Society of Economic Paleontologists and Mineralogists
(Eastern Section) Field Trip (1975): Introduction and Itinerary

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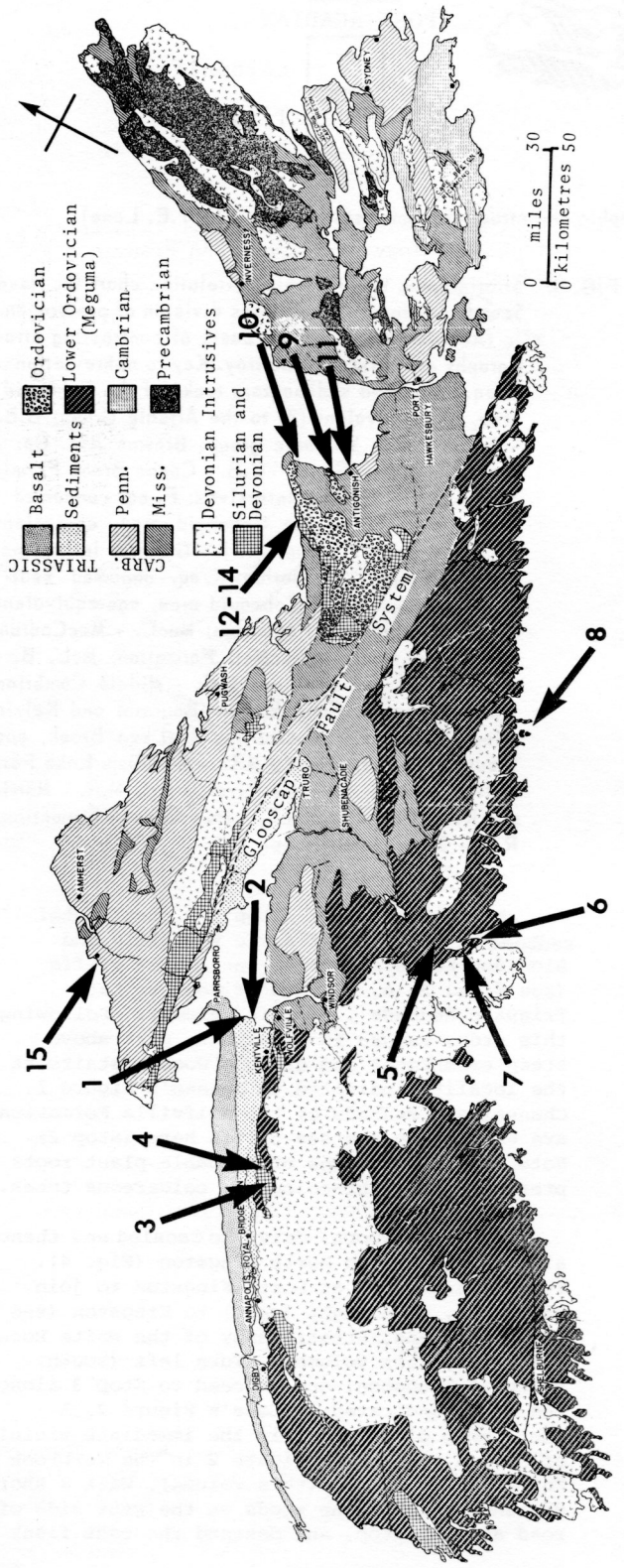

FIG. 1. Generalized geology of Nova Scotia and field stops.

INTRODUCTION

The Eastern Section S.E.P.M. Field Trip (June 11-15, 1975) is a 5-day excursion to examine the Paleozoic and Early Mesozoic sedimentary rocks of Nova Scotia (Fig. 1). The itinerary (see below) includes field stops at outcrops that represent a variety of marine and non-marine sedimentary facies. The principal objective of the field trip is to examine the sedimentary structures that characterize these strata.

The guidebook is a collection of papers published in three issues of MARITIME SEDIMENTS (Nos. 1, 2 and 3, Vol. 11, 1975). The papers were prepared both as a guide to the outcrops visited in the course of the field trip, and as a general source of information on the sedimentary rocks that underlie much of mainland Nova Scotia. Several of the papers present the results of recent work and new or revised interpretations.

