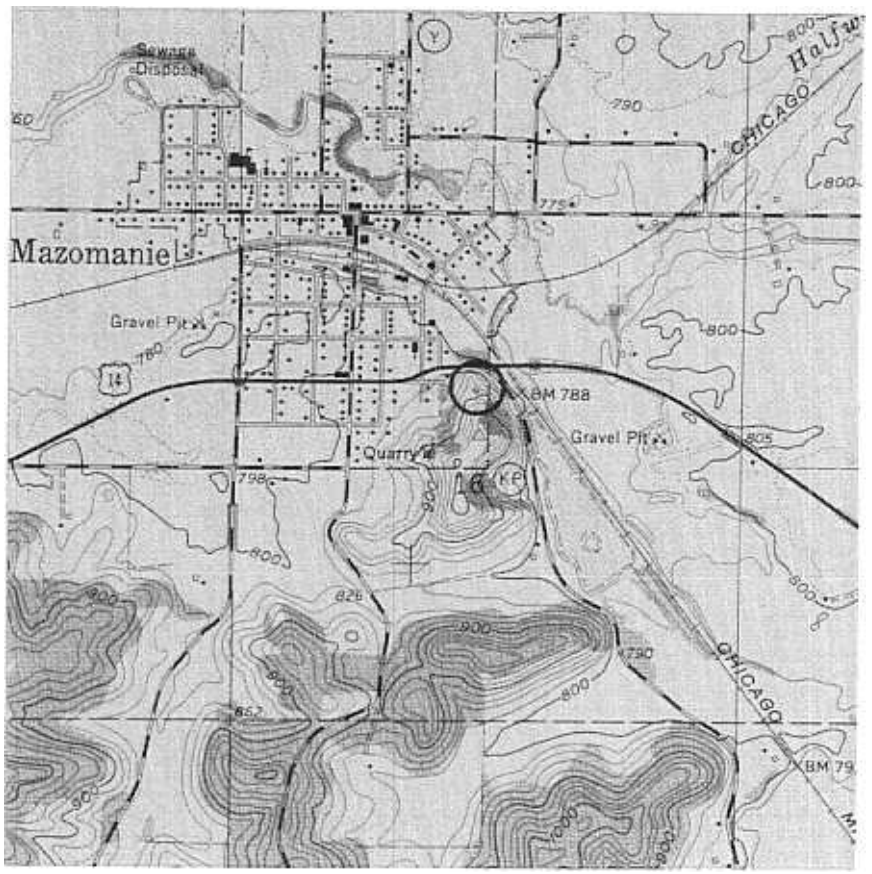
OUTCROP 7

Title: Mazomanie (School House) Bluff

Location: South of U.S. Highway 14 at east edge of Mazomanie, Wisconsin in the NE¼, SE¼, NW¼, Sec. 16, T.8N., R.6E., Dane County (Mazomanie 7.5 minute topographic quadrangle, 1962).

