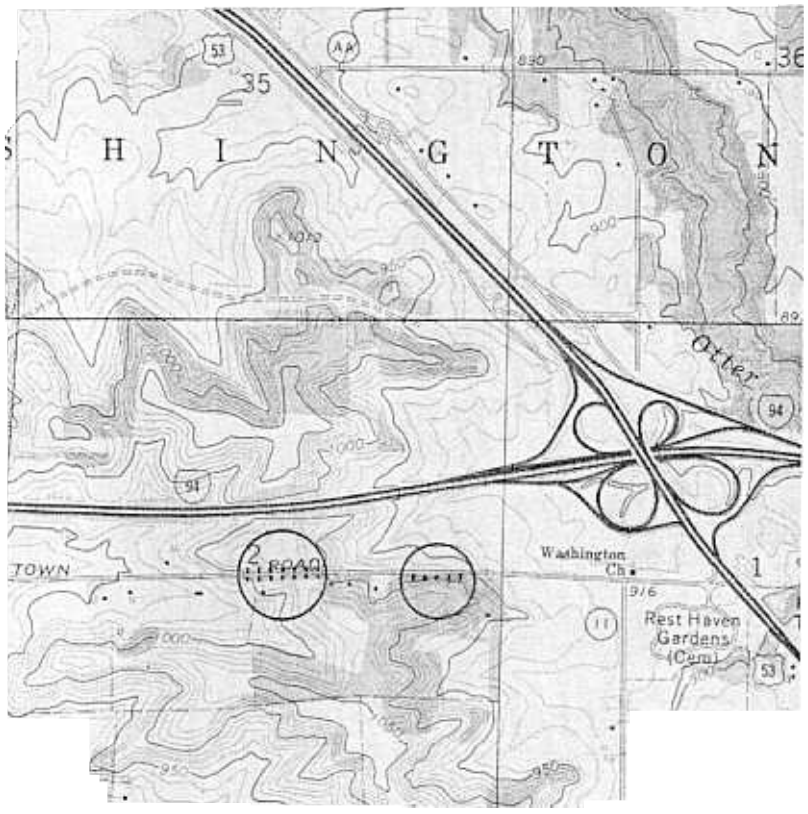
Title: Rest Haven Gardens Town Road

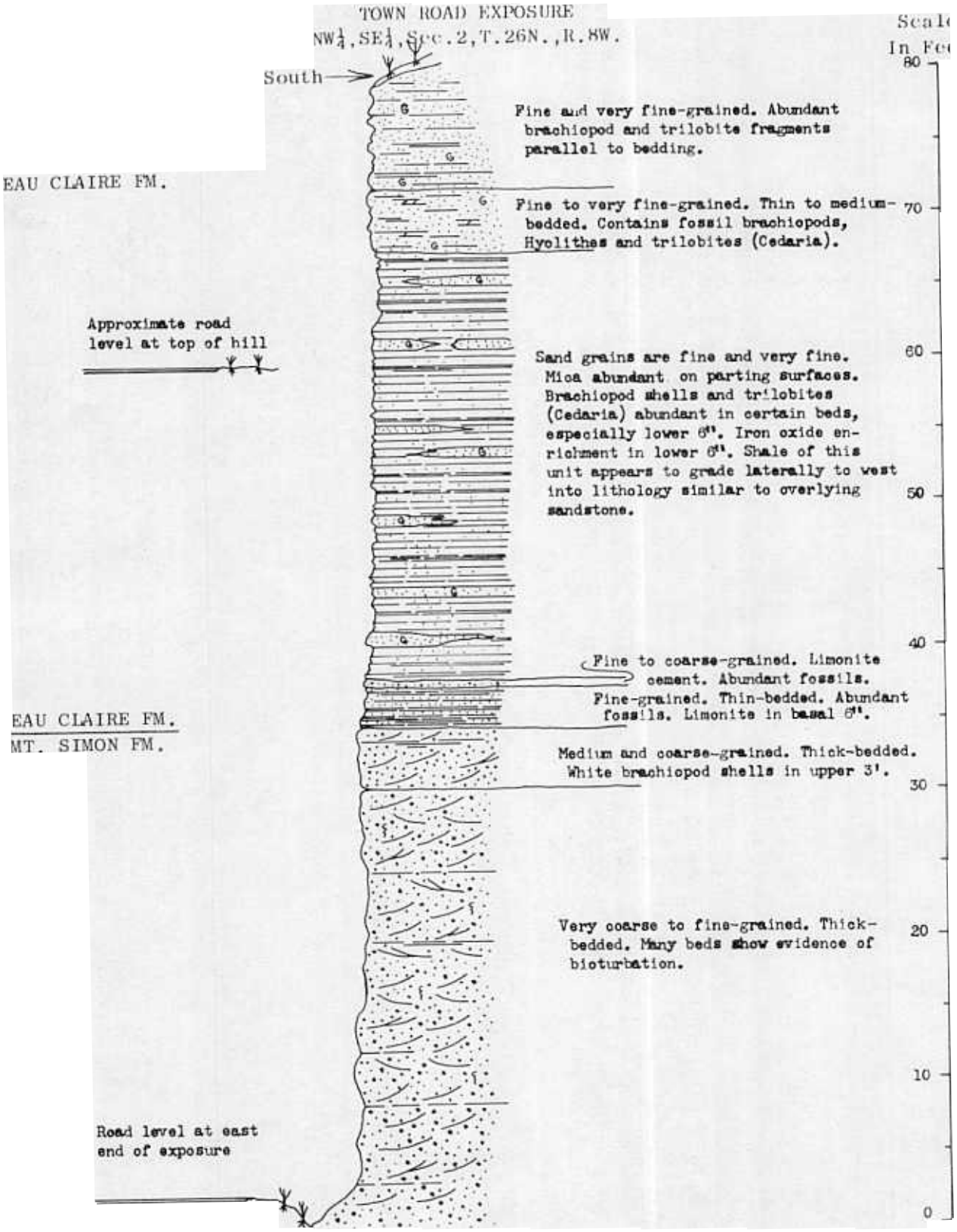
Location: Roadcuts on east-west asphalt roads 0.8 miles west of junction of U. S. Highway 53 with County Highway "II" south of City of Eau Claire on the north line of the NW$\frac{1}{4}$, SE$\frac{1}{4}$, Sec. 2, T.26N., R.9W., Eau Claire County (Eau Claire East 7.5-minute topographic quadrangle, 1972).



