

THE GLADSTONE GOLDFIELD1. Location & access.

This goldfield is situated around and to the south and north east of the township of Gladstone in the north-eastern part of the State.

Access is gained by a good motor road from Herrick, 16 miles in length. Herrick is connected to the remainder of the State by motor roads, and also by the Government railway system. Herrick being the terminus of the north-eastern railway from Launceston.

TOPOGRAPHY

The topography of the district is partly of high relief, and partly of low relief. The highest part is occupied by the Mt. Cameron Range, a short range with an east-west trend and rising abruptly above the surrounding country to heights of 1800 feet above the sea or 1400-1500 feet above the surrounding country. The south-eastern and northern foothills are largely bounded by the valley of the Ringarooma River. The region to the south-east of the Ringarooma River forms the northern foothills of the Blue Tier. The country north of Mt. Cameron is occupied by a dissected plain (the Great Northern Plain), which has an altitude of 300 feet above the sea near Gladstone and along the foothills of Mt. Cameron, and slopes gently towards the coast in a north-westerly direction. The north-eastern and eastern boundary of this plain is formed by the low Ringarooma Tier and its south-easterly continuation along the Cape Portland road. The country to the east is gently undulating country interspersed with lagoons and alluvial flats and extends as far at least as the Great Mussel Roe River.

The western part of the district is drained by the Ringarooma River and its tributaries. From Gladstone to the north-west, the river flows approximately along the junction of the Great Northern Plain with the foothills of Mt. Cameron, only small remnants of the plain being left on the southern side of the river. The eastern part of the district is drained by the Great Mussel Roe River and its tributaries.

GEOLOGY

Cambro-Ordovician. The oldest rocks within the district are the slates and quartzites of the Cambro-Ordovician system. They form the bedrock of the district north of the Mt. Cameron Range, except where small extensions of granite and dolerite occur. Owing to coverings of upper Tertiary to recent sediments, however, they do not occupy a large proportion of the surface.

The rocks have a general north and south strike. Owing to the paucity of exposures and the irregularity

of dips, the structure was not determined, but it is probable that the rocks are folded into a series of anticlines and synclines.

There is no evidence of the age of these rocks but from general lithological and structural considerations, they are correlated with the Mathinna series in north-eastern Tasmania and regarded as being of Cambro-Ordovician age.

Devonian Granite. Granite occupies only a small proportion of the surface of the district, but it has a considerable extent to the south (from Mt. Cameron) to Blue Tier) and the east, forming the batholith of the north-eastern Tasmania. An isolated outcrop occurs to the north of Gladstone, but detailed mapping might prove that this is joined to a portion of the main mass, with which it is certainly connected at depth.

The granite is generally a coarse grained type with porphyritic feldspars. It consists essentially of plagioclase, quartz and biotite, and approaches an adamellite. In a few places orthoclase predominates, and the rock approaches a true granite. The numerous modifications and types found in large granite intrusions with associated tin deposits, viz. pegmatites, aplites, greisen etc., are present in certain localities. The granite is usually more even grained in the vicinity of the tin deposits.

In common with other granites in Tasmania, the north-eastern intrusions are regarded as belonging to the Devonian igneous intrusions.

Mesozoic Dolerite (Diabase). Dolerite occurs to only a small extent as Cape Portland is approached. The largest exposure is that forming the Ringarooma Tier, which occurs to the west of the Gladstone - Cape Portland road some 5 to 7 miles north of Gladstone. Numerous other low ranges occur both to the west and north of this tier, and Cape Portland is occupied chiefly by this rock. An isolated outcrop exists on the west and northern slopes of Aberfoyle Hill, some 5 miles north west of Gladstone and its extension forms the bedrock of the tin workings in that vicinity. The dolerite is intrusive into the Cambro-Ordovician rocks. It is identical with the Mesozoic diabase in other parts of the State and needs no further description.

Lower Tertiary Sediments. Although no sediments of this age (and comparable with the deep leads of the Ringarooma Valley) were recognized, it is possible that some of the deeper deposits of the Great Northern Plain belong to this system. Any such deposits, however, do not represent the north-westerly continuation of the Mussel Roe deep lead. The latter turned sharply to the west after passing near the Edina mine and then passed south of Mt. Cameron to join the Ringarooma system of leads.

