnes. The New Golden Gate Mine is known to have had the highest gold grade, averaging about 26 g/t, and more than 90% of the gold produced in the area came from this mine.

It has been reported (Finucane, 1935) that gold enrichment was observed at the intersections of two or more quartz veins (e.g. Loane's and Main quartz lodes at the New Golden Gate). Gold enrichment may also be as the result of oxidation and leaching of sulphides or leaching and reprecipitation of gold in near-surface conditions, resulting in gold enrichment at only shallow

depths. Probable secondary enrichment has been postulated in the Pincher Mine (Mangana Goldfield) as the gold grade decreased with depth from around 60 g/t between the surface and 4 m to about 6 g/t at 15 metres. A similar interpretation has also been made for a number of deposits characterised by gold-rich quartz veins which have been worked at shallow (~30 m) depths (e.g. City of Hobart, Yellow Boys, see fig. 3 for locations). However surface gold enrichment has not been proven, and it was probably the most convenient explanation for the early miners, as the Golden Gate Mine had been abandoned for many years before the testing of a small quartz vein in an adit at depth led to the discovery of the New Golden Gate vein system.

In regard to the formation of these goldfields, Threader (1967) concluded that gold mineralisation is related to shear zones rather than the folding and emplacement of granitoid bodies. He noticed that the regional trend of the goldfields in NE Tasmania is 330°, whereas the trend in individual goldfields is about 320°. This was interpreted to be due to the effect of a series of N-S dextral post-mineralisation shearing movements within the area.

Based on our limited studies, it is suggested here that the gold-bearing quartz veins occur in post-fold faults. It is extremely difficult to prove, by surface mapping, that major faults control the development of the auriferous quartz veins. The system of mapped ore shoots and rare surface faults found within the area is interpreted as indicating control of the mineralisation by a system of NNW-trending dextral strike-slip displacement zones, jogging right progressively northward, and their related Riedel shear systems (Findlay, this volume). In this model, the tensional jogs form the sites of the main goldfields in the area. Results from preliminary fluid inclusion and oxygen isotope studies of the quartz veins also indicate that the ore-forming solution was probably derived from a metamorphic fluid rich in CO₂ at temperatures of around 300°C.

Placer gold deposits

The potential for the occurrence of alluvial gold deposits within the area was well known before 1883 (Krause, 1883). However the history of alluvial gold deposits has not been encouraging and no records of alluvial gold production are available. The areas of potential for alluvial gold mineralisation mainly occur along the Black Horse Gully, Long Gully Creek, Dans Rivulet and the South Esk River Valley (see fig. 3 for locations). These areas lie along the major NNW-trending shear zone with associated auriferous quartz veins. These valleys drain the mineralised zones, suggesting a good potential for the occurrence of economic alluvial gold deposits. The sediments of the gullies mainly consist of clay and gravel, with depth to bedrock ranging from less than one metre to four metres.

According to Twelvetrees (1907a) some 458 700 m³ of alluvium grading 1 g Au/m³ were indicated from 87 backhoe holes at the mouth of the Black Horse Gully.

In 1973 (Turner, 1974) a total of 198 backhoe holes were dug in Black Horse Gully and Long Gully Creek. The holes were dug across the two gullies in 12 lines, ten of which were in Black Horse Gully. The lines were about 150 to 550 m apart and the holes were drilled at 25 m intervals. Two lines were considered to be of economic significance, yielding 0.7 g Au/m^3 over 305 m and 0.3 g Au/m^3 over 152 metres.

In general the higher values of gold are confined to the lower part of the alluvial sediments, approximately 50 cm thick and resting on the clayey slate and siltstone bedrock. The backhoe testing of alluvial material in watercourses draining in the western part of the Mathinna Goldfield indicates an estimated $191\,000 \text{ m}^3$ averaging about 0.7 g Au/m^3 . It should be mentioned that the sampling and assaying were inadequate and therefore the estimated gold grade could be subject to significant errors. Rare high values up to 350 ppm were reported from some of the drill holes but in general the gold distribution was considered to be highly erratic in the two gullies, and no further work was recommended for this area.

In the Dans Rivulet Goldfield the depths to bedrock were surveyed by two seismic traverses across the Dans Rivulet, these indicating a thicker alluvial cover up to 70 m thick (Cox, 1973). Eighteen percussion (churn) drill holes were drilled on the present flood plain and other older alluvial terraces. The average depth to bedrock for the flood plain was about 5 m and that of the terraces about 10 metres. Some nine backhoe holes were dug in two lines, but the gold values obtained from this work were similarly considered to be sub-economic and did not warrant any further investigation (Cox, 1973; Turner, 1974).

A program of 25 reverse-circulation rotary drill holes was carried out in the Dans Rivulet Goldfield (Mitchell, 1980). The purpose of the study was only to locate areas containing economic gold concentrations. The work identified three distinct alluvial horizons, viz:

- (a) topsoil, mainly consisting of brown clay and with local high proportions of gravel,
- (b) fine to coarse gravel, and
- (c) yellow to orange clay with minor gravel.

The holes were drilled across the valley in three lines in a general NE-SW direction. The northern and southern lines were spaced about 1 and 2.4 km respectively from the middle line. The centre of the middle line occurs approximately 0.5 km southwest of the Carnegie Mine. In general, gold grades were considered to be "of extremely low order". Most gold values were below the detection limit of 0.3 g/t and no further work was recommended.

The valley of the South Esk River between Mathinna and Fingal was also prospected for alluvial gold deposits (McBride, 1981; Scott, 1982; Mellor, 1982). Over 250 holes were dug, mainly on the alluvial plain north of the Beauty Flat Road. The holes were drilled at 80 m intervals on lines approximately 800 m apart. The areas

with higher gold grades were checked by some 15 churn drill holes. The results of the drilling indicated that:

- (a) There is no Tertiary sediment below the Quaternary alluvial sediments.
- (b) Sediments to the north of Beauty Flat Road mainly consist of gravel and sand with higher gold grades than the sediments to the south of the road, which are mainly clay and carbonaceous sand.
- (c) The depth of the Quaternary river alluvium is up to 14 m and averages about 7 metres.
- (d) There is probably one to two million cubic metres of gold-bearing gravel with a gold grade of about 30 mg Au/m^3 .
- (e) The gravel at Marshalls Flat (fig. 3) shows the highest gold grade, averaging about 50 mg Au/m^3 .
- (f) There appears to be a shallow N-trending gold channel with the highest grade of 113 mg Au/m^3 indicated in one of the drill holes. The maximum potential size of the channel is in the order of three million cubic metres. However the overall results were not considered to be economically viable.

In 1986 two costeans were excavated along the Upper Esk Road at the top of Dunne Street in Mathinna and some 750 m up Black Horse Gully from Dunne Street. The average depth of the costeans was about 2.2 m and around 383 m^3 of soil was taken from each costean. The gold grade ranged from 0.15 to 0.27 g Au/m^3 with an estimated $818\,000 \text{ m}^3$ of material of which about $382\,000 \text{ m}^3$ was considered to be higher than 0.234 g Au/m^3 (Tasmanian Alluvials, 1986).

Twelve churn drill holes were drilled over a length of around 500 m across the Dans Rivulet valley in the Rosedale Flat area (~5 413 000 mN). The gold grades were low, with a mean and standard deviation of 4.8 and 10 mg Au/m^3 respectively. Depth to bedrock varied from six to eight metres. Further work was recommended by Threader (1987) but did not eventuate.

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[6 August 1992]

APPENDIX 1

Summary of gold deposit locations

Mathinna and Tower Hill Goldfields

<i>Deposit name</i>	<i>Deposit No.*</i>	<i>Location</i>		<i>Page</i>
		<i>mE</i>	<i>mN</i>	
New Golden Gate Shaft	1	574 480	5 406 600	20
Tasmanian Consolidated Shaft	2	574 480	5 406 680	22
Golden Hinges Adit	3	574 200	5 406 700	23
Golden Gate Extended Shaft	4	574 540	5 407 000	23
Commercial Shaft	5	573 500	5 404 550	31
Golden Ladder Shaft	6	574 850	5 406 890	-
East Golden Gate Shaft	7	574 850	5 407 030	23
Star of Mathinna Shaft	8	574 550	5 407 200	-
Golden Spur Shaft	9	574 250	5 407 250	19
Enterprise Shaft No. 1	10	574 210	5 407 660	18
City of Hobart Main Shaft	11	573 630	5 406 850	30
Volunteer Consolidated	12	573 130	5 407 610	28
Yellow Boys Main Shaft	13	573 400	5 407 500	29
Old Boys Main Shaft	14	573 200	5 407 400	27
-	15	581 600	5 405 400	-
Saint Patrick Shaft	16	573 200	5 406 900	-
Pride of the Hills Shaft	17	573 260	5 405 500	31
Scott and Pickett Shaft	18	573 250	5 404 600	31
Caledonian Adit	19	574 650	5 406 850	22
Victorian Golden Gate Adit	20	573 800	5 406 250	24
North Eldorado Adit	21	574 300	5 406 250	24
New Eldorado Adit	22	574 250	5 406 100	24
Gladstone Adit	23	574 350	5 405 450	25
Horseshoe U Shaft	24	574 470	5 405 100	25
Telegraph Shaft	25	574 560	5 404 960	25
Miners Dream U Shaft	26	574 600	5 405 800	26
South Miners Dream Adit	27	574 850	5 405 680	26
South Golden Gate Shaft	28	574 510	5 406 250	22
City P.A. Adit	29	574 960	5 404 880	-
Jubilee Main Shaft	30	575 010	5 404 550	33
Mountaineer Shaft	31	575 150	5 404 430	32
Old Derby Shaft	32	575 070	5 404 600	-
Golden Stairs	33	574 300	5 408 070	17
Welcome Stranger	34	574 300	5 408 170	17
Loane's Prospect	35	574 300	5 407 460	-
Gold Estates	36	574 250	5 407 120	-
Snake Shaft	37	574 550	5 406 300	-
Air Shaft	38	574 480	5 406 550	-
Sunbeam	39	574 080	5 401 180	36
Tower Hill	40	573 600	5 401 200	36

