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PROCEEDINGS
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SOME SELECTED REFERENCES FOR FOSSIL COLLECTING SITES IN THE ROCHESTER, NEW YORK AREA

by

NINA LOCKWOOD

SOME OBSERVATIONS ON THE PERSISTENCE AND CHANGES IN GREEN TERATOLOGIC FORMS OF TRILLIUMS

by

H. LOU GIBSON

A STUDY OF THE GASTROPODS OF CONESUS LAKE, LIVINGSTON COUNTY, NEW YORK

by

CAREY E. VASEY and JEAN Q. WADE

ABSTRACTS OF PAPERS, SECOND ANNUAL DAY FOR SCIENTIFIC PAPERS, STATE UNIVERSITY COLLEGE AT BROCKPORT, N.Y. NOVEMBER 1, 1975

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ABSTRACTS

SOME SELECTED REFERENCES FOR FOSSIL COLLECTING SITES IN THE ROCHESTER, NEW YORK AREA

Nina Lockwood*

Paleontological field trips in the Rochester area are interesting and productive because of the succession of Paleozoic sediments which form the bedrock of our area. These sedimentary rock formations are still relatively horizontal and undisturbed, containing a wide variety of well-preserved marine invertebrate organisms.

The purpose of this guide is to make it easier for the collector as well as the scientist or student to quickly locate the bibliographic data to some of the more popular fossil collecting areas close to Rochester. Eight localities are included. A short description of each is given, followed by references to that area, and then information as to where these references may be found. Most of these are in the Geological Sciences Library or Rush Rhees Library at the University of Rochester and subject to the circulation rules of those libraries. (These will be abbreviated G.S.L.-U. of R. and R.R.L.-U. of R.) There are several works which cover the entire area and rather than repeat them in each section, they will be listed first.

The New York State Geological Association produces an annual field guide for each of its conferences held at differing colleges and universities throughout the state. Detailed instructions for the location of each site can be found in these guides. The particular guide pertinent to that site will be the first reference given in each list. Also given will be the appropriate United States Geological Survey topographic quadrangle map.

Remember- many of these places are on private property; some are dangerous. Obtain permission of the owners before trespassing.

Amos, Fred C., et al., 1968, Getting Acquainted with the Geological Story of the Rochester and Genesee Valley Areas: Rochester, New York. Rochester Academy of Science, 87 pages. (Reserve shelf-G.S.L.-U. of R.)

Empire State Geogram. New York State Science Service Geological Survey. L. V. Rickard, ed. (Reserve shelf-G.S.L.-U. of R.)

Field Trip Guide to Some Mineral and Fossil Localities of New York State., 1969, Rochester, New York. Mineral Section, Rochester Academy of Science. Prepared for the 19th Annual Convention and Show of the Eastern Federation of Mineral and Lapidary Societies, Inc. (Reserve shelf-G.S.L.-U. of R.)

Hall, James, 1843-1894, Natural History of New York: Albany, New York State Natural History Survey. (QE 145. A15g-G.S.L.-U. of R.)

Hall, James, 1843-1894, Natural History of New York. Palaeontology: Albany, New York State Natural History Survey. (QE 747.67 A15p-G.S.L.-U. of R.)

International Geological Congress. XVI Session. United States. 1933 Guidebook to Excursions. A-4. The Paleozoic Stratigraphy of New York. Prepared under the direction of D. H. Newland (QE 77. I61g-G.S.L.-U. of R.)

Joint Committee on Invertebrate Paleontology. Treatise on Invertebrate Paleontology. Raymond C. Moore, ed. Geological Society of America and University of Kansas Press, Lawrence, Kansas. 1953-1971. 18 volumes (QE 770. J74t-G.S.L.-U. of R.)

New York State Education Dept. Albany. Report of New York State Science Service activities 1974. (Reserve shelf-G.S.L.-U. of R.)

Payne, Thomas Gibson, The Genesee Country: a field guide to various natural features which reveal the geologic past: Rochester, New York, Rochester Museum of Arts and Science. 1938. (QE 145. P34g-Reserve shelf-G.S.L.-U. of R.)

* Geological Sciences Library, University of Rochester, Rochester, N.Y.

New York State Geological Association, Guidebooks to Field Trips: (All of these are in QE 145. N56)

1956 - 28th Annual Meeting - Rochester*
1957 - 29th Annual Meeting - Wellsville
1958 - 30th Annual Meeting - Peekskill
1959 - 31st Annual Meeting - Ithaca
1960 - 32nd Annual Meeting - Clinton
1961 - 33rd Annual Meeting - Troy
1962 - 34th Annual Meeting - Port Jervis
1963 - 35th Annual Meeting - Binghamton
1964 - 36th Annual Meeting - Syracuse
1965 - 37th Annual Meeting - Schenectady
1966 - 38th Annual Meeting - Buffalo
1967 - 39th Annual Meeting - Newburgh
1968 - 40th Annual Meeting - Long Island
1969 - 41st Annual Meeting - Plattsburgh
1970 - 42nd Annual Meeting - Cortland
1971 - 43rd Annual Meeting - Adirondacks
1972 - 44th Annual Meeting - Utica
1973 - 45th Annual Meeting - Brockport*
1974 - 46th Annual Meeting - Fredonia
1975 - 47th Annual Meeting - Hempstead

New York State Museum and Science Service., 1966, Albany, New York, Educational Leaflet No. 20. Geology of New York; a short account. (Reserve shelf-G.S.L.-U. of R.)

New York State Museum and Science Service, 1959, Correlation Chart of the Ordovician Rocks of New York State by D. W. Fisher. (Reserve shelf-G.S.L.-U. of R.)

New York State Museum and Science Service, 1962, Correlation of the Silurian Rocks of New York State by D. W. Fisher. (Reserve shelf-G.S.L.-U. of R.)

New York State Museum and Science Service, 1964, Correlation of the Devonian Rocks of New York State by L. V. Rickard. (Reserve shelf-G.S.L.-U. of R.)

New York State Museum and Science Service, 1975, Correlation of the Silurian and Devonian Rocks of New York State by L. V. Rickard. (Reserve shelf-G.S.L.-U. of R.)

Rochester Gas and Electric Corporation, Rochester, New York. Standardized Nuclear Unit Power Plant System. Sterling Power Project Nuclear Unit no. 1. Addendum to preliminary safety analysis report. (TK 1345.S7 R64-G.S.L.-U. of R.)

Torrey, Paul D. The Geology of New York and Northern Pennsylvania. American Petroleum Institute. Dallas, Texas, 1932. (QE 145. T69g-G.S.L.-U. of R.)

1. ROCHESTER GORGE:

Guidebook: NYSGA, 1956; Map: Rochester East and West Quadrangles

The Rochester Gorge is an excellent place to see strata exposed from the Ordovician up through the Middle Silurian. The lowest and oldest member exposed by the river is the Ordovician age Queenston. Above it is the Silurian Medina group containing the Grimsby sandstone. Then the members of the Clinton Group of Silurian age - the Thorold, Kodak, Maplewood, Brewer Dock, Furnaceville, Reynales, Sodus, Williamson, Irondequoit and the highly fossiliferous Rochester Shale at the top.

Alling, H. L., 1936, Quantitative Petrology of the Genesee Gorge Sediments; Proceedings of the Rochester Academy of Science, v. 9, no. 1, p. 5-61. (Q 11. R67p-G.S.L.-U. of R.)

*(especially helpful for this area)

Alling, H. L., 1947, Diagenesis of the Clinton Hematite Ores of New York. Geol. Soc. Amer. Bull., v. 58, no. 2, p.991-1018. (QE 2. G34b-G.S.L.-U. of R.)

Bassler, R. S., The Bryozoan Fauna of the Rochester Shale. U. S. Geol. Surv. Bull. 292. 136 pages. (QE 75. B93-R.R.L.-U. of R.)

Berry, B. N., and Boucot, A. J., 1970. Correlation of the North American Silurian Rocks. Geol. Soc. Amer. Spec. Pap. 102., p. 9-19. (QE2. G34s-G.S.L.-U. of R.)

Berry, B. N., and Boucot, A. J., 1935, Thorold Sandstone. Am. Assoc. Petroleum Geologists Bull. v. 19, p. 702. (TN 860. A51b-G.S.L.-U. of R.)

Fairchild, H. L., 1891, A section of strata at Rochester, New York, as shown by a deep boring. Proc. Roch. Acad. Sci., v. 1, p. 182-186. (Q 11. R67p-G.S.L.-U. of R.)

Fairchild, H. L., 1901, Beach Structure in the Medina Sandstone. Amer. Geol., p. 9-14 (July). (QE 1. A513-R.R.L.-U. of R.)

Fisher, D. W., 1953, A Microflora in the Maplewood and Neahga Shales. Buffalo Soc., Nat. Sci. Bull., v. 21, no. 2, p. 13-18. (QH 2. B92b-R.R.L.-U. of R.)

Gartland, E. F., 1973, Conodont Biostratigraphy of the Wallington Limestone member of the Reynales Limestone and the Lower Sodus Shale. Unpublished M.S. Essay. (G.S.L.-U. of R.)

Gillette, Tracy. The Clinton of Western and Central New York. 1947. New York State Museum Bulletin 341. (Q 11. N567m-G.S.L.-U. of R.)

Goldring, W., 1930, Handbook of Paleontology for Beginners and Amateurs, Part I The Fossils. New York State Museum Handbook 9, 366 pages. (Q 11. N567h-G.S.L.-U. of R.)

Goldring, W., 1931, Handbook of Paleontology for Beginners and Amateurs, Part II The Formations, New York State Museum Handbook 10, 488 pages. (Q 11. N567h-G.S.L.-U. of R.)

Grabau, A. W., 1908, A Revised Classification of the North American Silurian. Science, v. 27, p. 622-623. (Q 1. S391-R.R.L.-U. of R.)

Grabau, A. W., 1913, Physical and Faunal Evolution of North America during Ordovicic, Siluric and Early Devonic Time, Jour. Geol., v. 17, p. 209-252. (QE 1. J863-G.S.L.-U. of R.)

Grabau, A. W., 1913, Early Paleozoic Delta Deposits of North America, Geol. Soc. Amer. Bull. v. 24, p. 399-538. (QE 2. G34b-G.S.L.-U. of R.)

Ruedemann, Rudolf. Some Silurian (Ontarian) Faunas of New York, 1925. New York State Museum Bulletin 265. (Q 11. N567m-G.S.L.-U. of R.)

2. LOCKPORT:

Guidebook: NYSGA, 1966; Map: Lockport Quadrangle

Younger than the Clinton Group is the Middle Silurian Lockport Formation consisting mostly of dolomitic limestone. A good site for seeing the well preserved fossils of the Gasport member of this formation is in a railroad cut on the east side of "The Gulf", 1.3 miles east on Route 31 from the intersection with Route 78 in Lockport.

Howell, B. F., and Sanford, J. T., 1947, Trilobites from the Oak Orchard Member of the Lockport Formation of New York. Wagner Free Inst. Sci. Bull. v. 22, p. 33-39. (Q 11. W13p-R.R.L.-U. of R.)

Kindle, E. M. and Taylor, F. B., 1913, Niagara Folio, U. S. Geol. Surv. Folio 190, p. 26. (G.S.L.-U. of R.)

Williams, M. Y., 1915, An Eurypterid Horizon in the Niagara Formation of Ontario, Geol. Surv. Can. Mus. Bull. 20, p. 21. (Available at S.U.N.Y. Buffalo)

Zenger, D. H., 1962, Proposed Stratigraphic Nomenclature for the Lockport Formation in New York State. Am. Assoc. Petroleum Geologists Bull., v. 46, p. 2249-2253. (TN 860. A15b-G.S.L.-U. of R.)

Zenger, D. H., 1965, Stratigraphy of the Lockport Formation in New York State. New York State Museum and Science Service Bull., no. 404. (Q 11. N567m-G.S.L.-U. of R.)

3. HONEOYE FALLS:

Guidebook: NYSGA, 1973; Map: Honeoye Falls Quadrangle

Eurypterids have been reportedly found in these Upper Silurian dolostones. However, they are rare and difficult to find. Check the 1973 New York State Geological Association Guidebook for the best localities.

