

Trip D

EURYPTERID HORIZONS AND THE STRATIGRAPHY OF THE UPPER
SILURIAN AND ?LOWER DEVONIAN OF WESTERN NEW YORK STATE

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Introduction

The Upper Silurian rocks of New York State comprise an interesting variety of distinct lithologies, e.g. red and green shales, some sandstone, limestone and dolostone, halite, gypsum, and anhydrite. While these rocks are of economic importance because of the halite and gypsum deposits they contain, much of current geologic interest in these strata is concerned with their sedimentology, correlation, and more recently, the paleontology of certain well-known fossiliferous units (see, for example, Treesch 1972, Rickard 1969, Berry and Boucot 1970, Berdan 1972). Often overlooked is the unusual eurypterid and scorpion faunas which these generally "unfossiliferous" rocks contain.

The purpose of this article and associated field trip is to familiarize the reader with the Upper Silurian and ?Lower Devonian rocks of the Genesee region, particularly the Bertie Group, and to examine outcrops of these rocks at localities which have yielded eurypterid remains.

Stratigraphy and Paleontology

The following rock units, in ascending stratigraphic order, constitute the Upper Silurian (Cayugan Series) and ?Lower Devonian (Helderbergian Series) of Western New York (Fig. 1). The lowest Cayugan unit is the Pittsford Shale (local member or facies of the Vernon Fm.), succeeded by the Vernon Fm., Syracuse Fm., Camillus Fm., Fort Hill Waterlime (new), Oatka Shy. Ds., members of the Fiddlers Green Fm. (formerly Falkirk), Scajaquada Fm., Williamsville Waterlime, Cobleskill Fm. (formerly Akron), Honeoye Falls Fm.

Recent stratigraphic studies which at least mention various portions of the Upper Silurian of Western New York include Rickard 1962, 1969, Fisher 1960, Leutze 1959.

A problem often encountered in the field is the identification of the various units in the upper portion of the Cayugan Series. Most commonly the Cobleskill Fm. is confused with all or the middle portion of the Fiddlers Green Fm. (and vice versa).

Indeed, at one time or another each of the units has been erroneously identified or confused with some other unit. The primary reasons for these errors are as follows:

1. The unconformity below the Devonian Bois Blanc-Onondaga Ls: This causes different units to be exposed beneath this unconformity at different localities. In central-eastern New York most of the units are always exposed because Helderbergian strata are exposed beneath this unconformity (Manlius, etc.)
2. Similarity of units: Many of the units appear to be lithologically similar in the field. For example, below the Cobleskill Fm. occurs a waterlime (Williamsville) and below the middle Fiddlers Green Fm. (Victor Member) occurs another waterlime (Morganville or basal Fiddlers Green). As recently as 1969 a new exposure of Morganville Waterlime was identified by Duskin (1969 p. 53) as "Oxbow" (=Williamsville Waterlime). The nearby banks were described as Forge Hollow Fm. (Duskin 1969 p. 36). I regard these exposures as typical Camillus Fm.

The lithologic (and paleontologic) similarities of various units are the result of cyclic sedimentation during the Upper Silurian (and probably at least a portion of the Lower Devonian). This resulted in the recurrence of similar lithofacies at various stratigraphic intervals in the section. For example, note in Figure 1 the occurrence of 'waterlime' units which formerly (except for the Williamsville Waterlime) were disguised in other formations (for example the Fiddlers Green and the Oatka).

The cyclic nature of the Upper Silurian sequence in New York has received little attention except on a broad scale wherein the entire Cayugan of New York is interpreted as a complete cycle, "underlain and overlain by relatively 'normal' marine carbonates, the Lockport and Cobleskill Formations respectively" (Treesh 1972). Furthermore, the well-known occurrence of the two Eurypterus faunas (the Eurypterus remipes remipes DeKay fauna of the "Herkimer Pool" and the Eurypterus remipes lacustris Harlan fauna of the "Buffalo Pool") is due to cyclic sedimentation which caused the deposition of similar sediments (facies) at two different times represented by the stratigraphically lower Fiddlers Green Fm. in the eastern or Herkimer area, and the stratigraphically higher Williamsville Waterlime of the western or Buffalo area.

While the two faunas have been known for about 150 years, it was only recently suggested that the two faunas were not contemporaneous but rather that they represented two parallel faunas different in age (Caster and Kjellesvig-Waering 1956). This novel idea was based on reported facies changes of the Bertie with the Brayman Shale of eastern New York. This suggested that the Bertie Group or some of its units, represented transgressive units and thus could not be of the same age throughout their extent. Nevertheless, the Bertie Group and even the coralline Cobleskill Fm. were shown as being contemporaneous units in their respective occurrences across the state (New York State Geological Survey Correlation Chart of the Silurian-Fisher, 1959).

