STRUCTURAL STUDIES IN THE NORTHERN CHESTER DOME OF EAST-CENTRAL VERMONT

by

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ABSTRACT

Rocks in the Eastern Vermont Sequence are highly metamorphosed and are said to range in age from Precambrian to Siluro-Devonian. The sequence outcrops on Keyes Mountain, about 6km Northwest of Pelchville, Vermont, and an area on this mountain about 2km square was mapped in great detail.

The dominant rock type found is quartzofeldspathic gneiss, but schistose gneiss, amphibolite, quartzite and schist also occur. Most of these rocks are layered but layering has been transposed in many places and much of it is probably secondary. Layering and schistosity both dip dominantly to the north at about 25°.

A number of mesoscopic structures can be mapped, including folds, schistosity, lineations, boudinage and low-angle dislocations.

Folds can be divided into three style groups :

- S. G. 1 : tight to isoclinal folds in layering with no axial-surface foliation.

- S. G. 2 : open to isoclinal folds in layering and schistosity with weakly to strongly developed axial-surface foliation.

- S. G. 3 : open to tight folds in layering and schistosity with no axial-surface foliation. Axial surfaces are usually at a high angle to foliation.

On the basis of overprinting relationships, at least three generations of folds exist. First and second generations cannot be separated by style and are referred to as "early folds" ; most early folds are isoclinal. The

third generation includes all S. G. 3 folds, although it is possible that more than one generation is present in S. G. 3. They are therefore referred to as "late folds".

Mesoscopic late folds plunge dominantly at 25° to 030, their axial surfaces dip steeply tothe west. A large, open macroscopic late fold occupies the whole area and is probably similarly oriented to mesoscopic late folds. Mesoscopic early fold axes are redistributed on a partial small circle by late folding but are inferred to have had a strong preferred orientation in the foliation plane before this event.

Evidence offered by previous workers for the interpretation of the Chester and other domes in Eastern Vermont as "Christmas Tree" folds is considered to be inadequate. An alternative model involving refolding of early folds by doubly-plunging late folds is favoured.

Five units with boundaries parallel to schistosity were delineated, each with distinctive lithologic and structural characteristics. The structurally "highest" and "lowest" both fit published descriptions of "basement." The central three units are characterised structurally by widespread transposition, intensely developed schistosity, and an abundance of low angle dislocations, boudinage and isoclinal folds. They are interpreted as a dislocation zone across which large relative displacements may have occured.

The stratigraphic formations mapped by previous workers could not be recognized in this area ; all unit boundaries are thought to be structural ones and each unit is probably a structural rather than a stratigraphic entity. It is possible that this is true of other "stratigraphic" formations and boundaries in the Eastern Vermont Sequence.

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