An important theme is the influence of Paleozoic plate tectonics on sedimentation in the region. Climactic orogeny during Middle to Late Devonian times hypothetically was related to the crustal convergence of the southern and northern halves of Nova Scotia (the areas on either side of the Glooscap Fault System, Fig. 1), and the disappearance of Paleozoic seaways that once flanked the northern area. The pre-orogenic stratigraphy and structural history of the two parts of the province are sharply contrasted, whereas the post-orogenic rocks of the two areas are stratigraphically and structurally comparable (Figs. 2 and 3). The lead paper (Schenk, Regional Synthesis, this volume) discusses these differences and similarities in terms of plate tectonics, and provides a frame of reference for the succeeding papers on the sedimentary characteristics and depositional setting of the rock units examined in the course of the field trip.

ITINERARY

Day 1 (Wed., June 11). Overnight accommodations are available at Acadia University (Crowell Tower residence), Wolfville, Nova Scotia, on the evening of June 10. The excursion officially gets underway the next morning at 8:30 with a meeting of the participants at Crowell Tower parking lot. From there, proceed to Kingsport (Fig. 4), then north 2 1/2 miles (4 km) to West Medford (see Fig. 1 of Jensen, Late Triassec Redbeds ..., this volume). At West Medford, turn right (east northeast) along a dirt track and drive about 1/2 mile (3/4 km). A footpath leads down a 50-foot (15-m) embankment to the shore.

FIG. 2. Geological divisions of Nova Scotia based on stratigraphic and structural contrasts (as drawn by T.E. Lane).

