GEOLOGICAL MAPPING, CARBONIFEROUS ROCKS

CAPE ANGUILLE MOUNTAINS, SOUTHWEST NEWFOUNDLAND

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I. Introduction

An area of 192 square miles located mostly in the southwestern part of the Cape Anguille Mountains was mapped at a scale of 1:50,000.

The area, geographically, is divisable into two (Fig. I):

A) The Cape Anguille Mountains - a dissected, rolling 1500' high plateau extending along the southern shore of St. Georges Bay for 30 miles from Ship Cove to Cape Anguille. The plateau is 10 miles wide.

B) The Codroy Valley - lying between the Cape Anguille Mountains and the rugged Long Range Mountains in the east.

II. General Geology and Stratigraphy

The Anguille area is underlain by sedimentary rocks of Mississippian to Pennsylvanian age. Three groups occur (from base to top):

A) Anguille Group of Mississippian age,

B) Codroy Group of late Mississippian age,

C) Searston Beds of late Mississippian and early Pennsylvanian age.

The Anguille Group is confined mostly to the Cape Anguille Mountains whilst the Codroy Group and Searston Beds outcrop in the Codroy Valley. Codroy Group rocks also occur in synclinal folds within the Cape Anguille Mountains.

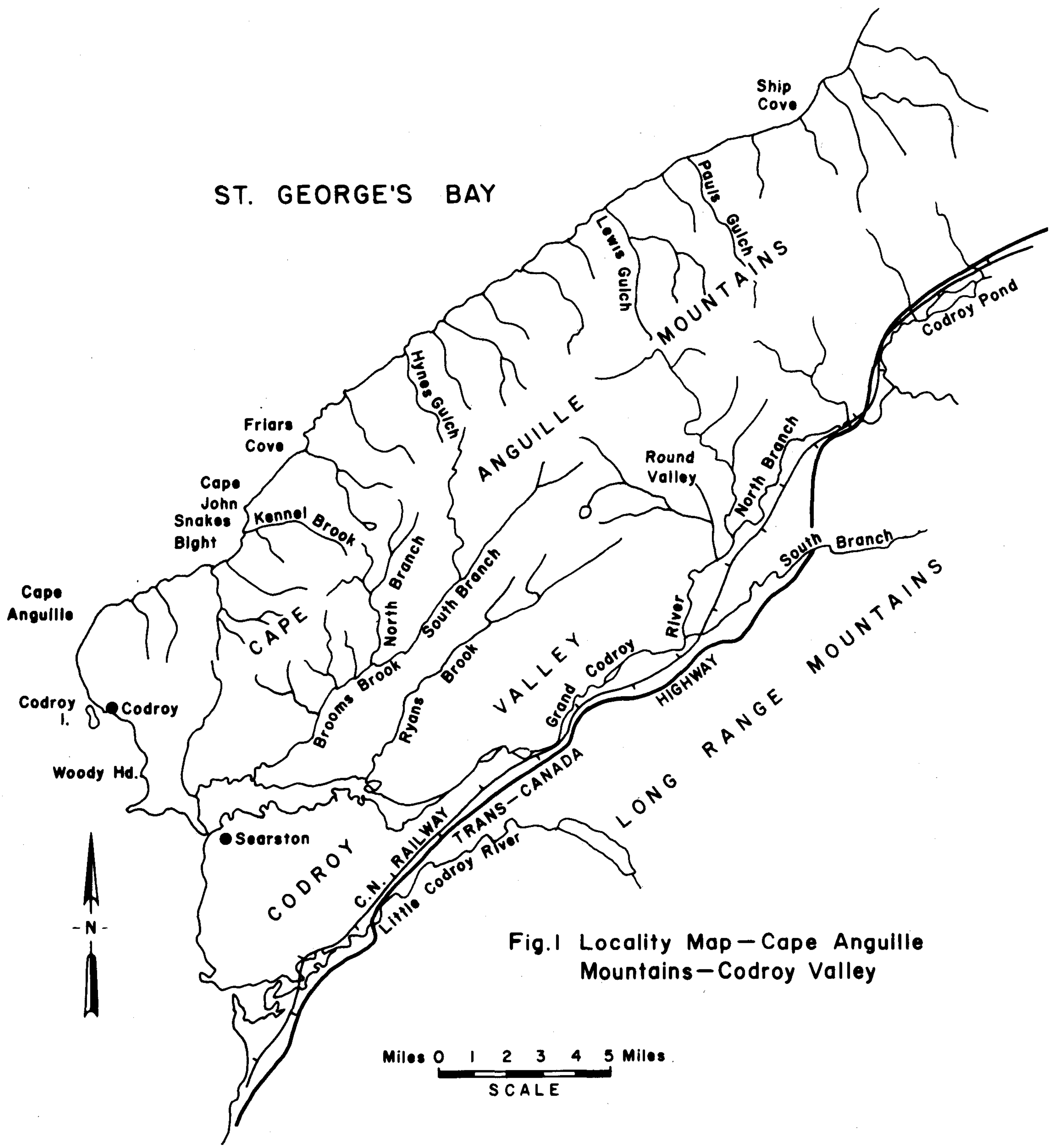

Fig. I Locality Map — Cape Anguille Mountains — Codroy Valley

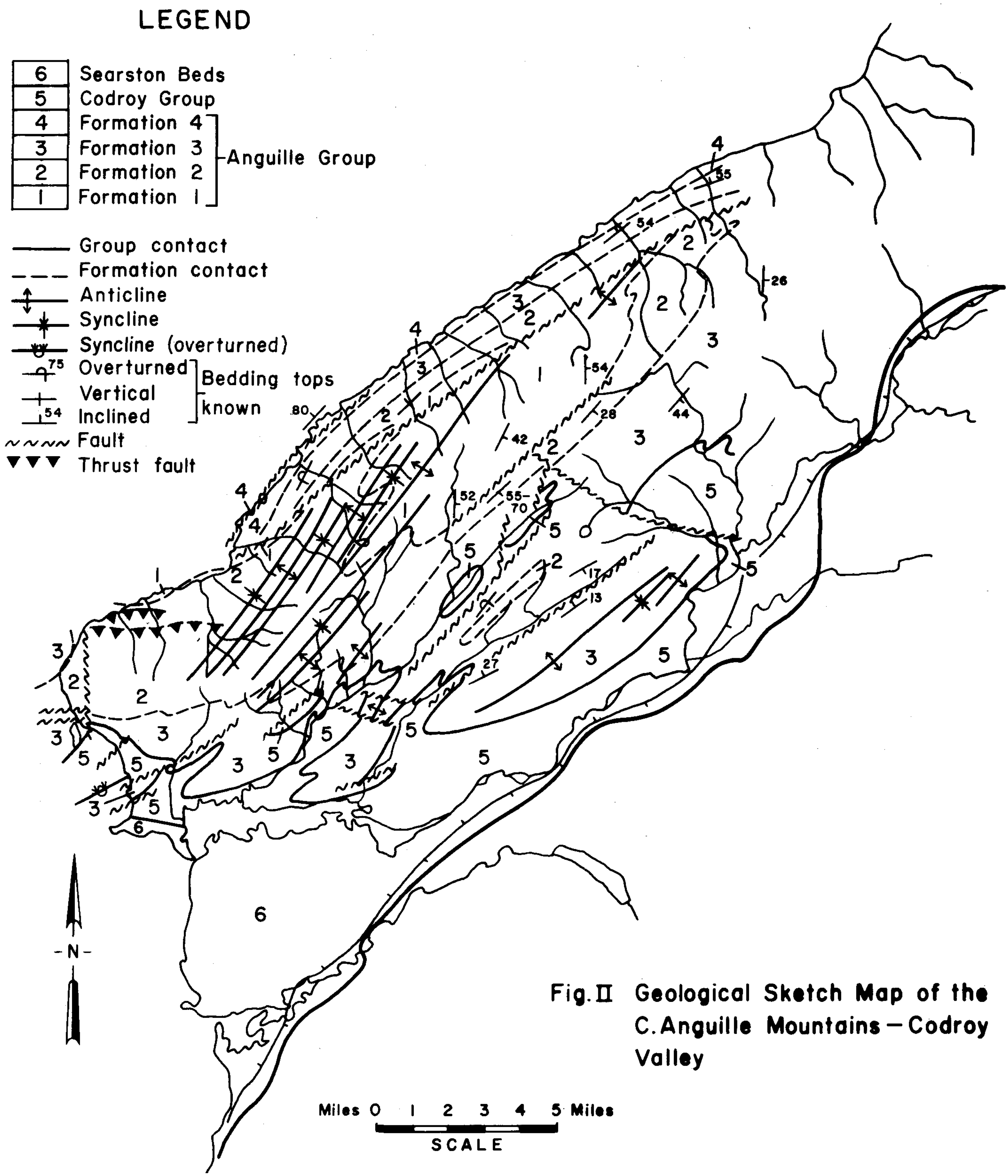

Fig. II Geological Sketch Map of the C. Anguille Mountains — Codroy Valley

A) The Anguille Group

The Anguille Group consists predominantly of clastic sedimentary rocks deposited in subaerial fluviatile, fluvial-marine, marginal-marine, and deeper water turbidity environments (Knight, 1973).

