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Geology of the northern Lewis Hills, western Newfoundland

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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.

TABLE OF CONTENTS

	Page
ABSTRACT	1
LIST OF FIGURES	ix
LIST OF PLATES	xiv
LIST OF TABLES	xv
ACKNOWLEDGMENTS	xvii
CHAPTER I	
INTRODUCTION	1
A. Purpose	1
B. Organizaiton of the Text	7
C. Previous Work in the Lewis Hills	8
D. Field Work	13
E. Exposure	15
CHAPTER II	
REGIONAL GEOLOGY	17
A. History of Investigation	17
B. Autochthonous Rocks of the Western Platform	27
C. Allochthonous Rocks in the Bay of Islands Area	30
Humber Arm Allochthon	30
The Coastal Complex	33
Age of the Coastal Complex	35
Bay of Islands Ophiolite Complex	36
Age of the Bay of Islands Ophiolite Complex and Obduction	40
D. Neoautochthon	42
E. Hare Bay Allochthon	42
F. Summary	44
CHAPTER III	
THE LEWIS HILLS COMPARED TO THE OTHER EXPOSURES OF THE BAY OF ISLANDS OPHIOLITE COMPLEX	47
CHAPTER IV	
PETROGRAPHY	52
A. Introduction	52
B. Rocks of the Coastal Complex	54
Little Port Assemblage	54

	Page
1. Hornblende-gabbros and Meta-gabbros.	56
2. Diabase and metadiabase.	59
3. Porphyritic Diabase.	60
4. Late Hornblende-gabbro Body.	63
5. Quartz-diorite to Trondhjemite	64
6. Other Rock Types	65
Mount Barren Assemblage.	66
1. Amphibolites	66
2. Quartz-rich Rocks.	68
3. Gabbroic Gneisses.	68
4. Mafic Sheets	70
5. Migmatites	70
6. Pegmatite Patches and Sills.	71
Intrusive Peridotites of The LPA and MBA	72
1. Rocks in the Interiors of the Peridotite Bodies.	72
2. Marginal Areas	74
3. Ultramafic Apophyses	77
4. Late Shear Zones	77
C. Rocks of the Bay of Islands Complex	78
Basal Metamorphic Belt.	79
Harzburgite Tectonite	82
Dunites	84
Megalens Rocks.	87
D. Rocks Found in Both the BOIC and Coastal Complex.	91
Hornblende-microgabbro Dikes.	91
High Strain Zone Rocks.	93
E. Rocks in Structurally Lower Assemblages	97
Hines Pond Metagabbro	97
Fine-grained Amphibolites	98
Other Lithologies	100

CHAPTER V

THE COASTAL COMPLEX IN THE NORTHERN LEWIS HILLS.	101
A. Introduction.	101
B. Little Port Assemblage in the Northern Lewis Hills.	105
Gabbro and Metagabbro	106
Intrusive Rocks	106
1. Diabase Dikes.	106
2. Sheeted Diabase Dikes.	107
3. Quartz-diorite	112
4. Coarse-grained Gabbro and Pegmatite.	112
5. Peridotite Intrusions.	114
6. Porphyritic Diabase.	116
7. Hornblende-microgabbro Dikes	118

	Page
Serpentinite Mélange,	118
Metamorphic Foliations and Lineations	122
C. Mount Barren Assemblage	123
Introduction.	123
Unit 1.	125
1. Metagabbros.	125
2. Metadiabase.	126
3. Metamorphic Foliations and Lineations.	127
4. Metagabbro Screens	128
5. Mount Barren Area.	128
Unit 2.	131
1. Gabbroic Gneisses and Mafic Sheets.	131
2. Oblique Shear Zones.	139
3. Pegmatite Veins.	140
4. Joints and Fractures	146
5. Hornblende-microgabbro Dikes	146
6. Late High Strain Zones	148
Unit 3.	148
1. Migmatites Near the Pluton	148
2. Metasomatic Effects.	151
Unit 4.	151
1. Peridotite Intrusive Bodies.	151
2. Ultramafic Pluton.	153
a. Marginal Areas of the Ultra- mafic Pluton	157
b. Layering in the Ultramafic Pluton	160
c. Apophyses.	165

