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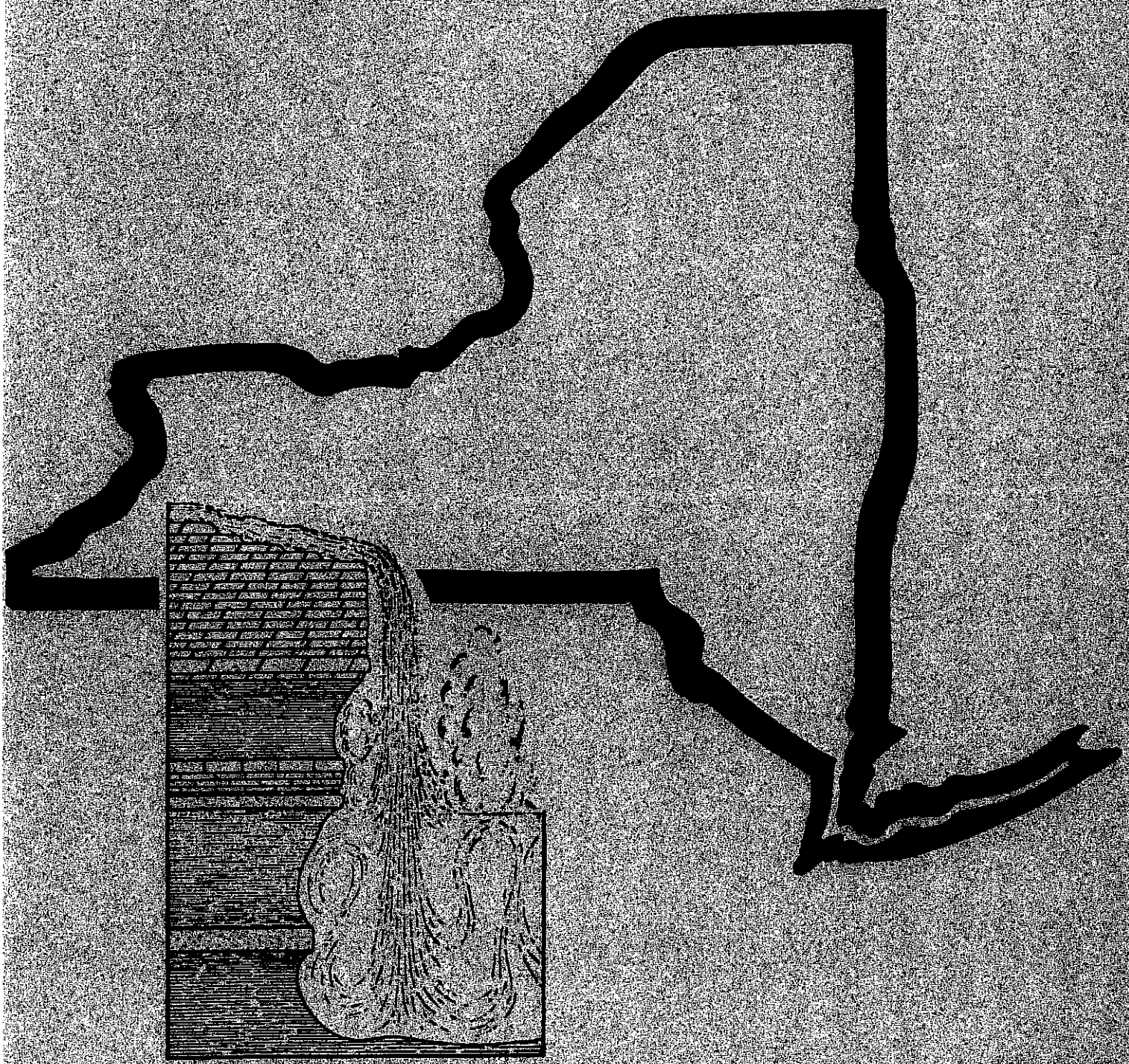
NEW YORK GLACIOGRAM



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10(2)

EDITORIAL POLICY

The Glaciogram is intended to be a collection of informal notes concentrated on Quaternary work relating to New York either directly or indirectly. It is not a formal publication and is not circulated to libraries nor to individuals not engaged in Quaternary research. The information included is often of a preliminary and tentative nature and as such should not be quoted and certainly not without communication with appropriate authors. One of the charter contributors (Muller, v. 6 (1)) has suggested that reference to information in the Glaciogram be identified merely as informal communication; we agree with this suggestion.

Merry Christmas!

Parker E. Calkin and G. Gordon Connally

November 1975

Donald R. Coates

Since my last report in May the primary glacial endeavors have been associated with the St. Lawrence Project. This was work sponsored and financed by the New York State Atomic and Space Development Authority and it involved a total of 20 Binghamton geologists...8 faculty and 12 students. The results of the work occur in a 268 page open-file report to ASDA. I reported on the work in the Power Siting Symposium at GSA-Salt Lake City. The report is titled "Identification of Late Quaternary Sediment Deformation and its Relation to Seismicity in the St. Lawrence Lowland, New York". The glacial part of the work was to map in reconnaissance deformed sediment localities, and then assess if the contorted units resulted from glaciation processes.

