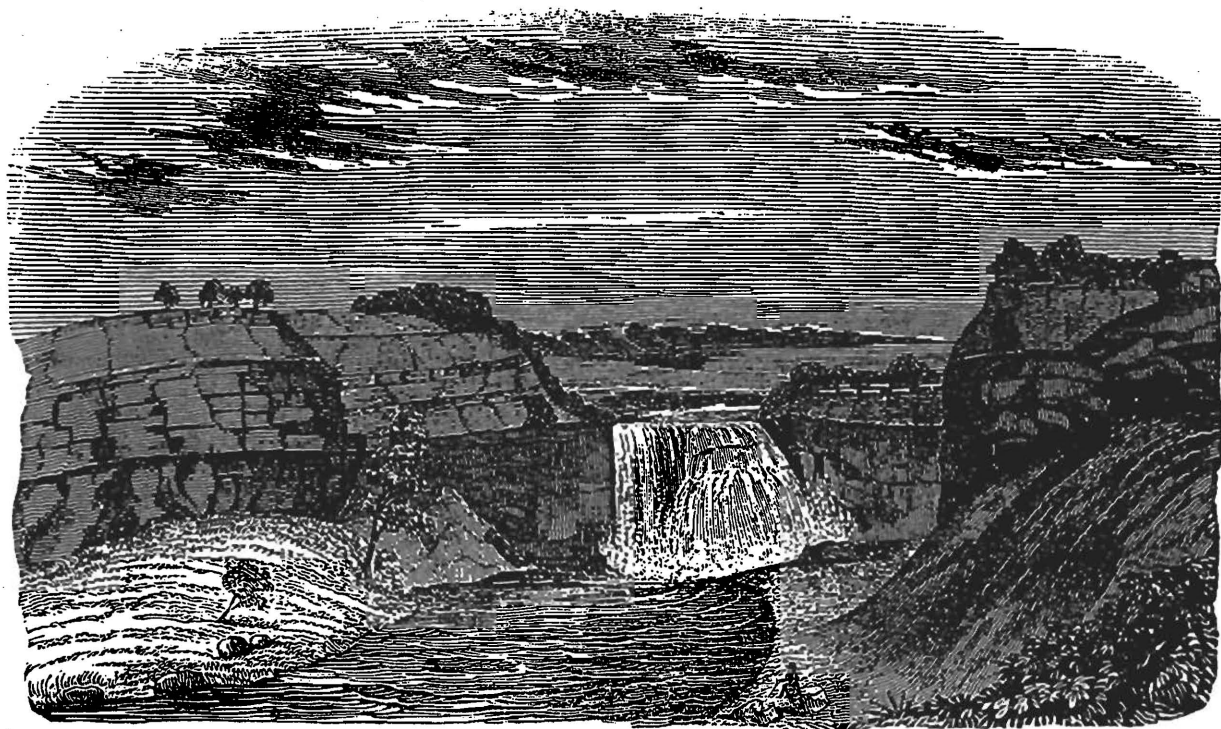


# FIELD TRIP GUIDEBOOK

*NEW YORK STATE GEOLOGICAL ASSOCIATION*

*66th Annual Meeting*

*October 7-9, 1994*



*Lower falls of the Genesee at Rochester. From a sketch by Mrs. Hall.  
[From James Hall, 1843, p. 382, figure 185]*

