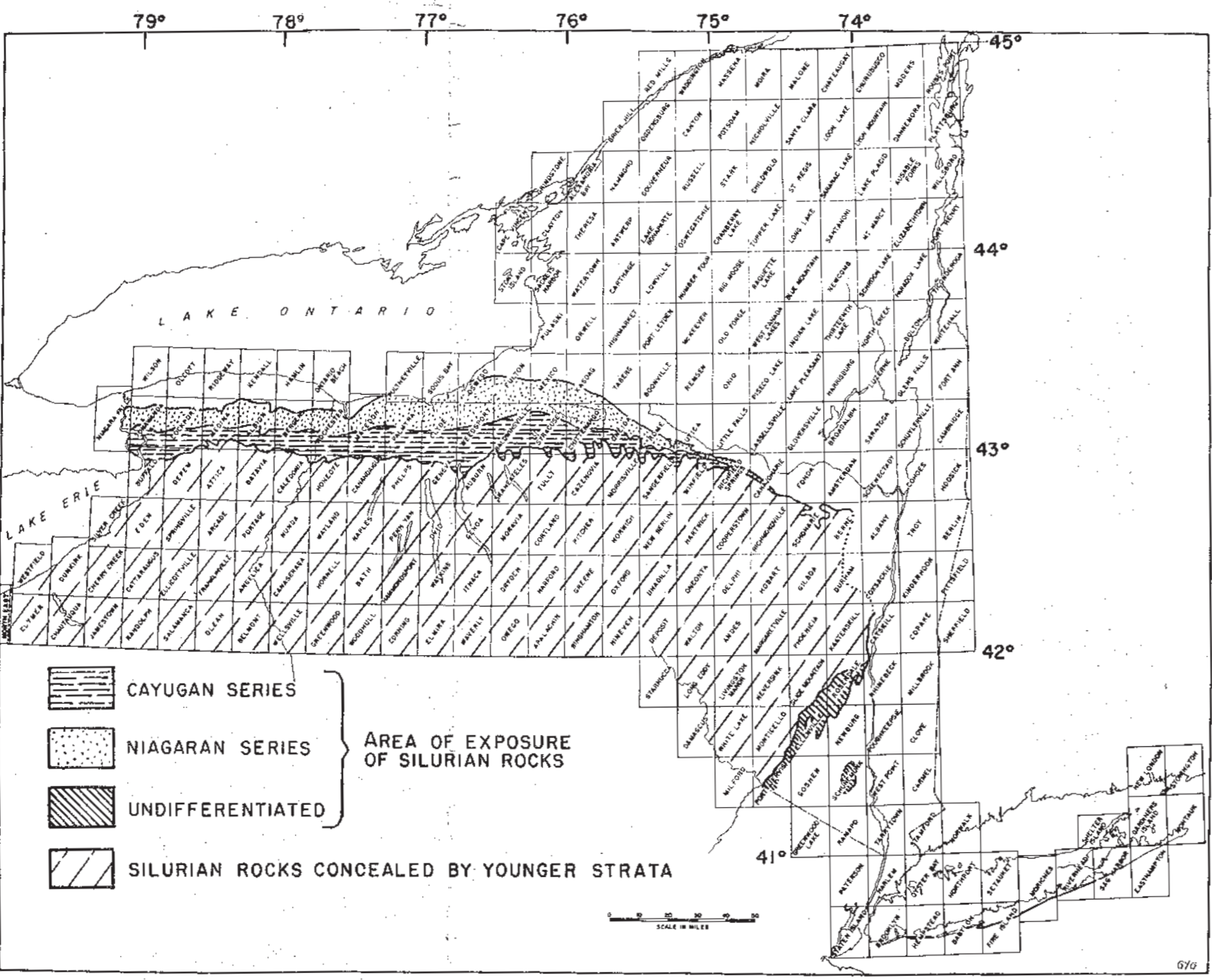


CORRELATION OF THE SILURIAN ROCKS IN NEW YORK STATE  
1959

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**PLAN OF THE CHART:**  
This chart is the first of a series of four (Cambrian, Ordovician, Silurian, Devonian) comprehensive correlation charts which are being prepared in conjunction with the new State Geologic Map (in preparation). The Silurian System became established in North America through the monographic works of Hall (1843, 1852) and Vanuxem (1842) of the New York State Geological Survey. It was then referred to as the "Ontario Division" of the "New York System." During the past half century a few generalized correlations have been outlined and a skeletonized correlation chart for the Silurian of North America has appeared (Swartz, and others, 1942) but no detailed correlation chart of the Silurian rocks of New York has yet been prepared.

