



# British Columbia Geological Survey Geological Fieldwork 1974

## VANCOUVER ISLAND

By G.E.P. Eastwood

### INTRODUCTION

In 1974 the writer took over responsibility for Vancouver Island from K. E. Northcote, who commenced a project in the Kamloops area. Continuing office duties precluded a full field season; 56 days were spent responding to requests for property examinations and geological assistance, investigating reports of interesting mineralization, and doing follow-up work in the area mapped by Northcote at the north end of the Island (see Northcote's report and map in GEM, 1970, pp. 254-262). Areas and properties reported on are arranged in NTS order and keyed by number to Figure 20.

#### 1. PERBELL MINES LTD. (Victoria Mining Division, 92C/9W)

The claims extend eastward from the Gordon River along the north side of the San Juan River. Regional mapping by the Geological Survey of Canada postulates an east-striking fault through the claims, separating metasedimentary rocks of the Leech River Formation on the south from batholithic intrusive rocks on the north. An assessment Report (No. 4940) shows the claims underlain mainly by chert and tuff, identified as Leech River, intruded by diorite to the north and northwest. The writer confirmed that metasedimentary rocks of Leech River aspect extend north of the fault into the mountainside. A thin-bedded chert is well exposed where a logging road formerly crossed the principal creek between Brown and Fairy Creeks. Paragneisses were identified north of the diorite toward the head of Brown Creek.

#### 2. REAKO EXPLORATIONS LTD. (Victoria Mining Division, 92C/9W)

A property examination in May was prompted by press reports of a potential 10 million tons of iron-copper ore. The showings were visited with the company's consulting geologist, R. L. Roscoe, and some geological mapping was done later. He explained that 1,225,000 tons was indicated as probable from surface exposures and drill core, and the extrapolation was based on strong magnetic anomalies not yet investigated.

The showings are in the upper valley of Renfrew Creek and are not well exposed. Magnetite, pyrrhotite, and chalcopyrite occur in skarn zones in an intrusive breccia. Two bands of limestone trend northwest across the valley, little affected by the intrusion and containing only one minor sulphide occurrence. The intrusive breccia grades west to diorite, which contains a large lens of massive magnetite.

#### 3. CARNATION CREEK (Alberni Mining Division, 92C/15W)

T. W. Chamberlin requested geological assistance for the multidisciplinary Carnation Creek Watershed Study, managed by Pacific Biological Station of the

Department of the Environment. The writer was a guest in the Study camp while making three forays into the watershed to estimate what work is needed. It was concluded that two weeks mapping should be done when the logging roads have been put in but before logging commences.

Carnation Creek flows west into Barkley Sound between Consinka Creek and the Sarita River. In the lower part of the valley the principal rock is grey to very dark grey, fine grained to dense, and is generally porphyritic. In places it appears to be very siliceous. Minor lapilli tuff and ignimbrite are intercalated. The rock appears generally fresh, but locally contains abundant disseminated pyrite. Most outcrops show weak to moderate fracturing, and intense fracturing was seen in some creek channels.

The summit area of Mount Blenheim is underlain by quartz diorite, which contains tongues and inclusions of fine-grained grey rock on the north and northeast flanks. The quartz diorite is mostly fresh and hard, but locally it is sheared and raveling. Quartz diorite is again exposed, with diorite and gabbro, on the southwest ridge 2,500 feet from the summit; these rocks are locally sheared and crumbly. The fine-grained grey rock is exposed in a saddle farther southwest, where it is crumbly and extensively veined. Argillite was found still farther southwest, on the south-facing slope; it may or may not extend into the watershed.

A flow-measuring weir has been installed at 500 feet elevation on Carnation Creek. The access road enters the watershed from the north and descends the valley of a small tributary. At the weir the rock is medium grey to greenish grey and dense, with close, blocky fracturing. Two zones of intense shearing strike southwest and west-northwest and intersect immediately south of the weir. Just above the weir and closest to the creek the rock is harder but is cut by epidote veins and hematite slips. Road cuts along the access road show considerable shearing and alteration. Where relatively fresh, the rock is grey to black and mostly dense, though locally granular or porphyritic. Diorite was identified in one exposure. The grey rock is altered to epidote and replaced by silica, and locally is closely veined by carbonate.

