

Conclusions.

Petrographic investigations indicate that this bore passed through the three shear zones described under a, b and c, viz.:-

- a. Zone 1: 462ft.-469ft. 9in.
- b. Zone 2: 504ft.-509ft. 10in.; and
- c. Zone 3: 583ft. 8in.-588ft. 4in.

With the exception of the comparatively rich 4ft. 9in. of lodestuff from 465ft. to 469ft. 9in. in Zone 1 (a), the values were negligible.

These three zones all contained the curious granulated biotised rock—mostly on the hangingwall. They resulted from the breaking down and crushing under heat, solution, and pressure of the reconstructed amphibolite in which they occur. The rich lodestuff in Zone 1 (a) from 465ft. to 469ft. 9in. is of considerable interest on account of the microcline and tourmaline it contains. It looks as if it is in some way connected with acidic residual solutions which have been forced along and between the foliation planes of the schisted rock in the shear zones.

No. 2 Bore.

1. This bore was completed at a depth of 525 feet.

2. The following is the succession of rocks passed through:—

Depth in feet.	Nature of rock.
20—210	.. Rotten decomposed amphibolite.
210—240	.. Reconstructed amphibolite.
240—243	.. Pyritic siliceous actinolite rock with granular sphene and microcline—a grade of lodestuff.
243—261	.. Chlorite-carbonate actinolite schist containing magnetite.
261—340	.. Amphibolite; semi-schisted and containing distinctly schisted bands, with a band of epidote rock from 264ft.—265ft.
340—437	.. Amphibolite of varying grades of crystallinity, grading into hornblende schist.
437—448	.. White quartz reef.
448—516ft. 6in.	Amphibolite.
516ft. 6in.—520ft. 9in.	Patch of oxidised schist.
520ft. 9in.—521ft. 6in.	Rock somewhat schisted, slightly pyritic and epidotic.
521ft. 6in.—525ft	Amphibolite.

3. One hundred and eleven (111) assays were made in the Government Analyst's Department: 98 yielded no gold at all; seven yielded traces; one 5 grains per ton; four yielded 3 grains, and one yielded 1 dwt. 5 grains per ton.

3.—BORING AT MT. ZION GOLD MINE.

(For Plan showing bores, see Dept. of Mines (S.M.E.'s.) Report for 1929.)

No. 2 Bore.

1. This bore was put down at an angle of depression of 65 degrees with a view to cutting the lode at deeper levels.

2. The total depth reached was 481 feet 8 inches.

3. The country rock of this bore was the same throughout, viz., a somewhat mottled greenish rock due to an admixture of chlorite and carbonate, the latter often forming bands. The rock on the whole was more or less schisted. Its origin is doubtful, but it was more than likely some ultra-basic rock.

4. The bore passed through no less than six zones of a perfectly banded black and white jasper. These zones will be referred to as lodes. Their positions along the bore are as follow:—

Depth in feet.	Width.
	ft. in.
Lode 1—150ft. 6in.—156ft. 3in.	.. 5 9
Lode 2—191ft. 4in.—200ft. 6in.	.. 9 2
Lode 3—251ft. —258ft.	.. 7 0
Lode 4—263ft. —307ft.	.. 44 0
Lode 5—341ft. 6in.—352ft.	.. 10 6
Lode 6—431ft. —466ft. 7in.	.. 35 7
Total	.. 112 0

The total thickness of these jasper bodies along the direction of the bore is therefore seen to be 112 feet.

5. *Values.*—The values derived from these so-called "lode formations" may be summarised as follows:—

Lode 1: 150ft. 6in. to 156ft. 3in.

Values: 150ft. 6in.-153ft.—Gold, trace.
153ft.-156ft. 3in.—Gold, 8 grains per ton.

Lode 2: 191ft. 4in.-200ft. 6in.

Values: 191ft. 4in.-195ft.—Gold, trace.
195ft.-197ft. 6in.—Gold, 1dwt. 2gr. per ton.
197ft. 6in.-200ft. 6in.—Gold, 11dwt. 0gr. per ton.

The rock from 197ft. 6in. to 200ft. 6in. was a heavily pyritic phase of the black and white jasper. The pyrites occurred in patches and partly as crystals. Some secondary veins of quartz and carbonates were noted.

Lode 3: 251ft. to 258ft.

Values: 249ft. 6in.—255ft. Gold: 13gr. per ton.
255ft.—258ft. Gold: trace.

Lode 4: 263ft. to 307ft.

Values: 263ft.—268ft. 6in. Gold: 5gr. per ton.
268ft. 6in.—272ft. 6in. Gold: 1dwt. 12gr. per ton.
272ft. 6in.—276ft. 9in. Gold: 1dwt. 0gr. per ton.
276ft. 9in.—281ft. Gold: 2dwt. 9gr. per ton.
281ft.—285ft. Gold: 1dwt. 7gr. per ton.
285ft.—289ft. Gold: 17gr. per ton.
289ft.—293ft. 6in. Gold: 1dwt. 18gr. per ton.
293ft. 6in.—297ft. 6in. Gold: 17gr. per ton.
297ft. 6in.—299ft. 6in. Gold: 3gr. per ton.
301ft. 6in.—307ft. Gold: 10gr. per ton.

Lode 5: 341ft. 6in.—352ft.

Values: 341ft. 6in.—345ft. 9in. Gold: 5gr. per ton.
345ft. 9in.—350ft. Gold: 5gr. per ton.
350ft.—352ft. Gold: nil.

Lode 6: 431ft. to 466ft. 7in.

