

Geology

Lessor's Quarry, near South Hero, Vermont, is located in the Middle Ordovician (~450 million years old) fossiliferous Glens Falls Limestone. The Glens Falls Limestone contains abundant fossils of marine invertebrates: *Prasopora* and *Hallopora* bryozoa as well as *Loxonema* gastropods, *Lingulella*, *Orbiculoidea*, *Orthambonites*, and *Camartoechia* brachiopods, and *Cryptolithus* and *Isotelus* trilobites (Massey and Snyder, 1999, after Fletcher and Wiswall, 1987). Glens Falls rocks also have graded beds of fossil fragments ("hash") interbedded with laminated micrite (carbonate mud), suggesting that storms punctuated a rather continuous carbonate sedimentation into the ancient Iapetus Ocean. The beds of fossil hash represent a "death assemblage"; these rocks were formed by material that washed off a shallow continental shelf and was deposited in deeper water at the base of the slope at the edge of the shelf.

Lessor's Quarry exposes several imbricate bedding-plane thrust faults (Stanley *et al.*, 1999 after Leonard, 1985). The most prominent fault is called the Lessor's Quarry Thrust and is exposed on the north wall of the quarry above the plaques (Stanley *et al.*, 1987). Slickenlines and fault-zone cleavage suggest that the upper plate moved west-northwest over the lower plate. As the Green Mountains were forming (~450-350 mya) western Vermont was compressed, resulting in displacement along low-angle thrust faults such as the one at the Quarry.

An interesting syncline (U-shaped fold) is located on the east end of the north wall and defines another fault boundary along which displacement occurred during folding (Stanley *et al.*, 1987). This fold, and an accompanying anticline (∩-shaped fold) to the east, can be traced onto the south wall of the quarry where the Stanley Fault-Bend Fold structure developed.

The main Lessor's Quarry Thrust truncates the fold and the synclinal fault. The structures at Lessor's Quarry indicate that ductile (plastic) deformation of the limestone, expressed by folding, accompanied brittle deformation, expressed by displacement along faults, during compression of the region.

References:

- Fletcher, C., and C.G. Wiswall, 1987. Concepts in geology: an activities approach to problem solving in the laboratory, Kendall Hunt Pub., Dubuque, Iowa.
- Leonard, K., 1985. Foreland folds and thrust belt deformation chronology: Ordovician limestone and shale, northwestern Vermont. UVM Master's Thesis, 120p.
- Massey, C., and S. Snyder, 1999. Geologic field trip sites for teachers in Northwestern Vermont, in Wright, S.F., ed., NEIGC 91st Annual Mtg. Guidebook—1999, p. 159-177.
- Stanley, R.S., K. Leonard, and B. Strehle, 1987. A transect through the foreland and transitional zone of Western Vermont; in Westerman, D., ed., NEIGC 79th Annual Mtg. Guidebook—1987, Vol. 2, p. 80-108.
- Stanley, R.S., T. Rushmer, C. Holyoke, and A. Lini, 1999. Faults and fluids in the Vermont foreland and hinterland in Western Vermont; in Wright, S.F., ed., NEIGC 91st Annual Mtg. Guidebook—1999, p. 135-158.

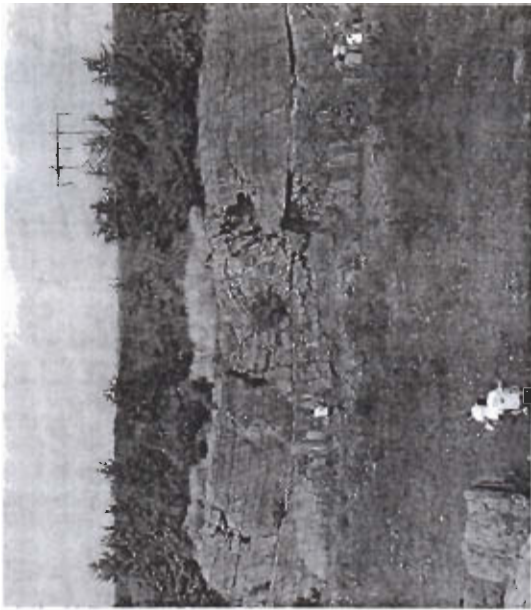
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LESSOR'S QUARRY

