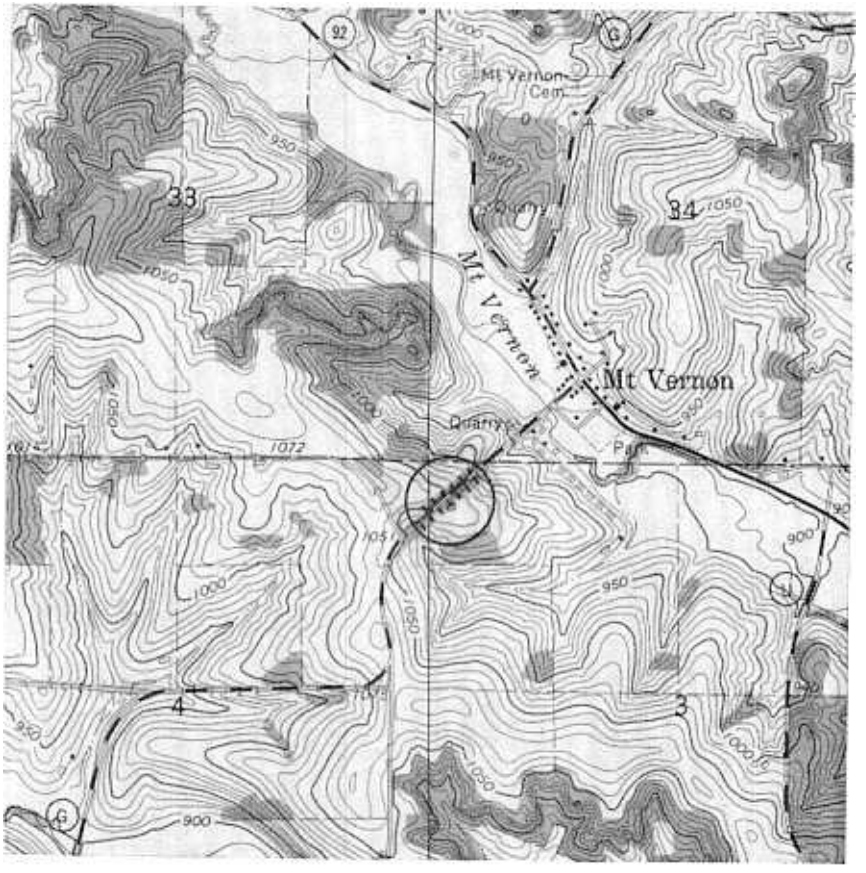
Title: Mt. Vernon

Location: Exposure in roadcut at both sides of County Highway "G" 0.2 miles west of village of Mt. Vernon in the NW¼, NW¼, Sec. 3, T.5N., R.7E., Dane County (Mt. Vernon 7.5-minute topographic quadrangle, 1962).



Author: M. E. Ostrom (modified from Ostrom 1965)

Description: Generalized diagrams of exposures on each side of the highway and a plan view, are shown on the next page. Close examination will reveal many faults of minor displacement now shown on the diagram. Can you find more?

1. Bedding: Oneota is massive- or thick-bedded; Shakopee is thin- or medium-bedded.

2. Texture: Oneota is commonly medium-crystalline and coarser textured whereas the Shakopee is finely-crystalline.

3. Impurities: Oneota has less sand and clay than the Shakopee, especially in its upper part.

4. Sedimentary structures: bedding planes in the Shakopee are commonly marked with worm trails and shrinkage cracks.

5. Fossils: With rare exception the only fossils noted in the Oneota are cryptozoa, whereas gastropods, algae, and locally brachipods may be common in the Shakopee. Fossils are rare at this exposure.

Although it cannot be seen clearly at this exposure the contact of the New Richmond Sandstone Member of the Shakopee Formation with the underlying Oneota Dolomite Formation is one of marked truncation. This truncation can be seen in the outcrop area of the Prairue du Chien Group between Bagley, Grant County, Wisconsin, and Hager City, Pierce County, Wisconsin. (Davis, 1965). Ulrich (1924) considered this truncation sufficient to establish the existence of the Canadian System. Thus, the list of systems present in the Upper Mississippi Valley area according to Ulrich would include the Cambrian (Mt. Simon through Van Oser), Ozarkian (Sunset Point through Oneota), Canadian (the Shakopee), and Ordovician (St. Peter through Maquoketa).