CHAPTER VI

DEFORMATION HISTORY OF THE COASTAL COMPLEX	166
A. Pure Shear versus Simple Shear Deforma- tion Models.	166
B. Reorientation of Dikes.	168
C. Lineations and Fold Axes.	176
D. Mesoscopic Foliations	178
E. Oblique Shear Zones	179
F. Late Joints, Dikes and Veins.	180
G. Summary and Discussion.	181
H. Monoclinial Flexure in Layering.	185

CHAPTER VII

BAY OF ISLANDS COMPLEX IN THE NORTHERN LEWIS HILLS.	188
A. Introduction.	188
B. Basal Metamorphic Belt.	191
Introduction.	191

	Page
Lithologies	192
Foliations	195
Tectonic Significance	196
Proliths	197
C. Basal Ultramafic Rocks	198
Basal Contact	198
Ultramafic Mylonites	198
Gabbroic Rocks	199
D. Harzburgite Tectonites	203
Lithologies and Structures	203
Origin of Layering	205
Harzburgite to Dunite Transition	207
E. Layered Tectonite Megalenses	209
Introduction	209
Lithologies	209
Layering	212
Gabbroic Sills	218
Layering at Cloud Mountain	219
F. Homogeneous Dunite Tectonites	222
Dunite	222
Chromite Layering	222
Dikes, Sills and Veins	223
G. Central Layered Megalenses	226
Lithologies and Layering	226
Plagioclase Grain Shapes	227
Gabbroic Sills and Veins	228
H. Cumulate Dunite	228
Shear Zones	229
Layering	230
I. Cumulate Layered Megalenses	230
Lithologies	230
Layering	231
Discordant Features	234
Layered Troctolite	234
J. Western Contact	235
Fragmental Cumulates	235
Wall Zone	238
K. High Strain Zones	239
High Strain Zones in Dunite and Layered Rocks	239
Amphibolitic High Strain Zones	244
Gabbros Along High Strain Zones	246

CHAPTER VIII

DEFORMATION HISTORY OF THE BAY OF ISLANDS COM- PLEX IN THE NORTHERN LEWIS HILLS	248
A. Deformation in the Layered Sequence	248
B. Macroscopic Folding	256
C. Geometry of High Strain Zones	258

	Page
 CHAPTER IX	
METAMORPHIC ROCKS IN THE WESTERN LEWIS HILLS, . . .	267
A. Introduction	267
B. Basis of Metamorphic Zonal Mapping	270
C. Description of Metamorphic Zones	274
Zone I.	274
Zone II	274
Zone III.	275
Zone IV	276
Zone V.	277
Zone VI	278
D. Mineral Changes Across Metamorphic Zones	279
Hornblende Color Variation	279
Plagioclase Composition Variation.	281
E. Discussion	281
Metamorphic Textures	282
Factors Controlling Recrystallization.	282
Pressure and Temperature of Metamorphism	284
Aureole Width.	286
Metamorphic History of the MBA	287
F. Relation to Ocean Floor Metamorphism	288
 CHAPTER X	
CHROMITE CONCENTRATIONS	291
A. Introduction	291
B. Types of Chromite Concentrations in the Northern Lewis Hills.	292
Type I.	293
Type II	296
Type III.	297
Type IV	298
 CHAPTER XI	
ALLOCHTHONOUS ROCKS BENEATH THE LEWIS HILLS KLIPPE	304
A. Allochthonous Sedimentary Rocks.	304
B. Ophiolite Mélange.	305
C. Hines Pond Metagabbro.	306
D. Other Allochthonous Assemblages.	309
 CHAPTER XII	
SUMMARY AND INTERPRETATION.	312

