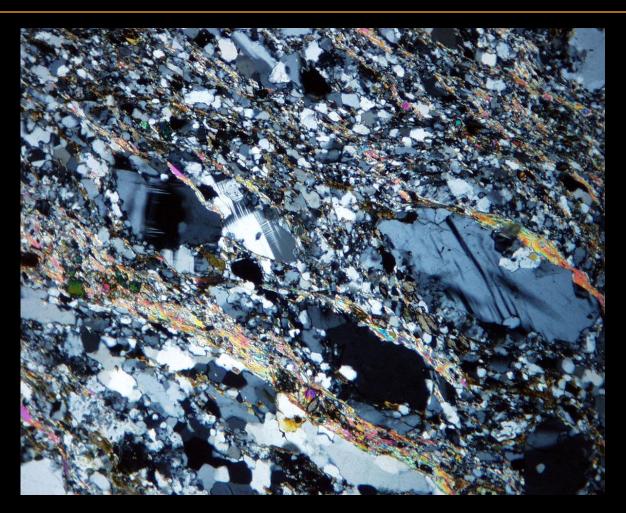
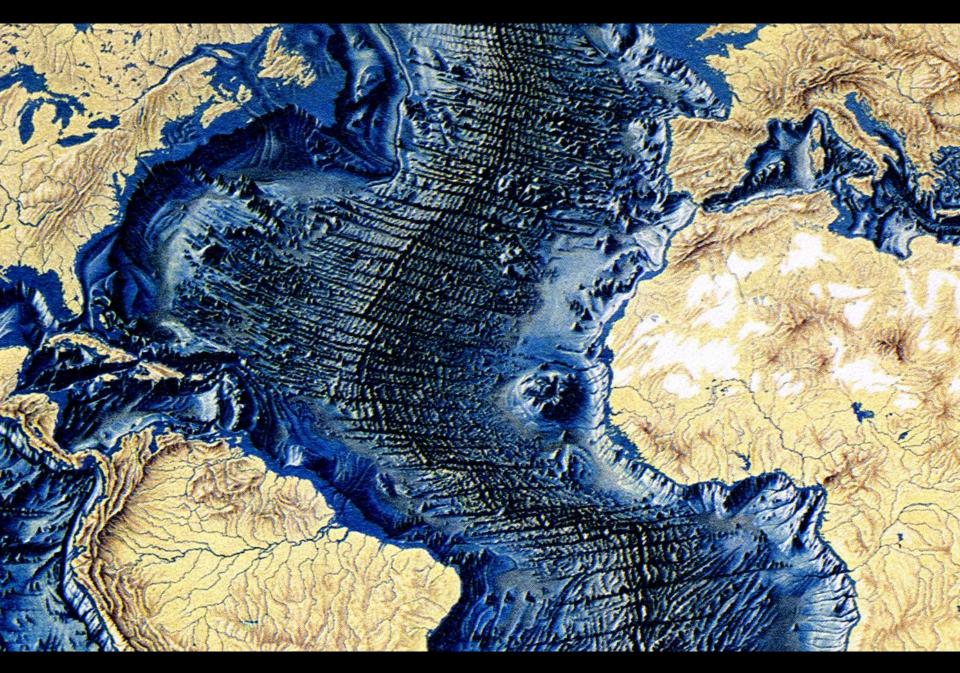
Aldrich Museum