Utilizing 27 detailed stratigraphic columns, this chart is a compendium of published research on Silurian rocks of New York coupled with unpublished information that the author has obtained in the field during the past 10 years.

Vertical ruling denotes a hiatus. Diagonal ruling signifies lack of bedrock exposure thereby concealing presence or prohibiting recognition of the unit. Dotted unit boundaries indicate uncertainty in the placement of such boundaries. Geologically undulating lines signify physical evidence of unconformity. Position of the asterisk (\*) denotes meridional location of the type locality. Dotted unit color of rocks (excluding limestones and dolomites) is given in parentheses following the geographic name of the unit. The vertical dimensions allotted to the stages indicate the approximate relative thickness as the author visualizes it at present and may hold little relation to the actual thickness involved.

**ABBREVIATIONS:**  
1. SERIES—The New York Silurian, the standard reference section for the United States, is divided into two series, an older—Niagaran and a younger—Cayugan. This is a departure from earlier usage involving three series. Early Niagaran faunas appear as similar to Middle Niagaran ones as Middle Niagaran faunas are to Late Niagaran ones. There seems no overwhelming reason for retaining the name Albion Series for the sequence of Medina rocks. The type section of the Niagaran Series is in the Niagara River Gorge between New York State and the Province of Ontario where a section from the Ordovician Onondaga Shale well up into the Lockport Group is continuously exposed. The Niagaran is considered to be the equivalent of the Middle and Upper Llandovery, all of the Wenlock and the lower part of the Ludlow of Europe. The Lower Llandovery appears to be unrepresented in the United States. The Cayugan Series is mod-

ified only slightly from previous usage. Formerly the younger Rondout and Manlius Formations were included in the Silurian but recent research unites these units with the Early Devonian Helderbergian limestones. The rocks of the northern portion of the Cayuga Lake Valley remain the type Cayugan. The Devonian is not represented in this chart. It now appears desirable to propose such a breakdown owing to the ever-increasing knowledge of the faunas and relations of the units. It is hoped that the suggested stage names will serve as useful a purpose as those which were instituted several years ago for the standard Devonian of New York. Accordingly, the Niagaran Series is divided into two stages: Lewistonian, and Murderian.

2. STAGES—Stage designation of the American standard Silurian has not been attempted previously. It now appears desirable to propose such a breakdown owing to the ever-increasing knowledge of the faunas and relations of the units. It is hoped that the suggested stage names will serve as useful a purpose as those which were instituted several years ago for the standard Devonian of New York. Accordingly, the Niagaran Series is divided into two stages: Lewistonian, and Murderian.

3. GROUPS—The Cayugan Series is divided into two stages: Lewistonian, and Murderian.

4. LITHOLOGY—The Lewistonian Stage is the lowest Silurian represented in the American standard section and includes the Medina Group. The type locality is in the Niagara Gorge at Lewiston, Niagara County, N. Y., where a complete sequence (about 100 feet) of Lewistonian units is displayed. It does not seem desirable to apply the name Albion to this stage as poor exposures exist at and near Albion, N. Y., and use of this name may cause confusion for it has been used in series, group and formation senses.

5. ONONDAGA STAGE—The Onondaga Stage includes the lower and middle portions of the Clinton Group. Onondaga rocks are well shown in the Niagara and Genesee Gorges and along numerous streams which cross the Ontario Plain between the Niagara Escarpment on the south and Lake Ontario on the north. The type section is in the Genesee River Gorge at Rochester. Onondaga rocks thicken eastward from about 18 feet in the Niagara Gorge (Niagara Falls quadrangle), 60 feet in the Genesee Gorge (Rochester quadrangle), 90 feet along Salmon Creek (Palmyra quadrangle) to over 135 feet near Onondaga Lake (Onondaga quadrangle).