*HOSTED BY:*

*DEPARTMENT OF EARTH AND ENVIRONMENTAL SCIENCES  
THE UNIVERSITY OF ROCHESTER  
ROCHESTER, NEW YORK 14627*

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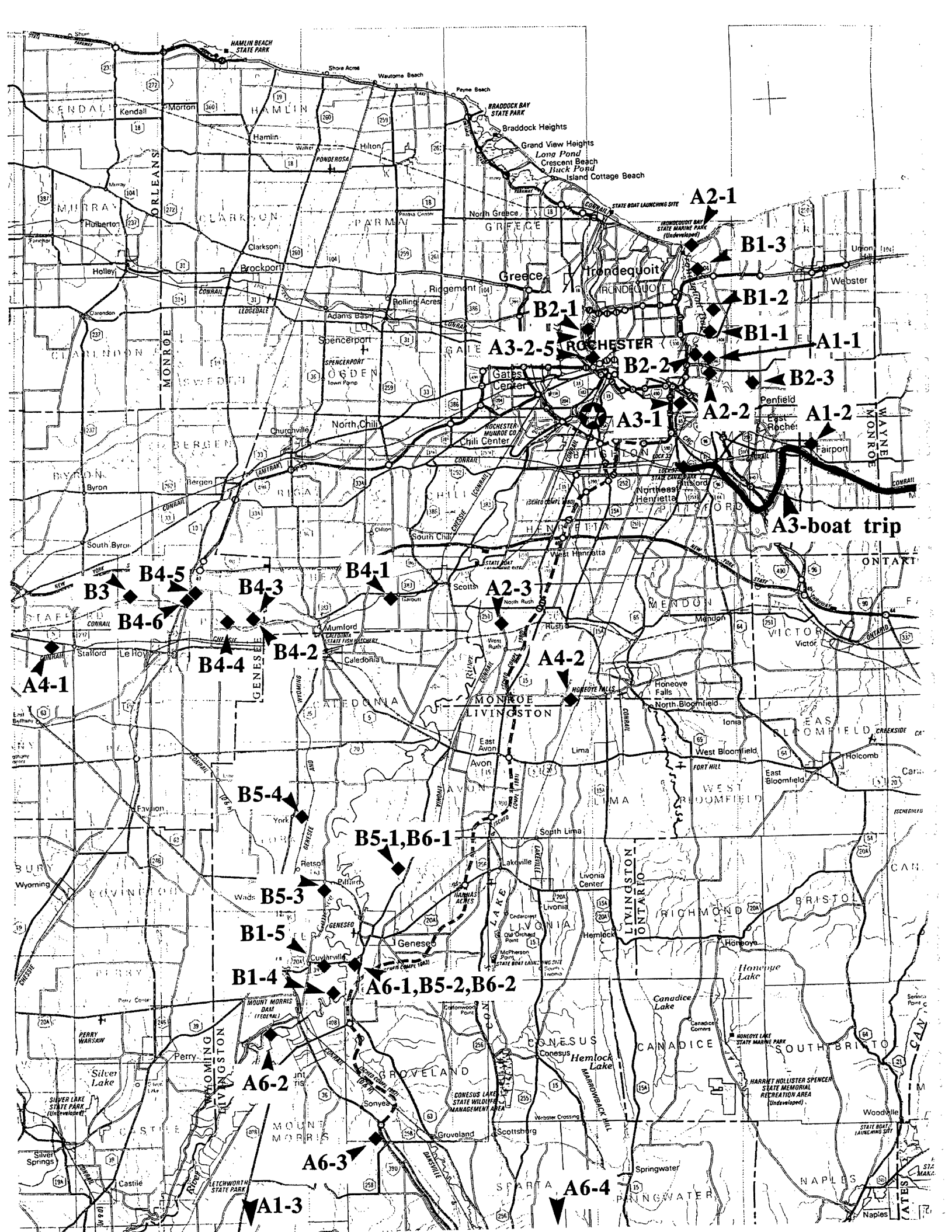