Three formations were proposed by Baird and Cote (1964). However, mapping during the past summer indicates the presence of four mappable formations (see Table 1). Baird et al. (1964) described and mapped their basal Cape John Formation at Cape John. However, the past summer's mapping showed that the rocks at Cape John occur in an inverted sequence (Baird and Cote did not recognize the inversion), which continues into rocks previously mapped as Seacliffs Formation by Baird et al. (1964). In this report, these rocks are located in Formation 4.

In view of these discoveries, it is suggested that the stratigraphic names previously used for the formations of the Anguille Group be re-evaluated.

TABLE 1

Baird et al. 1964	Knight (this report)
Seacliffs Fm.	Fm. 4 (Red beds) Fm. 3 (Marine sandstones)
Snakes Bight Fm.	Fm. 2 (Turbidity sandstones)
Cape John Fm.	Fm. 1 (Sandstones and Redbeds)

Formation 1 consists of green to grey, chloritic sandstones interbedded with red and green siltstones and shales and exhibiting good slatey cleavage. Conglomerates and pebbly sandstones are common in the north. A light grey, irregularly laminated and thin bedded limestone forms the top of the formation near Snakes Bight and Friars Cove. Well developed "melange" like units occur at some localities and appear to predate the deformation. Crossbedding and mudcracks suggest the formation was a subaerial deposit of fluviatile origin.

Formation 2 consists of rocks previously called the Snakes Bight Formation (Baird, et al., 1964). Baird et al. (1964) reported that the formation conformably overlies Formation 1. However, a disconformity or fault may exist since the limestone described above is not always present and there is considerable deformation and faulting within the basal rocks of formation 2. Six units occur within the formation. They are, in ascending order:

a) Black mudstones with boudinaged sandstones and thick units of sedimentary deformation.
b) Dark grey, fine grained turbidites cut by a good slatey cleavage. Some dolomitic beds also occur.
c) Alternating, 15 cm. thick, beds of sandstone rich in turbidity structures, and dark grey shales.
d) Alternating thick turbidity sandstone units with thick black mudstone units containing beds of siltstone, sandstone and dolomitic mudstones.
e) Grey, thick bedded sandstones.
f) As for d

Evidence of turbidity deposition exists throughout the formation which is possibly as thick as 5800'. The turbidity currents moved northward and westward.

Formation 3 consists of a basal conglomeratic member overlain by grey sandstones and shale members. Some thin sequences of red beds also occur.

The basal conglomerate member locally overlies an erosional disconformity at Cape Anguille but elsewhere appears to grade transitionally upwards from unit f of Formation 2. In the north of the area mapped, the conglomerates actually lie in lithofacies typical of the upper part of Formation 2. The conglomerates are composed of mixed plutonic, acid volcanic, metamorphic and sedimentary pebbles. Limestone pebbles are common only at Cape Anguille. Initially, the conglomerates were the product of submarine debris flows but pebble sorting and layering at Cape Anguille and elsewhere also suggests surf action.

The sandstones and shales overlying the conglomerates exhibit features of fluvial and shallow marine sedimentation and were deposited in delta channels and beach and tidal flat environments (Knight, 1973). Formtion 3 also includes the sediments of the Woody Cove and Woody Head beds of Bell (1948) (Knight, 1973).

Formation 4 consists of green and red sandstones and red siltstones which display abundant features of subaerial fluviatile deposition. The formation is well exposed along the coast and western flank of the mountains. These red beds are absent along the southeastern side of the Cape Anguille Mountains where lateral equivalents are grey, marine sandstones of Formation 3 (Knight, 1973).

A rough shoreline dividing the two environments probably existed from Codroy Pond to southwest of Cape John.

