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NEW YORK GLACIOGRAM
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co-editors

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EDITORIAL

The object and philosophy of this non-publication (similar in some respects to the nonorganication of Flint, (1971, p. iv)) is understood by past contributors and has been discussed in previous issues (see particularly guest editorial by Ernie Muller, v. 6, (1)). However, for potential new contributors we quote what we consider a very important part of Muller's discussion and a suggested policy to which for our part we will follow.

> The objective from the outset has been to facilitate rapid, but informal communication. To protect individuals willing thus to make preliminary and tentative information available for use, I have not favored distribution of the Glaciogram to libraries or to those not engaged---- in Quaternary research. Among this group, information included in the Glaciogram should be used just as information received in conversation. To retain this status, I suggest as a general practice that reference to information published in the Glaciogram be identified merely as informal communication.

In order to insure that our mailing list includes all actively interested people we sent each person two copies of the original letter, one for themselves and one to pass along. Furthermore, we asked you each to return a tear sheet to us. We have reasoned that anyone who could not invest a few moments to fill in his name, check a column, and address an envelope is not vitally interested in the Glaciogram. We are sending this issue to all those in New York and contiguous states regardless of whether or not they returned their tear sheet this time but are not including those from other states who did not indicate further interest. However, anyone not responding to the spring solicitation letter will be dropped from the mailing list and this procedure will be continued while the Glaciogram emenates from Buffalo.

As already noted in our solicitation letter in September, this academic year we will return to the twice yearly format. Contributions are welcomed on any subject matter relating to the Quaternary of New York. Contributions from nearby States are welcomed but should relate to New York. Newsworthy items of past numbers have included original research, work of students, referral to papers in or soon in print, questions, requests for information, and news of glacier - related activities.

George M. Banino

Since the last advance of the Glaciogram, personnel of Dunn Geoscience Corporation (our new name - formerly James R. Dunn & Associates, Inc.) have been quite active on the "Pleisto-scene."

One of our activities has been assisting a Pennsylvania engineering firm in designing a mining practice manual for the Commonwealth of Pennsylvania. To be included in this manual is a New York State Esker delta complex currently being mined. The manual will use as an example the comprehensive rehabilitation plan developed by Dunn Geoscience.

Also, we have been using glacial geology and geomorphology as a tool for engineering geology in site investigations. The glacial history of the site has been instrumental in determining the types and engineering properties of soils to be expected on the site, knowledge of which is quite helpful for planning the kind and intensity of geophysical and mechanical techniques to be used in the investigation. We have also recently conducted several exploration and evaluation projects for sand and gravel, relying heavily on glacial geology.

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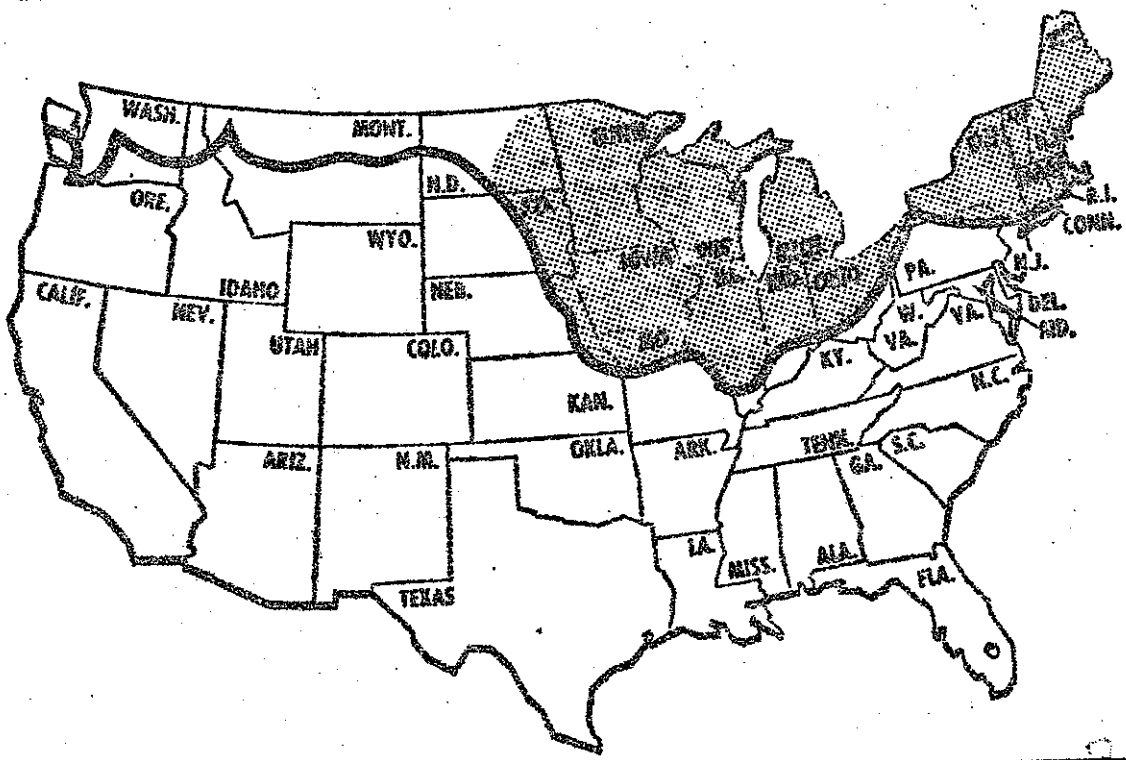
T. M. Berg & W. D. Sevon