The St. Lawrence project has had an impact on students so that I am currently directing two M.A. and one Ph.D. students on problems associated with deformational sediments...Robert Gillespie, Carol Terrana, and Lester Smith.

Since August and until June 1976 we are privileged to be the host for Dr. Jorge Rabassa. He is a Fulbright Scholar from the Barloche Foundation in Argentina whose specialization is glaciation in the southern Andes. We are working together on several projects.

My paper on "Quaternary Stratigraphy of New York and Pennsylvania" is in press with the symposium that Bill Mahaney directed, and is editing for Dowden, Hutchinson & Ross, Jim Kirkland and I are preparing a paper on the Champlain Sea for the symposium that Walt Newman is organizing. Other projects include a Landslide volume which I am editing for the Geological Society of America (if any of you have papers on landslides, or know of some that are ready for review please let me know since I am rounding out the stable of authors). I am also editing the manuscript for papers that will be presented at our 1976 symposium on "Geomorphology and Engineering". This volume will be published by Dowden etc. and ready for distribution at the symposium.

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Thomas M. Cronin

The Champlain Sea fossils have proven to be quite informative as far as the changing ecological parameters such as temperature and salinity throughout the history of the sea. I have found evidence for a Mya phase to the sea in New York state, corresponding to that found by Elson in Quebec. This is the last phase of the sea nd temperatures were quite high and salinities were very low. The ostracods which I am presently studying bear this out clearly, as do the molluscs. Radiocarbon dates are needed; however, no funds are available to me for this purpose and I still have to use altitude to give me estimates of the relative age of each locality.

I'd be glad to answer any specific questions about the sea. Using all lines of faunal evidence including microfossils I can get a good idea of conditions during Champlain Sea times. It would be interesting to compare with ideas of the palynologists and fresh water paleontologists, if there's a good record from 12,000 to 10,000 years B.P.

George Crowl

This winter I will compile a map of the Late Wisconsinan border in eastern Pennsylvania, from the Delaware River to Trout Run north of Williamsport. It will include work by Berg, Bucek, Connally and myself. It will be published by the Pennsylvania Geological Survey on a scale of 1:100,000. We must still cover one degree of longitude to tie to Ernie Muller's work at the New York State line.

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Kernan Davis

Guidelines and regulations are being developed by the Department of Environmental Conservation (DEC) for the State Environmental Quality Review Act (SEQR). After 1 June 1976, all State, regional and local government agencies must prepare environmental impact statements (EIS) on actions they propose to undertake or over which they have approval powers, if the actions could significantly affect the environment. SEQR is designed to assist agencies in making environmentally sound decisions, to reduce red tape, to avoid duplication and to speed project approvals.

What will SEQR mean to Ice Age geologists? You may be called upon to provide input to an EIS, describing the surficial geology of a site in terms that are useful to a planning effort, such that a decision regarding the significance of possible environmental impacts can be evaluated. If you want to participate, contact your local town or county Environmental Board or Council.

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Robert H. Fakundiny

There are three major glacial geology studies that I am currently heading at the New York State Geological Survey. All are in preliminary stages of progress and will not generate definite conclusions until early in 1976.

The first is a comprehensive investigation of the glacial and post-glacial deposits on and around the Western New York Nuclear Service Center in Cattaraugus County, New York. The work is supported by two grants, one from the United States Geological Survey, and the other from the United States Environmental Protection Agency. Field work so far has been undertaken by Robert G. LaFleur and Henry H. Bailey.

The purpose of this project is to delineate the geological conditions that form the setting for ground water movement through the deposits at the low level nuclear waste burial ground.

The second project is a search for surface expression of the various branches of the Clarendon-Linden fault along its length from the Lake Ontario shoreline southward to the northern portion of Allegany County.

This research is supported by a grant from the United States Geological Survey. Field work so far has been undertaken by Jeffrey Pferd, Robert LaFleur, Robert Dineen, and several students from SUC at Brockport acting as field assistants. The goal of the project is to determine whether the zone displays incontrovertible evidence of post-glacial faulting.

The third project is a geological mapping study in the Genesee River Watershed. The project is funded under a grant from the International Joint Commission to study the pollution of Great Lakes Basins through the New York State Department of Environmental Conservation. Field work so far has been undertaken by Ernest Muller, Mike Wilson, Paul Willette, and Dalles Rhodes. We expect that Richard Young and Ken Fahnestock will play active roles in the remaining part of this project. The goals of the project are to determine which types of surficial deposits are contributing significant sediment load to the Genesee River, to determine whether features formed during floods can be recognized and used to determine recurrence rates and erosion rates for these catastrophic events affecting the sediment load of the River, and to determine whether land-use practices affect sediment contribution to the River.

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Rhodes Fairbridge

To Members and Friends of I.A.G. Commission on Recent Crustal Movements
Committee For the Neotectonic Map of North America (Chairman, R.W.F.)

It has been informally suggested that at the A.G.U. Meeting next Spring (April 1976, NOT June, as in 1975) there should be a symposium on Neotectonic Mapping and Recent Crustal Movements.

Three different time categories are envisaged:

(a) Contemporary ($< 10^2$ yr);
(b) Holocene ($< 10^4$ yr);
(c) Cretaceous-Cenozoic ($< 10^8$ yr).