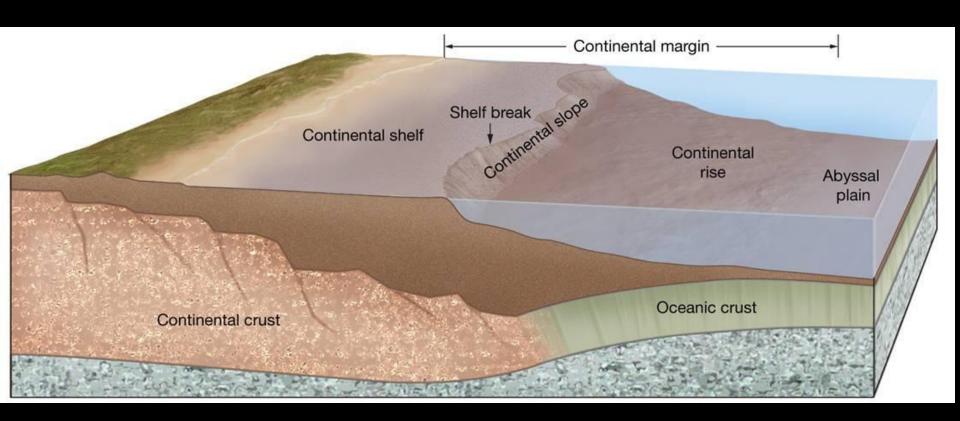
The Science Behind Cameron's Line

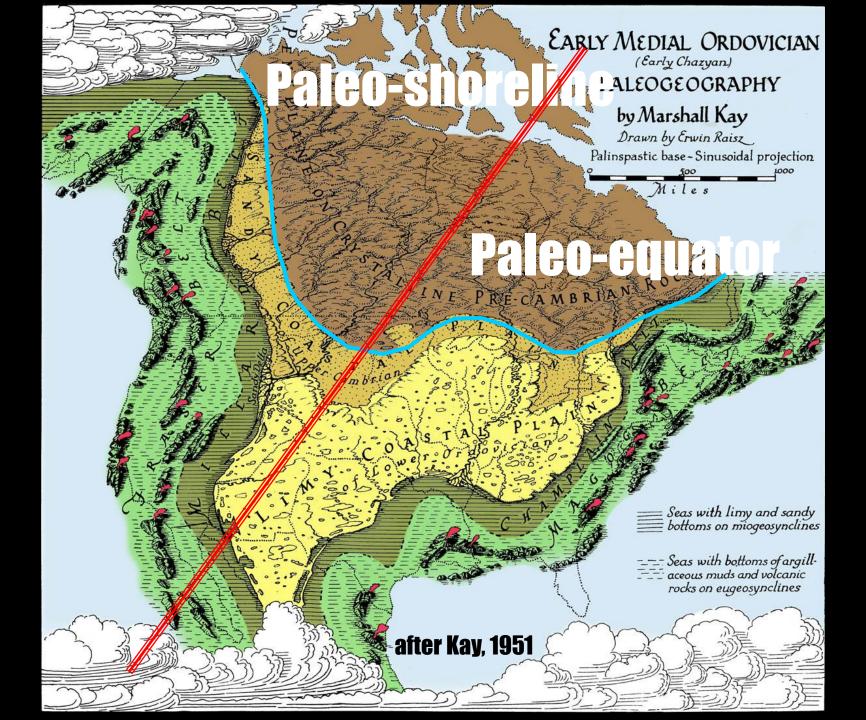


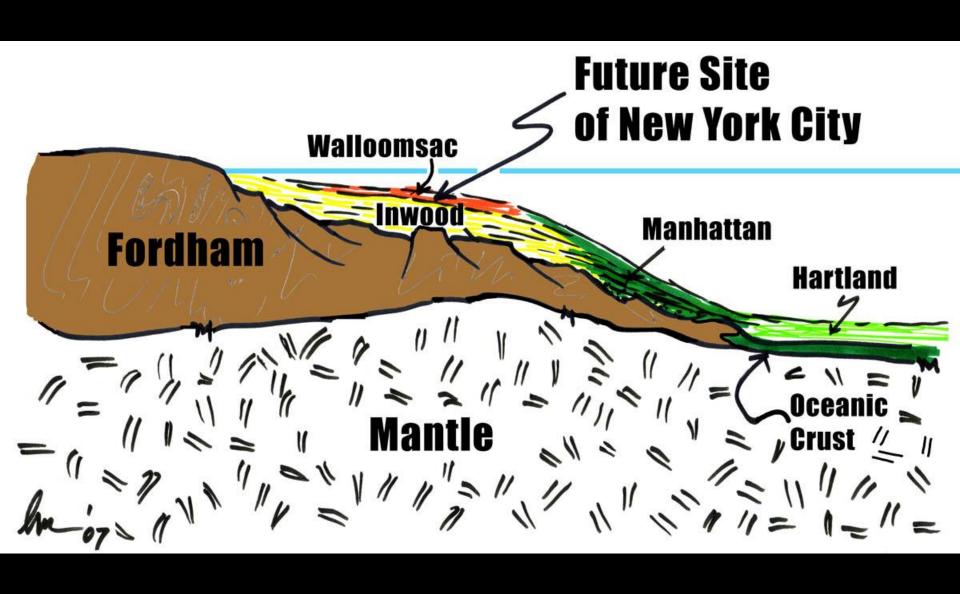


Marie Tharp 1969

Modern Passive Continental Margin



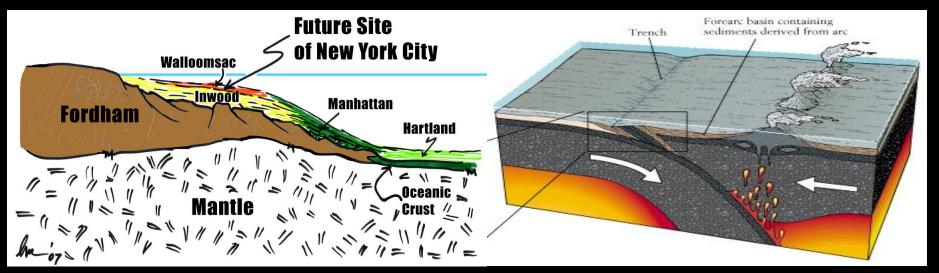




~ 450 Ma Taconian Arc – Passive Margin Collision











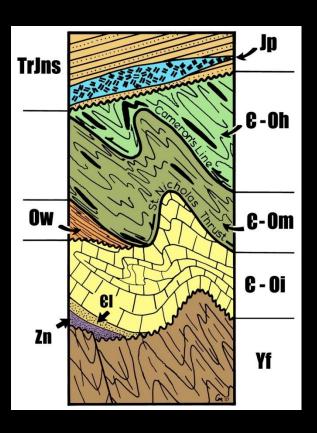
Merguerian Has Spent Most of his Career Mapping the Surface and Subsurface Geology of NYC

> Proper Field Attire For NYC

O-Ch Hartland Formation and Manhattan Schist (upper unit) WESTCHESTER COUNTY Omm Manhattan Schist (middle unit) Oml Manhattan Schist 0-Eh (lower unit) 0-Ei Inwood Marble HARTLAND TERRANE Fordham Gneiss (HUTCHINSON RIVER GROUP Yonkers Gneiss 0-€h Long Island Sound River 0-€ East TERRANE 0-Eh

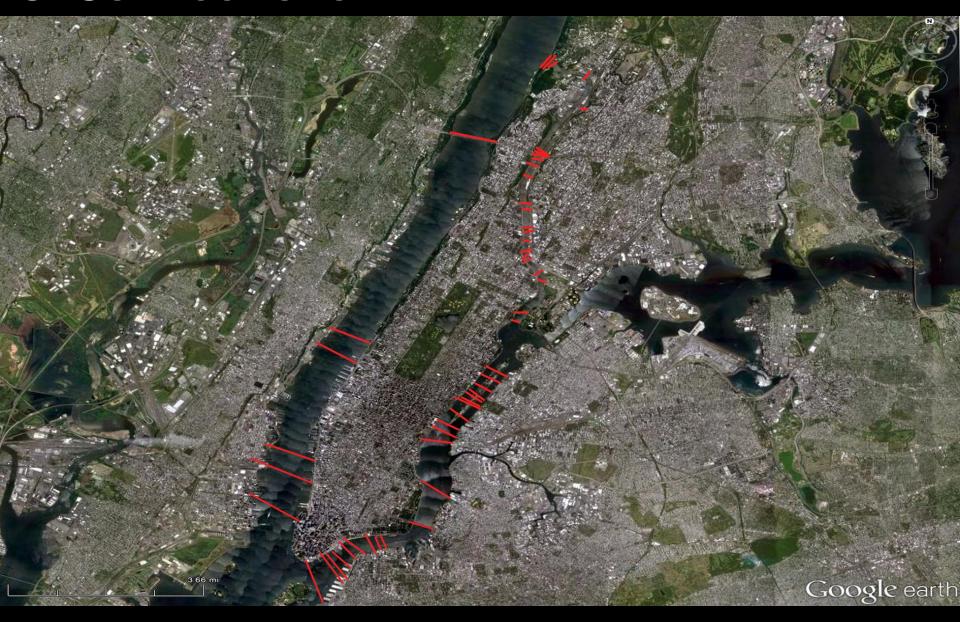
Hudson River O-Ch O-Ci O-Ci O-Ci O-Ci O-Ci O-Ci O-Ch St. Nicholas thrust O 0.5 1 2 KILOMETER

