

Title: Waukon Junction, Iowa -- Lower Ordovician New Richmond Member

Location: Roadcut at west side of Iowa state highway 364, 0.3 miles northeast of its junction with Iowa state highway 76, and 2 miles southwest of Waukon Junction, in the NW1/4 NE1/4 SW1/4, sec. 16, T. 96 N., R. 3W., Allamakee County, Iowa (Harpers Ferry, Iowa-Wisconsin, quadrangle, 7.5-minute series, topographic, U.S. Geological Survey, 1983) (fig. 1).

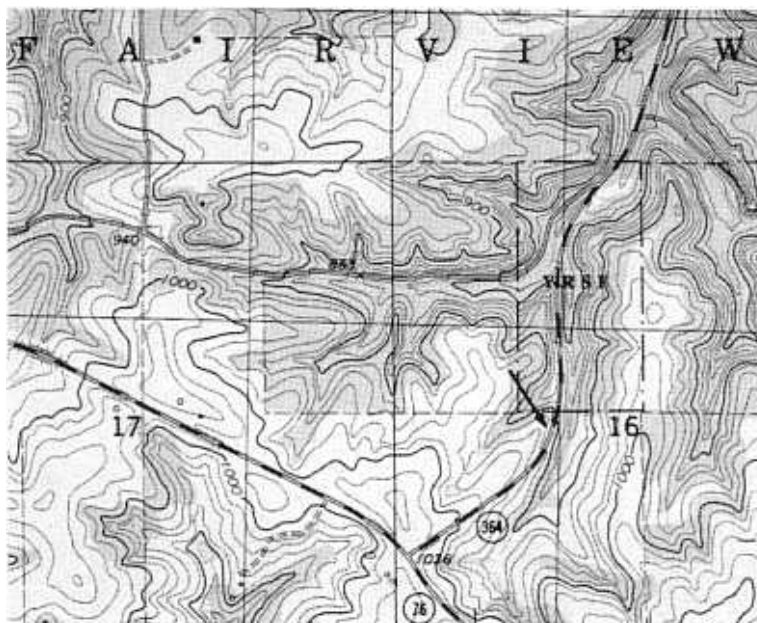


Figure 1. Location of roadcut in Lower Ordovician strata southwest of Waukon Junction, Iowa, showing New Richmond Member.

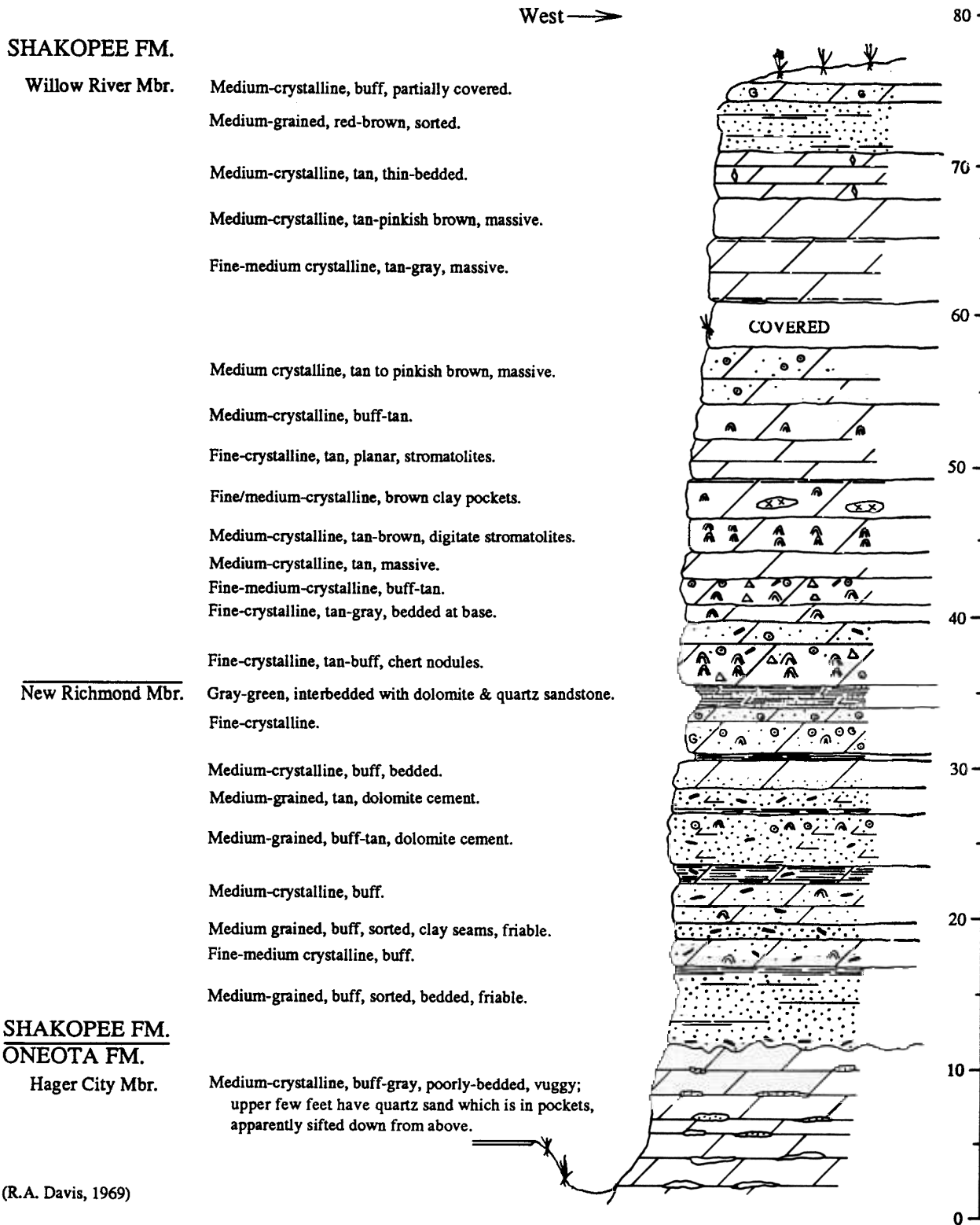
Author: M.E. Ostrom, 1987 (modified from Ostrom and others, 1970, p. 70-73).