Without question 1972 has been an interesting year in northeastern Pennsylvania. Some of the events of the year we hope will not be repeated in the near future. Sevon started the year with a paper at the Northeastern Section Geological Society of America meeting in Buffalo in which he reported on boulder fields and boulder colluvioum developed from and on Late Wisconsinan till in Monroe County, Pa. The hypothesis was that the boulder deposits were the result of periglacial activity associated with the development of a small end moraine. More field work this summer indicates that the story is complicated by the almost exclusive occurrence of sandstone (Catskill Formation) as the underlying bedrock, but that the basic idea is correct. The end moraine associated with these boulder deposits probably extends eastward to the Delaware River in the vicinity of Bushkill, but its westward extension is not yet known.

During the week of June 19-23, George Crowl, Ed Coilkosz, John Kempton (Illinois Geological Survey), Berg and Sevon had an interesting field trip examining many of the drift deposits between the Delaware River and Bloomsburg. That was also the week Agnes strolled through and drowned the Pennsylvania Geological Survey in 10 feet of water. As a result of the flood, programs in northeastern Pennsylvania are slightly behind schedule.

Cancer More Prevalent in Areas Where Glaciers Left Radioactive Soil, Says Expert



The black line across the map indicates the Canadian Glacial Shield of Pleistocene Ice Sheets which occurred about 1½ million years ago. The shaded portion on the map indicates where radioactive soil deposits accompanied the ice.

It is in this same area where the highest proportion of cancer deaths occur.

The areas in the clear portion above the line are those where no radioactive soil deposits occurred during this period

Other areas of high cancer occurrence are Colorado, Utah, Nevada and California — where uranium is mined.

Glaciers that invaded our land mass a million and a half years ago are linked to the cause of present high cancer rates in certain parts of the U.S. by a public health scientist.

Dr. Ross Cameron, who has studied cancer incidence areas for many years, points out that the highest proportion of cancer deaths in the U.S. occur precisely where glaciers from the Ice Age deposited radioactive soil. This occurred over a broad area stretching from Maine to North Dakota and southward as far as Missouri.

"Glaciers brought down radioactive soil from the North Pole," Dr. Cameron told The ENQUIRER. "When the ice melted, the radioactive soil was exposed. Tests show that a large amount of radioactive soil still exists at the Pole."

In addition to the high cancer areas where the glaciers invaded, there are other sectors of high cancer occurrence in Colorado, Utah, Nevada and California — and in those sectors, uranium, a radioactive element, is present and being mined, he pointed out.

In 1962 Dr. Cameron was transferred from Maryland, where he did his initial research, to Pinellas County (Fla.) Health Dept., where he is director of the Division of Chronic Illness and Adult Health. At that time, the county's cancer death rate concerned officials because it was the highest in the nation.

But Dr. Cameron found that most of those who died from cancer in that county came originally from the localities shown on the national map as high cancer areas.

— DAVID KLEIN

A clipping from the National Enquirer

courtesy of

GEORGE RANINO

*It may be worthy of note that the National Enquirer is published in Lake North Florida.

Berg has completed mapping of the Brodheadsville 7 1/2' quadrangle and has prepared a very detailed surficial geology map of the area which includes part of the Wisconsinan terminal moraine and a large outwash plain. Some good carbon material was collected from clays deposited in a kettle hole on the outwash plain and George Crowl is in the process of obtaining what we hope will be a significant date.

