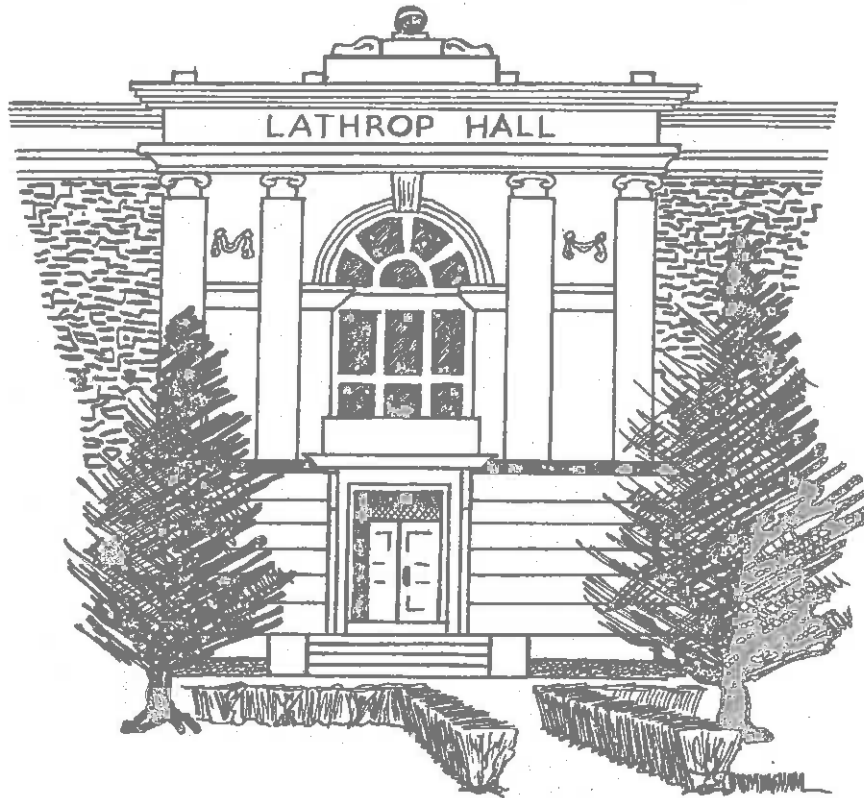


NEW YORK STATE GEOLOGICAL
ASSOCIATION

27TH ANNUAL MEETING

MAY 13TH AND 14TH



COLGATE UNIVERSITY

HAMILTON, NEW YORK

1955

NEW YORK STATE GEOLOGICAL ASSOCIATION
TWENTY SEVENTH ANNUAL MEETING
(THIRTIETH ANNIVERSARY)

GUIDEBOOK

PREPARED BY THE STAFF AND STUDENTS
OF
COLGATE UNIVERSITY

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COLGATE UNIVERSITY

HAMILTON, N. Y.

Colgate University is a Liberal Arts College for men, which was founded in 1817 by thirteen men with thirteen dollars and thirteen prayers. So you can readily understand why we do not hesitate to select Friday the 13th as a meeting date for the NYSJA. It is located on the Skaneateles formation near the middle of the Hamilton Group. Important events in the history of the village of Hamilton are the visit of Vanuxem in 1838 when he studied and defined the Hamilton rocks and the fact that a Colgate University student, G. Arthur Cooper (1920-1926), studied and redefined the Hamilton rocks of New York State.

The population of the Village of Hamilton is said to be about 3600 which must have been recorded when Colgate University was in session or perhaps complemented by a NYSGA meeting. A map of Hamilton was mimeographed on a separate sheet so that you can carry it in your pocket and not lose your way.

We have good and generous neighbors in Cornell University, Syracuse University and Hamilton College, all of whom offered to help us make your visit more interesting.

We appreciate the visit last fall to some of the outcrops in this section by Donald Fisher and Lynn Kreidler of the New York State Museum.

Diverse material by several individuals has been assembled in this Guide Book. The itineraries for convenience were printed separately.

GENERALIZED SECTION
ONEIDA QUADRANGLE

Devonian

Holderborg
Group

Transitional

Manlius
Group

Silurian

Salina
Group

Hamilton Group -

Onondaga Limestone 65-70'

Oriskany Sandstone 0-10'
New Scotland For. 0-2'

Cocynans Ls. Mem. 35'

Jamesville Ls. 12-15'

Clark Res. Ls. 2-3'

Elmwood Beds 12'

Olney Ls. Member 53'

Rondout Ls. Member 45'

Cobleskill Ls. Mem. 9'

Bortie Ls. Member 10'

Fiddlers Green Ls. Mem. 26'

Camillus Shale Mem. 450'

Vert. Scale



Vernon Shale Mem. 335'

SILURIAN

SALINA FORMATION

VERNON SHALE MEMBER

The Vernon red and green shales, gray and brownish gray shales, and thin layers of calcareous and dolomitic mudstones are thick in the Hamilton area. The shales are argillaceous with occasional silty layers. Small imperfectly spherical areas of green occur in abundance in the red shales. The Vernon is interbedded with the gray shales of the Camillus near the top. The boundary must be arbitrarily drawn separating the two members. The shales are generally unfossiliferous but a collection of fossils was made by R. Wayland-Smith and described by R. Flower (Bull. Mus. of Comp. Zool., Harvard, vol. 107, No. 6, Oct. 1952)

CAMILLUS SHALE MEMBER

(J. M. Clarke, 1903)

The Camillus shale member is composed of gray, greenish gray and brownish gray shales in the lower and middle parts. Layers of thin dolomitic and calcareous mudstones increase in numbers and thickness as the Bertie limestone member is approached at the top of the Salina beds. Mud cracks, ripple marks, and occasional salt crystal impressions - "salt hoppers" - are in the upper beds. In general the Camillus is unfossiliferous but local zones are fossil bearing and ostracods are present on the surface of some of the upper layers. The "vermicular" limestone of Vanuxem (1842), is described thus, "it is a porous or cellular rock strongly resembling porous or cellular lava -". Dr. E. H. Kraus (1905) identified the mineral celestite taken from some of the wormlike cavities from rock freshly exposed near Jamesville, N.Y. but calcite filling is more common than the celestite. This rock outcrops in the Oneida Valley east of Munnsville and is frequently present in the gravel deposits of glacial origin in the Morrisville Quadrangle.

BERTIE LIMESTONE MEMBER

The Bertie, a brownish gray impure limestone, 10' in thickness, outcrops in the gullies to the east of Munnsville where according to Dr. T. Root "the upper 4' is thick-bedded, drab; lower 6' thin-bedded, shaly, drab to dark bluish gray: little reaction with HCl."

MANLIUS FORMATION

THE COBLESKILL LIMESTONE MEMBER

The Cobleskill limestone, about 8' in thickness, is the basal member of the Manlius. This is the equivalent of the Akron dolomite or "Bullhead" limestone of western New York where the member is thicker. It is the only member of the Manlius which continues from eastern New York to the western part of the state. The unconformity of Oriskany time has also cut out the Helderberg group,

the lowest formation (Coeymans) disappearing in Onondaga County. (The Manlius and Rondout extend a little farther west). It is a grayish blue massive and thin-bedded argillaceous dolomite with many small cavities and occasional larger ones filled with calcite, celestite, barite and other minerals. Stylolites, many vertical, are very common and the small horn coral Cyathophyllum hydraulicum is fairly common. Irregular small masses of chert are abundant. An excellent exposure may be seen at the Clockville outcrop included in Mr. Rickard's Saturday trip.

RONDOUT LIMESTONE MEMBER

The Rondout limestone, 45' - 50' thick in this area, is a brownish gray to faint bluish gray thin-bedded limestone interbedded with shales with more massive beds near the top and bottom of the section. It is rather drab in appearance and only sparsely fossiliferous, and is conformable with the Cobleskill below and the Olney above.

OLNEY LIMESTONE MEMBER

The Olney limestone, 53'± thick, is the lower part of what for many years has been called the Manlius limestone. It is a thin-bedded limestone, dense and finely crystalline, dark bluish gray in a fresh outcrop, weathering to a lighter color. The thin beds only a few inches in thickness, are high in calcium content and are interbedded with very thin layers of dark calcareous shales. The layers of limestone are much thicker in the upper part of the section and stromatoporoids can be found at many levels, being especially common in the Elmwood member of the Manlius above the Olney and at points approximately 10' and 25' below the top of the Olney.

THE ELMWOOD BEDS

The Elmwood beds (Smith 1929) are divided into three members, A, B and C. A and C being "waterlimes" of 5'± in thickness, thinly laminated with clay and silt so that upon weathering the silty layers give the "stratified" appearance described by some early authors. Layer "B", called by quarreymen the "diamond blue" limestone, 3' in thickness, is slightly darker bluish gray and lacks the laminations present in A and C. The beds contain few fossils. Tentaculites gyracanthus have been found on the floor of the old quarry at Stockbridge Falls at the top of Elmwood "C" but they are not very abundant.