Caster, K. E., and Kjellesvig - Waring, E. N., 1956, Some notes on the Genus Dolichopterus hall., Jour. Paleo., v. 30, p. 19-28. (QE 701. J866-G.S.L.-U. of R.)

Chadwick, G. H., 1917, (abstract) Cayugan Waterlimes of New York. Geol. Soc. Amer. Bull., v. 28, page 173-174. (QE 2. G34b-G.S.L.-U. of R.)

Hopkins, T. C., 1914, Geology of the Syracuse Quadrangle. New York State Museum and Science Service Bull. 171. (Q 11. N567m-G.S.L.-U. of R.)

Kjellesvig - Waring, E. N., 1958, The Genera, Species and Sub-Species of the Family Euripteridae, Burmeister 1845., Jour. Paleo., v. 32, no. 6, p. 1107-1148. (QE 701. J866-G.S.L.-U. of R.)

Rickard, L. V., 1953, Stratigraphy of the Upper Silurian Cobbleskill, Bertie and Brayman Formations of New York State. Unpublished M. S. Thesis. (G.S.L.-U. of R.)

4. LEROY:

Guidebook: NYSGA, 1974; Map: LeRoy Quadrangle

Overlying the Silurian rocks seen on the first three trips is the lower Devonian Onondaga Limestone. Patch reefs with abundant corals are characteristic of this formation and can be seen best in an abandoned quarry near LeRoy.

Eaton, A., 1823, Geological Profile of the Rocks from Onondaga Salt Springs, New York to Williams College, Massachusetts. New York Board of Agriculture Memoir 2, p. 41-43. (S 95. A1r-R.R.L.-U. of R.)

Eaton, A., 1839, Cherty Lime Rock or Corniferous Lime Rock Proposed as the Lime of Reference for State Geologists of New York and Pennsylvania. Am. Jour. Sci., v. 36, p. 61-71. (Q 1. A517-R.R.L.-U. of R.)

Emmons, E., 1846, Agricultural Geology of Onondaga County. Am. Quart. Jour. of Agriculture, v. 3, p. 161-193. (S 1. A512-R.R.L.-U. of R.)

Goldring, W., 1931, Handbook of Paleontology for Beginners and Amateurs, Part II The Formations, New York State Museum Handbook 10, 488 pages. (Q 11. N567h-G.S.L.-U. of R.)

Kindle, E. M., 1913, The Unconformity at the Base of the Onondaga Limestone in New York and its Equivalent West of Buffalo. Jour. Geol. v. 21, p. 301-319. (QE 1. J863-G.S.L.-U. of R.)

Mather, W. W., 1840, Fourth Annual Report of the First Geological District of the State of New York. New York Geological Survey Annual Report 4, p. 209-258. (QE 145. A15g-R.R.L.-U. of R.)

Moyer, P. T., 1956, Nature and Origin of Chert in the Onondaga Limestone at LeRoy and Oaks Corners, New York. Unpublished M. S. Thesis. (G.S.L.-U. of R.)

Oliver, W. A., 1954, Stratigraphy of the Onondaga Limestone in Central New York. Geol. Soc. Amer. Bull., v. 65, p. 621-652. (QE 2. G34b-G.S.L.-U. of R.)

Vanuxem, L., 1842, New York State Natural History Survey, Albany. Geology of New York Comprising the Survey of the Third Geological District, p. 132-138. (QE 145. A15g-G.S.L.-U. of R.)

Wray, I., 1936, The Onondaga Limestone and its Insoluble Residues from Sections of New York State. Unpublished M. S. Thesis. (R.R.L.-U. of R.)

5. EAST BETHANY:

Guide: Robert Sutton's Thesis; Map: Stafford Quadrangle

The railroad cut south of the town of East Bethany provides a seemingly endless supply of fossils from both the Centerfield Limestone and the younger Ledyard-Wanakah Shales. This has long been a favorite site for collectors.

Campbell, A. R., 1952, Some Ostracods from the Basal Ludlowville (Hamilton) Genesee County, New York. Unpublished M. S. Thesis. (G.S.L.-U. of R.)

Clarke, J. M. and Luther, D. D., 1904, Stratigraphic and Paleontologic Map of the Canandaigua and Naples Quadrangles. New York State Museum and Science Service Bulletin 63. (Q 11. N567m-G.S.L.-U. of R.)

Cooper, G. A., 1930, Stratigraphy of the Hamilton Group of New York. Amer. Jour. Sci. Serv. 5, v. 19, p. 214-236. (Q 1. A517-G.S.L.-U. of R.)

Cooper, G. A., and Warthin, A. S., 1942, Correlation of the Devonian Sedimentary Formations of North America. Geol. Soc. Amer. Bull., v. 53, p. 1729-1794. (QE 2. G34b-G.S.L.-U. of R.)

Cooper, G. A., et al., 1942, New Devonian (Hamilton) Correlations. Geol. Soc. Amer. Bull., v. 53, p. 873-888. (QE 2. G34b-G.S.L.-U. of R.)

Fisher, D. W., 1951, Marcasite Fauna in the Ludlowville Formation of Western New York. Jour. Paleo., v. 25, no. 3, p. 365-371. (QE 701. J866-G.S.L.-U. of R.)

Kramers, John William. The Centerfield Limestone (Middle Devonian) of New York State and its clastic correlatives, a sedimentologic analysis. Ph.D. Thesis - Rensselaer Polytechic Institute. 1970. (QE 665. K7-G.S.L.-U. of R.)

Smith, M., 1952, Ostracods from the Middle Devonian Ledyard, Wanakah and Tichenor Shales of New York. Unpublished M. S. Thesis. (G.S.L.-U. of R.)

Sutton, R., 1951, Stratigraphy and Structure of the Batavia Quadrangle. Roch. Acad. Sci. Proc. v. 9, nos 5-6, p. 348-408. (Q 11. R67p-G.S.L.-U. of R.)

Vanuxem, L., 1842, New York State Natural History Survey, Albany. Geology of New York Comprising the Survey of the Third Geological District, p. 150-161. (QE 145. A15g-G.S.L.-U. of R.)

6. JAYCOX RUN:

Guidebook; NYSGA, 1973; Map: Geneseo Quadrangle

Abundant Hamilton fossils can be found at this well known site near Geneseo. Be sure to get permission of the owner, William P. Wadsworth, before collecting.

Clarke, J. M., 1901, Limestones of Central and Western New York interbedded with Bituminous Shales of the Marcellus Shale with notes on the Nature and Origin of their Faunas. New York State Mus. Bull., 49, p. 115-138. (Q 11. N567m-G.S.L.-U. of R.)

Chadwick, G. H., 1935, Faunal Differentiation in the Upper Devonian. Geol. Soc. Amer. Bull., v. 46, p. 305-342. (QE 2. G34b-G.S.L.-U. of R.)

Cooper, G. A., 1930, Stratigraphy of the Hamilton Group of New York, parts one and two. Amer. Jour. Sci. 5th Series, v. 26, p. 537-551. (Q 1. A517-R.R.L.-U. of R.)

Grabau, A. W., 1896, Faunas of the Hamilton Group. New York State Museum Annual Report, No. 50, v. 2, p. 227-339. (Q 11. N567a-R.R.L.-U. of R.)

McAlester, A. L., 1960, Pelecypod Associations and Ecology in the New York Upper Devonian. Geol. Soc. Amer. Bull. v. 71, No. 12, pt. 2, p. 1924 (abstr.) (QE 2. G34b-G.S.L.-U. of R.)

McCave, Ian Nicholas. A stratigraphical and sedimentological analysis of a portion of the Hamilton Group (Middle Devonian) of New York State. Ph.D. Thesis. Brown University 1967. (QE 665. M3-G.S.L.-U. of R.)
Oliver, W. A., 1951, Middle Devonian Coral Beds of Central New York, Amer. Jour. Sci. v. 249, p. 705-728. (Q 1. A517-G.S.L.-U. of R.)

7. TAUNTON GULLY AND LITTLE BEARD'S CREEK:

Guidebook: NYSGA, 1973; Map: Leicester Quadrangle

Just northwest of the village of Leicester in the Genesee Valley are Little Beard's Creek and Taunton Gully. Here one finds the type section of the Upper Hamilton Moscow Formation. Many rare fossils have been found here.

Chadwick, G. H., 1935, Faunal Differentiation in the Upper Devonian. Geol. Soc. Amer. Bull. v. 46, p. 305-342. (QE 2. G34b-G.S.L.-U. of R.)
Cooper, G. A., 1930, Stratigraphy of the Hamilton Group of New York. Amer. Jour. Sciences Ser. 5, v. 19, p. 214-236. (Q 1. A517-R.R.L.-U. of R.)
Cooper, G. A., and Williams, J. S., 1935, Tully Formation of New York. Geol. Soc. Amer. Bull. v. 46, p. 781-868. (QE 2. G34b-G.S.L.-U. of R.)
Fulreader, R. W., 1957, Geologic Studies of the Leicester Pyrite. Unpublished M. S. Thesis. (G.S.L.-U. of R.)
Cleland, H. F., 1903, A study of the Fauna of the Hamilton Formation of the Cayuga Lake Section in Central New York. U. S. Geological Survey Bull. 206, 112 pages. (QE 75. B93-R.R.L.-U. of R.)
Fisher, D. W., 1951, Marcasite Fauna in the Ludlowville Formation of Western New York. Jour. Paleo., v. 25, no. 3, p. 365-371. (QE 701. J866-G.S.L.-U. of R.)
Grabau, A. W., 1917, Stratigraphic relationships of the Tully Limestone and Genesee Shale in Eastern North America. Geol. Soc. Amer. Bull. v. 28, p. 945-946. (QE 2. G34b-G.S.L.-U. of R.)
Loomis, F. B., 1903, The Dwarf Fauna of the Pyrite Layer at the Horizon of the Tully Limestone in Western New York. New York State Museum Bull. 69, p. 892-920. (Q 11. N567m-G.S.L.-U. of R.)
Stover, L. E., 1956, Stratigraphy and Paleontology of the Moscow Formation (Hamilton) in Central and Western New York. Ph. D. Thesis. (R.R.L.-U. of R.)
Trainer, D. W., Jr., 1932, The Tully Limestone of Central New York. New York State Museum Bulletin 291, 43 pages. (Q 11. N567m-G.S.L.-U. of R.)

8. EIGHTEEN MILE CREEK:

Guidebook: NYSGA, 1974; Map: Eden Quadrangle

This is the youngest exposure in our area; the Upper Devonian Rhinestreet of the Westfalls Formation.

Buehler, E. J. and Tesmer, I. H., 1963, Geology of Erie County, New York. Buffalo Soc. Nat. Sci. Bull. v. 21, no. 3, 118 pages. (QH2. B92b-R.R.L.-U. of R.)
Butts, C., 1903, Fossil Faunas of the Olean Quadrangle, New York. State Mus. Bull. 69, p. 990-995. (Q 11. N567m-G.S.L.-U. of R.)
Chadwick, G. H., 1935, Faunal Differentiation in the Upper Devonian, Geol. Sci. Amer. Bull. v. 46, p. 305-341. (QE 2. G34b-G.S.L.-U. of R.)
Colton, G. W., and DeWitt, W. Jr., 1958, Stratigraphy of the Sonyea Formation of Late Devonian Age in Western and West Central New York. U. S. Geological Survey Oil and Gas Investigation Chart OC 54. (Map Room-G.S.L.-U. of R.)

DeWitt, W. Jr., 1959, Revised Correlations of Lower Upper Devonian Rocks in Western and Central New York, Amer. Assoc. Pet. Geologists Bull., v. 43, p. 2810-2828. (TN 860. A15b-G.S.L.-U. of R.)