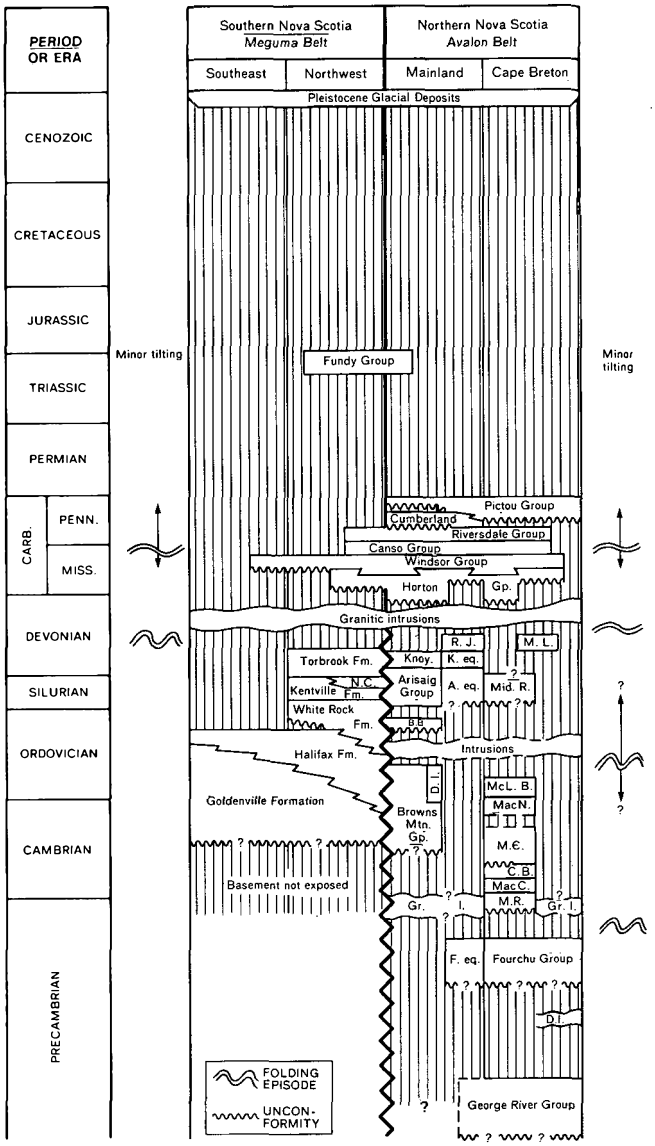

FIG. 3. Stratigraphic and tectonic correlation chart for Nova Scotia. Sawtooth line denotes division of pre-orogenic (Acadian) rocks on the basis of contrasting stratigraphy and structural histroy. Key to abbreviations: A.eq. - unnamed sedimentary rocks of the Cobequid area, age-equivalent (?) to the Arisaig Group; B.B. - Bears Brook Volcanic group; Browns Mtn. Gp. - Browns Mountain Group; - C.B. - Canoe Brook Formation; D.I. - dioritic intrusives; F. eq. - unnamed volcanic rocks of the Cobequid area, equivalent (?) to the Fouchu Group; Gr. I. - Granitic intrusives; Knoy. - Knoydart Formation; K.eq. - unnamed sedimentary rocks of the Cobequid area, age-equivalent (?) to the Knoydart Formation; MacC. - MacCodrum Formation; MacN. - MacNeil Formation; McL. B. - McLeod Brook Formation; M.C. - Middle Cambrian units of eastern Cape Breton (Bourinot and Kelvin Glen Groups, and MacMullin, MacLean Brook, and Trout Brook Formations); M.L. - MacAdam Lake Formation; Mid. R. - Middle River Group; M.R. - Morrison River Formation; N.C. - New Canaan Formation; R.J. - River John Group.

At this locality (Stop 1), continental redbeds of the Late Triassic Wolfville and Blomidon Formations crop out in sea cliffs (see Figs. 2, 6, 7 and 8 of Jensen, Late Triassic Redbeds ..., this volume). Following this stop, return to Kingsport, park above steep embankment and descend wooden stairs at the locality indicated in Jensen's Figure 1. Channelized redbeds of the Wolfville Formation are exposed in the sea cliffs here (Stop 2). Note several horizons of probable plant roots preserved as light-coloured, calcareous tubes.

From Kingsport, drive to Canning and thence along Route 221 to North Kingston (Fig. 4). Turn left (south) at North Kingston to join Highway 1, then right (west) to Kingston (see Fig. 2 of Lane, Stratigraphy of the White Rock Formation, this volume). Turn left (south) again at Kingston, and proceed to Stop 3 along the route indicated in Lane's Figure 2. A sketch-map of the area in the immediate vicinity of Stop 3 appears as Figure 2 in "The Torbrook Formation" by Jensen (this volume). Walk a short distance through the woods on the west side of the road at this stop, and descend the east flank