Tertiary Basalt. Two areas of basalt occur to the north of Gladstone. One is situated on and to the east of T. Groves' 30 acre block, some 6 miles N.N.E. of Gladstone. The other occurs on Bowen's property some 10 miles north of

Gladstone. Both appear to be surface flows and are similar to other basalts in Tasmania.

Upper Tertiary (?) or Pleistocene Sediments. The Great Northern Plain and its former extension to the foothills of Mt. Cameron are composed of gravels, sands and clays with which vegetable matter is often associated. These sediments were deposited in an estuary extending from Bass Strait in a general S.E. direction between Mt. Cameron and the Ringarooma Tier. As stated above the deepest and lowest portions of these sediments may be of Lower Tertiary age. The beds of sand are almost certainly of marine origin and this marine transgression occurred probably during the Pleistocene age.

The gravels which occupy part of the surface of the plain may be of fluvial origin, and formed by the Ringarooma River or other streams during the adjustment of drainage after the sea receded.

Recent. Recent deposits occur along most of the existing streams. Those along the Ringarooma River are the most extensive and important and consist of shingle and river alluvium. The extensive flats some 5 miles north of Gladstone are probably also of Recent age.

Part of the loose sand along the Cape Portland road may represent recent wind blown sand.

#### ECONOMIC GEOLOGY

The mineral deposits include those of tin, wolfram and gold, and while this report deals only with the latter, there is a certain relationship between all of them.

The primary tin deposits are almost entirely restricted to the granite, cassiterite being the tin mineral present in them. The most important ones are those in the Fly-by-Night Creek immediately adjacent to the contact with the slates etc., These deposits consist of greisenised granite, quartz, greisen veins and mica greisen veins. Narrow greisen veins also occur in the adjacent slates etc.

The gold deposits consist of the ordinary veins of reef quartz in the slates and quartzites. The relation between the gold and tin deposits is shown by the fact that some of the gold-quartz veins in the Fly-by-Night Creek contain cassiterite.

The only wolfram deposit is a quartz vein containing cassiterite and wolfram.

The gold bearing quartz reefs have generally the same characteristics throughout the district. The quartz is the typical reef quartz common to all gold fields, but in the Royal Tasman area it has a fine grained marble-like appearance. The quartz is mineralised with

sulphides, which in their relative order of abundance are arsenopyrite, pyrite, chalcopyrite, galena and sphalerite (zinc blende). Arsenopyrite is present in all the reefs and is by far the most abundant sulphide. Pyrite is also common but not nearly as abundant as arsenopyrite. Chalcopyrite appears to be restricted to the reefs of the Royal Tasman group. Galena and sphalerite are reported from the Portland mine.

The gold is seldom visible in the quartz, except in the Coarse Gold Creek area, and it is there present in very fine particles. That the greater portion of the gold is free is proved by the fact that it is easily recoverable by amalgamation. The gold is partly associated with the sulphides, as is evident from the high assay content (up to 48 ozs. per ton) of the Victory concentrates and the difficulty that was experienced in treating some of the Portland ore.

The proportions of gold and silver have a considerable range. The gold is generally much in excess of the silver, but the other extreme was found in the Portland mine where the silver content was often three times that of the gold.

The quartz reefs are of the high temperature type as is evident from their arsenopyrite content and from their position in respect to the granite.

The principal areas in which gold-bearing quartz veins occur are around Gladstone; north-east of the Lochaber mine; at the Portland mine; in the Blue Bell, Prince Imperial and Grand Flaneur group; and on the Mussel Roe River east of the Blue Bell etc.,. These areas all occur in a narrow belt with a trend from S.S.W. to N.N.E. This may be due to the fact that it is along this region that the Cambro-Ordovician rocks outcrop most prominently, being covered by gravels etc., in other parts of the district. However, sufficient other areas are occupied by the slates etc., without quartz reefs, so it appears that the above belt represents one that was favourable for the formation of gold bearing quartz veins. This would probably be due to the configuration of the underlying granite or the trend of the granite on the eastern side of the belt.

The fact that the quartz veins are of the high temperature type and relatively close to the granite does not necessarily detract from the possibility of important gold reefs occurring. The formation of the reefs and the gold content depended upon the temperature gradient and conditions generally in the intruded rocks, and it is quite conceivable that such conditions would occur closer to the granite in some cases than in others.

THE BLUE BELL AREA.