<i>Deposit name</i>	<i>Deposit No.*</i>	<i>Location</i>		<i>Page</i>
		<i>mE</i>	<i>mN</i>	
	41	573 960	5 400 960	-
	42	573 680	5 401 260	-
Alluvial (Black Horse Gully) 1	43	574 000	5 408 600	-
Alluvial (Black Horse Gully) 2	44	573 900	5 407 850	-
	45	574 000	5 408 500	-
	46	573 900	5 407 550	-
	47	574 100	5 406 800	-
Alluvial	48	574 400	5 408 300	-
Section 10998-m	49	574 300	5 407 350	18
Moore's Shaft	50	574 200	5 407 200	19
Section 359-G	51	575 380	5 405 400	26
Chester and Murray (Hatherton)	52	573 250	5 407 190	29
Section 451-G	53	573,550	5 406 250	30
Section 1734-G	54-1	573 850	5 405 760	32
Section 1734-G	54-2	573 900	5 405 500	32
Twilight	55	573 550	5 402 250	35
Section 135P-G	56	574 000	5 401 000	37
Section 1729-G	57	575 320	5 404 280	33
Tyne River	58	568 000	5 408 000	-
Brooks Creek	59	569 800	5 408 400	-
Midsons Flat	60	575 300	5 408 700	-
South Esk River	61	575 000	5 409 000	-
Sunbeam	62	573 900	5 401 300	36
Romeo	63	568 250	5 406 160	34
Butchers	64	566 800	5 404 040	34
Wallis	65	566 850	5 402 520	34
Tiger Gully	66	567 200	5 402 850	35
Hen and Chickens	67	574 100	5 407 700	-
Alluvial Flats/Kennedy Flats	68	574 000	5 408 000	-
Martyns Section	69	573 500	5 406 300	-
	70	582 300	5 400 100	-
Dawn of Hope Workings	71	573 200	5 407 520	27
Black Horse Gully 3	73	573 900	5 407 300	-
Long Gully	74	574 500	5 407 000	-
Volunteer Mine	75	572 600	5 408 300	28
Evercreech	76	579 600	5 408 200	-

* Deposit number as shown on Figure 3.

Dans Rivulet Goldfield

<i>Deposit Name</i>	<i>Deposit No. *</i>	<i>Location</i>		<i>Page</i>
		<i>mE</i>	<i>mN</i>	
Golden Horseshoe	1	573 400	5 410 600	37
True Blue	2	572 400	5 410 130	38
City of Melbourne	3	572 750	5 409 950	38
Lady Mary	4	572 300	5 411 180	38
Heaton	5	572 180	5 411 540	39
King Solomon	6	571 900	5 411 900	39
Bright Star	7	571 780	5 412 400	39
October	8	570 580	5 414 200	41
Mabel	9	570 450	5 414 650	41
Revenue	10	569 780	5 415 300	42
Baileys	11	570 250	5 416 160	42
O'Briens	12	569 700	5 417 420	43
National Investment	13	569 350	5 417 850	45
Havelock	14	569 050	5 418 140	45
Lady Havelock	15	568 750	5 418 800	46
Laranda	16	568 850	5 418 950	46
Strickland	17	568 850	5 419 900	47
Hinemoa	18	568 150	5 421 050	47
King Edward	19	570 500	5 418 200	44
Starlight	20	570 500	5 417 950	43
Carnegie	21	570 650	5 417 900	44
	22	572 100	5 415 250	-
Waterfall	23	574 100	5 414 250	40
New Golden King	24	576 550	5 411 850	40
Section 819/93G	25	572 250	5 415 300	42
Section 821/93G	26	572 100	5 415 550	42
Una No. 1	27	567 980	5 422 200	48
Una No. 2	28	568 080	5 421 950	48
Una No. 3	29	568 150	5 421 800	48

* Deposit number as shown on Figure 4.

APPENDIX 2

Summary of gold deposits

- This appendix does not include all the prospects shown on Figures 3 and 4 as some of the prospects have not been described in the literature.
- The terms "formation" or "reef" appear to include a group of closely associated quartz veins within a bed of particular lithology hosting the veins. However in places the terms have not been sufficiently described and may only indicate auriferous quartz veins.
- The content of a summary for each described prospect may vary depending on the availability of the information.
- Strikes of lodes from the literature have been converted to the AMG.

Prospect: GOLDEN STAIRS
Goldfield: Mathinna
Location: 574 300 mE, 5 408 070 mN

Style of Mineralisation:

Quartz veins striking 337° and 314°

References:

Montgomery, 1892; Twelvetreets, 1907a; 1914; Finucane, 1935.

Summary:

The mine consisted of three shafts. The shafts were sunk to depths of 16 m, 9 m and 71 m (main shaft). Mining operations commenced sometime before 1892 and were suspended by 1893. Two crosscuts were driven from the main shaft. The upper crosscut intersected a quartz vein varying in thickness from 0.3 to 1.2 m on the footwall, and a 0.6 m thick quartz vein on the hanging wall. The lower crosscut was driven over a length of 114 m and intersected some thin and irregular quartz veins which apparently were low in gold content. In 1914 an exploration shaft was sunk to a depth of 14.5 m where a narrow quartz vein was intersected. Ten tons of quartz were crushed and approximately 155 g of gold was won. Total gold production is not known.

Prospect: WELCOME STRANGER
Goldfield: Mathinna
Location: 574 300 mE, 5 408 170 mN

Style of Mineralisation:

Quartz vein, striking 67°.

References:

Twelvetreets, 1907a; Finucane, 1935.

Summary:

A 12 m deep shaft was sunk on a quartz vein which appears to have been barren. The shaft was sunk prior to 1891. Another shaft was sunk to a depth of 6 m south of the Welcome Stranger shaft and intersected a white gold-bearing quartz vein.

Prospect: ENTERPRISE

Goldfield: Mathinna

Location: 574 210 mE, 5 407 660 mN

Style of Mineralisation:

Auriferous quartz veining, striking 204°/70°NW in No. 1 shaft, 314°/80° W and 349°/80°W in No. 2 shaft, and 129°/64°SW in No. 3 shaft.

References:

Montgomery, 1892; Nye, 1927; Finucane, 1935.

Summary:

The mine mainly consists of three shafts and few trenches. Shaft No. 1 was sunk to a depth of 23 m on a reef varying in thickness from 20 to 80 cm. The gold grades were in the range of 3 to 6 g/t. A 20 cm pyritic quartz vein carrying 23 g/t gold was also intersected by this shaft. The vein was developed for about six metres. About 10 tons of quartz was crushed from the shaft and yielded 9.3 grams of gold.

Shaft No. 2 occurs about 47 m southwest of Shaft No. 1. The shaft is 15 m deep and was sunk on quartz veins varying in widths from 5 to 40 cm with gold values up to 7.7 g/t. In 1928 a hole to a depth of 174 m was drilled to test the northern extension of the veins. Many quartz veins were intersected from a depth of 33 m to the end of the hole. A few analysed samples from a 1.5 m thick quartz vein-bearing interval indicated "poor" gold contents. However no systematic sampling appears to have been undertaken from the intersected quartz veins.

Shaft No. 3 is located about 120 m south of Shaft No. 1 and was sunk on "a vein of gold-bearing stone from which fair prospects were obtained" (Montgomery, 1892).

Prospect: SECTION 10998-M

Goldfield: Mathinna

Location: 574 300 mE, 5 407 350 mN

Style of Mineralisation:

Quartz veining.

References:

Finucane, 1935.

Summary:

The workings include a 61 m deep shaft with a 5 m SW-trending drive. A drill hole was extended "some distance below the bottom of the shaft" which intercepted a gold-bearing quartz vein. According to Finucane (1935) very little underground prospecting has been undertaken in this part of the field. He also emphasised the uselessness of the shafts without exploratory crosscuts, as the veins appear to be steeply dipping and trend N, NW or NE.

Prospect: GOLDEN SPUR
Goldfield: Mathinna
Location: 574 250 mE, 5 407 250 mN

Style of Mineralisation:

Auriferous quartz veining striking 310° and dipping SW.

References:

Twelvetreets, 1907a; Finucane, 1935.

Summary:

The workings consist of a 32 m deep shaft and a few crosscuts. The shaft was sunk to test the Moore's Reef at depth.

Prospect: MOORE'S SHAFT
Goldfield: Mathinna
Location: 574 200 mE, 5 407 200 mN

Style of Mineralisation:

Auriferous quartz veining, striking 151° and dipping steeply NE.

References:

Finucane, 1935.

Summary:

A shaft was sunk 46 m south of the Golden Spur shaft. The quartz vein intersected by this shaft appears to have been "payable".

Prospect: NEW GOLDEN GATE MINE

Goldfield: Mathinna

Location: 574 480 mE, 5 406 600 mN

Style of Mineralisation:

Six major subparallel auriferous quartz veins striking in a general N to NNW trend (fig. 5). A shear zone ("main slide") trending 327°/70°SW has been interpreted to be an important conduit for the gold-bearing solution (i.e. predates the vein formation). The maximum width of the main slide is about 12 metres. The main veins occur on the SE or SW sides of the zone, but auriferous quartz veins and lenses are not common within the zone. This structure has not been positively located outside the mine.

References:

Twelvetreets, 1907a; 1907b; Finucane, 1935; Hughes, 1947.

Summary:

The mine was by far the largest gold mine in NE Tasmania and it was worked from 1887 to 1926. The total production was 253,865.1 oz (7197.076 kg) with an average grade of 26.0 g/t. Mining operations extended to 500 m below the collar of the main shaft. Levels opened out at 35 m, 54 m, 72 m, 96 m and 122 m, and then at about 30 m intervals to 488 metres. The deepest level was at 548 m with a winze from 548 m to 580 m.