New York City



Merguerian, 2001

51 Connections



Modern Excavation Methods





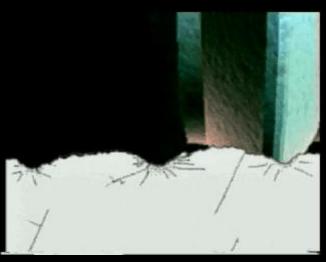


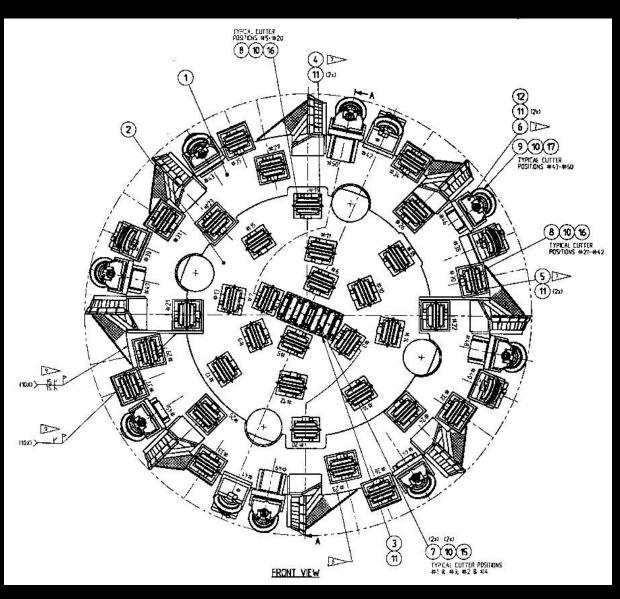




TBM Chip Production









Queens Tunnel TBM 422 HP Electric Water Cooled, Three Phase Motors

10 Motors Total
Usually 8 Online
Rotated Cutterhead
at 8.3 Rev/Min



New Research TBM Cutter Head Torque Dynamics















Unforseen Tunneling Problems

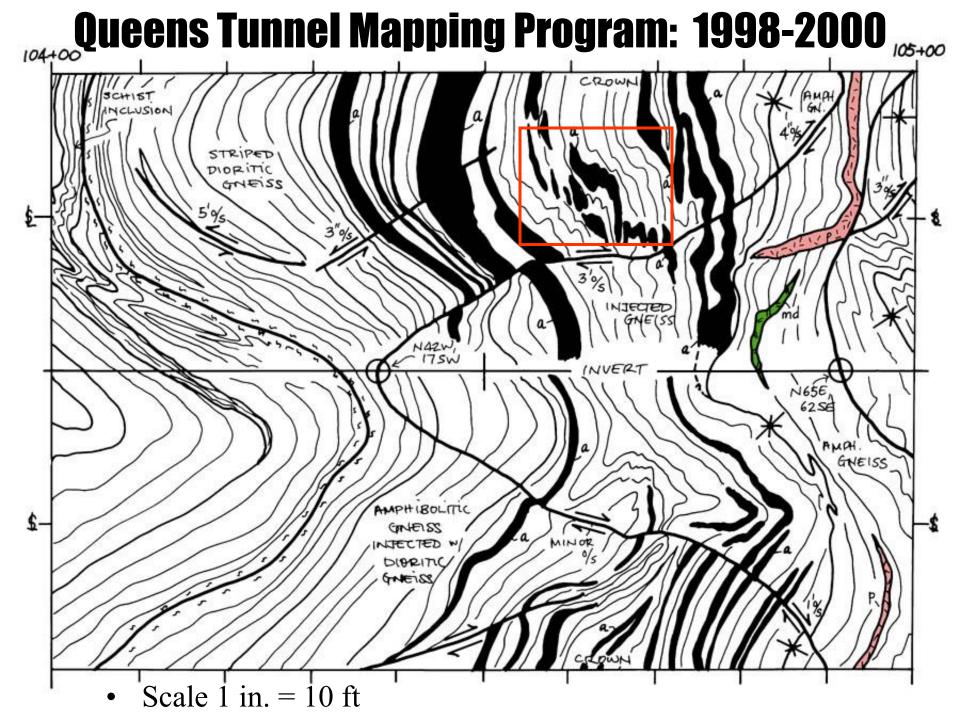




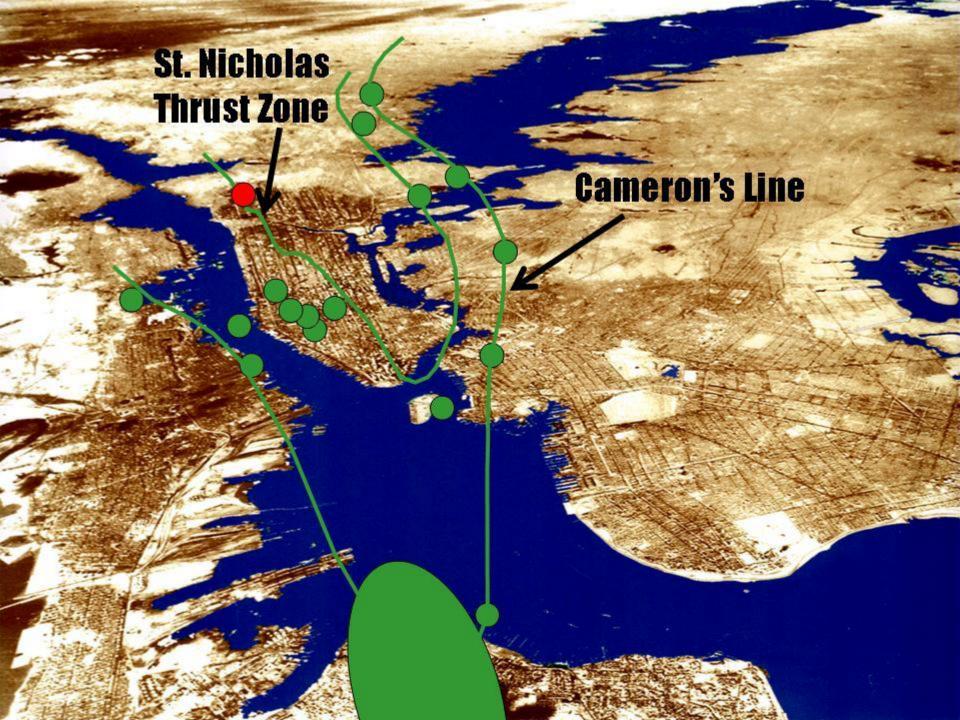


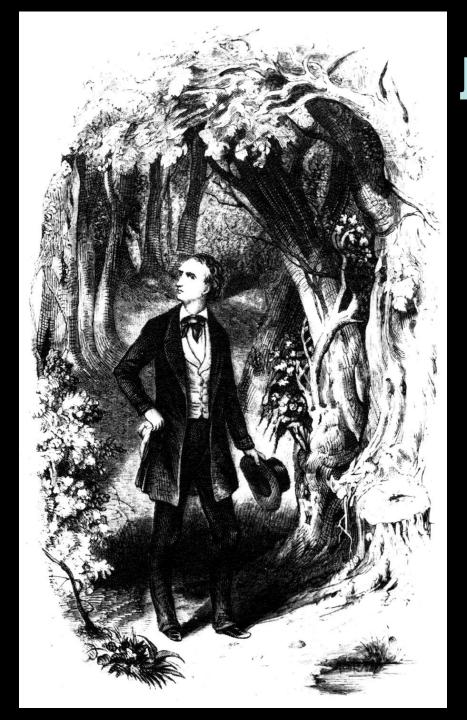


Merguerian's Queens Tunnel Field Office



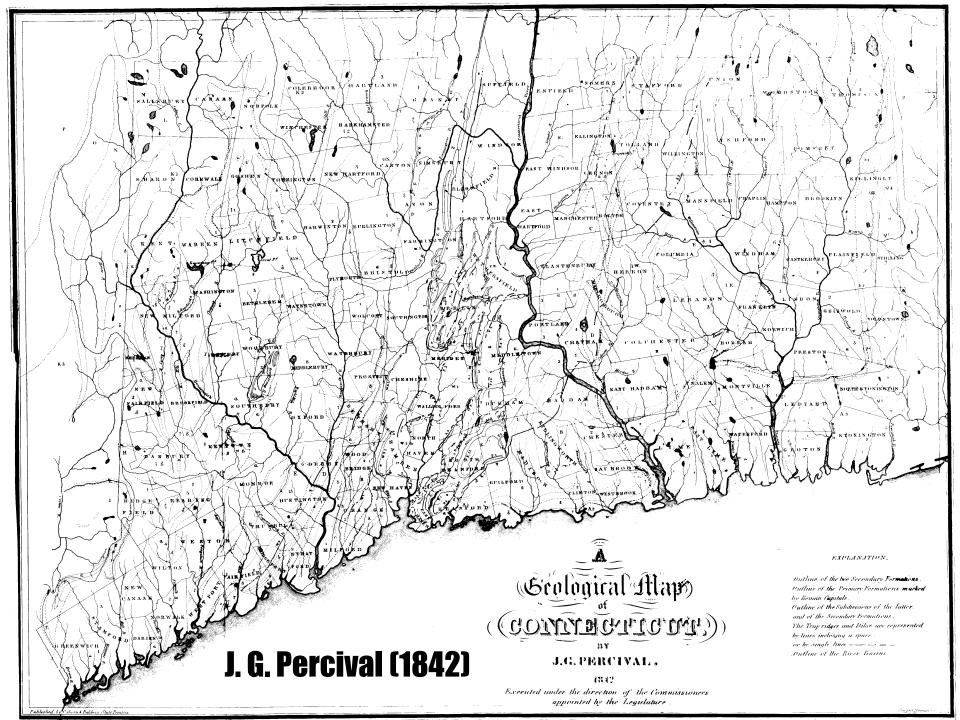






James Gates Percival [1795-1856]