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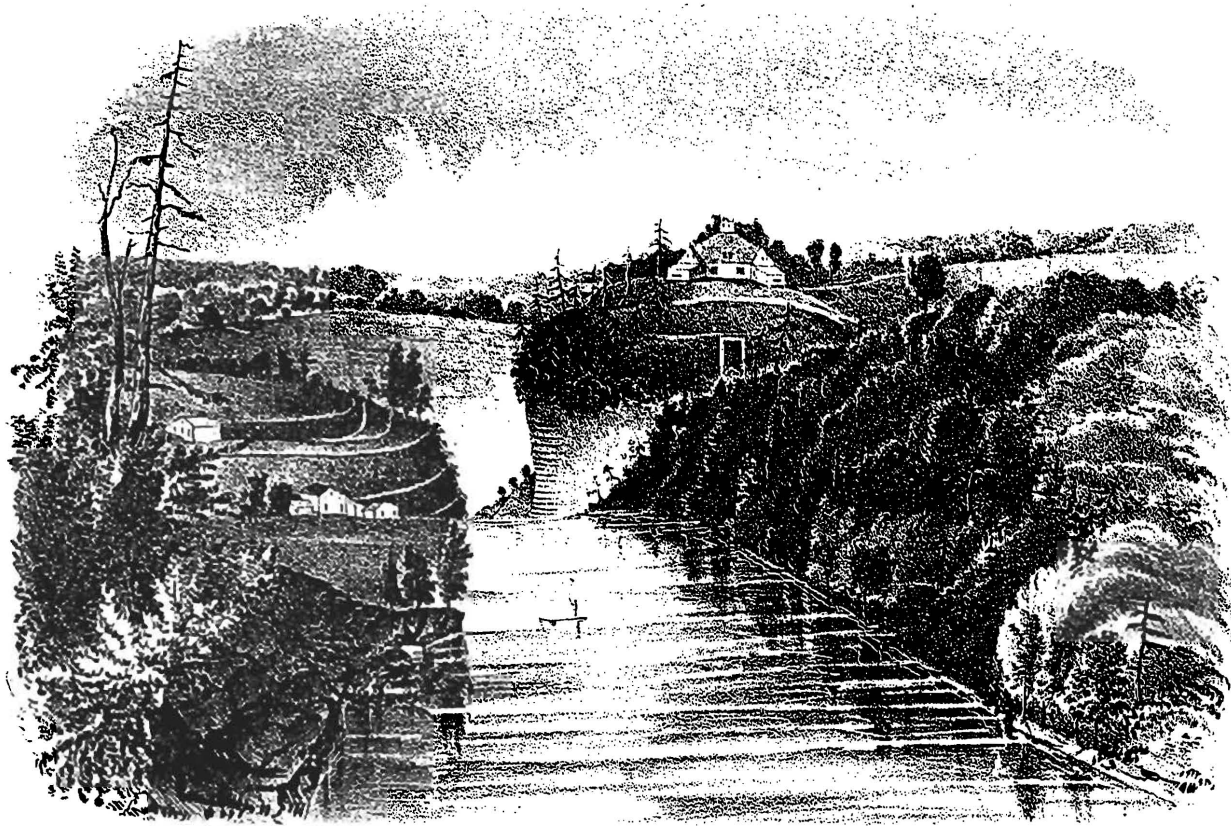
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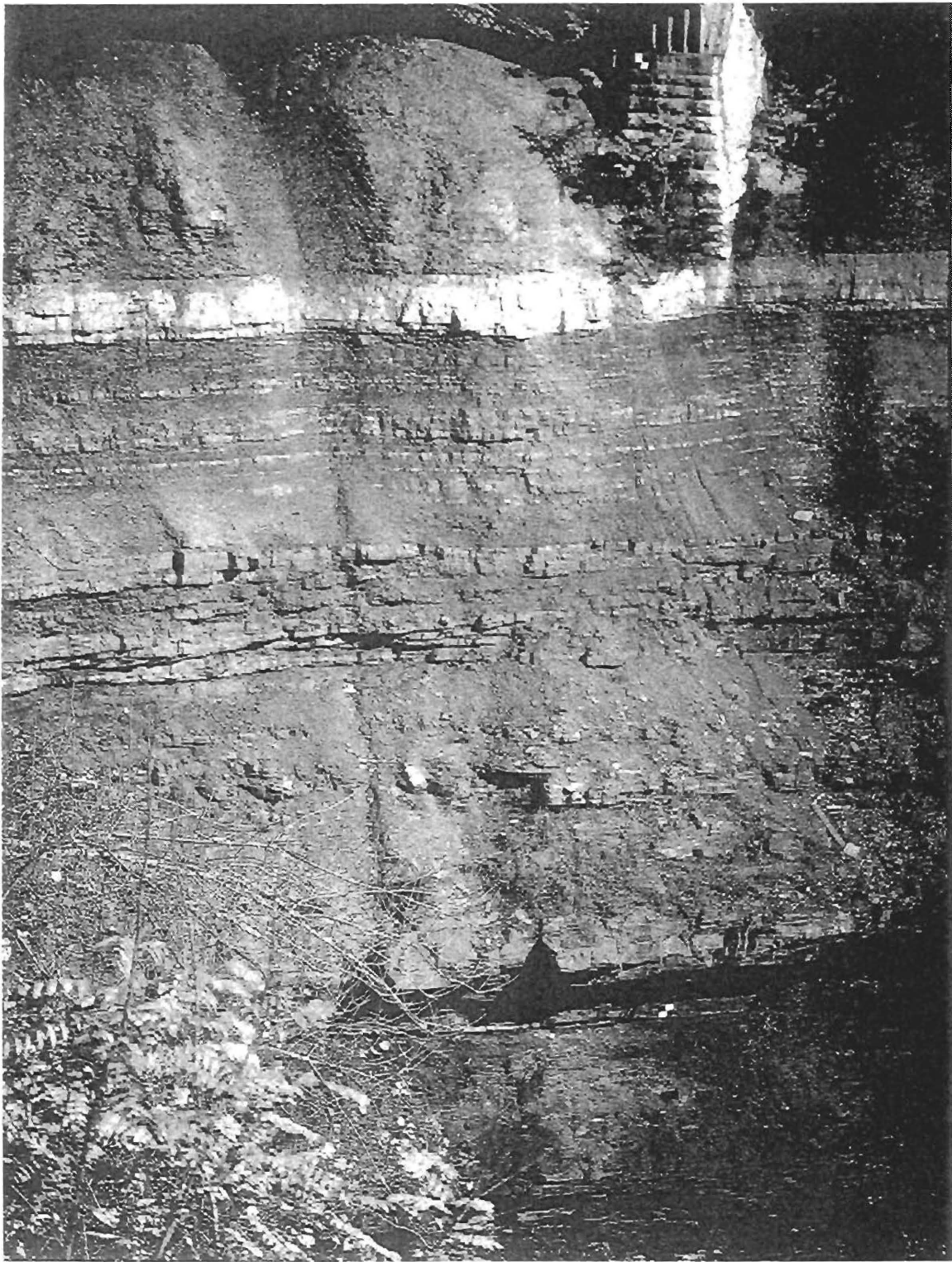
NEW YORK.