6. LOCKPORT STAGE—The Lockport Stage comprises those rocks which are younger than Onondaga and older than the Murderian, and includes the upper Clinton strata. Good exposures occur in the northern part of the Tonawanda quadrangle from whence the name is selected. However, the type section is in the Niagara Gorge, where about 50 feet are continuously exposed. Tonawandan rocks measure 115 feet in the Genesee Gorge, 210 feet in central New York, 180 feet near Onondaga Lake and 105 feet at Clinton, N. Y. (Routt quadrangle).

7. CAYUGAN STAGE—The Cayugan Stage has the same stratigraphic limits—from the base of the Gasport to the top of the Guelph—in the type section in Lockport Township, Niagara County, where about 210 feet of limestones and dolomites occur. Well records reveal that Lockportian rocks possess a remarkably uniform thickness into central New York. The Cayugan Stage contains all of the Salina Group, from the base of the Vernon to the top of the Camillus—the lower Cayugan of previous usage. The type section is in Sullivan, Lincoln, Cortland and Vernon Townships near Canastota, N. Y. (Chattanooga and Onondaga quadrangles) where about 850 feet of Canastota rocks occur. In western New York (west of Batavia), well records indicate that the thickness of Canastota rocks has diminished to 350-400 feet.

8. MURDERIAN STAGE—The Murderian Stage is named from the type section along Murder Creek in Akron Falls Park, Akron, N. Y. (Medina quadrangle) where a maximum of 65 feet of rock of this age is exposed. Murderian rocks encompass those from the Falkirk (or Oatka) Fiddlers Green-Syracuse to the top of the Silurian and reach 90 feet in central New York and 40 feet in the Rosendale quadrangle.

9. GROUPS—Most of the rock units in the New York Silurian are assembled into larger categories, principally for convenience in discussion and mapping. These well-known rock units are: Medina, Clinton, Lockport, Salina, Bertie. Whether these deserve the rank of group or formation is a subjective matter on which there is apt to be divergence of opinion; the author regards them as groups. These group names do not apply to the 6 columns on the right hand side of the chart. Furthermore, it should be emphasized that these rock unit names should not be utilized outside of New York State in discussions pertaining to correlation and ages. No time connection should be applied to these names. Moreover, the stages herein defined are the time-rock units that are properly reserved for such matters.

10. THE MEDINA GROUP was named from Medina, N. Y., Orleans County, where red and white sandstones are exposed. The rocks of this unit are primarily red, white and mottled sandstones with a subordinate amount of silt green and red shales.

11. THE CLINTON GROUP has its type locality at Clinton, N. Y. (Routt quadrangle) where quartz pebbles conglomerates, silt green and gray shales, thin limestones, mostly gray shales and fine-textured impure sandstones constitute the unit. These lithologies change westward into calcareous shales, limestone and generally less clayey type rocks. Patch reefs occur in the knobby quartz limestone. Heterogeneity of lithology characterizes the Clinton Group.

12. THE LOCKPORT GROUP—type locality in Lockport Township, Lockport, N. Y.—consists of a basal encinal limestone, dolomitic limestones, calcitic dolomites (sometimes cherty), and cream-

colored, sugary textured dolomites. Patch reefs occur within the basal Gasport unit.

The Salina Group was named from Salina Township which borders the City of Syracuse on the north. The precise type locality is unknown but numerous exposures of Vernon, Syracuse and Camillus rocks exist in the northern part of Onondaga County (Syracuse quadrangle). The rocks are red and green shales, gypsiferous and siliceous shales and argillaceous dolomites.

The Bertie Group, as here used, includes the rocks between the base of the Oatka and the top of the Williamson. The unit consists of related silt dolomites and argillaceous dolomites with varying amounts of calcite, dolomitic shales and natural cement rock. The type section is in Bertie Township, Ontario County.

Recent studies by L. V. Rickard (in press) suggest that the Marlous, upper Chrysler and Whiteport (Upper Centure of the Rondout) are Devonian, pending precise placement of the Silurian-Devonian contact in Europe and more refined intercontinental correlations. The Glasco and Cobleskill limestones appear to be the youngest fossil-bearing Silurian rocks in New York. The name Glasco is preferred to that of LeFever because the latter was never adequately described in print.

7. Fiddlers Green is not recognized, it is not considered preeminent for use in New York. This name was used previously for an Eocene tuff in Oregon and there is little likelihood of confusion because of their geographic or geologic proximity.

