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CANADA

DEPARTMENT OF MINES AND RESOURCES

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GEOLOGICAL SURVEY OF CANADA

PAPER 48-11

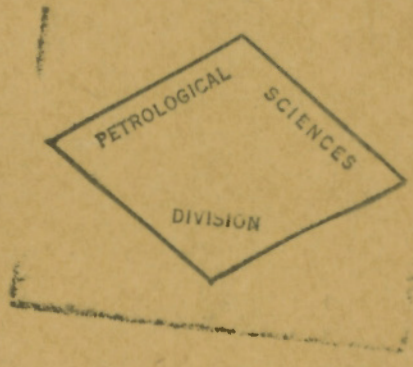
MARGAREE AND CHETICAMP MAP-AREAS,

NOVA SCOTIA

(REPORT AND TWO MAPS)

BY

H. L. CAMERON



OTTAWA

1948

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MARGAREE AND CHETICAMP MAP-AREAS, NOVA SCOTIA

(Summary Account)

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Illustrations

Margaree and Cheticamp Map-Areas, Nova Scotia

INTRODUCTION

LOCATION AND AREA

The adjoining Margaree and Cheticamp map-areas lie on the west coast of Cape Breton Island between 46°15' and 46°45' north latitude, and 61°00' and 61°15' west longitude. The combined land area is triangular in shape, with the coast line as hypotenuse, and has a maximum width of 13.8 miles, a length of 27.25 miles, and an area of about 190 square miles. The nearest railway station is Inverness, $3\frac{1}{2}$ miles south of the southwest corner of Margaree map-area, whereas Cheticamp harbour, which can accommodate ocean going vessels, is at the northeast corner of the Cheticamp area.

POPULATION AND INDUSTRIES

The area is thinly populated, and settlements are confined to the coast and larger valleys. Cheticamp, the largest village, has a population of 2,726. Many abandoned farms in the district would appear to indicate that the rural population is decreasing.

The chief industries are fishing and farming, and the tourist trade is becoming of some importance seasonally. Fishing is done from numerous coves and beaches along the coast, and processing plants for both fresh and dried fish have been built at Margaree Harbour, Grand Etang, and Cheticamp. Many of the fishermen are also farmers in a small way. The best farming areas are confined to the valleys of Margaree River and its two principal branches, and are underlain by soft rocks of Windsor age.

Coal is mined at St. Rose and supplies most of the local market, but production is small and only a few men are employed. Gypsum was formerly quarried east of Cheticamp, but operations have been suspended for some years.

TOPOGRAPHY

The area mapped borders on, and merges with, the northern highland of Cape Breton, which reaches a height of 1,500 feet above sea-level. The nature of the underlying rocks is indicated by the topography, which is essentially the result of a second cycle of erosion on an uplifted peneplain. The old erosion surface is represented by the flat-topped hills and uplands along the northeastern side of the area, which are underlain by rocks of pre-Carboniferous age. The uplands of the central and western sections are lower and are underlain by rocks of Lower Pennsylvanian and Lower Mississippian age. Basal Horton rocks appear to have been nearly as resistant to erosion as those of the harder pre-Carboniferous complex, and where Horton strata overlie members of the complex, the hills rise gradually without a distinct escarpment. The lowlands, which consist of the major river valleys and a coastal strip in the north, are developed almost entirely on softer rocks of Upper Mississippian age. These areas usually have a gently rolling surface, and in many places karst topography is developed in limestone and gypsum beds.

Areas underlain by Riversdale rocks show distinct ridges of massive sandstone, with intervening valleys or swales underlain by less resistant shales. The structure in such areas may be interpreted from these features.

Faulting is responsible for many typical physiographic forms, such as wind gaps, water gaps, displaced ridges, and escarpments.

DRAINAGE

The main drainage system of the area is Margaree River with its tributary brooks. The larger streams are developed on the softer rocks of the Windsor and Canso groups, and thus are consequent streams. Most of the smaller brooks have short, youthful valleys that notch the upland escarpments.

PREVIOUS WORK

The geology of the area was first studied by Hugh Fletcher in the years 1880 to 1882. He summarized his findings in the Geological Survey Report of Progress for 1882-83-84 and by geological maps Nos. 6, 9, 11, 13, and 14, of the serial map-sheets of Nova Scotia.