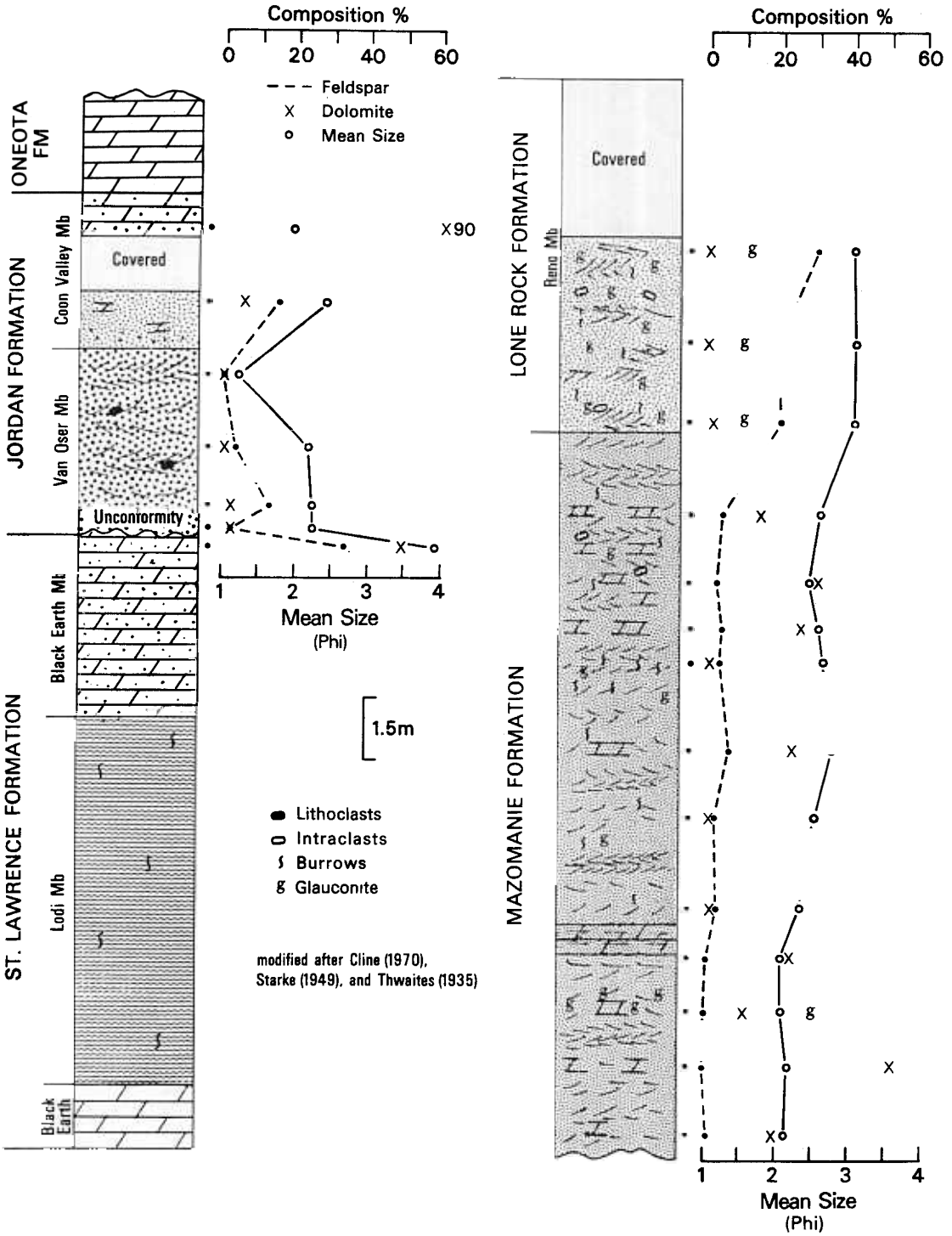


Author: I. E. Odom

Description: School House Bluff is considered to be the type section of the Mazomanie Formation, and it is a magnificent exposure for the total stratigraphic section is the most complete in central Wisconsin. Most of the Oneota, the Jordan, the St. Lawrence and large parts of the Lone Rock and Mazomanie Formations are well exposed. The main purpose for examination of this section is to observe the effects of the Wisconsin Arch on the local sedimentation of the Jordan, St. Lawrence, and Mazomanie Formations.

The Wisconsin Arch was definitely a positive area during the deposition of the Mazomanie, Jordan, and perhaps to a lesser extent the St. Lawrence Formations. The Norwalk Member of the Jordan is entirely absent (eroded). The Van Oser Member thins to 5.5 meters, the minimum thickness observed in Wisconsin, and it is disconformable with the Black Earth Dolomite. The Coon

MAZOMANIE, WIS.



Valley Member of the Jordan is also thin. Transportation of sand from the direction of the Baraboo Islands is shown by lithoclasts of Baraboo Quartzite in the Van Oser Member, some of which are up to one centimeter in diameter. The famous Dikelocephalus fauna has been collected at this locality from the middle of the Lodi Member.

Based on mineralogical and textural analyses, the upper 4.5 meters of the Tunnel City Group is assigned to the Reno Member of the Lone Rock Formation and the lower 15 meters to the Mazomanie Formation. These analyses show that the Reno Member is a glauconitic, feldspathic, very fine-grained sandstone, whereas the Mazomanie at this location is essentially a fine-grained quartzose sandstone, although it contains thin zones in which glauconite is moderately abundant. Both the Mazomanie and the Reno Member are locally intensely burrowed (Skolithos assemblage), dolomitic at certain horizons, and contain intraclasts. Trough and some planar-shaped cross stratification are present, especially in the Mazomanie.

Interpretations: This outcrop further documents that the Wisconsin Arch influenced local sedimentation in Late Cambrian and Early Ordovician time, and that uplift and local erosion occurred prior to deposition of the Van Oser Sandstone. It is interpreted that the absence of the Norwalk Member is due to erosion rather than to nondeposition because several feet of the Norwalk lithology can be identified in nearby outcrops where it was not completely eroded. The local thickening of the St. Lawrence might also indicate that the Wisconsin Arch was a factor in its deposition. The abundance of algal mounds in the St. Lawrence only along the crest of the arch (McGannon, 1960) possibly indicates a type of "reef" development with the algal mats serving to trap and hold sediment. The "reef" dolostones were more resistant to erosion, as they are at the present time, because they formed hills of low relief on the pre-Van Oser erosional surface. Variations in the elevation of the base and increase in the thickness of the Van Oser Member nearby suggest that it was possibly being deposited in surrounding areas before its deposition at this locality; however, no specific beach deposits or lithoclasts of the St. Lawrence have been identified in the Van Oser Sandstone.

The presence of bioturbation, thin bedding and lamination in the Lodi Siltstone, algal structures in the Black Earth Dolostone, some mottling, and possibly dessication cracks (?) have prompted speculations that the St. Lawrence Formation was deposited in intertidal and perhaps supratidal environments. Although such sedimentary structures might form in tidal environments, as well as in other environments, the regional stratigraphy and sedimentology of the St. Lawrence and overlying and underlying lithic units make a tidal interpretation for the entire St. Lawrence highly dubious. More diagnostic indicators of tidal environments such as fining upward sequences, seaward-coarsening, tidal channels, and true flaser bedding, which would be necessary to show water movement, are absent in the St. Lawrence. The thin, scattered conglomerate beds that occur locally in the St. Lawrence, previously suggested to reflect tidal processes, could easily have been formed by hurricane-force storms (see paper by Dott, this guidebook). A shallow subtidal environment seems more probable for most of the St. Lawrence, but the algal mounds along the arch possibly formed in a tidal environment.

The probable nature of the regional and local depositional environments of the Mazomanie Formation and Reno Member of the Lone Rock Formation is discussed by Odom (this guidebook). The quartzose sandstones that compose the Mazomanie at this location are interpreted to have accumulated on a littoral shoal paralleling the Wisconsin Arch (Fig. 35). The quartzose Mazomanie accumulated simultaneously with the feldspathic Mazomanie and with the glauconitic Reno Member in off-shore areas to the west, south and east (Figs. 35 and 36). The Reno facies migrated over the arch with the transgression that occurred in late Franconian time (Fig. 35).