Sevon is involved in reconnaissance mapping of the surficial materials in the Williamsport area (central Pa.) and has identified Early Wisconsinan (younger than Illinoian, older than drift associated with the Wisconsinan terminal moraine) drift in that area. Drift of similar age was identified to the east by George Crowl this summer.

With luck, and despite the flood, 1973 should be a great year for publications about northeastern Pa. At least seven and possibly nine 7 1/2' quadrangle reports, all with something about Pleistocene materials, are anticipated during the year.

In case anyone missed it, we recommend G. S. Boulton's "Modern Arctic glaciers as depositional models for former ice sheets," Jour. of the Geological Society of London, v. 128, p. 361-393, 1972.

Editors Note;

Tom Berg and Bill Sevon understate the devistation of Agnes. For more details see Sevon's article in the August issue of Pennsylvania Geology, Vol. 4/3, p. 21-29 and the pictures that precede it.

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Donald H. Cadwell

The problem presently under study is the bedrock control of meltwater channels during the retreat of the Woodfordian ice sheet. There are several valleys in the northern reaches of the Chenango River valley (east-west flowing tributaries) that illustrate the manner of bedrock control. I am able to relate the meltwater flow in the uplands to particular valley ice tongue locations, by tracing discontinuous kame terraces along the valley walls of the tributaries. I am finding that there is stratified drift along the north-facing valley wall and a till veneer on the south-facing wall. In places the till is capped by stratified drift from streams flowing in outflow channels. The maximum thicknesses of till (whether ablation or lodgement) are up to 245 ft. on the south-facing slope.

* *

Parker Calkin and Jock McAndrews

At the Northeast Sectional Meeting of the GSA in 1969 we reported on our palynologic and C-14 restudy of Muller's Cheery Tavern (we call

it Nichols Brook as Cheery Tavern is not on new maps) organic site in southeastern Erie County. Two C-14 dates were obtained here, the oldest 14,900 from organic detritus at the contact of a marly lake deposit resting on outwash of the nearby (to the north) Lake Escarpment Moraine. Parker (1970, Ohio J. Sci. v. 70 (2)) therefore suggested this as a new minimum date for recession from the distal side of the Lake Escarpment Moraine. The date has important consequences for correlation across the state and in Pennsylvania and Ontario because of the moraine's great extent and its sometime correlation with the Port Huron Stade. Well, the bad (or good) news is that after obtaining even a third date which helped coaborate the above, Jock was still uneasy (based on some pecularities of pollen correlation which Parker - who writes this at the last minute - would not attempt to repeat). We therefore stood on our heads (a fourth time) below stream level to obtain enough wood for dating. Although no wood was found directly on the outwash, the date from this wood slightly above suggests, by extrapolation, that at least one of our detritus dates is too old by 1800 years and perhaps also the 14,900 date. Look out for detritus dates from marly deposits!

* *

Donald R. Coates

Geomorphically the big news at SUNY Binghamton is the funding of my NSF proposal to bring over Professor Cuchlaine A. M. King as a Senior Visiting Foreign Scientist. She will be with us during the 1972-73 academic year and is jointly teaching with me coastal geomorphology this fall, and glacial geomorphology in the spring. In addition she will give lectures in other courses and will visit a number of universities. She is also involved with some of the research that Marie Morisawa and I are doing. Professor King is a delightful Briton, and it is a great pleasure to have her on our staff. We are also fortunate to have with us Gary Carver, who is filling the line of geomorphic intern-postdoc in the Department. Gary did his work in the Cascades under Steve Porter at the University of Washington.

The press of over projects permitted only part of the summer to be glacially oriented. I have started directing and doing research in our Sea Grant Program, financed by the U.S. Department of Commerce (NOAA), with Marie as co-investigator. This is a multi-year project to investigate coastal processes (natural and man-made) and management practices on beaches of Long Island. Four students are completing M.A. thesis on different problems and three more will start in 1973.

Another summer involvement was the writing and editing of two different style books. I am in the midst of completion of the second volume of a three-volume series on Environmental Geomorphology and Landscape Conservation. (The first volume has recently been published, Dowden, Hutchinson & Ross, Inc., and treats the period before 1900). The second volume concerns non-urban regions, and the third will be on urban areas. The other book that was completed in the summer resulted from our NSF In-Service Institute during which we developed an Environmental Science Workbook.

On September 28-30, we hosted our third annual geomorphology symposium on the theme Coastal Geomorphology. Preparation of this event took summer time, especially since all speakers had to submit manuscripts early so that I could start the editing job in order to have an early publication date of the proceedings volume by February 1973.