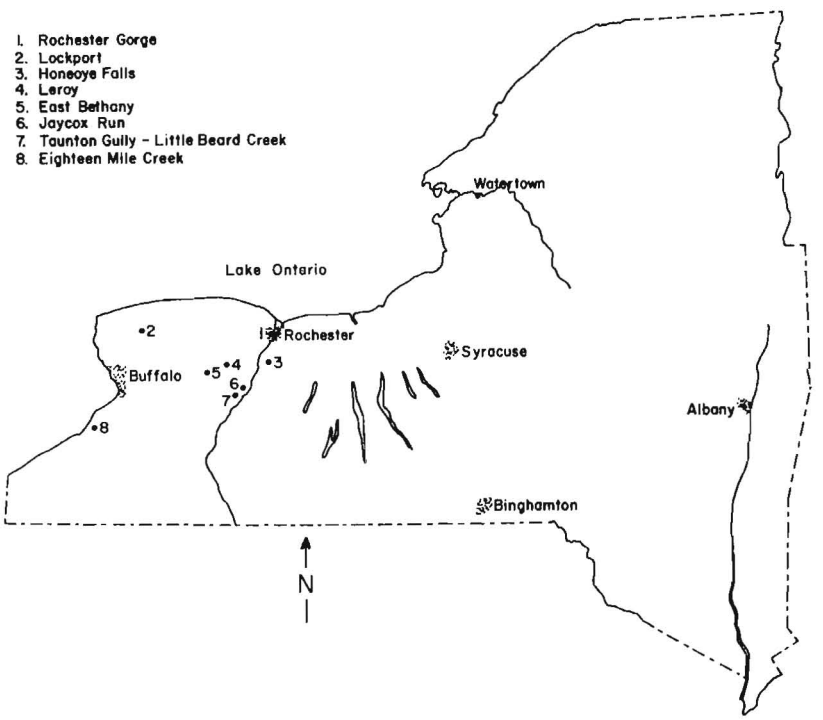
DeWitt, W. Jr., 1960, Java Formation of Late Devonian Age in Western and Central New York. Amer. Assoc. Pet. Geologists Bull. v. 44, p. 1933 - 1939. (TN 860. A15b-G.S.L.-U. of R.)

Grabau, A. W., 1896, The Faunas of the Hamilton Group of Eighteen Mile Creek and Vicinity of Western New York. New York State Museum Annual Report No. 50, v. 2, p. 227-339. (Q 11. N567a-R.R.L.-U. of R.)

Pepper, J. F., 1956, DeWitt, W. Jr., Colton, G. W., 1956, Stratigraphy of the Westfalls Formation of Late Devonian Age in Western and West Central New York, U. S. Geological Survey Oil and Gas Chart OC 55. (Map Room-G.S.L.-U. of R.)

Tesmer, I. H., 1963, Geology of Chautauqua County, New York, Part I, Stratigraphy and Paleontology. New York State Museum Bull. 391, 65 pages. (Q 11. N567m-G.S.L.-U. of R.)

APPROXIMATE LOCATIONS OF FIELD TRIPS



SYSTEM		ROCK UNIT		TRIP
DEVONIAN	UPPER	Canadaway Group		Wolf Creek congl. Wellsville sh. & ls. Camden sh. & ls.
		Java Fm.		Hanover sh. & ss. Wiscoy sh. & ss.
		West Falls Group		Angola sh. Rhinestreet sh.
	MIDDLE	Sonyea Group		Cashaqua sh. Middlesex sh.
		Genesee Group		West River sh. Penn Yann sh.
		Tully Fm.	Hamilton Group	Leicester pyrite
		Moscow Fm.		Windom sh. Kashong sh. Menteth ls.
	LOWER	Ludlowville Fm.		Deep Run sh. Tichenor ls. Wanakah sh. Ledyard sh. Centerfield ls.
		Skaneateles Fm.		Levanna sh.
		Marcellus Fm.		Oatka Creek sh.
SILURIAN	UPPER			Onondaga Fm.
		Salina Group		Fiddlers Green dol. Oak Orchard dol.
		Lockport Group		Penfield ss. & dol. Gasport ls. & dol. Gates dol.
	LOWER	Clinton Group		Rochester sh. Irondequoit ls. Williamston sh. Sodus sh. Reynales ls. Furnaceville hem. & ls. Maplewood sh. Kodak ss. Thorold ss.
		Medina Group		Grimsby ss. & sh.
ORDOVICIAN				Queenston Fm. ss. & sh.

TRIP: 8 (Wolf Creek congl. – Rhinestreet sh.); 7 (Leicester pyrite – Menteth ls.); 6 (Deep Run sh. – Centerfield ls.); 5 (Deep Run sh. – Centerfield ls.); 4 (Onondaga Fm.); 3 (Fiddlers Green dol. – Oak Orchard dol.); 2 (Penfield ss. & dol. – Gates dol.); 1 (Rochester sh. – Queenston Fm. ss. & sh.)

SOME OBSERVATIONS ON THE PERSISTENCE AND CHANGES IN GREEN TERATOLOGIC FORMS OF TRILLIUMS

H. Lou Gibson*

While several species of trilliums are subject to some minor aberrations, Trillium grandiflorum (Michx.) Salisb., the white trillium, exhibits numerous, often drastic, morphological variations and diverse incursions of green into the petals. Pechuman[1] has recorded and illustrated an excellent outline of such modifications. Several forms of the "green trillium" are quite elegant and would make fine cultivars. In my experience, however, only two forms show any promise of permanence.

Disappointments with the uncertainties of cultivating transplanted showy specimens led me to investigate their vagaries. For over 15 years I have studied aberrant specimens in my garden in Rochester, New York and also occasionally in one main site in which all of Pechuman's recorded modifications have been observed by me. Some other sites were also observed and collected in western New York. This was done because transplanting, which is known to cause changes in some other plants, might have been the source of the deterioration encountered in the garden. However, regressive behavior of both transplanted and wild, slightly abnormal and clearly monstrous, T. grandiflorum appear to run parallel. This is also true for the few teratological, including "green" forms of Trillium erectum, L., that I have been able to study.

While even a green form falls in the category of a teratological (or monstrous) plant, many of them are normal in structure, and calling them monsters does them an injustice. My major interest has been in normal-looking plants with incursions of green into the petals.

Structural monsters include those in which a kind of reverse phyllody has transformed flower parts -- sepals, petals, stamens, and even ovaries -- into leaf-like components. The second structural anomaly involves petioles on ordinarily sessile plants. These become long and may branch from near the peduncle, low on the stem (see Figure 1), or from the rootstock below the ground surface. Sometimes petioles, and leaves too, are absent. Such extreme structural aberrants are usually low in height and have more scientific than floricultural value. The first type sometimes incorporates petiole anomalies and always involves greening of the petals. The second sometimes carries petals with normal coloration.

GREEN INCURSION

Petals exhibiting various degrees of green coloration occur in both species mentioned above. With T. erectum, they are relatively rare, and the green tends toward black because of optical filtering by the undisplaced normal magenta pigmentation. It will be helpful, for those interested in carrying on the investigation of these green manifestations further, to discuss present knowledge of the cause. In this way, some aspects of the regressive trend to be reported here might suggest corroborative or additional data. It is also likely that the agent causing the color aberrations might be responsible for the morphological departures, too.

GENETIC MUTATION

Gad and Cruise[2] present a good summary of the various theories of green streaking in T. grandiflorum. It was first thought that genetic mutations were involved. Some "sports" were given species status[3], because their color

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* Based on the author's paper "A Photographic Survey of Trilliums" presented at the Academy's Autumn Session Day for Scientific Papers, at State University College of Arts and Science, Geneseo, New York, October 26, 1974.

pattern is duplicated by many individuals over widespread areas and regions of the country. Against the genetic theory is the fact that no one has found viable seed from such "species". A few observers have noted that these forms change upon transplanting, which is not a trait of most fixed species. My studies have followed such specimens either to a demise or to a regeneration to normal plants.

Seeming to support genetic mutation, there is a vigorous but not very striking form that persists and vegetatively divides in great profusion. The plants are tall and normal in every way except for a narrow green stripe along the main longitudinal vein of one or more petals. The petals are asymmetrical -- two extend almost horizontally, and a slightly larger one hangs down to produce a near T-shape, rather than the more common Y-shape. This T-configuration often occurs in all-white specimens.

Again, I have a green plena form plant in my garden and have observed another elsewhere. (Sometimes such plants are called "double," but it is better to reserve this word for the doubling that occurs when a single rootstock puts out two stems.) The flowers last most of the summer. Both of these plants have vegetatively multiplied vigorously -- doubling and dividing almost every year for many seasons, and maintaining their plena flower characteristics. This is also the property of all-white plena forms, but the flowers die in about three weeks.

VIRUS AND MYCOPLASMA

Because of viral streaking in parrot tulips and streaking in other plants, a virus agent has been investigated. Hall (cited in ref. 2) noted that the cold, northern-type woodlands, in which green trilliums are found, are conducive to virus growth. But Hall obtained negative results from several experiments and was unable to inoculate normal plants. Hooper, Case, and Myers (cited in ref. 2) considered a mycoplasma -- a proven agent in aster yellows disease of strawberries. Electron microscopy revealed such organisms in the phloem cells of green trilliums. (It would be interesting to check morphologically aberrant specimens that show no greening.) These experimenters are now trying to determine how infection is transmitted; they suspect leaf hoppers.

Hooper, et al., (cited in ref. 2) warn against growing green trilliums among white ones. In my garden there are about 200 white plants, from many different sources, in the main bed, along one side. On the other side of the garden is a small experimental bed for studying aberrants. Any of these that seem to be stable for three seasons after introduction are moved to the other side. In the experimental bed there are at present two normal plants, one from the main site, to be described further on, and one from another. These serve as controls. Leaf hoppers and other sucking insects are present.

In over 15 years a teratological form has never appeared in the main bed*, other than the ones transplanted there. In my experimental bed, one normal-looking control plant from the main wild site did exhibit the phenomenon now to be presented.

DEGENERATION, REGENERATION

These two terms may not be exact in a literal sense but they are used to indicate changes observed over several years. These changes follow a course in which the rootstocks give rise to several small plants (degeneration) that eventually reappear as normal ones (regeneration). Because of the end result, any infection implicated must be quite self-limiting. All the changing aberrants in the experimental bed, and after two or three additional seasons, the seemingly persistent ones put in the main garden too, are following this course.

* Excluding spontaneous, temporary, quadrimerous forms (with four petals and four otherwise normal leaves in four trillium species, and dimerous plants in three instances.

Figure 1 -- This specimen shows the incursion of green pigment into the petals. It also has one of the structural anomalies (long petioles) found in certain stands of white trilliums.

Figure 2 -- This cluster of small plants arose from a degenerative change in the rootstock of a large white trillium that had previously exhibited a showy green incursion into the petals. Note that these "pseudo seedlings" did not grow from seed.

Aberrants from other locations in addition to the main wild site are included. Only T. grandiflorum is involved in the discussions in the rest of this paper.

The timetable for the changes varies somewhat with the specimen. Precise time data were not kept, because there was no way of knowing the sequence of events in advance. The original purpose of the experimental bed was to provide a proving ground for discovering desirable varieties that would persist.

First Two or Three Seasons: The plants get smaller, eventually coming back with no flowers, the most freakish going first, and the near-normal, last. No change in the basic teratological character occurs.

About the Fourth or Fifth Season: The plants either die out (most freakish) or come up as a cluster of "pseudo seedlings" (see Figure 2). The taller and more vigorous the original plant, the greater the number in the cluster. These vegetative clusters contain from 10 to 40 separate tiny plants, each with one, single, leaf lobe. They look like normal first-year seedlings, but derive from the rootstock, not from seeds. The rootstocks average 3/16 inch in length, and each supports one leaf. A few in each cluster are clumped into a joined rootstock 3/4 inch in length. Such a clump carries four to eight single-lobed leaves. An occasional small three-lobed plant appears in a cluster.

Next Six to Eight Seasons: The clusters persist, some reducing their numbers, and others increasing, probably from division in the small clumps. The leaves are usually about 3/4 inch long. An occasional 1-1/4 inch lobe appears; sometimes two petioled lobes arise on a stem; these two events occur only when the cluster comprises just four or five members.

Final Course: The vegetative pseudo seedlings return as grouped, separate, three-leaved plants about three inches high; then, after one more season, six inches high. After still one more season, vigorous normal, all-white petalled plants about 12 inches high are produced. At the time of writing (1976), only three green-flowered, structurally normal originals introduced in 1961 have reached this stage. In one instance, the cluster was separated (1973) and the pseudo seedlings transferred to the main garden -- before there was any inkling of what would happen. But my idea that transplanting per se might cause a regeneration had to be changed when two of the clusters in the experimental bed followed the same course as the transplanted specimens. One cluster here now has produced 15, equally tall, tightly-grouped plants; the other, five. The rest of the clusters are being watched to see whether they serve as the source of teratological forms as well as normal ones, or both.