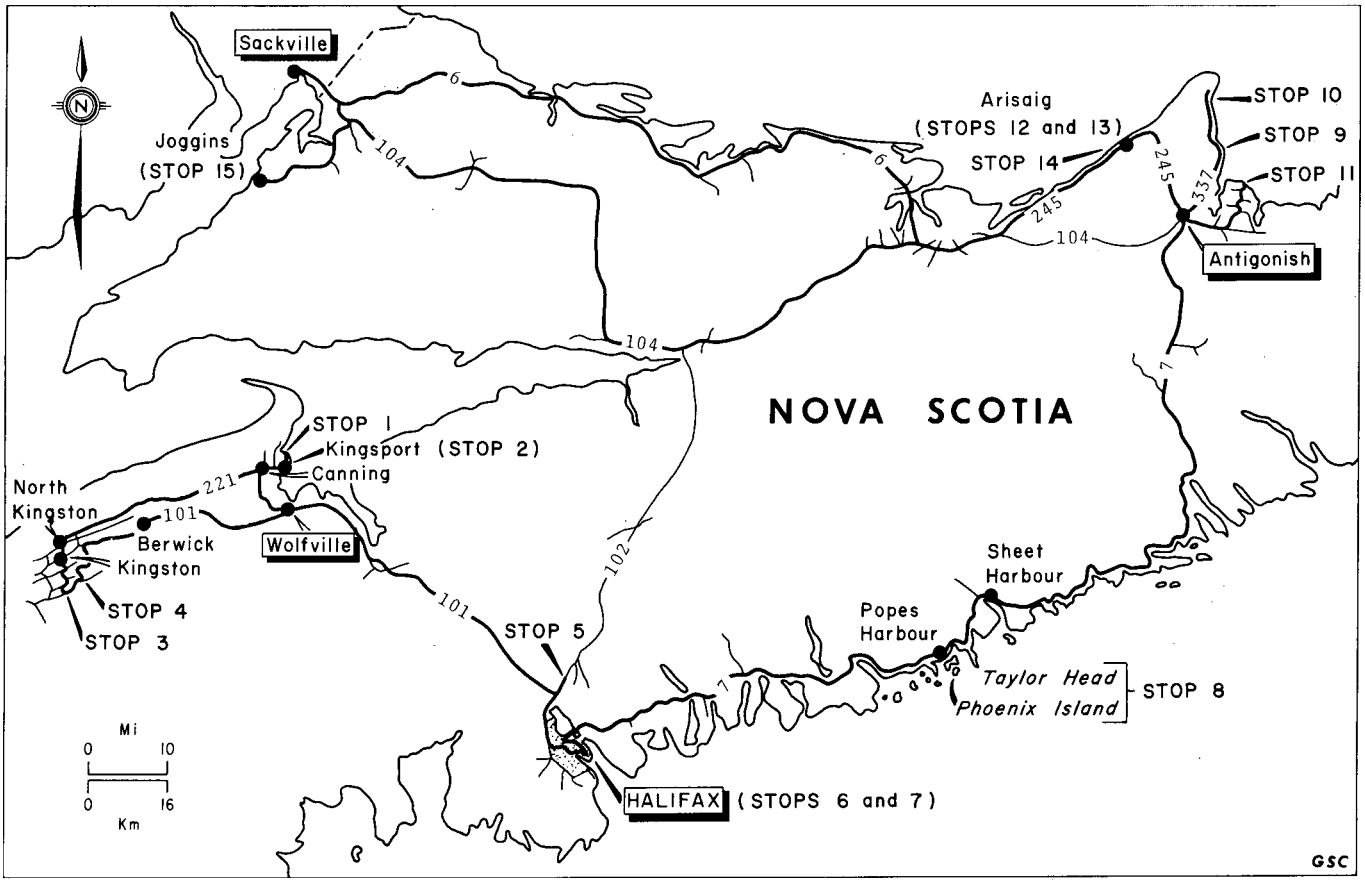

FIG. 4. Field stops, overnight stops (boxed place-names), and excursion route.

of the deeply incised valley of Spinney Brook, until outcrop is encountered (approximately halfway down the slope). Steeply inclined strata (fossilferous and arenaceous limestone, coquina lenses, fine-grained sandstone, siltstone and slate) of the Torbrook Formation crop out intermittently over a distance of approximately 130 yards (120 m) along this slope. The Torbrook Formation is exposed at other localities along Spinney Brook as well (see Jensen's Fig. 2), but the other outcrops will not be visited during this field trip.

Refer again to Figure 2 of Lane's paper on the White Rock Formation for the route from Stop 3 to Stop 4. At the latter stop, steeply inclined strata of the White Rock Formation (see columnar sections, Figs. 7 and 9 of Lane's paper) are exposed along Fales River, within easy walking distance of the road leading to Rockville Notch (see Lane's Fig. 8). From Stop 4, proceed to Highway 1 along the route indicated in Lane's Figure 2. Drive east on Highway 1 to the Berwick turn-off, then north through Berwick to Highway 101, and proceed toward Halifax (Fig. 4) (supper en route).

Stop 5 is optional, and involves leaving Highway 101 on the approach to Bedford, turning northeastward onto Highway 102, and driving approximately 2 miles (3 km) to a road-cut (Fig. 5). Highway 102 is subject to heavy traffic, and it is advisable to park well off the pavement and to keep away from the road while moving about the outcrop. Thick beds of quartz-rich graywacke (Goldenville Formation) exhibit some unusual sedimentary features at this outcrop (Harris and Schenk, this volume). From Stop 5, drive to Halifax and proceed to Howe Hall Men's Residence, Dalhousie University (Fig. 6), for overnight accommodations.

Day 2. Assemble at the parking lot immediately to the west of Howe Hall, then drive in convoy to Black Point Beach, Point Pleasant Park (Stop 6, Fig. 6). This is a 3/4-hour stop to examine fine-grained metasediments of the Halifax Formation (see Figs. 3a, 4 and 5 of Harris and Schenk, this volume). From there, drive across the city to Titus Park (Stop 7, Fig. 6) for a brief stop to see more metasediments of the Halifax Formation. These are finer-grained than the rocks at Stop 6, and possibly of a different sedimentary facies (see Figs. 3b and 6 of Harris and Schenk, this volume). The outcrop has glacially-smoothed surfaces that display a variety of bedding structures.

