This pdf file consists of figures containing photographs, and their captions, scanned from Vol 1 of:

THE GEOLOGY OF THE SOUTHERN PART OF THE NORTH ARM MOUNTAIN MASSIF, BAY OF ISLANDS OPHIOLITE COMPLEX, WESTERN NEWFOUNDLAND WITH APPLICATION TO OPHIOLITE OBDUCTION AND THE GENESIS OF THE PLUTONIC PORTIONS OF OCEANIC CRUST AND UPPER MANTLE

by

John F. Casey

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 Science and Mathematics

Department of Geological Sciences

1980

-- To those whose attention has never been called to the former changes in the earth's surface which geology reveals to us, the position of land and sea appears fixed and stable. . . . . In every century the lands in some parts (of the Globe) are raised and in others depressed, and so likewise is the bed of the sea.

Sir Charles Lyell, 1875, p. 253

Sunset over Sandy Pond on the
North Arm Mountain Massif

Figure 3D - Vertical mélange zone marking the contact between the North Arm Massif (right) and the Skinner Cove Assemblage (left). Outcrop is located along the Gulf of St. Lawrence north of lower Berth Cove.

Figure 3E - Mafic volcanics showing evidence of weathering with red hematite staining along joint surfaces (lower Crab Brook).

Figure 3F - Thoroughly weathered coarse gabbro approximately 7 meters below the paleo-erosion surface. Mafic phases have undergone total disintegration to clay minerals and exhibit a deep red hematitic color.

Figure 3G - Thoroughly weathered and in situ brecciated coarse gabbro. Matrix zones consist of residual products of intense weathering of the gabbro. Clasts are monomict and can be matched across the matrix zones. Outcrop lies just below the paleo-erosion surface.

Figure 3H - Sedimentary breccia contain weathered basalt and diabase clasts with red hematitic weathering rinds up to 2 cm thick. (Crab Point Formation).

Figure 3I - Unsorted sedimentary breccia containing large blocks up to 1/2 meter in diameter as well as small fragments. Blocks and clasts are dominantly gabbro with some small fragments of diabase and trondjhemite (Crab Point Formation).

Figure 3J - Unsorted polymictic breccia containing clasts of trondjhemite, gabbro (light-colored fragments), basalt and diabase (darker fragments) (Crab Point Formation).

Figure 3K - Polymictic breccia containing clasts of diabase, basalt, trondjhemite gabbro and red sandstone (adjacent to lens corner) (Crab Point Formation).

Figure 3L - Polymictic breccia containing clasts of diabase, basalt, foliated amphibolite and large block of serpentinized peridotite (right center) (Crab Point Formation).

Figure 3M - Block of spheroidally weathered pillow basalt found within red shale near Crab Point.

Figure 3N - Severely weathered pillow basalt with concentric manganese banding (same locality as above).

Figure 30 - Typical red shale with green shale laminae (Jaws Brook Formation).

Figure 3P - Interbedded green to grey shale and finely cross-laminated buff weathering calcareous siltstones. Note disruption of one of the siltstone beds (Jaws Brook Formation).

Figure 3Q - Pebbly mudstone containing green siltstone and shale fragments (Jaws Brook Formation).

Figure 3R - Highly contorted and twisted beds of brown and green shale (Jaws Brook Formation).

Figure 3S - Isolated blocks of massive buff brown weathering grey mudstone in a grey shaly matrix (Jaws Brook Formation).

Figure 3T - Volcanic block in shale west of Buck Head, note vesicle trains and white calcite vein fill; typical of the Skinner Cove volcanics (Jaws Brook Formation).

Figure 3U - Massively bedded and friable purplish red calcareous sandstones of the Summerhouse Brook Formation (west of Buck Head).

Figure 3V - Pebbly purplish-red sandstones, containing fragments of hematized mafic volcanics (Summerhouse Brook Formation).

Figure 5A - Mesoscopic-scale isoclinal folds (F_1) affecting compositional layers (S_o) of harzburgite (light spotted brown), dunite (light yellow-brown), and orthopyroxenite (dark brown). Note layer thinning and attenuation along fold limbs and thickening of the hinge areas. Crosscutting synkinematic (S_2) and post-kinematic (S_3) pyroxenite and dunite veins crosscut layering and fold structure.