I was not completely devoid of glacial activities during the summer (although an eye operation in August considerably slowed me down) because we will host the 1973 meeting of the Friends of the Pleistocene and plans are well advanced for this affair. Those who have already done work include Don Cadwell (now at Lafayette College) Cuchlaine King, Jim Kirkland, Marie Morisawa, and myself.

Three of my students have recently completed thier work:
Don Cadwell "Late Wisconsinan Deglaciation Chronology of the Chenango River Valley and Vicinity, New York". Ph.D. Thesis.

Jean J. Flint "Fluvial Systems: A Re-evaluation of Horton's Laws" Ph.D. Thesis.

Robert Newton "Deglaciation of the Ossipee Lake Area, New Hampshire". M.A. Thesis.

In closing I wish to express my appreciation to Parker and Gordon for continuing Glaciogram. It has had a very interesting history and under their guidance I am sure that new levels of communication will be achieved. I thoroughly enjoy being on the other end of the correspondence line.

* *

G. Gordon Connally

I have very little progress to report on my New York projects from this summer. However, I do think that I have located the Rosendale readvance border in the Hudson Valley. I think that it correlates with a massive kame terrace just southwest of Poughkeepsie. If this correlation holds up then the massive moraine banked against the north slope of the Hudson Highlands is probably correlative with the Wallkill Moraine and not the Pellets Island Moraine as I had previously suggested. This would tend to project the Wallkill Moraine as THE feature in the mid-Hudson Valley and to make the Connally and Sirkin correlation with the Valley Heads Moraine in western New York look better and better intuitively, if not in fact. Also, I am fooling around with the tills in the Champlain Valley again, although most samples are from Vermont. I hope that (new?) rock stratigraphic definitions will be the end result. Hopefully, the Glens Falls quadrangle and the New York Moraine Map will be published in the Spring by the New York Survey. Glens Falls would probably be out by now but I have been dragging my feet on the Manuscript.

Continued work in Pennsylvania will probably lead to a paper at the northeast section with Jack Epstein, tentatively entitled "Regional deglacial sequences in southeastern Pennsylvania" and the Mount Mansfield quadrangle is still in process with the Vermont Survey. Incidentally, George Crowl, Bill Sevon, and I have invited the Freinds to southeastern Pennsylvania for 1975.

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Jesse L. Craft

I am now engaged in the challenging job of being the Environmental Geologist of Western Pennsylvania with the Pennsylvania Geological Survey, living and working out of Pittsburgh, Pennsylvania.

I am glad to see the Glaciogram getting back on tract.

* *

Robert J. Dineen

Dr. James F. Davis and I have completed gathering data for a 1:62500 bedrock topography map of the area from Crown Point on Lake Champlain to Coeymans on the Hudson River. We are using a contour interval of fifty feet. We hope to be able to unravel the pre-glacial drainage of the Hudson-Champlain Valleys from the contour maps.

* *

Duane T. Eppler

"Late Pleistocene geology of Elm Creek, South Edwards, and Pitcairn Valleys, St. Lawrence County, New York" is the tentative title of my yet to be completed Master's thesis at Syracuse University. Three months of field work in Jim Street's rainy north country has led me to conclude that MacClintock and Stewart's (1965) placement of the Fort Covington terminal moraine between Stalbird and South Edwards is correct. However, there is little evidence to support their extension of the ice margin north through Hermon and north-northeast toward Canton. Rather, exposures of ice contact debris at Russell indicate that the Fort Covington terminal moraine extends northeast from Stalbird through Russell towards Pierrepont. Field work has also shown that the terminal position for Fort Covington ice extended south from South Edwards through East Pitcairn and on to Harrisville.

The area is characterized by a dearth of till exposures and extensive Late Pleistocene fluvial and lacustrine deposits. Consequently, morphology is the primary indicator of moraine positions. Initial analysis of elevations suggests that until Fort Covington ice receded north of Gouverneur, proglacial drainage may have been channelled south through Hermon and Edwards. This would provide an

explanation for the Fullerville sands and Buddington's (1934) Natural Bridge delta.