This area includes a number of old workings and extends from the Blue Bell in the south to the Grand Flaneur in the north. It is situated some 6 miles N.N.E. of Gladstone and access is gained by cart tracks from the Gladstone - Cape Portland road. The surface is generally level, but rises into low hills near the Grand Flaneur workings.

Blue Bell Mine. The reefs on this property were discovered in 1870, and the first prospecting lease taken up by D. Campbell. Shallow prospecting was carried out and in 1881 the Blue Bell Gold Mine Co., Reg. was formed. Two east-west reefs- the north and the south reefs had been discovered 130 feet apart, and were tested by this company. A 16 foot shaft had been sunk on the south reef which proved to be 2 feet wide and dipped north at 80 degrees. A trial crushing of one ton gave a return of 1 oz. 5 dwts of gold. A shaft was sunk to the north of the reef and at 32 feet level a 40 foot cross cut south intersected the reef. The reef averaged 2½ feet in width and dipped south at 87 degrees, and a trial crushing of one ton gave 10 dwts of gold.

The company sank a main shaft (11' by 3½') to a depth of over 100 feet and prepared to drive north and south to cut both reefs which were 80 feet apart at this depth. Water trouble was encountered and a steam pumping plant was installed. A ten head battery was also erected.

The results of the above cross cutting are not known. W.H. Twelvetees (1907) stated that a crushing was taken out at 1000 (?100) feet south, but no figures are quoted. Apparently the crushing was not successful and the company was wound up in 1884.

As the mine is not open for inspection, its importance can only be gauged by the results of these old workings. Apparently two well defined reefs were located, but though the trial crushings were promising, the crushing from depth must have been a failure.

Country between Prince Imperial and Blue Bell. The prospecting work in this vicinity is shown on the attached plan. It consists of trenches and shallow shafts. Quartz occurs on most of the dumps and sometimes can be seen in the sides of these workings. No well-defined reefs are visible, but the formations consists of numerous closely spaced and narrow veins of quartz throughout quartzites and slates. The veins have a general east and west trend.

Prince Imperial Mine. The old workings known as the Prince Imperial are situated on lease 10602/11 of 5 acres, held by A.C. Murray and J.H. Carney situated 20 chains north of the old Blue Bell Mine. The quartz reefs were probably discovered shortly after those on the Blue Bell in 1870, on the North prospecting lease of 23 acres held by D. Campbell. Prospecting became active again in 1880-81, and the ground was held at intervals during the nineties. Further work was carried out in 1907, the mine being then called the New Imperial. Recently further work has been formed by Messrs. Murray and Carney.

The workings consist of shallow prospecting shafts, trenches etc., and are shown on the attached plan. They occur along a line bearing north of west and east of south.

Quartz occurs on the dumps of several of the shafts and two of the trenches and suggest a reef or reefs with the above bearings. Most of these workings are old and not available for inspection. In his report of 1907, Twelvetees states "A goodmany years ago a shallow shaft was sunk on the reef. From accounts, the reef at the bottom was split into auriferous veins. It is now filled in. About 10 feet south east of it a new prospecting shaft has been put down 26 feet apparently striking N 25 degrees W, and a cuddy opened west across the reef from the bottom of the shaft. In the floor of the shaft is a formation of metamorphic sandstone veined with quartz and about  $3\frac{1}{2}$  feet wide. This is succeeded on the west in the cuddy by 4 feet of slate and sandstone, and then by 18 inches of quartz and 6 inches of pyrite matter. The samplings which I took have been assayed by the Government Analysts with the following results:-  
From the floor of slope 8 grains gold per ton (Little pyrite was present in this sample). From the cuddy 13 dwts. gold, 7 dwts silver per ton. This corresponds fairly well with the result reported by the promoters of an assay of 1 cwt of shale taken by them from surface and across the lode in course of sinking, and made at the Ballarat School of Mines, Some assays have been published as retaining from 2 to 23 ozs per ton, but it is scarcely necessary to mention these, except to say that they are in agreement with what might be expected from samples from different parts of an arsenal pyrites lode".

In September 1930, J.B. Scott sampled the dumps from the shafts with the following results:-

	<u>GOLD</u>				<u>SILVER</u>							
Murray shaft.	1	oz	2	dwts	5	grns	per ton.	11	dwts	18	grns	p. t.
Richards shaft	0	"	3	"	22	"	"	3	"	22	"	"

At the end of 1931 or beginning of 1932, the lessees had a trial crushing treated at Alberton and it is stated that the results were approximately 2 dwts of gold per ton.