It should be noted that normal plants, in the garden and in the woods, often form groups with joined or separate rootstocks, but this is the result of vegetative division via offset rootstocks, not via pseudo seedlings. The new members of such a normal group first come up as three-leaved plants, usually four or five inches high. Hence these normal groups comprise mature, as well as young, plants. The fully regenerated groups from abnormal precursors so far observed comprise mature plants only. Doubled normal rootstocks often carry two mature plants from the start. Incidentally, the tendency to divide among normal plants varies greatly with the specimen. I have had one plant for 30 years that has doubled only once in this period. Another, with my help in separation, has produced over 50 plants in five years. The rootstocks have been single, double, or clumped.

One other specimen plant is worth considering. In the wild (1960) this had a doubled rootstock. It carried a normal plant and another with very long sepals that had a broad white longitudinal stripe. In the garden it grew this way for several years. Then I cut the root to separate the stems. The piece carrying the striped sepals came up the next season with striped sepals on one flower and normal ones on the other. It persisted this way for 12 more years. Narrow green stripes have appeared lately in all the petals. The normal piece, planted beside the other, failed to come up the next season.

BEHAVIOR IN THE WILD

In the early sixties, in order to determine whether transplanting was causing degeneration, several aberrant T. grandiflorum plants in different woodlots were mapped and were left undisturbed. Their location was referred to nearby trees and further marked with large nails put into the ground near the plants. Some plants disappeared and others followed the early pattern of those in my garden. But at that time I was not on the lookout for "seedling" clusters.

In 1972, the main wild site was studied more carefully. It is a northwesterly slope on the point south of the mouth of Tufa Glen Creek in Penfield, New York. Two gullies coming down to creek level contain most of the aberrant specimens, but some are on the ridge and slope. The area has not been disturbed, but the trillium profile has changed. The following is a qualitative appraisal made during some of my visits.

1961 -- Very prolific stands. Most normal plants 24 inches high and usually separated or in pairs. They had large broad petals 2-1/2 inches long. A fair amount of grouped normal plants in evidence, mostly low ones. About ten percent of the total population was aberrant with respect to coloration. Such plants were 24 inches high and structurally normal, but showed green incursions into the petals. Another one percent comprised low, very freaky plants. These were frequently in small groups and sometimes contained more than one teratological form, but were not mixed with the structural normal, green plants present. No pseudo seedling clusters were sought at that time.

1972 -- Populations about the same proportion, but the total number estimated to be half of 1961. Some pseudo seedling clusters noted.

1976 -- Numbers again reduced. Very few tall plants left. Most normal ones were around 12 inches high, many in groups of five to seven, equal in height. Less than one percent were aberrant in any way. Pseudo seedling clusters and groups were more numerous; they had 1-3/4 inch leaves, and only five to eight plants in a cluster.

Also, in 1976, three plants of varying aberration have been mapped and three similar plants transplanted to the experimental bed. They will be compared in subsequent seasons for the purpose of refining the timetable with respect to degeneration in relation to the degree of aberration.

One of the groups found during this 1976 visit and left in situ, had eight plants that arose from four, doubled rootstocks. One of the pairs had all-green flowers. Such pairs (or single ones) no doubt give rise to new teratological sequences. This group, because of its homogeneity with respect to maturity, appears to have arisen from a pseudo seedling cluster. Thus, such a cluster may not always regenerate to all normal plants. It would be interesting to find out whether an anomaly derived in this way is the same as the teratological form that might have initiated the cluster.

One has to speculate as to how an abnormal plant may get started before such terminal groups have occurred. The rootstocks of normal plants must undergo some change and this could produce a single aberrant directly. In woodlots where normal plants are sparse and mostly not grouped, any aberrants are also usually isolated. It should be noted that one of my normal-looking plants has degenerated to a seedling cluster, but it has not yet regenerated.

In addition to this main site, there are numerous stands of normal white trilliums in this same general region of Irondequoit Bay, some large in area and very dense. I have been unable to find pseudo seedling clusters among the normal plants in stands where there are no abnormal plants. Solitary normal seedlings do occur.

There is only one other gully in this vicinity that had many teratological plants. This is a dark, narrow gully, about one mile south from the main site. Many normal stands intervene. In this gully all plants were low; about 60 percent were aberrant and most of these very freaky. So few normal plants were

there that almost total degeneration and possible disappearance of the stand was suggested. I do remember a few small groups and clumps with four or five, single-lobed, 1-1/4 inch leaves. Around 1965 this gully was bulldozed for a dump and cannot now be studied for a possible regeneration.

It is hoped that these observations shed a little more light on the phenomenon of green trilliums. However, they do not hold out much hope for discovering showy green cultivars, apart from the intriguing green plena form. And while the two such plants mentioned have been stable for over ten years, their future may be in doubt. They might change to the white plena form, which would not be a total loss.

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A STUDY OF THE GASTROPODS OF CONESUS LAKE, LIVINGSTON COUNTY, NEW YORK

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ABSTRACT

Investigation of the gastropods of Conesus Lake has been conducted by the Biology Department, State University of New York, College of Arts and Science at Geneseo, New York, since the summer of 1971. This work has included collection, identification, and preservation of the specimens. Eleven species of snails have been thus far verified and three others tentatively identified.

INTRODUCTION

A number of studies have been conducted on the gastropod fauna of New York State. These include: Baker (1899, 1916, 1918a, 1918b, 1918c, 1928); Beauchamp (1886); Birge and Juday (1914, 1921); Blakeslee (1946); DeKay (1843); Harman (1967, 1968a, 1968b, 1971); Harman and Jackson (1967); Harman and Forney (1970); Harman and Berg (1970, 1971); Jacobson (1945); Letson (1905); Lewis (1856, 1860, 1872, 1874); Maury (1916, 1919); Pinney and Coker (1934); Robertson (1933); Robertson and Blakeslee (1948); Smith (1906); Walton (1892).

Maury (1916) reported only seven species for Conesus Lake in her survey of shells from central and western New York. However, since that time there have been a number of changes in the taxonomic nomenclature. Similarly, Robertson and Blakeslee (1948) investigated the snail fauna for the Niagara Frontier region and specifically mentioned that a few snails were collected on the west shore of Conesus Lake. Aside from these sparse samplings, no study has been conducted on the gastropods of Conesus Lake. To date, 14 species have been collected and identified, of which eleven have been confirmed.

Conesus Lake is the western-most member of the Finger Lakes of New York State. Its physical aspects have been described by Berg (1963)[1] and by Forest and Mills (1971)[2]. The shallow beaches have a sandy or gravel bottom which support a varied flora and provide an ideal habitat for snails. There are few predators. The lake affords good fishing and serves as a resting place for a number of migratory birds, including a variety of ducks and geese.

METHODS AND MATERIALS

Snails were collected from seven sites by hand-picking and scooping (see Figure 1 for sites). Specimens were observed and identified in the laboratory using a standard Bausch and Lomb Model BVB0125 dissecting microscope. Identifications were based upon criteria indicated in Pennak (1953)[4] and Harman (1971)[3]. Snails not immediately used were maintained in the laboratory in aquaria. A number of snails have been held in this manner for extended periods for additional studies not included in this paper.

DISCUSSION

The distribution of snail families in terms of number and percent collected for five separate years is indicated in Table I. This tabulation does not include data on the Valvatidae, Hydrobiidae, Ancylidae, or Lymnaeidae as these were only recent collected and is undoubted due to improved collection technique rather than actual absence of snails.

Eleven species, representing six families of gastropods, have thus far

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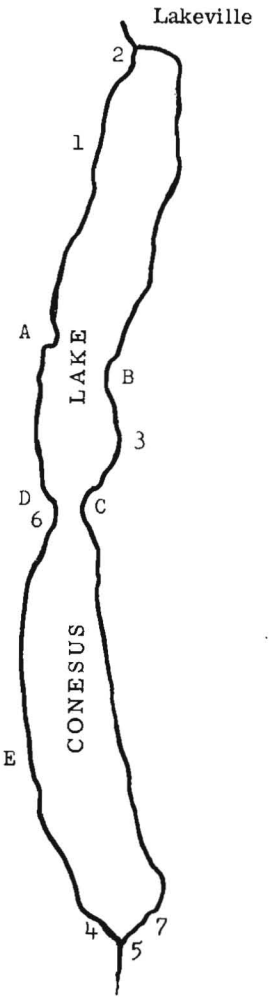
Fig. 1. Collection Sites on Conesus Lake



Collection Sites:

1. 240 West Lake Road
2. Outlet at Lakeville
3. Babcock's
4. Robinson's
5. Inlet
6. Long Point Park
7. DaCola Shores

Reference Locations:

A Eagle Point
B Old Orchard Point
C McPherson's Point
D Long Point Park
E Maple Beach

North

Table I. Distribution of snail families in terms of number and percent for the five-year study, Conesus Lake.

Period dated	Families Viviparidae	Pleuroceridae	Planorbidae	Physidae	
9/19/71 to 10/31/71	174	101	26	20	(321)
	54.2%	31.4%	8.1%	6.2%	
6/21/72 to 8/20/72	92	97	15	15	(219)
	42.0%	44.4%	6.8%	6.8%	
6/19/73 to 12/ 8/73	283	112	22	22	(439)
	64.4%	25.5%	5.0%	5.0%	
5/27/74 to 2/16/75	148	85	8	34	(275)
	53.8%	30.9%	2.9%	12.3%	
5/18/75 to 9/22/75 & 11/ 1/75	40	75	7	17	(139)
	28.7%	54.0%	5.0%	12.2%	
Summary of years					
1971-1975	737	470	78	108	(1393)
	53%	33%	6%	7%	

been collected, identified, and confirmed. These include: Viviparus georgianus (Lea) 1834, Campeloma decisa (Say) 1817, (Viviparidae); Helisoma trivolvis (Say) 1817, H. campanulata (Say) 1821, Gyraulus parvus (Say) 1817, (Planorbidae); Goniobasis livescens (Menke) 1830, Pleurocera acuta Raf. 1831, (Pleuroceridae); Physa gyrina Say 1821, P. integra Haldeman 1841, (Physidae); Valvata tricarinata (Say) 1817, (Valvatidae); and Amnicola limosa (Say) 1817, (Hydrobiidae).

Three other species have been tentatively identified. These are: Promenetus exacuous (Say) 1821, (Planorbidae); Laevapex fuscus (Adams) 1840, (Ancylidae); and Lymnaea stagnalis (L.) 1758, (Lymnaeidae).

ACKNOWLEDGMENTS

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A special thanks to Drs. Edward Ritter and Herman Forest of the Biology Department, State University of New York at Geneseo for their help and encouragement in preparing this paper.

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ROCHESTER ACADEMY OF SCIENCE

SECOND ANNUAL SCIENTIFIC PAPER SESSION

State University of New York, College at Brockport, New York

COCHAIRMEN: Dr. Clarence W. Gehris and Dr. H. David Hammond

November 1, 1975

ABSTRACTS OF PAPERS

Concurrent Session No. 1 - ECOLOGY
Dr. J. C. Makarewicz, presiding.

DISTRIBUTION AND ABUNDANCE OF ZOOPLANKTON IN THE LOCKPORT-ROCHESTER SECTION OF THE NEW YORK STATE BARGE CANAL

Daniel Murphy and Robert H. Ellis, State University College, Brockport, New York

This study was part of a comprehensive ecological survey of the Lockport-Rochester section of the New York State Barge Canal. The objective of this phase of the study was to determine the species composition and abundance of zooplankton organisms at five locations between Lockport and Rochester. In addition, one location in the Cayuga-Seneca Canal was sampled for comparative purposes.

A total of 17 taxa were taken (Copepoda were keyed only to sub-order). Rotifers, especially Kertella quadrata, were numerically the most abundant component of the zooplankton in late fall and early spring. Bosmina coregoni, calanoid copepods, and Daphnia spp. were the most abundant organisms during the remainder of the year. With the exception of the late spring and early summer samples, zooplankton standing crop was low at all stations (range, 1-52 organisms per liter).