The greatest problem that I have encountered working in this area concerns differentiation of MacClintock and Stewart's Malone and Fort Covington drift sheets. Direction of ice movement and till color, the two criteria with which MacClintock and Stewart define their tills, are not reliable indicators in the Canton-Edwards-Harrisville area. Both till fabric orientation and color are extremely variable. So, anyone in need of field work (ho, ho) might consider collection and subsequent analysis of drift material from along MacClintock and Stewart's (1965) Fort Covington drift border from Covey Hill to Harrisville. Hopefully, the outcome of such a study would be the establishment of locally reliable criteria for distinguishing between Malone and Fort Covington drifts.

References cited:

Buddington, A.F., 1934, Geology and mineral resources of Hammond, Antwerp, and Lowville quadrangles: N.Y. State Mus. Bull. 296, 251 p.

MacClintock, Paul, and Stewart, David, 1965, Pleistocene geology geology of the St. Lawrence lowland: N.Y. State Mus. Bull. 394, 152 p.

* *

Dave Fullerton

The Ohio State Geological Survey is initiating a long-term program of detailed investigation of Quaternary stratigraphy in Ohio. The work in the Grand River and Killbuck lobes, by George White and his associates, will be extended westward and southward in the Scioto and Miami lobes.

The Fall field activities were highlighted by a six-day excursion in the Grand River and Killbuck lobes, under the supervision of George White. George Richard Struble, Jerry Groenewold, and I visited several "classic" exposures, as well as new exposures in strip mines, gravel pits, and roadside cuts. Five major aspects of the drifts in the two lobes were demonstrated to our complete satisfaction.

1) The oxidized portion of a till sheet, and not the unaltered till, holds the key to identification and differentiation of drifts in the field. The unoxidized tills seldom can be differentiated without laboratory analysis.

2) The physical characteristics (color, structure, texture, staining, etc.) of the oxidized tills are remarkably uniform throughout the two lobes. The characteristics are not greatly influenced by the nature of the underlying material (shale, sandstone, older till, clay, sand, gravel, etc.).

3) The oxidized tills can be identified and differentiated, with reasonable certainty, where two or even three tills are entirely within the leached horizons and the soil profile. The physical characteristics are related to oxidation, but apparently they are not influenced appreciably by leaching or soil formation processes.

4) All the tills of Late Wisconsin age (Kent, Lavery, and Hiram in the Grand River lobe; Navarre, Hayesville, and Hiram in the Killbuck lobe) are thin and discontinuous. Early Wisconsin drift (Titusville or Millbrook drift) nearly always is within 20 feet of the surface where thick drift sections are exposed. The "end moraines" in both lobes have thick cores of Titusville or Millbrook till, and the morphology is primarily inherited. The Late Wisconsin tills seldom constitute a total thickness of more than 20 or 30 feet on the moraines.

5) In a number of places in the Grand River and Killbuck lobes the Titusville and Millbrook Tills are underlain by several older tills that are separated by weathered horizons, gravel, colluvium, paleosols, or other sediments. The older tills commonly are of greater thickness than the overlying tills and they are chiefly unoxidized.

The Millbrook, Navarre, and Hayesville Tills have been traced into the Scioto lobe in central Ohio. All three tills are present in Richland, Morrow, Knox, Delaware, and Franklin Counties. The relationships of the tills to the Rocky Fork (Gahanna), Darby, Caesar, and Boston Tills in the Scioto lobe are not clear at the present time.

The physical characteristics of the oxidized Titusville, Kent, Lavery, and Hiram Tills in the Grand River lobe are remarkably similar to those of oxidized tills in western New York. The distinctive characteristics of the tills and their equivalents are uniform from the axis of the Scioto lobe in central Ohio to the New York State line. Are the tills east of the Genesee River valley in New York really different? Are they indistinguishable in the field? Or is the problem one of "knowing what to look for"?

The ability to distinguish the Titusville, Kent, Lavery, and Hiram Tills in Ohio and Pennsylvania can be gained only by prolonged contact with the tills in the field, with instruction from someone who has studied them in detail. It cannot be gained through casual visits to a few selected, spectacular, exposures on a two-day field trip. The descriptions of the tills in publications by George White and his associates are accurate and detailed. Nonetheless, the ability to confidently recognize and distinguish the tills cannot be gained from the descriptions.

If Pleistocene stratigraphers in New York State can organize a week-long field excursion in northwestern Pennsylvania, under the guidance of George White, the experience will not be forgotten. A

word of warning, however, I predict that faith in one's own previous assumptions of ages and stratigraphic relationships of tills in New York (not to mention those of other workers) will be seriously undermined. The "Binghamton problem" and the emerging "Olean problem" and "Valley Heads problem" will be overshadowed by even more mind boggling questions.