The main auriferous quartz veins included the Upper West Reef, the Central Reef, Loane's Reef, the Main Reef, the East Reef and the Lower West Reef (fig. 5).

The Upper West Reef is irregular and varies in width from 0.8 to 1.2 m and was worked from surface to 53 m level over a total length of about 54 metres. The gold grade varied from 6 to 20 g/t.

The Central Reef consisted of irregular masses of quartz veins up to 3 m wide and was intersected in the adit at 69 m from the entrance. The veins were driven on for a "short distance" to the north and south.

Loane's and the Main Reefs were the most important in the mine and were worked down to depths of 274 m and 244 m respectively. Loane's Reef was intersected in adit level at 38 m from the entrance. However no attention was initially given to this vein by the company which drove the adit. A winze was sunk on this vein which yielded few tons of quartz grading 40 g/t gold.

The Main Reef is parallel to the Loane's Reef and it was intersected at 30 m in the shaft. The veins increased in width and gold content with depth and at the 72 m level Loane's Reef yielded 60 g/t gold. The average widths of the veins were about 2 m at this level. At 96 m level the length of "payable" quartz vein on the Main Reef in general was less than that of Loane's Reef and below 244 m the reef petered out. The rich intervals were often found at the intersections of the two reefs. The average gold from these two reefs was 28 g/t.

The Eastern Reef was discovered in 1896 by a crosscut from Loane's Reef at 247 metres. It was developed to a depth of 580 m by many drives up to 165 m long at different levels. The reef was up to 8 m wide but low in gold contents on some levels (1-2 g/t). Some of the drives were extended later but no results regarding the nature of quartz veins or their gold grades are available.

The Lower West Reef was cut at 395 m level and was worked at different levels down to 548 metres. The reef diverged into two or more quartz veins varying in thickness from less than 30 cm to 4.5 metres. The gold grade was generally erratic, ranging from 1.5 to 40 g/t.

There were also a number of smaller reefs which worked to the southwest and west of the main shaft.

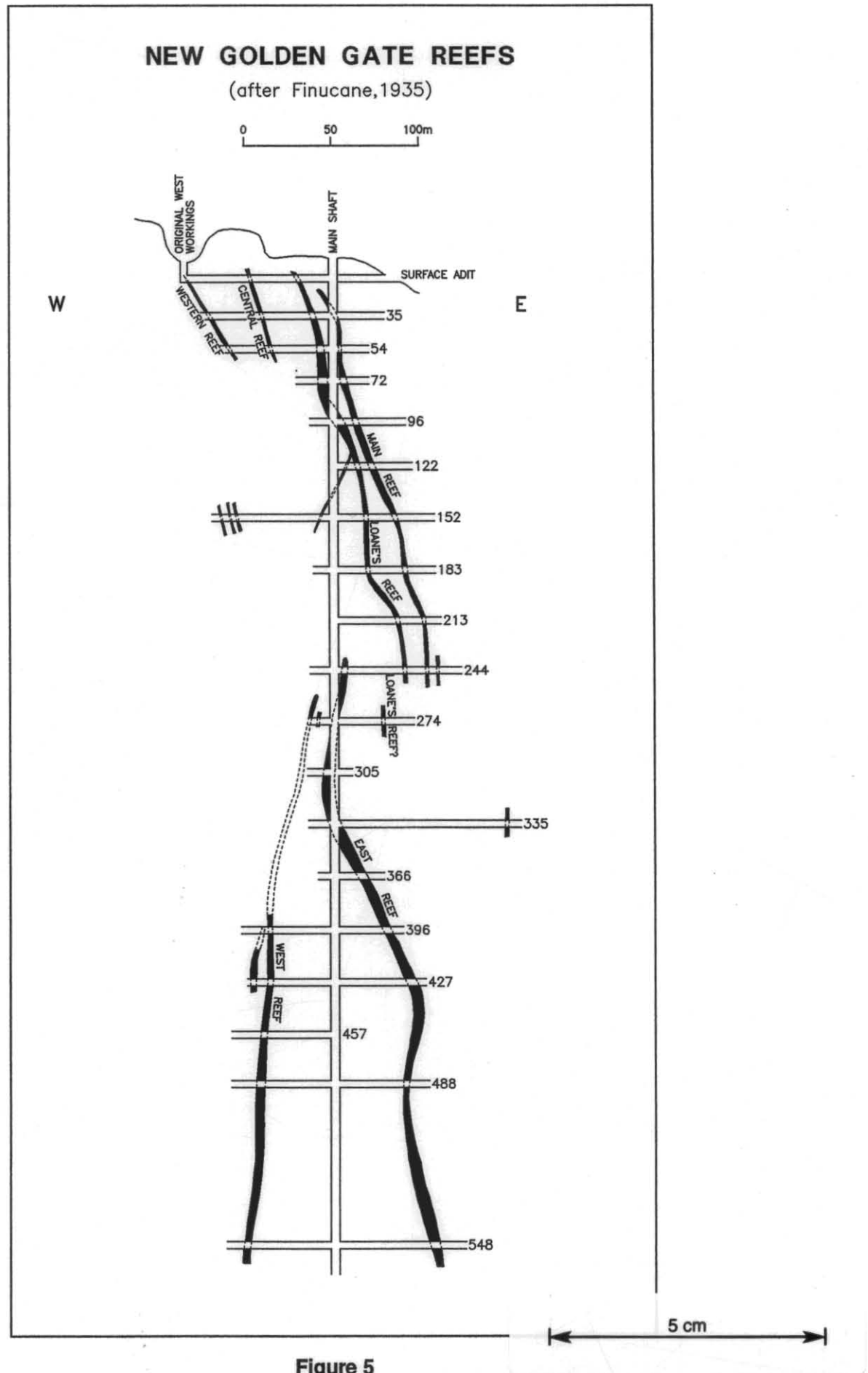


Figure 5

E-W cross section, showing the main reefs at the New Golden Gate Mine, Mathinna Goldfield

Prospect: TASMANIAN CONSOLIDATED MINE (NORTH GOLDEN GATE)

Goldfield: Mathinna

Location: 574 480 mE, 5 406 680 mN

Style of Mineralisation:

Zones of auriferous quartz veins were intersected at different levels. One zone was intersected at 47 m level with a strike of 329°, dipping to the northeast.

References:

Twelvetreets, 1907a; 1907b; Finucane, 1935; Montgomery, 1892.

Summary:

The mine is located about 80 m north of the New Golden Gate shaft. The main shaft was sunk to 480 metres. The mining operation commenced prior to 1890 and closed in 1908. Quartz-rich zones up to 7 m thick were worked at different levels. Some of the veins were interpreted to be the extension of the New Golden Gate reefs but the veins were in general thin, irregular and low in gold content. The total gold production was 311.76 kg with an average grade of 14.5 g/t.

Prospect: SOUTH GOLDEN GATE SHAFT

Goldfield: Mathinna

Location: 574 510 mE, 5 406 250 mN

Style of Mineralisation:

Quartz vein striking 319°.

References:

Twelvetreets, 1907a; Finucane, 1935; Hughes, 1947.

Summary:

The shaft is located about 380 m southeast of the New Golden Gate shaft. The shaft was sunk to 122 m below the surface and a few crosscuts were driven at the 61 m and 122 m levels. At the 61 m level a 2 m wide reef formation containing a barren quartz vein was intersected. At the 122 m level, two formations 18 m and 23 m wide were also intersected, but no driving was done on these formations which may indicate the quartz-rich zones were barren.

Prospect: CALEDONIAN

Goldfield: Mathinna

Location: 574 650 mE, 5 406 850 mN

Style of Mineralisation:

Auriferous quartz veins striking at different directions (116°/ 70°NE, 120°/45°NE, 63°/70°N, 60°/?, 102°/ 60°N, 320°/75°SW, 83°/80°?, 120°/80°SW, 80°/70°NE, 350°/55°E, 165°/55°NE).

References:

Twelvetreets, 1907a; 1914; Finucane, 1935.

Summary:

The mine was located 800 m east of Mathinna. It consisted of two shafts, one adit, some drives, surface stopes and trenches. The quartz veins were generally irregular and thin (few centimetres to 30 cm) containing up to 36 g/t gold, although the gold grade appears to have been erratic. A 97 m long adit lies about 100 m SW of the Caledonian Mine. A quartz-rich zone consisting of many irregular quartz veins was intersected in the adit and was driven for four metres. Two shallow shafts (~5 m deep) were also sunk on two separate EW-trending zones of small, irregular quartz veins about 100 m NE of the Caledonian Mine. No gold grades are available from these workings.

Prospect: GOLDEN GATE EXTENDED SHAFT

Goldfield: Mathinna

Location: 574 540 mE, 5 407 000 mN

Style of Mineralisation:

Short quartz veins striking NNW.

References:

Twelvetreets, 1907a; Finucane, 1935.

Summary:

The shaft was sunk to 125 metres. Crosscuts and some drives intersected many zones of small quartz-rich zones (formations) at different levels. Some of the veins were mineralised, but in general the gold grade appears to have been "low".

Prospect: EAST GOLDEN GATE WORKINGS

Goldfield: Mathinna

Location: 574 850 mE, 5 407 030 mN

Style of Mineralisation:

Quartz veining, two small quartz veins trending 34°/90° and 320°/?.

References:

Finucane, 1935.

Summary:

The workings included a main shaft sunk to a depth of between 60 to 91 m, a few shallow shafts, and an adit. The main shaft was sunk in dark coloured slates and quartzite. Results from further development of this shaft were considered to be discouraging. There are some workings on a vertically-dipping quartz vein about 50 m north of the main shaft. There is also some surface trenching over a quartz vein located approximately 100 m NW of the main shaft. However there is no information in regard to the gold contents of these quartz veins.

