

PALEOECOLOGY OF A BLACK LIMESTONE,
CHERRY VALLEY LIMESTONE, DEVONIAN, NEW YORK STATE

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The Cherry Valley Limestone is documented in the literature as early as 1842 when Vanuxem referred to the "Goniatites" or "Agoniatites Limestone" of the Marcellus Formation in his publication of Geology of New York: Third Geologic District. In 1903, Clarke proposed the name of Cherry Valley Limestone for the "Agoniatites Limestone"; named for the excellent exposure in Cox's Ravine just south of the village of Cherry Valley. This section was presumed to be typical of the Marcellus Formation throughout western New York.

The Cherry Valley Limestone is known to extend for 160 miles across central New York from its westernmost outcrop in Flint Creek near Phelps, Ontario County to the easternmost outcrop in Onesquethaw Creek near Clarksville, Albany County. The Cherry Valley overlies the Union Springs Member of the Marcellus Formation and is capped by the Chittenango Shale Member. To the east the Cherry Valley grades into the Stoney Hollow Sandstone and to the west joins with the upper beds of the Onondaga Limestone.

Perhaps the Cherry Valley is best known for its unique assemblage of cephalopods as documented by Flower (1936). Previous work has been done mainly by Clarke (1901), Grabau (1906),

Cooper (1930,1933), Smith (1935), Flower (1936,1943), and Rickard (1952),

The previous environmental interpretations of the Cherry Valley Limestone as a product of a highly reducing environment are untenable due to the presence of an abundant benthonic fauna in most parts of the unit. At the type section, the Cherry Valley is four feet thick and consists of a thin basal black limestone with numerous small brachiopods and abundant cephalopods, a middle nodular unit of interbedded micrites and silty shales, and an upper black limestone with abundant brachiopods, ostracodes, and cephalopods. Thin zones containing the coral Aulopora separate the lower and upper limestone units from the central nodular unit. In the easternmost outcrops, these zones with Aulopora thicken and comprise most of the Cherry Valley.

To the west, the Cherry Valley undergoes a series of faunal and lithologic changes, thinning to less than half the thickness of the type section. The basal limestone grades into a brown to black micrite with a fauna dominated by trilobites and brachiopods; cephalopods are absent. Shales disappear from the middle unit which thins and is characterized by a fauna of Aulopora and brachiopods. The uppermost unit exhibits an abundant gastropod fauna at some localities and in the westernmost section is characterized by corals and brachiopods. As in the east, the coral facies expands and comprises most of the Cherry Valley.

The Cherry Valley apparently reflects deposition in shallow, calm waters, affected by cyclic variation in delivery of clastics possibly combined with sea level fluctuation. Circulation and

oxygenation were effective enough to support an abundant and relatively diverse benthonic fauna.

SELECTED BIBLIOGRAPHY FOR THE CHERRY VALLEY LIMESTONE

- Clarke, J. M. 1901. Marcellus Limestones of Central and Western New York and Their Fauna; New York State Museum Bulletin 49, pp 115-138.
- Cooper, G. A. 1930. Stratigraphy of the Hamilton Group of New York; American Journal of Science, 5th Series, Vol 19, pp 116-134, 214-236.
- Cooper, G. A. 1933. Stratigraphy of the Hamilton Group in Eastern New York; American Journal of Science, 5th Series, Vol 27, pp 1-12.
- Flower, R. H. 1936. Cherry Valley Cephalopods; Bulletin of American Paleontology, Vol 22
- Flower, R. H. 1943. Werneroceras in the Devonian of New York; Bulletin of American Paleontology, Vol 28, pp 14-21.
- Grabau, A. W. 1906. Geology and Paleontology of the Schoharie Valley; New York State Museum Bulletin 92
- Rickard, L. V. 1952. The Middle Devonian Cherry Valley Limestone of Eastern New York; American Journal of Science, Vol 250, pp 511-522.
- Smith, B. 1935. Geology and Mineral Resources of the Skaneateles Quadrangle; New York State Museum Bulletin 300

ROAD GUIDE FOR CHERRY VALLEY FIELD TRIP.

STARTING POINT: Holiday Inn, Downtown Utica

<u>MILAGE</u>	<u>DIRECTIONS</u>
0.0	East on Genesee Street to Route 5S.
0.6	Turn right on Route 5S East.
11.2	Bear right, continue on 5S East.
11.5	Ilion, New York
12.3	Go straight ahead at the light, off of 5S East and onto Main Street, Ilion, New York.
14.5	Turn right on Route 51 South
23.9	Turn left on Route 20 East.
31.9	Richfield Springs, New York
35.4	Warren, New York
38.3	Intersection Route 80.
40.7	East Springfield, New York
47.9	Turn right at sign for Mohawk Campsites 300 yards before TeePee; bear right at Y.
48.1	STOP #1: The Cherry Valley Limestone outcrops for several hundred feet along the roadside and is one of the most extensive outcrops available for study. This location was chosen as the type section for the study conducted during the summer of 1968. The contact between the Cherry Valley and the Union Springs member below is gradational over a distance of 0.2 feet. The lowermost portion of the Cherry Valley contains abundant brachiopods and ammonoids. It is a medium grained dark gray skeletal limestone separated from the middle beds by a thin zone of <u>Aulopora</u> . The central unit is a nodular bed composed of medium grained limestone interbedded with argillaceous layers. The limestones, up to 0.6 feet thick, are broken into nodules; a case of sedimentary boudinage. The central unit is only slightly fossiliferous. The zone above the central unit is similar to the basal unit in that it contains a thin zone of <u>Aulopora</u> which separates it from the massive bed above. The uppermost unit of the Cherry Valley is a massive medium to coarse grained limestone with abundant orthocone nautiloids and brachiopods. The brachiopods found in the uppermost layers vary from those found in the basal layers. The Cherry Valley is gradational with the shales above which are extremely fossiliferous with brachiopods and bryozoans.