It seems likely that many of the creeks follow zones of shearing or close fracturing, which could contribute considerable debris if exposed to accelerated erosion. The grey rock has been mapped as Bonanza by the Geological Survey of Canada. The apparent scarcity of fragmental layers is surprising, but no better lithologic correlation can be made with any other unit.

#### 4. A CLAIMS (Alberni Mining Division, 92F/2W)

Two new showings were examined at the request of the owner, Lawrence Vezina. The claims cover a broad saddle between tributaries of Cous and St. Andrew Creeks, and extend across a contact between Quatsino limestone on the southwest and Karmutsen amygdaloidal lava on the northeast. The limestone is intruded by small, irregular bodies of andesite, of which at least two have been altered to garnet-epidote skarn. In the north showing, chalcopyrite, less bornite, and superficial malachite and azurite occur in both skarn and limestone near their

mutual contact, whereas in the south showing the same copper minerals are confined to the altered andesite. The mineralization is irregular and pockety; while *specimens of very good grade may be obtained, any practical volume outlined must include much barren rock. The potential tonnage appears small.*

*Several rusty patches were found in the amygdaloidal lava north of the north showing. A broken surface disclosed thickly disseminated pyrite with some chalcopyrite.*

5. CENTENNIAL (Alberni Mining Division, 92F/6E)

The Centennial and No. 5 showings were examined at the request of the owner, Frank Murphy. Briefly, the showings occur in Karmutsen lava respectively on the northwest and northeast slopes of Little Thunder Mountain, north of Great Central Lake. The Centennial is a small body of rock which has been abundantly mineralized with chalcopyrite and pyrrhotite. The No. 5 showing comprises *sparsely disseminated chalcopyrite and a trace of bornite in a narrow calcite vein, a narrow felsic dyke, and adjacent lava.*

6. HERB (Alberni Mining Division, 92F/6E)

Mineralized argillite had been reported to occur in rocks mapped as Karmutsen by the Geological Survey of Canada, and this was investigated when the Centennial and A were examined. Much time was spent hunting for the exposures, due to inaccuracies in available maps, and when they were finally found, only a brief examination could be made. Petrographic study of some of the specimens is needed.

*The exposures are on the north side of Sproat Lake, about 100 feet above the new highway, 1.0 mile from the head of Taylor Arm, on the southeast rim of a creek canyon. Natural outcrops have been augmented by trenching, but exposure is discontinuous. There are at least three exposures of black and dark grey argillite resting on an unidentified light grey rock, which in turn rests on amygdaloidal lava typical of the Karmutsen Formation. The top of the argillite was not seen, and the interrelationships of the argillite exposures were not determined. Pockets and disseminations of chalcopyrite occur in the argillite, but the mineral potential is limited by the apparent small size of the argillite occurrences.*

Drilling was in progress on another part of the property at the beginning of May. The target evidently was the weak chalcopyrite disseminations reported in *Geology, Exploration, and Mining in British Columbia, 1971*, page 247. The operation was not visited, and results are not known.

## 7. FS (Nanaimo Mining Division, 92K/3W)

Assessment Reports 4179 and 4823 had described sparse copper mineralization immediately below a flat-lying amygdaloidal flow in the Karmutsen Formation. A ribbon of limestone at the base of the flow was interpreted as a channel filling. This suggested to the writer some interruption in volcanism, which might be significant for mineralization. The flow was identified, but time did not permit tracing it around to the reported limestone and mineralization.

The flow is exposed at 900 feet elevation on a bluffy hillside half a mile west of Brown Bay. It may be reached via the Adams Resort road and logging skid road which leaves it one-third mile past the second lake. Most of the Karmutsen Formation on this hillside is variably porphyritic and amygdaloidal with white phenocrysts and amygdules. The flow of interest is distinguished by hard black amygdules which weather in relief, and could be a useful marker in mapping. In thin section the rock is andesite and the amygdules were estimated to have the following composition: quartz, 25 per cent; pumpellyite, 35 per cent; serpentine, 40 per cent. The base of the flow was not identified; the black amygdules thin out downward and the rock grades to massive andesite over an interval of 6 feet. No sulphides nor malachite were found in the rock or in quartz-epidote veins.

## 8. ISLAND COPPER TO KEOGH RIVER (92L/11W)

In order to gain more familiarity with the Bonanza Subgroup the writer called at the Island Copper mine and toured sections of the open pit. Discussions with mine geologists indicated that it would be helpful to have the Parson Bay-Bonanza contact more precisely defined and located. Several new exposures were found between the head of Rupert Arm and the logging-road bridge over the Keogh River, and several quarries were examined in the belt north of the mine.