Prospect: GOLDEN HINGES

Goldfield: Mathinna

Location: 574 200 mE, 5 406 700 mN

Style of Mineralisation:

Quartz veining, one set follows a puggy fault zone striking 297° and dipping 70°SW.

References:

Finucane, 1935.

Summary:

The mine consisted of a 83.5 m long adit with a few drives and a winze. Quartz veins intersected by the adit mainly occur as fissure-filled zones up to 1.2 m wide. The gold contents of the veins are not known.

Prospect: NORTH ELDORADO

Goldfield: Mathinna

Location: 574 300 mE, 5 406 250 mN

Style of Mineralisation:

Quartz veining trending 343°/NE and 270°/80°S.

References:

Twelvetreets, 1907a; Montgomery, 1892; Finucane, 1935.

Summary:

The main workings included three shafts, some surface stopes and trenches, and an adit. A 33.5 m deep shaft was sunk on a 45 cm wide quartz vein and was driven for 98 metres. The adit is 96 m long and intersected several zones of quartz-filling fissures in a quartzite bed. A 37 m deep shaft was also sunk in the hope of intersecting the faulted portion of the New Golden Gate Mine by crosscutting. However it is not known whether any crosscuts were extended from the shaft. In general "a number of tons" of quartz were crushed but the overall results indicated "poor" gold contents (Montgomery, 1892).

Prospect: NEW ELDORADO

Goldfield: Mathinna

Location: 574 250 mE, 5 406 100 mN

Style of Mineralisation:

Quartz veining consisting of two veins striking in a general E-W direction.

References:

Montgomery, 1892; Finucane, 1935.

Summary:

The workings included an open cut, stopes, shafts, shallow trenches and an adit. The two veins vary in thickness from 15 to 60 cm.

From 1886 to 1892 some 535 tons of quartz were crushed yielding 43 g/t of gold. According to Montgomery (1892) about 500 tons of quartz was crushed prior to 1886. He also stated an early crush of 29.5 tons of quartz yielded 2835 g of gold (100 oz). Later gold production in 1909 involved the crushing of some six tons of quartz from a drive in the adit, yielding 382 g (13.5 oz) of gold (61 g/t).

Prospect: VICTORIAN GOLDEN GATE

Goldfield: Mathinna

Location: 573 800 mE, 5 406 250 mN

Style of Mineralisation:

Lenticular formation striking 103°/63°SW and hosted by a quartzite bed.

References:

Finucane, 1935.

Summary:

The mine consisted of a 73.5 m long adit, two shafts and some trenches. The adit intersected a lenticular quartz body, 1.2 m thick in the centre, thinning to a few centimetres over 9 m and dying out over 20 metres. The quartzite bed containing quartz veins was also followed for about 21 metres.

Prospect: HORSESHOE
Goldfield: Mathinna
Location: 574 470 mE, 5 405 100 mN

Style of Mineralisation:

Auriferous quartz veining striking 315°, also small quartz veins as fracture-filling showing different orientations.

References:

Finucane, 1935.

Summary:

Auriferous quartz veins occur along a bed of quartzite underlain by slate which is folded in an anticline (saddle reef). The mine mainly consists of a 21 m deep shaft, a nine metre drive, and an adit. The formation could not be traced more than 2 m below the surface at the time of Finucane's inspection in 1934. The total recorded production is about 1435 g, which was obtained from crushing some 88 tons of ore.

Prospect: TELEGRAPH
Goldfield: Mathinna
Location: 574 560 mE, 5 404 960 mN

Style of Mineralisation:

Quartz vein striking 360°.

References:

Montgomery, 1892; Finucane, 1935; Daly, 1981.

Summary:

The mine consisted of a shaft and a 49 m long adit. The adit intersected some thin quartz veins. A 40 cm quartz vein has also been located on a geological map by Daly (1981). There is no information in regard to the occurrence of gold from this mine.

Prospect: GLADSTONE
Goldfield: Mathinna
Location: 574 350 mE, 5 405 450 mN

Style of Mineralisation:

Quartz vein striking 279° and dipping SW.

References:

Montgomery, 1892; Twelvetees, 1907a; Finucane, 1935.

Summary:

The workings consist of a few shafts which were sunk on a 60 cm reef. The reef was worked to a depth of 12 m over a length of 20 metres. The crushing of 70 tons of quartz yielded about 1120 g of gold.

Prospect: MINER'S DREAM
Goldfield: Mathinna
Location: 574 600 mE, 5 405 850 mN

Style of Mineralisation:

Quartz veins striking between 190° to 339° and dipping 40° to 60° NE to SE.

References:

Reid, 1925; Finucane, 1935.

Summary:

Mining began in 1903 when the first auriferous quartz vein was discovered and continued until 1927. The workings consist of few shafts, drives, crosscuts and an adit.

The worked quartz veins were generally irregular and narrow, and mostly discontinuous. They varied in thickness from less than 10 cm to 4.8 m, and were up to 36 m long. The deepest shaft was sunk to a depth of 85 m below the surface with an unsuccessful 92 m crosscut.

Total recorded gold production is 12.29 kg which was won from 202 tons of quartz. More than 75% of the gold was produced prior to 1905 from only 67 tons of quartz, giving an average of 127 g/t.

Prospect: SOUTH MINER'S DREAM ADIT
Goldfield: Mathinna
Location: 574 850 mE, 5 405 730 mN

Style of Mineralisation:

Quartz veining with a general direction of 290°.

References:

Reid, 1925; Finucane, 1935; Daly, 1981.

Summary:

The adit lies 200 m to the south of the Miner's Dream main shaft and was extended for 123 m with the object of intersecting the Miner's Dream reef system. Some quartz veins up to 15 cm wide were intersected at different localities. Only two quartz veins (48 m and 95 m from the portal) contained "a little" gold whereas other veins were barren.

Prospect: SECTION 359-G
Goldfield: Mathinna
Location: 575 380 mE, 5 405 400 mN

Style of Mineralisation:

Quartz reef striking 309° and dipping 40°NE.

References:

Finucane, 1935.

Summary:

The main workings included a 41 m long adit which intersected a flat reef formation. The formation consists of slate hosting quartz veins which vary in width from 2 to 15 cm. It is not known whether the quartz veins were auriferous but no stoping appears to have been carried out.

Prospect: OLD BOYS

Goldfield: Mathinna

Location: 573 200 mE, 5 407 400 mN

Style of Mineralisation:

Quartz veining trending 109°, 124° and 14°.

References:

Nye, 1927; Reid, 1929; Finucane, 1935; Daly, 1981.

Summary:

The mine was active between 1923 and 1931. Initially a winze was sunk on a quartz reef to a depth of 36 metres. A shaft was then sunk to a depth of 114 m to intersect the quartz vein system at depth. The quartz veins varied in thickness from less than 5 cm to 60 cm, but in general they were thin and discontinuous and many were barren. The quartz veins were worked through drives, crosscuts and winzes at different levels.

The gold grades appear to have been mostly less than 10 g/t, but small quartz veins containing up to 203 g/t gold were intersected. A total of 230 tons of quartz was crushed; from this 210 tons averaged 5.5 g/t and the remainder yielded 34 g/t gold.

During the underground operation, the prospecting of nearby quartz veins led to small gold discoveries, with 6 tons of quartz averaging 28 g/t gold and 2 tons of quartz containing 68 g of gold. A large quartz reef located to the west of the main shaft was worked prior to 1892. A shaft was sunk to a depth of 36 m at an intersection of two quartz veins. The quartz reef varied in width from <1 cm to 3.6 m and the gold grade ranged from 6 to 15 g/t, but in general the whole reef was considered to be unpayable. Nye (1927) proposed drilling to a depth of 76 m, but this did not eventuate. Reid (1929) believed that the mineralisation is stratigraphically controlled and that the reef is richer in gold at the 92 m level than at the surface. It should be noted that most of the veins in this area appear to be gold bearing and are persistent at the 92 m level.

Prospect: DAWN OF HOPE

Goldfield: Mathinna

Location: 573 200 mE, 5 407 520 mN

Style of Mineralisation:

Two quartz reefs striking 25° and 360°.

References:

Twelvvetrees, 1914; Finucane, 1935.

Summary:

The workings included two shallow shafts. A total of 22 tons of quartz was crushed yielding 297.7 grams of gold (~13.5 g/t).

Prospect: VOLUNTEER MINE

Goldfield: Mathinna

Location: 572 600 mE, 5 408 300 mN

Style of Mineralisation:

Auriferous "reef" trending NE and dipping 70° NW.

References:

Finucane, 1935.

Summary:

The main workings include a main shaft sunk to a depth of 127.7 m, small prospecting shafts, and an adit. The "reef formation" is about 60 cm wide, although it appears that the best gold values were obtained above the 30 m level, and the reef diminished in size and gold values below this level.

Total recorded production from 1902 to 1905 was 72.292 kg with an average gold content of around 8 g/t.

Prospect: VOLUNTEER CONSOLIDATED

Goldfield: Mathinna

Location: 573 130 mE, 5 407 610 mN

Style of Mineralisation:

Auriferous quartz veining (reefs), attitudes: W or WNW/S and NE.

References:

Finucane, 1935.

Summary:

Initially mining involved sinking a shallow shaft on two quartz reefs in 1895. The gold values were up to 28 g/t. A main shaft was then sunk to a depth of 137 m to intersect the reefs at depth. The workings mainly include drives which were opened out from the shaft at 48 m, 61 m and 91 m and were up to 42 m long. Several reefs were intersected, varying in width from 0.2 to 1.8 metres. Prospecting was also carried out at the 137 m level but failed to reveal any sufficient quantity of payable quartz. In general the quartz veins were irregular and thin, although a 90 cm gold-bearing quartz vein was intersected at the 91 m level. Recorded gold production is 35.792 kg (1262.5 oz) which was produced from 1760 tons of quartz. The average gold grade decreased from approximately 80 g/t in 1901 to 12.4 g/t in 1905, when the mining operation ceased.