TRANSITIONAL BEDS

JAMESVILLE LIMESTONE AND THE

CLARK RESERVATION LIMESTONE (SMITH, 1929)

The Jamesville and the Clark Reservation limestones are here grouped together, since the Clark Reservation cannot always be easily

distinguished, as such, at the base of the Jamesville. Where distinguished it is a light bluish gray, finely crystalline limestone, 3'± in thickness and slightly resembling the Lowville of the Black River group. Diagonal fracturing is often well developed.

The Jamesville has a distinctive bluish gray color and is finely crystalline. It is 12' - 15' thick in this area. The Jamesville and Clark Reservation have been tentatively assigned to the Silurian by recent authors. The lack of fauna distinctive of either the Manlius or the Helderberg with continuous deposition from the Manlius into the Helderberg leaves an arbitrary boundary necessary. The paper by George Davis, N. Y. State Museum, Circular 35, 1953, emphasizes the nature of this problem.

THE HELDERBERG GROUP

(Clark and Schuchert, 1899)

The base of the Helderberg represented in this area by the Coeymans limestone for the most part is a fine to coarse grained bluish gray limestone with occasional contaminations of clay and silt. The environment was probably a shallow clear sea with some wave action as suggested by the macerated character of some of the abundantly fossiliferous beds. A similar lithology may be seen in the beds below, as far down as the upper part of the Olney. These represent brief invasions of a clear sea environment. This may be seen near the bridge below the falls at Stockbridge Falls. Where the Helderberg rocks have been exposed to weathering the characteristic fossils, Uncinulus mutabilis, Stropheodonta demissa (Conrad), Atrypa "reticularis" (Linnaeus), Leptaena "rhomboidalis" (Wilckens), Gypidula coeymanensis (Schuchert), Meristella laevis, can be readily found.

The Coeymans has a thickness of 34'± at Stockbridge falls and thickens to about 40'± at the Oriskany Falls quarry. At this quarry the upper three feet is characterized by a fauna which is probably New Scotland. Some chert is present in the Helderberg but it is also present in the beds below, even to and including the Manlius. This is not considered a distinguishing trait but an environment of deposition. The fauna here includes Meristella laevis, Rhynchonella eminens.

ORISKANY SANDSTONE

The Oriskany sandstone unconformably rests upon the Helderberg and in the Oriskany Falls quarry several of the largest blocks of Oriskany have angular pieces of the Helderberg (New Scotland) imbedded in its base. The Oriskany at the top of the quarry is 9' in thickness, is a medium grained gray sandstone, weathering to a buff color and abundantly filled with the brachiopods, Costospirifer arenosus (Conrad), Hipparionyx proximus (Vanuxem), and Rennsellaria elongata (Conrad). Along the east-west strike of the Devonian outcrops in Central N.Y. Oriskany time is conspicuous as an unconformity and it is represented at some points by only grains of sand,

phosphatic nodules, etc. It thins to zero from the Oriskany Falls to the Munnsville quarry 6.5 miles to the west.

ONONDAGA LIMESTONE

The Onondaga limestone rests unconformably upon either the Oriskany sandstone or the Helderberg limestone in this area. It has recently been very ably described by W. A. Oliver, Jr. (1954). The cherty character of the lower part, Edgecliff, is well displayed in the Oriskany Falls and Stockbridge Falls outcrops. Near the top the Seneca member is very impure and shaly with great numbers of "pink" Chonetes in evidence. The Nedrow and the Moorehouse members above the Edgecliff, have not been isolated as distinctive units in this area. In addition to the veriegated chert, the honeycomb and rugose corals are abundant in the lower part and a few brachiopods and other fossils are present.

See fossil plates for some of the common fossils of the formations briefly described.

The above description has in a more or less orthodox fashion followed the nomenclature of the sections as recognized up to now. It is fortunate that we have new views and revisions in nomenclature offered by Mr. Rickard who for the past few years has made an extensive study of the upper Silurian and lower Devonian problem. Some of his ideas are stated in this guide book and others will be given at the panel discussion to-night at 8 P.M. Some of the evidence will be presented on his field trip Saturday, May 14th.

Syracuse
quad.

T.C. Hopkins
1914

Skaneateles
quad.

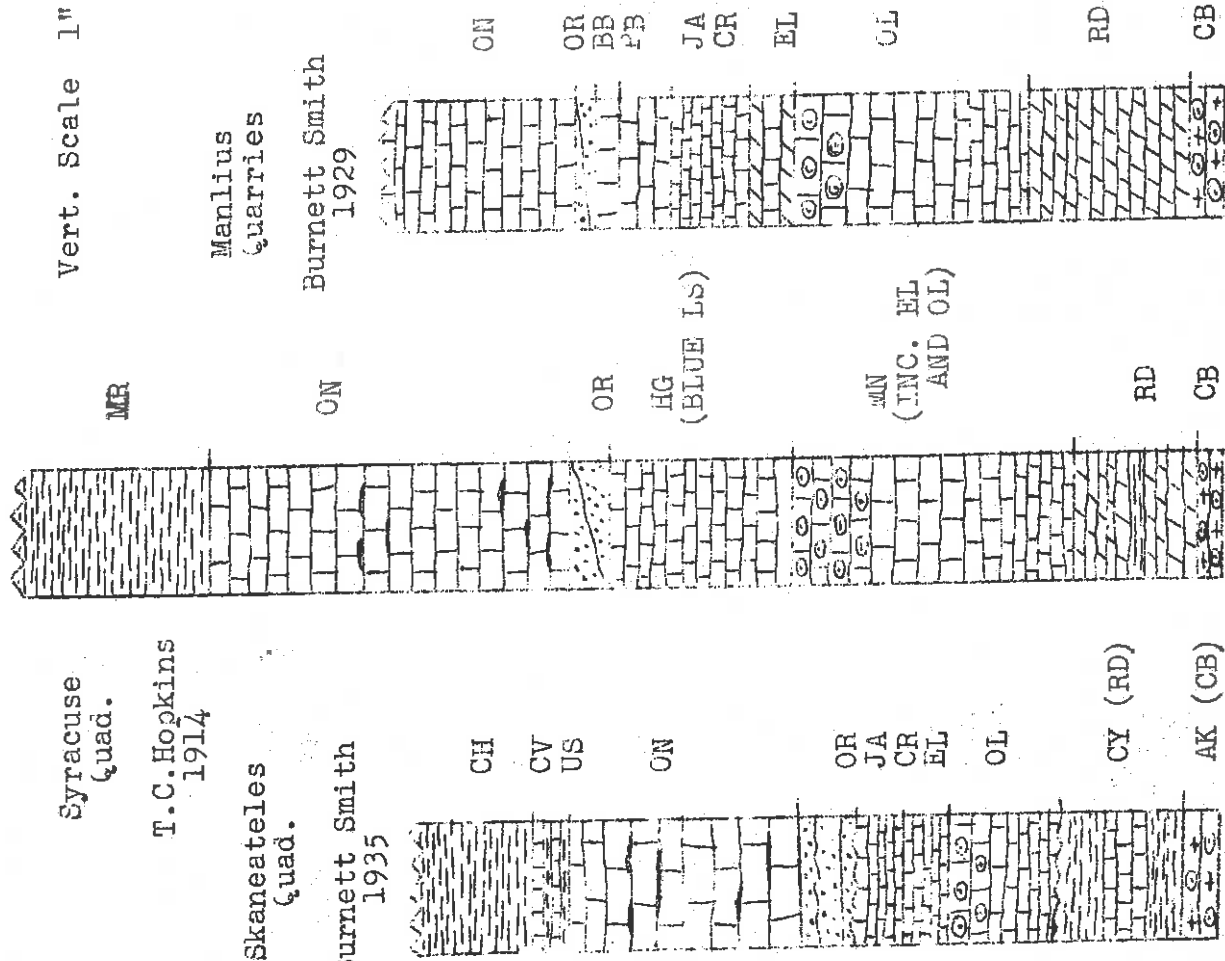
Burnett Smith
1935

Vert. Scale 1" = 50'

KEY

- CH Chittenango
- CV Cherry Valley
- US Union Springs
- MR Marcellus
- SE Seneca
- ED Edgecliff
- ON Onondaga
- OR Oriskany
- NS New Scotland
- BB Bishop Brook
- PB Pools Brock
- CY Coeymans
- HG Heldoberg
- JA Jamesville
- CR Clark Reser.
- MAN Manlius
- EL Elmwood
- OL Olney
- RD Rondout
- CY Chrysler
- CB Cobleskill
- AK Akron

- Stockbridge Falls
- Quarry floor near Stream
- "Pink Chonetes"
- Gypidula
- Atrypa



8 Miles

Stratigraphy of the Upper Silurian and Lower Devonian
of Central New York

L. V. Rickard

The Upper Silurian Cayugan Series (revised) contains two formations -- the Salina and the Bertie. The Salina consists of two facies, the Vernon red shales near the base, and above, the Camillus gray calcareous shales and dolomites with salt and gypsum beds. These lithologies interfinger and alternate, are poor in fossils, and are considered to be two facies of one mappable formation. The overlying Bertie formation consists of three members, in ascending order: the Fiddlers Green, the Forge Hollow (new), and the Williamsville. The presence of abundant eurypterids in the Fiddlers Green dolomite, 25 to 30 feet thick, and its apparent continuation into the Falkirk member of the Bertie formation of western New York indicate that this unit should be referred to the Bertie and not to the Camillus. It is not restricted to the Syracuse region but may be traced both east and west for considerable distances. For the overlying gypsiferous shales, 25 to 40 feet, the name Forge Hollow member is proposed. The Williamsville dolomite, 4 to 10 feet, is believed continuous with the same unit in western New York.

