

Late Cambrian Eau Claire Formation at Strum, Wisconsin

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LOCATION

Abandoned quarry at east side of County Trunk Highway D 0.2 mi (0.3 km) north of its junction with U.S. 10 at the north edge of the village of Strum in the NW¼, NE¼, SE¼, Sec. 18, T.24N., R.8W., Trempealeau County, Wisconsin, Strum 7½-minute Quadrangle (Fig. 1).

SIGNIFICANCE

This is one of the better, and certainly one of the most accessible, exposures of the Eau Claire Formation in Wisconsin (Ostrom, 1978). The Eau Claire Formation was named by Wooster (1882, p. 109) in referring to "Eau Claire Trilobite Beds" exposed in Eau Claire, Wisconsin. It is assigned to the Upper Ironton Dresbachian Stage on the basis of its trilobite fauna. In ascending order the trilobite assemblage zones in the Dresbachian are the *Cedaria*, *Crepicephalus*, *Aphelaspis*, and *Dunderbergia*. The Eau Claire strata in the region have been characterized faunally by the presence of the Upper Cambrian trilobite genera *Cedaria* and *Crepicephalus* (Ulrich, 1914, p. 354). The *Aphelaspis* Zone is known only from outcrops in the city of Hudson at the west edge of Wisconsin in the east bluff of the St. Croix River. The *Dunderbergia* Zone is not present in Wisconsin. In addition to being faunally zoned, the Eau Claire Formation has been subdivided on the basis of lithology. Morrison (1968, p. 21) subdivided the formation into five distinct lithologic units principally on the basis of bedding character and clay content. The lithologic units are:

E. Upper Massive Beds (±20 ft; 6 m). Sandstone; fine and very fine grained, light yellowish gray to brownish and greenish gray, massive and submassive, glauconitic; exposed near Strum and near Whitehall.

D. Upper Thin Beds (±15 ft; 4.5 m). Sandstone; fine and very fine grained, greenish gray; thin bedded; very glauconitic; usually missing.

C. Lower Massive Beds (±25 ft; 8 m). Sandstone, fine and very fine grained, light greenish gray to light brownish gray, thick to massive bedded; may be very glauconitic; few very argillaceous irregularly bedded units separating the more characteristic massive beds.

B. Lower Thin Beds (±20 ft; 6 m). Sandstone, fine and very fine grained, light greenish gray; thin and thick bedded; glauconitic and micaceous.

A. Shaley Beds (±15 ft; 4.5 m). Sandstone shale; dark gray to greenish gray, sandstone very fine and fine grained; very thin bedded; beds less than 3 in (8 cm) thick; very argillaceous.

The Eau Claire Formation is conformable with the underlying Mount Simon Formation. It is believed to represent a transgressive shallow marine shelf depositional environment deposit



Figure 1. Location of exposure at Upper Cambrian Eau Claire Formation in abandoned quarry north of Strum, Wisconsin.

(Ostrom, 1966; 1970). The formation is unconformable with the overlying Galesville Member of the Wonewoc Formation (Ostrom, 1970). The Eau Claire thins from a thickness of about 90 ft (27 m) in the subsurface of western Wisconsin to zero in outcrops at Sheep Pasture Bluff in Juneau County and at Friendship Mound in Adams County. Thinning is attributed to postdepositional erosion, which produced the unconformity.

At the Strum North exposure the section (Fig. 2) extends from the upper part of lithologic Unit A to near the top of Unit C. In addition, both the *Cedaria* and *Crepicephalus* faunal zones are present and readily distinguishable. The faunal break between the two zones occurs near the base of Unit C. One can speculate that in Wisconsin the reason for the almost complete absence of the overlying *Aphelaspis* Zone, and the complete absence of the succeeding *Dunderbergia* Zone, is that they were removed partially or completely by post-Eau Claire and pre-Galesville erosion. The Eau Claire Formation is succeeded by the Galesville Sandstone Member of the Wonewoc Formation. The Galesville Sandstone is interpreted to have formed in a broad and shallow beach/near-shore environment that transgressed over the eroded Eau Claire surface. The unconformable relationship is clear in an exposure in

