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REPORT ON THE GEOLOGICAL SURVEY

OF THE COUNTRY BETWEEN SCAMANDER AND MATHINNA

INTRODUCTION:

The examination of this area was undertaken to determine the extent of the reported potential alluvial gold deposits; it was claimed that payable gold had been obtained in the Avenue River, a branch of the Scamander, many years ago and that no effort had been made to thoroughly test the prospects.

The scope of the survey was extended to permit an examination of the country between Scamander and Mathinna two areas which had been examined geologically previously.

Altogether seven weeks, from 16th February to April 2nd, were spent in the field but much of that time was ineffective owing to the lack of transport facilities.

PREVIOUS LITERATURE:

Reports on the areas, which it was proposed to connect, are contained in the following:-

(1) On the Country along Hogan's Track by W.H. Twelvetrees, 1901, which deals with the extreme north of the area examined.

(2) Scamander Mineral Field, Geological Survey Bulletin No. 9, which covers the eastern limit.

LOCATION AND ACCESS:

Broadly, the area lies between Mathinna and Scamander but more specifically between the two main branches of the Scamander River the northern branch being known as the Scamander and the southern as the Avenue.

Beyond the Golden Ridge in the north and Cato Creek in the south, access is comparatively difficult as no tracks exist, although the country is quite open, at the present time, owing to the bush fires which have destroyed most of the undergrowth.

The Golden Ridge is reached by following a road which connects with the properties along the Evercreech Rivulet; this leaves the Fingal-Mathinna road about three miles south of Mathinna. About one mile beyond the Rivulet crossing Hogan's track leaves the road and climbs a steep spur on to the plateau and then continues over five miles of undulating country to the Golden Ridge; the track continues beyond the mine for another mile along a sharp ridge and then drops very steeply down the northern side to Paul Beahrs and the old Trafalgar mine. A branch track sidles down the ridge on the southern side to the Old Queen of the Earth mine.

The southern end was reached by a motor road to Ryan's property situated on the Avenue River, about four miles west from Upper Scamander.

TOPOGRAPHY:

The area, although not rising to great heights is one of high relief, consisting as it does of a deeply dissected peneplain; this pre-Permo-Carboniferous peneplain is the most striking physiographic unit in the area.

The drainage is effected by the Scamander River drainage system; the northern branch takes its rise in the high country west of Hogan's Track and flows south-easterly to unite with the southern branch which rises on the northern slopes of the Mt. Nicholas Range, as far west as the Huntsman's Cap. These branches unite about eight miles from the sea and then continue in a general easterly, meandering course to the sea, acquiring an estuarine character for the last five miles.

The creek beds, in most cases, are dry and for the greater part of their length expose a bare rock bottom; it is for a chain or two only, near their junction with the main streams, that they are filled with coarse wash. This coarse wash appears to be part of the flood plain of the river rather than an accumulation of the material transported by the tributaries; although it may be due to the main stream cutting down its channel at a faster rate than the tributaries thus increasing their transporting power near the junction.

The stage of development that the drainage has reached is so youthful, due to rejuvination, that large accumulations of wash are impossible.

In the Avenue itself, there are restricted depressions serving as natural concentrating areas alternating with long streches of bare, smooth rock; the economic significance of this will be discussed more fully under economic geology.

The valleys between the ridges are steep-sided V-shaped and for the most part dry, although the accumulation of stones indicates torrential falls of rain. Jointing appears to have excercised a dominant control in moulding the course of the streams.

The dissected pre-Permo-Carboniferous peneplain presents an endless series of steep ridges and spurs; the most persistent ridges are those developed along the dip. The influence of differential erosion is apparent across successive ridges where reltiavely high, isolated peaks are characteristically developed in the quartzite beds and also in the vicinity of the metamorphic aureole surrounding the granitic intrusion.

GEOLOGY:

The geology of the area is relatively simple consisting as it does of a large area of slates and quartzites intruded by a dyke-like mass of granite.

CAMBRO-ORDOVICIAN:

The rocks range from soft drab, grey, purple and dark slates through argillaceous and indurated sandstones to quartzites. They have been folded into a series of isoclinal folds; the strike of the beds is roughly meridional with high dips east and west.

Cleavage is well developed in places and several sets of joint planes cross the cleavage planes either diagonally or at right angles; reference to the effect of these on the topography has already been made.

This series of slates and sandstones is co-extensive with the Mathinna Series of rocks and for that reason is referred to the Cambro-Ordovician period. With the exception at Warrentina in 1934, which suggest a possible Silurian age for the series no palaeontological evidence of age is available and as has been the practice in recent years the rocks are referred to the Cambro-Ordovician; until better preserved fossils give more definite evidence as to age no change is warranted.

Mica is abundantly developed along joint planes. Owing to short jointing in the rocks accumulations of angular debris occur on the hillsides.