Several anomalies or problems have already emerged that call for close study:

1. Contemporary geodetic relevelling discloses uplift over Phanerozoic anticlines at rates of one or two orders of magnitude above mean Tertiary rates: if they were oscillatory, why do the majority of positive motions correspond to ambient anticlinal structures - and negative motions to synclinal structures? If they are not oscillatory, but secular, then the observed positive rates would produce Himalayan type mountains in present plains situations.

2. Peripheral to the former glaciated areas a marginal bulge is predicted that should now be decaying (subsiding). Evidence from both N. America and the Scandinavian areas suggest that the former bulge areas are today disposed into areas of alternate uplift and downwarp.

3. The (horizontal) wavelength of the Contemporary neotectonic motions is of the order of 100-1000 km. Sustained motions suggest vertical departures not exceeding 10 m.

4. Mean sea-level studies suggest a contemporary marginal bulge collapse in eastern N. America across a belt of approximately 1000 km (radial to the former ice margin: see Walcott's results). Geomorphic studies (10^4 year scale) do NOT indicate any reversal (positive motion) in the eastern U.S., in spite of geodetic results to the contrary. Along the Pacific coast, emergence alternates with subsidence.

5. On the 10^8 yr scale North America discloses a net emergence of the order of 500 m as predicted by plate tectonic (eustatic) calculations (by Pitman et al.). Additional, regional uplift is disclosed in many parts of the West (Rocky Mts., Cordilleran belt) and in the East (limited to domal sectors of New England, the central Appalachians,, the Ouachitas, etc.). Regional subsidence is recognized in intramontane basins and around almost the entire coastline of the U.S. but not of Canada. Essentially no intracratonic subsidence has occurred in 10^8 yr, except in foothills situations, and contrary to the geodetic indications.

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Jane L. Forsyth

Not a lot to report, as the year has been mainly spent in trying to clean up old, long-standing obligations. Still trying to learn where the Erie-Basin floodwaters went, after the Great Flood in 12,500 B.P., across central New York state. Ernie Muller and others have been most helpful, but distinction of the effects of this flood from those of other floods of closer origin remains unresolved, and the area east of Syracuse is still enigmatic

Closer to home, am still trying to complete mapping of the ancient high-level, narrow ice-marginal lakes in west-central Ohio (near Lima), and to decide what physical (geologic) factors controlled the location of prairies in Wood County (Bowling Green) area. And the subjects of late-glacial history of northwestern Ohio and relation of geologic substrates to plant distribution continue to be pursued. My best to all.

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Dave Fullerton

Just a note to bring to your attention The Viscosity of the Earth's Mantle, by Lawrence M. Cathles, III (Princeton University Press, 1975). Although the title is such that the book may be overlooked by Quaternary geologists, more than half the book deals with glacial and postglacial isostatic changes in North America and Fennoscandia.

Topics include uplift and submergence in Canada, in New England, and along the Atlantic coast to Florida; discussion of sealevel curves, isostatic uplift curves, and coastal submergence; isostatic changes of Lake Bonneville strands; the world-wide pattern of uplift and submergence. Considerable emphasis is placed on the "peripheral bulge", and Walt Newman should find some provocative reading. The treatment of development, migration, and collapse of the "bulge" provides some potential fodder for those interested in modeling of changes of levels of glacial lakes in the Ontario Basin and in the Hudson and Champlain Lowlands. If you belong to the "no bulge" school and you can handle the chicken tracks and sheet music (mathematics), you will have plenty of target area to shoot at.

10(2)

Chauncey D. Holmes

No doubt you all have seen, in SCIENCE 17 October 1975, the paper by Fritz, Anderson, and Lewis on Late-Quaternary climatic trends and history of Lake Erie...As a kind of footnote to that paper I offer herewith a pollen diagram from a small kettle lake at Tully. The section consists of marl overlain by peat at depth 5 feet. Small shells are common beginning at 16 feet depth, none at deeper levels. Sample interval is 6 inches (15 cm). The C-14 dates on the diagram are set by correlation with a peat section located about 20 miles east of Tully.

Our authors' Lake Erie record begins with till from the Port Bruce advance dated 13,800 B.P. Two "major climatic improvements" are interpreted from oxygen and carbon isotope data, with some reference to pollen percentages. The first warming trend was from 12,730 to 12,500 B.P. The second began about 10,000 years ago. The warm interval beginning with the first improvement is well shown, but the record of cooling at its close is absent because of unconformity. Deposition at the sampling site ceased with the improvement in climate which, in some way or ways, initiated the low-water stage of Early Lake Erie. Deposition resumed about 2,000 years later when isostatic crustal recovery restored the inflow of water from the western lakes and perhaps raised the Erie outlet (?).

