

GEOLOGY OF THE NORTHERN LEWIS HILLS,
WESTERN NEWFOUNDLAND

by

Jeffrey Alan Karson

A Dissertation

Submitted to the State University of New York at Albany

in Partial Fulfillment of

the Requirements for the Degree of

Doctor of Philosophy

College of Arts and Sciences

Department of Geological Sciences

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ABSTRACT

The Lewis Hills is the southernmost of the four Bay of Islands Ophiolite Complex massifs. These massifs are considered to be the dissected remnants of a once nearly continuous thrust slice of oceanic crust and upper mantle of Early Ordovician age. The Lewis Hills Massif may be divided into three north-south trending zones. The eastern zone (Bay of Islands Complex) is composed of variably deformed and recrystallized gabbro, troctolite, wehrlite and dunite cumulates and harzburgite tectonites. The western zone (Little Port Assemblage) consists of greenschist facies metagabbros, diabase dikes and minor quartz-diorite bodies. The central zone (Mount Barren Assemblage) is a 3 kilometer wide zone of highly deformed metagabbros and amphibolites cut by syn- and post-kinematic mafic and ultramafic intrusive bodies. The central zone grades into the western zone but has a sharp igneous contact against the eastern zone. It is proposed that the central zone rocks represent the deep crustal levels of an oceanic fracture zone preserved between two less deformed assemblages of oceanic crust and upper mantle. Along strike to the northeast, rocks similar to those of the eastern and western zones of the Lewis Hills are exposed in the Bay of Islands Ophiolite Complex and the Coastal Complex respectively. The Mount Barren Assemblage has not been previously described as part of the Coastal Complex and provides an important link between the Bay of Islands and Coastal Complexes. Detailed studies in the Lewis Hills permit fairly well constrained models to be constructed for

the kinematics and timing of processes during the evolution of oceanic fracture zones and the obduction of the Bay of Islands Complex.

"Transformed individuals make a transformed world"

-Celestial Seasonings Red Zinger Tea tag line-



Frontispiece : Ultramafic rocks (gold) of the northern Lewis Hills are thrust over Humber Arm Supergroup sediments (vegetated lowlands in foreground). Lewis Hill Peak (2673', highest point on the Island of Newfoundland) is on the skyline at the extreme left.

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