Author: M. E. Ostrom (modified from Ostrom, 1970)

Description: At this exposure the contact relations of the Mt. Simon and Eau Claire formations are clearly shown. The Mt. Simon consists primarily of medium and coarse-grained sandstone with some fine-grained sandstone. The upper approximately 20 feet of the formation consists of transitional beds composed of particles ranging in size from silt to granules. Certain of these beds are thoroughly burrowed. The upper few feet of the transition beds commonly contain brachiopods.

The Eau Claire Formation is distinquished from the Mt. Simon by its generally finer grain size and thin-bedding, and by the presence of glauconite, trilobites, and abundant shale. Commonly the contact is marked by iron oxide enrichment in a zone about one foot thick.


TOWN ROAD EXPOSURE
NW¼, SE¼, Sec. 2, T. 26N., R. 8W.
Scale
In Fe
South
EAU CLAIRE FM.
Approximate road level at top of hill
EAU CLAIRE FM.
MT. SIMON FM.
Road level at east end of exposure
Fine and very fine-grained. Abundant brachiopod and trilobite fragments parallel to bedding.
Fine to very fine-grained. Thin to medium-bedded. Contains fossil brachiopods, Hyolithes and trilobites (Cedaria).
Sand grains are fine and very fine. Mica abundant on parting surfaces. Brachiopod shells and trilobites (Cedaria) abundant in certain beds, especially lower 6'. Iron oxide enrichment in lower 6'. Shale of this unit appears to grade laterally to west into lithology similar to overlying sandstone.
Fine to coarse-grained. Limonite cement. Abundant fossils.
Fine-grained. Thin-bedded. Abundant fossils. Limonite in basal 6'.
Medium and coarse-grained. Thick-bedded. White brachiopod shells in upper 3'.
Very coarse to fine-grained. Thick-bedded. Many beds show evidence of bioturbation.
80
70
60
50
40
30
20
10
0

In a recent study of the Eau Claire Formation in western Wisconsin sponsored by the Wisconsin Geological Survey and used by Bradford Morrison (1968) for a Master's Degree at the University of Wisconsin it was determined that the Eau Claire could conveniently be subdivided into 5 laterally persistent lithologic units which are:

E. Upper Thick-Bedded Unit. Sandstone, fine and very fine-grained, thick to medium-bedding, glauconitic; Upper unit at STOP 4; missing at STOP 7. About 20' thick.

D. Upper Thin-Bedded Unit. Sandstone, fine and very fine-grained, thin distinct bedding, very glauconitic. Described as "usually missing from sections." Lower Unit at STOP 4 and upper unit at STOP 7. About 15' thick.

C. Lower Thick-Bedded Unit. Sandstone, fine and very fine-grained, thick-bedded, locally very glauconitic. A few very clay-rich irregularly-bedded units separating the more characteristic thick-bedded units. Thick-bedded unit at entry at STOP 7. About 25' thick.

B. Lower Thin-Bedded Unit. Sandstone, fine and very fine-grained, mixed thin and thick beds, thin beds regular and distinct, glauconitic, high clay content, mica common. Abundant fossils and trail markings. Unit at top of exposure at STOP 3 and at path level and below springs at grotto at STOP 7. About 20' thick.

A. Shaly beds. Shaly sandstone and shale, very fine and fine-grained and, very thin-bedded, individual beds often indistinct and seldom over 3" thick. Abundant fossils and trail markings. Lower unit at STOP 3. About 15' thick.