In view of the past workings and this low return from the trial crushing, one must conclude that the prospects of attaining payable quartz in this reef are not favourable.

Grand Flaneur. This mine is situated about 70 chains north of the Blue Bell mine. The quartz reefs on this mine were probably discovered shortly after those in the Blue Bell mine as the ground was taken up as a lease (No. 3 North) in 1870 by C. Hazell. The greater part of the old workings appears to have been carried out during 1881-83, when N.E. Geach held the lease, and the Grand Flaneur G.M.Co., Reg. worked the property and sank the main shaft. Little, if any, work has been done since that date.

The workings in the vicinity of the old main shaft are shown on the attached plan. The surface at this place is thickly covered with quartz. The trenches, prospecting shafts and excavations revealed one main reef, although narrow veins occur at other points. This reef (Grand Flaneur) has a general east-west strike, but the outcrop is curved due to the dip of the reef ( $30^{\circ}$  to  $35^{\circ}$  to the south) and the configuration of the ground (the reef outcrops at the south-eastern end of low undulating hilly country).

The reef at its outcrop is exposed in a trench and the L shaped excavation north of the main shaft, and is shown to dip to the south at  $30^{\circ}$ . The south-western corner of the L shaped excavation is connected by a shallow drive or working with a shaft to the south. A shallow trench to the west of this shaft has also exposed the reef near the outcrop, while two other shafts to the south-west have intersected the reef at depths of 5 to 10 feet.

The main shaft was sunk by the Grand Flaneur Co. in 1881 to a depth of 63 feet. The reef was probably cut and passed through, and arrangements were being made to drive south at the 55 feet level.

The above workings prove that the reef is an east-west one, with a southerly dip of  $30^{\circ}$ . The width is 2 to 3 feet, but is not constant and in places vertical veins arise from the top of the reef. The quartz is atypical reef quartz and is of the white and semi-vitreous type. No gold is visible in the stone, but arsenopyrite is abundant while pyrite also occurs, these sulphides being especially developed in the quartz from the shafts west of the main shaft. A large dump of quartz containing 20 to 30 tons is still intact at the surface, being apparently obtained from the L shaped excavation and possibly from the main shaft.

The gold content is not known from the result of any tests or crushings made by the company. It is reported that a washing test of 50 lbs of quartz yielded gold at the rate of  $1\frac{1}{2}$  ozs. per ton. A sample (481/32) from the dump (pieces from all over the dump) yielded on assay a trace of gold and 6 dwts. of silver per ton. Another similar sample 482/32 from the dumps of the two shafts west of the main shaft (this sample contained much sulphate) gave 4 dwts 10 grns of gold and 16 grs. of silver per ton.

The quartz therefore, appears to be low in gold

values and the cessation of work in the eighties probably confirms this view. The gold values in the sulphide bearing quartz is somewhat encouraging and it is unfortunate that the results from the Main shafts are not known. The only work that appears warranted, however, is further sampling of the dumps and clearing out and sampling of the old workings. Further work would depend upon the result of the above.

Two other shafts were sunk  $6\frac{1}{2}$  chains west of the Main shaft, but no quartz is visible on the dumps which comprise quartzites and slates.

A number of trenches occur about 20 chains north of the main shaft. The most eastern shows only narrow veins of quartz. Another trench 4 chains to the west shows a one-foot vein of quartz striking north and south and dipping vertically. Two other trenches occur further west, but cannot be properly examined.

#### THE GREAT MUSSEL ROE RIVER AREA

The Blue Bell mine and the Great Mussel Roe River area is occupied partly by slates and sandstone and partly by basalt. Quartz veins occur in the slates and sandstones and numerous old trenches and prospect holes have been excavated on the quartz outcrops. None of the workings are extensive and generally the reefs or veins appear to have been narrow and low in gold contents and not worthy of much testing. The prospecting has been restricted largely to the west bank of the river.

On the northern side of the small creek running through 706/G several trenches occur, but the nature of the veins or reefs cannot now be seen.