The Eastern Gulf Oil Company carried out a geological reconnaissance in Margaree area in 1926, and in 1927 drilled five holes near Margaree Harbour and Belle Cote, to determine structure. The holes on the west side of Margaree River were of great assistance in the present work as they were all drilled in drift-covered areas, and thus supplied information otherwise unobtainable (19)[1].

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[1] Numbers in parenthesis are those of bibliographic references at end of report

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In 1943 Dr. W.A. Bell (5) of the Geological Survey of Canada mapped the coast line from Broad Cove to north of Margaree Beach and made a special study of the Chimney Corner and St. Rose coal seams. He correlated the two groups of coal seams and definitely established the stratigraphic succession by fossil content. Bell also visited other parts of the area and remarked on the occurrence of Canso strata in the Friar Point area (6).

A structural examination of Windsor strata in part of the area was made in 1942 by Dr. D.J. MacNeil, for the Lion Oil Company.

RECENT FIELD WORK

The entire field season of 1946 and part of that of 1947 were spent by the writer in a geological survey of the Margaree and Cheticamp map-areas. Pace and compass traverses were made of all important streams and truck traverses of all passable roads. In many parts of the area vertical aerial photographs were used directly in the field to locate various features. The study of these photographs, using a Ryker magnifying stereoscope, helped to solve structural problems and to obtain much detail that would otherwise have been missed. Many features of superficial geology, such as gravel accumulations and benches, were first detected by such methods and later were checked on the ground.

During the field season of 1947 a geophysical field party of the Nova Scotia Department of Mines carried out magnetometer surveys near the old copper prospect southeast of the village of Plateau.

ACKNOWLEDGMENTS

Messrs. J.W. Coveney and W.J. Glover rendered careful and conscientious assistance during the 1946 field season, and Messrs. W. Bardswitch and L.M. Cummings in 1947.

GENERAL GEOLOGY

GENERAL STATEMENT

The consolidated rocks of the district are separated by a large erosional unconformity into two major systems, which may be termed Carboniferous and pre-Carboniferous. Rocks of the latter system underlie the eastern part of the area from Farm Brook south to Marsh Brook, and occur also in the southeast corner. They comprise volcanic and sedimentary rocks that have been intruded by dykes and masses of granite. The definite age of these rocks is as yet unknown, but they may be equivalent to the volcanic and sedimentary rocks of southeastern Cape Breton, which are Cambrian or older(24).

Strata of the Horton group of Lower Mississippian age, overlie unconformably the pre-Carboniferous rocks and may be subdivided into a lower division of predominantly coarse clastic rocks and an upper division of mainly fine-grained strata, all of terrestrial origin. Rocks of the lower division have been intruded by basic dykes.

Overlying the Horton strata are those of the Windsor group of Upper Mississippian age. They comprise grey and red sandstones, limestones, grey shales, gypsum and anhydrite. These rocks are of marine origin. Where observed, however, the Horton-Windsor contact was not structurally discordant, thus indicating that the encroachment of the Windsor sea was not preceded by significant folding. The basal Windsor member is a laminated limestone, which is readily recognizable and forms an excellent horizon marker. Windsor strata in general occupy lowland belts of varying width between the underlying Horton strata and the overlying Riversdale beds, both of which are structurally more competent than are rocks of the Windsor group.

The Canso group comprises red and green shales, red and grey sandstones, and a few thin limestone beds. The group as a whole has been referred to the Upper Mississippian by Bell, but he states that it may be in part Pennsylvanian(6).

Rocks of the Riversdale group form two disconnected basins along the coast from Broad Cove to Margaree Harbour, and occur on the coast from Margaree Beach to Friar Point. Cheticamp Island and the east shore of the harbour are also underlain by these rocks. The group comprises massive grey sandstones interbedded with dark grey and red shales, all of which are considered to be terrestrial, shallow water deposits. Near the top of the group is a zone containing five coal seams four of which are 3 feet or more thick. Two of these are considered to be of economic importance, and one is now being mined at St. Rose.