B) Codroy Group

The Codroy Group in the map area consists of at least three mappable formations previously described as the Lower Codroy by Bell (1948) and Baird et al. (1964). They are:

Formation 1 formed of the Basal Ship Cove limestone (Bell, 1948) which is a laminated, algal and pelleted grey limestone deposited upon a very extensive sabhka flat. The limestone is consistent lithologically throughout the area and occurs extensively in cores of synclinal folds within the Cape Anguille Mountains.

Formation 2 consisting of red, green and blue-grey mudstones, siltstones and very fine sandstones of fluviatile, lacustrine and possibly marine origin associated with two or possibly three gypsum horizons and two black limestone units. The gypsum is stratigraphically partly in place but in many cases, shows evidence of post-depositional movements and intrusion (Knight, 1973). The uppermost black limestone is the Black Point Limestone of Bell (1948) which forms a convenient marker for the top of the formation.

Formation 3 conformably overlies the Black Point Limestone and consists of a sequence of alternating red siltstones, and yellow, limonitic, calcareous fine sandstones or limonitic limestone breccias, the thickest of which was called the Codroy Breccia by Bell (1948). The sandstones become much coarser to the north. Fourteen limonitic sandstone or limestone horizons occur, some which contain brachiopod shell fragments suggesting a marine origin rather than deposition in a playa as suggested by Knight (1973). Algal oncolites also occur in the limestones.

These three formations are well exposed along the Codroy coastal type section. No outcrops occur to indicate how much or what type of sediments overlie these formations but it has been suggested (Knight, 1973) that fine grained red beds overlie Formation 3 and grade up transitionally into fluviatile red and green sandstones of the Searston Beds. Formations 2 and 3, and the overlying fine grained red beds are likely equivalent in part to Formation 2 mapped by Fong in the northern part of the basin (Fong, this volume).

C) Searston Beds

Knight (1973) subdivided the Searston Beds into two members.

1) A lower red and green sandstone and siltstone member of sub-aerial fluviatile origin. These may possibly be equivalent to Formation 3 (Fong, this report) in the St. Georges area.
2) An upper member of green sandstones, intraformational conglomerates, grey mudstones and red siltstones possibly deposited in a deltaic marginal marine complex.

No further work was undertaken during the summer of 1974.

111. Structure and Metamorphism

Regional deformation following the deposition of the Carboniferous produced a complex of northeast trending folds and faults. Simple to recumbent folds have axial planes usually dipping southeast and axes that plunge to the southwest in the southwest and northeast in the north. Good slatey cleavage is developed throughout Formation 1, in the lower members of Formation 2 and locally in inverted sequences within the Anguille Group.

A large fault striking northeast from Snakes Bight truncates both bedding and fold structures of the centre of the mountains (see Fig. 2). Bedding to the northwest of the fault is inverted from Cape John to north of Hynes Cove, but continuing northeast it becomes vertical and eventually upright. The structure associated with the fault suggests that the rocks to the east have overridden those to the west. This fault is probably a high angle reverse fault and is probably related to similiar subparallel faults of both large and small size.

Small thrust faults trending northeast occur in the eastward, shallow dipping limbs of anticlines and are especially common in Formation 2 of the Anguille Group particularly near the base of the formation.

Normal, high angle faults striking obliquely and approximately at right angles to the main structural trends are common. They downthrow both north-east and southwest. Such faults probably explain the presence of the Codroy Group in Round Valley which penetrates five miles into the Cape Anguille Mountains and is enclosed on three sides by the Anguille Group.

One phase of deformation produced the main structural style of the area. Slatey cleavage and metamorphic chlorite growth in sandstones occurs in the deepest parts of folds and near major faults associated with this deformation. Locally, the attitude of bedding and changes of plunge of folds suggests a second minor axial trace trending southeast. It is probably later and may be related to the southeast trending syncline in the upper Codroy Group sandstones recorded at St. Davids by Riley (1962).

IV. Mineralization

A) Anguille Group

Cu-Zn-Pb mineralization in thin calcite, siderite and quartz veins occurs extensively throughout Formation 2 especially to the west of Brooms Brook (see also Knight 1973; Knight and Stevens, 1973; McArthur and Knight, 1974). Baryte mineralization was seen cutting sandstones of Formation 1 on Kennel's Brook.

B) Codroy Group

Traces of fluorite, baryte, iron and copper mineralization was seen in the Chip Cove Limestone and some copper mineralization also exists in the Black Point Limestone.

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