South Hero, Vermont

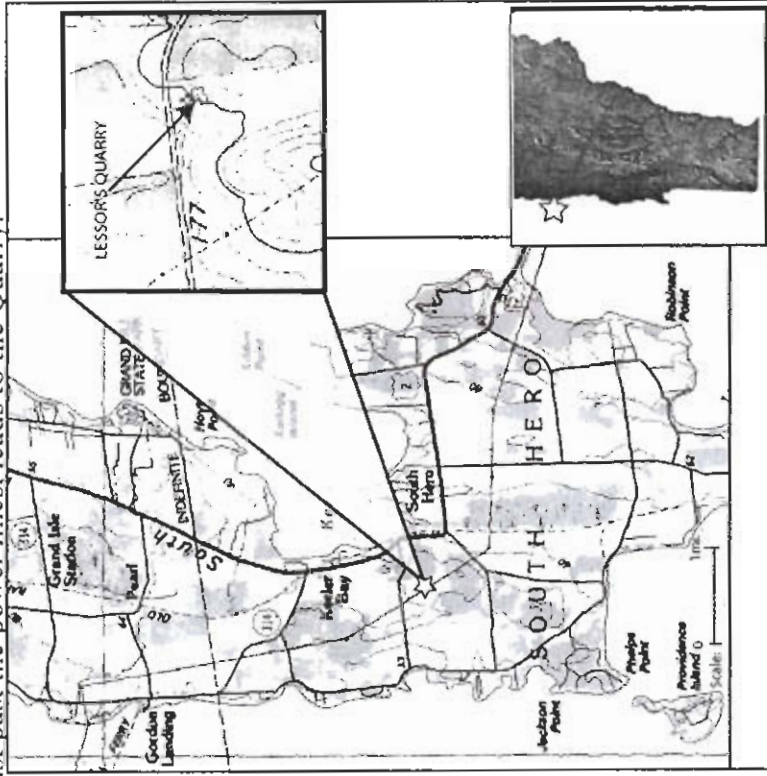


Rolfe Seaton Stanley
Teaching Outcrop

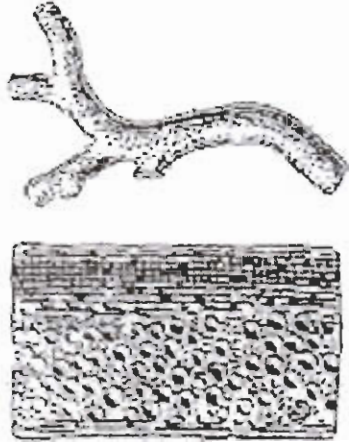
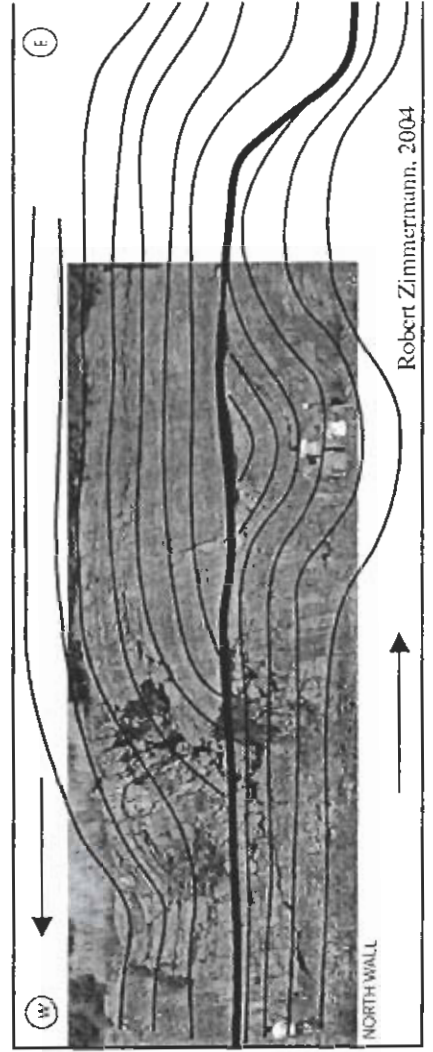
UVM Geology Professor, 1964-2000

Driving Directions

Take I-89 to exit 17. Follow Rt. 2 west through the village of South Hero. Turn left onto Sunset View road and drive about half a mile. A narrow dirt road on the left, just past the power lines, leads to the Quarry.



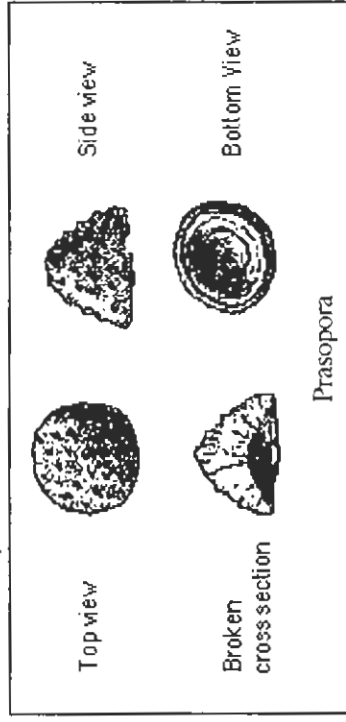
Fault-Bend folding on the north wall. Bold line is Lessor's Quarry Thrust, arrows show



Hallopora



Camarotoecchia



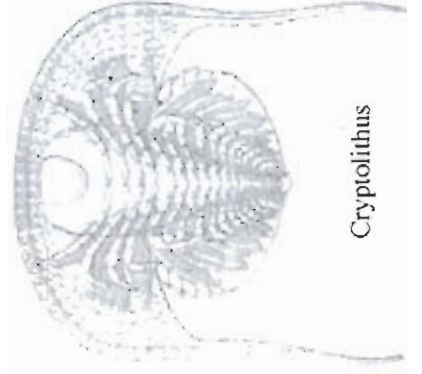
Prasopora



Loxonema



Lingulella



Cryptolithus



Isotelus