Whereas the transition beds in the top of the Mt. Simon are believed to have formed in a nearshore environment located near to but seaward of the beach the Eau Claire Formation, by way of contrast, is believed to have formed in an offshore area of lower energy located seaward of the nearshore environment. This interpretation, is suggested by uniform but thin and laterally persistent beds, presence of glauconite, presence of marine animals in a variety of forms and abundant trail markings, and small scale cross-bedding. Bedding character is interpreted to indicate brief episodes of higher energy and the increase in carbonate content indicates conditions of light and water depth were conducive to formation of carbonate.

The history suggested by these rocks is one of deepening waters probably caused by subsidence of the land surface and northward transgression by the sea over the land (Ostrom, 1964a). Thus beach deposits (thick-bedded Mt. Simon) are mantled by nearshore deposits (transitional Mt. Simon) which are in turn mantled by offshore deposits (Eau Claire). A recurrence at higher levels of any of the lithologies noted would indicate regression. That this happened can be seen at the Galesville stop where the Mt. Simon lithology is repeated in the Galesville Sandstone Formation.

The type section of the Eau Claire is located in the east side of Mt. Washington in the City of Eau Claire but is no longer accessible to groups. The following description of the type section is slightly modified from W. H. Twenhofel (1935):

Section at Stop 34 Mt. Washington, Wisconsin

Section at Mt. Washington, 4 miles from Eau Claire, Wisconsin, in the NE$\frac{1}{4}$, NW$\frac{1}{4}$, Sec. 25, T.27N., R.LOW, Eau Claire County (Chippewa Falls 15-minute topographic quadrangle, 1936).

CAMBRIAN

St. Croixan series
Elk Mound Group (205.3 ft.)
Eau Claire Formation (60.0 ft.)

Top of rock, about 2 feet soil and drift above

192.3'-205.3'	23.0'	8.	Upper quarry face, southwest corner shows only exposure. Sandstone, medium-grained, massive, glauconitic, yellow, in lenticular beds. Basal beds about 2 feet. About 15 feet above the base a non-laminated soft layer of yellow and brown greatly burrowed silty sandstone with poor brachipod shells, oboloid shells abundant in some beds, a bed 8 feet from base is literally jammed with trilobites. Hyolithes primordialis (Hall), "Crepicephalus" danace (Walcott), "Crepicephalus" unca (Walcott), Dresbachia amata (Walcott) Lonchocephalus chippewaensis (Owen), "Agnostus" sp., Anomocarella volux (Walcott), "Pagodia" thea (Walcott), Coosia connata (Walcott), Crepicephalus sp. nov., Dicellomus politus (Hall), new species of Obolus, Lingulella, Lingulepis.
145.3'-182.3'	37.0'	7.	Lower quarry face. Sandstone, fine grained, yellow to light brown, irregularly bedded, lenticular beds from $\frac{1}{2}$ inch to 8 inches. Partings of pale blue-green silt with mud cracks; oboloid and linguloid brachiopods, layer 10 feet from base shows excellent heads and tails of Cedaria woosteri. Extends to top of cliff or level of upper quarry floor=top of Cedaria zone. Cedaria woosteri (Whitfield), Menomonia calymonoides (Whitfield), Hyolithes primordialis (Hall), Obolus namouna (Walcott), Obolus rhea (Walcott), Lingulepis sp. nov., Lingulepis cf. ancuminata (Conrad).
			Mt. Simon Formation (138.0 ft.)
138.0'-145.3'	7.3'	6.	Sandstone, medium to coarse-grained, in alternating thick and thin beds, yellow to gray or brown, Obolus namouna (Walcott) (base of lower quarry).
123.0'-138.0'	15.0'	5.	Sandstone, medium to coarse-grained, massive bedded, beds to 2 feet, yellow to brown, laminated, sparing oboloids=basal Cedaria zone.
			Mt. Simon member (123 ft. exposed)

	-123.0'	53.0'	4. CONCEALED to base of cliff on northeast side of Mount Washington with a few ledges of coarse to medium-grained sandstone in upper 10 feet. Note: 124 feet from terrace level below to flat of quarry floor.
60.0'	-70.0'	10.0'	3. CONCEALED on terrace with road.
33.0'	-60.0'	27.0'	2. Sandstone, coarse-grained, unfossiliferous, white to yellow, cross-laminated; granules and pebbles of quartz, sorting poor, units 2 inches to 12 inches, foresets short and steep, dip east or northeast, cliff.
	-33.0'	33.0'	1. CONCEALED to corner of school grounds with small ledges of medium-grained sandstone in upper 10 feet.

Significance: This exposure illustrates the contact relationships and the major mineralogical and lithological differences between the Mt. Simon and Eau Claire Formations. In addition, the Eau Claire Formation is the oldest major fossil-bearing Formation in the Paleozoic of Wisconsin.

What is the significance of the contact relationships between the two formations? What environments do the formations represent and what is the evidence? Could a reverse relationship of the two formation lithologies occur, namely Mt. Simon type lithology above Eau Claire-type lithology? What kinds of fossils occur in the Mt. Simon? the Eau Claire? What is their significance in terms of environmental interpretation?

References: Thwaites, 1935; Twenhofel, Raasch, & Thwaites, 1935; Ostrom, 1964 and 1970; Morrison, 1968.