*Deep Gorge of the Genesee below the Middle Falls at Portage.*

[From Hall, 1843, *Geology of the Fourth District*, Plate XIX]

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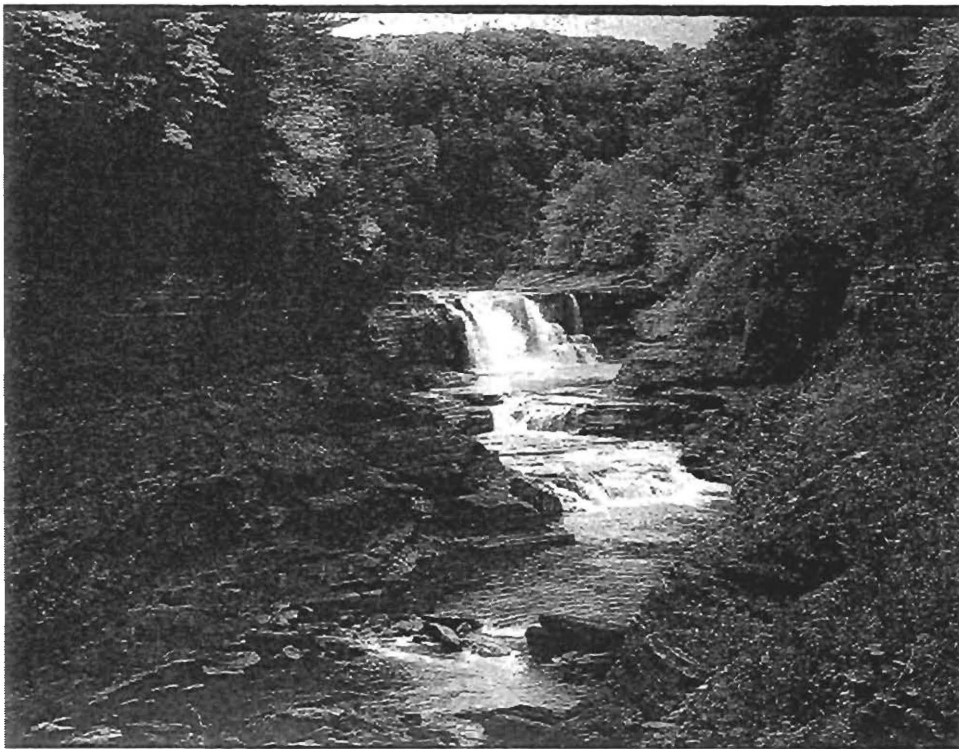
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Ordovician-Silurian stratigraphic section at Lower Falls, Rochester, New York. Upper Ordovician Queenston Shale at base (contact above white reflectors), overlain by red Medina Sandstone; Kodak Sandstone (prominent white band) is overlain by greenish-grey Maplewood Shale.



Meander on the Genesee River near Jones Bridge Road.