In the extreme southwest corner of the area, rocks of the Pictou group (Inverness formation), are in faulted contact with Windsor strata. They comprise grey sandstones, grey and red shale, and coal. The grey sandstones and shales of Margaree Island are also correlated with the Inverness formation. The latter is overlain conformably by the Broad Cove formation of brick red shales, red sandstones, and conglomerate.

The unconsolidated rocks of the region comprise glacial gravels and clays, with some recent stream gravels. Most of the area is mantled with these deposits, rock outcrops being confined mainly to stream beds and the sea coast.

TABLE OF FORMATIONS

ERA	PERIOD OR EPOCH	FORMATION AND THICKNESS	LITHOLOGY
Cenozoic	Pleistocene and Recent		Alluvium, recent gravels, stratified gravels and sands, boulder clay
		Great unconformity	
Palaeozoic	Upper Pennsylvanian or (?) Permian	Broad Cove formation	Red shale, red sandstone, conglomerate
		Disconformity (?)	
	Upper Pennsylvanian	Pictou group (Inverness formation)	Grey sandstone, grey shale, red shale, coal
		Unconformity	
	Lower Pennsylvanian	Riversdale group (Port Hood formation) 6,500'	Grey sandstone, grey shale, red shale, coal
		Disconformity (?)	
	Upper Mississippian	Canso group (Mabou formation) 2,700'	Grey sandstone, grey shale, red shale, red sandstone, thin limestones
		Disconformity	
	Upper Mississippian	Windsor group 2,500	Red and grey shale, gypsum and anhydrite, thin sandstones, limestone, dolomite
		Disconformity	
	Lower Mississippian	Horton group 5,000	Grey sandstone, grey shale, red shale, pebble conglomerate and arkose. Basic dykes
		Unconformity	
Palaeozoic (?)	Pre-Carboniferous	Granitic intrusions; small to large masses	Granite, granodiorite(?) inclusions of quartzite
		Intrusive Contact	
		Volcanic and sedimentary group	Basic tuffs, acid tuffs, rhyolite flows, volcanic breccia; conglomerate, shale, and sandstone

PRE-CARBONIFEROUS

Volcanic and Sedimentary Rocks

A group of volcanic rocks, with a few interstratified sedimentary beds, underlies the Horton group along the eastern margin of the area mapped, and is in faulted contact with Windsor rocks in the southeast corner of Margaree map-area. It comprises acid and basic tuffs, volcanic breccia, rhyolite, and conglomerate, with a few sandstone and shale members.

The exact age of this group is as yet undetermined, but the rocks are probably the equivalent of those of the volcanic group in east Cape Breton, which Weeks has mapped as Cambrian or earlier(25).

Intrusive Rocks

Granite masses intrude the pre-Carboniferous volcanic rocks east of Big Brook and on Factory Brook. The granite carries small inclusions of quartzite that appears to be altered arkosic sandstone. The granite of Pine Brook is a fine- to medium-grained, grey to pinkish rocks. In thin section it is seen to be composed of quartz, orthoclase, microcline, oligoclase, biotite, and hornblende, with accessory magnetite and sphene. The plagioclase is partly altered to a colourless mica.

LOWER MISSISSIPPIAN

Horton Group

The Horton group derives its name from Horton Bluff on Avon River, northwest of Windsor, Nova Scotia. There it has been divided by Bell(3) into upper and lower formations. Norman(18) made a similar division in the Lake Ainslie district. On lithological grounds the Horton of the Margaree-Cheticamp area may best be described as comprising a basal facies of coarse clastic rock types, and a finer facies of shale and sandstone.

The age relationships of these facies are in doubt. They may be wholly or in part synchronous or may represent two distinct periods characterized by different conditions of accumulation. Lateral variations appear to indicate a close relationship between source of materials and rock types. Identification of this group with the Horton of Lake Ainslie, and elsewhere, is based on its position immediately beneath the Windsor and the lithological similarity of its rocks to those of Horton age in the Lake Ainslie district.