The Cayugan Series is overlain by the Helderbergian Series (revised) of the Lower Devonian. It consists of nine formations, only five of which are found in central New York-- the Cobleskill, Rondout, Manlius, Coeymans, and Kalkberg. The Cobleskill consists of a nearly barren central and western dolomite facies, 10 to 17 feet thick, and an eastern fossiliferous limestone facies, 10 feet thick. Characteristic fossils of the Cobleskill are Camarotoechia litchfieldensis, Howellella corallinensis, Fardenia interstriata, corals, ostracods and stromatoporoids. The overlying Rondout, 30 to 50 feet, is composed of thin-bedded calcareous shales and dolomites without any known fauna. The Manlius formation of fine-grained dark blue limestones has been subdivided into five members in ascending order--the Thacher (new), Olney, Elmwood, Clark Reservation, and Jamesville. The Thacher limestone, 0 to 50 feet, is the only portion of the Manlius present in eastern New York. The higher limestone members, all named by Smith (1929), pass laterally into the Coeymans limestone of eastern New York and hence are undoubtedly Devonian in age. In central New York these four members total about 60 to 70 feet in thickness. The Manlius fauna contains Howellella vanuxemi, Tentaculites gyracanthus, Leperditia alta and many other ostracods and many stromatoporoid biostromes.

The Coeymans limestone of central New York, overlying the Jamesville member of the Manlius, is entirely younger than the Coeymans of eastern New York. The name Deansboro is proposed for this portion of the Coeymans. It consists of massive gray or blue coarse-grained limestones, 30 to 60 feet thick, characterized by the presence of Gypidula coeymanensis, Brachyprion varistriata, Atrypa "reticularis", Camarotoechia semiplicata, Leptostrophia planulata, and Uncinulus mutabilis. At least four coral reefs have been found in the Deansboro limestone of central New York. The "Bishop Brook" is merely a reappearance of the Deansboro at Manlius beneath the pre-Onondaga unconformity. The Kalkberg cherty limestone is considered to be distinct mappable formation separated from the Coeymans

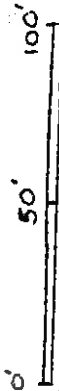
L.V.Rickard

below and the shaly New Scotland above. It extends as far west as Oriskany Falls where it is represented by the uppermost 6 feet of limestone just beneath the Oriskany sandstone in the Oriskany Falls quarry and where it is much younger than it is in eastern New York. It contains Meristella arcuata and other brachiopods in abundance.

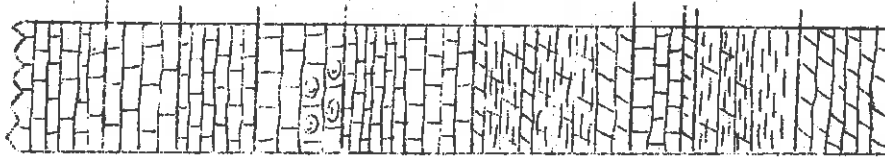
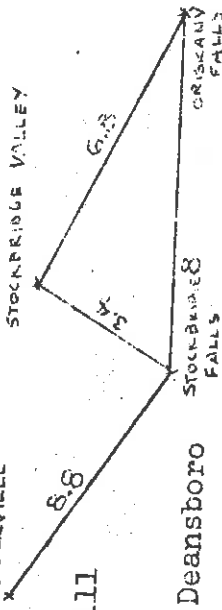
The New Scotland (restricted), Becraft, Alsen and Port Ewen formations of the Helderbergian Series are not present in central New York. The Oriskany sandstone, which occurs sporadically across the State, is the only remaining Lower Devonian unit present in central New York. The Esopus and Carlisle Center formations of eastern New York, found above the Oriskany and below the Onondaga, are also absent.

Chittenango Falls

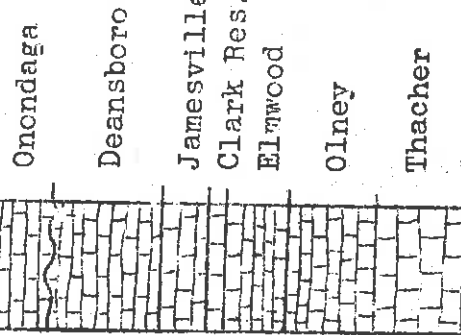
- 9 Onondaga
- 8 Deansboro
- 7 Jamesville
- 6 Clark Res.
- 5 Elmwood
- 4 Olney
- 3 Thacher
- 2 Rondout
- 1 Cobleskill



Vertical scale

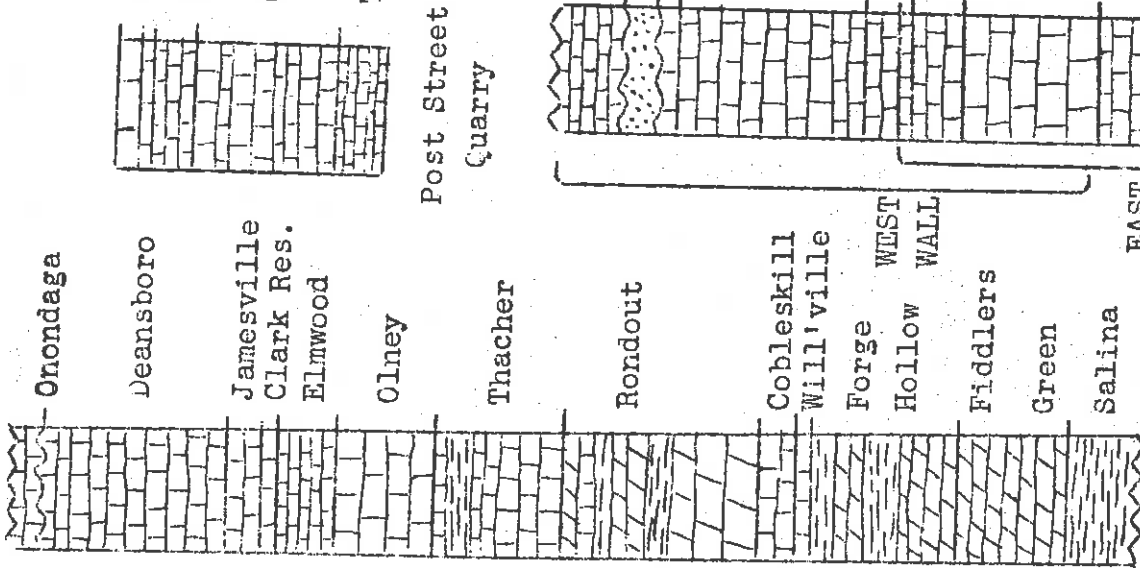


- Deansboro
- Jamesville
- Clark Res. and Elmwood
- Olney
- Thacher
- Rondout
- Cobleskill Will'ville
- Forge Hollow
- Fiddlers Green
- Clockville Area



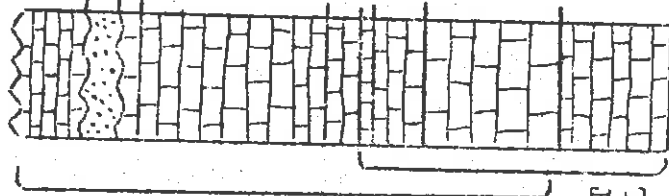
- Onondaga
- Deansboro
- Jamesville Clark Res. Elmwood
- Olney
- Thacher

