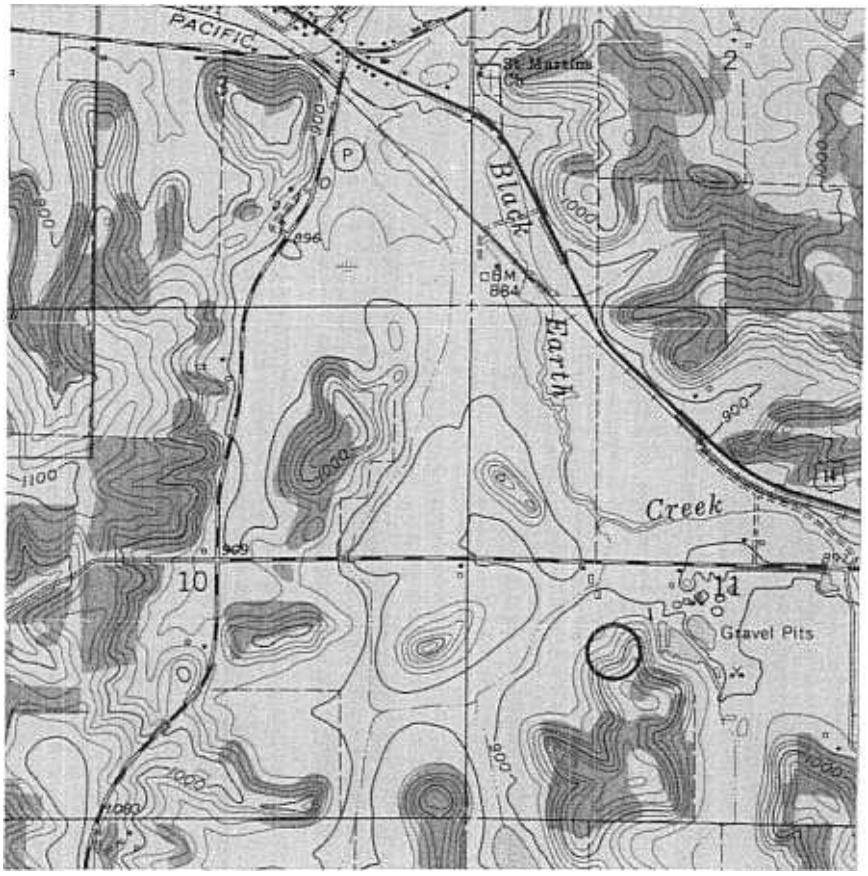
Outcrop 5

Title: Cross Plains East

Location: Capitol Stone Quarry, 2 km east of Cross Plains, Wisconsin in the SW$\frac{1}{4}$, NW$\frac{1}{4}$, SW$\frac{1}{4}$, Sec. 11, T. 7N., R. 7E., Dane County. (Cross Plains 7.5 minute topographic quadrangle, 1962).

