SUPPLEMENT

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NEW ZEALAND GAZETTE

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Report on the Golden Point Quartz Reef, Queen Charlotte Sound.

Colonial Museum of New Zealand,
Wellington, 2nd February, 1878.

SIR,—Some rich specimens of auriferous quartz having lately been exhibited in Wellington, from near Picton, at the request of the prospectors I examined the locality where they were obtained, on the 16th January, and have the honor to furnish you with a report of my observations.

The mine, which has been named "The Golden Point," is situated on the west side of Queen Charlotte Sound, five miles below Picton, and three miles short of the western entrance to Tory Channel. The promontory is marked on the Admiralty Chart as Price's Point, and forms the northern headland of Powerful Bay, one of the numerous indentations of the shore line, and in the entrance to which lies Negara Island.

Under the shelter of the point, within the bay, are the peach groves and cultivations of the deserted Maori settlement of Kaipapa, where there is a small extent of available land, but elsewhere the country consists of narrow rocky ridges with steep sides covered with scrub to the water's edge.

The locality of the mine was reached from Picton by boat, but the steamers pass close to it, and there is safe anchorage for vessels of any size in the bay.

GEOLOGICAL FORMATION.

The prevailing formation along the west side of the Sound is mica-schist and clay slate, both metamorphic rocks that are impregnated with quartz in irregular veins and laminæ. These metamorphic rocks are similar to the schists of the Otago Gold Fields, and form a narrow belt that extends from Cape Jackson, S.W., to the Wairau River.

Indications of the existence of gold have been found in various parts of this area. Thus, near Cape Jackson, at the Turner Mine, several reefs were formerly worked, and many rich specimens obtained. Quartz collected by myself from this reef in 1872, without visible gold, yielded as high as 3 oz. 6 dwt. per ton. (*Geol. Reports*, 1872, p. 129.)

Also on the Onamarutu Creek, a tributary of the Wairau River, which flows through the same schists, alluvial gold was extensively mined during 1869–70, followed by the discovery of the Sutherland reef on the western borders of the formation. This reef yielded by analysis about 1 oz. per ton, but it never received a fair trial, and was abandoned, after the erection of expensive machinery, before the mine was thoroughly explored. (*l.c.*, p. 122.)

The Golden Point reef occurs under similar geological conditions to both the foregoing.

The rock is a fine-grained mica-schist of a dark grey colour, with thin laminæ of quartz; the foliation planes having a strike of N. 15° E., and an average dip of 40° to the westward. The rock is intersected by vertical joints in the manner usual in mica-schists, but there is very little contortion of the foliation planes.

Besides the thin laminæ, quartz occurs in veins or leaders that traverse the rock mass in an irregular manner, expanding and contracting from a few inches to nearly two feet of thickness in some parts.

At least six of these leaders are exposed within a distance of 60 feet in the face of the sea-cliff where the mine is situated (as shown in the enclosed sketch A), and about the same number have been met with in the underground workings, but as far as yet followed they do not appear to form into a well-defined lode or reef.

Cutting across these leaders and displacing them, vertical faults are seen in the sea-cliff, and in the workings one of them is marked by a thin cross course or vein of banded quartz, carrying water. The direction of these faults is about N. 40° W.; and in the same line round the point on the beach below the Maori garden there is a wide vein of blue mullock or tenacious clay full of kernels of white quartz and minute crystals of pyrites. Further on and still in the same line on the hill above, blocks of cherty iron-

stone and quartz indicate the outcrop of a heavy reef, but nothing has been done to test the ground in this direction.

It is therefore probable that if a steady defined reef is found it will have a N.W. and S.E. direction and easterly dip, and in this respect agree both with the Jackson and Sutherland reefs, and also with the auriferous quartz and antimony lode between Endeavour Inlet and Port Gore (*Cox, Geol. Rep.*, 1875, p. 2), so that N.W. appears to be the prevailing course of mineral lodes in the district.

The workings in the Golden Point Mine have hitherto been for the purpose of tracing the irregular leaders of quartz already mentioned.