Stockbridge Falls
Clockville Area



- Onondaga
- Deansboro
- Jamesville Clark Res. Elmwood
- Olney
- Thacher

Post Street Quarry

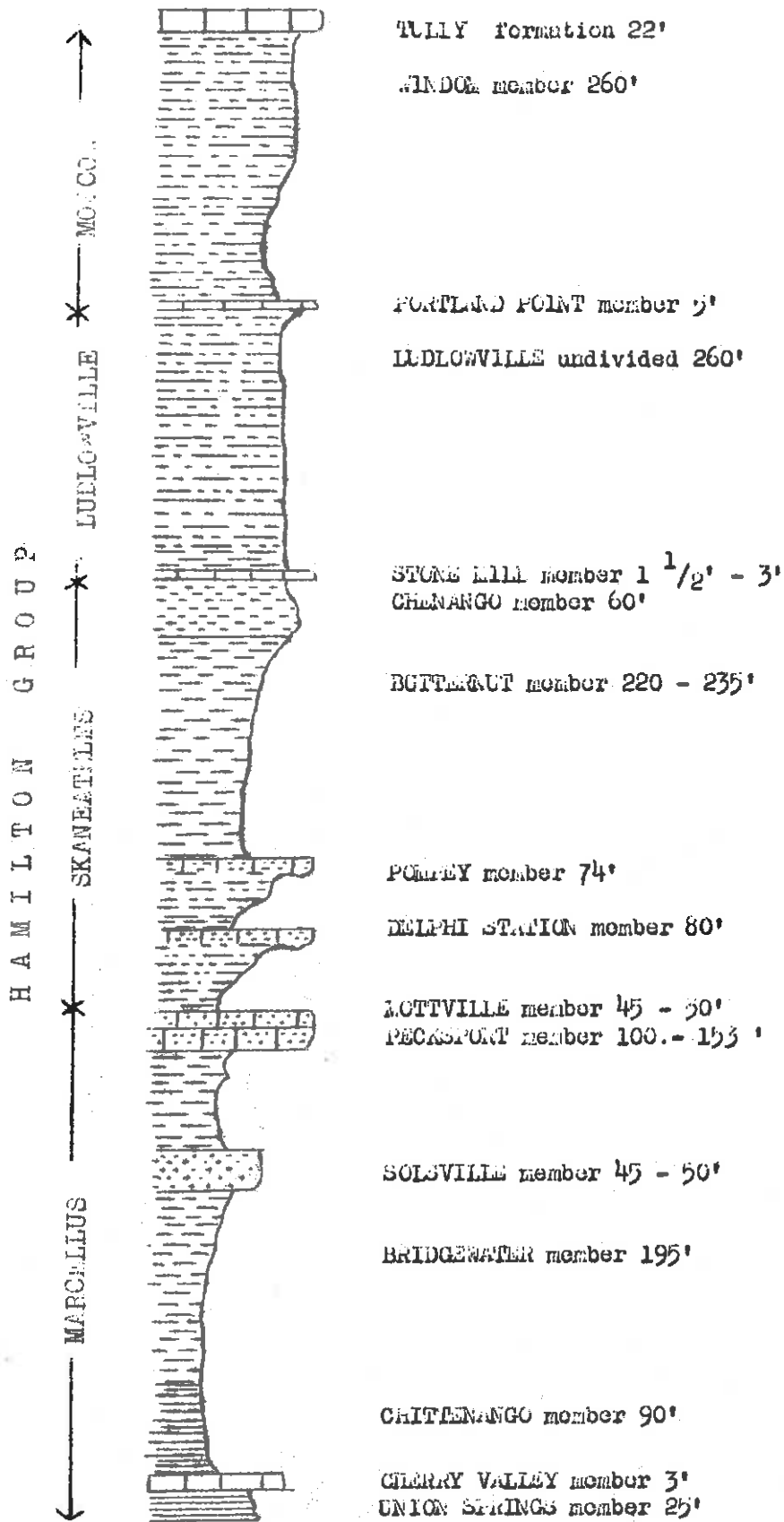


- Onondaga
- Oriskany Kalkberg
- Deansboro
- Jamesville Clark Res. Elmwood
- Olney
- Thacher

Munsville Area

Oriskany Falls

NEW YORK GEOLOGICAL ASSOCIATION



Hamilton Group

The region about Colgate University is a happy choice for the study of Hamilton rocks because this is the type section of the Group. The Hamilton rocks of this area are a part of a great wedge of Middle Devonian sediments which thins from about 4500 to 5000 feet in eastern New York to less than 400 feet at Buffalo. The Hamilton Group is exposed in its entirety in the glens tributary to the Chenango River from Stockbridge Falls to North Norwich, a distance of about 30 miles. The Group has a minimum thickness of 1465 feet. The rocks dip about 65-75 feet per mile to the southwest.

The Hamilton Group in New York is a classic example of interlocking facies and laterally shifting lithologies. The thin end of the wedge near Buffalo, New York is composed of black shale and limy sediments, but the eastern thick mass on the eastern front of the Catskill Mountains consists mostly of alternating red beds, conglomerates and greenish gray sandstones. The intermediate part in the Chenango Valley has a black shale at the base and alternating arenaceous shales and fine-grained sandstones above. The sediments, by their sand content, mollusk fossils, plant debris, and current markings show the influence of shallow water.

Four formations have been described, all defined west of the Chenango Valley in the early Survey of New York, 1839-40, in ascending order: Marcellus, Skaneateles, Ludlowville and Moscow.

Marcellus formation.- This consists of 503 feet including the Union Springs member of alternating black limestone and shale; the Cherry Valley member, a black irregularly fracturing limestone; Chittenango member, black shale weathering to paper-thin fragments; Bridgewater member of soft crumbly, black to dark gray sandy shale; Solsville member, a sandstone; Pecksport member, dark sandy shale and the Hottville member, a hard calcareous sandstone that makes water falls.

The Skaneateles formation, 434 feet thick, has the Delphi Station member at the base, dark shale grading upward into sandy mudstone and calcareous sandstone; then comes the Pompey member, dark shale grading into cross-bedded sandstone; followed by the Butternut member, dark gray shale grading upward into the Chenango sandstone.

The Ludlowville formation, 263 feet thick, has a crinoidal limestone, the Stone Mill member, at the base which represents the Centerfield formation of central and western New York. The overlying Ludlowville sediments are mostly dark gray sandy shales and sandstones.

The Moscow formation, 265 feet thick, consists of the Portland Point and Windom members. The former is mostly sandstone and crinoidal debris with Pustulina and Centronella; the overlying Windom is bluish gray sandy shale and fine-grained sandstone.

Post Hamilton beds.- The dark gray Tully limestone and dark gray to black Genesee formation, comprising the Taghanic stage overlie the Hamilton Group.

Hamilton Fauna

Fossils are abundant in the vicinity of Colgate University. All parts of the Group yield a variety of fossils usually preserved as impressions of the exterior and interior, the latter often showing internal structures in faithful detail.

Coelenterata, as might be expected from the sandy-muddy bottom prevalent in this region, are rare. A few small cup corals, Favosites and Eridophyllum are known. Conularia of large size is occasionally taken from the Solsville member. Sponges are unknown.

Echinoderms are rare fossils here. Crinoids are usually rare on a muddy bottom, and are seldom found in a well-preserved state. The quarry on the Colgate Campus is famous for the handsome starfish, Devonaster, which has been found there. Agclacrinites, a great rarity, is occasionally found on the pollecypod Actinodesma in the same quarry. An occasional blastoid has been found.

Bryozoa are common and one of the commonest species is Tacniopora exigua which occurs throughout the section.

Brachiopods are numerous and among the most useful of Hamilton fossils. A few are restricted, but most of them are long ranged. They serve as guides best in combinations of species. Important species are: Ambocoelia umbonata (Conrad), Athyris cora (Hall), Camartocchia congregata (Conrad), Chonetes syrtalis (Conrad), Laucrospirifer mucronatus (Conrad), Pustulina pustulosa (Hall), and Tronidolentus carinatus (Conrad).

Mollusks, especially pollecypods, occur in profusion and some are important guide fossils: Myassa arguta Hall and Whitfield characterizes the Skaneateles; Muculites oblongatus (Conrad) occurs in all the dark shales; Cornellites flabellus (Conrad) ranges from Marcellus through Ludlowville. Orthonata undulata Conrad is a distinctive razor-type clam. Glyptodesma erectum characterizes the sandy beds. Snails are fairly common and Bombarda sulcomarginata (Conrad) is abundant at the base of the Delphi Station member. Cephalopods are common in the Cherry Valley member, especially the large ammonoid Agoniatites. Spyroceras croctalum (Hall) is a distinctive orthocroid of the Hamilton. The pteronod Styliolina occurs in swarms in the Union Springs member.

Trilobites are fairly common, but only of a few kinds. The large Dipleura dekayi (Green) is common in the lower Delphi Station member, and Greenops boothi (Green) may be found throughout. Ostracods are common in some beds but generally have not been studied. Identifiable fish and plant fossils are rare.