MILEAGEDIRECTIONS

- 48.1 Turn around, return to Route 20.
- 48.3 Turn left onto Route 20 West.
- 51.7 Outcrop of Cherry Valley on the right at the top of the hill.
- 54.9 East Springfield, New York.
- 60.6 Warren, New York.
- 63.4 Richfield Springs, New York.
- 72.8 Turn left onto Gulf Road, 50 yards before Mac's Fruit Stand
- 73.2 STOP #2: The Cherry Valley Limestone has thinned from a thickness of 4.2 feet at the type section to 2.9 feet at this Gulf Road section. Again the Cherry Valley is gradational from the underlying shales and cephalopods and brachiopods are present in the lowermost layers. Here we see the first introduction of trilobites to the Cherry Valley fauna. Fragments of cephalon, thorax, and pygidium can be found in the lower unit. The Aulopora zone at the top of the lower unit is not as well defined, and Aulopora seems to be present within the middle unit only. The middle unit has thinned from 1.9 feet at the type section to 0.8 feet and retains its nodular appearance. A few brachiopods and Aulopora comprise the fauna of the middle unit. The upper unit is gradational from the overlying shales and contains abundant brachiopods and cephalopods. It is a fine to medium grained black limestone with some replacement of shell material with coarse grained rusty calcite. The shales and limestone layers of the Union Springs member below show some evidence of folding.
- 73.2 Turn around, return to Route 20 via Gulf Road.
- 73.6 Turn left onto Route 20 West.
- 75.6 West Winfield, New York.
- 78.9 Bridgewater, New York.
- 86.4 Sangerfield, New York.
- 93.6 Madison, New York.
- 95.6 Bouckville, New York.
- 97.7 Turn right onto Route 46 North.
- 103.2 Turn left onto Pratt Road.
- 103.8 Turn right onto Falls Road.
- 105.5 STOP #3: The Cherry Valley Limestone outcrops for several hundred feet along Falls Road and along the banks of Oneida Creek. The thickness of the section fluctuates between 2.1 and 2.8

feet with the greatest variation being seen in the upper unit. Again trilobites are present in the lower unit and crinoids make their first appearance in the western sections. They appear as single crystals of calcite in the medium grained black limestone of the lower beds. Brachiopods and cephalopods also comprise the fauna of the lower beds. The middle unit is separated from the upper and lower units by irregular surfaces and maintains its nodular appearance. A few brachiopods and Aulopora are the only noticeable fauna. The upper unit consists of a fine to medium grained limestone which grades into the shales above. Cephalopods and brachiopods are abundant.

- 105.5 Turn around, return to Pratt Road via Falls Road.
- 107.2 Turn left onto Pratt Road.
- 107.8 Turn right onto Route 46 South.
- 113.3 Turn right onto Route 20 West.
- 116.4 Morrisville, New York.
- 123.6 Nelson, New York
- 127.3 Cazenovia, New York
- 129.0 Turn right onto Route 92 West.
- 133.7 Oran, New York.
- 136.4 Manlius, New York.
- 136.8 Junction with Route 173, turn left at light.
- 137.0 Go straight ahead at light staying on Route 173.
- 138.9 STOP #4. The final stop on the field trip is perhaps the most picturesque. The Cherry Valley Limestone outcrops in a stream bed approximately 300 yards from the road. Actually two outcrops may be seen at this location as the stream splits and allows for two exposures. The left branch of the creek offers the better section. The lower unit of this section is a fine grained black to brown limestone with a fauna consisting of mainly brachiopods and trilobites. Some evidence of crinoids is seen in single crystals of calcite within the fine grained limestone. The large ammonoids and orthocones are missing from the fossil assemblage. The middle unit consists of a nodular black fine to medium grained limestone with apparent secondary calcite replacement. There are few fossils present and some very thin shaly interbedding. The upper unit consists of a basal bed which closely resembles the middle unit in lithology. It has the nodular appearance of the middle unit yet lacks the shaly interbedding. It has a scattered fauna of brachiopods and corals. The middle layer of the upper unit is the most fossiliferous with abundant brachiopods and cephalopods. Corals and crinoids are present also. The uppermost layer of the Cherry Valley is a dense fine grained black limestone gradational from the shales above. Very few fossils are present.
- 138.9 Turn around, remain on Route 173 to Chittenango.

MILAGEDIRECTIONS

140.0	Manlius, New York.
147.0	Chittenango, New York.
147.4	Junction Route 5 East, bear right onto Route 5 East.
155.8	Wampsville, New York.
159.8	Onieda Castle, New York.
161.0	Sherrill, New York.
164.7	Vernon, New York.
172.6	Kirkland, New York.
176.2	Turn left onto Route 5A East.
177.8	New York Mills, New York.
180.2	Utica, New York.
181.7	Junction Route 5S East, stay on Route 5S East.
182.3	Turn right onto Genesee Street.
182.9	Holiday Inn --- HOME AT LAST!!