Interestingly, the occurrence of two additional eurypterid horizons within the Bertie Group has gone unnoticed until recently (Ciurca 1969), except for the important early observation that eurypterid remains occur in the "Oatka beds, dark gray and shaly with a blocky waterlime at base" (Chadwick 1917). The new horizons occur in the Morganville Waterlime and the stratigraphically lower Fort Hill Waterlime. These new occurrences appear to represent yet other examples of the cyclic nature of the Upper Silurian sequence in New York. Obviously, cyclic sedimentation also occurred in adjacent nearby areas (Pennsylvania, Ohio, etc.).

The cyclic sediments, represented by the lithostratigraphic units which constitute the Bertie Group and the overlying preBois Blanc/Onondaga Lss. (Devonian) beds, are described below in ascending order. The Vernon and Syracuse Fms. and the overlying Camillus Fm. will not be described since only the upper portion of the Camillus Fm. will be observed during the associated field trip.

Cayugan Series

FORT HILL WATERLIME

This thin unit (1 - 2 feet) has previously been only inconspicuously noticed (except for the keen observations of Chadwick 1917) as a waterlime at the base of the "Oatka beds." The unit is treated by Ciurca (1969) as a lithologic unit which can be traced from west of Oatka Creek (North LeRoy area) to Phelps, New York (exposures along N. Y. 88 and also N. Y. S. Thruway). The Fort Hill Waterlime is a very fine-grained straticulate dolostone. The type section is the exposure on N. Y. 19 north of LeRoy. At this locality it is characterized by small mineraliferous vugs (calcite?), large SALT HOPPERS, ostracods, and eurypterid remains (at least two species). The same lithology is seen at exposures near Phelps (exposures on both sides of N. Y. 88, along the N. Y. S. Thruway just to the east, and exposures in Flint Creek at Phelps). Outcrops east of this locality are rare, especially at this interval. The Fort Hill Waterlime, therefore, has not been recognized east of the Phelps area.

OATKA FORMATION

The Oatka Fm. consists of "shaly" dolostone. The type section is presumably at Buttermilk Falls, Oatka Creek, north of LeRoy, N. Y. The section at Flint Creek, Phelps is proposed as a reference section. The unit is approximately 10 feet thick in the LeRoy area and also at Phelps. No fossils have been found or reported. It is underlain by the Fort Hill Waterlime and overlain by the Morganville Waterlime Member of the Fiddlers Green Fm.

FIDDLERS GREEN FORMATION

The Fiddlers Green Fm. was named by Hopkins in 1914 for

strata overlain and underlain by gypsiferous strata. The occurrence in this formation of the Eurypterus remipes remipes fauna, and the suggestion that this formation was of more than local extent and represented the "Falkirk Member" of the Bertie of Western New York was strongly suspected by Rickard (1953). I have carefully traced the Fiddlers Green Fm. (type section is Butternut Creek north of the village of Jamesville in Onondaga County) into the "Falkirk" of Western New York (Ciurca 1969) utilizing key structures. The use of the term "Falkirk" in Western New York is therefore discouraged. Furthermore, I have divided the Fiddlers Green Fm. into three members which are well-displayed in Western New York and traceable into the Fiddlers Green Fm. of Central-Eastern New York. The three members are described below:

MORGANVILLE WATERLIME

This lower unit of the Fiddlers Green Fm. consists of very fine-grained dolostone having a conchoidal fracture and containing a rare Eurypterus remipes ssp. fauna (Ciurca 1969). The type section of the Morganville Waterlime is the exposure in Black Creek at Morganville, Genesee County where it is overlain by the crystalline Victor Member of the Fiddlers Green Fm. The Morganville Waterlime is traceable from Buffalo to Cayuga Junction on the east side of Cayuga Lake without difficulty and is probably represented as far east as Forge Hollow, Oneida County. It contains SALT HOPPERS or salt crystal impressions and ostracods at several localities and a Eurypterus remipes sp. fauna at Cayuga Jct. and also at Marcellus Falls, N. Y. This unit was confused with the "Oxbow Waterlime" by Duskin (1969 p. 53).

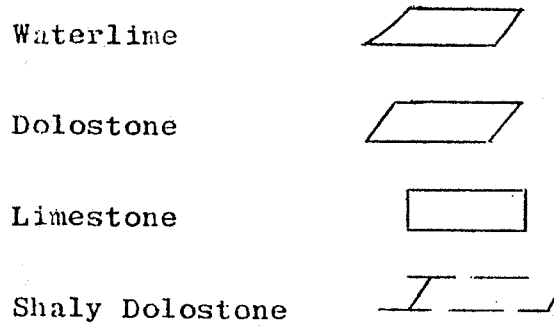
At Mud Creek, East Victor (immediately south of N. Y. 96) the Morganville Wl. forms a small falls and exhibits large conchoids. This occurrence is repeated in the village of Phelps beneath the N. Y. 96 bridge over Flint Creek).

