

GEOLOGICAL MAPPING
 NORTHERN PART OF ST. GEORGE'S BAY
 CARBONIFEROUS BASIN
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Introduction

The St. George's Bay Carboniferous Basin on the west coast of insular Newfoundland covers an elongated coastal lowland bounded on the northwest by St. George's Bay and on the east by the Long Range Mountains.

Mapping in the northern half of the basin (see map) was started in 1973 with a reconnaissance survey (Fong, 1974). In 1974, the area was mapped in detail utilizing two, 2-man field parties. Mapping in the southern half of the basin is being conducted simultaneously by Knight (1974, and this volume).

Four groups of rocks occur in the map area. In descending order they are:

- Barachois Group.....Pennsylvanian
- Conformity?-----
- Codroy Group.....U. Mississippian
- Conformity?-----
- Anguille Group.....L. Mississippian
- Unconformity-----
- Crystalline Complex.....Pre-Carboniferous

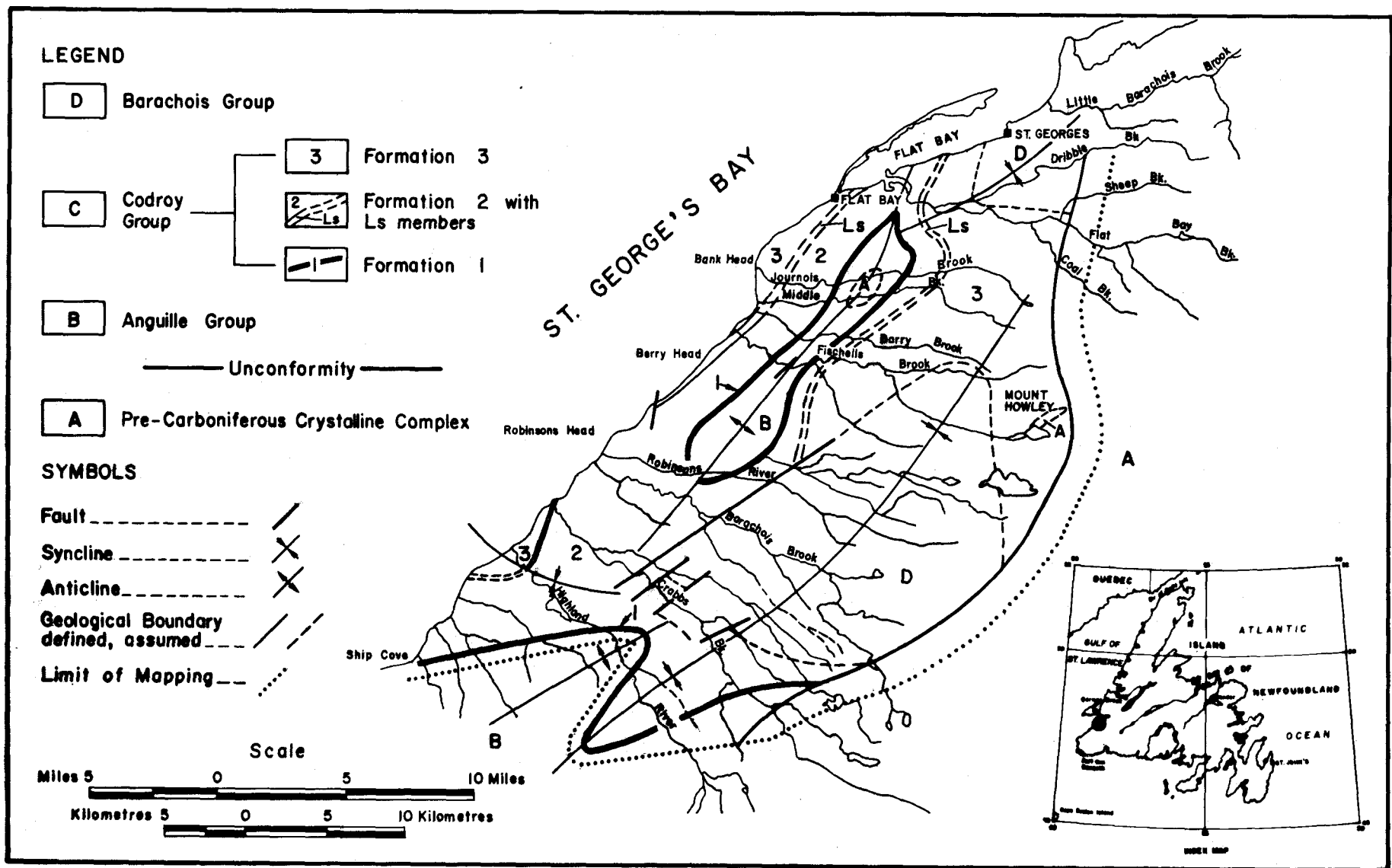


Fig. 1 Geological Map St. George's Bay Area

Pre-Carboniferous Basement

Pre-Carboniferous crystalline rocks forming the Long Range Mountains, along the eastern boundary of the area, are in fault contact with Carboniferous sedimentary sequences. Within the map area the crystalline complex is assumed to unconformably underlie the Carboniferous sequences. In Journois Brook two small outcrops of coarse grained granitoid gneiss are exposed in what seems to be a small structural window.

Anguille Group

Anguille rocks of Lower Mississippian age in the map area comprise two distinct types: a tabular quartzitic sandstone and a sandy conglomerate. The tabular quartzitic sandstone is light grey to red with conspicuous hematitic laminations. It crops out in Ship Cove Brook and in the Highland River. The conglomerate is grey to greenish grey and contains boulders up to one foot in diameter. Many of these boulders were derived from Ordovician St. George Group and Table Head Formation carbonate beds. This conglomerate is well exposed in Robinsons and Fischells Brooks.

The base of the Anguille Group is not exposed in the map area. It is conformably overlain by the Ship Cove Limestone, the lowest lithologic unit in the Codroy Group.