Tully Formation or Group

Facies changes exhibited by the Tully formation in the Hamilton region and east to Otogo Valley are complicated. In the vicinity of Otselic or Bonney the Tully consists of about 17 feet of limestone divisible into a hard lower 2 feet, the Apulia-member containing Hypothyridina and an upper division of argillaceous limestone called West Brook member containing the brachiopod Elytha fimbriata (Conrad).

In Chenango Valley at West Brook, 3 miles south of Sherburne, the Hypothyridina occurs in a 4" oolite, but the succeeding West Brook member, 28" thick, is composed mostly of shale and calcareo-arenaceous shale, the lower 3' abounding in fossils.

In Unadilla Valley, 9 miles east of West Brook, the Apulia member is reduced to a foot or less in thickness, but the West Brook member becomes 67'-90' of sandy shale and calcareous sandstone with a zone of E. fimbriata at the top.

Profound changes take place between Unadilla and Butternut Valleys, 8 miles east of Unadilla Valley. On a branch of Stony Brook near New Lisbon 60 feet of New Lisbon member, thin-bedded sandstone appears at the base of the Tully, followed by 35' of argillaceous sandstone, Laurens member, containing Hypothyridina and correlated with the Apulia member. The West Brook appears above the Laurens and is 89' thick.

Changes continue into Otogo Valley where the New Lisbon member has disappeared, but Hypothyridina ranges through 90-100 feet of the Laurens member, and the West Brook is about 50' thick. The upper boundary is uncertain.

East of Otogo Valley the section above the Hamilton continues to change, Hypothyridina occurs near Collierstown and Schenectady, but it was not found east of those places. Ultimately in the Catskill region Tully rocks pass into red beds and conglomerates of the Gilboa formation and Kaaterskill red beds. The Tully must be represented by 300-500 feet of rock.

Tully fauna. Fossils from Tully rocks, with few exceptions, are derived from the underlying Hamilton. These exceptions are exotic forms: Hypothyridina venustula, Scutellum tullium, and Schizophoria tulliensis; however, these have Middle Devonian antecedents. Only one brachiopod, Nervostrophia tulliensis (H. S. Williams), is a more typical Upper Devonian than Middle Devonian type. No other unequivocal Upper Devonian species is known. Thus the Tully fauna is a Middle Devonian fauna and is correlated with the Cedar Valley of Iowa and Upper Stringocephalus zone of Germany. An odd feature of the Tully (West Brook) fauna is the recurrent Skaneateles element, especially among the mollusks.

The most distinctive fossils are:

<u>Hypothyridina venustula</u> Hall	Apulia and Laurens members
<u>Echinocoelia ambocoelioides</u> C. & T.	Laurens member
<u>Atrypa lentiformis</u> Vanuxem	Apulia member
<u>Chonetes aurora</u> Hall	Apulia and Laurens members
<u>Elytha fimbriata</u> (Conrad)	West Brook member
<u>Metricorythium tullium</u> (J. S. Williams)	West Brook member
<u>Scutellium tullium</u> (Hall)	West Brook member

1. OTSELIC VALLEY

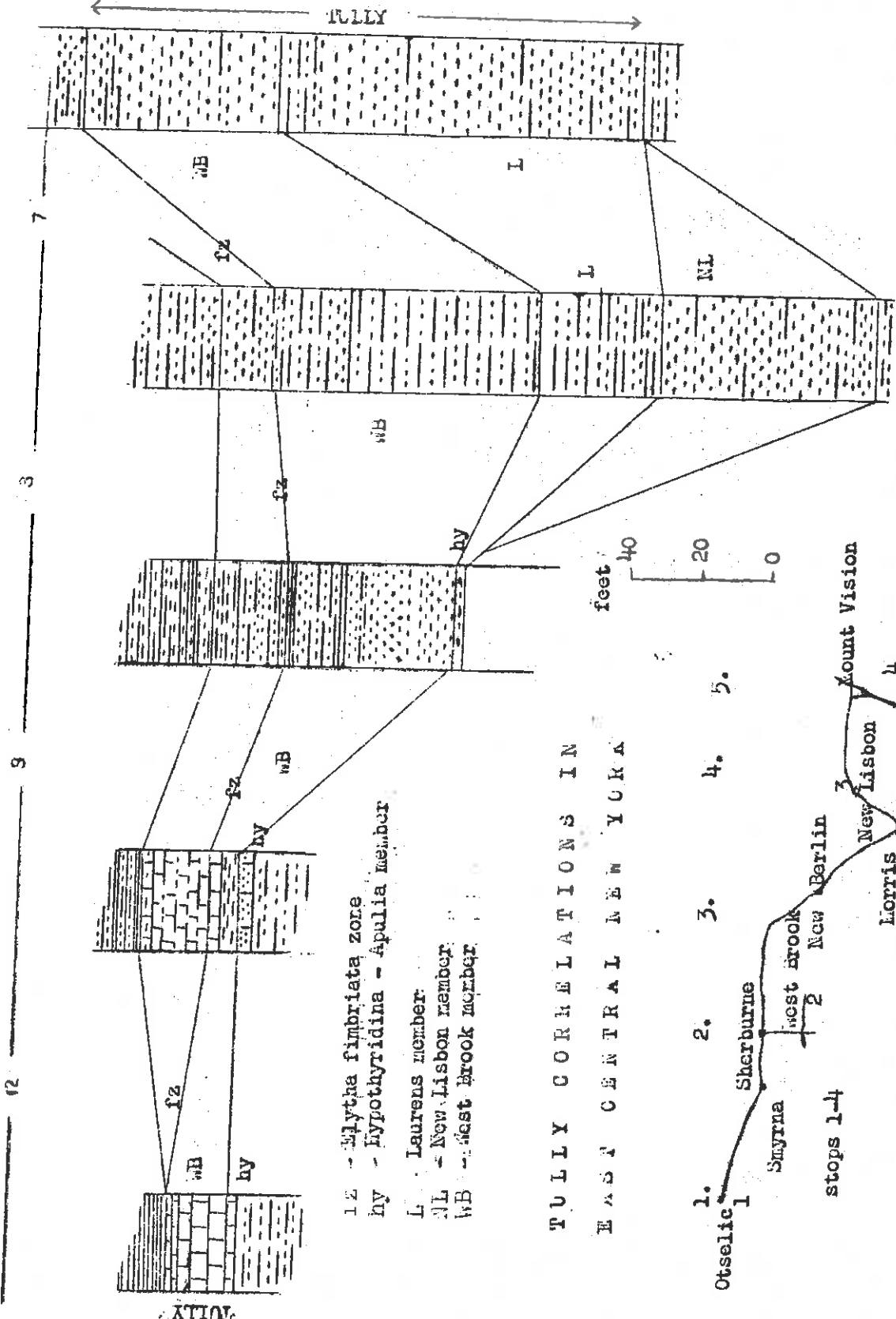
2. CHEERANGO VALLEY

3. UNADILLA VALLEY

4. BUTTERNUT VALLEY

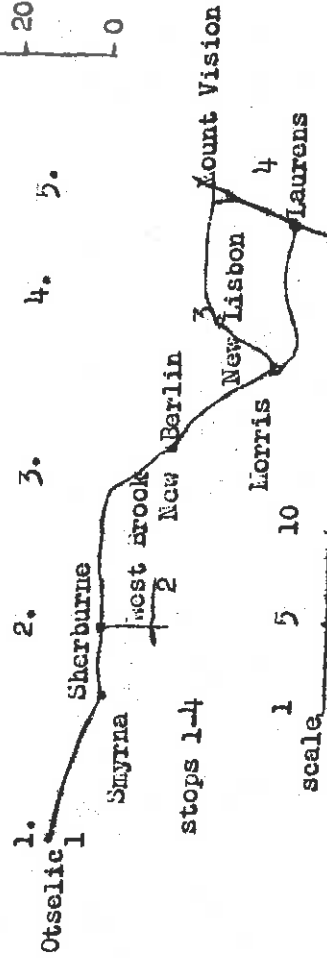
5. OTEGO VALLEY

Liles



- fz - *Elytha fimbriata* zone
- hy - *Hypothyridina* - *Apulia* member
- L - Laurens member
- NL - New Lisbon member
- wB - West Brook member

TULLY CORRELATIONS IN
EAST CENTRAL NEW YORK



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Devonian of central New York StateVERNON SHALE (Clarke, 1903)

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Geomorphology
and
Pleistocene History of the
Hamilton Region

The area included in this trip is located near the northern boundary of the Appalachian Plateau and near the Mohawk Lowland in Central New York. The southern portion of the area is included in the Susquehanna drainage system while the northern part drains into the Mohawk-Hudson system.

The hill summits over the entire area show close accordance in elevation and have been assigned by Fridley to the Schooley erosion surface.¹ This uplifted surface had reached the stages of early maturity in pre-Pleistocene time.