Values: 431ft.—450ft. 6in. Gold: nil.
450ft. 6in.—454ft. 8in. Gold: 2oz. 14 dwt. 8gr. per ton.
454ft. 8in.—458ft. 7in. Gold: 3dwt. 11gr. per ton.
458ft. 7in.—462ft. 8in. Gold: 1dwt. 15gr. per ton.
462ft. 8in.—466ft. 7in. Gold: 13gr. per ton.

This lode was banded black and white jasper to 450ft. 6in., at which point a change came in. The banded rock gave place to a much shattered siliceous stone between 450ft. 6in. and 454ft. 8in. Under the microscope it was seen to consist of microcrystalline quartz cut by shatter cracks and small shear lines bordered by carbonates. Carbonate and quartz veins, and some chlorite as well as jasperoid to chalcedonic silica were noted. At 450ft. 9in. was second-

ary silica, plates of carbonates and strong brown prisms of tourmaline. The iron pyrites was in small amount and in an exceedingly fine state of division.

6. In addition to the foregoing assays core from the following depths was assayed with results that showed no gold at all:—354 to 431 feet, and 466ft. 7in. to 481ft. 5in.

No. 1 Bore.

1. This bore reached a total depth of 461 feet along its angle of inclination.

2. The core started in rotten rock at 26 feet. From this point to the bottom of the bore the succession of rock formations met with is as follows:—

Depth in feet.	Nature of rock.
26ft.—78ft.	Rotten banded ferruginous jasper.
78ft.—157ft. 10in.	Green carbonate rock.
157ft. 10in.—167ft. 2in.	Pyritic quartz carbonate rock with some heavy iron sulphide in places.
167ft. 2in.—168ft.	Pyritic green schist.
168ft.—204ft.	Banded black and white jasper.
204ft.—233ft.	Almost white carbonate rock.
233ft.—235ft.	Glassy white quartz.
235ft.—255ft.	Pyritic dense white carbonate rock.
255ft.—273ft.	Mottled chlorite carbonate rock, in part schistose and like the average rock in No. 2 Bore.
273ft.—287ft.	Gray carbonate rock.
287ft.—309ft.	Mottled chlorite carbonate rock.
309ft.—355ft.	Massive dark carbonate rock.
355ft.—434ft. 2in.	Mottled chlorite carbonate rock.
434ft. 2in.—446ft. 7in.	Mottled chlorite carbonate rock with 6 inches of pyritic jasper (some red) and glassy quartz at 440 feet.
446ft. 7in.—461ft.	Mottled chlorite carbonate rock.

3. The rock throughout the whole of this bore varied somewhat in appearance from point to point. This was simply due to chemical and dynamic changes in the one rock formation, viz., a chlorite-carbonate rock analogous to that which formed the dominant rock in the No. 2 Bore.

4. The so-called jasper lodes were not so frequent in this as in the No. 2 Bore. Their positions along the direction of the bore, together with assay results, are as follows:—

No. 1 Lode: 26 to 78 feet. Rotten jasper.

Values: 26ft.—48ft. 9in. Gold: nil.
48ft. 9in.—60ft. Gold: trace.
60ft.—62ft. 6in. Gold: 5gr. per ton.
62ft. 6in.—67ft. 4in. Gold: 3gr. per ton.
67ft. 4in.—78ft. Gold: 8gr. per ton.

No. 2 Lode: 157ft. 10in. to 167ft. 2in. Pyritic quartz carbonate rock with some heavy iron sulphide in places.

Values: 157ft. 10in.—162ft. 6in. Gold: 21gr. per ton.
162ft. 6in.—167ft. 2in. Gold: 14gr. per ton.

No. 3 Lode: 168ft. to 204ft. Banded black and white jasper.

Values: 167ft. 2in.—169ft. 2in. Gold: 5gr. per ton.

169ft. 2in.—176ft. Gold: nil.

176ft.—194ft. 5in. Gold: trace.

194ft. 5in.—196ft. 7in. Gold: 6dwt. 13gr. per ton.

196ft. 7in.—200ft. 9in. Gold: trace.

200ft. 9in.—202ft. 10in. Gold: 2dwt. 4gr. per ton.

202ft. 10in.—204ft. Gold: trace.

The foregoing were the only three lode formations noted. At 440 feet there was 6 inches of pyritic red jasper, but it contained no gold.

The only other values recorded were between 78ft. 6in. and 89ft. 2in., carbonate rock yielding 3 grains of gold per ton.

5. The remainder of the core was averaged and assayed. It contained no gold for the most part, with traces in places.

4.—BORING AT NORSEMAN.

No. 4 Bore, Viking Gold Mine.

(For Locality Plan and Cross Section of No. 4 Bore, see Department of Mines (S.M.E.'s) Report for 1929.)

1. This bore reached a total depth of 575 feet.

2. The bore started in coarse-grained epidiorite, it then passed through a great width of fine-grained epidiorite to 511 feet, where a distinct schisted zone made of hornblende-biotite schist came in. The bore after passing through this zone continued in coarse-grained epidiorite.

3. Details of rock formations are as follow:—

Depth in feet.	Nature of rock.
35ft.—150ft.	Coarse-grained epidiorite.
150ft.—511ft.	Fine-grained epidiorite.
511ft.—522ft.	Schisted zone of hornblende-biotite schist with some quartz.
522ft.—575ft.	Coarse-grained epidiorite.

4. Assays.—A great number of assays were made, including average samples of practically the whole of the core. The results were negative, no gold being recorded in any of them.

5. Although no gold was recorded it is of interest that sheared and schisted zones persist to depths of 511 feet.