Lower falls of Genesee River at Letchworth State Park.

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## PREFACE

The Genesee Valley is a classic region for the study of sedimentary geology. The Genesee gorges at Rochester and Letchworth were explored geologically by many of the great early American geologists, particularly James Hall. Herman Leroy Fairchild, an early professor of Geology at the University of Rochester, and a founder of the *Geological Society of America*, made a career of studying the Genesee Valley glacial history.

The Genesee Valley area features an excellent cross-section of mid-Paleozoic sedimentary rocks, ranging in age from the Late Ordovician to the Late Devonian. Upper Ordovician Queenston redbeds and overlying Lower to Middle Silurian mixed carbonates, shales, and sandstones, including the well known Clinton hematite, are exposed in the heart of Rochester itself. To the south are exposures of Late Silurian evaporites, shales and eurypterid-bearing dolostones, succeeded by fossiliferous beds of the Middle Devonian Onondaga Limestone. Still younger black and dark gray, exceptionally fossiliferous shales of the Middle Devonian Hamilton Group are exposed in tributaries of the Genesee River south of the Thruway. Outstanding exposures of Upper Devonian shales and siltstones of the "Portage" facies crop out in the spectacular cliffs of the Genesee River gorge at Letchworth Park, "the Grand Canyon of the East". Many of the outcrops in the Genesee area and the immediate vicinity are extraordinarily fossiliferous, and the strata themselves have been subject to substantial reinterpretation in the light of event and sequence stratigraphy, taphofacies, and models of foreland basin dynamics.

The Genesee region is an outstanding area for the study of surficial and glacial geology. The Genesee Valley was occupied by an extraordinary sequence of proglacial and moraine dammed lakes. Classic examples of eskers, kames, kettles and drumlins can be viewed in areas such as Mendon Ponds Park and also in the Pinnacle Hills moraine within the city of Rochester itself. Within the past decade, Pleistocene sand and marl deposits in the Genesee Valley region have yielded two exquisite mastodon skeletons, as well as other vertebrate and invertebrate fossils. The basic outlines of the complex Pleistocene geologic history of the Genesee Valley were established by Fairchild. However, renewed interest in surficial deposits, together with radiocarbon dating, has yielded a modified picture in the past several decades.

The Rochester area is also an ideal region for the study of urban geology and environmental hazards and problems. These include the highly publicized problem of roof collapse of the Akzo salt mine, landslides and slumps within Pleistocene sediments around the Irondequoit Bay region, problems of river erosion and flood control, including spectacular examples of migrating meander loops in the modern Genesee River, and the development of hazardous waste dumps in several places in the region.

This guidebook provides updated synthesis of several of these aspects of regional geology in the Genesee area. Bedrock geology of the Upper Ordovician to Upper Devonian is covered in a series of papers. Three other articles provide new syntheses and insights into aspects of surficial geology and environmental geology. Inevitably, there are gaps. There is no paper on the Salina Group, for example, which is unfortunate given recent interest in salt mining! Also, no tectonic or petrologic studies are included. However, on the whole, I believe that the guidebook presents a reasonable cross-section of Genesee Valley geology.

On a personal note, I cannot help but reflect that the first New York State Geological Association meeting that I attended as a student was held over twenty years ago

in 1973, the last time NYSGA met in the Rochester area. (In fact, it was actually hosted by SUNY at Brockport.) It was on that occasion, while I was camped at Hamlin Beach State Park with some other students, that my friend, Gerry Kloc, came running back from the Saturday evening banquet full of excitement about a unique individual, named Gordon Baird, who knew about the geology of Erie County and other parts of New York State. I said "No way; nobody else really works on this stuff!" Nonetheless, the next day, accompanied by my fiancée (now wife), Betty Lou Hilton, I went to Old Dewey Hall at the University of Rochester to meet with this "Wunderkind". Sure enough, Gordon did know about Penn Dixie quarry, the North Evans conodont bed, and a great deal more that I thought that I had discovered. We had been working on the same stratigraphic sections for over five years without crossing paths. I was, of course, greatly impressed by Gordon's extensive collections of weird and wonderful geological specimens. More than that, I was struck by his incredible store of knowledge, wit and enthusiasm. Here, was a kindred spirit. Under other circumstances, Gordon and I could have become bitter rivals, like Cope and Marsh. That was not to be, however, for we both preferred cooperation to competition. From that September day onward, we became coconspirators in the "plundering of northeastern geology". By the time of the 46th Annual NYSGA, we had worked together enough to collaborate for the very first time in leading a field trip. Ironically, the trip dealt with the Windom Shale, a topic we again address in this guidebook, with considerable updating, some 20 years later. In the meantime, we have jointly studied over 1,000 streams and other outcrops in New York, have made many exciting discoveries, and have had countless conversations on the geology of the northeast during thousands of miles of travel on New York's Thruway and back roads. It has been an exciting ride, and a considerable part of it is logged in NYSGA guides.