In the south-eastern corner of lease 707G, the Big Mussel Roe reef outcrops on a steep cliff face. It consists of quartz veins throughout sandstones over a width of 50 feet. The apparent strike is north and south and the formation is exposed a little to the north of the cliff. Twelvrees quotes assays of 2 dwts of gold and 2 dwts 15 grns of silver from the cliff face and 3 dwts 6 grns of gold and 4 dwts 14 grns of silver per ton from the reef to the north. Such formations are fairly common in North-east Tasmania, but none has been proved to be of commercial importance.

Twelve chains further south, three trenches have exposed a reef striking north and south, and dipping to the west.

A few old trenches occur on 10808/M, of 10 acres held by J.W. Graves. It was stated a recent hole had been sunk and that the quartz gave a good assay of gold. This hole could not, however, be located during the recent visit.

PORTLAND AREA

This area is situated  $4\frac{1}{2}$  miles N.N.E. of Gladstone and access is gained by a cart track branching off the Gladstone-Cape Portland Road.

The surface is very flat and exposures are almost absent, rendering prospecting difficult. Numerous leases were held in this locality but only one mine - the Portland - was developed.

Portland Mine.

The Portland reef was discovered in 1880 by Moore and King, but extensive work does not appear to have been carried out until 1896 when the Portland G.M. Co., N.L. was formed. The main shaft was sunk to a depth of 210 feet, and levels opened out at 80, 150, and 200 feet. The ore could not be treated at the mine and was sent away for treatment.

In 1902 operations were renewed and in 1903, the Brisbane Consols G.M. Co., N.L. was formed to work the mine.

The old workings are situated on forfeited lease 674/G of 10 acres and cannot now be examined. The following information has therefore been obtained mainly from former reports. The surface works consist of four shallow shafts and several trenches. Nothing can be seen of the reef in these, but they generally form a line bearing  $56^{\circ}$  and distant some 100 feet north-west of the main shaft. The small timbered shaft on this line was sunk to a depth of 25 feet near the reef. The shaft between this and the Main shaft was sunk to a depth of 45 feet, and a crosscut driven N.W. to the reef. An underlay winze was sunk on the reef from these two levels and connected with the 80ft. level from the Main Shaft. These workings are shown on a mine plan, and the reef has a steep dip to the south. From information received by W.H. Twelvetrees levels were also opened up from the Main shaft at 150 and 200 feet.

Widths reported as follows:-

Between surface and No. 1 level	6 to 12 inches
" No. 1 & No. 2 levels	10 to 12 inches av.
Intermediate level between	
Nos. 2 and 3	12 inches average
At No. 3 level	12 " "

Values and nature of the ore are reported as follows.

Down to No. 1 level	Carried fair proportion of freegold.
Between Nos. 1 & 2 levels	Very little free gold. Reef charged with arsenopyrite, galena and sphalerite. 1 to 2 ozs. gold per ton.
At No. 2 level and below Intermediate level.	Values poor and patchy. Arsenopyrite present.
No. 3 level	4 dwts. per ton where struck. Low grade.

Samples reported from the ends of No. 1 level and stopes above confirm the above as assays ranged from 19 dwts 14 grns of gold and 3 ozs 18 dwts of silver per ton to 3 oz 11 dwts 2 grns of gold and 16 ozs 0 dwts 3 ozs of silver per ton. The ore from this portion of the mine

was sent to N.S.W. for treatment and is stated to have averaged 2 ozs of gold while some parcels ranged up to 6 ozs of gold per ton.

The return for quarter ending December 1902 was 90 tons of quartz crushed for 94 ozs of gold.

A noticeable feature of the reef is that the quartz is heavily charged with sulphides and that the silver contents greatly exceeds the gold (3 to 5 times).

The quartz was apparently payable down to a depth between the nos. 1 and 2 levels, but unpayable below. This rather suggests a zone of secondary enrichment down to that depth and the unpayable primary zone below.

The other unfavourable feature is the narrow width, which while great enough when the quartz carried good values, was too small when the values declined.

It therefore appears that the reef has little or no chance of being commercially exploited.

#### THE LOCHABER AREA

A number of old trenches and shafts exist to the north and north-east of the Lochaber mine. These were probable dug in the eighties or nineties and are now fallen in.

Popes Prospect. The most numerous group of workings are situated in the S.W. portion of the former lease 713/87M, and are stated to have been carried out by Pope many years ago.