From Titus Park, cross the MacKay Bridge and proceed through Dartmouth to Highway 7 (Fig. 6), and thence to Popes Harbour on the "Eastern Shore" (Fig. 4). If weather and sea conditions are favourable, a local fisherman can transport the group by a fishing vessel from his jetty at Popes Harbour to Phoenix Island (Fig. 7). From the landing site in

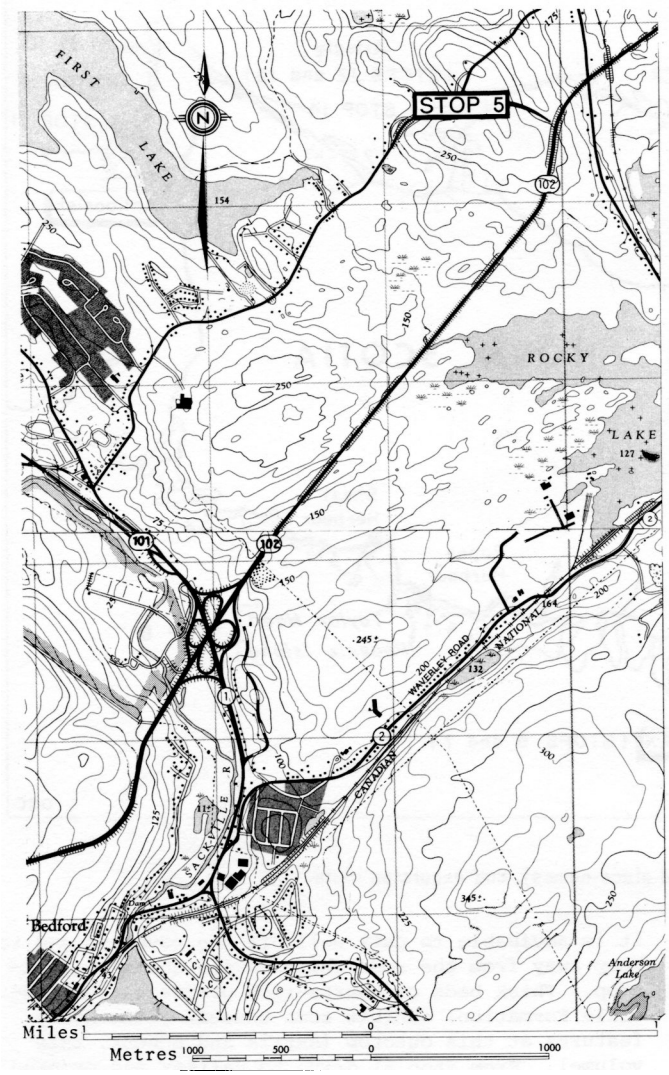

FIG. 5. Map showing location of Stop 5.

Phoenix Cove, walk through the woods and along the shore on a trail indicated by a dashed line in Figure 7. Alternating beds of graywacke-sandstone, siltstone and slate of the Goldenville Formation are almost continuously exposed along this shore. Approximately four hours will be spent on the island to enable close examination of the sedimentary structures that characterize these strata (see Figs. 2 and 8 to 14 of Harris and Schenk, this volume). Particularly fine examples of these structures are exposed at Popes Head and in the vicinity of Dipper Point (Fig. 7).

If weather conditions are unsuitable for the trip to the island, the group will go to Taylor Head instead. For this destination, take the Taylor Head road from Spry Bay and proceed until a gate across the road is reached. From this point, continue by foot along the west side of the peninsula, as indicated by a dashed line in Figure 7. The Goldenville Formation is extensively exposed along this shore, and most of the sedimentary structures that can be seen at Phoenix Island are also found at this locality. Following Stop 8 (Phoenix Island or Taylor Head, as the case may be), drive to St. Francis Xavier University in Antigonish for overnight accommodations in a university residence (2 nights).

Day 3. Following breakfast in Antigonish, proceed on Route 337 to McIssac Point (Stop 9, Fig. 8). Climb down the coastal embankment to the beach to see outcrops along the shore of Windsor fanglomerate unconformably overlying redbeds of the Horton Group, stromatolitic limestone and dolostone (Macumber-type), limestone breccia, and evaporites (see Fig. 9 of Schenk, Windsorian Stage ..., this volume).

From Stop 9, continue on Route 337 to Stop 10, and there walk across open fields and down a coastal embankment to the shore. The route of the foot-traverse is indicated by a dashed line in Figure 8. Red conglomerate, sandstone and siltstone, thin-bedded carbonate interlayered with grey to black shale, dolostone breccia, and a basaltic flow crop out along this shore. These Windsor Group rocks lie unconformably above red conglomerate and sandstone of the Horton Group. The latter are the most southerly outcrops encountered at Stop 10.