In most respects the topographic aspects of the region are the result of glaciation during the Pleistocene time. This is especially true of the valley deposits which are the principle objectives for study on this trip.

The exact substage of the Wisconsin glacial stage to which the deposits between Sherburne and Oneida in the valley should be assigned, cannot be established at present with any certainty.² Since the exact substage for the Valley Head moraines can not be established, any deposits, overflow channels, etc., north of the Valley Heads must be accounted for by readvances of middle Wisconsin ice.

One of the most difficult problems encountered in the valley between Sherburne and the Valley Head moraines at Pratts Hollow and Oriskany Falls is the interpretation of the four well defined terraces. These have been termed for study purposes (1) Sherburne, which is the lowest and for mapping purposes includes the present flood plain of the Chenango River and its branches; (2) Earlville, the next highest, which is typically developed at the village of Earlville and the Cossitt Cement Block Plant at Randallville; (3) Randallville, which is best seen north of this small hamlet on the west side of the valley and (4) Woodman Pond, which is the highest and is well developed on both sides of the valley north of Hamilton at Woodman Pond, at the mouth of the Lake Moraine valley and on the valley floor at Madison. This surface merges with the Valley Head moraine which fills the valleys at Oriskany Falls and Pratts Hollow. These terraces or surfaces seem to be the result of ordinary stream erosion of a valley train which filled the valley to the highest or Woodman Pond surface. This interpretation would require a shrinkage in volume of the stream issuing from the ice at the Valley Head stage and the overflow from the later lakes in the Stockbridge valley.

Studies of the Valley Head moraine at Pratts Hollow reveal the presence of lake clays capped with coarse gravel near the summit of the moraine (Elevation 1160-1180). These deposits, the stratified sands behind the moraine in the Cowaselon Valley, deltas at Stockbridge Falls and Oneida Castle, and the overflow channels on the

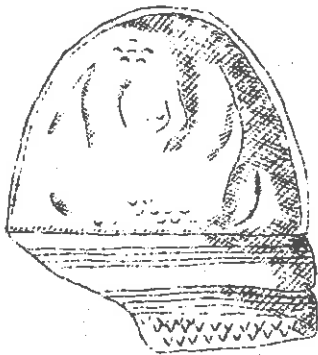
north end of West Stockbridge Hill are all assigned to a stage later than the Valley Head moraine substage and its associated features to the south.

The valley bottom deposits north of the Valley Head to Oneida Castle are controversial in nature, resembling lake clays in places and ground moraine "till" in others. These deposits are the subject of a study being conducted by Mr. Robert Oldale of Cornell. Their position requires them to be placed in a substage later than the Valley Head moraine. Mr. Oldale will be on the trip and will discuss these deposits with those interested.

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FOSSILS COMMON TO THE VERNON SHALE



X 4.5

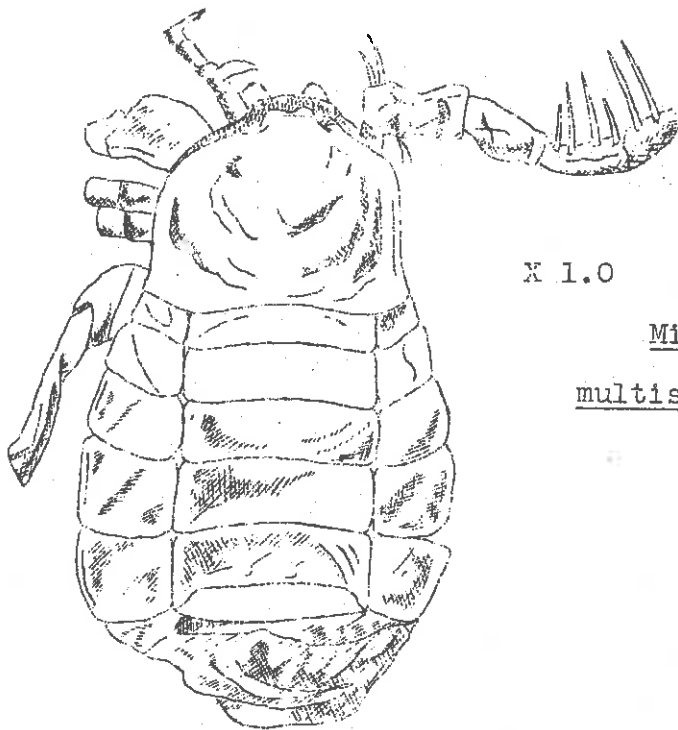
Hughmilleria phelpsae



X 1.5

Hexameroceras

chadwicki



X 1.0

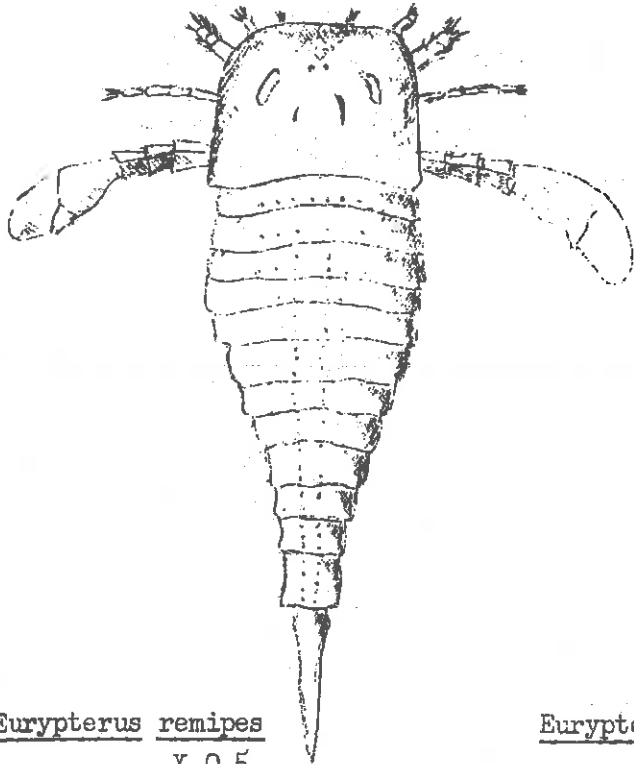
Mixopterus

multispinosus

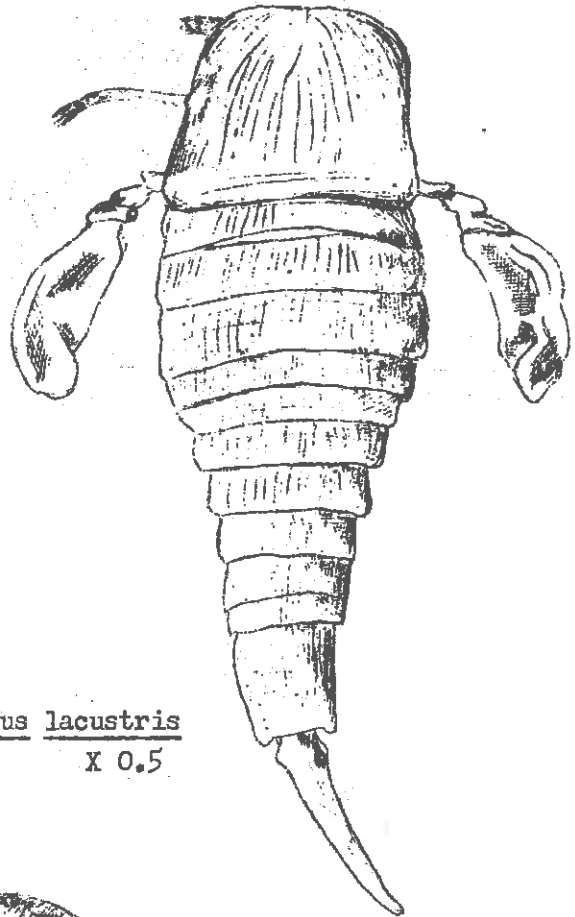
(After Clarke and Ruedemann)

(Plate I)

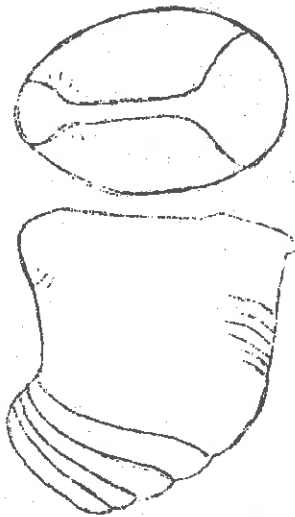
INDEX FOSSILS OF THE BERTIE WATERLIME



Eurypterus remipes
X 0.5



Eurypterus lacustris
X 0.5



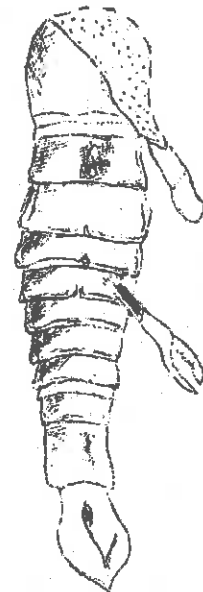
Phragmoceras accola X 0.5



Diaphorostoma (Platyceras)
X 1.0



Hormotoma gregaria X 2.0



Pterygotus macrophthalmus
X 0.5

(After Shimer and Shrock, Index Fossils of North America)
(Plate II)