Geologist Naturalist Smart Guy Linguist





Dr. Eugene Cameron

Economic Geologist University Wisconsin

"I don't know why
they called it
Cameron's Line —
It was John Agar
Who told me about it"

State of Connecticut

State Geological and Natural History Survey Bulletin No. 84

Explanatory Text for Preliminary Geological Map of Connecticut, 1956

John Roders, Ph.D., Yale University

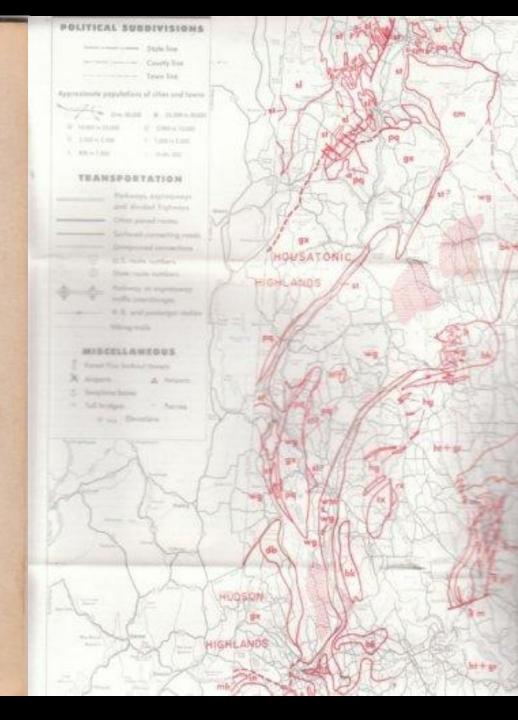
Borest M. Gates, Ph.D., University of Wisconsin

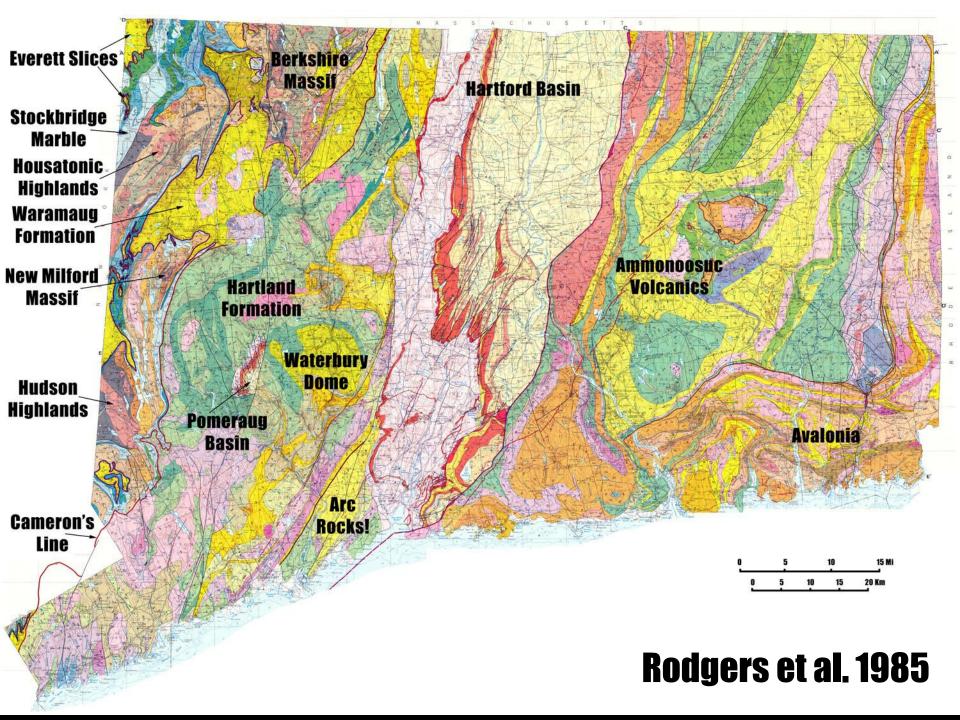
John L. Rosenfeld, Ph.D., University of California, Los Angeles



STORRS

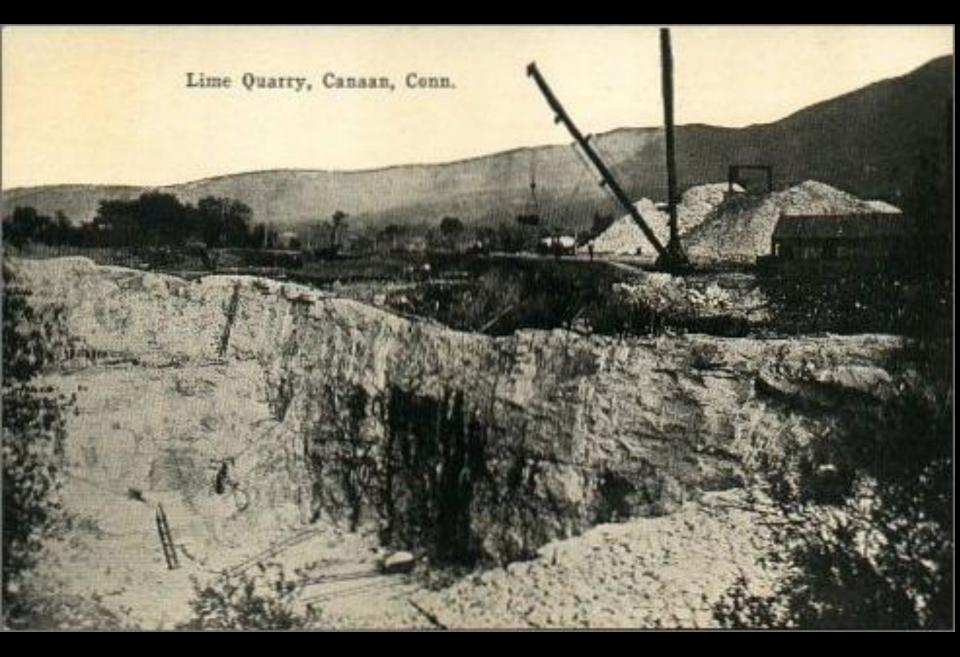
Printed for the State Geological and Natural History Survey
1959







