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TRIP A-1, by L. T. Trembath, University of New Brunswick.

ZEOLITE MINERAL ASSEMBLAGE, GRAND MANAN ISLAND, NEW BRUNSWICK

The Triassic basalts of Grand Manan Island have been divided into two units:

- (1) A series of small flows and sills termed the multiple flow unit which is best exposed along the section of coast-line called the Seven Days Work, and
- (2) A 500' thick sill which extends over most of the island and is best exposed as 200 - 300' cliffs on the western side of the island. The basaltic rocks are in fault contact with the Precambrian rocks and the base of the basaltic units are in conformable contact with the underlying red-bed sediments of the Annapolis formation. The 500' thick sill appears to be in both conformable and transgressive contact with the multiple flow-sill unit.

ZEOLITES

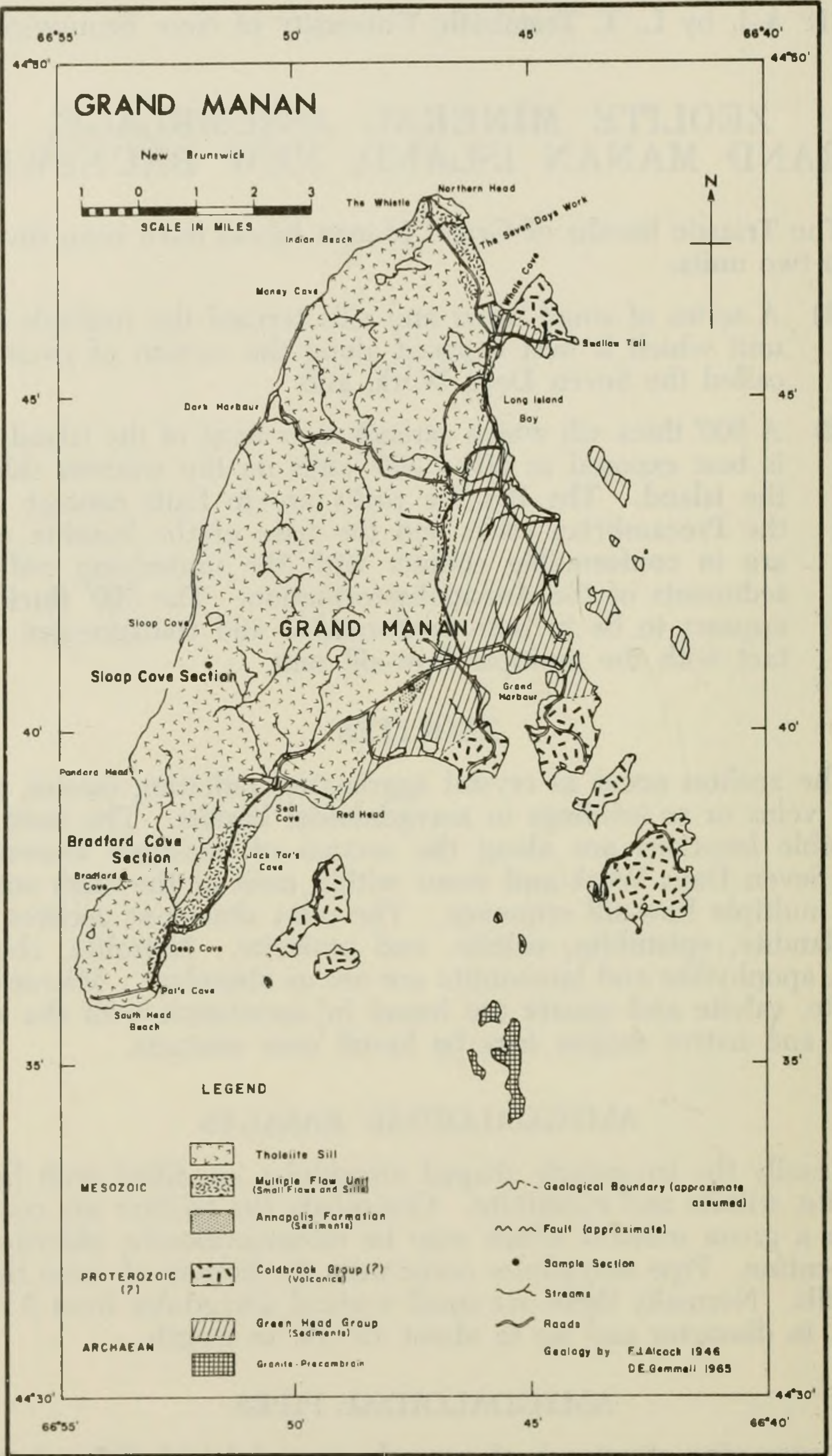
The zeolites occur as crystal aggregates, radiating masses, narrow veins or as infillings in amygdaloidal basalts. The most accessible locations are along the section of coastline known as the Seven Days Work and occur within most of the units within the multiple flow-sill sequence. The most abundant zeolites are heulandite, epistilbite, stilbite, and scolecite. Natrolite, chabazite, apophyllite and laumontite are not as abundant. Microcline, albite, calcite and quartz are found in association with the zeolites and native copper may be found near contacts.

AMYGDALOIDAL BASALTS

Usually the irregularly shaped amygdules are filled with heulandite, stilbite and epistilbite. Commonly the zeolites are coated with a green mineral which may be montmorillonite, chlorite or serpentine. Pipe amygdules occur near the bottom of some flows or sills. Normally these are small vertical amygdules from 2 - 15 mm. in diameter and up to about 15 cm. in length.

AMYGDALOIDAL PIPES

Larger pipe structures of coarsely amygdaloidal (0.5 - 1 cm.) basalts from 1 - 10 cm. in diameter and up to several meters in



length are found in a near vertical attitude within either massive basalt or more finely amygdaloidal basalt. In a few instances two or more pipes coalesce upwards to form one large pipe or more rarely one large pipe separates into two or more smaller pipes.

COLUMNAR JOINTING

Columnar jointing is common in the 500' unit and in some of the more massive multiple flow units. The joints are normally in a near vertical attitude and may have oxidation rings concentric to the columnar joint pattern and extending the length of the column.

LOG AND DIRECTIONS

Assemble at the Grand Manan Ferry Service Wharf in Black's Harbour for the 10.15 ferry, Friday, October 12th and proceed by car ferry to North Head, Grand Manan Island. Please arrive in Black's Harbour one hour prior to departure time as we will reduce the number of cars to a minimum at this point. (Car transport is six dollars). Meals are normally available on the ferry. Arrival time — 12.00 p.m.

MILEAGE

- 0.0 Turn left (south) on leaving wharf.
- 0.2 Pass Shorecrest Lodge where we will be staying the night.
- 0.3 Junction of main highway and Whistle Road.
- 2.6 Bridge over Eel Brook.
- 2.7 Park cars in parking area adjacent to town dump. Take the trail to Eel Brook Beach (approximately 1/2 mile).

Traverse along the cliff section known as Seven Days Work. Return to Shorecrest Lodge for dinner. After dinner a brief trip will be made to the north end of the island. Follow the same route along the Whistle Road to the end of the road at North Head. Walk to the shore and continue west about 1500' along the shore.

SATURDAY, OCTOBER 13

Leaving Shorecrest Lodge at 8.30 a.m. Proceed to Whale Cove via the Swamp road which leaves the main highway about 100 yards east of the junction with the Whistle Road. Traverse along the south end of the cliff section towards Northern Head. Return to ferry wharf by 11.15 and return to mainland by 12.15 ferry.