Figure 5B - Isoclinally folded dunite (S_2) (light brown) vein cutting harzburgite. The vein has been essentially transposed into parallelism with the foliation S_1 and main compositional layering (S_o) which lies parallel to the pencil in the above photograph. Deformed dunite vein in turn has been crosscut by numerous thin mostly undeformed orthopyroxinite veins (S_3) (dark brown).

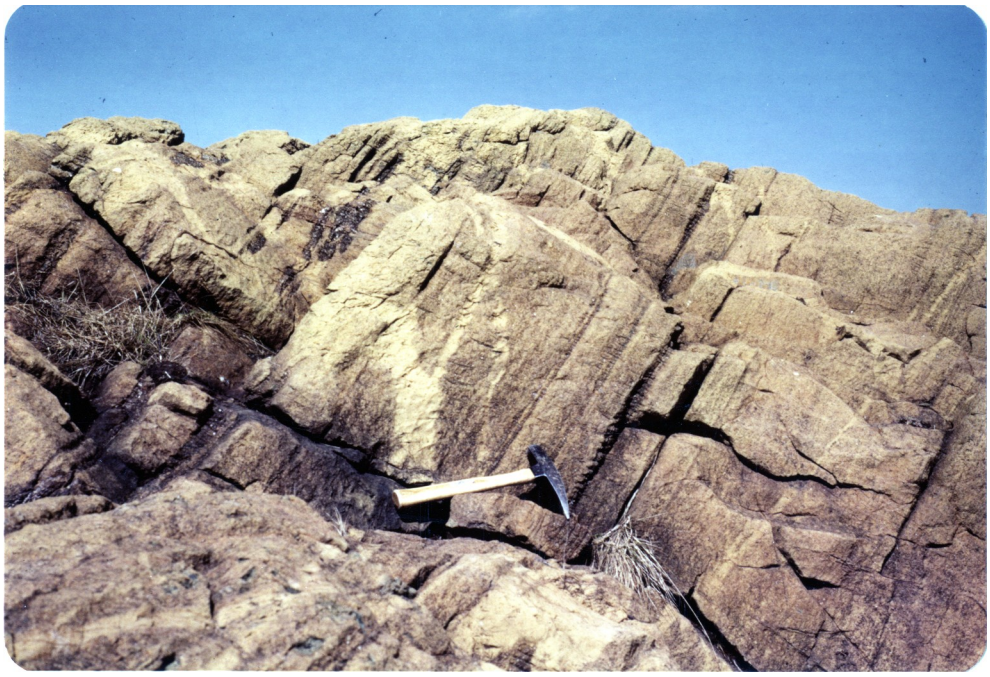

Figure 5C - Outcrop showing main compositional layering (S_o) oriented parallel to the dominant foliation S_1. Layers consist of harzburgite (brown) with varying modal proportions of olivine and pyroxene and some orthopyroxenite (dark brown) which have been crosscut by numerous branching post-kinematic dunite veins and dikes.

Figure 5D - Randomly oriented undeformed dunite veins and dikes crosscutting harzburgite tectonites.

Figure 6A - Undeformed dunite vein crosscutting feldspathic dunite and wehrletic dunite layers.

Figure 6B - Folded clinopyroxinite vein crosscutting wehrlite country rock which has a strong foliation parallel with the axial surface of folds affecting the veins.

Figure 6C - Typical outcrop of the transition zone. Outcrop consists of interlayered anorthosite and dunite. Note non-gradational nature of contacts.

Figure 6D - Typical outcrop or the base of the Layered Gabbroic unit. Outcrop consist dominantly of undeformed igneous layers of melanocratic olivine gabbro, anorthosite and luecogabbro.

Figure 6E - Thin diabase dike cutting layered gabbros, anorthosites, and troctolites.

Figure 6F - Large diabase xenolith enclosed in massive isotropic gabbro found approximately 200 meters below the diabase/gabbro contact.

Figure 6G - Medium-grained diabase xenolith heavily veined prior to stoping and incorporation coarse isotropic gabbro xenolith is approximately 30 meters below diabase/gabbro contact.