Horton strata underlie approximately a third of the Margaree-Cheticamp area. Because of their greater resistance to erosion, they form ridges and uplands that stand prominently above the lowland areas of Windsor and Canso rocks. The strata range from coarse arkose and pebble conglomerate to grey banded shale and reddish sandstones. The arkose is massive, and in places resembles granite. Rocks of this type are well exposed on Marsh and Gallant Brooks and their tributaries. Near Marsh Brook the lower arkose beds are cut by a few diabase dykes.

The finer grained strata are well exposed in the southern parts of the area, where they comprise massive reddish sandstones, grey sandstones, and grey ribboned shale. The grey shales are best exposed in the west tributaries of Big Brook and in the first west tributary brook of the Northeast Margaree, above the fault gap.

The thickness of the Horton in this area is believed to be less than 5,000 feet.

UPPER MISSISSIPPIAN

Windsor Group

This group receives its name from the type locality at Windsor, Nova Scotia. Included in it are workable deposits of gypsum, and its distribution is thus of economic interest. Rocks of the group comprise red and grey shales, grey sandstone, limestone, dolomite, gypsum, and anhydrite. All are relatively soft rocks, and the lowlands of the area have been developed largely where they form the bedrock.

The Windsor strata are closely folded and much faulted. Thick beds of gypsum and soft shale afforded incompetent zones along which structural adjustments took place, and, as a result, the true thickness of the group is difficult to estimate.

The base of the Windsor is placed at the bottom of a readily recognizable laminated limestone 30 to 40 feet thick. This limestone is present wherever the Windsor overlies the Horton, and forms an excellent datum zone. A massive gypsum band occurs a short distance stratigraphically above the laminated limestone. Near the middle of the Windsor section is a readily recognizable, thin, buff weathering limestone. The youngest gypsum bed occurs near the top of the Windsor group, and rests on a grey dolomite member about 35 feet thick. The estimate made of the thickness of the Windsor in the area is based on scale measurement of a plotted structure-section.

Fossil shells were found in the dolomitic limestone and the buff limestone, but only those in the former were identifiable. They were determined to be Martinia sp. by W.A. Bell.

MISSISSIPPIAN AND(?) PENNSYLVANIAN

Canso Group (Mabou Formation)

Canso beds overlie Windsor strata in the valley of Southwest Margaree River and along the coast, where they form a band between the Windsor and the Riversdale. They are the equivalent of the Mabou formation of the adjoining Lake Ainslee map-area. Through faulting the Canso is missing from north of Mill Valley Brook to Friar Point, except in a small section north of Margaree Beach. From Friar Point to Cheticamp, Canso strata are well exposed along the coast, and appear again on the coast northeast of Cheticamp. A thickness of 2,700 feet was computed in the section north from Friar Head, but some repetition of beds is believed to have occured.

The lower beds of the Canso group comprise reddish brown shales, grey and red shales, thin sandstones, and a few thin limestones. The upper beds are grey and red sandstones and red shales. Bell has placed the upper and lower contacts on palaeontological evidence and lithological differences in the sandstones (5,6).

PENNSYLVANIAN

Riversdale Group (Port Hood Formation)

Riversdale strata, the equivalent of the Port Hood formation of the Lake Ainslee map-area, form two disconnected basins along the coast from Broad Cove to Margaree Harbour. A narrow band of these rocks extends along the coast from Margaree Beach to Friar Point,

where they are in faulted contact with Canso strata. Riversdale beds appear again at the south end of Cheticamp village, and extend along the east shore of the harbour to the headland. Cheticamp Island is also underlain by rocks of this group.

The group comprises massive grey sandstone, dark grey and red shales, and, toward the top, a coal-bearing member. These rocks are well exposed along the coast, and the rugged and picturesque shoreline is due largely to weathering of massive Riversdale sandstone. The latter contains abundant coarse plant debris, in many places altered to coal. Petrified logs (Cordioxylon) are particularly noticeable. A few coal seams occur in the lower sandstone beds, but none observed was more than 3 inches thick. The dark grey shale beds contain small Anthracomya (Anthraconauta) and Naiadites of the N. modiolaris group(5).