DEVONIAN:

Denudation has revealed portion of the underlying granite massif in a dyke-like extension of the southern portion of the St.Helens - Blue Tier granite massif; this massif forms the northern boundary of the area examined and although greatly restricted in extent, continues in a south-easterly direction from the junction of Brilliant Creek and the Scamander River across the area to Cato Creek.

The following petrological notes are based on Twelvetrees' observations.

Generally the granite is a light-grey rock, even-grained to coarsely porphyritic, with biotite, hypersthene and porphyritic quartz and felspar.

Up Cato Creek, on Ryan's clearing, the granitic rock is hornblende-bearing granitite porphyry with fine grained ground-mass and phenocrysts of plagioclase felspar, biotite and quartz.

Dykes of aplite, a fine grained pink variety occur on the west side of the Cato Creek hornblende granitite porphyry.

Regarding the age of these rocks, no more definite age relationship was established than that they intruded Lower Palaeozoic rocks which in turn were unconformably overlain by the next younger rocks - the Permo-Carboniferous; therefore, following established practice they were assigned to Devonian age.

ECONOMIC GEOLOGY:

The primary object of this examination was to determine the extent of the reported potential gold areas in the Avenue River watershed, but the opportunity was taken also of examining the Gold Ridge mine to determine the possibility of re-habilitating the mine under present conditions

ALLUVIAL GOLD AREAS:

Regarding the potential gold areas in the Avenue River watershed, prospects, taken in nearly every tributary creek of the Avenue, with the exception of two creeks, did not show a colour of gold; the two creeks which did show colours of gold had been worked already. These were

on the south side of the Avenue, about 20 chains and 40 chains respectively, west of where the granite crosses the river.

In the first creek the amount of wash available would be approximately ten feet wide, six feet deep, and one chain in length, about 130 cubic yards in all. The second one contained a little more, having about same cross-section but being about a chain and a half in length. The amount of gold obtained in the prospects from these creeks was very small, only a few colours.

As has been pointed out previously the creek beds in most cases are dry, and for the greater part of their length expose a bare rock bottom. It is for a chain or two only, near their junction with the Avenue River that they are filled with wash; this wash is a very coarse, sub-angular one and it attains a maximum depth of approximately ten to fifteen feet, while the width would be generally about ten feet, although it is nearer thirty feet in the Huntsman's Creek.

As the greater proportion of the creeks feeding the Avenue do not contain gold, the amount of gold in bed of the river itself must be negligible. Furthermore, owing to the nature of the deposits, restricted areas of natural concentration, followed by long stretches of bare rock, a few isolated prospects are likely to create an inflated impression of the value of the deposits.

Owing to the very dry summer the river level was particularly low and it was possible to test the bottom of the river itself but even this failed to give any encouraging prospects.

THE GOLDEN RIDGE MINE:

The workings now known as the Golden Ridge mine are west of the original workings and are located within mineral lease 10649/M - 10 acres, last held in the name of S. Chapman and J.F. Egan. The portion of the lease on which the workings are actually located, at one time, comprised one of the three old Brilliant sections known as Shearn's section 602/93G.

With the object of determining the possibility of re-opening the mine, in the light of changed conditions, a detailed examination and a thorough sampling campaign was undertaken; altogether 26 samples were cut, and with one exception, were 10 foot channel samples. The exception being No. 26 which was a 15 foot section. These were crushed, coned and quartered until the sample was reduced to one or two pounds.

In view of the nature of the deposit it was thought that perhaps some structural control could be determined but the assay results were so low as to discourage any intensive work.

The rock type is a massively bedded, fine-grained buff to white, coloured sandstone, which in places, particularly in intermediate level, has been intensely silicified, giving place to a dense, bluish-white quartzite. In these parts pyritisation was apparent, although sulphur determinations in conjunction with the assays showed a remarkable constancy.

There is no evidence of any definite vein structure and apparently the gold occurred mainly along joint planes, in minute blade-like veins. The three most commonly

developed joint planes strike north 88° east, south 37° east and south 50° west.

A fault, of small rotational displacement, striking north 12° west, with a northerly dip at a high angle, passes through the main bench of the open-cut, a few feet east of the pass.

The dip of the beds is distinctively flatter here, and suggests an anticlinal position although it may reflect only the intrusion of the granite; the dip is 20° - 25° in a north westerly direction.

The main ore-body as indicated by the workings appears to have a slight south-easterly underlay, with a flattening to the east. The occurrence being tested by the intermediate level is not sufficiently developed to form any opinion as to its extent.