Figure 6H - Thin diabase dike crosscutting trondhjemite body which itself encloses xenoliths of diabase, amphibolite and gabbro.

Figure 6I - Accumulation of diabase xenoliths at the apparent base of a large quartz diorite - trondhjemite stock that intrudes isotropic gabbro.

Figure 6J - Coarse isotropic gabbro xenolith accumulations in trondhjemite body.

Figure 6K - Mylonitized gabbro xenoliths in trondhjemite.

Figure 6L - Resorbed xenoliths of diabase in quartz diorite.

Figure 6M - Typical outcrop of gabbro diabase transition unit Fine-grained diabase dike with strongly chilled margin intruding gabbro.

Figure 6N - Isoclinal fold (F_1) that appears to refold an earlier generation fold (F_0). Outcrop consists of interlayered dunite and clinopyroxinite.

Figure 6O - Folded anorthositic, troctolitic and olivine gabbroic layers of the transition zone. Fold closure is angular and contains minor folds in the hinge area. Mineral foliation is axial planar.

Figure 6P - Rounded fold closure described by thick massive clinopyroxinite layer surrounded by wehrlite.

Figure 6S - Folded and boudinaged clinopyroxenite layers and dunite layers. Ellipsoidal boundaries of clinopyroxinite have their long dimensions sub-parallel to the fold hinge line.

Figure 6T - Syn-kinematic folded dunite vein crosscutting hinge area of isoclinal fold in wehrlitic dunite country rock.

Figure 6U - Synkinematic troctolite vein crosscutting fold closure in interlayered clinopyroxinite and dunite country rock. Troctolite possesses a strong foliation described by the preferred dimensional orientation of olivine grains.

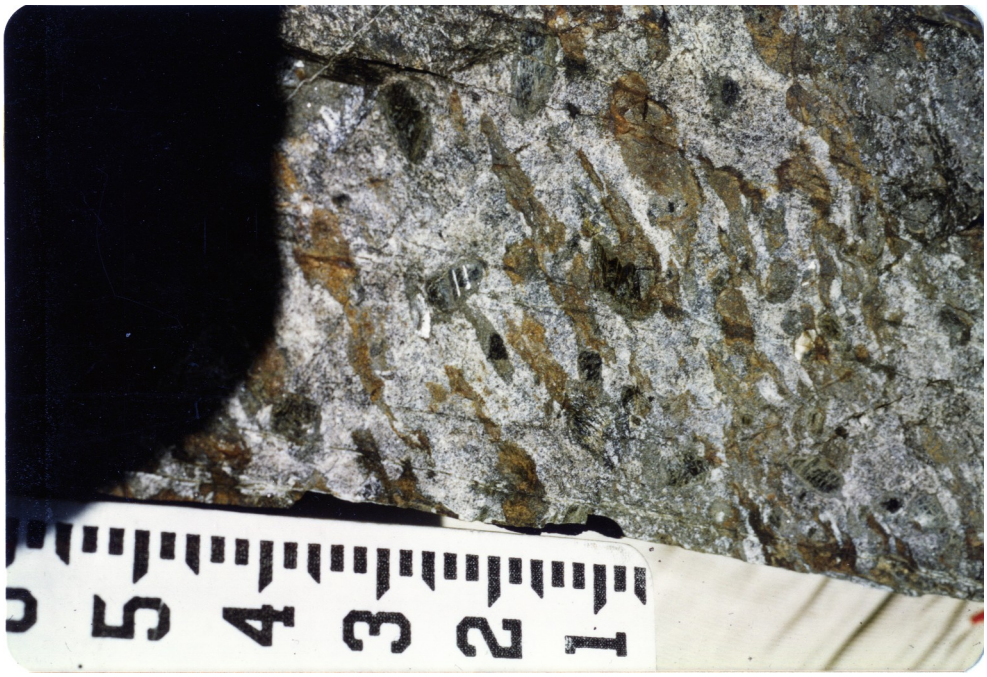

Figure 6V - Strongly lineated gabbroic gneiss from high strain zone southeast of Liverpool Brook.

Figure 6W - Mylonitized gabbro from isotropic gabbro unit with strong foliation trending from upper left to lower right corner of photograph. Mylonite zone is crosscut by undeformed fine grained diabase dike.