The coal-bearing member outcrops at Chimney Corner, where some 500 feet of grey shale and reddish shale and sandstone are exposed. Four seams 3 feet or more in thickness are known in this section, but only two are of possible commercial value. A little mining was done on these seams prior to 1873 and later, in 1919, but the total production was small. A series of seams believed to be the equivalent of those at Chimney Corner has been found at St. Rose. These seams do not outcrop but have been partly explored by drilling and trenching. Present mining operations are confined to No. 2 seam in the St. Rose section. The St. Rose and Chimney Corner sections are separated by a fault zone.

Pictou Group (Inverness Formation)

In the southwest corner of the Margaree map-area strata of the Inverness formation (Pictou group) are in faulted contact with Windsor rocks. Farther north grey sandstones and grey shales of this formation are exposed on the shore, and just south of the area, the included coal seams are mined at Inverness. It is probable that the Inverness seams are present at depth to the southwest of the fault, and extend northwest beneath the sea, for an unknown distance. The strata of Margaree (Sea Wolf) Island are also of Pictou age. They comprise grey sandstone and grey shale, with some red shale.

Broad Cove Formation

Overlying the Inverness beds with apparent conformity is the Broad Cove formation composed of red sandstone, red shale, and reddish conglomerate. It was named by Norman(18), who referred it doubtfully to the Pennsylvanian, though he stated that it might be Permian.

PLEISTOCENE AND RECENT

Throughout the area the bedrock is mantled by clay, sand, and gravel of Pleistocene age. These deposits vary in thickness up to at least 120 feet. In places, such as south of Margaree Harbour and west of Margaree Forks, the sands are finely bedded and are undoubtedly water lain.

In several places Recent stream gravels form deposits in the lower courses of the tributary brooks of the Margaree system. These are the result of the rapid headward erosion of these streams where they notch the escarpments.

The chief effect of the glacial deposits is to mantle the bedrock so that outcrops are confined almost entirely to stream valleys and the coast line. Some striae have been observed striking north, whereas others trend easterly.

STRUCTURAL GEOLOGY

FOLDING

The rocks of the area have been moderately folded, and the folds then subjected to compressive stresses that ruptured the more competent rocks and crumpled the softer strata. The relatively soft Windsor rocks lying between the harder Riversdale and Horton strata were crumpled and faulted. In some places this group appears to have acted as a lubricant over which moved the broken segments of Riversdale rocks, as shown by the narrowing of the Margaree Valley where a syncline of Riversdale rocks encroaches from the west.

The principal folded structures in the area are: (1) the Marsh Point basin, which extends from Broad Cove to Dunvegan, where it is cut off by a fault that follows its east margin south beyond the area; (2) the Margaree syncline, which extends from Dunvegan to Margaree Harbour. This structure has been extensively faulted, and movement along the faults has resulted in secondary closed synclines in the Mill Valley Brook section and at St. Rose; and (3) the two anticlinal domes of Horton rocks in the south, separated by a faulted syncline in the valley of the Southwest Margaree.

The valley of Captain Allan Brook and the west Coolavee glen are occupied by narrow synclines of Windsor, which are faulted on the west side.

FAULTING

The area has been extensively faulted. Although faulting no doubt occurred in pre-Carboniferous time, only post-Pennsylvanian faults have been recognized. Two large thrust faults are known, and others are believed to exist, though evidence is insufficient to prove their occurrence. Several local cross-faults offset the major faults, and minor faults have resulted from the crumpling of the soft Windsor and Canso strata. The following is a brief description of some of the principal faults shown on the maps, from southwest to northeast.

The Plaster fault lies in the extreme southwest corner of the Margaree map-area. Windsor rocks there have been thrust northwest over Pictou and Broad Cove strata. The overthrust relationship is shown at the Inverness mine workings, which extend east of the surface trace of the fault.

The Dunvegan fault is 2 miles east of, and in part parallel with, the Plaster fault. Its position is indicated by vertical strata and abrupt reversals of high dips along its course. The offsetting of the ridges at Dunvegan, and the shore road gap are further evidence of its position. It is inferred to extend north, as shown, to cut off the St. Rose fault. In the south the fault forms the contact between Windsor and Canso beds, whereas north of Dunvegan it cuts Riversdale strata. A branch of this fault extends northwest to the shore at Dunvegan Cove. A left-hand movement of this branch is indicated by the drag on the ends of the sandstone ridges west of the fault. The direction and extent of movement on the main fault are not known, but narrowing of the exposed width

of Windsor rocks is believed to be due to this fault.

