CHAPTER IV

ECONOMIC GEOLOGY

Horton-Windsor Contact

In this map area the Horton-Windsor contact is of interest because economic base metal mineralization has been found at other locations in Nova Scotia. This contact occurs as a northeasterly trending zone for a length of nine miles from Port Hastings to the extreme north limits of the map (See Map 2). Folding and indications of associated faulting within this zone give some expectancy of metallic mineralization.

Near the Horton-Windsor contact at Port Hastings, varying amounts of disseminated galena and sphalerite were noted in Horton pebble-conglomerate. One sample from a mineralized sheared zone in this conglomerate outcropping on the Strait of Canso gave a combined copper-lead-zinc assay of 0.84 per cent. About one mile northwest of Mackdale a small amount of disseminated galena was found in the basal Windsor limestone. If the structure along the Horton-Windsor contact at Port Hastings is related and continuous with that of the Mackdale area, it would appear that a considerable area of ground northeast of Port Hastings may be a host for base metals.

METALLIC MINERAL OCCURRENCES

Copper

Occurrences of pyrite and chalcopyrite have been found in the Riversdale sandstone at several locations in the map area but do not appear to have any economic significance. These occurrences are limited to localized replacement of fragments of coalized plant remains. Copper mineralization in the form of chalcopyrite has been found associated with basic dikes at Port Hastings.

Iron

Small pockets of clay and fault gouge containing disseminated specularite were found at several locations throughout the map area. These occurrences coincide with the placement of major faults that cut the Windsor strata. These occurrences of iron are considered to be of no economic importance.

NONMETALLIC DEPOSITS

Gypsum

Gypsum occurs at Port Hastings, Askilton, north of Sugar Camp, southwest of Beaver Dam Lake, northeast of Port Richmond, and on Evans, Freeman, Bumbo, and Round Islands in the Inhabitants Bay. Only the occurrences in the Sugar Camp area are considered to be of possible economic importance.

Near Port Hastings the gypsum occurrence is estimated to be less than one hundred feet thick and considerable quantities of impurities are evident. A small amount of this gypsum is reported to have been exported during the last century. Analysis of two samples from this deposit are given in Table II.

The gypsum deposit in the Sugar Camp area is larger than the Port Hastings occurrence and exploration efforts to assess this deposit have recently been carried out by private interests. Some diamond drilling has been done on this property but the extent and findings of the exploratory work is not immediately known.

Most of the other gypsum occurrences in the map area are small, poorly exposed, and are considered to be uneconomical at present.

Limestone

No limestone deposits of commercial quality and quantity are know at present to exist in the map area. Practically all the known limestone beds in the area are thin and dip too steeply to permit satisfactory and economical quarrying operations, although several small quarries have been operated in the past to produce agricultural lime. For this purpose the rock was quarried from basal Windsor limestone beds, crushed, and burned in crude kilns. The lime thus produced was applied to fields cultivated in the area. Present-day requirements for agricultural limestone are far above those that could be supplied from the basal Windsor limestone beds in this area (See Table 1, samples 124 and 1).

A limestone horizon suitable for quarrying may exist approximately one mile northeast of Port Richmond. The limestone here is of sufficient quality (See Table 1, sample 2), but the exposure is poor and no estimates of

thickness or attitude of the bed could be obtained from surface examination.

Fluorite

Some thin white calcite veinlets cutting the basal Windsor limestone contain small amounts of purple fluorite. Such veinlets were noted in the anticlinal structure near the Port Hastings Railway Station. The fluorite occurs as granules up to one-quarter inch in diameter but is considered to be of no economic importance.

Coal

The Riversdale group is characterized by the occasional occurrence of coal seams but none were found in the area. Three mines which once produced coal, the Richmond Mine, Sea Coal Bay Mine, and Whiteside Mine, were visited but none of the seams were observed at surface as the old workings are caved in and filled with water. Mining at these sites was carried out principally in the years 1863 to 1868. The seams ranged from a few inches to four feet in thickness and the quality of the coal was variable. Near-vertical dips, poor-quality coal, and the pinch and swell nature of the structures which increased the cost of production, were the apparent causes of pit closures. In 1928 the Tidewater Fuel and Navigation Company carried out some development work on the Whiteside Mine and produced approximately nine hundred tons of coal. This output apparently depleted the workable tonnage of available coal as the mine was closed permanently after this operation.

AEROMAGNETIC SURVEY

No magnetic anomalies were recorded on aeromagnetic survey sheets which cover the map area. Aeromagnetic maps of this area are available at the Nova Scotia Department of Mines.

GEOCHEMICAL SURVEY

During a part of the 1960 and 1961 field seasons reconnaissance geochemical work was performed in the map area with emphasis on those sections underlain by the Horton-Windsor sediments and contact zone (see Map No. 4). The results of this survey have shown a number of anomalous metal concentrations which apparently co-

incide with fold structures found in these sediments and at the contact zone.

Southeast of Askilton along Black Brook, a geochemical anomaly, later found to be due chiefly to copper, was recorded. The entire area within this anomaly is pasture and hay land and it is probable that the copper concentration in the soil of this area is due to the presence of fertilizers. Several other samples that had high copper values were taken from pasture or hay lands.

Numerous anomalous values of zinc and lead were detected in traverses across the Horton-Windsor contact zone between Port Hastings and the MacMaster Road west of Glenora. High values were recorded in several locations between Mackdale and the Trans-Canada Highway along Northwest Arm Brook, on Sugar Camp Brook east and west of the road, on MacMaster Road, and in a stream between the northwest end of Plaster Cove and the Trans-Canada Highway. These anomalies are small in areal extent but seem to have a general northeast trend. It is interesting to note that the anomalies coincide fairly well with the theoretically placed fold axis in the Mackdale area (See Map No. 4).

This survey is not definite but it does show that there are significant amounts of base metals, particularly zinc and lead, in the soils of various areas along the Horton-Windsor contact zone in this part of Cape Breton Island. No attempt was made to map the areal extent or limits of these apparent anomalies. While coincidence with fold axis seems evident, most of the geochemical traverses were perpendicular to the trend of the structures so that the cause of this apparent lineation cannot be confirmed definitely. A more detailed survey would be necessary to evaluate the true size and economic implications of these results.

BUILDING STONE

Several sandstone horizons, particularly some of the Upper Riversdale members, are considered to possess building-stone qualities. West of River Inhabitants, however, the dip of the beds generally exceeds fifty degrees from the horizontal and prohibits economic quarrying operations.

One area of particular interest is the central basin-like structure southeast of Cleveland. The rock here is gen-

erally grey, thick bedded to flaggy Riversdale sandstone with a few beds of reddish-brown silty sandstone. The beds dip less than ten degrees and contain a set of vertical joints which are very nearly perpendicular to each other. The area is cut by Mill Brook on which a long section of rock is exposed. The Canadian National Railways branch line and Highway No. 4 pass within two and one miles respectively from this area, and the Basin Road, which runs from Highway No. 4 to the Canadian National Railway line, passes directly through the area. This appears to be the only locality within the map area that merits any serious attention as a source of building stone.