Numerous trenches and shafts exist along a line bearing  $55^{\circ}$ . Quartz occurs on the dumps of many of these and is the only evidence now available as to the presence of reefs. These suggest a reef bearing  $55^{\circ}$  and which was continuous throughout the length covered by the workings. However, the long trench east of the main shaft suggests either a break in the reef or a search for parallel reefs.

A grab sample taken from quartz on the dump of the main shaft yielded an assay a result of 6 dwts 16 grs of gold and 2 dwts 12 grs of silver per ton. Thus the quartz is gold bearing but little can be said as to the general value, width, length etc., of the reef.

#### THE GLADSTONE AREA

The Gladstone area is situated in the immediate vicinity of the township, chiefly to the north and south thereof. The principal gold mining and prospecting in the district is being carried out in this area.

Numerous leases have been taken up and several companies and syndicates have carried out prospecting operations. One company the Victory - has installed a small plant and crushed the quartz obtained from its underground workings.

The Victory Gold Mining Co. N.L.

The property of this company includes a number of reefs including the Wolfram, Royal standard, North Tasman, Royal Tasman, Flemings, and the Royal Mint. These reefs and the workings thereon have been described in a separate report entitled "The Victory Gold Mining Co. N.L. ".

Lease 10919/M, H.G. Beltz.

This lease covers part of the township of Gladstone, and a number of old shafts and trenches exist on it. A new shaft was sunk to test the quartz reef from a point in Chaffey St., 102 feet south west of the of the junction with Swan Street. It was sunk to a depth of 30 feet, the reef at the top having a high dip to the S.E. and passing into the end of the shaft near the bottom. The reef ranged in width from 2 to 8 inches, the country rocks being slates and micaceous sandstone striking N and S, and dipping W at 45°. Near the bottom of the shaft narrow zones of the sandstones appeared to be weathered or altered and it was stated that prospects of gold could be washed from these zones.

A short drive was put into the south-west, and proved the reef to range from two to four inches in width. A sample across 4 inches yielded an assay only a trace of gold and silver. The quartz in this shaft was the ordinary white reef quartz and little mineral was observed in it, but concentrates from prospects proved the presence of arsenopyrite.

It was stated that 2 trenches and a 7 foot shaft excavated to the south-west, had picked up the reef which contained good values, and was 2 feet wide in the shaft. However, all these old workings have long been filled in and could not be inspected.

To the north-east of the new shaft, three old shafts and one trench exist but have been partly or wholly filled in. One of these 60 feet from the new shaft showed the reef with a width of 9 to 12 inches, and dipping high to the south-east.

A combined sample from both ends yielded on assay 5 dwts 17 grs of gold, and 20 grs of silver per ton.

About 118 feet north east of the new shaft, an old alluvial tin working exists. Numerous narrow and irregular quartz veins occur in the slate bedrock, some of which are generally in the line of the reef.

It is stated that 32ozs of gold were obtained along with the tin ore.

The above workings suggest a reef with a general strike of 45°, and a dip high to the south-east or vertical. The greatest width visible was 12 inches but it ranged down to 2 inches. Near the surface the quartz is stated to have given fair prospects of gold and the sample from the old shaft agrees with this. In the bottom of the new shaft the reef was narrow and contained only a trace of gold, so that generally the prospects of the reef as a whole and particularly in depth do not appear promising.

COARSE GOLD CREEK AREA.

Lease 10847/M. A.M. McDougall. No work had been carried out on this section before or during the visit of inspection, but it is understood that trenching and shafting has since been performed near the northern boundary in an attempt to cut the southern extension of the quartz reef from the adjacent section to the north. (For further information see description below.)

Lease 10883/M. A. Moore, J.T. Shields, V. Moore and M.J. Morrison (40 acres) As the name of the creek implied, coarse gold has long been known to occur in this area, having been recovered during the sluicing for tin ore.

During the latter part of 1931, M. Morrison sluiced portion of the bed of the creek and a small patch on the western side thereof, and a long and narrow strip to the N.W. of the above patch.

This sluicing exposed the bedrock and a number of narrow quartz veins in it, for the quartz in which yielded good prospects of gold.

