

REPORT ON DISTRICT BETWEEN JANE RIVER AND
PRINCE OF WALES RANGE.

LOCATION AND ACCESS.

This district is situated in the western highlands, 35 miles to the south-east of Queenstown.

The area examined consists of a tract of country commencing at Algonkian Mountain in the north and extending 15 miles south to Lancelot Hill, about the head waters of Maxwell River. From Prince of Wales Range, in the east it extends westward to Jane River a distance of 8 miles.

The west-coast road, connecting Hobart and Queenstown, passes 15 miles to the north of the area. At 123 miles from Hobart a recently graded foot track deviates from the road and provides access, in a general southerly direction for a distance of 20 miles, to Jane River gold diggings, in the northern part of the district.

TOPOGRAPHY.

The topography of the region is in parts of very high relief while in others it is of comparatively low relief. It has been formed by the denudational action of the present stream systems. A direct relation between the geology and topography of the district is established, since the more elevated parts are composed of indurated schists and the less elevated regions consist mainly of easily eroded dolomite.

A series of more or less parallel mountain ranges and smaller ridges trending north-north-east and south-south-west are in evidence between the eastern and western boundaries of the area. The most prominent feature is that of Prince of Wales Range, a rugged mountain mass with precipitous sides. It extends along the eastern periphery of the area, rises 2,000 feet above wide, low lying valleys on either side; and attains a height of approximately 3,500 feet above sea level. Algonkian Mountain, a thickly timbered eminence connected by a high saddle with the northern extremity of Prince of Wales Range, stands out to the north-west of the latter, while Lancelot Hill represents its smaller counter-part off southern end of the range. From southern side of Algonkian Mountain a broad timbered spur known as Gum Ridge extends south-south-westerly, in which direction it loses its identity to the north-west of Lancelot Hill. River Peak and Norway Range are other ridges further west, bordering the east side of Jane River and west side of Norway Creek respectively.

Drainage is effected by means of two large tributaries of Gordon River comprising Jane River and Maxwell River. Within the area Jane River flows in a general south-south-westerly direction, for the most part through a deep, steep sided gorge, but afterwards turns westerly and joins Franklin River before its waters reach Gordon River. Jane River is augmented locally by Algonkian Rivulet which gathers the waters draining the northern and middle regions by way of Ridge Creek, Norway Creek, Peak Creek and many unnamed streams.

Maxwell River drains southern portion of the area by means of two large branches comprising Lancelot Rivulet

and Prince Rivulet. These take their rise in the Prince of Wales Range and, together with other subsidiary creeks flowing southerly from west side of Gum Ridge, eventually join to form the main stream, running south to Gordon River.

In the vicinity of Algonkian Rivulet, and extending southerly for several miles, wide belts of open plain country occur on either side of Gum Ridge. That on the east side extends easterly to foot of Prince of Wales Range, and that on the west to a low ridge from $\frac{1}{2}$ a mile to one mile westwards. In general the plains are associated with exposures of dolomitic limestones.

GEOLOGICAL MAP.

A reasonably accurate sketch map to accompany this report was compiled from information obtained during the examination.. The positions of all outstanding topographical points within the area were fixed by compass intersection primarily controlled by the trigonometrical stations of Frenchmans Cap (4756 feet) and Wyld Craig (4400 feet).

Topographical features shown on existing maps were altered where necessary and many previously uncharted features added.

GEOLOGY.

Pre Cambrian:- Sedimentary rocks of this system (dolomites, compose the greatest portion of the district. They consist of dolomitic limestones, quartzites, quartz breccias, slates, argillaceous schists, quartz sericite schists and quartzitic schists.

The dolomites and dolomitic limestones appear to be the lowest members of the system. They are light to dark grey coloured rocks varying in all degrees from fine grained, massive types, to coarsely crystalline varieties. On the southern bank of Algonkian Rivulet at $\frac{1}{2}$ a mile above the junction with Jane River dolomitic limestone, conformably underlying slates, has assumed a schistose structure but elsewhere schistosity is absent. These rocks are exposed in the low lying areas, along the open valleys and plains of the district.

In several instances intricate networks of honeycombed silica in the form of quartz, traverse the dolomites. This is of a secondary nature and has been formed by a process of rock replacement. Occasional thin bands of extremely fine grained white quartzites are interbedded with dolomites to the west of Gum Ridge.

In the bed of Norway Creek an unusual dark red variety of magnesium limestone occurs overlying massive purple and grey coloured slates. The following analysis of this rock indicates that the red colouring matter is due to the presence of iron oxides.

