

Title: Mineral Creek, Iowa — Prairie du Chien Group contact relationships

Location: Roadcut at east side of Iowa state highway 76 in valley of Mineral Creek, about 1.2 miles north of the village of Hanover, in the SE1/4 SE1/4 NW1/4, sec. 23, T. 99 N., R. 6W., Allamakee County, Iowa. (Dorchester, Iowa, quadrangle, 7.5-minute series, topographic, U.S. Geological Survey, 1971) (fig.1).

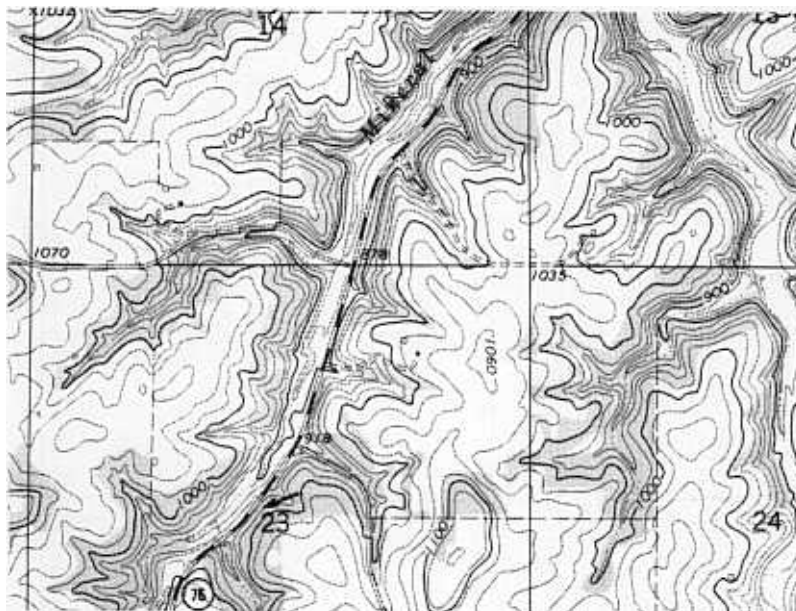


Figure 1. Location of roadcut in Lower Ordovician strata showing unconformable contact relationship between the Oneota Formation and overlying New Richmond sandstone, 1.2 miles north of Hanover, Iowa.

Author: M.E. Ostrom, 1987 (modified from Ostrom and others, 1970, p. 77).

Description: The Mineral Creek exposure is part of a more extensive section exposed along Iowa state highway 76 and in the valley of the Iowa River in secs. 11-14 and 23, T. 99 N., R. 6W. (fig. 2).

At this exposure the Hager City Member of the Oneota Formation consists of buff to gray, medium-crystalline, thick-bedded dolomite that dips to the north at approximately 6 degrees. More than 45 ft of the Hager City Member is exposed downslope and north of the outcrop. It is unconformably overlain by the New Richmond Member of the Shakopee Formation. The New Richmond Member consists of reddish brown, medium-grained, well sorted, friable, cross-bedded sandstone. Approximately 30 ft of the New Richmond is exposed up-slope to the south and east of the outcrop.

Significance: This excellent and accessible exposure shows the unconformable erosional relationship between the Hager City Member and the overlying New Richmond Member.

The erosional relationship between the Oneota Formation and Shakopee Formation was first noted by Ulrich (1924), who designated the contact as the boundary between the Ozarkian and Canadian Systems. The contact was considered to be transitional by Powers (1935), Heller (1956), and Shea (1960), who interpreted it to signify continuous deposition with the Prairie du Chien Group. Ostrom (1964, 1970) agreed with Ulrich's interpretation on the basis of

the erosional unconformity separating two of five depositional cycles that occur in Cambrian and Lower and Middle Ordovician rocks in the upper Mississippi valley area. Regional study by Davis (1968) confirmed this relationship.



Figure 2. Unconformable contact of New Richmond sandstone with underlying Oneota Formation in roadcut on Iowa state highway 76, 1.2 miles north of Hanover, Iowa (from Ostrom and others, 1970).

The lithologic character of the formations at this exposure is similar to that in a roadcut along Iowa state highway 76, about 13 miles to the north and northeast of Wilmington, Minnesota (Ostrom, 1987). However, in contrast to the Wilmington exposure, the contact relationship here is distinctly angular. Thus, at this exposure, in addition to a distinct lithologic change and a small amount of relief on the Oneota surface, the slightly dipping Oneota (fig. 3) is truncated. Also, fragments of Oneota dolomite are common in the lower 5 ft of the New Richmond Member.

References

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LAKOPEE FM.

New Richmond Mbr.

Medium-grained, well-bedded; red brown, sorted.

Fine-medium crystalline; flaggy quartzite.

Medium-grained, red-brown, sorted.