VICTOR MEMBER (DOLOSTONE, LIMESTONE)

The middle Fiddlers Green Fm. consists of massive crystalline (sugary) dolostone, often mottled, and some limestone. The type section is in Mud Creek, East Victor, Ontario County south of N. Y. 96. A reference section is the excellent exposure along the N. Y. S. Thruway north of Phelps, New York. This unit is fossiliferous (though fossils are often poorly preserved and difficult to extract) and contains a brachiopod fauna, ostracods and eurypterid remains. It has been confused with the Cobleskill Fm. because of its crystalline and mottled appearance and because it contains a brachiopod fauna. The Victor Member has been traced from the Buffalo area to Cayuga Lake and probably extends much further to the east. A thin, fossiliferous limestone bed (A) occurs at the base and can be recognized at Phelps along N. Y. 88, and along the N. Y. S. Thruway just to the east. It is also seen as an extremely resistant (rings when struck) unit at Cayuga Jct. on the east side of

Figure 1 COMPOSITE STRATIGRAPHIC SECTION
 based on examination of outcrops at Honeoye
 Falls, N.Y. and outcrops to the west and
 east (LeRoy to Phelps, N.Y.)

Note: The eurypterid bearing waterlimes
 have been emphasized.



1 in. = ~ 20 ft.

BERTIE GROUP

Fiddlers
 Green
 Formation

Onondaga
 Formation

Honeoye Falls
 Formation

Cobleskill
 Formation

Williamsville Waterlime

Scajaquada
 Formation

Phelps Waterlime

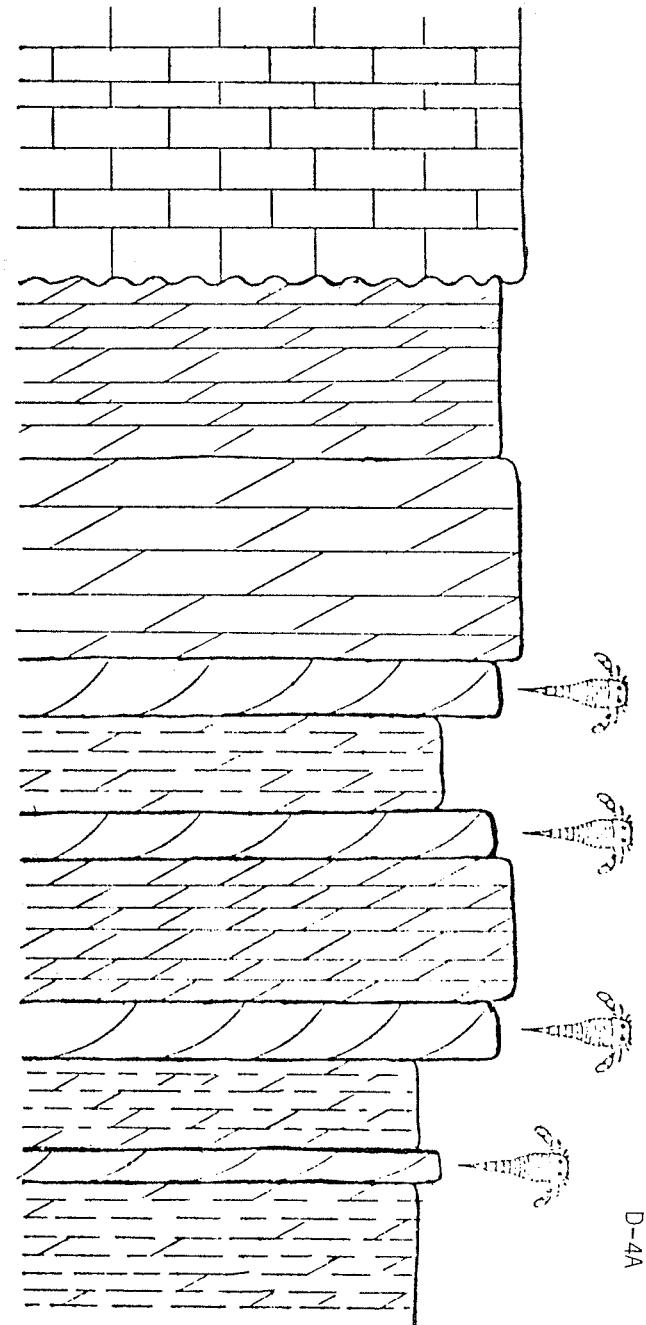
Victor
 Member

Morganville Waterlime

Oatka
 Shy. Dolostone

Fort Hill Waterlime

Camillus
 Formation



Cayuga Lake. Brachiopods are abundant in this unit at Phelps. Beds overlying Victor A consist of crystalline brownish to grey mottled dolostone containing some vuggy layers. The small vugs are often mineralized and this feature provided an additional source for confusion of this member with the Cobleskill Fm. of Western New York. At the N. Y. 88 locality, very nice cubes of fluorite have been found in some of the vugs.