Following Stop 10, drive back through Antigonish to join Highway 104. Go east on Highway 104 to the Pomquet turn-off, and thence to Monks Head (Stop 11) along the route indicated in Figure 8. A location map and graphic logs of the rocks at Monks Head are provided in Figures 6a, 11, 12, and 13 of Schenk (Windsorian Stage ...., this volume). The section is readily traversed at low tide, but is partly inaccessible at high tide.

Day 4. After breakfast in Antigonish, drive on Route 245 to Arisaig (Fig. 8). Stops 12, 13, and 14 occur on a 3-mile (5 1/2-km) stretch of the Arisaig shore The sedimentary geology of the rocks at these stops is outlined by Lane and Jensen (this volume). More complete descriptions of the general geology of the area are given by A.J. Boucot and others (1974, Geology of the Arisaig area; Geological Society of America, Special Paper 139) and D.G. Benson (1974, Geology of the Antigonish Highlands, Nova Scotia; Geological Survey of Canada, Memoir 376). A side-road leads from Route 245 to Stop 12 at Arisaig Point (see Fig. 2 of Lane and Jensen, this volume). An outcrop beside the road at this stop displays subaerial rhyolite of the Bears Brook Group unconformably overlain by an oligomictic conglomerate of the Beechhill Cove Formation. At a nearby locality, the basal Beechhill Cove strata comprise marine mudstone and lenticular sandstone. The succeeding Beechhill Cove strata are marine beds of massive siltstone and intercalated mudstone (see Figs. 5 to 8 of Lane and Jensen, this volume).

The short journey from Stop 12 to Stop 13 involves a return by car to Route 245 and then a half-mile walk back to the shore, as indicated in Figure 2 of Lane and Jensen (this volume). Marine strata of the Ross Brook Formation (Upper Member)