The best exposure of the contact is in a quarry at the east end of a hill tentatively named Washlawlis Hill. This hill rises to an elevation of over 500 feet from a small plateau between Washlawlis Creek and the north fork of Waukwaas Creek, and is 2.2 miles east of Rupert Arm. In the quarry the beds dip gently to moderately south. Considerable faulting is evident, but displacement ranges from a few inches to a few feet, and the main units can readily be traced through the quarry. Typical slates of the Parson Bay Formation grade up to soft argillaceous siltstones, which are abruptly succeeded by about 15 feet of greenish grey volcanic conglomerate and coarse sandstone containing black granules in the upper part. This is overlain by about 10 feet of distinctive banded, dense siliceous beds, and then more than 15 feet of massive green rock which appears to be a volcanic flow. The banded unit was identified in two quarries north of Island Copper mine and appears to be a useful marker. The formational contact for this belt is placed at the base of the volcanic sandstone and conglomerate, for two reasons: this unit consists of grains and pebbles of volcanic origin and is clear evidence of the onset of Bonanza volcanism nearby; and the banded beds are very different from the Parson Bay and do not merely represent a resumption of Parson Bay sedimentation.

The contact extends almost due east to the Keogh River, just south of the highway, where it is bracketed by outcrops of typical Parson Bay slate and Bonanza tuff 140 feet apart. It was not traced through in the opposite direction, but its position in the quarries north of the mine indicates an east-southeast strike. There is increased displacement on faults in these quarries, accompanied by local folding, and a felsic sill intrudes the rocks in two adjacent quarries.

A mafic dyke containing spectacularly large hornblende phenocrysts transects the Quatsino-Parson Bay contact at an oblique angle northeast of the last-mentioned quarries. It is a fresh-looking rock, contrasting with the variably altered andesite which commonly intrudes the Quatsino limestone, and may be relatively young.

9. QUATSE LAKE AREA (Nanaimo Mining Division, 92L/12E)

As shown on Figure 29 in *Geology, Exploration, and Mining in British Columbia, 1970*, a belt of Quatsino limestone extends from Washlawlis Creek to the area north of Quatse Lake, where it is disrupted by faulting and at least two ages of intrusion. This disturbed area contains a number of mineral showings, which are covered by claims belonging to North Island Mines Ltd. The showings include the old *Caledonia copper - silver - lead - zinc mineralization in skarn, and recently discovered copper mineralization associated with faults and fractures in andesite in the east part of the property.* Detailed mapping in and over the Caledonia adit disclosed that the Quatsino limestone has been massively invaded by andesite and only scattered inclusions remain. The andesite has in turn been intruded on the southwest by a sheared granitic rock, which has been reddened along fractures and red aplite dykelets. There are scattered exposures of andesite and limestone along the tractor road up to the ridge crest, where altered diorite is exposed; none of the andesite could be positively identified as Karmutsen. On the east part of the property, however, many andesite outcrops are amygdaloidal and can be assumed to be Karmutsen lava. One repetition of section by strike faulting was deduced, and additional faults are probable. Systematic mapping is required.

10. HUSHAMU MOUNTAIN (Nanaimo Mining Division, 92L/12W)

A visit was made to Utah Mines Ltd.'s diamond-drill camp southwest of the rugged, gossaned peak at the head of Hushamu Creek which it is proposed to call Hushamu Mountain. This peak has been carved from the siliceous, pyritic rocks of a Bonanza volcanic centre. The geology is described in Assessment Report 3400, where it is recorded that the main silicified zone is essentially barren of copper; some chalcopyrite was found along the northeast margin, coincident with magnetic highs and rock geochemistry spot highs. This marginal zone underlies a heavily timbered valley occupied by Hushamu Lake and a tributary of Hepler Creek. The 1974 drilling was directed to testing and evaluating this zone; 5,100 feet in eight holes had been drilled by July 25.

The rocks cored were mainly chloritized lapilli tuff, pyritic silicified rock, and large masses of quartz-feldspar porphyry. Andesite was encountered on the north side of the valley. Pyrophyllite was sporadic, except near Hushamu Lake where it forms a breccia.