PHELPS WATERLIME

At the top of the Fiddlers Green Formation of Eastern New York occurs a very fine-grained (sublithographic) dolostone having a conchoidal fracture. It has been and still is the primary source of eurypterid remains in the eastern portion of the state (so called "Herkimer Pool"). The most prolific locality since its discovery by Rickard (1953) is still Passage Gulf near Spinnerville, N. Y. The waterlime bed at the top of the Fiddlers Green Fm. at this locality has yielded thousands of specimens of eurypterid remains of the Eurypterus remipes remipes DeKay fauna. This waterlime unit has been traced from Passage Gulf westward to the Buffalo area where it has been referred to as the Phelps Waterlime (Ciurca 1969). The type locality of the Phelps Waterlime is along the N. Y. S. Thruway north of Phelps. At this locality the unit has also yielded the Eurypterus remipes remipes DeKay fauna. The Phelps Waterlime contains a zone of MUDCRACKS at the top of the unit which is traceable from Mud Creek at East Victor to east of Passage Gulf, Herkimer County. SALT HOPPERS are also relatively common in this unit.

SCAJAQUADA FORMATION

In Western New York shaly beds occurring between the underlying Fiddlers Green Fm. and the overlying Williamsville Waterlime were termed Scajaquada (Chadwick 1917). Somewhat thicker beds in Central and Eastern New York at this stratigraphic interval are referred to as the Forge Hollow Fm. (Rickard 1953). It seems best to retain these two names since the lithologic appearance is quite different in the two areas. In Central New York (for example the Lyndon-Heard Gypsum Quarries, abandoned) thick gypsum beds occur at this interval.

No fossils have been found in the Scajaquada-Forge Hollow Fms. in New York. As noted previously, gypsum beds are well-known in the Forge Hollow of Central New York.

At the WPA Quarry (Work Projects Administration Quarry) the Scajaquada Fm. contains MUDCRACKS. The locality is west of Auburn, New York. The author suggests that this be the arbitrary cutoff of the Scajaquada Fm. Localities to the south (Cayuga Lake area) and to the east should be referred to the Forge Hollow Fm. Interestingly, the WPA Quarry was described by Duskin in 1969 as "the best exposure of the Fiddlers Green the writer has seen, including the type locality. About 25 feet of the Fiddlers Green

are exposed in three benches." When I examined this locality I found that the three benches were nothing more than Scajaquada Fm. overlain by Williamsville Waterlime, which was overlain by thick Cobleskill Fm. The Fiddlers Green Fm. is present but only in the streambed below and southward along the base of the same "rocdrumlin."

WILLIAMSVILLE WATERLIME

This fine-grained dolostone is perhaps the best known Upper Silurian unit, primarily because it was formerly quarried extensively (cement beds) and because such quarrying operations resulted in the discovery of abundant eurypterid remains (Eurypterus remipes lacustris Harlan fauna). Indeed, the Bertie has often been described in terms of the Williamsville Waterlime (Rickard 1953, p. 101) and many eurypterid remains from Western New York have been simply described as coming from the "Bertie Waterlime." Unfortunately, this tells us nothing of the exact horizon from which remains originated. Now that Eurypterus remipes remipes DeKay is known from the Fiddlers Green Fm. in Western New York, and that at least three other eurypterid horizons are now known, it is imperative that the exact stratigraphic horizon from which fossils are collected be known.

The Williamsville Waterlime of the Buffalo and Williamsville areas still yields eurypterid remains. To the east, however, eurypterid remains are very rare. The easternmost locality at which Eurypterus remipes lacustris Harlan has been found is Mud Creek, East Victor where the Williamsville Waterlime is well-displayed but quite unfossiliferous. This extends the geographic range of this species considerably.

Careful search of the Williamsville Waterlime east of Mud Creek has not yielded this species. However, a well-preserved coxa found in the upper Williamsville (or transitional beds) below the Cobleskill Fm. on Frontenac Island in Cayuga Lake (a new eurypterid locality) may represent this species. Paracarcinosoma scorpionis was recently found by the author in the Williamsville Waterlime in a ravine east of Clifton Springs (Ciuarca, in preparation).

Other fossils found by the author in the Williamsville Waterlime (especially at Mud Creek) are gastropods, Linglua sp., and portions of phyllocarids (probably Ceratiocaris sp.).

COBLESKILL FORMATION

The Correlation Chart of the Silurian Rocks of New York State (Fisher 1960) still reveals the problem of the relationship between the "Akron Dolostone" of Western New York and the Cobleskill Fm. of Eastern New York. Careful tracing of key beds in the Fiddlers Green Fm. below the Akron-Cobleskill Fms. leaves no doubt as to the equivalent stratigraphic position of the Akron Dolostone and

the Cobleskill "Limestone." This is not meant to imply that the Akron-Cobleskill is of the same age throughout its geographic extent. Undoubtedly, such a "coralline" unit probably is time transgressive in nature, and only careful study of the unit will reveal this and other relationships of the Cobleskill Fm. with underlying and overlying units. The name Akron Dolostone should be replaced by Cobleskill Fm. The term Cobleskill was introduced by Clarke in 1902 (see Rickard 1953, p. 81) and has priority.