Both the variety component and equitability component of species diversity measurements were low. This information, when combined with the low standing crop estimates, supports the conclusion that the Barge Canal presently provides only marginal habitat for most zooplankton species. High turbidity in the canal appears to be limiting light penetration to the point that phytoplankton production is greatly reduced. It is possible, therefore, that the herbiverous zooplankton are food limited in the canal.

Samples taken from the Cayuga-Seneca Canal contained about the same number of taxa per sample as those from the Barge Canal. The relative abundance of organisms differed, however, with relatively fewer Daphnia spp. and a much higher percentage of Bosmina coregoni.

DISTRIBUTION AND ABUNDANCE OF BENTHIC MACROINVERTEBRATES IN THE LOCKPORT-ROCHESTER SECTION OF THE NEW YORK STATE BARGE CANAL

Doyle Roarabaugh and Robert H. Ellis, State University College, Brockport, New York

This study was part of a comparative ecological survey of the New York State Barge Canal. The objective of this phase of the study was to determine the species composition and abundance of macrobenthic organisms at five locations between Lockport and Rochester. One station was also established in the Cayuga-Seneca Canal for comparative purposes.

Quantitative samples were taken with an Eckman dredge at approximately 2-week intervals from July-December 1974 and May-June 1975. In addition, monthly samples were taken from January through April when the Barge Canal was drawn down. The total number of species in the bottom sediments was low at all five Barge Canal Stations. Tubificid worms (Tubififides) were the most abundant group of organisms and generally composed from 60-95% of the total numbers taken. Midge larvae (Chironomidae) were the second most abundant group with Procladius spp. and Chironomus spp. comprising the majority of the catch. Other organisms commonly found at most stations includes leeches (Erpobellidae), amphipods (Gammarus) and a few mayflies (Heptageniidae).

Standing crop of benthic invertebrates was relatively low throughout the canal. Generally the highest standing crops were found at Lockport with a gradual decline to a low at Brockport. Differences in substrate characteristics were probably responsible for most of the station differences. Standing crops in the bottom sediments during the draw down period were as high or higher than standing crops during the summer and fall.

Samples taken from the Cayuga-Seneca Canal had slightly more species but a substantially lower standing crop than those from the Barge Canal.

SPECIES COMPOSITION AND DISTRIBUTION OF FISHES IN THE LOCKPORT-ROCHESTER SECTION OF THE NEW YORK STATE BARGE CANAL

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The Barge Canal between Lockport and Rochester, New York, constitutes a unique aquatic environment. This section is totally man-made and is very uniform in physical characteristics. It is subject to extended dewatered periods for maintenance of physical structures. The fish population has never been investigated. The proposed linear park along this reach of the canal, along with the proximity to populated areas, suggests the potential for the development of a recreational fishery.

To investigate the species composition and distribution of fishes in the canal, sampling stations were established as follows: five main canal stations located near Lockport, Medina, Albion, Brockport and Rochester; and three widewater areas near Knowlesville, Holley and Spencerport. Fish were collected seasonally at each site by means of a series of gill nets of mesh sizes 1 to 3 inches in half-inch increments. A boat mounted electroshocker was also used at the main canal sites.

As a result of this study, it has been determined that the fish population consists of approximately half game fish and half rough/forage fish species, with a variety of species of each category being present at all sites. There were some differences between main canal sites, between main canal and widewater sites, and seasonally at all sites. These differences will be discussed in relation to physical and chemical parameters in the canal.

Abstracts

GENERATION TIMES OF ZOOPLANKTON IN LAKES OF VARYING TROPHIC STATUS

Joseph C. Makarewicz, State University College, Brockport, New York

The effect of lake trophic status on generation times and brood size of rotifers and cladocerans was investigated. Organisms were cultured in natural assemblages of phytoplankton, bacteria, and detritus from oliogotrophic Mirror Lake, New Hampshire, and eutrophic Lake Myosotis, New York. Blooms of blue-green algae, which are thought to inhibit the filtering of lake water by herbiverous zooplankton, are prevalent in Lake Myosotis. Even so, generation times of rotifers and cladocerans significantly decreased in response to the larger amounts of food present in eutrophic Lake Myosotis.

PRIMARY PRODUCTIVITY OF LAKE ONTARIO WETLANDS

Bruce Gilman, Syracuse University, Syracuse, New York

Net annual primary productivity was estimated in two wetland systems along the eastern shoreline of Lake Ontario in Jefferson County, New York. Aboveground standing crop biomass measurements were made at five intervals (May to October) over the 1974 growing season, and net annual productivity was estimated as the sum of peak standing crop values for each component species. The Black Pond wetland occurs at the periphery of a shallow flood pond, separated from the lake by a sandy barrier beach while the Campbell Marsh wetland occupies a narrow flood plain along a tributary stream entering the lake. Herbaceous productivity at Campbell Marsh increased from 248.6 g/m^2 in the stream middle to 439.1 along the stream bank. Maximum productivity occurred in the flooded emergent meadows with 1045.1 g/m^2 in cattail dominated areas and 735.8 g/m^2 in sedge-grass dominated areas. Productivity decreased in meadow communities mixed with shrubs to 557.2 g/m^2 (average shrub cover was 14.9%). In Black Pond, damage from recent high water years has reduced emergent meadow productivity to 567.3 g/m^2 in the least affected areas to 100.7 g/m^2 in recent killed areas and to 201.4 g/m^2 in the oldest dead area. Species composition in the older dead systems was similar to that of the submerged aquatic communities where productivity was 767.4 g/m^2. Environmental relationships, community structure and successional tendencies are discussed within the two wetland systems.

THE DISTRIBUTION OF AQUATIC WEEDS IN THE FINGER LAKES OF NEW YORK STATE AND RECOMMENDATIONS FOR THEIR CONTROL

Gary Miller, Eisenhower College, Seneca Falls, New York

An aquatic macrobenthic vegetation analysis of the Finger Lakes of New York State was conducted during the summer and fall of 1974. The seven largest Finger Lakes were analyzed for species composition, density, and diversity as related to their zonal distribution. The data obtained concerning the plant communities of each lake indicates that the flora and effects of cultural eutrophication are distinct for each lake. Cayuga Lake exhibits the worst of the weed problem areas encountered during the course of this study. Seneca Lake's weed problem approaches Cayuga Lake's in severity in limited areas. Otisco Lake due to a unique recent history is almost devoid of weeds. Canandaigua, Owasco, Keuka, and Skaneateles Lakes were found to be in excellent condition.

Correlations between the plant species and environmental parameters were made. The general availability of nutrients, in combination with heavy sedimentation in areas of shallow depth appear to be the primary causes promoting the luxuriant weed growth observed in the Finger Lakes.

To preserve the Finger Lakes for recreational use, insure the quality of potable water, and maintain the value status of the Finger Lakes, short and long term recommendations have been made. Mechanical removal of plant biomass via harvesting in conjunction with stringently regulated herbicide application are short-term procedures which can alleviate weed congested areas. Harvesting has the additional long-term advantage of removing nutrients tied up in the plant biomass. Dredging procedures give relatively long-term relief from dense weed infestation and removes nutrients, particularly phosphorus, associated with the sediments. Programs should be developed to combat the related pollution problems of sedimentation and nutrient loading. The regulation of "urban sprawl" via land use restrictions similar to the Adirondack Plan would appear to be the most effective long-term goal.

PRELIMINARY STUDIES ON SUCCESSION IN Pteridium aquilinum (BRACKEN FERN) DOMINATED COMMUNITIES

William M. Marceau and Archibald Reid, State University College, Geneseo, New York

Twenty bracken colonies in Livingston, Alleghany, Genesee, Oneida and Herkimer Counties were examined. The purpose of the study was to identify associated species appearing to be severely diminished in size or number during encroachment of bracken, with the intention of subsequently germinating these species in aqueous extracts of bracken to test for evidence of allelopathic activity. At each site, associated vascular plant species were assigned density ratings of 1 (sparse), 2 (intermediate), and 3 (dense). 224 species in 50 families were identified. Most common families were Compositae, Rosaceae, Laguminosae, Labiatae, Ranunculaceae, Cornaceae, Rubiaceae, Umbelliferae, and Liliaceae. Observations were also made on health and development of species growing beneath bracken canopies or in dense bracken litter, and compared with observations on these species in nearby areas not colonized by bracken. From data collected, 22 species have been tentatively chosen as showing reduction in size, vigor, or numbers in presence of bracken. They are: Chrysanthemum leucabthemum, Ranunculus acris, Daucus carota, Prunella vulgaris, Asclepias syriaca, Hiercium aurantiacum, Hiercium pratense, Hypericum perforatum, Taraxacum officinale, Erigeron annus, Solidago graminifolia, Maianthemun canadense, Acer rubrum, Anemone virginiana, Trifolium agrarium, Solidago altissima, Achillea millefolium, Cichorium intybus, Impatiens pallida, Brassica kaber, Melilotus officinalis and Melilotus alba. Color slides of bracken colonies and associated species have been taken when possible.

Concurrent Session No. 2 - PHYSIOLOGY

Dr. P. H. Pritchard, presiding.

A MODEL FOR ANALYSIS OF PESTICIDE TOXICITY: PESTICIDE EFFECT ON Chlamydomonas moewusii MATING

K. L. Lynch, H. B. Bosman and R. J. McLean, State University College, Brockport, New York

A model system utilizing the mating of Chlamydomonas as a bioassay is presented for analysis of toxicity of pesticides. The system has the advantage that teratogenesis, cell surface phenomena, and mutagenesis can be studied as well as direct effects of the pesticide on a low member of the ecosystem in which the algae may be exposed to the pesticide.

Malathion, 2,4,6-Trichlorophenol, 2,4,6-T, Phenyl Mercuric Chloride (PMC) and Dieldrin were tested for their effects on the mating reaction in Chlamydomonas moewusii. Increasing concentrations of the pesticides during the gametogenesis period resulted in decreased flagellation and sexual activity as determined by pair formation. The exception to this was Dieldrin which did not significantly affect production of flagella but appreciatively inhibited pair formation. The action of Malathion, 2,4,6-T and PMC seemed to affect overall cell viability while Dieldrin more directly affected the mating reaction.

INFLUENCE OF CULTURE MEDIA ON THE In Vitro DEVELOPMENT OF MOUSE BLASTOCYSTS

James A. Kell and Robert J. Wordinger, St. Bonaventure University, St. Bonaventure, New York

The objective of this preliminary study was to observe the effects of different culture media on the in vitro development of mouse blastocysts. Blastocysts were collected from mature female mice 82 hours postovulation. They were cultured in 35X10 mm plastic petri dishes utilizing the embryo culture system of Brinster (1968). Four commonly used tissue culture media were initially employed to examine hatching, attachment, differentiation, and trophoblast cell growth. The optimum values obtained for hatching with minimum essential medium (MEM), Neuman-Tytell serumless medium (NTSM), basal medium-Eagle (BME), and NCTC-135 respectively are: 53% (90/169), 58% (43/74), 67% (106/158), and 67% (64/95). The optimum values obtained for attachment with MEM, NTSM, BME, NCTC-135 respectively are 37% (63/169), 48% (36/74), 63% (100/158), and 62% (59/95). Based on these results BME was selected as the culture medium for future studies.

The influence of glucose concentration on in vitro blastocyst development was examined by increasing the glucose content of BME to 2x, 3x, 5x, and 10x the normal level. The optimum values for hatching, attachment, trophoblast outgrowth and differentiation for the above concentrations of glucose are: hatching; 67% (106/158), 74% (87/117), 46% (58/124), 33% (34/104), 25% (20/81); attachment: 63% (100/158), 64% (75/117), 42% (52/124), 37% (39/104), 26% (21/81); trophoblast outgrowth; 3.5% (6/169), 0.8% (1/117), 0% (0/203), 0% (0/104), 0% (0/151); differentiation; 3% (5/169), 1.7% (2/117), 0.5% (1/203), 0% (0/104), 0% (0/151).

The influence of amino acids on in vitro blastocyst development was examined by increasing the amino acid concentration of BME according to Spindle and Pederson (1973). The optimum values for BME and BME plus increased amino acids respectively are: hatching; 67% (106/158) and 64% (101/157); attachment; 63% (100/158) and 67% (105/157); trophoblast outgrowth; 3.5% (6/169) and 2.5% (4/157); differentiation; 3% (5/169) and 18% (28/157). The implications of glucose and amino acid influences on in vitro mouse blastocyst development will be discussed.