Codroy Group

The Upper Mississippian Codroy Group in the map area comprises three

distinct formations referred to in this report, in descending stratigraphic order, as Formation 3, Formation 2 and Formation 1. Correlation of the present terminology with that used by previous workers is presented in Table 1.

Formation 1

In the southern part of the map area and extending southwards into the Anguille Mountains - Codroy Valley area, a sequence of dark grey, silty, finely laminated limestone beds conformably overlies rocks of the Anguille Group. This limestone sequence was named the Ship Cove Limestone by Bell (1948), and is considered to be the base of the Codroy Group. North of the Highland River, in Robinsons North Feeder and Fischells Brook, this limestone sequence changes to an alternation of grey oncolitic, pisolitic and oolitic laminated limestone and greenish grey shale, while the conformably underlying Anguille Group rock is a grey sandy conglomerate.

Formation 1 is conformably overlain by rocks of Formation 2.

Formation 2

Formation 2 is exposed almost continuously in Fischells Brook. This formation comprises gypsiferous shale, evaporites, ripple-marked red and green siltstone, finely cross-bedded siltstone, fossiliferous limestone beds, algal reefs, and brick red dolomite beds. Thicknesses of beds as well as facies variations change rapidly and abruptly within short distances. Major evaporite bodies generally occur in the lower part of the formation. The stratigraphic positions of these evaporite bodies,

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Table 1

Hayes and Johnson 1938		Bell 1947		Baird 1958		Fong 1973		This Report	
Codroy Series	Woody Point Sandstone	Codroy Series	Woody Head Beds	Codroy Group	5	Codroy Group	Unit C	Codroy Group	Formation 3
	Woody Cove Shale		Woody Cove Beds				Unit B		Formation 2
	Black Point Limestone		Black Point Limestone		4		Unit A		
	Codroy Shale		Gypsiferous Zones						Ship Cove Limestone
Anguille Series	Anguille Rocks Undivided		Anguille Series		Anguille Rocks Undivided	Anguille Group	Anguille Rocks Undivided		Anguille Group