The Cobleskill Fm. of New York should be regarded as a relatively fossiliferous unit exhibiting a number of facies changes from its type locality in Eastern New York to Buffalo, New York and into Canada. In Western New York the Cobleskill Fm. is generally a massive unit. It is fossiliferous, though apparently not to the same extent as exposures of this unit to the east (primarily Frontenac Island in Cayuga Lake, and Forge Hollow to the type locality).

Stromatoporoids have been reported in the Cobleskill Fm. at Oaks Corners Quarry (southeast of Phelps) and have been observed by the author west of Honeoye Falls (Five Corners area). Favosite corals have been observed by the author also in the Five Corners area. Horn corals (usually referred to *Cyathophyllum* sp.) are locally abundant, for example in the Bennett Quarry at Buffalo. They have also been observed at Mud Creek, East Victor. Recently brachiopods were encountered in this fm. at Honeoye Creek, Honeoye Falls, New York. No eurypterid remains are definitely known from the Cobleskill Fm. of Western New York.

At the request of Erik N. Kjellesvig-Waering, I checked the source of Eurypterus laculatus Kjellesvig-Waering known from a carapace in the New York State Museum Collections which had been collected from Black Creek, Morganville, New York and reportedly originated in the Cobleskill Fm. A study of the locality (Ciurca 1967) revealed no Cobleskill Fm. present. The eurypterid horizon was found to be Victor Dolostone (Middle Fiddlers Green Fm.) which is easily confused with the Cobleskill (see description of Victor Member). At Morganville the uppermost unit exposed is the Victor Member of the Fiddlers Green Fm. All higher units are missing due to the unconformity beneath the Devonian Onondaga and/or Bois Blanc Lss.

The fauna of the Cobleskill Fm. of Western New York needs to be restudied and precautions taken to make sure specimens are originating from the desired unit and not a lithologically similar unit such as the Victor Member of the Fiddlers Green Fm. The brachiopod fauna of the Cobleskill Fm. of Eastern New York has recently been redescribed (Berdan 1972).

Helderbergian Series

HONEOYE FALLS FORMATION

The strata exposed on Honeoye Creek at Honeoye Falls, New York have been repeatedly misinterpreted as belonging to various units of the Bertie Group or the Akron-Cobleskill Fm. For example,

Rickard (1953, p. 100) noted that "at Honeoye Falls, for example, it is believed that the Onondaga rests unconformably upon the Falkirk member." Leutze (1959, p. 104) also agreed with this interpretation when he suggested that the base of the Fiddlers Green occurred to "at least Honeoye Falls, locality 259" where "there is a similar argillaceous bed at the bottom which develops huge conchoidal fractures on weathering." An illustration of the "Falkirk" (=Fiddlers Green) at Lehigh Valley R. R. just northwest of Honeoye Falls (Fairchild 1927, pp. 419, fig. 56) also identified this unit as occurring in the Honeoye Falls area.

The strata exposed below the Onondaga Fm. on Honeoye Creek (and downstream to the N. Y. 65 overpass) have been termed Honeoye Falls Formation (Ciarca 1967, 1969). No rocks belonging to the Bertie appear to outcrop at this locality. The geographically isolated Honeoye Falls Fm. is in a similar stratigraphic position to the Chrysler Fm. of Central New York and probably represents a Chrysler outlier. At Honeoye Falls the unit is characterized by massive and thin bedded dolostone including "waterlimes." MUDCRACKS have been observed in at least two horizons. No fossils have yet been observed other than rare remains of the eurypterid Erieopterus microphthalmus ssp. discovered by the author in 1964. Erieopterus has been known previously only from the Helderbergian Olney Ls.

While the contact with the underlying Cobleskill Fm. has not yet been observed, a small outcrop of the Cobleskill Fm. in Honeoye Creek has recently been observed below and within visual sight of the Honeoye Falls Ds. Therefore, the Honeoye Falls Fm. definitely rests upon the Cobleskill Fm.

The Honeoye Falls Fm. has also been observed in the unnamed ravine just south of Five Points, Rush Quadrangle (elevation about 620 - 630 ft.) and at the locality illustrated by Fairchild and mentioned above. Both localities are west of the type section at Honeoye Creek, Honeoye Falls, New York.

The strata exposed at all of these localities have always been misinterpreted as being Bertie or Cobleskill or both.