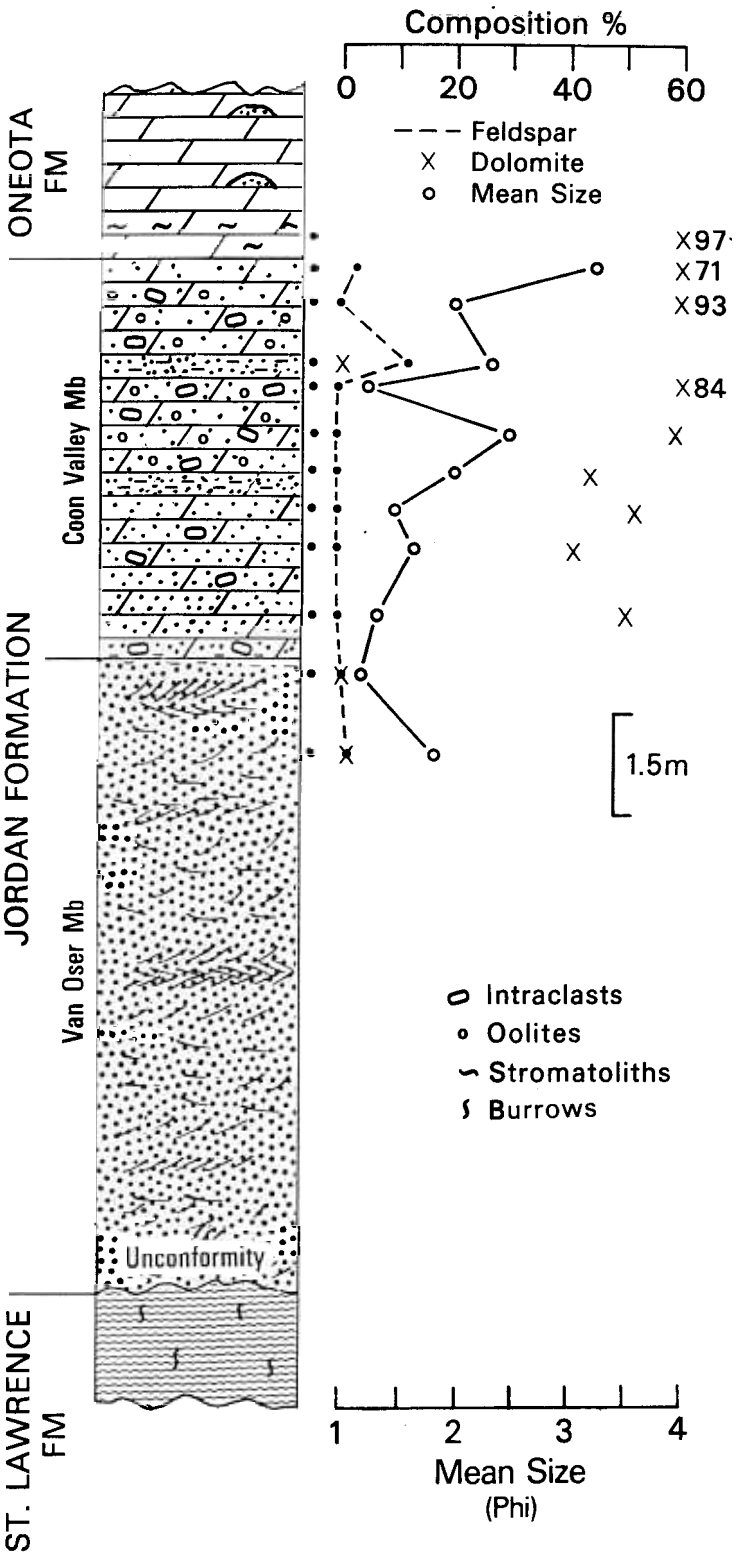


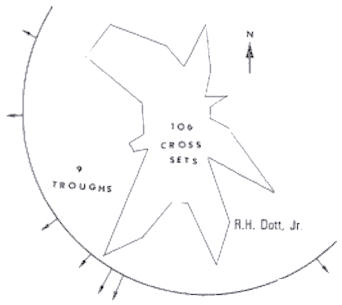

Author: I. E. Odom

Description: The Oneota, Jordan, St. Lawrence and the top of the Lone Rock Formations are exposed in the quarry and in the hillside below (The Lone Rock is not included in the above section because it may have been recently covered by fill for a new quarry road). The Norwalk Member of the Jordan is absent and the Van Oser Member rests unconformably on the St. Lawrence. This same stratigraphic relation can also be seen on U. S. Highway 14 north of the quarry. The Van Oser Member is transitional with the Coon Valley Member, which is in turn transitional into the Oneota Dolostone.

This exposure and others nearby (Outcrops 6 and 7) provide unequivical proof that a local unconformity (disconformity) exits on the axis of the Wisconsin Arch between the Jordan (Van Oser) and St. Lawrence Formations. The unconformity migrates up section toward the west, and at Soldiers Grove, Wisconsin, it is present between the Van Oser and Norwalk Members.

## CROSS PLAINS, WIS.






Paleocurrent directional data for the Van Oser Member.

Parts of the Van Oser Member are highly cross-stratified. Current directional data (shown above) by R. H. Dott, Jr. show a dominantly southwest transport. Grains of Baraboo Quartzite have been found near the top of the Van Oser and in the base of the overlying Coon Valley Members, which demonstrates sand transport from the direction of the Baraboo Islands (Figs. 22 and 31).

The Coon Valley Member is represented by dolomitic sandstones and sandy, "oolitic" dolostones which contain abundant intraclasts. The upper contact of the Coon Valley is placed at the top of the sandy dolostones and below the prominent algal dolostone bed that occurs at the base of the Oneota. Although the Oneota is not sandy, two thin sandstone lenses occur a few feet above the contact. This is the only locality where sandstone has been found interbedded with nonsandy Oneota. See Figure 33 for further data on the petrology of the Coon Valley Member and the Oneota Dolostone at this quarry.

Along the axis of the Wisconsin Arch, the thickness of the Coon Valley is locally more variable than elsewhere in the Upper Mississippi Valley (Figs. 16 and 17). Although it is slightly more than 4 meters at this location, in several nearby outcrops the Coon Valley is approximately 1 1/2 meters in thickness, and in one outcrop near Sauk City, Wisconsin, it is represented by just .3 meters of shaly sandstone.

Interpretations - The Jordan-St. Lawrence stratigraphic relationships indicate that following deposition of the Norwalk Member (several feet of the Norwalk is present in nearby outcrops) regional uplift occurred, especially in the area of the Wisconsin Arch. This uplift resulted in a short interval of subaerial erosion which locally entirely removed the Norwalk and variable amounts of the St. Lawrence Formation. The Van Oser Sandstone was deposited in this area over an irregular surface and is considered to be part of the Cross Plains Bar complex, which in Cambrian time is believed to have extended westward from the north end of the Baraboo Islands (Fig. 22). The lithoclasts of Baraboo Quartzite attest to the direction of sediment transport.

No Sunset Point Sandstone is known in this area. The western most outcrop of what is interpreted to be the Sunset Point Sandstone occurs at Middleton, 11 km east; thus it is inferred that the margin of the Sunset Point lagoon during deposition of part of the Van Oser in the Cross Plains area was located near Middleton. The lithic nature of the Coon Valley Member at this location records a transition from a littoral to a carbonate shelf environment. Adams (this guidebook) concludes that the Oneota Formation and perhaps the upper part of the Coon Valley Member in this area were deposited in a supratidal environment.