* *

Paul F. Karrow

This past summer I continued studies on Lake Algonquin east of Lake Huron with more wood submitted for dating and more fossil collections made. Near Waterloo a new date of >39,000 years is the first sub-till date from the interior of "Ontario Island" and is presumed Port Talbot-aged material. Andy Cooper is beginning an M.Sc. study on pre-Catfish Creek tills (early Late Wisconsinan and older) of the Waterloo district. Dr. Anne Morgan is just completing her study of fossil beetles of the Scarborough Formation at Toronto and Dr. Allan Ashworth has returned to North Dakota, taking with him samples for fossil beetle study from the Don Formation (Toronto) and Lake Aegonquin sediments. Dr. Peter Fritz is studying carbon and oxygen isotopes in mollusco with a view to paleotemperature reconstructions. Dr. M. G. Sreenwasa is studying fossil diatom floras of Lake Algonquin age.

Recent publications of mine of interest to New York are on Lake Iroquois molluscs and St. Lawrence valley earthflows (Can. J. Earth Sciences, May, 1972) and a manuscript on bedrock topography has just been completed.

* *

James T. Kirkland

My current research has been primarily concerned with the glacial geology of the western Catskills. The deglaciation of this region was highly controlled by the topography with major effects being in the larger valleys such as the West Branch of the Delaware River where well developed outwash, kame moraine, and kame terrace sequences were formed and to the lee side of the higher uplands where large masses of ice were topographically cut off from their source.

I have been unable to substantiate John Rich's ideas for local glaciation but my work in the highest Catskills has been limited. I would like to hear comments from those who have traversed some of the higher regions in terms of evidence for either local glaciation immediately following the last major retreat or for the presence of relict alpine topography dating prior to the last major advance.

Connally (Glaciogram v. 7) referred to the Olean Glacier as having either originated in or passed over the Adirondack Mountains. In support of this direction of outflow, I would like to note that both

striae and erratics on the Appalachian Plateau suggest having the Adirondacks acting as a center of outflow during the late Wisconsin maximum. In addition if a model of an ice cap with a shear stress of 1 bar (Nye 1952) is fitted to the Wisconsin terminal position in Pennsylvania and New York, the fit of the circular outline of the ice cap is very close to that of the glacial terminus and the center falls in the high peaks region of the Adirondacks. Further if the longitudinal profile of the ice cap is positioned with its terminus coinciding with the glacial terminus, it overtops the Adirondacks by about 1500 feet (457 meters) and if backwasted it remains overtopping them until the terminus recedes to almost the Mohawk Valley. Recession using this model would also leave a thickness of over 1500 feet (457 meters) of ice cut off from its source on the lee side of the Catskills helping to explain the massive till in Sullivan County.

By plotting the intersection of the ice cap with the topography during any phase of retreat, ice margins can be approximated.

Reference: Nye, J.F. 1952, A Method of Calculating the Thickness of the Ice-Sheets. Nature, vol. 169, p. 529-530.

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Donald B. Krall

Pebble counts, garnet ratios, till textures and fabric analyses were used to distinguish Mohawk from Valley Heads drift on the northern edge of the Applachian Plateau. Till texture is closely related to underlying bedrock, with areas underlain by similar lithologies showing a secondary discrimination attributed to drift provenance. Valley Heads drift is siltier, more erratic rich and contains a higher proportion of purple garnets than Mohawk drift.

Till stratigraphy and drumlin morphology demonstrate Valley Heads drift to have been deposited by a major readvance of the Ontario lobe subsequent to Mohawk recession.

A previously unrecognized moraine was delineated between Cassville and Cooperstown, New York. The moraine crosses several divides permitting calculation of ice front gradients, which compare favorably to those of active, steady-state, temperate glaciers. Ice slope considerations and topography suggest correlation of the Cassville-Cooperstown drift border with the Peckamoose substage of the Catskill moraine.

A depositional origin for the Mohawk drumlin field is suggested from analysis of till fabric. First approximation values for the spatial distribution of drumlin fields can be calcualted based on the accretional theory of drumlin origin (Muller, 1963) and the dilatatant properties of till (Smalley and Unwin, 1968). Drumlins form where differential stresses exist on opposing sides of obstacles in the glacial bed. Differential stresses are limited to ice thicknesses of 1100-1400 meters, depending on bed roughness. The equation for ice sheet profiles (Nye, 1952c) gives maximum distances for drumlin

formation of 60-100 km. behind the ice margin. Calculations agree with location and distribution of most drumlin fields.