FOSSILS COMMON TO THE COBLESKILL LIMESTONE



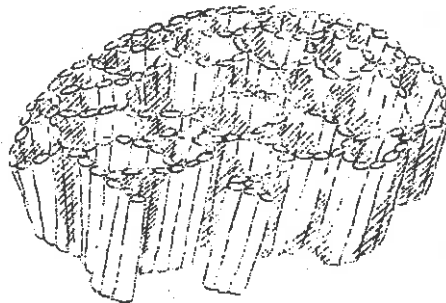
X 1.0

Schuchertella
interstriata



X 3.0

Leperditia
scalaris

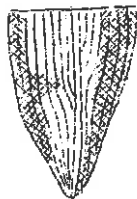


X 1.0

Halysites
catenulatus

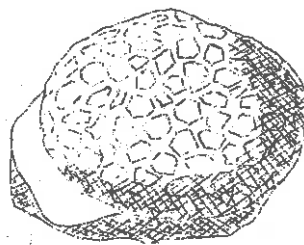
Enterolasma
caliculum

X 1.0



Favosites
niagarensis

X 1.0



(After Shimer and Shrock)

(Plate III)

FOSSILS COMMON TO THE MANLIUS LIMESTONE



X 2.0

Howellella vanuxemi

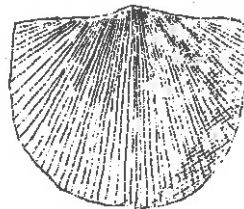
Tentaculites gyraeanthus

X 6.0



Stropheodonta varistriata

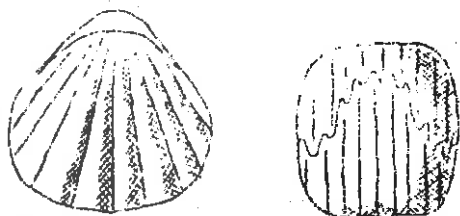
X 1.0



(After Shimer and Shrock)
(Plate IV)

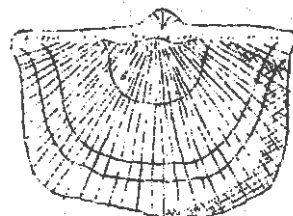
FOSSILS COMMON TO THE HELDORBERG LIMESTONE

X 2.0

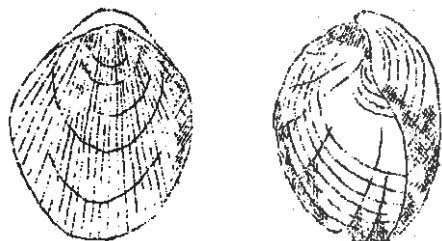


Uncinulus
mutabilis

X 1.0



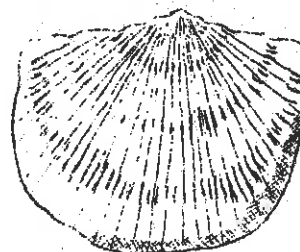
Stropheodonta
domissa



Atrypa
"reticularis"

X 1.0

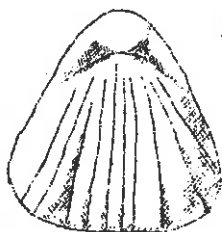
X 1.0



Leptaena
"rhomboidalis"

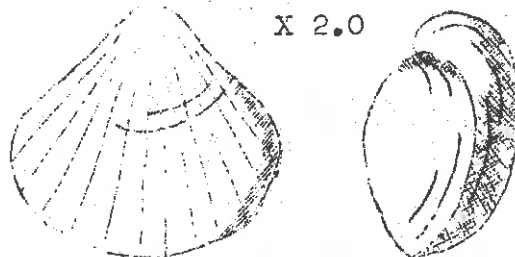
Gypidula
coeymanensis

X 1.0



Meristella
laevis

X 2.0

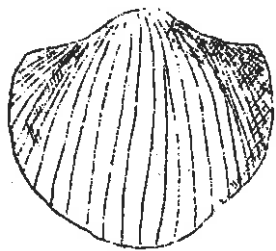


(After Shimer and Shrock)

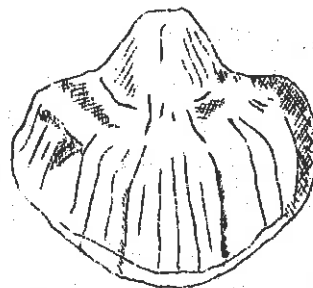
(Plate V)

FOSSILS COMMON TO THE ORISKANY SANDSTONE

X 1.0



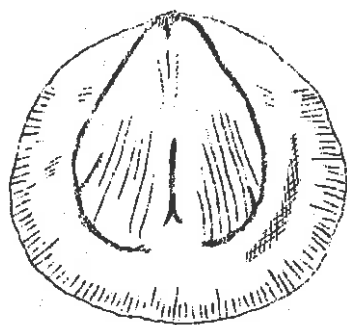
X 1.0



External and Internal casts of the
Costispirifer arenosus

Hipparionyx

proximus



X 1.0

Rensselaeria

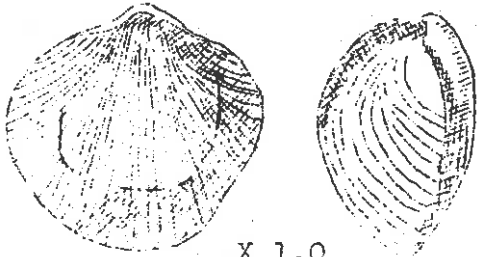
ovoides



X 1.0

(After Shimer and Shrock)
(Plate VI)

FOSSILS COMMON TO THE ONONDAGA LIMESTONE



X 1.0

Atrypa
"reticularis"



X 1.0

Chonostrophia
reversa

X 1.0



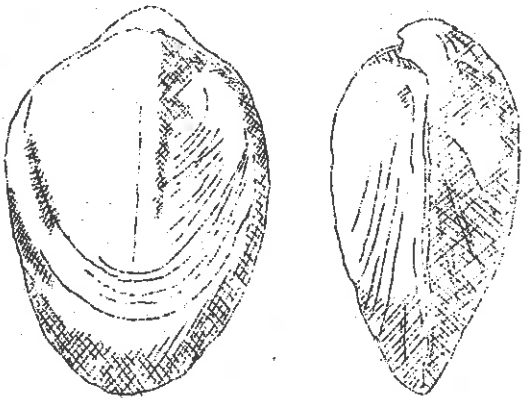
Chonetes
lineatus

Amphigenia
elongata

X 1.0

Heterophrentis
prolifera

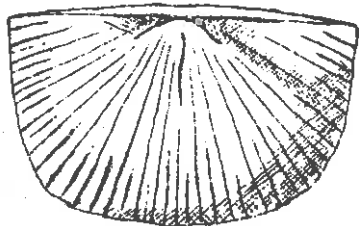
X 1.0



(After Shimer and Shrock)

(Plate VII)

