SOUTHWEST BRITISH COLUMBIA

SICKER PROJECT
(92B/13; 92C/16E)

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INTRODUCTION

The Sicker Group was named and mapped in the Duncan area by Clapp and Cooke (1917) in the early years of this century. In the Cowichan Lake area to the west Fyles (1955) demonstrated that the group is capped by Permian limestone. With this limestone as an intermittent marker the Sicker Group could be correlated with rocks in other areas, notably the Buttle Lake area where certain members are hosts to the orebodies of Western Mines Limited which are localized along faults. On Big Sicker Mountain, north of Duncan, the Lenora-Tyee orebodies occur along a shear zone that appears to be the axis of a schist belt, along which exploration was concentrated for some years.

An alternative hypothesis would have the orebodies remobilized from primary deposits, possibly of Kuroko type. Fyles' (1955) observation that the Sicker Group underwent facies changes across strike in the northeast corner of the Cowichan Lake area gives this hypothesis some credence, and a restudy of the Sicker Group was initiated involving some road reconnaissance and systematic mapping of two areas.

Clapp and Cooke (1917) showed that eastward from the Cowichan Lake area the belt of Sicker rocks is split into three by tongues of Nanaimo Group sedimentary rocks and that the two southerly belts are partly covered by these sedimentary rocks, reappearing on Mount Tzuhalem and Stoney Hill south of Crofton. No significant mineralization has been reported from the southerly belts, and only minor volcanic rocks are shown. The northerly belt appeared to have more potential, in spite of extensive intrusion by quartz feldspar porphyry and gabbro, which break up the section and obliterate parts of it. Another problem is the intense shearing within the schist belt, which has obliterated bedding and rendered other primary features difficult to recognize. Preliminary examination of rocks along the Osborn Bay Road south of Crofton and along the Lenora-Tyee access road showed that they were mostly intensely sheared. Since Fyles (1955) does not mention widespread shearing in the Cowichan Lake area it seemed likely that its intensity diminished to the west.

WEST CHIPMAN VALLEY

Fyles (1955) shows amygdaloidal lava in the core of an anticline on the north side of the west fork of Chipman Creek. It was hoped that this structure would provide the starting point for working out the detailed stratigraphy and demonstrating at least the trend of facies changes, but the results of 10 days of mapping were disappointing.

Natural exposures are rather scarce in the West Chipman Valley, and do not give a good indication of the nature of the rocks. Artificial exposures along logging roads built in recent years show that the anticlinal axis coincides approximately with the axis of the schist belt. The core rocks are chlorite and locally sericite schists. To the north they are interbanded over a short distance with black schist, which grades outward to strongly cleaved but recognizable argillite. Northward the rocks consist of interbanded and intergrading chert, argillite, siltite, and fine-grained quartzite or greywacke, and several generally thin bands of greenstone. Clearly defined bedding was found about 1 200 metres north of the axis of the schist belt, but appeared to be dragged into parallelism with the cleavage a few metres to the south. Weakly graded bedding indicated that the north-dipping beds were right-side-up. The south side of the schist belt is less well exposed, and relations are further obscured by intrusions of porphyry, gabbro, and quartz diorite, and by some overlying Nanaimo Group conglomerate. The few exposures of less-sheared Sicker rocks are mostly greenstone, suggesting that there may have been a southward increase of volcanic material. The crest of the ridge overlooking the Chemainus River is definitely south of the schist belt and massive black argillite is exposed.

STRATFORD–WESTHOLME AREA

At the Island Highway the schist belt is restricted to the northern third of the Sicker belt. Fairly massive Sicker volcanic rocks of the central part are well exposed in fresh road cuts and in outcrops along the adjacent transmission line. Mostly they are characterized by somewhat rounded medium grains of feldspar and by coarse plates of partly rounded crystals of hornblende or by epidote-rich bodies ranging from one to several centimetres in diameter. The coarse-grained hornblende and the epidote-rich bodies tend to be mutually exclusive. In places bands marked by coarse-grained hornblende, of the order of 15 centimetres wide, alternate sharply with thinner or thicker bands marked by medium-grained hornblende, or by epidote-rich bodies, or by neither. These bands would appear to be tuff beds, and hence most of the sequence would appear to be made up of tuff or volcanic breccia. Cooke (1917) interpreted the epidote nodules as flow-top breccia fragments, but their wide distribution in the central part of the belt and their variable concentration would indicate that they were erupted as fragments. Most of the identifiable tuff beds lie close to vertical, and no tops could be determined. Intercalated in the tuff sequence are 1 to 3-metre-thick bands of schistose fine-grained mafic rock of uncertain origin. They appear too thin to be flows, too schistose to be offshoots of the gabbro, and too mafic to be fine-grained phases of the tuff.

To the west, these tuffs have been traced to the base of the bluff on Little Sicker Mountain, and to the east, over the hill northwest of Mount Richards and thence southeast along Richards Trail past Jackson Valley Road. On the hill northwest of Mount Richards, a band marked by coarse-grained hornblende, 5 metres wide, was traced through almost continuous outcrop for 350 metres, to a point where the hornblendes had decreased in size and abundance and the band was distinguishable no farther. The strike is 290 degrees and the dip is essentially vertical.

The tuffs contain many bodies of quartz porphyry and quartz feldspar porphyry. West of the Island Highway they have the form of fairly persistent dykes, generally 12 metres or less in width. Eastward they are less persistent, and west of Mount Richards the bodies are irregular and unconnected. Possibly these are

boudins, but the enclosing tuffs do not show flowage around them. Southwest of Jackson Valley Road there are one or more large inclusions of porphyry in gabbro. Though variable in character, the porphyry is commonly highly siliceous, consisting of round quartz eyes in a dense, chert-like groundmass.

The Sicker belt is traversed by at least five large dykes of gabbro. In the central and southern parts it is massive and medium to coarse grained. The largest dyke forms the south boundary of the belt between the south slope of Little Sicker Mountain and Richards Trail, but just to the east of the trail a little tuff is exposed south of the dyke. Farther southeast along the trail there is an outcrop of chert-like rock of uncertain origin. A gabbro and a porphyry dyke passing under the north end of Eves Park effectively form the north boundary of the tuffs and the south boundary of the schist belt.

The schist belt is not well exposed east of the Island Highway; most outcrops are sheared gabbro and a sheared country rock which may be of sedimentary origin. Most of the country rock is dense and chert-like. Quartz eyes are present in a few places, indicating the presence of porphyry dykes. On the transmission line to Crofton, near the third crossing of Nimmo Road, bands of cleaved black argillite occur in sericite-quartz schist. At the most northerly exposure along the Island Highway a grey schist is probably sheared argillite. If the siliceous rocks are largely sheared cherts the tuffs are flanked by sediments and the overall structure is probably anticlinal.

REFERENCES

Clapp, C. H. (1917): Sooke and Duncan Map-Area, Vancouver Island, British Columbia, with Sections on the Sicker Series and the Gabbros of East Sooke and Rocky Point by H. C. Cooke, *Geol. Surv., Canada,* Mem. 96, pp. 125-172, Map 42A.

Fyles, James T. (1955): Geology of the Cowichan Lake Area, Vancouver Island, *B.C. Ministry of Mines & Pet. Res.,* Bull. 37, pp. 13-18, 25, 26, Fig. 2.