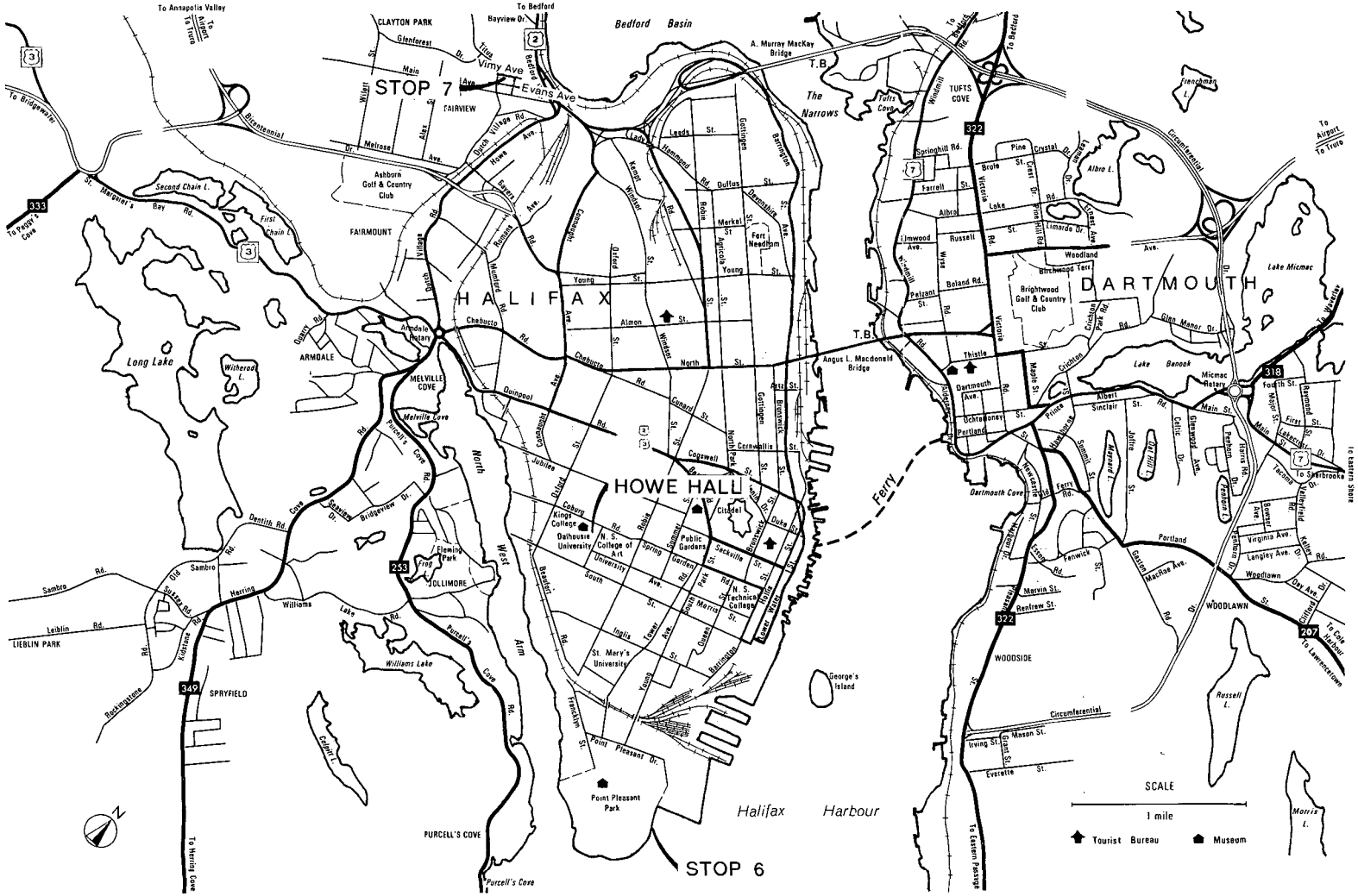

FIG. 6. Halifax and environs.

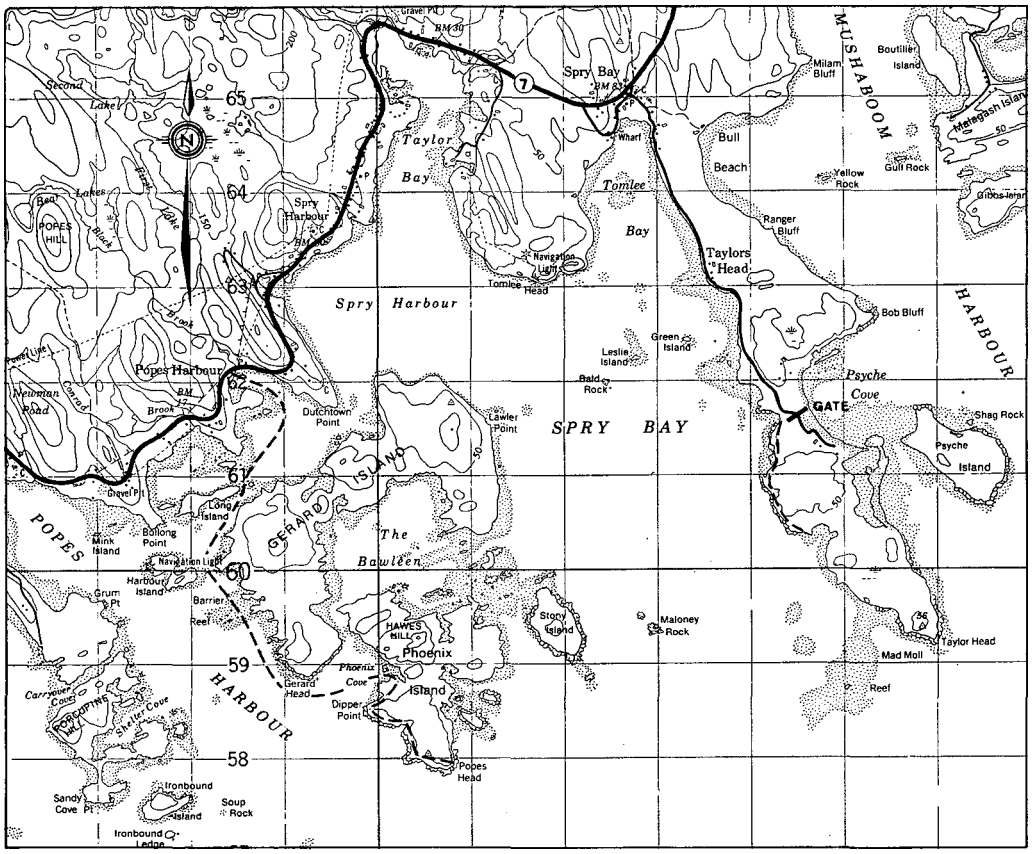

FIG. 7. Location map, Popes Harbour and environs.