The St. Rose fault is a quarter mile inland and parallel with the coast. Windsor and Canso strata are in contact along this fault with Riversdale rocks. The minimum movement, allowing for a west rise to the St. Rose syncline, is 7,300 feet. This fault changes direction just west of St. Rose and extends seaward, probably cutting off the group of faults that separate the St. Rose and Chimney Corner coal areas.

Between Chimney Corner and St. Rose is a group of faults (Nos. 1 to 5) of which the four most northerly are clearly shown on the coast by brecciated zones and, inland, by sudden reversals of dips, offset ridges, and local folds. One is a major structure that extends northeast to Margaree Harbour and beyond. The same fault, or a closely related one, forms the Windsor-Riversdale contact to Friar Point. From Margaree Beach northward Canso strata are missing, due to faulting, with the exception of a small fault block just north of Margaree Beach.

The Friar Point fault meets the coast just north of Friar Point. Here Canso strata are in faulted contact with Riversdale and Windsor rocks. The fault plane is exposed on the shore and dips 45 degrees northeast. A similar fault cuts only Canso strata from just south of the next point to the north to its junction with the Friar Point fault. Both faults curve east and north, and beyond their junction follow the Windsor-Canso contact northward to beyond Cheticamp. Three, well defined cross-faults offset this combined fault at Grand Etang, Factory Brook, and Farm Brook respectively.

The Coolavee fault is one of a series of northeast-trending, nearly parallel faults in the southeast quarter of Margaree map-area. It extends from Northeast Margaree River up Timmins Brook, and has been traced as far as Big Interval, beyond the map-area.

A complex east-west fault zone extends from just east of Margaree Forks to the valley of the Northeast Margaree. The river channel has been excavated along this zone to form the striking water gap in the Horton ridge.

In the extreme southeast corner of Margaree area, Windsor and pre-Carboniferous rocks are in contact along a fault that strikes northeast parallel with the Coolavee fault.

Local cross-faults occur in the synclinal valleys of the Southwest Margaree and Captain Allan Brook.

ECONOMIC GEOLOGY

COAL

Chimney Corner Area

Coal of economic importance occurs in measures about 500 feet thick near the top of the Riversdale group. At Chimney Corner four seams more than 3 feet thick have been mapped, and a fifth seam, not now exposed, evaluated(5). These have been numbered 1 to 5 on the map, and their equivalent seams at St. Rose numbered in the same order.

No. 4 seam of this area was worked prior to 1873, and up to that time approximately 10,000 tons had been produced. Fire destroyed the surface buildings in that year and operations were suspended. In 1919, No. 5 seam was opened by a slope known as the Chimney Corner mine. This operation lasted for 2 years, and production was less than 3,000 tons. In 1937 a test slope was opened on No. 5 seam

about 4,500 feet south from Chimney Corner Cove. No. 4 seam was also explored here by a pit, but both seams were found to be thin and dirty.

Bell estimates a reserve of 2,604,300 long tons for Nos. 2 and 5 seams, of which 50 per cent is submarine. The steep inclination of the seams, the impurity of the coal, and the presence of faults, are features unfavourable to mining in this district.

St. Rose Area

The seams in the St. Rose area occupy a synclinal basin formed by drag-folding along one of the group of faults that radiate from a point west of St. Rose Cove. This basin is limited in length and is cut off to the west by the fault that separates the coal beds from Windsor rocks on the shore. None of the five seams outcrops, but all have been identified in drill-holes, and the No. 2 seam has also been exposed in mining operations. This seam has been mined intermittently since 1916, and present operations are confined to it. A new mine consisting of a 65-foot vertical shaft with a slope from the bottom on the seam, was opened late in 1945, by Mr. Dean Evans of Chimney Corner. Four levels have been driven to the south and one to the north. The first south level connects with a vertical air shaft and is used as a manway. A total of eighteen men are employed underground and on surface, and 20 to 25 tons are hoisted daily. The coal is mostly sold locally, with a little going to the Magdalen Islands. Nos. 2 and 5 seams of the St. Rose section are estimated by Bell(5) to contain a reserve of 7,887,800 long tons.