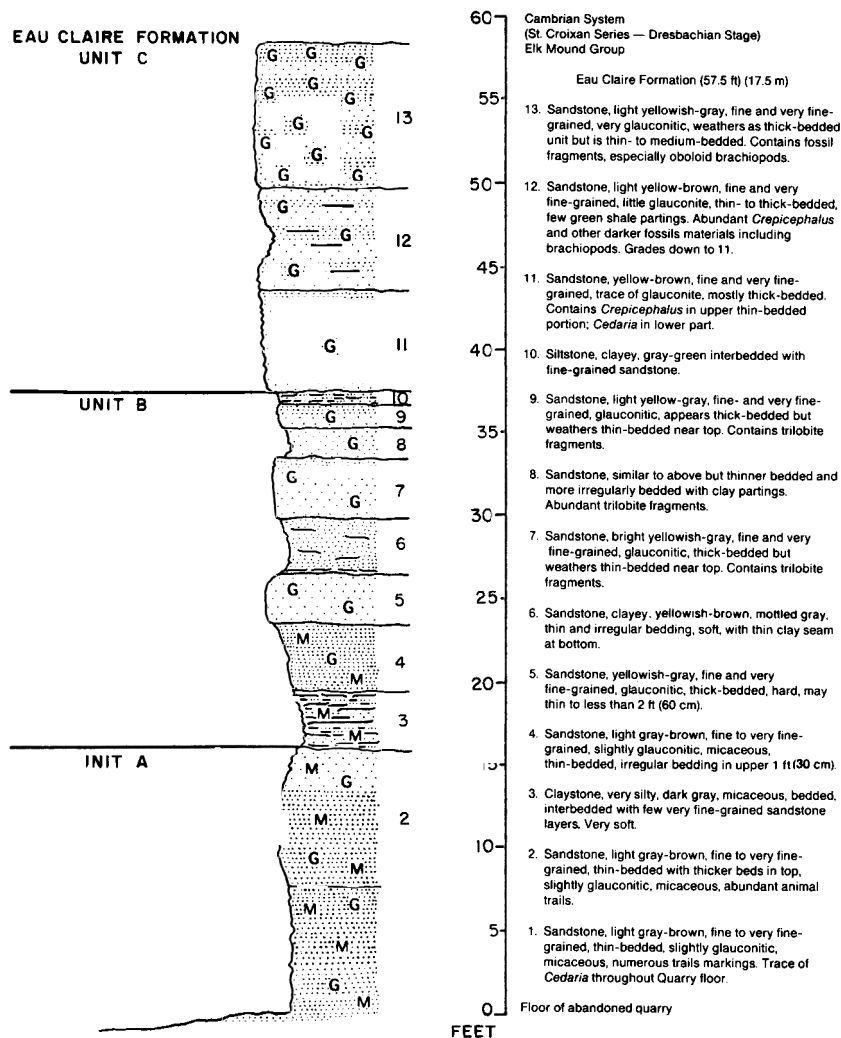


Figure 2. Section exposed in abandoned quarry north of Strum, Wisconsin.

the face of an abandoned quarry in the east bluff of Bruce valley located at the east side of County Highway D about 5 mi (8 km) south-southeast of Strum (NE $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ Sec.9,T.23N.,R.8W., Trempealeau County, Wisconsin) and in the type section of the Galesville Sandstone, which is in a high and precipitous cliff cut by Beaver Creek where it passes through the city of Galesville about 32 mi (51 km) south of Strum (NE $\frac{1}{4}$ NW $\frac{1}{4}$ Sec.33, T.19N.,R.8W., Trempealeau County). The Galesville Sandstone is essentially unfossiliferous and is conformable with the overlying Ironton Sandstone, which contains the *Elvinia* fauna of the Franconian Stage. The lack of distinctive fossils in the Galesville Sandstone, its unconformable relationship with the underlying Eau Claire Formation, the eastward thinning and disappearance of the Eau Claire Formation and the conformable relationship of the Ironton Sandstone, which contains the Franconian *Elvinia* fauna, suggest that the Galesville Sandstone should be assigned to the Franconian rather than to the Dresbachian. Viewed from another perspective, it should be noted that no Dresbachian fossils are known to occur above the base of the Galesville Sand-

stone, which is transitional with strata containing a Franconian Fauna. From this perspective, one can reasonably assign the Galesville to the Franconian rather than to the Dresbachian as has been done traditionally.

REFERENCES CITED

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