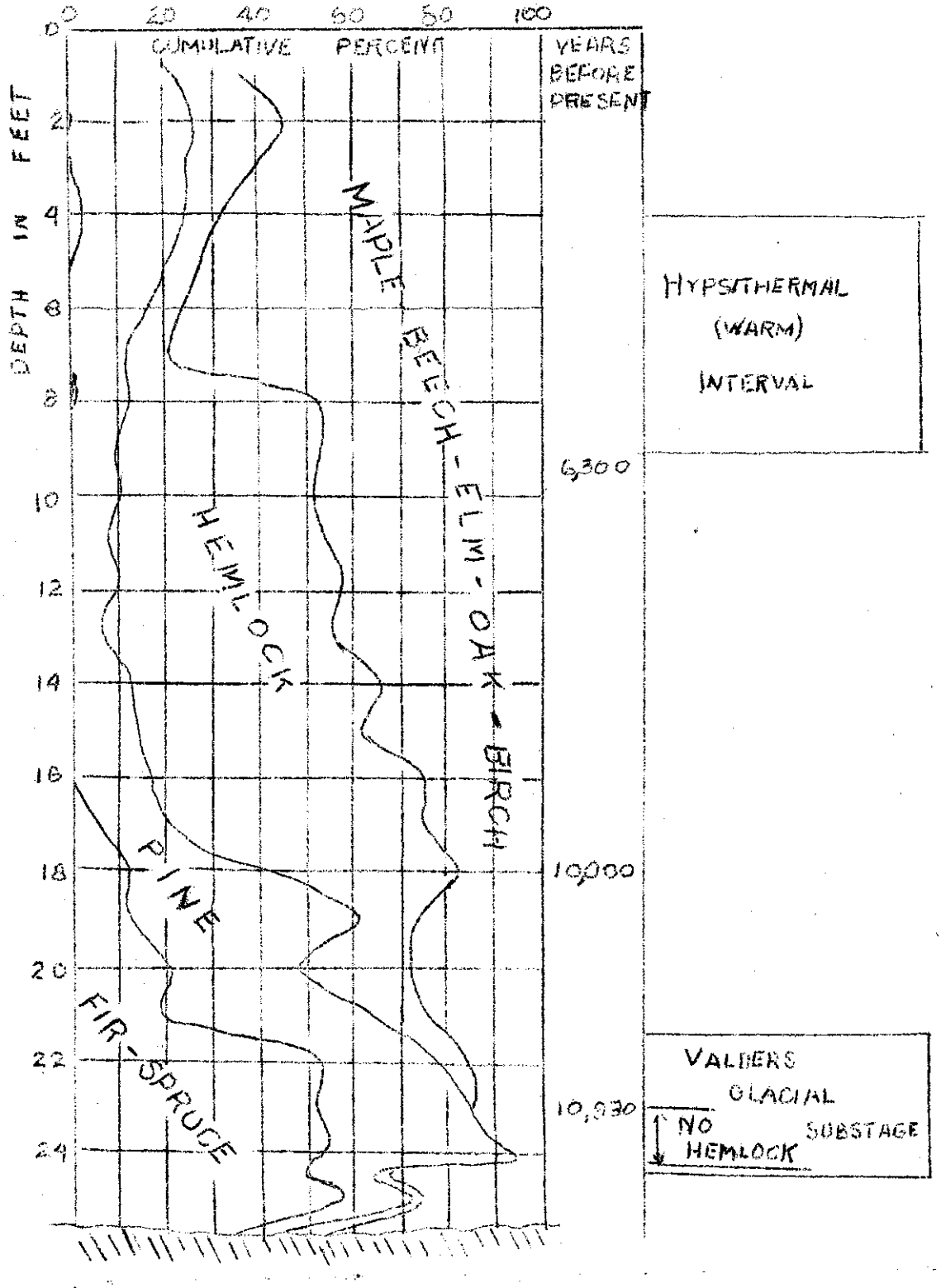
The basal portion of my Tully section supplies a setting for some of the missing record, beginning with the climatic cooling that preceded the second warming trend. We may infer a rapidly deteriorating climate with its climax at about 11,000 years B.P. The subsequent improvement corresponds in general to that interpreted for the Erie basin except that hemlock (Tsuga) rather than pine (Pinus) was the dominant conifer. Below about 22 feet depth jack pine (P. banksiana) predominates.

The hemlock record in central New York is significant not only because of its prominence but also because hemlock is said to be sensitive to dryness in its early stages of growth. This invites a bit of climatic speculation. The Erie isotope data are believed to indicate that each climatic improvement brought an increase in average annual temperature of 5° to 8° C. This contrasts with the 2° C rise which Stuiver (1968) found for regions east of the Great Lakes. Assuming that all these results are valid, how is such contrast in regional temperature to be explained? I suggest an hypothesis.

When the retreating glacier front had cleared the drainage divide southward, proglacial lake waters hastened the retreat to an extent unknown but important, by the well-known principle of convection melting at the water-ice interface. In the warming climate, much lake water was recycled back onto the glacier as snowfall, especially eastward with the prevailing winds. This would have produced heavy snow conditions in New York and New England, thus keeping the average annual temperature there much lower than that of the western Great Lakes area. Presumably this so-called lake effect grew stronger as the expanse of proglacial lake surface increased, while the strong east-west contrast in temperature must have generated severe

POSTGLACIAL FORESTS

THE POLLEN RECORD FROM GREEN LAKE, TULLY



storm winds.