Prospect: **YELLOW BOY REEF**

Goldfield: Mathinna

Location: 573 400 mE, 5 407 500 mN

Style of Mineralisation:

Auriferous quartz veining. One reef strikes 59° and dips 80°SE.

References:

Finucane, 1935.

Summary:

A line of old stopes and trenches extends along a reef for some 120 metres. Based on the old stopes the "reef formation" appears to vary from 0.45 to 1.2 m wide. The reef contains a number of small stringers and quartz veins, about 5 to 10 cm wide, although in places these are up to 1.2 m wide. The surface mining was carried out prior to 1892. The results from a trial crushing of 90 tons of quartz in 1901 was reported to be "satisfactory". In 1903 a shaft was sunk to 35 m below the surface and intersected three quartz lodes, two of which were considered to be payable.

Crushing of 210 tons of quartz from the workings yielded 2.41 kg (85 oz) of gold. Mining ceased in 1905 for an unknown reason. The actual gold production from this mine is not known.

Prospect: **CHESTER AND MURRAY**

Goldfield: Mathinna

Location: 573 250 mE, 5 407 190 mN

Style of Mineralisation:

Quartz reef striking 117° and dipping south at 72°.

References:

Finucane, 1935.

Summary:

The mining activities began prior to 1896 and were suspended at different times until the late 1920s when the mine was shut down.

The mine consisted of a main shaft sunk to 107 m below the surface with drives opened out at different levels and some prospecting shafts and trenches.

The average gold values were stated to be over 28 g/t, however no information regarding the width of the reef is available. The recorded gold production is 2.55 kg.

A few prospecting shafts intersected two quartz reef striking 329° and dipping west. About 2.5 tons of quartz was crushed which yielded 10.5 g/t of gold. There were also some old workings on a vein striking 15°, but no details are available.

Prospect: CITY OF HOBART
Goldfield: Mathinna
Location: 573 630 mE, 5 406 850 mN

Style of Mineralisation:

Quartz reef striking 5° and dipping to the west.

References:

Montgomery, 1892; Twelvetreets, 1907a; Finucane, 1935.

Summary:

The mining activity began prior to 1877 and the mine was abandoned in 1882. In 1901 some work was carried out and in 1910 an unsuccessful shaft was sunk. The mine was developed by driving a 152 m long adit along the quartz reef. The first 36 m of the reef gave an average of 28 g/t gold, but the remainder of the drive was poor in gold grade.

A shaft was also sunk to a depth of 201 m and the reef was worked at different levels. The gold grade of the reef from the surface down to 100 m was more than 28 g/t. The width of the reef averaged about 90 cm from the surface to a depth of 91 metres. Below the 100 m level the quartz was laminated, about 40 cm wide, and had a high arsenopyrite content. At a depth of 177 m the reef appears to have been displaced by a fault. There was also a small NW-trending quartz vein which was worked in the adit and varied in width from 7 to 10 cm. The quartz contained about 20 g/t of gold. There is no recorded gold production, but it appears that gold to the value of £80,000 was won from this mine (Twelvetreets, 1907a).

Prospect: SECTION 451-G
Goldfield: Mathinna
Location: 573 550 mE, 5 406 250 mN

Style of Mineralisation:

Reef striking north and dipping to the east.

References:

Twelvetreets, 1907b; Finucane, 1935.

Summary:

The quartz reef was initially located by trenching, and two shafts to depths of 24 and 15 m were sunk. The latter was discontinued when it intersected the reef. Sampling at this level yielded 7.8 g/t gold. The reef appears to have been "bluish" quartzite containing quartz veins and sulphides.

Prospect: THE PRIDE OF THE HILLS REEFS

Goldfield: Mathinna

Location: 573 260 mE, 5 405 500 mN

Style of Mineralisation:

Auriferous quartz vein striking 332°.

References:

Twelvetrees, 1907a; Finucane, 1935.

Summary:

The main lode is a quartz vein varying in width from 15 cm to one metre. The lode was traced over a length of 335 m although it is not known whether the vein was continuous for the entire length. The quartz vein contained gold, arsenopyrite, pyrite and galena. The old workings include a shaft, an adit and some trenches. Quartz veins intersected by the adit and shaft varied in thickness from 15 to 50 cm. According to Twelvetrees (1907a) 80 to 90 tons of quartz were crushed from these workings and a 15 ton sample of quartz yielded 23 grams of gold. A shaft was being sunk on a 20 cm thick quartz vein at the time of Finucane's inspection in 1934. His sampling from the shaft gave values of less than 2 g/t gold. Although the reef is continuous over a considerable distance, its gold content appears to be very low. Another reef occurs within the area about 60 m east of the old shaft. A shallow shaft was sunk on this vein, which was traced over 76 metres. However no further information is available from this vein.

Prospect: SCOTT AND PICKETT

Goldfield: Mathinna

Location: 573 250 mE, 5 404 600 mN

Style of Mineralisation:

Quartz reef striking 16° and dipping 8°NW.

References:

Twelvetrees, 1907a; Finucane, 1935.

Summary:

The main workings included two adits and one shaft. The southern adit was about 30 m long and the shaft was sunk to a depth of 19 metres. The worked gold-bearing quartz reef was about 10 m long, 34 m deep and varied from 25 cm to one metre in width. Sections of the reef intersected by the adits were barren or low in gold content. The reported gold production is 1.332 kg obtained from 92 tons of quartz giving an average of around 9 g/t. Mining ceased in 1908. The reef in the northern adit strikes 27° and dips 80°NW.

Prospect: THE COMMERCIAL REEF

Goldfield: Mathinna

Location: 573 500 mE, 5 404 550 mN

Style of Mineralisation:

Auriferous quartz veining striking 270° and dipping 80° to the north.

References:

Twelvetrees, 1907a; Finucane, 1935.

Summary:

The reef was worked by a shallow shaft and varied in width from 7 to 90 cm. The gold contents varied from 1.5 to 9 g/t. No further information regarding gold production has been reported.

Prospect: SECTION 1734-G

Goldfield: Mathinna

Location: Reef No. 1 573 850 mE, 5 405 760 mN
Reef No. 2 573 900 mE, 5 405 500 mN

Style of Mineralisation:

Two quartz reefs, No. 1 striking 312° and dipping 70°SW and No. 2 striking 4° and dipping 75°W.

References:

Finucane, 1935.

Summary:

The main workings consisted of an adit and two shafts. A shaft was sunk on quartz reef No. 1 to a depth of 11 m, the width of the intersected reef varying from 15 to 25 cm. The country rocks mainly consist of slate and quartzite striking 295° and dipping 72°N. An adit was also driven for 69 m and intersected a few small quartz veins and an irregular "quartzose formation", 1.2 m wide, containing small quartz veins. At the end of the adit a 2 to 15 cm wide quartz vein with a similar trend to the main lode was also intersected.

Quartz reef No. 2 was intersected by a 15 m deep shaft. The reef consisted of white vitreous quartz about 45 to 60 cm wide. No information regarding the gold content is available and the operation ceased in 1926.

Prospect: MOUNTAINEER MINE

Goldfield: Mathinna

Location: 575 150 mE, 5 404 430 mN

Style of Mineralisation:

Quartz reefs with attitudes of 118°/90° and 300°/90°.

References:

Twelvetreets, 1914; Finucane, 1935.

Summary:

The mine consisted of three adits and a shallow shaft. Adit No. 1 was about 21 m long, with the reef varying in width from less than 10 cm to 25 cm. Gold grades up to 14 g/t have been reported from the quartz veins.

Adit No. 2 was approximately 40 m long and was located about 40 m north of shaft No. 1. The adit was driven in intensely cleaved slate containing numerous quartz veins showing no general direction in strike or dip. The quartz is generally vitreous and barren.

Adit No. 3 was 63 m long and was about 6 m west of shaft No. 2. Irregular quartz veins similar to those observed in adit No. 2 also occur in adit No. 3. At 30 m a flat vein and patches of quartz up to 1.2 m wide can also be seen. The quartz veins appear to be barren.

Prospect: SECTION 1729-G
Goldfield: Mathinna
Location: 575 320 mE, 5 404 280 mN

Style of Mineralisation:

Quartz veining with a general attitude of 94°/75°S

References:

Finucane, 1935.

Summary:

The reef was worked by a shaft and some trenches over a length of 17 metres. The quartz, where visible, is approximately 60 cm wide. At about 60 m north of these workings an adit was commenced in order to intersect the reef at a depth of 30 m below the outcrop. The adit needed to be driven for 60 m, although this project was not completed and it was only driven for 13 metres. There is no information on the gold content of this reef. A number of other trenches, shafts and adits can also be found within the area on irregular and discontinuous quartz veins.

Prospect: JUBILEE
Goldfield: Mathinna
Location: 575 010 mE, 5 404 550 mN

Style of Mineralisation:

Four main reefs, containing quartz, gold, arsenopyrite with minor chalcopyrite, pyrite and galena. The vertical parts of the Derby and Flat Reefs strike 318° and are parallel to the cleavage planes. However the reefs may follow the bedding or cut across both the bedding or the cleavage planes. Some of the reefs appear to have been related to a small shear zone slide striking 40° and dipping 30° to 50°SE. The Eastern Reef strikes 333° and dips 50° to 70°E. The strike and dip of the City Reef are 345° and 85°E.

References:

Montgomery, 1892; Twelvetreets, 1914; Nye, 1924.

Summary:

The quartz reefs were discovered some time prior to 1870 and were worked intermittently by different companies until at least 1923.