A bench has been cut on the face of the hill clear of tide level, and a tunnel put in for 50 feet to the north. At the end of this tunnel a shaft has been sunk to a depth of 30 feet, and from the bottom a cross level has been cut 17 feet to the east and 19 feet to the west. A thin leader is cut in the roof of the tunnel near the entrance, but having a north-east dip intersects the floor about 20 feet further in, where it expands to about 12 inches in thickness. It was from a shallow pit on the east side of the tunnel at this point that the rich specimens exhibited in Wellington are stated to have been obtained. Several dishes of stuff from the leader, roughly broken, were tested on the spot, and in every case gold was obtained. One prospect, got in this rough way, was preserved and weighed, and gave half of a grain to the dish, or about half an ounce per ton. Eighteen and a half pounds of stone from the same place was taken for further examination in the Laboratory, and yielded at the rate of 14 oz. 15 dwt. 5 gr. per ton. The next leaders examined are in the cross-cut at the bottom of the shaft. The ground is tolerably dry considering that it is so close to the sea and about 25 feet below tide-mark, and the leakage water being only faintly brackish, proves that the ground is tight and favourable for deep working. In the cross drive towards the east three leaders have been cut, two of which dip to the east at a flat angle, and the third is seen to split as it rises from the floor to the roof of the drive into an east and west branch. Quartz from the junction was tested and gave a prospect of $\frac{1}{5}$ of a grain to the dish. A mixed sample from the leaders, weighing 125 lb., was taken for further examination, and has yielded at the rate of 3 oz. 16 dwt. 5 gr. to the ton. In the cross drive to the west a small east dipping leader is first cut, and then a strong leader of very compact quartz, also with easterly dip, is seen in the roof and upper half of the walls of the drive, but it is cut off by a cross course which has been filled by a subsequent deposit of banded quartz about two inches in thickness, and to which I have previously alluded. A few pounds of quartz from both the leader and the cross course were taken, for comparative examination in the Laboratory, and gave the following results:—

	Oz.	dwt.	gr.
Flat leader, per ton ...	0	13	21
Cross course, per ton ...	1	3	8

The gold from the cross course or latest formed reef being decidedly more argentiferous than that from the leader.

The following are the details of the various examinations and analyses of specimens from the mine which have been made by the Analyst in the Laboratory under my supervision:—

1, 2, 3, 4. Samples taken by myself.

1. Dish of broken quartz from the "Specimen Hole" (*a* on and plan and sections), washed in the sea under unfavourable circumstances. Weight of sample, about 10 lb. Gold obtained in rough flakes, 0·55 gr.
2. Dish of stuff from the Y leader at the east end of the cross drive (*b* on plan and sections). Weight of sample, about 10 lb. Gold obtained in fine specks, 0·15 gr.
3. From flat leader in the west cross drive (*e* on plan and sections), compact slightly ferruginous quartz. Sample of 5 lb. weight, after roasting and crushing, yielded by amalgamation process at rate of 13 dwt. 21 gr. per ton.
4. From the cross course or vertical vein cutting and displacing the leader from which sample No. 3 was taken. A thin vein of ferruginous quartz with a banded structure, but breaking into angular fragments. From this vein there is a constant drip of water. Sample of about 3 lb., after roasting and crushing, yielded by amalgamation process at the rate of 1 oz. 3 dwt. 8 gr. per ton.

5, 6. Samples taken in my presence, and crushed at Mills' Foundry, under the superintendence of Mr. J. F. E. Wright. The pounded quartz being passed through a sieve, and all the coarse gold separated, the pounded stone and the coarse gold was delivered at the Laboratory in separate parcels.

5. From the hole on east side of the tunnel, at 20 feet from the entrance, where the rich specimens were found, samples of 18½ lb. yielded,—

	Oz.	dwt.	gr.
Gold in separate packet, being that picked out by Mr. Wright with the sieve, at rate of ...	11	9	3
Amalgamation of the crushed stone yielded	3	11	12
Total yield per ton ...	14	20	15

6. From the leaders in the east cross drive, Sample of 125 lb.—

	Cwt.	dwt.	gr.
Gold in separate packet ...	0	11	5
Obtained by amalgamation ...	3	5	0
Total yield per ton ...	3	16	5

Two samples of the gold have been analyzed, one of them (*a*) being extracted from the prospectors' specimens, and the other (*b*) from the leader in the east cross drive:—

	a.	*b.*
Gold	92·51	94·22
Silver	4·38	3·93
Iron and loss ...	3·11	1·85
	100·00	100·00

The proportion of silver to 100 parts of gold is therefore in *a* 4·70, in *b* 4·17, so that the two samples are of similar quality.