The fault blocks between Chimney Corner and St. Rose may hold infaulted sections of these seams that do not outcrop. The following is evidence for the assumed direction of horizontal movements along the bounding faults, dealing with them in order from north to south:

Fault No. 1 lies just south of the test shafts on Nos. 4 and 5 seams south of Chimney Corner, and has, apparently, offset to the east the prominent ridge extending southward from that locality. The left-hand offset can be seen on the ground and in air photographs.

Fault No. 2 shows a drag to the southwest in Chimney Corner Brook and Mill Valley Brook, the syncline in the latter section being due to this drag. The high ridge offset by the No. 1 fault does not appear south of the No. 2 fault, and the nearest comparable high ground is east of the road.

Fault No. 3. A synclinal structure due to fault drag is present south of the fault half a mile east of the road.

Fault No. 4. The direction of movement along this fault is not defined, but strikes and dips obtained in the brook just west of the road, and in the brook 1 mile east of the road, indicate a left-hand movement.

Fault No. 5 is inferred from the position of the coal seams in the St. Rose basin relative to their assumed position south of Fault No. 4.

The blocks between these five faults may hold sections of the coal seams, but only the block between the Nos. 4 and 5 faults is considered to be of economic importance, the others being too broken and folded to afford an opportunity for economical mining.

The presence of the coal seams in the block between Nos. 4 and 5 faults, which appears to be unbroken and only moderately folded, could be tested by a single drill-hole near the shore road due east from St. Rose Cove.

The strata beneath No. 5 seam hold at least one seam 1.5 feet thick, and others may occur(5). Thin seams are found at Grey Point and near Margaree Harbour. At the latter place, the coal is about 3,900 feet stratigraphically below No. 5 seam.

PETROLEUM

No petroleum has been found in the Margaree or Cheticamp map-areas, but some attempts have been made by oil companies to find suitable structures in the Windsor and Horton groups. Five holes were drilled near Margaree Harbour in 1927 by the Eastern Gulf Oil Company, testing for structure(19). No encouragement is known to have been afforded by these holes, nor has the present investigation been able to supply any.

GYPSUM

Quarrying for gypsum was formerly carried on at Belle Marche, east of Cheticamp and just east of the map-area, but ceased during the war. At several places in the area, sulphate beds may be of economic interest, were it known that they were composed mainly of gypsum. The presence or absence of anhydrite in these beds may be determined satisfactorily by drilling.

COPPER

Copper minerals have been known in the northern part of the area for nearly a century. The most important occurrence is that some three-quarters mile southeast of the village of Plateau. Here a vertical shaft was sunk 106 feet, and an adit driven 379 feet into the hillside to the shaft. The sulphide minerals are chalcopyrite and pyrite, and occur in a gangue of coarsely crystalline calcite, which, in turn, occupies fissures in fine, red, arkosic sandstone believed to be of Horton age. A short distance northeast of these main workings, a short adit was driven on similar veins in dark green tuff. Thus it would appear that the mineralization is post-Horton in age.

On Faribault and Grandin Brooks, chalcopyrite, pyrite, and galena were observed at some old prospect workings. Chalcopyrite and pyrite have also been seen in calcite veins in granite some miles north of the area.

A brief geophysical survey of the Plateau prospect, using a Watts variometer, was carried out in 1947 by the Nova Scotia Department of Mines. The results were negative so far as determining the presence of any ore.

LIMESTONE

Limestone for agricultural purposes has been quarried at Grand Etang, east of St. Joseph du Moine Lake, at East Margaree, on Big Brook and its tributaries, and on the Southwest Margaree. In addition, marl deposits have been worked in several localities.

GRAVEL

Pleistocene gravels with interstratified sands occur throughout the area. They are especially abundant at Dunvegan, south of Margaree Forks, south of Margaree Harbour, and from Grand Etang to Pointe Crosse. Gravel pits have been opened at these places to provide road material.