	<u>Per. cent</u>
Loss in ignition	40.42
Moisture	0.14
Insoluble	9.96
Al ₂ O ₃	1.01
Fe ₂ O ₃	2.37
FeO	1.51
Mn O ₂	0.19
P ₂ O ₅	0.16
Ca O	25.92
Mg O	18.26
S	0.03
Total	<u>99.97</u>

Several varieties of argillaceous schists including sericitic and chloritic types are interbedded with slates and succeed the dolomites. In places the schists are puckered and contorted but in general the planes of schistosity are developed parallel to the bedding. Exposures occur to the best advantage in Jane River gorge, upstream from the junction with Algonkian Rivulet, where approximately 300 feet of the rocks are displayed in cliff faces. The included slates are black in colour, extremely fissile, and show incipient schistosity. Several small outcrops of massive slates occur in Norway Creek and the upper reaches of Ridge Creek. These are purple and grey in colour and show only slight cleavage. They are more typical lithologically of the Dundas Series of slates as developed in the west and north-west of the State, but there is little doubt that they are here conformable with the dolomites and schists. The argillaceous schists and slates are developed to their greatest extent along the ridges and low hills from Gum Ridge to west side of Jane River.

The quartzites and quartzitic schists are very fine grained, extremely siliceous, types of a general white colour. They generally occur as massive beds of great thickness overlying the argillaceous schists and slates series, but thin beds of quartzites are included in the latter and also the dolomite series. These rocks comprise the largest part of Prince of Wales Range where they stand out conspicuously along the precipitous slopes of the mountain. Here also beds of quartz-sericite schists, up to 200 feet in thickness are interbedded with the quartzitic schists.

The strike of the bedding and schist planes varies throughout the area within wide limits, but the more general directions appear to be between north-west and

north-east. Low angles of dip averaging 40 degrees are the rule and a series of comparatively gentle folds with axes trending north-north-east and south-south-west are indicated by the lines of outcrops of the different rock types. The mapping shows that much faulting has taken place and this has apparently obscured the structural details.

PLEISTOCENE:- Over the open plains between Prince of Wales Range and Gum Ridge gravels, drifts and clays have been deposited up to 20 feet or more in thickness. The gravels consist of slightly rounded pebbles of quartzite and quartzitic schists and exhibit no well defined stratification. Although the average size of pebbles is 3 inches many boulders up to 3 feet in size are distributed through the deposit.

The occurrence is probably a glacial deposit modified by fluvial action.

RECENT:- The present streams are depositing gravels along their courses but with the exception of portions of the larger streams these are generally very shallow, and local. Down stream from Gum Ridge deep gravels and alluvium are distributed over the Algonkian Rivulet flood plain and remnants of older terrace gravels of the same stream occur at intervals up to a maximum height of 30 feet above the present flood plain. The lower parts of Prince Rivulet, Lancelot Rivulet and Norway Creek are also flowing over flood plains composed of thick beds of gravels and alluvium.

ECONOMIC GEOLOGY.

(1) Mining History.

As far as can be ascertained gold was first discovered in the district about the year 1894 when W. Burrows worked an alluvial claim in a small creek to the north of River Peak. It is said that about the same period H. Smith obtained some alluvial gold in the locality but no official records of this are in existence. Since that time numerous prospectors including many assisted by the Government, have attempted to search the area for minerals, but with little success until 1935. In August last, during a prospecting campaign extending over a period of 5 months, R. Warne discovered payable alluvial gold in several small tributaries of Ridge Creek.

Within two months between 30 and 40 men were either working claims or prospecting on the new field, but of this number only 15 remain at present.

(2) Primary Deposits.

No primary deposits of economic value have been disclosed in the district. Small irregular veins and bunches of quartz occur in several localities, but these are not plentiful and in some instances the quartz appears to be of a secondary nature. In the vicinity of the alluvial workings quartz veins containing chlorite and bunches of crystalline pyrite have been disclosed, traversing the schists. In the same locality some thin bands of argillaceous schists are impregnated with fine pyrite. Outcrops of iron oxide in the form of limonite, often concretionary, occur at intervals, and these appear to represent the oxidised residue of pyrite impregnation of the rocks.

Although several pieces of gold, adhering to quartz have

been obtained in the alluvial deposits the source has not yet been disclosed, but there appears to be little doubt that the gold has been shed from quartz veins in the immediate vicinity.

(3) Alluvial Gold Deposits:-

(a) General : With the exception of the extreme southern portion of the area, alluvial gold, generally of a very fine grain size, is distributed through gravels along the courses of most of the streams in association with some fine ilmenite and magnetite. In only a few places is the gold concentrated sufficiently to form workable deposits. The latter occur in the north-west of the district in several small creeks constituting the head waters of Ridge Creek, where gold is now being won.

(b) Reward Creek Workings.

About one mile east of Warne Lookout, R. Warne has applied for a Reward Lease (11542 M) of 30 acres about the upper portion of a small west flowing creek. Further downstream the remainder of the creek bed is held under Miner's Right claims.