The Flat Reef: The total length of the reef is about 213 metres. The reef has been opened on the surface by trenching, shallow shafts and stopes and it was developed underground by four adits. The reef varies in width from 0.3 to 1.2 m and consists of irregular quartz veins hosted by slate. The results of a few assays indicate low (2 g/t) gold contents, however a combined sample taken from different portions of the reef contained 23 g/t of gold. Silver contents are low (<2 g/t).

Derby Reef: This reef varies in width from 15 cm to over one metre. It was worked through surface workings, an adit and a main shaft about 79 m deep. The reef apparently varies in gold content.

Eastern Reef: The reef was intersected by a crosscut at 49 m level in the main shaft. The reef is about 90 cm wide containing 60 cm mineralised quartz with little or no gold.

City Reef: The reef consists of altered (weathered?) slate with a width of over 7 m and containing several narrow quartz veins. The quartz is white and barren looking.

Prospect: WALLIS

Goldfield: Mathinna

Location: 566 850 mE, 5 402 520 mN

Style of Mineralisation:

Quartz veining.

References:

Nolan, 1990.

Summary:

The workings consist of a shallow pit and three shallow bulldozer scrapes about 50 m long. The country rock (siltstone and sandstone) containing the veins is exposed in a small creek. Some of the quartz veins contain remnants of arsenopyrite, pyrite, galena and chalcopyrite. Rock chip sampling generally indicated low (0.5 g/t) gold values with the exception of one sample with a value of 9.7 g/t.

Prospect: BUTCHERS

Goldfield: Mathinna

Location: 566 800 mE, 5 404 040 mN

Style of Mineralisation:

Quartz veining.

References:

Nolan, 1990.

Summary:

The workings consist of shallow shafts sunk in early prospecting. Recent rock chip sampling indicate low (0.2 g/t) gold contents.

Prospect: ROMEO

Goldfield: Mathinna

Location: 568 250 mE, 5 406 160 mN

Style of Mineralisation:

Quartz veining.

References:

Nolan, 1990.

Summary:

The prospect consists of a few shallow shafts. Recent sampling gave very low gold contents (<0.008 g/t).

Prospect: TIGER GULLY CREEK

Goldfield: Mathinna

Location: 567 200 mE, 5 402 850 mN

Style of Mineralisation:

Quartz veining.

References:

Nolan, 1990.

Summary:

Recent sampling from quartz veins along the creek gave low (<0.4 g/t) gold contents.

Prospect: TWILIGHT

Goldfield: Tower Hill

Location: 573 550 mE, 5 402 250 mN

Style of mineralisation:

Quartz veining striking 25° and dipping 80°W.

References:

Finucane, 1935.

Summary:

The reef was traced on the surface over a length of 180 m, however the quartz does not appear to be continuous over the whole length of the reef. Three shafts were sunk on the reef and there are a few trenches along the outcrops. The quartz varied in width from 2 to 60 cm. No information regarding gold production is available, although the mine was equipped with a battery. The operation was suspended in 1897 and the battery was removed in the following year.

Prospect: TOWER HILL
Goldfield: Tower Hill
Location: 573 600 mE, 5 401 200 mN

Style of Mineralisation:

Quartz veins hosted by quartzite striking 319° and dipping steeply NE.

References:

Nye, 1930; Finucane, 1935.

Summary:

The reef consists of a bed of quartzite varying in thickness from 18 to 30 m, and hosts numerous quartz veins. Some of the quartz veins are auriferous and vary in width from 1 cm to 25 cm or more. Some of the larger veins trend across the strike but in general they show random directions.

Four shafts were sunk to intersect the formation at depth. The depth of the shaft ranged from 15 to 30 m and some crosscuts were extended up to 23 m at the 15 m and 30 m levels. A few metres of the formation were intersected by the crosscuts but no further development took place. In 1930, 63 samples consisting of the whole quartzite bed from five trenches and various outcrops were analysed for gold. Fifty-four samples contained only traces of gold and the remaining nine samples yielded 1.5 to 15 g/t gold. Nine quartzite samples free of quartz veins were also analysed (Nye, 1930), but the results were disappointing, giving nil both for gold and silver contents.

In general none of the quartz veins appear to be of sufficient size to warrant mining, and the quartzite bed as a whole may not be profitable to mine. Only the parts of the quartzite which contain closely-spaced veins and irregular masses of quartz may be considered to be exploitable ore bodies, providing the veins are sufficiently rich to mine at a profit.

Prospect: SUNBEAM
Goldfield: Tower Hill
Location: 573 900 mE, 5 401 300 mN

Style of Mineralisation:

Quartz veins in a slate bed striking 279° and dipping steeply to the south.

References:

Finucane, 1935.

Summary:

The workings include a few prospecting shafts and trenches. The reef is about 1.2 m wide and consists of quartz veins occurring along fractures in a slate bed.

The results from the development of the workings were considered to be rather disappointing and the operation ceased in 1897. In 1908 the crushing of 12 tons of quartz by prospectors yielded 117 g of gold.

Prospect: SECTION 135P-G
Goldfield: Tower Hill
Location: 574 000 mE, 5 401 000 mN

Style of Mineralisation:

Quartz veins hosted by quartzite striking 319°.

References:

Finucane, 1935.

Summary:

The reef is located about 400 m southwest of the Tower Hill Mine. The formation is similar to that at the Tower Hill Mine and consists of irregular quartz veins hosted by a bed of quartzite about four metres wide. A shaft was sunk on a 30 cm wide quartz vein striking 290° and dipping to the south at 85°. No information is available in regard to the gold content of the quartz but the quartz vein followed by the shaft was stated to contain few grams of gold per ton. About 120 m south of these workings there is another reef striking north and steeply dipping to the east.

Prospect: GOLDEN HORSESHOE
Goldfield: Dans Rivulet
Location: 573 400 mE, 5 410 600 mN

Style of Mineralisation:

Quartz veins mainly striking EW and dipping 60° to vertical.

References:

Hughes, 1947.

Summary:

The lease was first taken in 1895 but there are no records of production until 1907. There has been extensive surface prospecting without any significant development at depth. A main shaft was sunk to a depth of 33 m without intersecting a quartz vein. A prospecting shaft, 24 m deep, was also sunk SW of the main shaft. The underground workings also failed to locate the ore shoots. Quartz veins from surface workings vary in width from 5 to 15 cm. Quartz is generally white, vitreous with iron oxide staining, but no sulphides were observed. The total recorded gold production from the surface workings is 6.357 kg (224 oz) which was obtained from 1807 tons of quartz (~3.5 g/t). Some surface sampling by Hughes (1947) gave values of around 1 to 2 g/t gold.

Prospect: CITY OF MELBOURNE MINE

Goldfield: Dans Rivulet

Location: 572 750 mE, 5 409 950 mN

Style of Mineralisation:

Quartz veins striking 78° and 33°, both dipping at about 80°S.

References:

Nye, 1941; Hughes, 1947.

Summary:

Mining apparently commenced in 1872 and continued intermittently until 1906. The main workings included two inclined shafts (43 m and 27 m deep) and a vertical main shaft 30 m deep.

The quartz veins are white to grey in colour, low in sulphide and vary in width from 10 to 75 cm, but are mostly in the range of 10 to 20 cm. The recorded gold production to 1900 was 1.701 kg. In 1905, 623 grams of gold were produced from 13 tons of quartz (47 g/t), and in 1906 the production was 184 g from 25 tons of quartz (7.4 g/t).

Gold values up to 58 g/t were obtained from relatively narrow (~15 cm) quartz veins (Nye, 1941).

Prospect: TRUE BLUE (THE BELL)

Goldfield: Dans Rivulet

Location: 572 400 mE, 5 410 130 mN

Style of Mineralisation:

Quartz veining in a reef striking E-W.

References:

Hughes, 1947.

Summary:

Workings include two shallow shafts sunk on the reef. A quartz sample taken from the surface gave a trace of gold.

Prospect: LADY MARY

Goldfield: Dans Rivulet

Location: 572 300 mE, 5 411 180 mN

Style of Mineralisation:

Quartz veins with a general northeasterly trend (45° to 65°) and dip 70° to 80°SE.

References:

Montgomery, 1892; Hughes, 1947.

Summary:

Work started in 1888 by sinking shallow shafts and surface trenching. The quartz veins vary in width from 10 to 40 cm and the quartz is white and vitreous and shows iron oxide staining. A main shaft was sunk to a depth of at least 32 m to intersect the veins at depth. However it is not certain whether the main shaft intersected the veins and there is no record of any gold production.

The gold assay from a series of quartz samples gave low (<2 g/t) gold contents (Hughes, 1947).

Prospect: HEATON
Goldfield: Dans Rivulet
Location: 572 180 mE, 5 411 540 mN

Style of Mineralisation:

Series of veins with a general E-W direction, dipping steeply to the south.

References:

Hughes, 1947.

Summary:

The lease was first taken up in 1895 and the mining activities continued until 1908.

The workings consisted of a main shaft, several shallow shafts, and surface stopes. The quartz veins are about 10 cm wide and there is no record of gold production. An assay from a quartz sample taken from the bottom of a shallow shaft yielded about 3.5 g/t gold and 5 g/t silver.

Prospect: KING SOLOMON
Goldfield: Dans Rivulet
Location: 571 900 mE, 5 411 900 mN

Style of Mineralisation:

Thin quartz veins showing different directions. The main vein, 15 cm wide, strikes 23° and dips steeply to the northwest.

References:

Hughes, 1947.

Summary:

Prospecting started in 1896 and the field appears to have been abandoned in the same year. The workings consisted of four shallow shafts (<10 m deep) and a number of stopes and trenches. The quartz veins are in general thin, being less than 10 cm, and irregular. The quartz is white with iron oxide staining but contains no visible sulphides.