Unconformities

In Western New York Helderbergian strata, well-displayed in Eastern New York, are absent, this interval being represented by a large unconformity. The vertical relief on the unconformity, as displayed by the youngest and oldest units observed just beneath its surface, has been previously underestimated. The discovery of post Akron strata in Western New York, i.e. Honeoye Falls Fm., and detailed examination of most exposures from Buffalo to the Oaks Corners Quarry southeast of Phelps reveal a total relief of about 60 feet on the unconformity. This figure is based on the vertical distance from the top of the Honeoye Falls Dolostone down to the Victor Member of the Fiddlers Green Fm., the lowest unit found to be in contact with the Devonian Onondaga Fm.

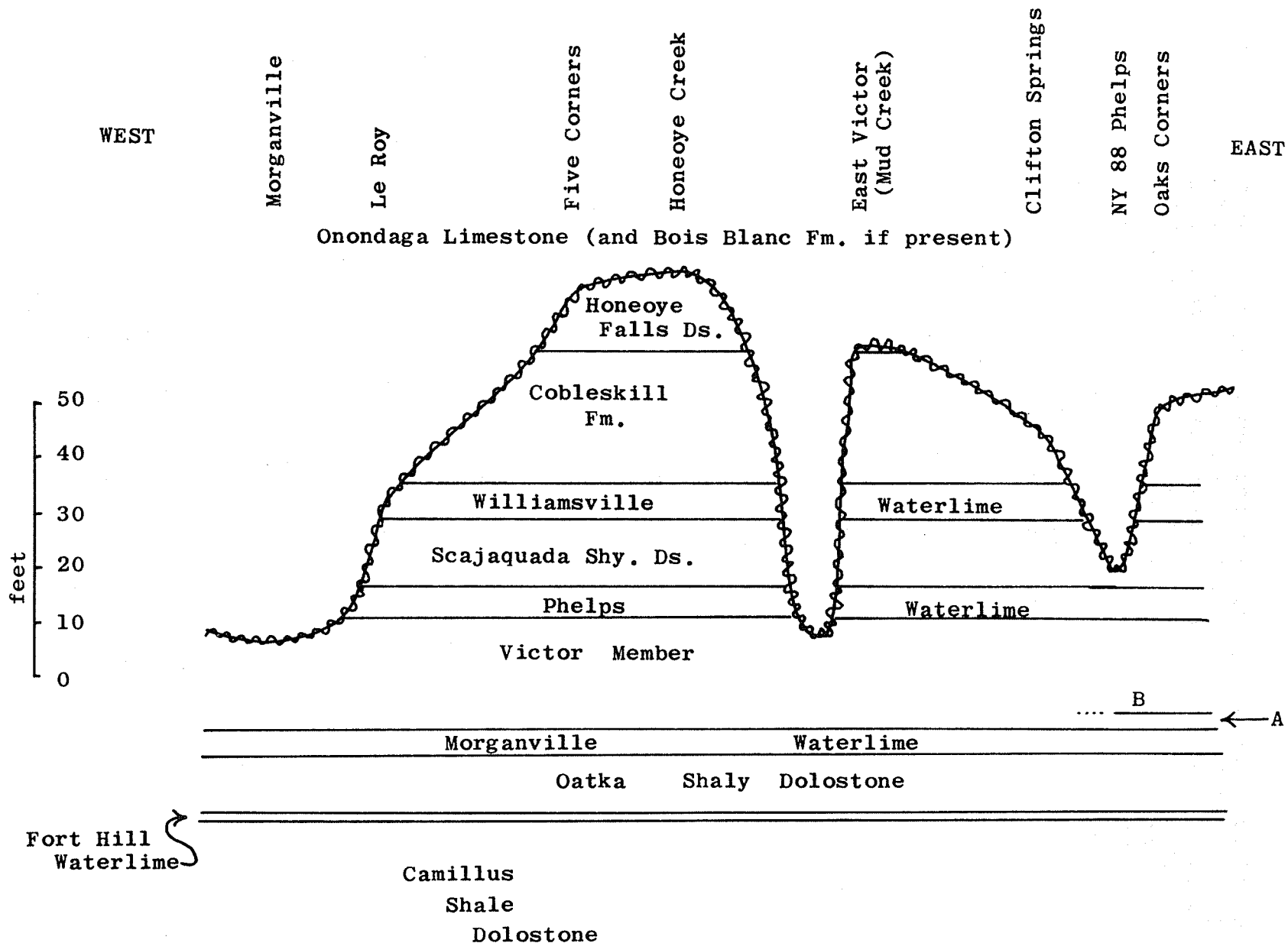


Figure 2 LITHOSTRATIGRAPHIC CROSS SECTION--Note the position and distribution of the Honeoye Falls Fm., and also the effect of the unconformity (beneath the Onondaga Fm.) on the nature of outcropping rocks.

This major unconformity is usually considered to represent an erosional interval. It has been suggested that the lack of highest Silurian and lower Devonian deposits in eastern Pennsylvania is due to nondeposition (Rickard 1969).