THE USE OF TETRAZOLIUM CHLORIDE IN TESTS OF VIABILITY AT THE CELLULAR LEVEL

Grace McCormack, Monroe Community College, and Victor Jelin, Monroe Community College and Genesee Brewing Company, Rochester, New York

Tests for viability are tests of some function of living organisms which are monitored in order to detect, or even measure, their capacity for survival in a given surrounding, in given conditions.

Among the chemical tests which probe into the capacity of a cell, or of an organism, to metabolize, are tests based on oxidation-reduction reaction indicators. The tetrazolium salts and their products of reduction, the formazans, have a very special niche among these indicators.

What singles out the tetrazolium salts is, on one hand, that, unlike most other organic reduction indicators, they are colorless in the oxidized state, and acquire color on reduction, tagging thus the cells which have a strong reduction capacity, the viable cells. (Most of the other organic dyes are colorless in the reduced state, and are thus a tag for the non-viable cells only.) The other characteristic which singles out the tetrazoliums is that their reduced form, the formazans, are insoluble in water and the biological fluids, and remain thus localized at the site where the cellular enzymes reduced the water-soluble, oxidized form, the respective tetrazolium salt, that is inside the metabolizing cell.

Having become familiar with the tetrazolium reaction in the testing of viability of seeds, we have applied the reaction to populations of yeasts, with encouraging results.

Our experiments have been designed to measure the amount of the tetrazolium salt reduced, and its rate of reduction by a given population of yeasts, in order to quantitate viability.

THE STUDY OF SKIN TEMPERATURES USING CHOLESTERIC LIQUID CRYSTALS

Elizabeth J. Arthur, Rochester Institute of Technology, Rochester, New York

"Liquid crystals" are ordinarily colorless mixtures of cholesteryl compounds. Thin coatings of liquid crystals have their optical properties altered by small changes in surface temperatures, selectively reflecting particular wave lengths of light. Skin surface temperatures are revealed as a color "contour map" or thermogram. The technique is being used to illustrate peripheral thermoregulatory responses to heat and cold stresses and metabolic heat production by muscle activity in humans. I am also using liquid crystal thermography in a current study of skin temperatures in female rats serving as controls. Data from these studies will be presented. Actual and potential applications of liquid crystal thermography in biology and medicine will be discussed briefly.

THE EFFECT OF ATMOSPHERIC AMMONIA ENVIRONMENT ON ATROPHIC RHINITIS IN BABY PIGS

J. V. Logomarsino, A. E. Barnitt, Jr., C. C. Brown III and G. Chmielewski, State University College, Geneseo, New York

Six one-day old specific pathogen free pigs were used to determine the effect of atmospheric ammonia on nasal turbinate bone morphology. Three pigs were housed in individual cages in a 2 cubic meter environmental chamber with an ammonia and air gas intake. The concentration of anhydrous ammonia gas was regulated at 50 ppm by a Matheson flowmeter and measured colorimetrically by a Matheson Kitagawa ammonia gas detector tube. Three control pigs were housed in a similar environmental chamber with normal room atmospheric air intake. After three weeks, all pigs were killed by exsanguination and the snouts and soft tissues were collected for histological examination. Nasal swabs taken at necropsy failed to reveal the presence of Bordetella bronchiseptica. Tissues were fixed in 10% neutral buffered formalin. After fixation, the snouts were demineralized in formic acid, embedded in paraffin, sectioned at 8 μm and stained with hematoxlyn and eosin. Evaluation of turbinate deformity and rhinitis were made using light microscopy. Each evaluation was assigned a

numerical grade of 0 for normal anatomy and 1, 2 or 3 for mild, moderate or marked lesions, respectively. All animals exhibited a mild turbinate rhinitis. There was no evidence of turbinate deformity in any of the pigs.

EFFECT OF EXTERNAL AMMONIA ON MEMBRANE ELECTROGENESIS IN Nitella

Bonnie L. Bower, Daniel Holland and Charles E. Barr, State University College, Brockport, New York

In this study an attempt was made to test the hypothesis that active H^+ extrusion is the principal mechanism by which an electrical potential is generated across the membrane of the giant cells of the alga, Nitella clavata. This was done by exposing cells to NH_4^+ of varying concentrations and observing the changes in the resting potential. The depolarizations observed (60 mv for 3.16 mM, 20 mv for 1.0 mM, and negligible for 0.316 mM at pH 6.8) are attributed to the entry of NH_3 and its alkalizing effect on the internal pH, tending to reduce active H^+ extrusion. To be valid, this conclusion requires a rate of NH_3 entry large enough to substantially reduce the H^+ extrusion, i.e., presumably of about the same magnitude as the normal H^+ extrusion. This was found to be true: the measured NH_3 influx under conditions corresponding to the 60 mv depolarization was about 8×10^{-12} mol cm^{-2} s^{-1}, similar to the H^+ extrusion estimated by other means. Ammonia determinations were made using a modified Nessler's method in which LiOH was substituted for NaOH.

THE PHYSIOLOGY OF AUTOCHTHONOUS BACTERIA FROM LAKE ONTARIO

E. Lucyszwn, St. Bonaventure University and P. H. Pritchard, State University College, Brockport, New York

Autochthonous bacteria are those which exhibit growth and metabolism at low nutrient concentrations in aquatic environments. They are considered to be organisms that are specifically adapted to growth in very constant but impoverished environments and as such, contribute significantly to the turnover of organic materials in this type of ecosystem. However, the physiological characterization of the autochthonous bacteria is very incomplete. Certain laboratory studies indicate that the physiology of these bacteria may be uniquely adapted to growing at constant but very low levels of substrate. We have consequently initiated a project to study their physiology. Using fresh samples of Lake Ontario water, bacteria were isolated by chemostat enrichment in which the metabolic type most adapted for growth at low concentrations was selected. Successful chemostat enrichments were obtained using lactose as the sole source of carbon and energy although they did not proceed as precisely as enrichments reported for seawater. Alterations in experimental procedure had to be adapted because of significant wall growth. Different bacteria, as indicated by colony morphology, were isolated at different substrate concentrations. Isolates obtained at low substrate concentrations (0.5 mg lactose/liter) out-competed isolates obtained at higher concentrations (50 mg lactose/liter) when both were grown at low substrate concentrations. When grown at high substrate concentrations there was no competition. Low substrate concentration isolates appear to be more liable to preservation procedures.

Concurrent Session No. 3 - GENERAL SESSION

Dr. H. D. Hammond, presiding.

"IS NATURE INDETERMINATE: THE PHYSICIST'S VIEWPOINT"

James R. Chen, State University College, Geneseo, New York

Two main questions are addressed. The first is "What is the nature of matter?"; namely "What is reality?" The second is "Is nature indeterminate?"

The answers to these questions are considered from the physicist's viewpoint. They are shown to be closely linked to our notions of cause and chance. Within the current framework of quantum mechanics, the conclusion is reached that nature is indeed indeterminate.

INDUCED MODULES

Gloria Potter, State University College, Brockport, New York

Let F be a field with characteristic p and let G be a group (not necessarily finite) with subgroup H. Denote by $F[G]$ the group algebra of F over G. The field F can be considered as a right $F[H]$-module if we define multiplication trivially by $h \cdot f = f$ where h is in H and f is in F. Since F is a field, F is an irreducible $F[H]$-module with the above defined action. Theorem: If the induced module $F^G = F \otimes_{F[H]} F[G]$ is completely reducible then $[G:H] = n < \infty$ and n is not a multiple of p the characteristic of F.

THE CAVENDISH LABORATORY AT THE UNIVERSITY OF CAMBRIDGE

Donald S. Allen, Eisenhower College, Seneca Falls, New York

The Cavendish Laboratory at the University of Cambridge in England has been and is, one of the most famous scientific research centers in the world. Opened in 1874 under the direction of James Clerk Maxwell, it has numbered among its investigators such famous names as Lord Rayleigh, J. J. Thompson, Ernest Rutherford, C. T. R. Wilson, F. W. Aston, Sir Lawrence Bragg, Kapitza, Sir John Cockcroft, Francis Crick, James Watson and more recently Anthony Hewish.

This paper summarizes the principal scientific achievements of the Cavendish along with personal anecdotes dealing with the principals involved. (N.B. The author has just completed a sabbatical year of study in the History and Philosophy of Science at the University of Cambridge.)

GLACIAL AND POSTGLACIAL GEOLOGY OF THE LETCHWORTH PARK GORGE OF THE GENESEE RIVER, LIVINGSTON COUNTY, NEW YORK

Richard A. Young, State University College, Geneseo, New York

The origin of the Letchworth Gorge of the Genesee River has been speculated upon by many geologists since the writings of Grabeau in 1894. The most detailed written account by H. L. Fairchild contends that the gorge section is in part a former south-flowing tributary to a proposed buried ancestral Genesee Valley extending from Portageville to Sonyea, N.Y. The narrow bedrock gorge sections are considered to have been cut in postglacial time as a "detour" after glacial deposits filled the older valley near Portageville.

A multistage origin for the gorge is certainly necessary to account for the existence of the mile-wide, six-mile-long broad valley segment, still partially filled with glacial deposits, between the narrow rock gorges at either end. It is

possible to rule out the theory that this wide portion of the gorge merely represents a reoccupation of a south-flowing tributary from a reconstruction of minimum elevation constraints near the base of the old channel exposed within the gorges. The older bedrock channel slopes to the north.

Well-exposed geologic sections in the wide central gorge region can provide a different explanation of the evolution of the gorge. This middle gorge section contains remnants of Quaternary deposits from which the following events can be deduced. An oxidized, variably indurated fluvial conglomerate with imbrication demonstrating northward flow rests on bedrock beneath the glacial deposits. A stony gray till with abundant clasts of black shale and crystalline rock types is the oldest preserved glacial deposit. Above the gray basal till is a variable and complex sequence of thin deformed brownish tills interbedded with deformed lacustrine sediments that record either minor ice front fluctuations or stratigraphic sections duplicated and deformed by ice thrusting. The younger brownish tills have conspicuously fewer clasts than the grayish basal till. In one section the two types of tills are separated by fluvial outwash(?) deposits showing distinctive imbrication demonstrating current flow from north to south.

The buried extension of this wider middle gorge departs from the modern valley at the south end of the Mt. Morris rock gorge about one mile southwest of the Perry entrance to Letchworth Park. At this point the wider valley, trending north-northeast, stops and the Genesee River enters the Mt. Morris rock gorge with an abrupt easterly bend. Topographic evidence suggests that the older buried valley formerly rejoined the modern Genesee River valley somewhere between Mt. Morris and York.

A north-flowing (Sangamon?) river in a pre-Wisconsinan valley was disrupted by a glacial (Early Wisconsinan?) advance which produced the gray basal till containing the abundant crystalline clasts. Minor(?) fluctuations of the ice front during its final recession at the close of the Wisconsinan Stage produced the outwash, lacustrine sediments and the younger, less stony, brown tills, which probably represent incorporation of fluvial and lacustrine sediments along the ice front.

A review of all the evidence suggests that two or more ancestral Genesee River gorge or valley sections with complex histories of glacial blockage, interglacial erosion, and partial postglacial reexcavation could be present, some portions as yet unrecognized. Our understanding of their complex origins and detailed spatial relationships to the modern Genesee River gorge is strongly influenced by the most recent and obvious glacial and postglacial events.

THE SOLAR ENERGY CLIMATE OF THE ROCHESTER AREA

John E. Hubbard, State University College, Brockport, New York

Insolation measurements made by the Department of the Earth Sciences, State University College at Brockport since 1970 were summarized. The nature of the solar energy spectrum, astronomical explanation for variation in intensity and daylength, and factors related to transmission of sunlight through the atmosphere were discussed.

Insolation is recorded by an Eppley model 8-48 pyranometer matched to a strip-chart recorder. Daily values are planimetered by hand. Measured average daily values in calories per square centimeter are presented below. Clear sky estimates are made by the author after analysis of periods when clouds were not present. To convert to English units of Btu per square foot multiply the values below by 3.69.

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Clear Sky Insolation(Est.)	235	325	460	605	720	775	750	655	520	375	260	207
Measured Insolation	155	212	289	414	450	514	522	470	325	211	114	83

WHAT SIGNALS FALL COLORATION IN Liriodendron?