	Page
 CHAPTER XIII	
BAY OF ISLANDS COMPLEX TRANSITION ZONE AND PLATE ACCRETION MODELS.	321
A. Bay of Islands Complex Transition Zone and Constraints on its Origin	321
B. Implications for Plate Accretion Models	328
 CHAPTER XIV	
EVOLUTION OF OCEANIC FRACTURE ZONES	333
A. Introduction	333
B. A Model.	336
C. Oceanic Crust and Upper Mantle In and Adjacent to Fracture Zones.	346
Transform Complex.	347
Older Oceanic Crust Adjacent to the Transform Complex	347
Younger Oceanic Crust Adjacent to the Transform Complex	349
D. Discussion	350
 CHAPTER XV	
OBDUCTION HISTORY	354
A. Relative Age of Oceanic Crust Obducted	354
B. Age of Obduction	356
C. Obduction Deformation and Metamorphism	357
D. Obduction at Oceanic Fracture Zones. .	358
E. Discussion	358
 CHAPTER XVI	
COMPRESSSIONAL WAVE VELOCITY STUDIES OF LEWIS HILLS ROCKS	361
A. Introduction	361
B. Geologic Setting	363
C. Structure of the Lewis Hills	366
Western Zone	367
Central Zone	367
Eastern Zone	367
D. Petrography.	368
Ultramafic Rocks	369
Feldspathic Ultramafic Rocks	369
Gabbroic and Troctolitic Rocks	374
Hornblende-gabbros and Diabase	374
Quartz-diorites.	375
Gneisses and Amphibolites.	375

	Page
E. Method.	375
F. Results of the Velocity Measurements.	382
G. Anisotropy.	383
H. Cumulate Preferred Orientation and Velocity Anisotropy.	387
I. Velocity Structure of Oceanic Fracture Zones.	389
 BIBLIOGRAPHY.	 397
 APPENDIX I	
THE COASTAL COMPLEX, WESTERN NEWFOUNDLAND : AN EARLY ORDOVICIAN OCEANIC FRACTURE ZONE	 418
 APPENDIX II	
MINERAL CHEMISTRY OF SOME LEWIS HILLS ROCKS.	 468

LIST OF FIGURES

Figure Number	Page
1. Generalized Tectonic Map of Newfoundland	3
2. Topography of the Lewis Hills Area	12
3. Tectonic Map of Western Newfoundland	20
4. Geology of the Bay of Islands Area	23
5. Restored Generalized Stratigraphic and Structural Relations	26
6. Nomenclature of Allochthonous Rocks in the Bay of Islands Area	34
7. Generalized Columnar Section of the Bay of Islands Complex	38
8. Cross Section of North Arm Mountain	50
9. Rocks of the Little Port Assemblage	58
10. Porphyritic Diabase	62
11. Rocks of the Mount Barren Assemblage	69
12. Photomicrographs of Intrusive Ultramafic Rocks of the Coastal Complex	76
13. Photomicrographs of Bay of Islands Complex Rocks	86
14. Photomicrographs of High Strain Zone Rocks	95
15. Dikes and Foliations in the Coastal Complex	109
16. Lineations in the Coastal Complex	111
17. Pegmatite Vein in Quartz-Diorite/Diabase Contact Zone	113
18. Serpentinite Mélange	121
19. Complex Relations in Metagabbro Screen	130
20. Sheeted Metadiabase Dikes	130
21. Interlayered Quartz-Diorite and Metadiabase	133
22. Mafic Amphibolite Sheet in the MBA	133

Figure Number	Page
23. Secondary Metamorphic Layering in the MBA	138
24. Isoclinal Fold with Attenuated Limbs	138
25. Apparent 'Double-Fold' Structure in the MBA	142
26. Sketch of Pegmatite Patch and Associated Hornblendite	144
27. Hornblendite Veins Cutting Lineation in the MBA	144
28. Gabbroic Gneiss Cut by Large Hornblende Porphyroblast	145
29. Hornblende-Microgabbro Dike Cuts Gneisses	147
30. Sketch of Outcrop Relations in Migmatites	150
31. Feldspathic Lherzolite	156
32. Surface of Feldspathic Lherzolite	156
33. Peridotite Intrudes Lineated Gneiss	158
34. Lherzolite Dike	159
35. Wall Zone of the Peridotite Pluton	162
36. Sketch of Outcrop Relations in Peridotite Wall Zone	162
37. Layering in the Interior of the Peridotite Pluton	164
38. Models for the Deformation of the Mount Barren Assemblage	170
39. Fields of Shortening and Elongation of Dikes in a Pure Shear Model	172
40. Fields of Shortening and Elongation of Dikes in a Simple Shear Model	174
41. Displacement Across the MBA	183
42. Schematic Block Diagram of the Structure of the Coastal Complex	187
43. Gabbroic Dikes in Harzburgite Tectonites South of Hines Pond	201