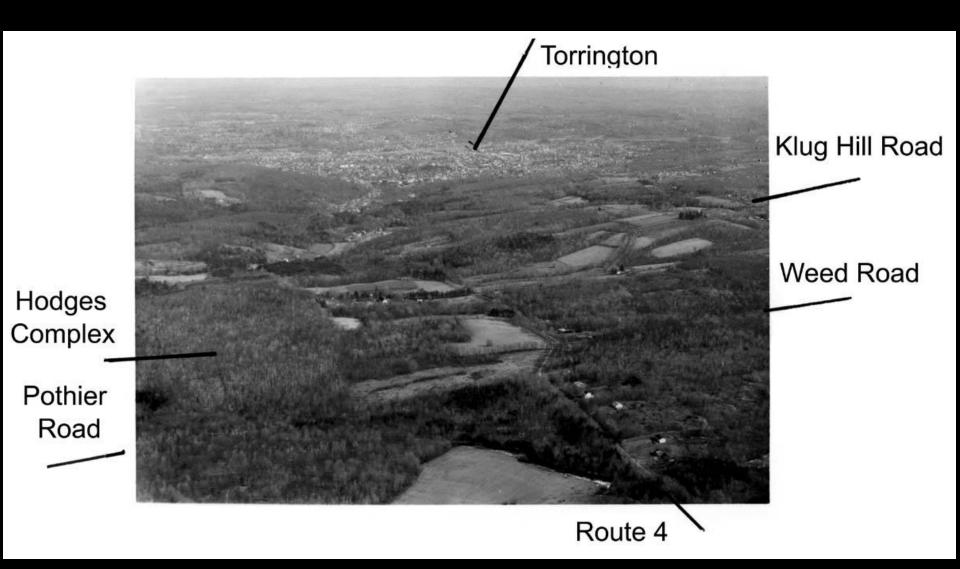




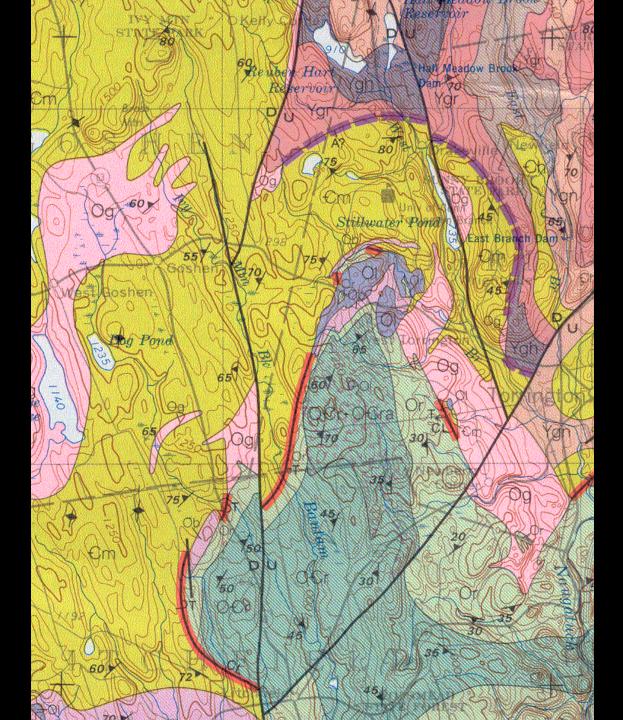
Lime Quarry, Canaan, CT

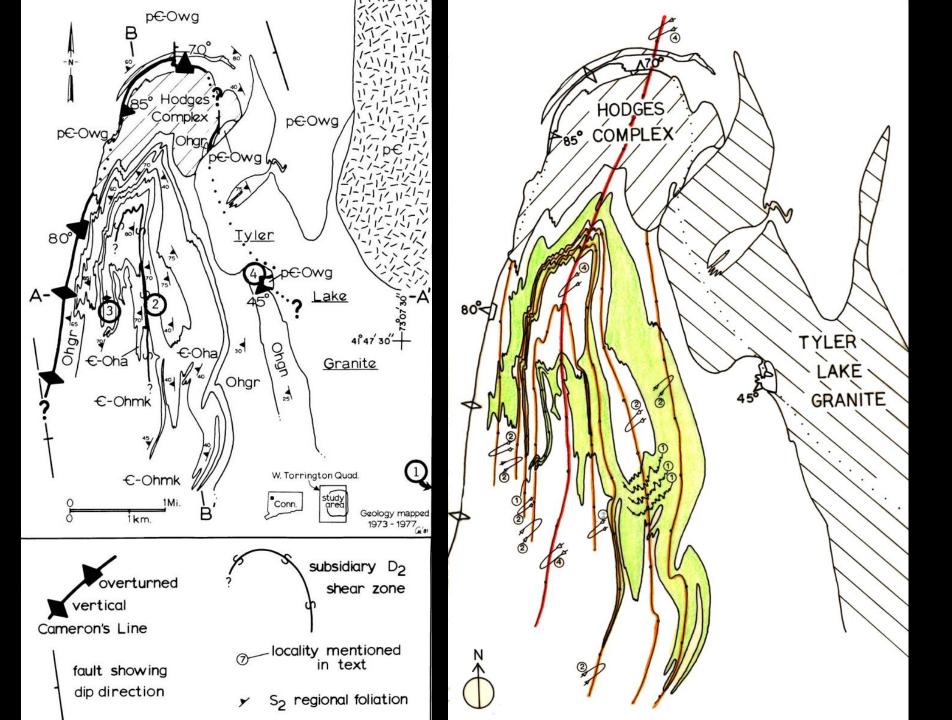


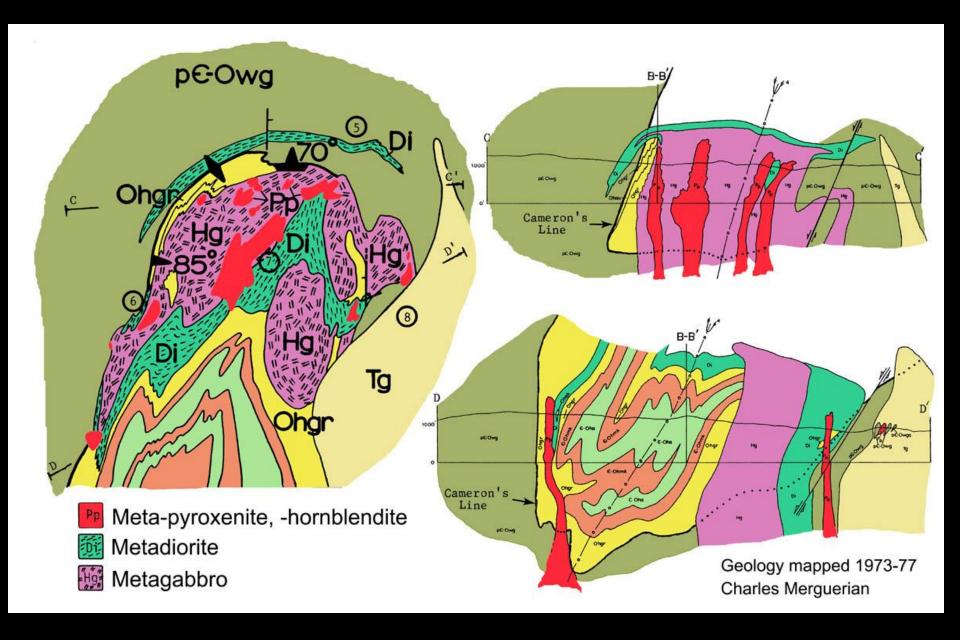
Hodges Nickel Mine, West Torrington, CT



Hodges Complex



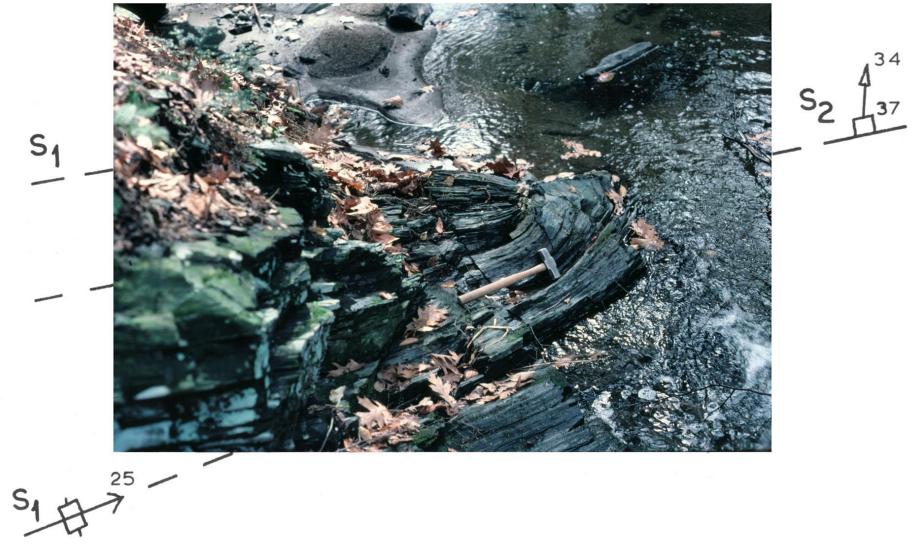




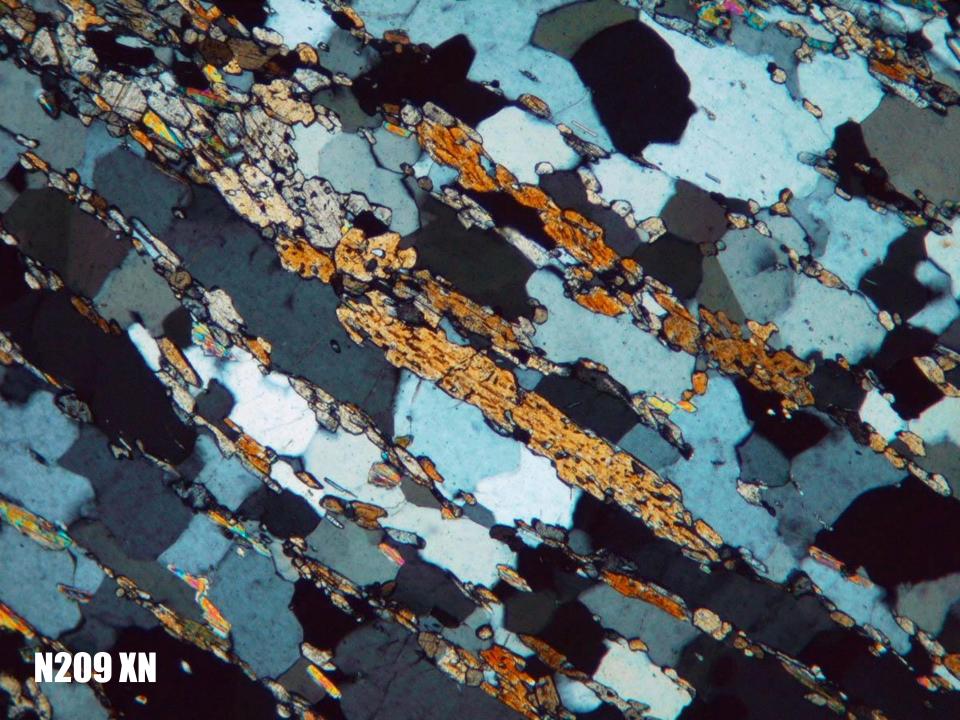