8. Aconit is suggested here for the unfossiliferous calcareous shale lying beneath the Rosendale Waterlime in the southern half of the Rosendale quadrangle. It may be the southern equivalent of the Helderberg Sandstone and/or transitional with the Rosendale and Decker Ferry. The type section is in the abandoned railroad cut at the southern edge of Accord, where 18 feet are exposed.

9. Fiddlers Green has not demonstrated the lateral continuity of the Williamson and Oxbow (new name, L. V. Rickard, in press), Sasajuga and Forge Hollow (new name, L. V. Rickard, in press), or the Falkirk and Fiddlers Green as indicated above. Thick glacial deposits conceal these units in the area where they may merge (north of Seneca Lake). The possibility of facies changes, for example, Falkirk to Forge Hollow should not be overlooked. Therefore, distinct names are retained for western and central New York.

10. The eastern equivalent of the Oatka waterlime is puzzling. It is shown as representing a more calcareous and dolomitic phase of the upper Camillus though it is equally probable that the Oatka may be a facies of the Fiddlers Green. Should the latter relationship prove to be the correct one, the Oatka should form the base of the Murderian Stage. Some earlier workers have sug-

gested a disconformity between the Oatka and Camillus. To date, the Oatka is known only from Murder Creek at Akron, Tonawanda Creek at Indian Falls (Medina quadrangle) and Oatka Creek at North Leyce (Bergen quadrangle).

11. It is highly improbable that the Vernon-Syracuse contact is a time plane. However, for lack of any known evidence to the contrary, it is drawn as a dashed contact unit, such time as a suspected faciological relationship may be demonstrated. Neither formation is known to exist west of Batavia.

12. The name Fiddlers Green has been discontinued for it is but a local greenish-black phase of the Vernon, containing eurypterids.

13. Outfield is proposed for the dolomitic limestones with a "normal" type Lockport fauna lying beneath the Oak Orchard Dolomite (carrying a Guelph fauna) and above the eastward thinning wedge of dolomite carrying a Guelph fauna here named the Devil's Hole Dolomite. The latter is the Lower Shelby (name preoccupied) of Clarke (1903). The type section of the Oakfield is along Oak Orchard Creek at Shelby, Orleans County, that of the Devil's Hole Dolomite is at Devil's Hole State Park in the Niagara Gorge.

14. There is a variance of opinion as to whether a time break exists between the Lockport Group and the underlying Rochester Shale. Some claim that the Brownport, Waldron and Laurel till this "gap." The evidence is not altogether conclusive inasmuch as the apparent facies differences may be due to ecological control. There seems to be a physical break between the Decew and Gasport in western New York but no physical break can be seen from Rochester eastward. The Rochester grades imperceptibly upward into Decew. The Decew is transferred to the Tonawanda Stage because it contains *Atractosteus bolowi* and *Trimerorhynchus* which are unknown in the Lockportian.

15. East of Syracuse, the Lockport Group grades into dominantly shaly shale for which the name Lion is proposed. The Lion consists of about 60 feet of sparsely fossiliferous calcareous gray shale with interbedded dolomite layers containing stromatolites, Lingulids and eurypterids has been found in the shales. The type section is in Starck Factory Creek, 5 miles west-southwest of Lion, Herkimer County (Utica quadrangle) where the unit is underlain by the Helderberg Sandstone and overlain by the Vernon Shale.

16. The exact ages of the High Falls, Longwood, Guyard, Otisville, Green Pond and Shawangunk (pronounced Shawangunk) are unknown ages are discovered in these units, by H. L. Alling, A. J. Boucot, J. G. Broughton, L. V. Rickard, J. Rodgers, J. W. Wells.

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SELECTED BIBLIOGRAPHY:

Only those papers are listed which deal principally with correlations of Silurian rocks in New York: Alling (1928), Chadwick (1918), Clarke and Schuchert (1895), Clarke and Knickerbocker (1912), Dutton (1894), Fisher (1935, 1936), Gillette (1940, 1947), Grubbs (1905, 1908), Hall (1843, 1852), Hattagel (1903, 1905, 1907), Rodeman (1925), Sanford (1935), Ulrich (1923), Vanuxem (1842).

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