BIBLIOGRAPHY

1. Bailey, Henry B.: The Relationship of Structure to Quality in the Gypsum Deposits of Northern Cape Breton; C.I.M. & M. Bull. 1935

2. Bell, W.A.: Joggins Carboniferous Section, Nova Scotia; Geol. Surv., Canada, Sum. Rept. (1913)

3. ____ Horton Windsor District, Nova Scotia; Geol. Surv., Canada, Mem. 155 (1929)

4. ____ The Pictou Coal Field, Nova Scotia; Geol. Surv., Canada, Mem. 225 (1940)

5. ____ The St. Rose-Chimney Corner Coal Field, Inverness County, Nova Scotia; Geol. Surv., Canada, Paper 43-14 (1943)

6. ____ Carboniferous Rocks and Fossil Floras of Northern Nova Scotia; Geol. Surv., Canada, Mem. 238 (1944)

7. ____ Use of some Fossil Floras in Canadian Stratigraphy; Trans. Roy. Soc., Canada (1944)

8. Fletcher, H.: Report on Explorations and Surveys in Cape Breton, Nova Scotia; Geol. Surv., Canada, Rept. of Progress, 1875-76 (1876)

9. ____ Report on the Geology of Northern Cape Breton; Geol. Surv., Canada, Ann. Rept. 1884, Part H, pp. 5-98 (1884)

10. Ferguson, S.A.: Strait of Canso Map-area, Inverness, Richmond, Guysborough, and Antigonish Counties, Nova Scotia; Geol. Surv., Canada, Paper 46-12

11. Gilpin, E.: The Geology of Cape Breton Island, Nova Scotia; Geol. Soc., London, Quart. Jour., Nov. 1886, pp. 515-526 (1886)

12. Grandin, B.M.: Notes on the Ore Deposits of South Cheticamp, Cape Breton Island, N.S.; N.S. Inst. Sci., April 1905 (1905)

13. Goldthwait, J.W.: Physiography of Nova Scotia; Geol. Surv., Canada, Mem. 140 (1924)

14. Gurnsey, T.D.: The Geology of North Mountain; Geol. Surv., Canada, Sum. Rept. 1927, Part C (1927)

15. Hyde, I.E.: The Stratigraphic Relationship of the Riversdale-Union and Windsor Rocks of Nova Scotia; Geol. Surv., Canada, Sum. Rept. 1913 (1913)

16. Hayes, O.A.: Geol. Surv., Canada, Sum. Rept. 1918 (1918)

17. Johnson, Douglas W.: The New England Acadian Shoreline, New York (1925)

18. Norman, G.W.H.: Lake Ainslie Map-area, Nova Scotia; Geol. Surv., Canada, Mem. 177 (1935)

19. N.S. Dept. of Mines; Ann. Rept; 1927, Part 1, pp. 170-173 Logs of Diamond Drill Holes in the Margaree Area (1928)

20. Poole, H.S.: A Submerged Tributary of the Great Pre-Glacial River of the Gulf of St. Lawrence: Trans. Roy. Soc., Canada, 1903 (1903)

21. Shepard, F.P.: Glacial Troughs of the Continental Shelves; Jour. Geol. Vol. XXXIX, No. 4, 1931 (1931)

22. Trask, P.D.: Preliminary Report on Geology and Oil Exploration in Cape Breton; Prov. of N.S., Dept. of Mines Ann. Rept. 1928, Part 1 (1928)

23. Williams, M.Y.: Arisaig-Antigonish District, Nova Scotia; Geol. Surv., Canada, Mem. 60 (1914)

24. Wickenden, R.T.D.: Glacial Deposits of Part of Northern Nova Scotia; Trans. Roy. Soc., Canada (1941)

25. Weeks, L.J.: Preliminary Map - Mira-Framboise, Cape Breton and Richmond Counties, Nova Scotia; Geol. Surv., Canada, Paper 47-17

26. Map 874A, Londonderry, Colchester and Hants Counties, Nova Scotia; Canada, Dept. of Mines and Resources, 1946. Map 867A, Bass River, Colchester and Hants Counties, Nova Scotia; Canada, Dept. of Mines and Resources, 1946; by L.J. Weeks, Geol. Surv., Canada.