The deteriorating pre-Valders climate drastically reduced the deciduous forest until the hemlocks probably succumbed to dryness from lack of shade for seedlings. Of the 187 pollen grains counted for depth 24 feet at Tully, two birch, one alder, and one maple represented the entire deciduous group. But once past the time of maximum cold, the increasingly moist climate soon restored the hemlocks, continuing until the advent of Hypsithermal dryness.

Whether or not this be it, I believe the central New York hemlocks have something Pleistocenic to tell us, and there may well be several variations on the theme.

The pollen diagram is from my booklet From Nelson To Chittenango: A Geological Journey, printed for the benefit of our local amateurs. (Copies are available from The Cazenovia Republican, Cazenovia, N.Y. 13035. $3.00 postpaid).

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James T. Kirkland

Although I have spent the past three months adjusting to the geology and climate of Texas, I am still deeply involved in a joint project with Bob Funk and his archaeological team on the upper Susquehanna River basin. This past summer I also had the pleasure of visiting a number of archaeological salvage sites along the I88 corrider with David Weide of the Univ. of Nevada at Las Vegas. These included a wide variety of upland sites displaying a complex interrelationship between fluvial and colluvial deposits. I suspect that most of the slope movement took place within the first few thousand years following deglaciation but have very little evidence to support this conclusion. I would be interested in hearing any comments as I believe this can be related to early overbank silt accumulation rates along the main Susquehanna River.

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Ernest H. Muller

Last summer came in three flavors, starting with an exhilarating two weeks with student groups in Iceland. Though I was supposed to be the one familiar with the country, Ken Fahenstock showed me and the accompanying graduate students some unexpected features on the sandurs of Vatnajokull's southern distributary glaciers. Following this, a month of family vacation in California before returning to problems of New York Quaternary geology.

Thanks to support from the Department of Environmental Conservation through the N.Y.S. Geological Survey, field work in August afforded particularly rewarding association with Dick Young, Dallas Rhodes and two Syracuse University graduate students, Mike Wilson, and Paul Willette. The investigation which will continue this coming spring involves mapping and study of the late-glacial and postglacial record in the middle and lower Genesee Valley.

The immediately striking realization is that the Genesee Valley is not a single valley, but a complex linkage of reaches in each of which the differing late-glacial and postglacial record is still dominant in the landscape, though in differing manner and degree. For this reason, if no other, glacial geology is focal to understanding the fluvial system as a whole.

Hopefully, Dick Young will comment elsewhere in this issue on the significance of stratigraphic relationships he is studying in Letchworth Gorge, and Dallas Rhodes on recent changes in flood plain patterns and his analysis of t the alluvial record.

Dissertation research completed and defended at Syracuse University since the last Glaciogram includes Henry Posamentier's "Glaciation of the Schobergruppe East Tyrol, Austria". Research presently under way includes Nena Salomon's study of till constitution variations transverse to glacier flow in bluff exposures a e along the south shore of Lake Ontario; Rick Moore plans to study till constitution variations parallel to glacier flow from Lake Ontario south to Syracuse; Mike Grieco is attempting to use till fabric as a tool in interpretation of drumlin origins.

A fall field trip in my Geomorphology class has for many years been devoted to consideration of the relative roles of glacial meltwater erosion and groundwater solution in shaping the topography of Clark Reservation State Park, southeast of Syracuse. Relevant information in this regard is coming out of thesis research by Gary Kapesser in the College of Environmental Sciences and Forestry. His study confirms that flow is not downdip, but rather northward from the Onondaga Limestone bench into the White Lake Channel where expensive residential development is underway. Still available for a similar study is the Cedarvale disappearing lake, southeast of Marcellus. Although the Marcellus Sanitary Waste Disposal is now closed, it had been inundated twice in recent years by the disappearing lake--which make the question how and where the water drains from the lake a matter of more than passing interest to residents northward in the valley of Ninemile Creek.

This fall at Syracuse University we have benefitted from a particularly active Quaternary Seminar group. For those sponsoring similar seminar groups elsewhere in the area, I can say that there is a fortunate wealth of good seminar material and leadership in the work being carried on by active investigators in upstate New York. Our group has benefitted from, and I can recommend most highly, the contributions, for instance, of Art Bloom, Jay Fleisher and Don Woodrow. Given a bit of organizational leadership some one ought to be able to generate a small-scale Quaternary lecture circuit-rider corps.

My research efforts this fall have been largely directed toward the proposed Quaternary Map of New York State to be published over the course of the next few years on the base previously used for the Geological Survey's bedrock map. The Niagara sheet, long identified in this newsletter as being under way is still coming. There is reason for optimism that funds for its publication by the Geological Survey may be committed this fiscal year. Meanwhile, preliminary, indeed very preliminary, compilation of the Finger Lakes sheet is some 60% toward completion. I have undertaken in a rash

moment to provide Eric Henderson with basic data for a generalized materials map of the U.S. part of the Ontario drainage basin as a contribution to the International Field Year on the Great Lakes, which most people thought was already a thing of the past.

Needless to say, I continue to see evidence of glacial hlaups in many places across central New York, but they are going to wait a bit before I can give them the attention they need. Any one for a good research project?