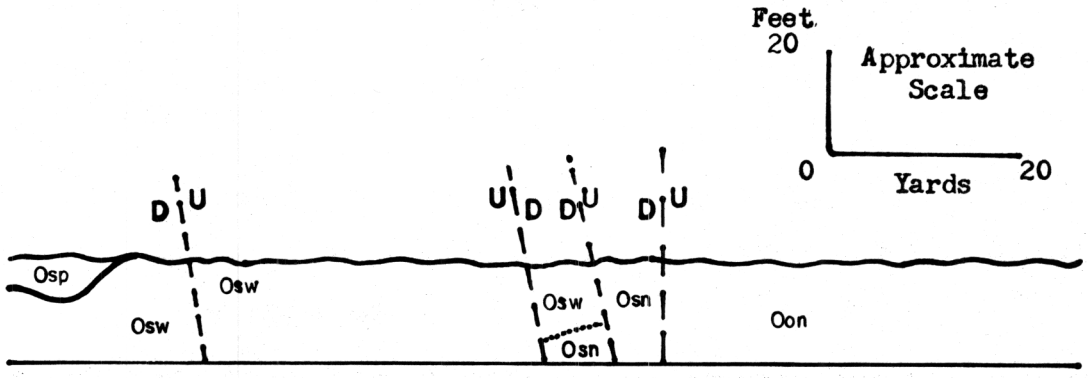
In Wisconsin the New Richmond Sandstone rarely approaches the "purity" of the Tonti Member of the St. Peter Formation or the Van Oser Member of the Jordan Formation and when it does it is very thin. However, in southeastern Minnesota the New Richmond Sandstone attains outcrop thicknesses of nearly 50 feet and consists of over 95 percent quartz sand. It commonly has a thin bed of green shale or argillaceous and silty sandstone on its top which is considered to be the approximate historical analogue of the Glenwood Shale or the Franconia "greensands".

If the assumption is correct that the Tonti and Van Oser members which are moderately well-sorted massive quartz sandstones, were deposited in a beach-nearshore environment, then it can also be assumed that where the New Richmond has a similar character it was deposited in a similar environment. It also follows that because at this outcrop there is no "clean" quartz sandstone in the New Richmond that the beach-nearshore environment did not extend into this area.

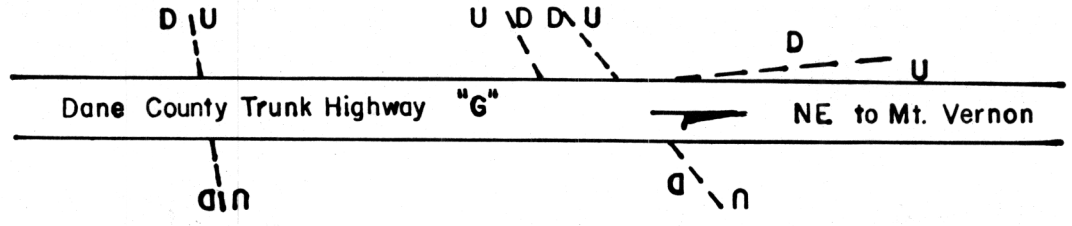
Significance: This exposure presents an excellent opportunity for comparing the Oneota and Shakopee Formations, for examining the content of the New Richmond and William River members of the Shakopee Formation, for examining the pre-St. Peter erosion surface, and for seeing faulting on the edges of the "stable" Wisconsin dome.

What differences can you find between the Oneota and Shakopee Formations? What is the environmental significance? How are they related to the New Richmond Formation? What was the environment of deposition? What is the relationship of the Oneota Formation to the St. Peter Formation? What is the historical significance of this contact? What is the orientation of the faults? How would you trace them across the landscape?

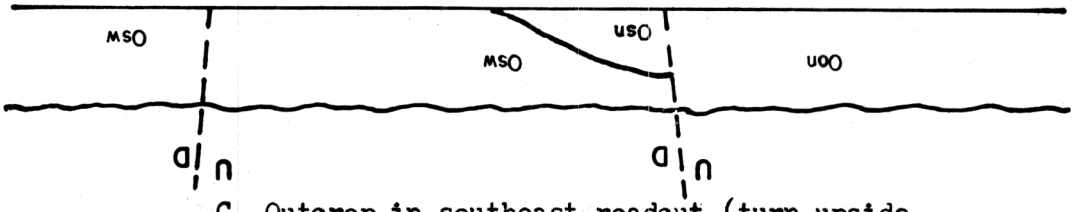
References: Ulrich, 1924; Davis, 1965; Ostrom, 1965.



A. Outcrop in northwest roadcut.



B. Plan view.



C. Outcrop in southeast roadcut (turn upside down to read).

Diagrammatic sketch of roadcuts on Dane County Trunk Highway "G" west of Mt. Vernon at Stop #12. Oon, Oneota Formation; Osn, New Richmond Member of Shakopee Formation; Osw, Willow River Member of Shakopee Formation; Osp, St. Peter Formation.