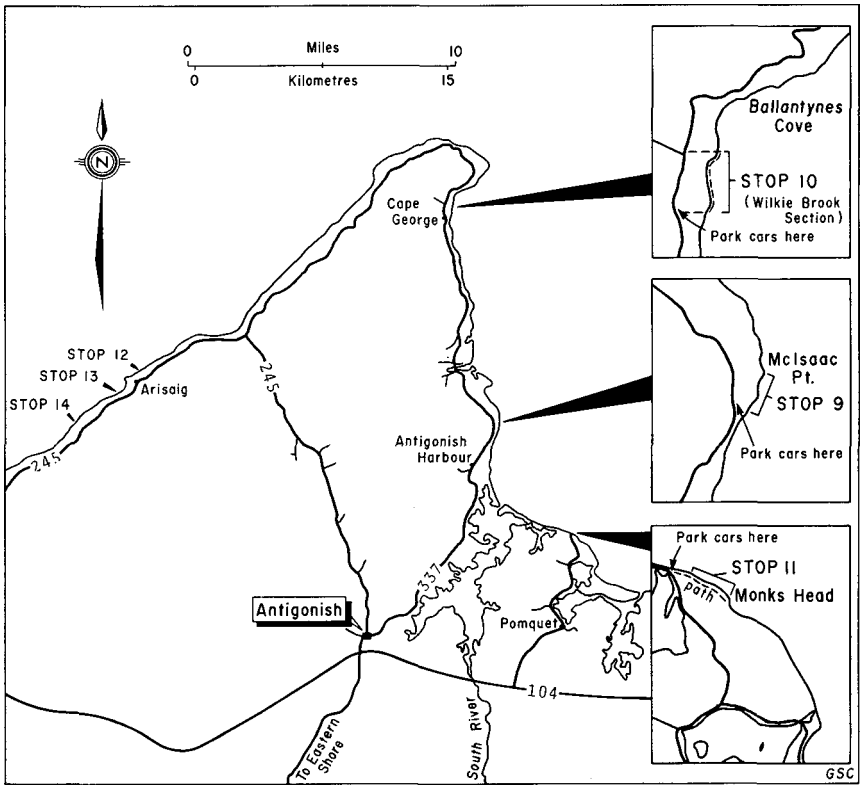

FIG. 8. Field stops in the Antigonish area.

are extensively exposed along the shore at this stop. These strata are characterized by laterally continuous beds of poorly sorted siltstone and silty shale, with minor fine-grained sandstone, and with coquina lenses in scour-depressions and ripple-troughs (see Figs. 12 to 26 of Lane and Jensen, this volume).

The route from Stop 13 to Stop 14 is shown in Lane and Jensen's Figure 2. A farm road provides easy walking from Route 245 to the shore at Stop 14. The Moydart and Stonehouse Formations are extensively exposed along this shore (see Figs. 27 to 36 and 38 to 44 of Lane and Jensen, this volume). Alternating beds of siltstone and shale containing a marine fauna make up a large part of these strata, as in the case of the rocks at Stop 13. However, the rocks at Stop 14 tend to be more calcareous than those at the previous stop, and a number of sedimentary structures are more prominently developed, such as lenticular bedding, scour-and-fill structures, coquina lenses, low-angle cross-lamination and biogenic structures. Red siltstone and calcareous mudstone at the top of the Moydart Formation have been interpreted as lagoonal or alluvial deposits, or both. Following Stop 14, drive to Sackville, New Brunswick (overnight accommodations at Mount Allison University, student residence). The fastest route to Sackville is via Highway 104, but Highway 6 is a slightly shorter and more scenic drive.

Day 5. Drive to Joggins from Sackville, for the last of the field stops. The time of departure from Sackville (9:00 a.m.) is planned so as to avoid the high tide, when the Joggins section is inaccessible. At the Joggins shore (Stop 15), Pennsylvanian cyclothems are exceptionally well exposed in sea cliffs and in outcrops of low relief in the intertidal zone (see Figs. 1 and 2 of Ferguson, this volume). Channel and sheet sandstones are interbedded with lutites (dark grey, greyish-green and red mudstones, and pale grey seatearths), thin limestones and coals. The occurrence of early amphibians and reptiles and their curious preservation in large, erect tree stumps are noteworthy. Return to Sackville in the early afternoon and proceed to the Library of the Geology Department, Mount Allison University, for a display of fossils recovered from Joggins in recent years.