Other unconformities within the Upper Silurian have been proposed. It is not the scope of this brief article to review this aspect of Upper Silurian stratigraphy, but this notion should be kept in mind when examining Upper Silurian sections. For example, a minor sandy layer occurs at the base of the Scajaquada Fm. Could this be an indication of a slight unconformity?

More importantly, the exposures at Akron Falls in Erie County reveal no Phelps Waterlime. Assuming this to be true, is the absence of this unit due to erosion, nondeposition, or some unusual facies change? That a zone of MUDCRACKS occupies uppermost Phelps Waterlime from Mud Creek at East Victor to the village of Deck, a distance of about 150 miles, suggests exposure to the atmosphere of at least this much of uppermost Fiddlers Green Fm.

Figure 2 represents a cross section of the area in question.

Summary

Eurypterid remains occur at several horizons (zones) in the Upper Silurian and ?Lower Devonian of western New York State.

Cyclic sedimentation played a large role during the Cayugan and early Helderbergian resulting in the recurrence of lithofacies (and biofacies) at irregular intervals as observed at exposed lithostratigraphic sections today.

At Honeoye Creek (type section) in Honeoye Falls, N. Y. and nearby localities, no rocks belonging to the Bertie Group are known to outcrop. Most of the reported strata in this area have been assigned to the Honeoye Falls Fm. This formation embraces strata overlying the Cobleskill Fm. and underlying the Onondaga Fm. (or Bois Blanc Fm., if present) and appears (lithologically) to be related to the thick (50 feet) Chrysler Fm. of central New York and may simply be an outlier.

The eurypterid genus Erieopterus, previously unknown in western New York, has been discovered in the Honeoye Falls Fm. at the type locality and in the ravine near Five Points to the west. This suggests that the Honeoye Falls Fm. may be Devonian in age since this genus is known only from the Manlius Group of central New York, and recently (Kjellesvig-Waering and Ciurca, in preparation) from the upper Chrysler Fm. of central New York (Marcellus Falls-Syracuse areas).

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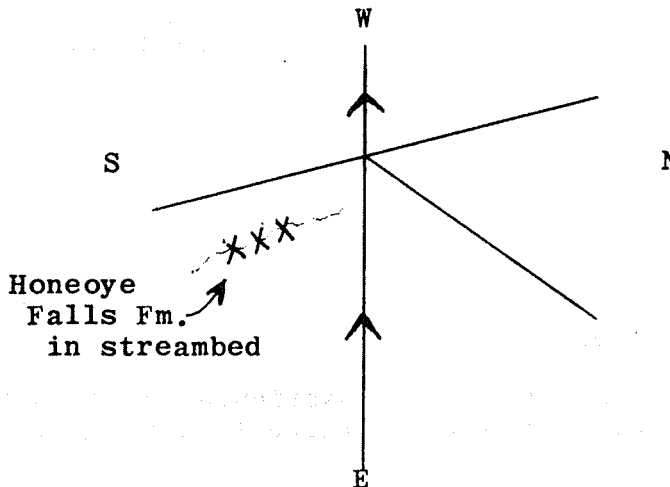
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FIELD TRIP

0	0	NYS Thruway entrance on US 15 (West Henrietta Rd.)
2.1	2.1	mileage post 361
1.0	3.1	Syracuse 72 miles (sign)
6.9	10.0	parking area
2.3	12.3	milage post 351
3.8	16.1	Exit 44
6.5	22.6	mileage post 341
0.7	23.3	Exit 43
3.1	26.4	Clifton Springs Service Area
5.6	32.0	OBSERVE large roadcut exposing Camillus Fm. up thru lower Onondaga Fm. This is one of the best sections in western New York (reference section-see text)
0.9	32.9	mileage post 331
3.6	36.5	Exit 43 EXIT HERE fee 60 cents
1.0	37.5	NY 96 overpass CONTINUE SOUTH ON NY 14
0.9	38.4	TURN RIGHT ON CROSS RD. heading for Oaks Corners
1.5	39.9	RR tracks
0.1	40.0	STOP sign jct Preemption Rd (County Rd. No. 6)
0.1	40.1	TURN RIGHT - SLOW DOWN quarry just ahead * STOP 1 Oaks Corners Quarry TURN LEFT just before RR tracks
TURN AROUND AND GO BACK TO INTERSECTION		
0.1	40.2	jct TURN RIGHT onto County Rd. No. 23
0.2	40.4	quarry visible on right
0.4	40.8	RR tracks SLOW DOWN
0.2	41.0	jct TURN RIGHT onto Lester Rd. and continue to NY 96
1.2	42.2	RR tracks
1.1	43.3	RR overpass SLOW DOWN jct NY 96, TURN LEFT into Phelps, N.Y.
0.5	43.8	traffic light in center of Phelps, N.Y. CONTINUE ON NY 96
0.2	44.0	* STOP 2 SLOW DOWN - bridge over Flint Creek. TURN RIGHT immediately after bridge onto Flint Street.
0.1	44.1	HEAD BACK to NY 96 - TURN RIGHT heading west SLOW DOWN
0.1	44.2	TURN LEFT onto William St.
0.1	44.3	* STOP 3 bridge over Flint Creek
TURN AROUND AND HEAD BACK TO NY 96		
0.1	44.4	jct NY 96 TURN LEFT and continue west
0.7	45.1	jct NY 88 (flashing yellow light) TURN RIGHT and proceed north