Prospect: BRIGHT STAR
Goldfield: Dans Rivulet
Location: 571 780 mE, 5 412 400 mN

Style of Mineralisation:

Thin quartz veins following shear zones striking 78° and 348°. Also a narrow quartz vein (3 cm) striking 78° and dipping to the south. The vein is hosted by a bed of quartzite trending 303°/75°SW.

References:

Hughes, 1947.

Summary:

The lease was initially taken up in 1888. The workings included a short adit, some surface trenches and a shallow shaft. Mainly narrow (<7 cm) quartz veins are exposed in the adit and surface workings.

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Prospect: NEW GOLDEN KING

Goldfield: Dans Rivulet

Location: 576 550 mE, 5 411 850 mN

Style of Mineralisation:

Quartz reef in a hard blue slate and blue quartzite striking 348° and dipping 70°SW, with a bedding attitude of 288°/30°NE.

References:

Hughes, 1947.

Summary:

The mine is the deepest and best developed mine in the area. The leases were first applied for in 1901 and mining activities continued until at least 1905.

The workings consisted of a prospecting shaft, a main shaft with levels at 37 and 58 m, and some small adits. The reef was driven for 9 m and varied in thickness from few centimetres to 1.5 metres. The gold values were higher in wider sections of the reef. In 1902 stoping was carried out on the reef and a total of 20,894 kg (737 oz) was obtained from crushing of 264 tons of quartz and the treatment of 260 tons of sand. The recorded production in 1903 from the lower level of the main shaft was 16,881 kg (593 oz) which was obtained from crushing of 1350 tons of quartz.

The variations in the thickness of the reef and, more importantly, the hardness of the country rock were the main factors in the decline of the mining activities and the eventual closure of the mine.

Prospect: THE WATERFALL MINE

Goldfield: Dans Rivulet

Location: 574 100 mE, 5 414 250 mN

Style of Mineralisation:

Quartz veins with one striking 356° and dipping steeply to the east and another vein with a strike of 63° and dip of 80°N.

References:

Hughes, 1947.

Summary:

Mining activity commenced in 1903 and continued until 1904. The workings consisted of few shallow shafts, some trenching and an adit. The two main quartz veins varied in width from 10 to 20 cm and are associated with minor pyrite. Some thinner (<5 cm) quartz veins also occur within the area. The country rock consists of weathered slate with the bedding attitude of 293°/60°NE. The gold grades from some sampling gave values between nil to 3.8 g/t.

Prospect: OCTOBER

Goldfield: Dans Rivulet

Location: 570 580 mE, 5 414 200 mN

Style of Mineralisation:

Quartz lode striking N or NE.

References:

Hughes, 1947.

Summary:

Mining activity began in 1897 and continued until 1901. The workings included three shafts with a level at 24 m in the main shaft. The lode was driven for 24 m with a gold grade of around 30 g/t. It is not known if further development was attempted below 24 m level. A quartz sample taken from the dump and containing arsenopyrite assayed 2 g/t of gold.

A 90 cm wide formation containing crumbled iron-stained quartz and minor sulphide occurs some 200 m west of the mine. The formation strikes 360° and dips 70° to the west. A composite sample only indicated traces of gold and silver.

Prospect: MABEL

Goldfield: Dans Rivulet

Location: 570 450 mE, 5 414 650 mN

Style of Mineralisation:

Quartz vein striking mainly 308°.

References:

Hughes, 1947.

Summary:

The lease was first held in 1896 with mining continuing intermittently until 1900. The workings consisted of a shaft at least 30 m deep and some surface cuts. The quartz vein is about 20 cm wide and is barren. There is also an irregular quartz vein up to 40 cm wide in one of the cuts. An assay result from this quartz vein indicated 1.2 g/t of gold. In 1898 a trial crushing of 96 tons of quartz yielded 1.077 kg (38 oz) of gold (11.2 g/t), and the result was considered to be disappointing. Another 1.077 kg of gold was also obtained from the crushing of 22 tons of quartz in 1900 (~49 g/t).

Prospect: REVENUE
Goldfield: Dans Rivulet
Location: 569 780 mE, 5 415 300 mN

Style of Mineralisation:

Quartz veins striking 78° and dipping to the north at 85°.

References:

Hughes, 1947; Hermann, 1987.

Summary:

The area was first leased in 1897 and mining activity continued at different intensities until 1904. The workings consisted of some shallow shafts, a 114 m long adit, and some surface stopes. The quartz veins have been followed to a maximum length of 45 m from the surface workings. The widths of the veins vary from 25 to 50 cm and assays from the quartz samples showed gold values in the range of nil to 4.9 g/t. A trial crushing of 18 tons of quartz from a reef 1.2 to 1.5 m wide yielded 670 g of gold, an average gold content of 37 g/t. A total of 2.962 kg gold was obtained from crushing of 411 tons of quartz, giving an average yield of 7.3 g/t.

Prospect: SECTIONS 819/93G AND 821/93G
Location: 572 100 mE, 5 415 550 mN—(centre of former mineral lease 821/93G)
572 250 mE, 5 415 300 mN—(centre of former mineral lease 819/93G)

Style of Mineralisation:

Quartz veins showing a general NW-trending in section 821/93G.

References:

Hughes, 1947.

Summary:

There has been some prospecting on these two sections. The workings consist of trenches, shafts and an adit. A quartz sample taken from a dump and containing arsenopyrite gave a value of 10 g/t of gold and 7 g/t silver. A few small parallel formations containing some quartz have been intersected in an adit on section 821, although only traces of gold were reported from these formations.

Prospect: BAILEYS
Goldfield: Dans Rivulet
Location: 570 250 mE, 5 416 160 mN

Style of Mineralisation:

Quartz veins, with the main attitudes of 360°/80°E and 45°/78°NW.

References:

Hughes, 1947.

Summary:

The area was worked sporadically from 1899 to 1942. The workings consisted of an adit and two shallow shafts. Sampling of a 60 cm thick dark grey quartz formation over 3.6 m yielded an average of 1.2 g/t Au and 1.2 g/t Ag. The quartz is associated with minor arsenopyrite. Another quartz formation intersected by one of the shafts is 60 cm wide and contains quartz veins up to 15 cm wide. The quartz is white and vitreous, and contains fine, disseminated sulphides. A fracture zone filled with quartz is exposed in the adit. The gold assays from quartz filling the fractures was reported to be "nil". A bed of quartzite located in the slate shows an attitude of 298°/45°NE, with the cleavage striking 318° and dipping vertically.

Prospect: O'BRIENS
Goldfield: Dans Rivulet
Location: 569 700 mE, 5 417 420 mN

Style of Mineralisation:

Four main reefs, two of which are parallel and strike 58° at 85° to the south and another one with an attitude of 100°/78°N.

References:

Twelvetrees, 1904; Nye, 1941; Hughes, 1947; 1954; Mitchell, 1980.

Summary:

The first lease was taken up in 1884 and mining activity continued intermittently until 1943. The workings included a 48 m deep main shaft, three adits, and surface workings.

The two parallel reefs up 60 cm wide were considered to be the main gold producing reefs. It has been estimated that 1320 tons of quartz were crushed, yielding an average of about 30 g/t gold.

The N-trending reef (Ironstone Reef) is about 30 cm wide and contained up to 85 g/t of gold over short distances. The fourth reef consists of dense white quartz and is up to 90 cm wide. Other small reefs, with gold values up to 50 g/t, can also be found.

A five-hole diamond drilling programme undertaken by the Department of Mines in 1954 resulted in three holes intersecting quartz veins and the other two intersecting minor veinlets. One of the drill holes (DDH 3) achieved a 4.6 m intersection containing 10.7 g/t gold and about 1% of arsenopyrite. However the quartz veins were not analysed systematically for gold.

Detailed sampling of the adits (Mitchell, 1980) revealed that most of the quartz veins were auriferous, with the best value being 17.8 g/t gold over a length of 73 centimetres. Sampling of the dump material indicated values up to 26 g/t gold.

Prospect: STARLIGHT
Goldfield: Dans Rivulet
Location: 570 500 mE, 5 417 950 mN

Style of Mineralisation:

Quartz veins.

References:

Twelvetrees, 1904; Hughes, 1947; Mitchell, 1980.

Summary:

The main mining activity appears to have taken place between 1889 and 1904, and between 1935 and 1942. The workings included a 152 m long adit, a shaft, and some surface workings. The quartz vein was mostly about 90 cm wide, but up to 3.6 m wide (Twelvetrees, 1904). Some parallel reefs were also intersected, but were generally unpayable. Small tonnages (~10 tonnes) with high gold grades up to 85 g/t were reported (Twelvetrees, 1904). A major 5 m wide fracture system containing quartz veins has also been described by Mitchell (1980). The gold contents of these veins appears to have been low (up to 2 g/t). The total gold production has been estimated to be between 17.01 to 22.68 kg (600 to 800 oz).

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Prospect: KING EDWARD
Goldfield: Dans Rivulet
Location: 570 500 mE, 5 418 200 mN

Style of Mineralisation:

Quartz veins.

References:

Twelvetreets, 1904; Hughes, 1947; Mitchell, 1980.

Summary:

The first lease was taken up in 1902 and cancelled in 1904. The second phase of mining activity was between 1935 and 1942. The workings consisted of two adits and some surface workings. The lower adit was driven for 35 m and a few centimetres of pebbly quartz was intersected. The upper adit was driven on a small vein which widened to 60 cm at 20 m from the adit entrance. Sections with high gold contents appear to have been intersected in the adit.

The quartz on the surface occurs as infillings in a brecciated fault zone. There are also small veinlets associated with minor sulphide averaging about 1.6 g/t of gold. The total reported production is 9.157 kg (323 oz) between 1904 and 1906.

Prospect: CARNEGIE
Goldfield: Dans Rivulet
Location: 570 650 mE, 5 417 900 mN

Style of Mineralisation:

Quartz veins. Main strikes and dips are 88°/80°N and 163°/80°E.