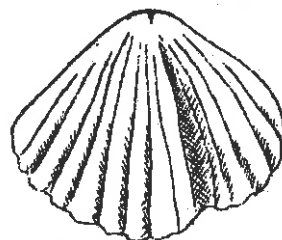
FOSSILS COMMON TO THE UNION SPRINGS MEMBER OF THE
MARCELLUS FORMATION



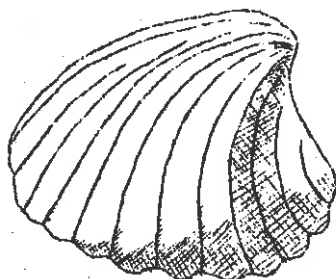
X 2.0

Chonetes syrtalis

Leiorhynchus multicostum

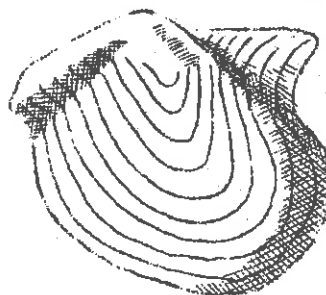


X 2.0



X 4.0

Lunulacardium curtum



X 6.0

Leiopteria laevis

Styliolina fissurella



X 2.0

Euryzone rugulata

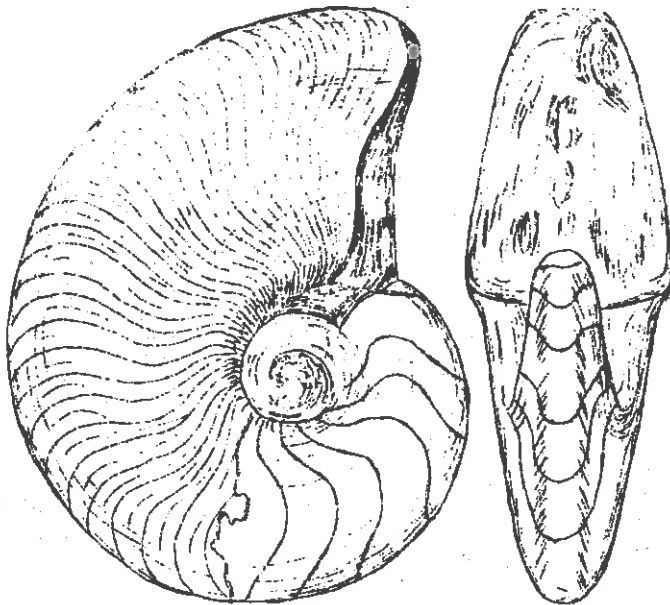


X 3.0

(Plate VIII)

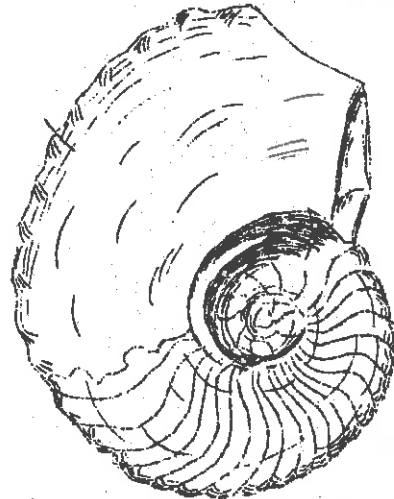
Fossils Common to the Cherry Valley
Member of the Middle Devonian

Agoniatites expansus



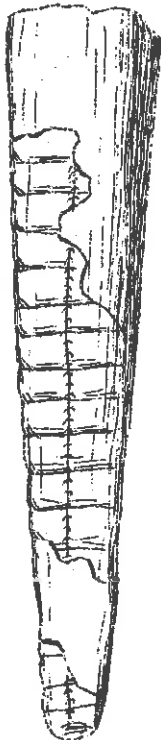
X 0.3

Centroceras marcellense



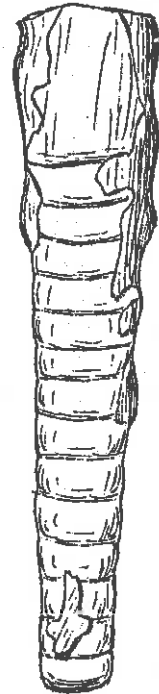
X 0.5

Striscoceras kionoceroides



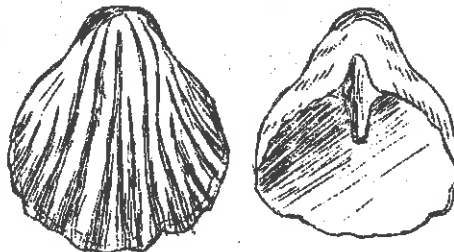
X 0.5

Casteroceras alternatum



Pentamerella

X 1.0



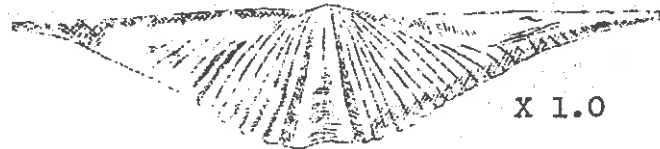
Shimer and Shrock,
Index Fossils of North America

(Plate IX)

BRACHIOPODS COMMON TO THE HAMILTON FORMATION



X 1.0



X 1.0

Camarotoechia

Mucrospirifer

congregata
(Conrad)

mucronatus
(Conrad)

X 1.0



Taeniopora exigua
Nicholson

(Bryozoan)

Chonetes

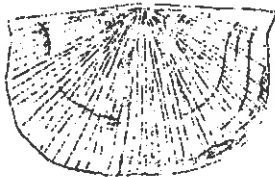
Tropidoleptus

Pustulina

syrtalis
(Conrad)

carinatus
(Conrad)

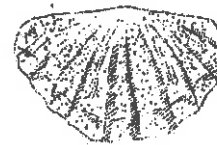
pustulosa
(Hall)



X 1.0



X 1.0



X 3.0

Ambocoelia

Athyris

umbonata

cora
Hall

(Conrad)



X 2.0

X 1.0



(After Shimer and Shrock)

(Plate X)

TRILOBITES AND
MOLLUSKS COMMON TO THE HAMILTON



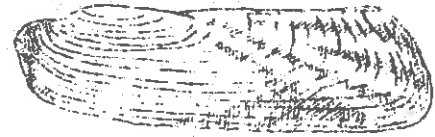
X 1.0

Nyassa arguta
H. & W.



X 1.0

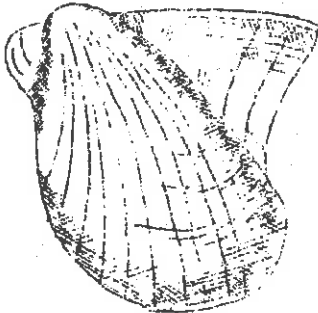
Nuculites oblongatus
(Conrad)



X 1.0

Orthonota undulata
Conrad

Cornellites flabellus
(Conrad)



X 1.0



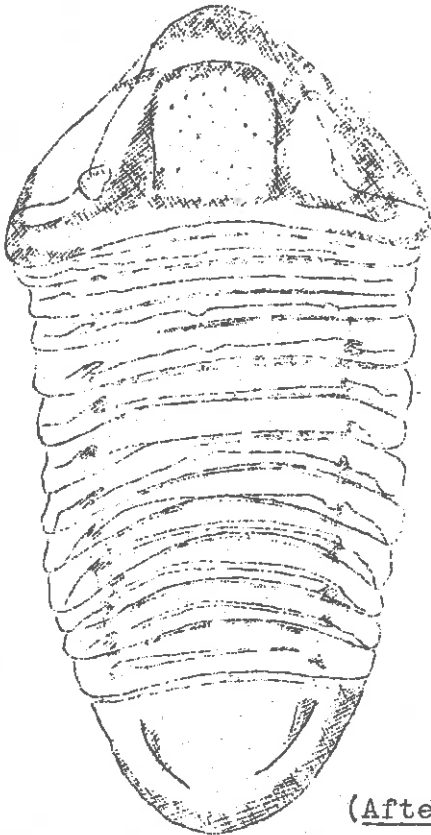
X 2.0

Bembexia

sulcomarginata
Conrad

Greenops boothi
(Green)

X 1.0



X 1.0

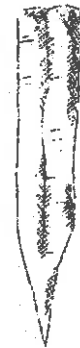
Dipleura

dekayi
Green

Styliolina

fissurella
(Hall)

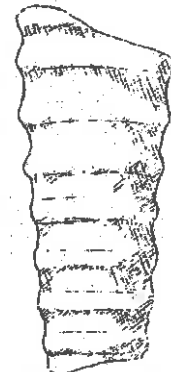
X 1.5



X 1.0

Spyroceras

crotalum
(Hall)



(After Shimer and Shrock)
(Plate XI)

FOSSILS COMMON TO THE TULLY FORMATION



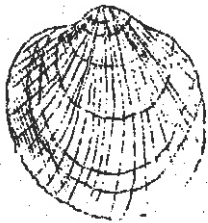
X 1.0

Hypothyridina venustula
Hall

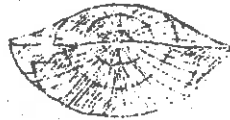
X 2.0



Echinocoelia ambocoelioides
Conrad and Williams



X 2.0



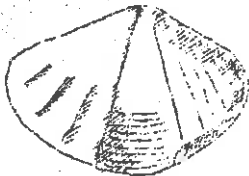
Atrypa lentiformis
Vanuxem

X 2.0



Chonetes aurora
Hall

X 1.0

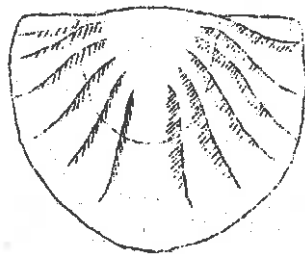


Elytha fimbriata
(Conrad)

X 2.0



Metriophyllum tullium
(J.S. Williams)



X 2.0

Scutellum

tullium
(Hall)

(After Shimer and Shrock)
(Plate XII)