0.5	45.6	NYS Thruway overpass SLOW DOWN
0.1	45.7	* STOP 4 PULL OVER to the right just before RR overpass
TURN AROUND AND HEAD BACK TO NY 96		
0.7	46.4	jct NY 96 TURN RIGHT and continue west
2.5	48.9	RR tracks
5.9	54.8	jct NY 21
6.1	60.9	Finger Lakes Race Track on left
0.8	61.7	jct NY 332 CONTINUE WEST ON NY 96
1.4	63.1	* STOP 5 Mud Creek PULL OVER to left side of the road-carefully
CONTINUE WEST TO VICTOR, NEW YORK		
1.8	64.9	signal light center of Victor
1.3	66.2	jct 251 TURN LEFT
0.2	66.4	RR tracks
4.0	70.4	jct NY 64 CONTINUE WEST on NY 251
0.1	70.5	RR tracks
3.9	74.4	jct NY 65 TURN LEFT heading south
2.1	76.5	Welcome to Honeoye Falls (sign) SLOW DOWN
0.6	77.1	* STOP 6 Bridge over Honeoye Creek PARK PAST BRIDGE
TURN RIGHT past bridge onto Maplewood Ave.		
TURN RIGHT onto Ulrich Lane		
0.3	77.4	* STOP 7 Sewage Treatment Plant
ADJUST		Start again at intersection of Ulrich Lane with Maplewood Ave. Head west on Maplewood Ave. (right turn from Ulrich Lane)
0.3	77.7	RR tracks
1.1	78.8	jct NY 15A CONTINUE WEST (straight ahead)
1.0	79.8	STOP sign at Works Rd. CONTINUE WEST
1.0	80.8	rock fences primarily of Cobleskill Fm. some stromatoporoids, rare favosite coral
0.2	81.0	jct Five Points CONTINUE STRAIGHT AHEAD:



1.0	82.0	jct US 15 TURN LEFT proceed to NY 5
4.5	87.5	jct NY 5 US 20 TURN RIGHT heading west towards Le Roy, N.Y.
1.3	88.8	entering Avon, N.Y.
1.0	89.8	RR tracks
0.5	90.3	Genesee River
5.8	96.1	Caledonia, N.Y. CONTINUE WEST on NY 5
2.4	98.5	RR tracks
0.6	99.1	RR tracks
0.8	99.9	entering Genesee County SLOW DOWN
0.7	100.6	jct Church Rd. (St Anthony's Church on NW corner) TURN RIGHT
0.2	100.8	RR (3 tracks)
0.7	101.5	RR tracks
0.1	101.6	jct Flint Hill Rd. TURN LEFT
0.2	101.8	jct Neid Rd. TURN RIGHT
0.4	102.2	* STOP 8 Neid Road Quarry (Town of Le Roy Metal Refuse Disposal) TURN LEFT
0.1	102.3	leave quarry TURN RIGHT onto Neid Rd and head back
0.3	102.6	jct Flint Hill Rd TURN RIGHT
0.3	102.9	RR (3 tracks)
0.2	103.1	entrance to General Crushed Stone Co.-Le Roy plant--quarry in the Onondaga Fm.
0.1	103.2	* STOP 9 brief stop-steam shovel used from 1906-1949-also small locomotive and car for carrying stone
0.2	103.4	quarries in the Onondaga Fm. on both sides of the road
0.6	104.0	jct Circular Hill Rd (Perry Rd on topo map) TURN RIGHT
1.0	105.0	RR tracks
0.7	105.7	Oatka Creek SLOW DOWN
0.1	105.8	jct Oatka Trail TURN LEFT
0.8	106.6	jct Parmelee Rd TURN LEFT
0.3	106.9	* STOP 10 LAST STOP FIND PLACE TO PARK Roadcut NY 19
		TURN RIGHT onto NY 19 and head north to Interstate 490
1.8	108.7	ENTER Interstate 490 East (Rochester 20 miles)
18.0	126.7	NY 47 exits 1 mile
1.2	127.9	TURN RIGHT onto NY 47 to get back to US 15

OR

CONTINUE on Int 490 into Rochester

COMMENTS

Depending on the weather and level of streams, BOOTS may be needed for some stops.

CAMERAS may be useful-particularly since a few stops are threatened by progress and waste (literally).