Description: In northeast Iowa and southwest Wisconsin the New Richmond Member of the Shakopee Formation grades from predominantly quartz sandstone in the west, such as near Hanover, Iowa (roadcut along Iowa state highway 76 in the SE1/4 SE1/4 NW1/4, sec. 23, T. 99 N., R. 6W, Allamakee County) and near Wilmington, Minnesota (roadcut along Minnesota state highway 76 in the SE1/4 NE1/4 SE1/4, sec. 11, T. 101 N., R. 6W., Houston County), to the interbedded sandstone and dolomite that occurs at this exposure and persists to the east (quarries in Wisconsin along Grant County highway X in Wisconsin at the base of the Mississippi River bluff at Bagley and Wyalusing).

The New Richmond Member is overlain by the Willow River Dolomite and underlain by the Oneota Formation. At this exposure, the Oneota Formation consists of buff to gray, medium-crystalline, poorly bedded, and vuggy dolomite assigned to the Hager City Member. In the upper 5 ft of this exposure, the Hager City contains rounded quartz sand grains that appear to have filtered down to concentrate in solution cavities during deposition of the overlying New Richmond sandstone.

Significance: This is an excellent exposure of a complete and accessible section of the New Richmond Member (fig. 2). The Oneota Formation is separated from New Richmond sandstone by an unconformity developed during an episode of

regression related to subaerial or very shallow marine erosion. Similar erosional unconformities mark the contacts between four other depositional cycles in the Cambrian and Lower and Middle Ordovician strata of this region (Ostrom, 1964, 1970).



(R.A. Davis, 1969)

Figure 2. Description of Lower Ordovician strata in roadcut on Iowa state highway 364, 2 miles southwest of Waukon Junction in the NW1/4 NE1/4 SW1/4, sec. 16, T. 96 N., R. 3 W., Allamakee County, Iowa.

depositional cycles, the New Richmond Member (in exposures to the west) was deposited in a highly energetic near-shore, shallow marine environment characterized by thick-bedded, cross-bedded, quartz sandstone. At this exposure and in areas to the east, the New Richmond Member is characterized by interbeds of sandy algal dolomite, dolomite, shaly quartz sandstone, and sandy shale. Oolites and intraclasts are common in the dolomite and in the dolomitic sandstone. This lithology is interpreted as having formed in a less vigorous shallow marine environment situated seaward of the highly energetic near-shore shallow marine environment. The absence of a distinct thick sandstone sequence suggests that the pre-New Richmond erosional surface formed under shallow marine conditions. The 1 ft of pale green shale that occurs here in the top of the New Richmond is common in exposures to the east, but tends to be less distinct to the west. Traced to the east into south-central Wisconsin near Pine Bluff (Dane County), the New Richmond Member is less than 4 ft thick and consists predominantly of sandy dolomite.

The New Richmond Member is conformable with the overlying Willow River Dolomite. The Willow River consists of different dolomite lithologies ranging from sandy, oolitic, and algal dolomite to dolomite. According to Davis (Ostrom and others, 1970) the carbonates are "dolomitized algal biolithite, grain sparite, intrasparite, and oosparite." Carbonate mud was apparently present in small quantities or was recrystallized to coarser textures. Algal stromatolites comprise a large portion of the section here and at the quarry at Wyalusing, Wisconsin. Davis (1966) interprets this as being an algal bank separating a shallow bay to the east from a normal marine shelf to the northwest.

References

- Davis, R.A., Jr., 1966, Revision of Lower Ordovician nomenclature in the upper Mississippi valley: *Journal of Geology*, v. 74, no. 3, p. 361-365.
- Davis, R.A., Jr., 1969, Stratigraphy of the Prairie du Chien Group (Lower Ordovician), upper Mississippi valley (abs.): North Central Section, Geological Society of America, Columbus, Ohio.
- Ostrom, M.E., 1964, Pre-Cincinnatian Paleozoic cyclic sediments in the upper Mississippi valley: a discussion: *Kansas Geological Survey Bulletin* 169, v. II, p. 381-398.
- Ostrom, M.E., Davis, R.A., Jr., and Cline, L.M., 1970, Field trip guide book for Cambrian-Ordovician geology of western Wisconsin: Wisconsin Geological and Natural History Survey Information Circular 11, 131 p.

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