The following assays are indicative of the gold content of the stone exposed in the workings at the present time:-

Registered Number.	Location	Gold Oz. Dwt. Grs.	Silver Oz. Dwt. Grs.	Sulphur %
307	10ft. section west of adit in open cut.	0 0 12	Trace	0.09
308	1st section West wall of adit (10')	1 1	12	0.09
309	2nd section West wall of adit (10')	Trace	Trace	0.09
310	3rd section West wall of adit (10')	Trace	Trace	0.08
311	Southern wall intermediate level to pass	Nil	Nil	0.07
312	10' West of rise in western end of intermediate level.	Trace	Trace	0.08
313	Northern wall intermediate level.	Nil	Nil	0.08
314	Northern wall intermediate level.	Trace	Trace	0.08
315	Eastern wall of cuddy	Trace	Trace	0.07
316	Southern wall of adit East of southern cuddy.	12	Trace	0.08
317	Northern wall of intermediate level.	Trace	Trace	0.06
318	Northern wall and round Eastern end of intermediate level.	Trace	Trace	0.06

Registered Number	Location	Gold oz. dwt. grs	Silver oz. dwt. grs.	Sulphur %
319	Southern wall of intermediate level and into southern cross-cut.	Trace	Trace	0.07
320	Eastern wall of cross-cut.	Nil	Nil	0.08
321	Eastern wall of cross-cut to northern wall of adit	15	Trace	0.09
322	Northern wall of adit.	8 14	3 3	0.07
323	Northern wall of adit and into northern crosscut.	12	Trace	0.07
324	Southern wall of adit (next to section No.10).	Trace	Trace	0.07
325	Souhhern wall of adit	18	Trace	0.08
326	Southern wall of adit drive.	Trace	Trace	0.07
327	Western wall of north crosscut.	Trace	Trace	0.09
328	Around end of north crosscut.	Nil	Nil	0.08
329	Eastern wall of north crosscut.	15	15	0.07
330	North wall of main adit	18	Trace	0.07
331	North wall of main adit.	12	Trace	0.08
332	15' around end of main adit.	Trace	Trace	0.05
	NOTE: Values lower than 12 grains per ton are reported as Traces.			

Descriptions of most of the workings on this section are contained in Twelvetrees report on Gold Mines near Hogan's Track so that only a description of the later work will be given. The mining operations to be described were undertaken when the lease was held by Chapman and Egan between August 1930 and April 1935.

The workings are situated approximately 200 feet north east of the south west angle of mineral section 10649/M; they consist essentially of an open-cut and an adit driven from the face of it, both of which are connected t to a transport adit with passes.

The open cut is approximately 100 feet long and probably 15 to 20 feet wide; it is in two benches. The main bench is 60 feet long with a maximum depth of 40 feet while the other is in a very early stage of development.

An adit has been driven from the face of the main bench, near the eastern corner, approximately 80 feet east. For the first 35 feet a chamber, with an average width of 15 feet and height of 11 feet has been cut, it then continues as a normal adit.

At 40 feet from the bench face, a small cross-cut has been driven, from the northern wall of the adit, about 25 feet west of the above cross-cut and 12 feet in length, connects with an intermediate level about 36 feet long; this level is only four feet below adit level and is practically east and west; it is connected at the western end to the transport adit by a pass.

About 12 feet from the bench face, another short cross-cut has been driven 10 feet south.

Between this cross-cut and the adit portal, a small narrow cuddy has been driven a few feet in a south-westerly direction.

The transport adit commences about 10 feet below and 30 feet west of the western end of the open-cut It has been driven north 46° east for 86 feet to connect. with the pass from the intermediate level. About 72 feet in, a cross-cut has been driven south 51° east for 16 feet to connect with the open cut pass.

A very primitive and inefficient method was employed in the treatment of the ore; it consisted of crushing the ore in a cylindrical mill and passing the discharge over blankets.

The mill had a ratio of diameter to length of 1 to 3 compared with the modern range of 1 to 1 - 1.6; the type of ball, if any, used could not be determined.

From an inspection of the mill dump it was quite apparent that the crushing efficiency was very low, with a correspondingly high tailing loss; no efford was made to determine the average gold content of the dump because no useful purpose could be served in so doing.

PRODUCTION:

The only recorded production during the period 1930-35 was in 1932, when one lot of 148 tons of material was treated for a recovery of 2.5 oz. of gold, returning 2.3 oz. fine, valued at £13/10/-, based on average London metal prices.

This indicates a recovery of 8.1 grains per ton.

CONCLUSIONS:

From this brief examination of the area it was quite apparent that the report, of the existence of potential alluvial gold deposits, had greatly exaggerated the possibilities and that the legend of the area not having been thoroughly prospected was unfounded on fact.

Furthermore, the area being co-extensive with the Mathinna goldfield and comparatively so easy of access, it is inconceivable that, if the area had any potentialities at all, it would have escaped attention in the eighties of last century, when the State was prospected with such vigour.

Regarding the possibilities of re-opening the Golden Ridge Mine, the examination has shown that the "ore-body" has no defined structure and this irregularity precludes any attempt to prospect it systematically. The grade of "ore" remaining is too low to warrant further exploration in the hope of locating richer ore.

Q. J. HENDERSON,
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