Figure Number	Page
44. Crosscutting Relations Between Layering and Orthopyroxenite Veins	201
45. Layered Megalens North of Hines Pond	211
46. Folded Anorthosite and Dunite in Megalens Rocks	211
47. Deformed Layered Clinopyroxenite and Dunite	215
48. Streaky Plagioclase-rich Layering	215
49. Deformed Small Scale Layering in Dunite and Clinopyroxenite	217
50. Fabric of Cloud Mountain Olivine Gabbro	221
51. Crosscutting Wehrlite Dikes in Dunite	225
52. Folded Cumulate Layering in a Central Megalens	225
53. Layered Olivine Gabbro and Troctolite	233
54. Fragmental Cumulates of the Western Contact Area	236
55. Anastomosing Shear Zones in High Strain Zone Rocks	242
56. Strong Stretching Lineation in High Strain Zone Rocks	242
57. Polish Slab of High Strain Zone Rock	245
58. Preferred Crystallographic Orientation of Minerals in Cumulate Rocks	254
59. Lineations Outside the High Strain Zones	260
60. Lineations in Subareas North of Hines Pond	262
61. Macroscopic Structures in the Lewis Hills	266
62. Metamorphic Zones in the Western Lewis Hills (in pocket)	266
63. Discontinuous Chromite Layering	294
64. Transposed Chromitite and Dunite	300

Figure Number	Page
65. Isoclinally Folded Chrome-rich Gabbro	300
66. Irregular Masses of Chromitite	302
67. Pre-Obduction Setting of the Humber Arm and Hare Bay Allochthons	314
68. Bay of Islands Complex Transition Zone Columnar Sections	325
69. Plan View of Ridge/Transform Geometry	335
70. Cross Sections of the TFZ and NTZ Regions of an Oceanic Fracture Zone	338
71. Correlation Between the Velocity Structure of Oceanic Crust and Upper Mantle and the Structure of Ophiolite Complexes	365
72. Plot of Compressional Wave Velocity vs. Density	377
73. Schematic Block Diagram of the NTZ Region of an Oceanic Fracture Zone	391

Appendix 1

1. Model of Geometric and Geologic Evolution of a Ridge/Ridge Transform and its NTZ Continuation	424
2. Tectonic Setting of the Bay of Islands Ophiolite Complex and the Coastal Complex of Western Newfoundland	433
3. Generalized Geology of the Bay of Islands Area	436
4. Restored Generalized Stratigraphic and Structural Relations of Upper Precambrian to Middle Ordovician Rocks of the Bay of Islands Area	439
5. Generalized Structural Sections of the Trout River Area and the Lewis Hills Area	443
6. Possible Present Day Analogs and a Possible Palinspastic Reconstruction of the Bay of Islands Area During Tremodocian Time	459

7. Two-Dimensional Model for the Obduction of the Bay of Islands and Coastal Complexes 462 & 463

Appendix 2

1. CaMg-CaFe-Fe-Mg Plot for Minerals in MBA Metamorphic Rocks and Other Low Pressure Metabasites 471
2. CaMg-CaFe-Fe-Mg Plot for Minerals in MBA Peridotite and Other Peridotites and Lewis Hills Dunite and Hbl-Microgabbro 472

LIST OF PLATES

Plate Number

- I. Lithologic Layering and Minor Intrusive Bodies in the Northern Lewis Hills
- II. Shear Zones in the Northern Lewis Hills
- III. Lineations and Fold Axes in the Northern Lewis Hills
- IV. Structural Cross Sections of the Northern Lewis Hills
- V. Compressional Wave Velocities of Mafic and Ultramafic Rocks in the Northern Lewis Hills

All plates are located in the pocket in the back cover of this dissertation.