References:

Twelvetreets, 1904; Hughes, 1947; Threader, 1963a; Mitchell, 1980.

Summary:

The main periods of mining activity were 1889 to 1904 and 1935 to 1942. The workings consisted of two adits and some surface stopes. Adit No. 1 was driven on a 90 cm thick quartz vein and was stoped from 12 m to the surface. The reported gold values from underground sampling are relatively high, ranging from 15 to 71 g/t. A crushing of 100 tons of quartz from adit No. 1 is said to have averaged 15.5 g/t of gold.

Adit No. 2 was driven for 32 m and intersected a one metre thick quartz formation containing fine, disseminated sulphides, mainly arsenopyrite. The vein appears to occur in a 7 m wide, NW-trending shear zone which can be traced over 80 metres. There are also narrow quartz stringers and pods with lower gold values (0.8–6.8 g/t). It is interpreted that the main lode in the Starlight Mine was intersected by this adit, and was around 10 cm wide and carrying 1.1 g/t gold. The main reefs between the Carnegie and Starlight can be traced over 300 metres. Preliminary surface sampling from the exposed quartz vein did not show any significant mineralisation between the two mines.

Two diamond-drill holes were drilled in the area in 1962 by the Department of Mines. Numerous barren quartz veins were intersected, although no gold or silver assays were reported. It has been suggested that the main reef between the Starlight and Carnegie Mines could carry higher gold contents at depth.

Prospect: NATIONAL INVESTMENT

Goldfield: Dans Rivulet

Location: 569 350 mE, 5 417 850 mN

Style of Mineralisation:

Quartz vein (58°/45°SE) parallel to the main quartz vein in the O'Briens Mine.

References:

Hughes, 1947.

Summary:

An adit was driven for 30 m some time between 1888 and 1908. The vein is up to 15 cm wide and consists of dark grey quartz containing small sulphide inclusions. Results of assays from two samples indicated low (< 3 g/t) gold and silver contents.

Prospect: HAVELOCK

Goldfield: Dans Rivulet

Location: 569 000 mE, 5 418 140 mN

Style of Mineralisation:

Possibly two parallel reefs striking 53° and dipping steeply to the southeast.

References:

Twelvetrees, 1904; Hughes, 1947; Mitchell, 1980.

Summary:

The area was first leased prior to 1887 and was held by various individuals and companies until the 1940s.

The workings included a 52 m adit, a prospecting shaft, and a 61 m deep main shaft with levels at 30 m and 42 metres. The average width of the formation was estimated by Twelvetrees (1904) to be around 45 cm.

At the 42 m level the reef was followed for some 60 m, of which 45 m was payable. At the 30 m level the reef was driven for 54 m and about 250 tons of quartz at a gold grade of 23 g/t was obtained. The main shaft was sunk to a depth of 60 m, but the pumping plant was not efficient and no development took place at this level.

According to Mitchell (1980) the reef in the adit occurs as numerous lenses occurring in brecciated slate zones. His sampling from the reef gave a range of 0.1 to 9.3 g/t gold. The production figures for 1900, 1901 and 1903 total 16.66 kg (588 oz) of gold which was obtained from crushing of 621 tons of quartz. About 170 g of gold was also obtained from 51 kg of pyrite.

It is not known whether one or two reefs were worked on the different levels.

The reef(s) appear to continue to depth, but because of the lack of sufficient capital or efficient machinery the workings were abandoned.

Prospect: LADY HAVELOCK
Goldfield: Dans Rivulet
Location: 568 750 mE, 5 418 800 mN

Style of Mineralisation:

Quartz veins with the attitudes of 78°/60°S and 33°/45°SE.

References:

Twelvetreets, 1904; Henderson, 1936; Hughes, 1947; Threader, 1963*b*.

Summary:

There are no formal titles on the area. The workings mainly consist of a three metre deep prospecting shaft and an adit with a winze. The shaft was sunk on a quartz formation which consists of solid lode material containing a quartz vein varying in width from 5 to 25 cm. The quartz is associated with arsenopyrite and pyrite. Other sulphides may also be present. An assay of a composite sample from the shaft gave 28 g/t of gold and 13 g/t of silver. Two quartz veins, each about 20 cm wide, were also intersected in the adit. The quartz is grey with abundant sulphides, mainly arsenopyrite, and the gold values vary from 3 to 23 g/t, apparently decreasing with depth.

Prospect: LARANDA
Goldfield: Dans Rivulet
Location: 568 850 mE, 5 418 950 mN

Style of Mineralisation:

Quartz veins. Attitudes: 328°/75°SW and 348°/75°W.

References:

Twelvetreets, 1904; Henderson, 1936; Hughes, 1947.

Summary:

Prospecting and mining activities were carried out sporadically between 1883 and 1935. The workings included a main adit, a 9 m deep shaft, and some surface trenching. The shaft intersected two formations about 10 cm wide which showed only a trace of gold. The main adit is about 60 m long and intersected some quartz stringers and a mullocky formation 35 cm wide with an assay result of about 1.5 g/t gold. A 25 cm wide quartz-sulphide vein was also intersected in the adit. The vein assayed 14 g/t gold. Apparently there are many more quartz veins within the area, but all appear to be low in gold content.

Prospect: STRICKLAND

Goldfield: Dans Rivulet

Location: 567 850 mE, 5 419 900 mN

Style of Mineralisation:

Quartz veins, attitude in lower adit 30°/80°NW.

References:

Twelvetreets, 1904; Hughes, 1947; Mitchell, 1980.

Summary:

The first lease was taken up in 1883 and the land was held by different lessees until 1941. The workings consisted of two adits and an underlay shaft. The upper adit was driven for 9 m on a quartz formation consisting of a number of quartz veins up to 15 cm wide. The quartz is white to grey and is associated with arsenopyrite. Assays of a few quartz samples ranged from 0.7 to 25 g/t of gold (Hughes, 1947; Mitchell, 1980). The lower adit was driven for 60 m and the reef was up to 60 cm wide. According to Mitchell (1980) there are three main quartz veins, of which only one is auriferous. The thickness of this vein varies between 0.2 to 1.5 m, with an average gold grade of 12 g/t over a length of 15 metres.

There is no recorded total gold production, however it has been reported by Twelvetreets (1904) that the last seven tons of quartz from the lower adit averaged about 70 g/t of gold, and 127 kg of concentrate containing 255 g/t gold was also saved. It has been interpreted by Twelvetreets (1904) that the adits intersected the same vein system (reef) and the reef increases in gold content and width with depth.

Prospect: HINEMOA

Goldfield: Dans Rivulet

Location: 568 150 mE, 5 421 050 mN

Style of Mineralisation:

Quartz with minor sulphides, occurring as veins, fissure-fillings and stringers.

References:

Twelvetreets, 1904; Finucane, 1935; Hughes, 1947; Mitchell, 1980.

Summary:

The lease was first acquired in 1903 and was held by various lessees until 1942. The workings consisted of three adits and some surface trenching. The width of the quartz vein in adit No. 1 varies greatly from 2 cm to 90 cm and in places appears as stringers, some of which are associated with sulphides. Twelvetreets (1904) indicated a gold grade of about 26 g/t over four metres. Sampling by Finucane (1935) resulted in an average gold content of about 23 g/t over widths ranging from 30 to 90 cm. The silver values varied from 3 to 57 g/t. Finucane (1935) recommended driving of an adit to the south and 30 m above the No. 1 adit. This was done, but no information is available as the adit is inaccessible. A lower adit, about 152 m south and 5.5 m below the No. 1 adit, intersected the lode which varied in width from 17 to 60 cm. The lode consists of several small parallel veins with bands of country rock, mainly blue quartzite, which show great variations in width. The quartzite bands contain arsenopyrite and pyrite but in general the formation is low in gold content (~2 g/t). Sampling by Mitchell (1980) indicated an average gold grade of 8.5 g/t over 18 m of the drive.

Prospect: UNA
Goldfield: Dans Rivulet
Location: Una No. 1–567 980 mE, 5 422 000 mN
Una No. 2–568 080 mE, 5 422 000 mN
Sulphide-rich vein–568 150 mE, 5 421 800 mN

Style of Mineralisation:

Main reef striking 320° and dipping steeply to the southwest.

References:

Twelvetrees, 1904; Danielson, 1973; Mitchell, 1980.

Summary:

The reef was worked intermittently from 1888 to the 1940s. Based on early observations (e.g. Twelvetrees, 1904), the main workings consisted of upper and lower tunnels. The reef has an average width of about 70 cm and can be traced for at least 365 metres. The country rock consists of slate and quartzite trending NW and dipping to the southwest at high angles (>60°).

Mitchell (1980) reported the occurrence of five adits and several trenches opened up on a number of lode deposits. According to Mitchell the lode deposits have been formed along a single shear zone with unknown length, and the mineralised zone occurs in a zone 550 m long and 75 m wide. The workings are all of a shallow nature, and surface sampling indicates low gold contents, although values up to 83.5 g/t Au have been recorded. The lodes vary in thickness but exhibit similar trend (NW) and dip steeply to the southwest.

The total gold production is not known, but Twelvetrees (1904) reported that at one time 595 g of gold was obtained from 3 tons of quartz.

A sulphide-rich vein has also been reported within the area. It varies in width from 7 to 50 cm and contains up to 265 g/t of Au (Twelvetrees, 1904). The vein strikes 335° and dips steeply to the east. It transgresses the bedding (327°/57°). The vein mainly consists of quartz, pyrite, arsenopyrite, marcasite, sphalerite and galena. Recent sampling (Danielson, 1973) gave gold values up to 48 g/t. Anomalous Sn values up to 100 ppm have also been reported. The occurrence of tin in association with gold may have some genetic significance (i.e. granite-related mineralisation). However this should be considered with caution, as the high Sn contents may be due to contamination during sample preparation.