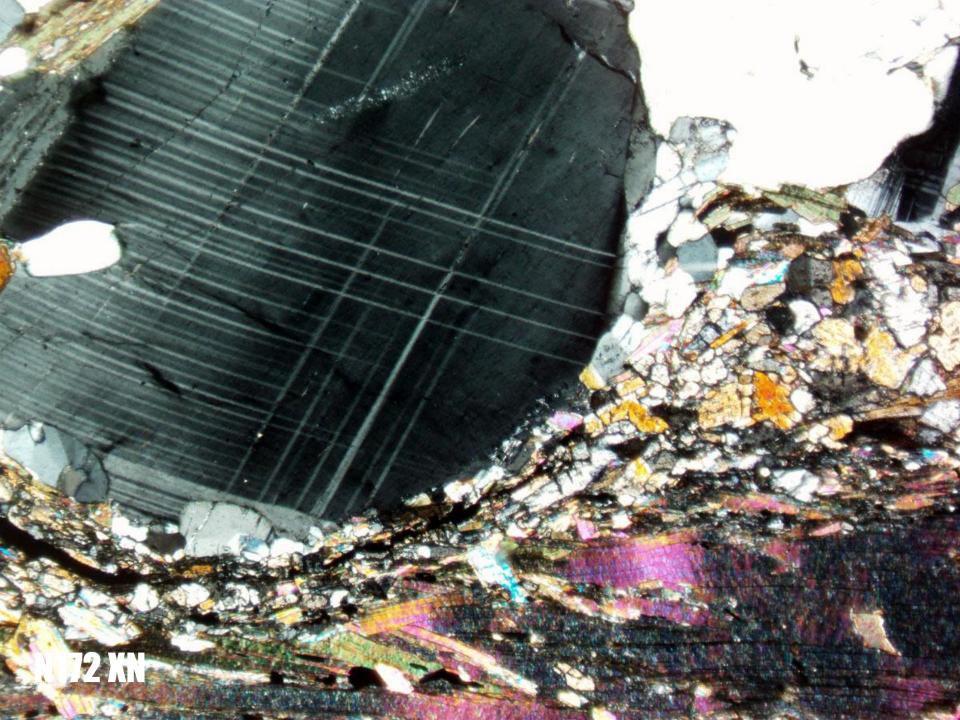


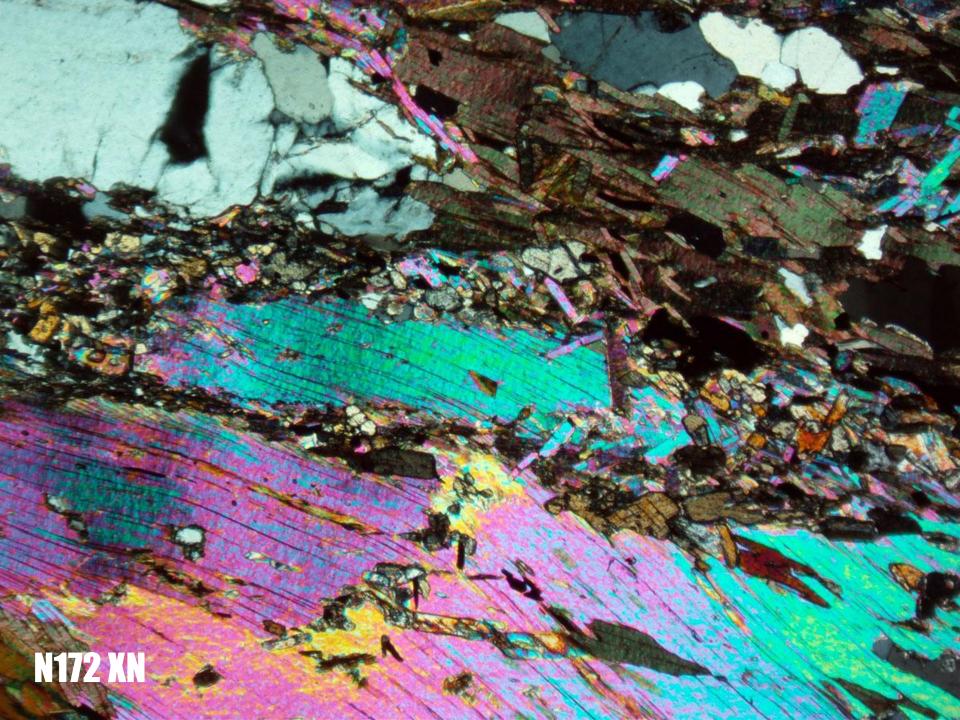




S₂



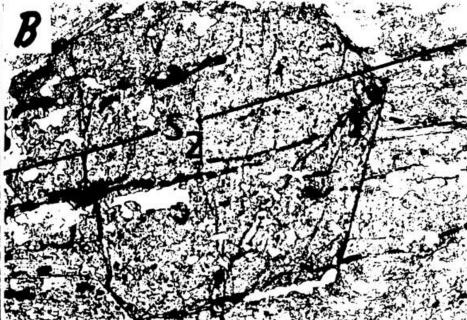






Hodges Contact Aureole





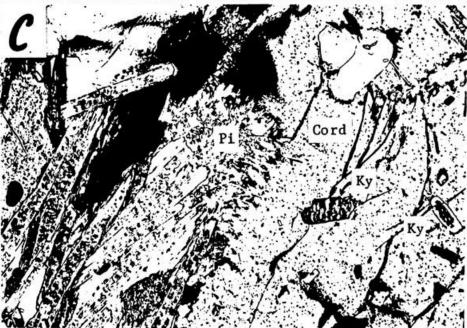
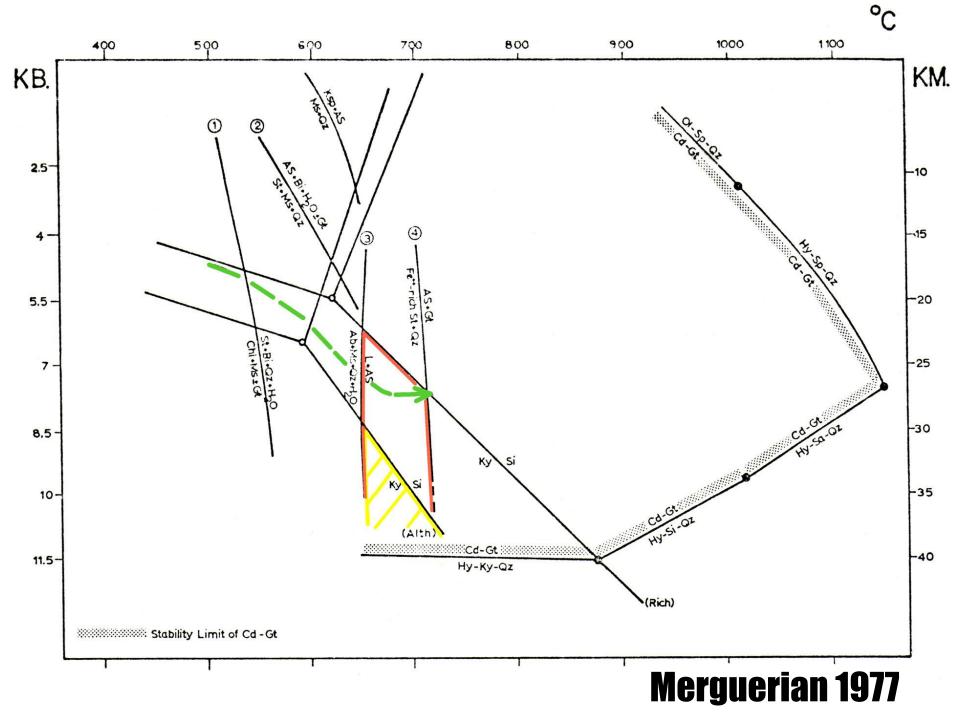
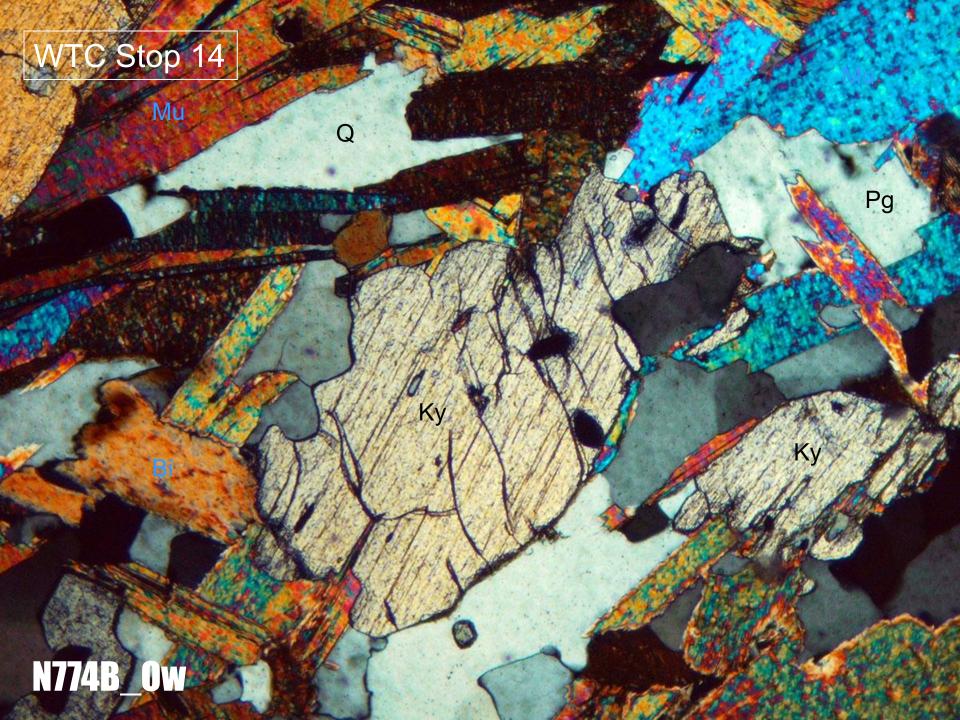
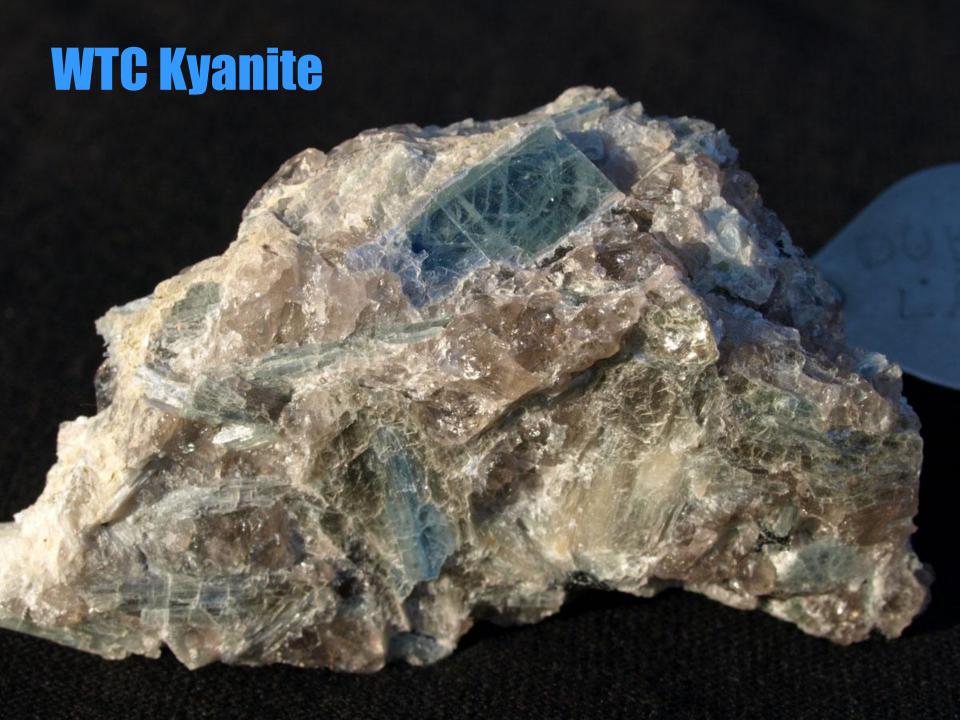