Herman S. Forest and Ray Lougeay, State University College, Geneseo, New York

Observations were made on a group of five Liriodendron tulipifera trees in and near Genesee Valley Park, Rochester, N.Y., during the fall color change seasons from 1972 to 1975. Change criteria were standard for the north American Phenological Project, to which the data were reported. Although the group of trees was not synchronous nor consistent in order, it was apparent that the key coloration criterion, half the leaf area of one branch, was reached approximately a week earlier each year - October 15 in 1972 and September 15 in 1975. Correlation was sought in climatological data plotted by computer to show averages, extremes, and cumulative amounts of rainfall and temperature for the weeks preceding change. No indication of correlation was found except possibly for earlier average temperature decrease in 1974. The search will be extended to cloud cover and total energy from insolation to identify a signal for fall color change.

ALFA GRASS: A RESOURCE IN TUNISIAN ECONOMIC REGIONAL DEVELOPMENT

Richard J. Paige, Eisenhower College, Seneca Falls, New York

This presentation includes both visual and verbal description of a native grass, the exploitation of which contributes significantly to the traditional and modern economy of the south central portion of Tunisia. Initially, the fibrous nature of the grass, its dryland habitat and the principal methods of acquisition and distribution are covered. Its utilization for the manufacture of a variety of commercial and non-commercial products is likewise presented. Finally, the direct and indirect impact of this natural resource on the economic development of the source region and the total economy of Tunisia is viewed: past, present and future.

Concurrent Session No. 4 - ECOLOGY

Dr. C. W. Gehris, presiding.

A SUCCESSIONAL SEQUENCE IN THE BERGEN-BYRON SWAMP

Franz K. Seischab, Rochester Institute of Technology, Rochester, New York

Gaussian ordination of vegetation was utilized in conjunction with soils and microtopographic data in order to determine successional sequences on a section of alkaline bog in the Bergen-Bryon Swamp.

The ordination of stands supported information pertaining to succession previously indicated by peat accumulation and changes in cation exchange capacity and specific conductance. This has resulted in an initial successional sequence for this section of alkaline bog.

BIRD COMMUNITIES OF THE BERGEN SWAMP

David D. Linehan, State University College, Brockport, New York, and Roberts Wesleyan College, Rochester, New York

A breeding bird census was conducted in the different vegetational zones

found in the Bergen Swamp to determine if these zones support distinct bird communities. The sedge-meadow association supported a distinct bird community, while the bird communities of the boreal and climax forests showed more overlap. Densities of certain species were found to be high when compared to studies in similar habitats.

THERMAL ECOLOGY OF THE AMERICAN ALLIGATOR

E. Norbert Smith, Rochester Institute of Technology, Rochester, New York

Unlike most crocodilians the American Alligator, Alligator mississippiensis lives in temperate regions where it is the largest ectotherm. Behaviorally it thermoregulates by basking when cool and seeking shade or deep water when warm. If no deep water is available, it will deepen existing pools. Aquatic basking occurs with the alligator floating high in the water and gaining radiant heat dorsally. Heat may be lost by evaporative cooling while floating high in the water. During cooling the dorsal surface is maintained wet by periodic submergence.

Physiological thermoregulation extends the time the alligator can maintain an optimal body temperature. Profound local cutaneous vasodilation occurs in response to heat greatly enhancing the rate of heat transfer. Cooling results in local cutaneous vasodilation and a reduction of heat loss. Mature alligators require twice as long to cool as they require to heat in both air and water. They are able to heat in air faster than they cool in water in spite of the greater thermal conductivity and specific heat of water. (Published in Dissertation Abstracts International, Vol. XXXVI, No. 6 (1975).)

A SURVEY OF SELECTED HEAVY METALS IN FISH FROM THE BARGE AND CAYUGA-SENECA CANALS

Arthur E. Robb, Jr., State University College, Brockport, New York

Five species of fish from six locations on the canals were analyzed for their heavy metal content. Gill, liver, and muscle tissue from each fish were wet-digested and tested for their cadmium, copper, lead, and zinc content using atomic absorption spectrophotometry. The data indicated that muscle tissue generally contained the lowest amount of cadmium, copper, and zinc but the highest amount of lead. Liver tissue was usually highest in copper and zinc and gills were highest in cadmium. The location factor did not appear to be as important as the variations between species for metal concentration found in the fish. Some significant metal concentration correlations were discovered between tissues in the various fish species. The author believes that food habits may play a major role in determining the amount of heavy metals found in fish from the canals.

THE MICROBIAL DEGRADATION OF OIL IN SEQUENTIAL CONTINUOUS CULTURE

J. M. Suflita and P. H. Pritchard, State University College, Brockport, New York

The microbial degradation of diesel oil was studied in a triple-stage continuous culture system designed to simulate degradation in a quiescent aquatic environment. Qualitative flame ionization gas chromatography was used to monitor the chemical changes occurring during the oil degradation processes in each of the three continuous culture vessels. Physical changes in the oil layer

were also noted and included bacterial attachment, impregnation, and emulsification. Results show that both alkane and aromatic fractions of the oil were substantially attacked and reduced or removed from the original chromatographic profile. In addition, numerous other hydrocarbon-like components appeared to be synthesized as a result of microbial activities. Sequential degradation was also observed, however, complete microbial degradation could not be demonstrated. It appears that this system could be useful in modeling the fate of organic materials in an aqueous system.

A REDESCRIPTION OF Corallotaenia minutia (FREZE, 1965: CESTODA; PROTEOCEPHALIDEA) FROM ALLEGANY COUNTY, NEW YORK

Clint Tallman, Genesee Community College, Batavia, New York and
Edward Ritter, State University College, Geneseo, New York

This study is an attempt to identify the genera and species of cestodes that parasitize brown bullhead in Allegany County, New York. Seven collection sites were selected to represent different types of water bodies throughout the county. Beaver Lake belongs to the major Ohio River and Great Lakes drainage areas and minor Allegheny River and tributaries drainage area basin. The other six collection sites belong to the Mid-Atlantic drainage area and the minor Genesee River drainage area basin.

Corallotaenia minutia (Fritts) Freze was the only cestode found and identified from bullhead in this area. The discovery of this cestode in Allegany County extends the statistical base line for proof of its existence as a distinct species and further verifies Freeman's amendment to Corallotaenia Freze. An additional correction to Freze's description of the genus Corallotaenia is noted in that the mature proglottids are wider than long.

Three unusual worms in the collection were treated as Corallotaenia minutia on the basis of proglottid anatomy. However, these worms appeared to be distinct from the other specimens in having a "purse string" effect in the scolex, different segment measurements, and highly contracted strobila. It will require the acquisition of eggs from a fresh specimen to verify whether or not these worms are truly Corallotaenia minutia or a separate and distinct species within the genus.

All of the collected worms have a furrow or sulcus extending from the apical region to the strobila. This taxonomic characteristic has not previously been reported in the literature for Corallotaenia.

A STUDY OF MONOGENETIC TREMATODES PARASITIC ON CONESUS LAKE FISH

James Mattison, State University College, Geneseo, New York

Eleven different species of fish from Conesus Lake, N. Y. were collected and examined to determine the variety of monogenetic trematodes which infested them. Of those species of monogenes, Clavunculus unguis (Mizelle, 1943), Actinocleidus fusiformis (Mueller, 1934) and Urocleidus helicus (Mueller, 1936) were found on the gills of the large mouth bass. The latter two monogenes were found together on the same host. The blue gill and pumpkinseed sunfish were both infested with Urocleidus ferox (Mueller, 1934). Cleidodiscus priceii (Mueller, 1936) was found on the brown bullhead and the northern pike was infested with Tetraonchus monenteron (Wagener, 1857). In all cases infestation occurred on the gills. The variety of monogenes was greatest on the large mouth bass. Camera lucida drawings of each parasite were made.

Abstracts

Concurrent Session No. 5 - BIOCHEMISTRY, PHYSIOLOGY, and MORPHOLOGY

Dr. R. P. Thompson, presiding.

PLASMA MEMBRANE ASSOCIATED RNA

Vincent Mancusi and Larry K. Kline, State University College, Brockport, New York

RNA extracted from purified rat liver plasma membranes was found to contain transfer RNA. Amino acid acceptor activity was detected for lysine, arginine and phenylalanine tRNAs. Other amino acids were not determined. The tRNA associated with purified plasma membranes was not due to microsomal, mitochondrial or other cytoplasmic contamination, as determined by analysis of synthetic mixtures of membranes with possible contaminating cell fractions.

THE EFFECT OF ACTINOMYCIN-D ON DEVELOPMENT AND INFECTIVITY OF A PARASITIC NEMATODE

Mark Buratt and T. P. Bonner, State University College, Brockport, New York

The effect of Actinomycin-D on development and infectivity was examined in third-stage larvae of Nippostrongylus brasiliensis. Control worms, grown in vitro, developed morphological characteristics comparable to larvae found in the lungs of the host. These characteristics included a rounding of the anterior end, intestinal cell widening and growth of the excretory gland. The level of infection with control worms was approximately 50%.

The larvae treated with Actinomycin-D (1 and 10 μg/ml) failed to develop the morphological characteristics seen in the control worms. Infectivity was significantly inhibited or prevented. The data suggested that development and infectivity require transcription.

ALLELOPATHIC EFFECTS OF GOLDENROD EXTRACT ON RADISH GERMINATION AND ROOT MORPHOLOGY

Margaret Graham, Edward Ritter and Archibald Reid, State University College, Geneseo, New York

A preliminary report on the macroscopic effects of goldenrod extract on radish germination and the subsequent relationships of root morphology as seen by electron microscopy.

ROOT AND SHOOT FORMATION IN EXCISED COTYLEDONS OF SOYBEAN (Glycine max (L.) MERRILL), THE CULTIVAR "KANRICH"

William T. Molin, North Carolina State University and Lawrence J. King F.R.A.S., State University College, Geneseo, New York

Excised soybean cotyledons (from 10-day old seedlings) were easily cultured and did not undergo senescence as did cotyledons left in situ. Roots were readily formed, but shoots formed only in cases in which the axillary bud was excised with the cotyledon. Cutting experiments and hormonal treatments revealed that the cotyledons exhibited polarity. As root formation occurred only on the proximal end of the cotyledon, a basipetal response was indicated. Low temperature was not detrimental to cotyledons although root formation was inhibited. Light

was not necessary for root formation. Callus developed on the cut surfaces, and roots then emerged. A special area on the abaxial cotyledonary surface is known as the "pit region", and was found to be responsive to certain plant hormones and not to others. The pit is a structurally weakened area formed during the embryogeny of the cotyledon. Histological examination of the pit and petiolar regions of cotyledons revealed that hormonal treatments had induced changes in patterns of cell division. However, none of the hormones studied induced shoot formation on cotyledons in which the axillary bud was not present. These hidden bud primordia on the base of the cotyledonary petioles were found by histological examination in three-day old seedlings. Thus in certain studies caution is needed in excising cotyledons that have no primordia. Upon falling to the ground these cotyledons might function as propagules - thus providing a form of vegetative reproduction not previously reported. This research comprises in part the masters thesis of W. T. Molin (Geneseo, N.Y., 1973. 62 pp., 25 plates).

ULTRASTRUCTURE STUDY OF SLIME PRODUCTION IN Physarum polycephalum

Roger Hangarter and Edward Ritter, State University College, Geneseo, New York

A study of the myxomycete Physarum polycephalum indicates the general morphology as seen at the ultrastructure level and proposed a possible mechanism for production of the slime material of the extraneous coat.

MICROTUBULE ULTRASTRUCTURE IN Dunaliella tertiolecta

David C. Eustice, A. Henry Latorella and Edward Ritter, State University College, Geneseo, New York

The ultrastructure of the microtubules in the isogamous unicellular green alga, Dunaliella tertiolecta, is interpreted from electron microscopy. Numerous stationary phase cells indicate temporary retention of one of the two flagella within the cytoplasm. The retained flagellum passes through the periphery of the cell for at least one-eighth the circumference of the cell while the second flagellum leaves the cell anterior to its basal body. Although light microscopy clearly indicated that the flagella of Dunaliella tertiolecta both emerge anteriorly, the emergence of the internally running flagellum is not observed. In all other respects the ultrastructure of the microtubules resembles the description by Ringo for Chlamydomonas reinhardi, a structurally related alga. Typical basal body and shaft structure are found in Dunaliella tertiolecta.