Finely-crystalline, quartzite, tan, flaggy.

Medium-grained, red-brown, friable, sorted.

SHAKOPEE FM.

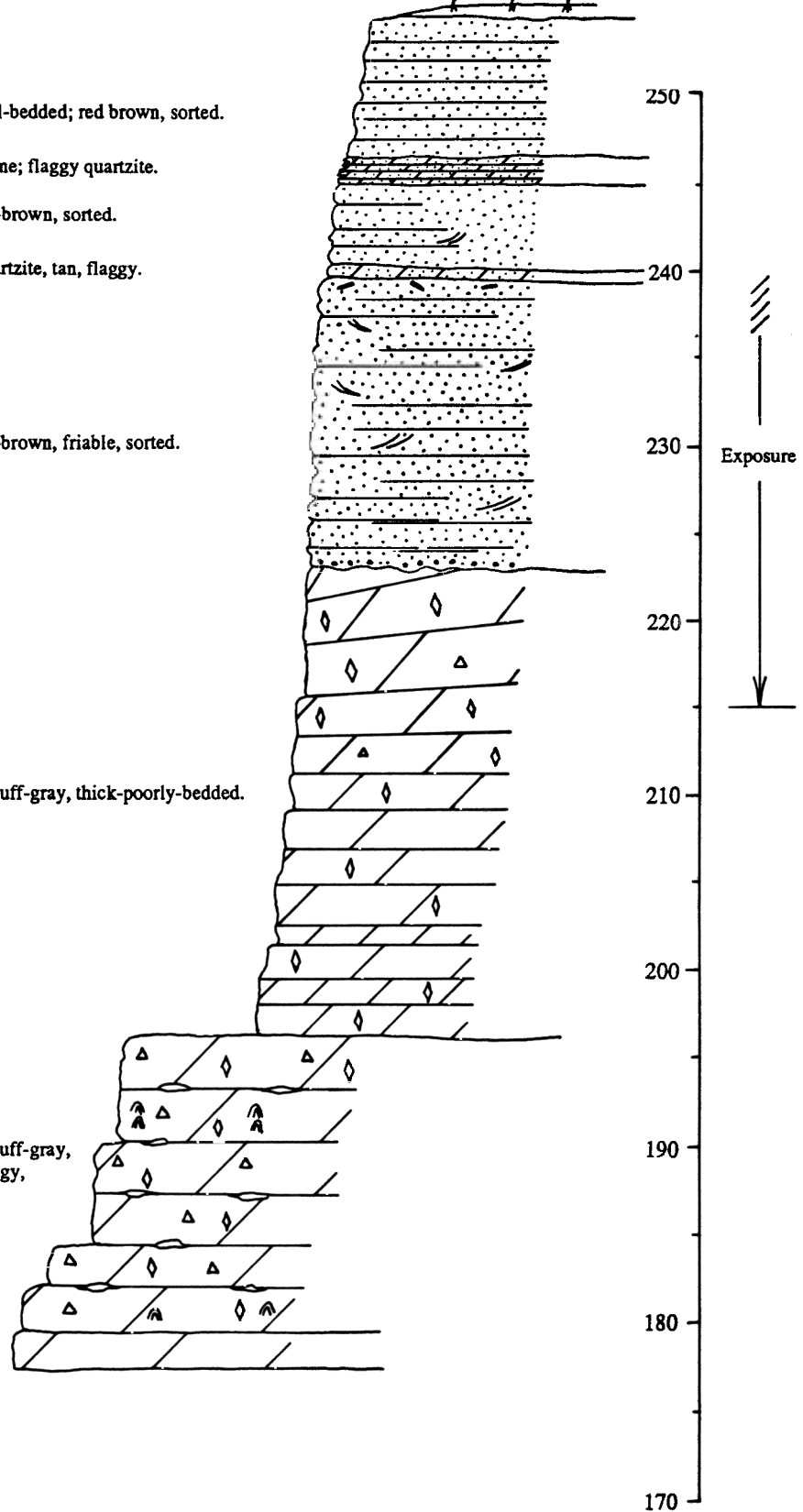
ONEOTA FM.

Hager City Mbr.

Medium-crystalline, buff-gray, thick-poorly-bedded.

Medium-crystalline, buff-gray, poorly-bedded, vuggy, rough weathering, limonitic staining.

Medium-crystalline, buff, homogenous, two distinct beds.



(Modified from R.A. Davis, 1966; 1969)

Figure 3. Description of roadcut in Lower Ordovician strata north of Hanover, Iowa, showing contact of Oneota Formation with Shakopee Formation.

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- Shea, J.H., 1960, Stratigraphy of the Lower Ordovician New Richmond sandstone in the upper Mississippi valley: University of Wisconsin, Madison, Master's thesis, 90 p.
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