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Walter S. Newman

Gordon Connally's strident attack on the misuse of radiocarbon dates by Avrill, Newman, Crowl, Sevon, Bucek and Parizek in the May, 1975 issue of the New York Glaciogram elicits symptoms of paranoia. We may disagree with Steve Avrill's hypothesis although he now has six radiocarbon dates suggesting an anomalous situation in northeastern New Jersey including a 6000 year old mastadon who was apparently unaware that he was supposed to be extinct. Apparently Gordon failed to get the "word" to that proboscidean.

Gordon wrote "A more flagrant misuse occurs in an abstract by Walt Newman where he states "A C-14 date of 13,470...was obtained...beneath the uppermost till in Queen's County' (Newman, 1973). Lo and behold, when we went to hear Walt deliver his paper we learned that the "uppermost till" contained bricks! In actuallity Walt inferred that the peat occurred below a till which cropped out elsewhere. Nonetheless, his "radiocarbon dated till" stands in the scientific literature as fact, rather than inference."

As Gordon's critique noted Avrill's (1975) abstract, I must assume he also read mine (Newman, 1975) in that very same issue. Noting the troubled locality, I wrote "In northern Queens, deformed and faulted lacustrine sediments are overlain by a discontinuous till cover which ranges north from these end moraine segments. A peat deposit atop the lake beds and deformed with them yielded a C-14 date of 13,470 $\pm$ 380 years B.P. (RL-157), the oldest late glacial date from Long Island." And that is exactly the situation. It is true that fill containing discarded bricks, two by fours and bottles lays with occasional obscurity unconformably upon the till. However, the foundation excavation occupied an entire city block and the relationships appeared reasonable clearcut. I attempted to report and interpret my observations with reasonable veracity - I assume my fellow trespassers committed the same "sin" - the sin evidently being that we are not conforming to Gordon's model of deglaciation.

Gordon's model reads as follows (Connally and Sirkin, 1973, p. 61):
"The rate of glacial recession is indicated by the ages of basal bog sediments on the glacial depositional surface. It is inferred that deglaciation began about 17,000 years B.P. in the end moraine region of western Long Island, and 15,000 years ago in the mid-Wallkill Valley and in southern New England (Fig. 6A)."

But Gordon's early deglaciation is, at best, informed speculation because the oldest basal bog age in eastern New York (including Long Island) barely exceeds 13,000 radiocarbon years. Gordon's editorial correctly states my view (No one really knows the age..." - the age of the Late Wisconsin terminal position) while he infers about 17,000 years for the Late Wisconsin terminal position. However, my interpretation of the evidence, essentially the singular paucity of radiocarbon dates in eastern New York of about 13,000 years or older, suggests the late Wisconsin glacier was near its terminal position as recently as 13,000 years ago. Somewhat similar conclusions have also been independently reached by Crowel, Sevon, Bucek and Parizek. We all may be dead wrong! But, even if we are dead wrong, have we been guilty of "abuse and misuse" of abstracts? I suggest not. What really happened is that Gordon was seized by a temporary attack of authoritarianism for which an antidote has now been administered. I have no "final solution".

The Queens College Radiocarbon Laboratory under the direction of Richard Pardi has been operational since the beginning of June. The lab has already turned out nearly 100 dates including a fair amount for Glaciogram readers. However, the fiscal crunch in which New York City finds itself may promise an early demise of our C-14 installation - unless we find alternate sources of funding. Grant proposals seeking partial funding for the operation have been submitted and several researchers and organizations have made modest contributions in acknowledgment of our dating efforts on their behalf. For those of you who might wish additional information concerning our radiocarbon laboratory, write: Mr. Richard Pardi, Queens College Radiocarbon Laboratory, Queens College (CUNY), Flushing, N.Y. 11367. The telephone number is 212 520-7651.

Bert Salwen, Professor of Anthropology at New York University, and myself have organized a conference on Amerinds and their Paleoenvironments in Northeastern North America. The conference is scheduled for the 4th through 6th of February 1976 at the Barbizon-Plaza Hotel in New York City. The conference is sponsored by the New York Academy of Sciences who will publish the conference volume. Participants include Doug Byers, Pete Ogden, Jeff Williams, Chris Kraft, Rhodes Fairbridge, Archie Stalker, Jim Adovasio, Meyer Rubin, Bob Stuckenrath, Joe Hartshorn, Antonio Segovia, Les Sirkin, Bill Sevon, George Crowel, Ernie Muller, John Foss, William Gardner, Herb Kraft, Charlie McNett, Bob Funk, Dena Dincauze, Alan Bryan, Paul Martin, Vance Haynes, George F. MacDonald, Hal Borns, Ruth Gruhn, James Fitting, Fred Kinsey, Bruce Rippeteau, Dean Snow, Ron Davis, David Sanger, Jim Tuck, Aleksis Dreimanis, Don Coates, Richard Harrington, Parker Calkin, and many others. Our purpose is to encourage interchange of ideas among the several represented disciplines.

For further information on the forthcoming conference, contact me here at Queens College (212 520-7487).

10(2)

Gerald W. Olson

Gerald Olson will contribute a paper entitled "Land use contributions of soil survey with geomorphology and engineering" to the Binghamton, Geomorphology Symposium in September 1976. He is involved in a variety of studies in New York along the line of soil survey interpretations, and land use planning.