LATEX AND LACTIFEROUS SYSTEM IN Gazania, A TUBIFLORAE

M. Joseph Klingensmith, Douglas G. Allen and Lorin R. DeBonte, Rochester Institute of Technology, Rochester, New York

Latex has been demonstrated to be present in Gazania sp., subfamily Tubiflorae of the Compositae. Light and electron microscopy indicate latex particles similar to those found in Cichorium, a Liguliflorae. X-sections of flower buds, leaves, and stems demonstrated articulating lactifers associated with the vascular system. Thin-layer chromatography of acetone extract of the latex fluid demonstrated six triterpenoids to be present in the latex of both Gazania and Cichorium. Rubber was indentified from a benzene extract of the latex.

CITATIONS IN THE ROCHESTER ACADEMY OF SCIENCE

ISABELLE B. BACON
Fellow
1974

Isabelle B. Bacon was born in Philadelphia where she attended Temple University. She met and married her husband in that city and together they have raised two technically oriented sons. She soon adopted her husband's interest in mineralogy and geology. It has been an equal partnership ever since, and together they have combed innumerable mines and quarries. Upon moving to Michigan, they ranged through the Midwest and Canada. Their collection now numbers over 4000 specimens. Because of her husband's professional activities, she holds the record among her friends for making visits to nuclear reactor plants under construction.

Mineralogy is her avocation, but not the only one. In addition to trusteeship in her church and to offices in volunteer groups, she has drafted constitutions for hospital auxiliaries, women's clubs, the Michigan Mineralogical Society, and recently the Mineral Section of our Academy. She and her husband have received a citation from the Rochester Museum and Science Center for work on their mineral collections and for contributions to the Neighborhood Museums Project. Presently she is a volunteer in the improving reading program of the Rochester School System.

She has written papers on the discovery and mining of silver and on the gravels of Michigan. She has given many lectures on minerals to women's groups and to school children.

For her many contributions to education and mineralogy, we are proud to make her a Fellow.

LESLIE R. BACON
Fellow
1974

A mineral collector is twice blessed for he not only gathers intriguing and beautiful specimens, but also can enjoy the experience of searching for them. When the hobby compensates a childhood spent in fighting rocks on a New Hampshire farm, it is pervaded by a feeling of victory. And when the collector is a physical chemist, he can appreciate the elegance of geometric laws.

Our candidate obtained his doctor's degree in physical chemistry at New York University, after graduation from the University of New Hampshire. He taught mathematics and chemistry at Drexel University in Philadelphia and also gained industrial knowledge from research on base-exchange gels. Moving to Michigan, he supervised the research and development of detergents and sanitizers, and made improvements in electroplating. He was active in advancing the concept of biodegradation as a means for saving our environment. He has been active in the chemical technology of nuclear energy.

As president of the Michigan Mineralogical Society, he hosted the Midwest Federation meeting. He is now a director of the Mineral Section of this Academy.

The Cranbrook Institute of Science has published several of his papers on the mineral resources of the Detroit area, as well as on the disposal of radioactive wastes. Membership in the Environmental Chemistry Division of the American Chemical Society, and work on the staff of "Genesee Valley CHEMunications", indicate his interest in ecological problems. He has other hobby interests, including being a proficient geneologist.

For his accomplishments in mineralogy and chemistry we cordially welcome him as a Fellow.

GORDON M. MEADE
Fellow
1974

Any member of the 600 club for birders has garnered a wealth of rewarding experiences. With 612 species on his life list, our candidate has spent countless hours in the open air of fields, woods, and shores. He is also an authority on bird diseases, an avocation that parallels his vocation.

Following undergraduate work at the University of Rochester, he earned an M. D. with honors in its School of Medicine. He has served as instructor, student health advisor, director of tuberculosis control programs, assistant professor of medicine, and assistant director of Strong Memorial Hospital. He is presently Clinical Associate Professor of Medicine and Assistant to the Dean. Previously he had spent 25 years as director and consultant for several institutions in the East. His fields have been tuberculosis and the health of miners. He holds medical fellowships in two American colleges, and is editor of the journal "Clinical Notes on Respiratory Diseases."

He pursues his hobby of ornithology with the same intensity as his profession. He was a founder and president of the Federation of New York State Bird Clubs, and of the Genesee Ornithological Society. He has been on the Board of Directors of the Audubon Naturalist Society in Washington. He is an editor for "Birding" and has written several papers on the birds of Nantucket and on the diseases of birds. He is currently Honorary Curator of Birds for the Rochester Museum and Science Center. Highlights of his field observations are the recording of the first Franklin's Gull and the first Sage Thrasher in New York.

For his achievements in promoting the physical health of his fellows and in widening their mental interests, we cordially extend to him our degree of Fellowship.

ALVAN ROGER GRANT
Fellow
1976

Alvan Grant graduated from Cornell University in 1940 with a degree in floriculture and ornamental horticulture. He settled in Mumford, New York, and leased greenhouses and opened a florist business. In two years, however, he was called for duty in World War II.

On his return, he came to Rochester and joined the City Parks Department as a laborer in charge of propagation at Highland Park. He was promoted to Assistant Superintendent of City Parks in 1948 and was made Superintendent in 1954. He continued to hold that post after the 1961 operating agreement of city and county parks, then became Deputy Monroe County Parks Director in 1963 and Director in 1966.

Although his present job as Director involves mostly administrative activities, Alvan still says that "what I always wanted to do was work in the soil with trees and plants." He did sow the seeds and helped in the development of the famous Rochester lilac, a horticultural variety. Under his direction the Monroe County Parks Department has continued to expand and grow. One of Mr. Grant's newest contributions to the Parks Department is the development of Springdale Farm at Northhampton Park, an educational and recreational farm dedicated to the youth of Monroe County.

The Academy has been indebted to Alvan Grant since 1965 because he arranged temporary housing for the Rochester Academy of Science Herbarium in the County Parks Department Building on Westfall Road at that time.

For his many years of contribution to botany, floriculture, and horticulture in Rochester, we are pleased to make Alvan Roger Grant a Fellow of the Rochester Academy of Science.

FLOYD T. KING
Fellow
1976

Conservation is one of the most important facets of every walk of life. Creating a better understanding of conservation as well as life out-of-doors has been the lifetime accomplishment of our candidate for Fellow of the Rochester Academy of Science.

Born and raised at Tidioute on the Allegheny River at the edge of the Allegheny National Forest, Floyd King had developed an interest in hunting by the time he started school. The Allegheny National Forest is a magnificent scenic region abounding in wildlife and everchanging seasons; it is an ideal environment for the development of the future outdoorsman. In fact, Floyd could now be described as a fisherman, a mountain climber, a skin diver, a canoeist, as well as a hiker. He has experienced virtually all areas of out-of-door life.

Floyd began working in Rochester for the Gannett Company in 1931 where he filled several different assignments as a writer and editor until his recent retirement. His articles in the Democrat and Chronicle on skiing and rod and gun activities have been eagerly read by many thousands of sportsmen and winter recreation enthusiasts. His continuing columns under the By-line, The Outdoorsman, are diverse and factual and enjoyed by all who read them.

In 1971 Floyd King was selected as the outstanding ski writer in the United States by the National Ski Patrol.

For the excellence of his written communications on all aspects of conservation and the out-of-doors, the Rochester Academy of Science is proud to name Floyd King a Fellow.

CLIFFORD FRONDEL
Honorary Member
1976

Clifford Frondel was born in New York City in 1907. He received a degree in Geological Engineering from the Colorado School of Mines, a Master's degree from Columbia University and, lastly, a doctorate in crystallography from Massachussetts Institute of Technology in 1939. While in New York City he became acquainted with Dr. Herbert P. Whitlock, Curator of Mineralogy at the American Museum of Natural History, a relationship which helped develop Dr. Frondel's lifetime interest in minerals and crystallography.

In 1937, Clifford Frondel became a teaching fellow at Harvard University and he has been at Harvard ever since. He is now Professor of Mineralogy and curator of one of the world's outstanding museums there.

Dr. Frondel has authored or co-authored more than one hundred books and papers on mineralogy. From 1965 to 1971, he was a consultant to NASA. In that capacity he helped the preliminary moon rock examination team at Houston open the first box of rocks from the moon. Because of a plumbing leak at the NASA laboratories, Dr. Frondel was quarantined with the returning astronauts for over a week.

Because his extensive research in the field of mineralogy has increased our knowledge both of earthly minerals and those beyond the planet earth, we are proud to confer on Dr. Clifford Frondel an Honorary Membership in the Rochester Academy of Science.

JUDITH WEISS FRONDEL
Honorary Member
1976

Dr. Judith Frondel was born in Philadelphia, Pennsylvania, and obtained her doctorate from Bryn Mawr in 1949.

She has been active in geology ever since, first on the U. S. Geological Survey and then at Harvard University. Dr. Frondel has written a number of papers on minerals. She has done extensive research on amber and the natural resins.

In 1966-67 she was a Radcliffe Institute Fellow, then from 1968 to 1974 she was a Research Associate at Harvard, and since then has been a Research Fellow at Harvard.

Judith Frondel's most recent publication is Lunar Mineralogy, a comprehensive catalog of all the minerals found in the Apollo 11 through 17 samples as well as Luna 16 and 20 missions.

Because of her excellence in the area of mineralogy, we are proud to confer on Dr. Judith Weiss Frondel an Honorary Membership in the Rochester Academy of Science.

CHARLES LOCKE KEY
Honorary Member
1976

Charles Locke Key has been described as a gourmet, a wine collector, a world traveller, a lecturer, and last, but not least, a collector of minerals, gems, shells and art works. He is currently a dealer who supplies major world museums with specimens.

Charles Key began collecting about 23 years ago. He has amassed one of the finest collections of zeolite minerals from Paterson, New Jersey, which is now in the Smithsonian Institution. His knowledge and close examination of minerals has credited two new mineral species, Ludlockite and Keyite, both of which were named after him. He has also been responsible for a number of interesting and unique finds from North Carolina, Tennessee, South West Africa, Peru, Brazil and Mexico.

For his many contributions to the knowledge and collection of minerals and gems, we are proud to confer on Charles Locke Key an Honorary Membership in the Rochester Academy of Science.

KATHERINE H. JENSEN
Special Citation
1976

We wish to honor tonight a person who has devoted many years of her life to the Rochester Academy of Science.

Mrs. Katherine H. Jensen was born in Ontario, New York, and soon moved to Rochester. She received her academic training at East High School and Rochester Business Institute. From 1936-1941 Kay worked at Eastman Kodak and, while there, took most of the photography courses offered to employees. The interest she developed in photography then has endured to this day and she now has an extensive collection of photographs of minerals, gems, fossils and geologic formations, as well as those of many wild flowers. Her mineral pictures have been used in slide sets, filmstrips and books.

In 1937 Kay joined the Rochester Academy of Science's Mineral Section and has been active in its leadership. Her interest in minerals coincided with that of another lover of minerals and as Dave Jensen says, they didn't know how to divide up their mineral pictures so decided to get married, in 1941.

In 1945 Kay became the Corresponding Secretary of the Rochester Academy of Science, an important job involving the maintaining of membership rolls and mailing monthly bulletins and other notices. She has held the post continuously since that time and when she officially retires as Corresponding Secretary this June, a period of 31 years will have elapsed. The Academy is greatly indebted to Kay for her untiring dedication to this time-consuming but vital position. Kay was made a Fellow of the Academy in 1951, and since 1956, has also published the Mineral Section's newsletter, currently known as the Rockester News. This year she and Dave became life members of the Academy.

In addition to the Academy activities just mentioned, Kay has also been active in Eastern Federation and American Federation mineral organizations.

For her continued dedication to the Rochester Academy of Science and for all phases of natural science, we wish to honor Mrs. Katherine H. Jensen tonight by giving her this special citation.

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The following bibliography is available from the Clinton Herbarium, Buffalo Museum of Science, Buffalo, New York 14211, on request.

Botanical Bibliography: Publications of the Buffalo Society of Natural Sciences, by Cynthia Cercone and Richard H. Zander.

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