The deposit consists of fine angular quartz gravel in association with sand and clay drifts. It extends to depths varying from 2'6" beneath the narrow creek bed in upper part of Reward claim, to 25 feet downstream, where the stream flows over a flat area, up to 2 chains in width. The gravels etc. overlies rock bottom, traversed by small quartz veins and composed of various types of argillaceous schists interbedded with fine quartz breccia and chalcedonic quartzite. Some gold is distributed throughout the deposit but is coarser in grain and more plentiful immediately above the bed-rock. No gold is found above eastern boundary of Reward section. The metal is generally medium to coarse in size and the grains sharp, and only slightly waterworn. The two largest nuggets obtained weighed 35 dwts. and 18 dwts. respectively.

A Mint assay of gold from Warne's section showed a decimal fineness of .9821, thus giving a value of £4/3/3 per oz., not including premium.

From a survey of several small areas worked on Reward Claim, it is estimated that this ground has produced an average of 1 oz. of gold to the cubic yard of material treated.

In the lower portion of the creek where the deposit is much deeper the average production would be much less.

(c) Other Workings:

Recently five other small affluents of Ridge Creek situated to the south and south-west of Reward Creek have been partly worked for their gold content by numerous parties. The alluvial deposits in these creeks are all shallow and much of the contained metal has already been won. They have not proved so rich as Reward Creek but in general the characteristics of the gold are similar.

Burrows alluvial workings of forty-two years ago are situated in a small creek flowing to Jane River from the low hills between north end of River Peak and Warne Lookout.

Here again the gravels are shallow and only a small area has been sluiced. It is reported that 13 ounces of gold were won at that period from this locality. With the exception of the creek heading south from Warne Lookout

and flowing to Ridge Creek on the west side, in which bedrock is dolomitic limestone, the rocks underlying the gravels of these several creeks consist of schists, quartzites and quartz breccias.

(d) Gold Production.

The recorded gold production from Jane River gold-field for two quarters ending March 1936 is given as 242 ounces fine. This is not necessarily the full amount produced but only that sold to the Mint during the period, and stated to have come from Jane River.

(e) Working Methods.

All of the gold obtained up to the present has been won by means of small sluice boxes and by panning methods. As sluicing water in the small creeks being worked is not abundant at any time, and during dry months becomes scarce, small conservation dams have been built across some of the stream beds. In the lower portion of Reward creek operations have been hampered owing to the lack of a race sufficiently deep to carry tailings away from the thick deposits in this locality.

To enable this ground to be worked efficiently it would be necessary to bring water to the site by race under adequate head pressure to facilitate sluicing by means of monitors, and to dig a race deep enough for the disposal of all tailings.

(4) Alluvial Cinnabar.

The mercury sulphide Cinnabar occurs in the gold bearing gravels of a small creek joining Ridge Creek from the south-east, a few chains below Reward Creek. It appears as small irregular, waterworn grains, averaging $1/16$ of an inch in size. Small pieces of quartz adhering to the cinnabar have been detected. This mineral is not plentiful and the quantities are too small to be exploited.

(5) Prospecting.

During the course of the geological examination of the district a supervised prospecting campaign was carried out by the writer's field assistants, (S. Edwardsen and M. Fletcher).

The prospecting of the area south of the workings established the fact that gold in a fine state of division was distributed along the watercourses of almost the whole of Algonkian Rivulet watershed, and also in the small creeks flowing southerly to Prince Rivulet, west of Gum Ridge. Gold was not found in the remainder of Prince Rivulet watershed. Lancelot Rivulet watershed was not thoroughly tested but the prospecting undertaken in the locality did not disclose any metallic minerals.

Although individual prospects up to one grain of gold to the dish were secured in different places, the best average content of any of the deposits tested, over a distance of

more than one chain, was very much less than that quoted.

The creeks in the greater portion of the area are running over smooth bedrock consisting of dolomite or dolomitic limestone and under these conditions, with little exception, neither gravels nor gold appear to have been deposited in quantities.

CONCLUSIONS.

The geological reconnaissance has demonstrated that the bed-rocks of the district consist of Pre-Cambrian schists, slates, quartzites and dolomites, and that Devonian igneous rocks with which the great majority of the mineral deposits of the State are genetically connected are absent.

Quartz veins traverse the rocks of the district but none have yet been found to contain minerals of economic importance.

Prospecting has proved that fine alluvial gold occurs in creek gravels throughout the northern and middle parts of the district but that the chances of finding further payable concentrations of gold are remote.

The best possibility for this appears to be in Ridge Creek below the small creeks in which the workings occur, and also the others streams joining Ridge Creek in that vicinity.

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