(This note compiled by P. Calkin from reprints sent by G. Olson)

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Nena Salomon

I am studying the glacial stratigraphy along the southern shore of Lake Ontario between the Niagara River and Lakeview, about seven miles northeast of Oswego. During the summer I described 56 outcrops and collected 150 samples of till. I Have completed texture analysis of all the samples and am currently describing the lithology of the very coarse sand fraction. I plan to look at the clay mineralogy, heavy mineral, and calcium carbonate content at a few select sites.

Based on information gathered in the field, there appear to be three different tills. The lower till is pale red (10R 6/2, G.S.A. Rock Color Chart) and contains numerous pebbles of red siltstone. It occurs in only a few outcrops. The unweathered middle till is light brownish gray (5 YR 6/1), and is pale yellowish brown (10 YR 6/2) when weathered. It contains numerous pebbles of green siltstone and sandstone and is found throughout the study area. The upper till is pale yellowish brown (10 YR 6/2) and contains abundant lenses of contorted sand, silt, and clay. It occurs in the middle of the study area, between Rochester and Somerset.

Texture was determined using the sieve-pipette method. The results are extremely variable and approximations are indicated here. The lower and middle tills are very similar with sand, silt, and clay percentages of 40-50-10. The upper till is siltier, 25-65-10.

The lithology of the very coarse sand fraction can be divided into five categories: carbonate (limestone and dolomite), red siltstone, siltstone (all other colors), shale, and others (igneous and metamorphic rock types and quartz). It appears that the tills can be differentiated on the basis of siltstone content. The lower till contains about the same amount of both siltstones. The middle till contains less red siltstone than other siltstones. The upper till contains abundant siltstone but very little red siltsone.

10(2)

Fred Van Alstyne and Joe Slack

As you probably know, Kernan Davis (see entry-ed.) has moved on to bigger and better (?) things. I now hold his old position (Senior Engineering Geologist, N.Y.S. Department of Environmental Conservation) and am assisted by Mr. Joseph Slack who joined me around July.

Most of the summer was spent drilling test wells at various fish hatcheries in the State. Information on the test drilling and production test is available for the following hatcheries: Bath, Catskill, So. Otselic and Warrensburg.

In addition to the above, some problems relating to groundwater contamination from landfills and hydrocarbon spills were investigated. Prospective landfill sites were also "reconned."

On the Federal scene, I've been reviewing and making suggestions on Area-wide Waste Treatment Management Planning (Section 208 of Federal Water Pollution Control Act Ammendments of 1972). This section is done by consultants and requires a review of groundwater availability, use and or misuse. Section 303(e) of the same Act, requiring an overall picture of groundwater conditions and non-point sources is being written by Joe and myself for various parts of the State.

Joe has another task of writing a portion of a non-point source handbook establishing guidelines for sedimentation-erosion control. The manual is a joint effort of DEC, Cornell Extension and the Soil Conservation Service.

Next summer we will probably be doing some further drilling at hatcheries and performing geophysical studies for various purposes, i.e., groundwater and landfills in addition to working on the Federal studies.

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George White

As compilation by George W. White and Stanley M. Totten of the maps and notes from field work in 1974 in Ashtabula County, Ohio progresses, it becomes apparent that there were lakes at two different levels at the Grand River Lowland in Ashtabula County and in Trumbull County to the south. The well-known one, whose deposits fill the inner valley to 820 feet, was controlled by the level of Lake Maumee, into which the outlet, Grand River, flowed at Painesville. This 3 mile wide inner valley was occupied by a whole series of lakes, which by latest Woodfordian time had filled the inner valley with at least 200 feet of , silt and clay.

Formerly puzzling higher lake deposits in Trumbull County now fit shoreline features at the same level in Ashtabula County to the north. It is now believed that a much wider lake existed for at least a short time at an elevation of about 920 feet. It was controlled by the margin of the Ashtabula ice in northern Ashtabula County and drained southeast in Trumbull County to the Mosquito Creek lowland.

Richard A. Young

GLACIAL AND POSTGLACIAL GEOLOGY OF THE LETCHWORTH PARK GORGE OF THE GENESEE RIVER, LIVINGSTON COUNTY, N.Y.

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. F. 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 believed to have been cut postglacially as a "detour" after glacial deposits filled the older valley near Portageville.