LIST OF TABLES

Table Number	Page
I. Abbreviations Used in the Text	53
II. Mineralogy of Rocks in the LPA	55
III. Mineralogy of Rocks in the MBA	67
IV. Mineralogy of Intrusive Ultramafic Rocks	73
V. Mineralogy of the Basal Metamorphic Belt Rocks	80
VI. Mineralogy of the Ultramafic Tectonites and Related Rocks	83
VII. Mineralogy of Megalens Rocks	89
VIII. Mineralogy of Hornblende-microgabbro dikes	92
IX. Mineralogy of Rocks of the Structurally Lower Assemblage	99
X. Symbols, Definitions and Relative Chronology of CC Structures	124
XI. Symbols, Definitions and Relative Chronology of BOIC Structures	193
XII. Petrography and Extent of Metamorphic Zones of the CC	272
XIII. Progressive Mineral Changes in the LPA and MBA	280
XIV. Relative Chronology of Geologic Events in the Northern Lewis Hills (in pocket)	
XV. Petrography of Compressional Velocity Samples	370
XVI. Compressional Wave Velocities for Mafic and Ultramafic Rocks of the Lewis Hills	378
XVII. Density and Velocity Ranges and Means of Major Rock Groups in the Lewis Hills	381
XVIII. Maximum and Restored Horizontal Plane Anisotropy	384

APPENDIX 2

I. Petrography and Setting of Electron Micro- probe Samples	469
II. Major Element Analysis of Lewis Hill Samples	470

ACKNOWLEDGMENTS

During the period of time that was spent working on this dissertation I have had the help, advice and support of a great number of individuals. To acknowledge all of the friends and colleagues who contributed to this work would require another hundred pages or more. The project would have been impossible without the cooperation of some of these people and I would like to acknowledge them.

Norman Burr, Art Edelstein and Suzanne O'Connell served as my field assistants in the Lewis Hills and deserve special thanks. They helped me faithfully through rain, sleet, snow and fog without complaints. Charles and Robert Lockyer of Corner Brook provided me with all types of supplies. Newfoundland Air Transport delivered supplies, mail, and my camp to the Lewis Hills despite tricky winds that cost them a float plane in 1975 at Hines Pond.

While working at Lamont-Doherty Geological Observatory in February 1977, Dr. Ed Schreiber and Tony Lomando taught me the art of compressional wave velocity measurement. Ed and Charlotte Schreiber's hospitality and encouragement got me through my long days and nights work in the mineral physics lab. Al Hajek helped prepare the rock samples for this work and provided his special talents for keeping all sorts of apparatus in running condition for me at SUNYA.

Dr. S. E. DeLong and Jerry Sullivan prepared samples and performed electron microprobe analysis on a number of my rock samples. The data is located in appendix 2. Dr. DeLong help-

ed me with data reduction and calculator programming for the probe data and compressional velocity data.

I would also like to acknowledge the following individuals for their helpful discussions during my research : Dr. A. R. Berger, Mr. J. Casey., Dr. S. E. DeLong, Dr. J. F. Dewey, Mr. W. J. Gregg, Dr. P. J. Fox, Dr., W, S, F. Kidd, Dr. W. D. Means, Dr. B. W. Nisbet, Ms. S. O'Connell, Dr. G. W. Putman, Dr. E. Schreiber, and Dr. T. Shibata. Drs. Bursnall, DeLong, Dewey, Fox and especially Dr. Kidd read this text critically and made mant suggestions that have improved it greatly.

Dr. J. F. Dewey introduced me to the problem and provided encouragement and stimulating ideas especially through the final stages of the study when he and I coauthored the publication found in appendix 1.

Financial support for this project came from NSF grant number EAR 76-14459.

Ms. Sally Spydell and Ms. Cindy Barcomb typed the bulk of the final text of this dissertation. Ms. Mary Regan typed figure captions and all sorts of odds and ends. Ms. Linda Schroll and Ms. Terri VanDerwerken also helped with the tables and the first draft.

Finally, I would like to thank all those mentioned above, the SUNYA geology graduate students, all my friends and especially Mary Grauerholz for all their companionship and support.