Mapping of the Cassville-Cooperstown moraine enables tracing of additional recessional positions of the Olean ice sheet. Recession was uniform, with little local valley control, suggesting an active, retreating ice fron rather than widespread ice stagnation. In contrast to suggestions of previous writers, ice recession was sub-parellel to the Olean terminal moraine as well as perpendicular to striations and ice-scoured through valleys.

Regional correlations imply deposition of the Cassville-Cooperstown-Peckamoose moraine was simultaneous to the 15,000 years B.F. Rosendale positions in the Wallkill Valley. Recession of the Mohawk lobe and readvance of the Ontario lobe is suggested to be concurrent, resulting from initial isostatic rebound subsequent to deglaciation of the Adirondack dome. The Valley Heads moraine is therefore a morphostratigraphic rather than a time-stratigraphic unit.

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Nye, J.F., 1952, A Method of Calculating the Thickness of the Ice Sheets: Nature, v. 169, p. 529.

Smalley, I.J. & Unwin, D.J., 1968, The Formation and Shape of Drumlins and their Distribution and Orientation in Drumlin Fields: Jour. Glaciol. v. 7, p. 377-390.

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Ernest H. Muller

With Bryce Hand of the Syracuse University Geology Department, I have been much interested in developing a detailed interpretation of the cutting of the Syracuse Channels. At the Northeastern Sectional Meetings of the G.S.A. in Buffalo last spring, and on a field trip of the New York State Geological Association this fall we presented the evidence which argues for at least one catastrophic event in their development when a drift plug was abruptly swept out of the Rock Cut Channel, probably lowering the level of the proglacial Onondaga through lake by approximately 100 feet in a matter of hours or at most a few days.

Frank Wright defended his Ph.D. dissertation at Syracuse University in September and is now teaching at Capital University in Columbus, Ohio. The subject of his thesis is "The Pleistocene and Recent Geology of the Oneida-Rome District, New York". [See contribution by Wright p 15. ed.]

Sal Giardina, a graduate student at Syracuse University is completing his M.S. thesis which interprets a wealth of sub-surface engineering data on the drift stratigraphy of the southeastern part of Syracuse.

THIRTY

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Walter S. Newman

What may be the oldest finite radiocarbon data from Long Island has been obtained on a silty peat sample out of the excavation for the Orbach Queens Fashion Mall just northeast of the intersection of the Long Island Expressway with Queens Blvd. in Rego Park, Queens Country. Engineering borings disclosed a thick section of laminated silts extending to more than 100 feet below present sea level. These laminated silts are traceable laterally for two miles towards the east to Flushing Meadows as well as for three miles along the north-south axis of the Flushing Bay-Flushing Meadows embayment. For the most part, the laminated silt (the "Flushing Formation") contains about 70% Cretaceous spores and pollen, the balance of the spectra being composed of Pleistocene pollen and spores. I believe the "Flushing Formation was deposited in a proglacial lake.

The "Flushing Formation" is rarely found higher than 20 feet below present sea level. At the site and above the "Flushing Formation", I observed blocks of folded, faulted and distorted stratified sand and gravel. Within the gravelly sand level, but also above it, are again found laminated silts. At about present sea level and above both the upper laminated silts and stratified drift, I noted a frequented block-faulted and rotated peat to peaty silt layer. From sea level to ground surface about 20 feet, I observed a till-like or a fill-like till. This uppermost unit is not stratified and contains many broken 2 x 4's, bricks, cans, metal, etc. Nevertheless, the Soils Engineer responsible for the foundation design, Dr. Melvin I. Esrig, at one time a Cornell Professor of Civil Engineering, insists the lower portion of this upper unit is honest-to-goodness till. Mel actually collected the sample I ultimately had dated because the stuff I myself subsequently collected did not seem as suitable for dating. About a mile to the west, I did find a thin till on top of outwash and suspect this is essentially the relationship as initially observed by Dr. Esrig and myself. On the other hand, tidal marsh peat actually does pinch out at the site and much of the area from the excavation east to Flushing Meadows is filled-in tidal marsh. Initially, I argued this out with Mel and finally decided to date his sample, betting him that it would be less than 1000 years old. The silty peat sample taken at about present sea level (RL-157) dated at 13,470 $\pm$ 380 years. The C-14 sample itself yielded 87 pine pollen grains, 6 spruce, and two spores. The adjacent laminated silt again yielded about 70% Cretaceous pollen and spores.