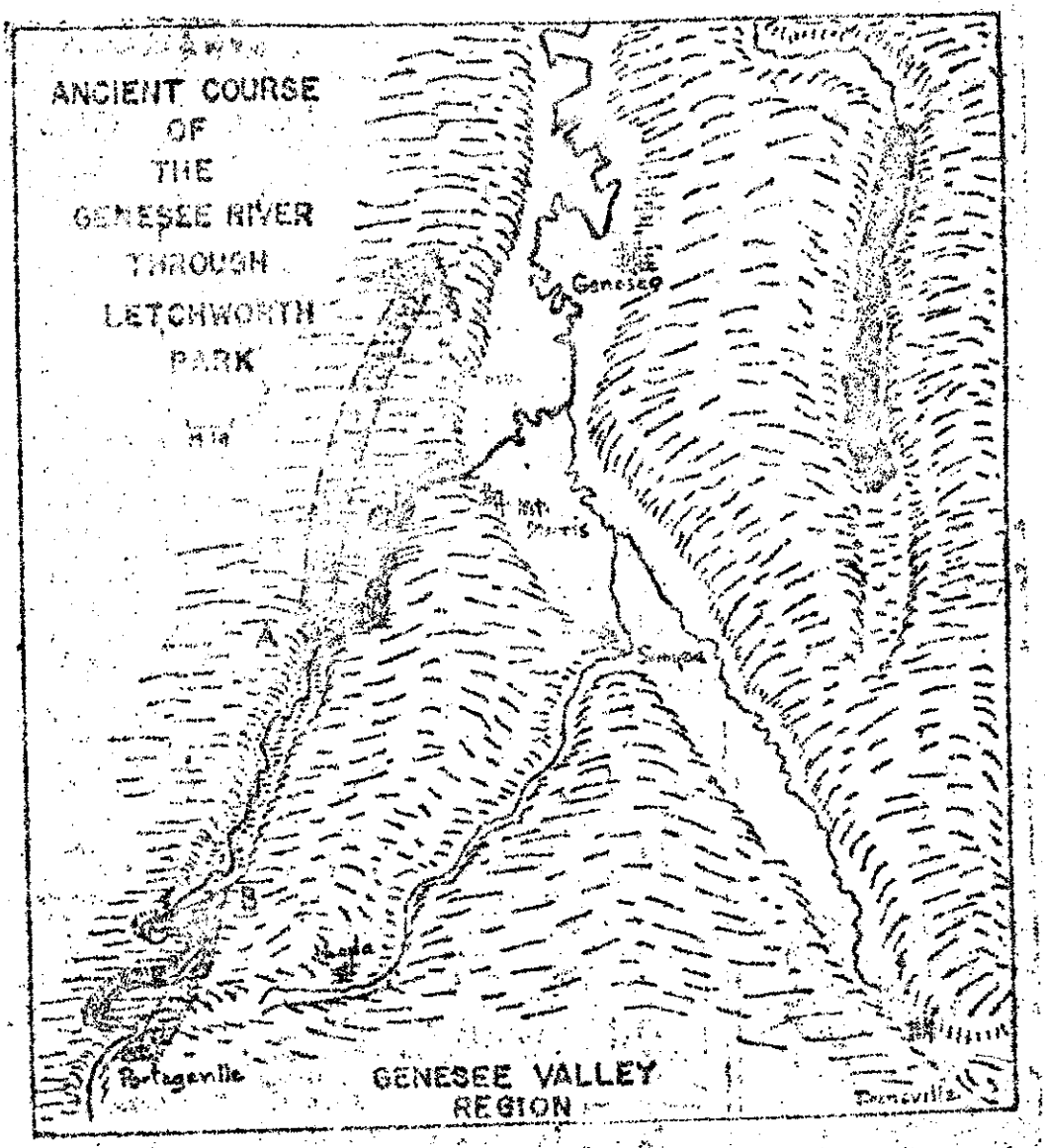
A multistage origin for the gorge is certainly necessary to account for the existence of the mile-wide, 6-mile long broad valley segment, still partially filled with glacial deposits, between the younger narrow rock gorges at either end. It is possible to rule out the theory that this wide portion of the gorge merely represents a reoccupation of a south-flowing tributary from a reconstruction of a minimum elevation constraints near the base of the old channel exposed within the gorged. 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 north-flowing drainage occurs between bedrock and the glacial deposits. A stony gray till with abundant clasts of black shale and many crystalline rocks 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 gray basal tills. 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 and field evidence suggest that the older buried valley formerly rejoined the modern Genesee River Valley somewhere between Mt. Morris and Fowlerville.

A north-flowing river in a pre-Wisconsinan (Sangamon?) 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



Sketch shows middle section of newly discovered buried channel, dotted arrow ... black area at right is Conesus Lake

Clipping from Courier-Express, Buffalo 28 Nov. 1975
entitled "Geologist at Geneseo State Finds
Buried River Gorge" - ed.

and spacial relationships to the modern Genesee River gorge is strongly influenced by only the most recent and obvious glacial and postglacial events.

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Edward Evenson

At the present time we (Neher, Sevon, Evenson) are undertaking an investigation of the three distinct drift sheets identified in NE Pennsylvania (Illinoian, Altonian, Woodfordian) in an attempt to quantitatively differentiate the deposits. Of particular interest are those deposits (Altonian) which lie intermediate in temporal and geographic position between the areas of accumulation of Illinoian and Late Wisconsin (Woodfordian) drift and tentatively assigned to the Altonian Substage by Sevon (1974). Currently this age assignment is based on preliminary qualitative observations of the physical characteristics (primarily the degree of weathering) of the drift and on similarity of the weathering and surface character to the Titusville till in N.W. Pennsylvania (Sevon, 1974; Sevon et. al. 1975).

The current differentiation procedure involves the investigation of each of the three drift sheets to determine the degree of weathering as an indicator of its relative age. Parameters to be investigated include: 1) depth and character of soil profile development; 2) weathering and alteration of the heavy mineral suite; 3) degree of clast weathering as measured by rind thickness; 4) depth of carbonate leaching; and 5) the clay mineral alteration sequence of each unite.

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Look foreward to more in late Spring -----Parker

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