I also note that the last time NYSGA officially met at the University of Rochester, in 1956, the guidebook, a thoroughly valuable contribution that was copied numerous times, was in more or less the form of handouts for student geological field trips. Since then, and even since 1974, the guidebooks have grown larger (yes, we have contributed to that), and of increasing quality. The NYSGA Guidebooks over the years, have become an invaluable trove of explicit information about New York's geology, coupled with road logs that enable students and professionals to assess for themselves the ideas presented in articles. These guidebooks present a great deal of information that is unavailable in any other source. I personally feel that the guidebooks have several very significant roles. The first, clearly, is that they are a vehicle for dissemination of often new, sometimes preliminary information. Certainly they continue to have a very critical teaching function. How many of us have at one time or another copied the road logs, figures or texts of NYSGA articles to supplement our class field trips? The articles in a guidebook, such as this one, present information, and more importantly, ideas, about geology, some correct, some perhaps incomplete or incorrect, but available for students in all categories of New York geology. In my view, the articles should present material in a variety of ways. Certain articles are geared for the more general audience, others are available for advanced students and for professionals specializing in particular areas. Another function which has not always been emphasized, but one which we have taken liberal advantage of, is that the guidebooks provide a vehicle for publication of fairly detailed information about regional geology. Where else can such information be published or found by the student interested in local details? Certainly, most of the professional journals, such as *Geological Society of America*, *Journal of Sedimentary Research* and others tend to publish articles that are broad, and of general interest, but typically, through editorial dictate, are "cleansed" of detailed outcrop-based information. In that regard, I feel that the NYSGA Guidebooks have a very important role to play as archives for such information.

I would like to express my sincere appreciation to numerous individuals who helped in the organization of this meeting and in the writing, editing and compiling of the

present guidebook. First of all, I owe a debt of gratitude to the authors of the several articles and leaders of the trips. They all came through and worked diligently to produce meaningful and interesting articles. Final preparation of manuscripts and compilation of the guidebook were aided greatly by the secretarial expertise of Susan Todd and Heidi Kimble of the University of Rochester. Mary Nardi, David Lehmann and James Scatterday helped greatly in the editorial process. Numerous reviewers, acknowledged in the individual papers, aided in the improvement of the final product. Dr. William Kelly of the New York State Geological Survey and presently head of the NYSGA, provided strong support and encouragement in the preparations for this meeting. Don Parry and Keith Kurz of the University's Conference Office also helped greatly in organization aspects of the registration and meeting logistics.

Finally, several past and present students of the Department of Earth and Environmental Sciences helped in numerous ways to prepare for the meeting. I particularly wish to recognize the efforts of Wendy Taylor, Robyn Hannigan, Chuck Ver Straeten and Gerald Kloc. Richard Hamell of Monroe Community College helped me with design of the cover; we chose a pale purple in recognition of Rochester's lilac traditions. My colleagues in the Department of Earth and Environmental Sciences, especially Curt Teichert and Robert Sutton, have always been supportive and encouraging to me in my various projects, including this one. Gordon Baird has helped me over the past two decades in ways too numerous to mention. Finally, I should acknowledge the patience and support of my family, particularly Dr. Betty Lou Hilton Brett, for without that, none of this would be possible. She cannot say she was not forewarned! You may note that she was with me on that famous first meeting with Gordon Baird; and we were engaged within the same week as that fateful meeting of the NYSGA in the Rochester area in 1973.

The Empire Soils Corporation of Huntington Enterprises, Inc. of Rochester generously provided \$200.00 in support of the meeting.

Carlton E. Brett, President  
New York State Geological  
Association - 1994



**This guidebook is affectionately dedicated to Dr. Robert G. Sutton, former professor of geology at the University of Rochester, in recognition of his contributions to the understanding of western New York geology and as an outstanding educator.**