The relationships at the now buried Orbach Fashion Mall excavation suggest to me a very late glacial advance shortly after 13,00 years B.P. The date plays havoc with the very few other dates from the general area. However, I venture the guess that the date and relationships require a last glacial advance down the axis of the Hudson Valley subsequent to the time when the immediately adjacent higher areas were long since deglaciated. If we grant that the late Winconsin ice sheet was lobate during its waning stage, glacier ice distribution in the Hudson-Champlain trough may well have had a configuration similar to that of Valley Heads ice. However, the intrusion of rising sea level into the Hudson Valley perhaps caused rapid calving of the simulated outflow glacier in the valley. The postulated calving event of the "wet-base" Hudson glacier was followed within a very short time interval by a temporary apparent lowering of sea level because at about this time the rate of regional differential isostatic rebound for a short time exceeded the rate of sea level rise. The increased regional glacial slope, the temporary lowering of the regional snow line simply because of this ephemeral increase in relative relief vis-a-vis sea level and local elevations, and the short lived recession of the sea from the lower Hudson valley (and adjacent waters) caused a last advance of the ice to Long Island. Indeed, I wonder if local mountain glaciation in the northeastern United States was caused simply by that interval when largely deglaciated surfaces were rising more rapidly than sea level causing, for a short interval only, a lowering of the regional snow line. Finally, when sea level rise once again began to exceed the differential rebound rate, the Hudson Valley ice very rapidly calved and wasted away for the last time.

My older work in the lower Hudson Valley, confirmed by the work of Dennis Weiss, requires rather high salinity waters at least to Peekskill by 12,000-13,000 years ago. Since the Champlain Sea was flooding into the Champlain Valley at about the same time, I also wonder if, for a short time interval, Fairchild's "Gilbert Gulf" strait between the Champlain Sea and the New York Bight might have actually existed.

Some years ago I obtained from Dr. William A. Ritchie, then the State Archeologist, an oyster valve he secured from the Bannerman Island Site just south of Beacon on the east bank of the Hudson River. This multicomponent site is described in:

Ritchie, W.A., 1958, An introduction to Hudson Valley prehistory: NY State Mus. Bull., No. 367.

The valve was secured from a small oyster midden located above a hearth whose carbonized wood gave a radiocarbon date of 4474 ± 300 years. The oyster valve yielded a date of 6150 ± 120 years (BL-177). Either the hearth was intrusive through the midden or one of the dates is incorrect. If the oyster valve date is correct and the oyster was harvested locally, the salinity of the Hudson Estuary at Beacon

must have been 10 o/oo or more some 6000 years ago. The present salinity is well below 1 o/oo. My 1969 paper requires sea level in the lower Hudson Valley to be at least 30 feet below its present level. Either there was much less organic silt in the valley at that time allowing easier sea water access up the valley or/and evapotranspiration in the upstream Hudson drainage basin was notably greater than it is today, another suggestion supporting the Altithermal concept for the mid-Hudson. All this means that even though some of us argued Gordon Connally out of his position that his late glacial erg episode south of Glens Falls lasted well into Holocene times, Gordon may be correct after all.

Editor's Note

Readers will please refer to reproduced article from National Enquirer p. 2a which contrary to the above, dates the ice front at Queens as 1.5 m.y. ago. Since the latter article is published and Newman's is not, the 1.5 date must be correct.

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F. K. Szucs

F. K. Szucs traveled extensively this past summer and contributed a paper on "Pollution Problems and Abatement in the Slippery Rock Watershed, Pennsylvania" at the International Geographical Union meeting in Budapest. Time was spent in Belgium with the Belgian Environmental Protection Agency and with the University of Liege. A paper published by the University of Liege on "Climatic Changes and Landscape Development in Moraine State Park, Pennsylvania: has just come out. Future plans include a study of the glacial and periglacial landscape in Pennsylvania and New York to be compared with Belgian observations.

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George W. White

I have completed a map of the glacial geology of Holmes County Ohio, with an accompanying text, which is now in press at the Geological Survey of Ohio. This county is of considerable interest because only the northern half is glaciated, but it does contain at least three Winconsinan tills of Altonian and Woodfordian Ages as well as some earlier deposits. An earlier map had appeared in an Ohio Geological Survey Bulletin 47, 1949, based on work actually done mostly before 1931. The earlier work was entirely morphological; it is stratigraphically unsophisticated.

No doubt you will want to note the appearance of the Till Symposium volume in a separate little review that you yourself may want to write.

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