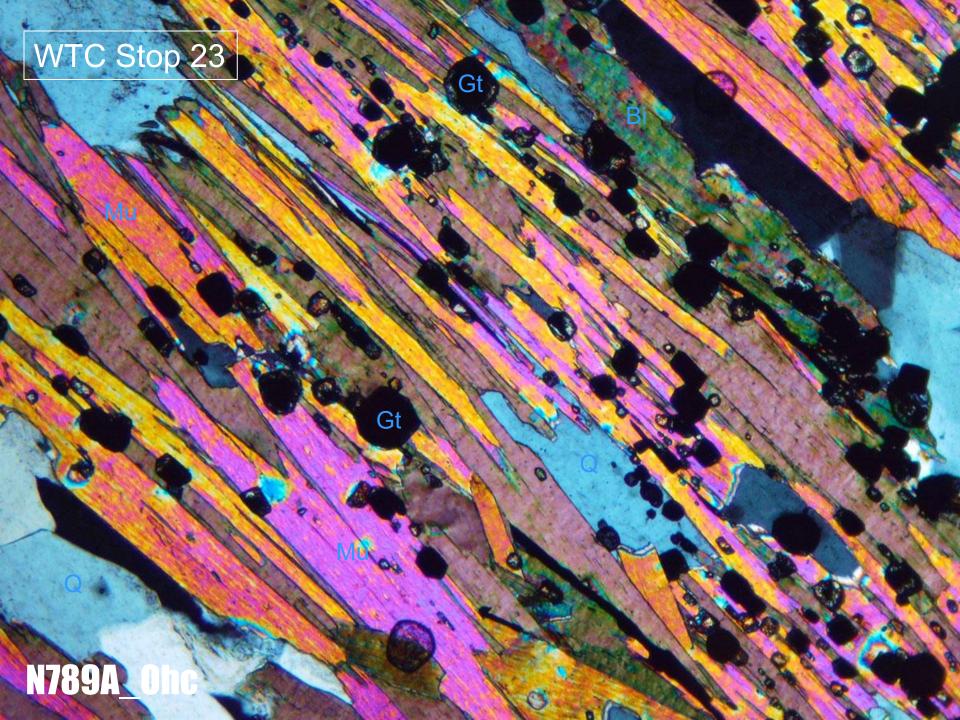


Figure 45 - a) Contact induced garnet enrichment in Hartland granofels xenolith from Stop 7.
b) Garnet porphyroblast overprinting and including the penetrative S₂ foliation in Hartland amphibolite (Ohau) from contact aureole of the Hodges Complex at Stop 6.