In order to test these at depth a shaft was sunk on the bank to the west of the sluiced area. It followed one of the narrow veins which had a strike of  $300^{\circ}$  with a vertical dip and a width of 2 to 6 inches. The shaft was 31 feet deep and from the S.W. end a drive was put in to the south-east for a distance of 10 feet. Work in the shaft was discontinued and resumed on the surface. This revealed an apparently large body of quartz with a fairly low dip to the west. Two shallow excavations were made in this quartz and proved that the reef had a north-south strike. In depth the dip became steeper and a fairly good footwall became apparent with a dip of  $48\frac{1}{2}^{\circ}$  to the west. The reef also appeared to have a width of 2 to 3 feet and consisted chiefly of reef quartz with slate walls. From each excavation narrow veins ran to the north-west, that from the northern excavation being the ore sunk on in the shaft.

The quartz is a typical reef quartz and contained a number of vugh-like cavities. Coarse gold was visible in nearly all specimens and was particularly associated with a reddish coloration of the quartz due possibly to small inclusions of iron oxide. No sulphides were visible, and crushings of trial parcels are stated to have yielded no concentrates of sulphides.

Four tons of quartz from the main reef and the two narrow reefs were treated at Alberton for approximately 7 ozs of gold. Later, one ton from the main reef yielded about 5 ozs of gold. In addition some 3 to 4 ozs were obtained by the washing of numerous prospects so that the quartz averaged approximately 3 ozs per ton.

To the north the reef has not been exposed and if it continues to the creek it will probably intersect a wide band of quartzite with numerous quartz veins. This

band of quartzites has a general strike of  $320^{\circ}$  and the slates to the west strike at  $344^{\circ}$  and dip west at  $60^{\circ}$ . As to what will occur at the junction of the reef with the quartzites can only be proved by prospecting at that point.

To the south the reef has possibly been intersected in the workings on lease 10847/M, but these were carried out after the time of the writer's visit. The reef is probably connected in some way with the flat and west dipping vein exposed in the creek bed in the N.W. part of 10847.

The long and narrow excavation that was sluiced to the north-west of the main reef did not cross the line of the reef. Dark and light slates were exposed with a zone of silicified rocks near the centre. Some quartz was exposed in the bottom of the excavation and water which deposits limonite issued from the slates nearby.

The most important reef so far discovered on the lease is that described above as the main reef (and known locally as the "Big Thing"). The work has proved it over a length of 20 to 25 feet and a width of 2 to 3 feet. It has a high gold content and the crushings suggest an average value of approximately 3 ozs per ton. Further work on the reef should be carried out in order to prove its extent in length and depth.

It is understood that a shaft is at present being sunk to 100 feet at which depths, a crosscut will be put in to the reef which will then be driven. The future prospects of the reef will depend mainly on this work.

#### CONCLUSION

The above descriptions show that the gold deposits of the Gladstone district consists of quartz veins contained in slates and quartzites. The latter are intruded by granite from which the quartz veins were derived.

The veins occur in a belt of country extending from Gladstone in a general N.N.E. direction through Coarse Gold Creek, Lochaber, Portland, Hue Bell and Grand Flaneur areas. This association may have some structural significance, unless it is purely accidental due to the covering of the bedrock by later gravels etc., in adjacent regions.

The veins are of the quartz arsenopyrite gold type and represent high temperature deposits which agrees with their comparative closeness to the intrusive granite. There is a general association of sulphides particularly arsenopyrite, with the quartz except in the main reef at Coarse Gold Creek. The gold is generally of fair quality except at the Portland mine where the silver content often exceeded that of the gold.

The reefs in each area are generally similar in strike, but that in each area is considerably different to that in others, so that there is no general similarity which would be indicative of a uniform structural control throughout.

The Gladstone area has probably the best prospects of any and includes a number of old mines such as Royal Tasman, North Tasman, Royal Mint, etc., This area is now being tested by the Gladstone G.M.Co. N.L. and its future depends entirely upon the developmental work now being carried out.

In the Coarse Gold Creek area, the main reef has yielded good prospects of gold, It has, however, only been tested over a short length and to shallow depths. The developmental work now being carried out will prove the possibilities of this reef.

The other areas contain old mines which were not successfully operated and which do not appear to offer favourable possibilities.

Generally therefore, the future of the gold mining industry of the district depends upon the results of the work being carried out at Gladstone and Coarse Gold Creek, and the discovery of hitherto undiscovered reefs.

Mines Department  
HOBART. 21/3/33

(signed) P.B. Nye  
GOVERNMENT GEOLOGIST