A tracing from the chart (A), showing the locality, and a plan of Price's Point (B), showing the position of the Golden Point Mine, is enclosed; together with a sectional view of the quartz leaders as they are seen in the cliff (C); and a ground plan and two vertical sections of the workings, showing the positions of the various points referred to in the foregoing report.

In conclusion, I may state that I consider the indications on the whole favourable, but that much work may be necessary before a defined reef is found. At the same time, the analyses above quoted prove that some at least of the quartz leaders contain a remunerative percentage of gold, provided that their extreme irregularity does not make the mining operations too costly.

Any further prospecting, apart from working the leaders, should, I think, take the form of a drive to the N.E., from a point on the beach about fifty yards south of where the outcrop of the mullocky reef occurs, as it is most probable that all the leaders will "make" into a quartz lode, a reef lying to the west and north of the mine, but underlying to the eastward.

I have, &c.,
JAMES HECTOR,
Director of Geological Surveys.

The Hon. the Colonial Secretary,
Wellington.

Report on the Phœnix Mine, Collingwood.

Colonial Museum of New Zealand,
Wellington, 7th February, 1878.

SIR,—I have the honor to enclose a Report on the Phœnix Mine, Collingwood, as it is the recommencement of mining industry in an important district, which has been greatly neglected for some years past, owing, I believe, to the injudicious manner in which the mines were formerly worked, and not to any lack of auriferous lodes.

I have, &c.,
JAMES HECTOR.

The Under Colonial Secretary.

The following notes on the Phœnix Mine, Collingwood, were made during a recent visit to the district:—

The mine is situated in the fork of a small tributary creek, with Coles's Gully immediately below the great outcrop of quartz formerly worked by the Commercial Company. Coles's Creek, from this point downwards, has been noted for its rich finds of specimen gold in the alluvium, indicating the close proximity of the matrix or reef from which it is derived. Two reefs have been discovered and exposed in the Phœnix Claim by outcrop working, and a tunnel, as shown in the enclosed sketch plan and section.

No. 1 reef, as seen at the outcrop about 100 feet above the creek level, where it has been laid bare by shallow excavations, consists of irregular masses of quartz, forming a band about 12 feet thick, but without any well-defined walls. From 20 feet above the creek a tunnel has been driven into the face of the hill for 300 feet, in the direction of N. 70° E., intersecting the No. 1 reef, and showing it to be the same character, but somewhat thinner than at the outcrop. It lies parallel with the junction of the dark blue slates and the overlying felspathic schists, having a faint dip to the S.E. of about 1 in 2, and in this respect corresponds with the reef worked in the Perseverance Mine further to the south, and of which it is probably the continuation.

The reef rests on a grey tufaceous sandstone, strongly impregnated with iron pyrites, in very minute crystalline grains. A specimen of this rock taken at random from the outcrop working yielded, after careful roasting, gold at the rate of 16 dwt. 14 gr. per ton.

A specimen handed to me by Mr. J. F. E. Wright, and apparently from the outcrop of the reef, consisting of compact reddish coloured quartz, containing films of gold, was crushed, and all the visible gold picked out by hand. The remainder of the quartz was then assayed with the following results:—

	Oz.	dwt.	gr.
Gold picked out by hand, at rate of, per ton	13	3	6
Gold not visible obtained by amalgamation	9	4	12
Total in specimen ...	22	7	18

I found several specimens both in the outcrop and in the drive that showed specks of gold, but the quantity was not determined.

No. 2 reef is seen in the gully crossing it as a hard rusty ledge with walls of green rock. It has been followed in a tunnel to the north for some 40 feet, and shows as a 4-foot vein of quartz containing from 40 to 60 per cent. of pyrites of light colour when fresh.

The lode has a well-defined broken foot-wall, the containing rock both above and below being of grey tufaceous schist of flaky structure charged with minute crystals of pyrites, which on being separated yielded gold at the rate of 14 dwt. 20 gr. per ton.

The lode-stuff after roasting yielded gold at the rate of 3 oz. 10 dwt. 21 gr. per ton. The pyrites also contained traces of silver and copper.

The dip of the lode is 70° to S.W. or towards the No. 1 reef. I estimate (not having made an exact survey) that the present tunnel will intersect the No. 2 reef at about 50 feet below the outcrop after it has been continued for 250 feet beyond where it intersected No. 1 lode, and that the two lodes will intersect at about 100 below the level of the tunnel. At this point I think a valuable find may be fairly anticipated.

JAMES HECTOR.

By Authority: GEORGE DIDSBURY, Government Printer, Wellington.