however, are highly variable, and are considered to occur randomly in the stratigraphic section throughout the map area. Towards the top of Formation 2 there occurs a sequence of carbonate beds. They vary in number from as many as six beds in Fischells Brook to only a single bed in the Highland River. Bell (1948) referred to these beds as Crabbs, Barachois, Jeffreys, Heatherton and Fishels (Fischells) Limestones. The present writer considers these beds to form a limestone zone that marks the top of Formation 2. This limestone zone crops out continuously in the map area and is a good marker in the field. Limestone beds in this zone comprise fossiliferous limestone that contains shelly marine fauna, and algal mat or algal reef limestone. Dolomite beds are usually in close association with algal limestone. Thin beds of gypsum and a single bed of celestite also occur in this limestone zone.

In the southern part of the basin, Knight (this volume) has mapped two formations (his formations 2 and 3) which are probably equivalent, at least in part, to the rocks here included in Formation 2.

Formation 2 passes without break into rocks of Formation 3.

Formation 3

Formation 3 comprises a thick sequence of highly calcareous, red sandstone. Cross-bedding, pebbly beds, kunkar beds and calcareous concretions are very common. Several thin beds or lenses of red limestone occur near the base of the formation.

The best exposure of this formation occurs in a syncline along the coast from St. Davids to the mouth of Highland River.

Rocks of Formation 3 pass without break into rocks of Lower Pennsylvanian Barachois Group.

Barachois Group

The Barachois Group comprises a thick sequence of shale, siltstone, sandstone and conglomerate with intercalated beds of calcareous siltstone and sandstone as well as locally occurring coal seams. The succession was folded into a broad syncline occurring on the eastern part of the map area, bordering the Long Range Mountains. It also occurs in a small syncline that underlies the town of St. Georges.

The Barachois Group is in gradational contact with the underlying rocks of the Codroy Group. The boundary between the two groups, therefore, is arbitrary.

Structure

The regional structural trend of the area follows closely the major structural trend of insular Newfoundland in a northeast-southwest direction. Two major folds occur in the map area.

In the northwest a doubly plunging anticline extends from Flat Bay in the north to Crabbs River in the south. Rocks involved in this fold

are mainly pre-Pennsylvanian in age. On the southeastern part of the area Early Pennsylvanian Barachois rocks are folded into a broad syncline that extends from the town of St. Georges in the north to the northern end of the Codroy Valley in the south. These two major folds are separated by a NE-SW trending normal fault that crosses Crabbs Brook, Barachois Brook and Robinsons River. Three minor faults, also maintaining the same NE-SW trend, occur in Crabbs Brook.

Although gypsum and anhydrite attain great thicknesses in Formation 2, structures attributable to such evaporite beds are restricted to the coastal section between Ship Cove and Plaster Cove where Formation 2 rocks are repeatedly folded and faulted to form tight anticlines, synclines, thrusts and overturned beds.

Economic Geology

Gypsum and anhydrite occur in great thicknesses in a continuous zone within Formation 2. Gypsum is currently mined in the Flat Bay area.

Salt has been discovered in drill holes at three locations within the area. A well drilled at Fischells Brook in 1968 intersected salt at 1200 feet below ground level and was abandoned in salt at 3600 feet. In the Robinson's area, a well drilled in 1972, intersected salt at 777 feet and continued predominately in salt to 1541 feet, and in intercalated mudstone and salt to 2280 feet. The third well, drilled in the St. Fintan's area, encountered salt at 756 feet and drilled through a mixed section of salt and clastic sediments to 1346 feet, and predominately clastic sediments to

abandonment at 1506 feet.

Celestite occurs at Heatherton as a thin 10 in. lens, with a visible exposure of 150 ft.

A single occurrence of fluorite is recorded from Ship Cove in the fossiliferous Cormorant Limestone.

Malachite stains were observed to occur on plant fragments in an arkosic sandstone lens in Formation 2. This sandstone crops out at the small headland between the Robinsons and Barachois Brooks.

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