c) Cordierite (Cord) with typical pinnite (Pi) alteration coexisting with kyanite (Ky). Sample from contact of Hodges gabbro with Hartland granofels (Ohgr) on the northeast slope of Klug Hill.







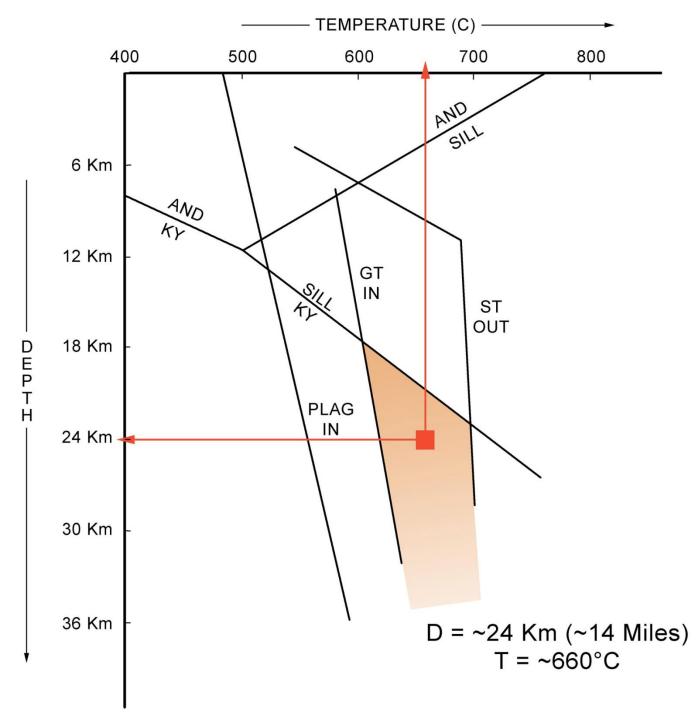


Minerals Are Your Pals!

WTC Minerals

Plagioclase Garnet Staurolite Kyanite





Cameron's Line = Deep-seated Appalachian Suture

