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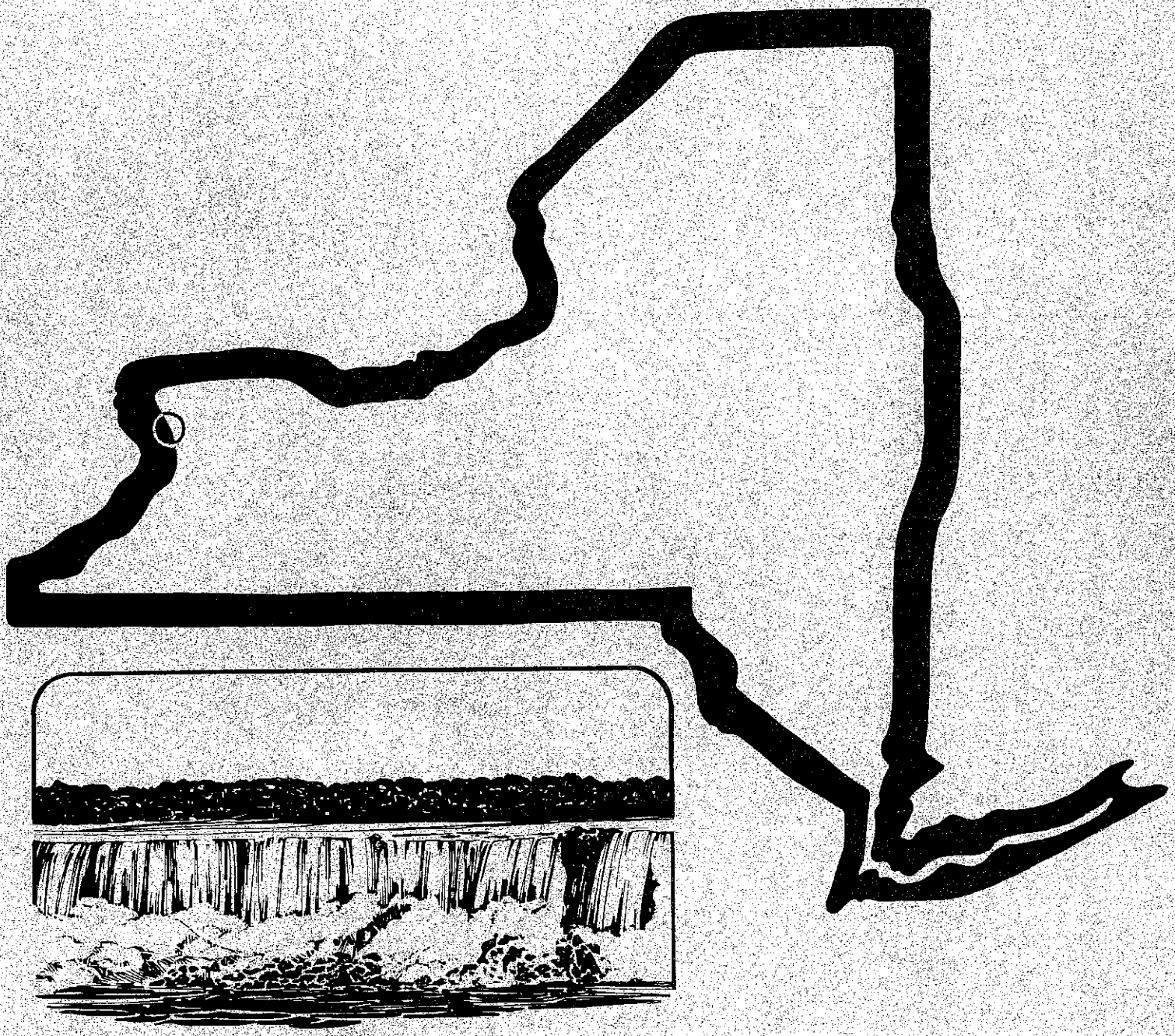
P.F. KARROW

NEW YORK GLACIOGRAM



DEPARTMENT OF GEOLOGY

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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 the appropriate authors. It is suggested that reference to information in the GLACIOGRAM be identified merely as informal communication.

Parker E. Calkin

Parker E. Calkin - Geology, University at Buffalo

After a sabbatical at INSTAAR, Boulder in the Spring I spent a month in Prince William Sound and the Copper River area working on Late Holocene glaciation and tree-ring dating with Greg Wiles and Ph.D. student David Barclay. MA student Ross Richards is also working in Alaska - the Bering Glacier ice sinks, with Bruce Molnia's USGS group.

In August I coordinated an environmental-engineering geology trip around Niagara Falls with Gary McKenzie (Ohio State U) and then attended the International Geomorphology Conference at Hamilton.

MA student Mike Liener (now teaching geology at Irondequoit High School) reports that his Quaternary Geology mapping of Monroe Co. is complete (at 1:62,500 scale) and he is able to differentiate two till units on the basis of exposures and boring logs. The logs show that the tills are apparently separated by a glaciolacustrine unit. Both tills are red and not well exposed to make differentiation easily possible on compositional grounds.

MA student Eric Pefley is STILL putting together the subsurface data in the Connewango Valley of Chautauqua County. Unfortunately he must spend most of his time at his full time job as an oil-gas geologist and driller. He's now concerned with a very shallow yet prolific oil field in turbidite deposits in western New York.

Editor's apology - for those who tried to send contributions via E-Mail. My address is:

"glgparkr@ubvms.cc.buffalo.edu"

I'd be glad to have them via E-Mail in future if that is convenient, but will send out notices again.- Parker

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Aleksis Dreimanis and Steve Hicock -Geology, University of Western Ontario

Not too much to report about the New York region.
Aleksis spent this summer writing review papers on the geology of Latvia for the Encyclopedia of World Regional Geology and, jointly with V. Zeles from the University of Latvia, for the volume on Glacial Deposits in NE Europe. In the Fall of 1993 he visited Latvia where he updated these reviews and participated in a re-examination of the stratotype section of one of the interstadials that will result in a re-interpretation. Another joint project with Zeles is the deciphering of glaciotectonic structures in drumlins.

Papers published:

Small to medium-sized glacitectonic structures in till and its substratum and their comparison with mass movement structures. Quaternary International 18, 69-79.

Downward injected till wedges and upward injected till dikes. Sveriges Geol. Undersokn. Ser. Ca 81, 91-96.

Water-eroded crescentic scours and furrows associated with subglacial flutes at Breidamerkurjokull, Iceland. Boreas 22, 110-112.

Steve has been supervising graduate students in British Columbia and writing a glacial geology paper based on an extensive coastal exposure in the Queen Charlotte Islands. He is also working on a paper about interpreting eigenvalues of stone a axis fabrics in till.

Paper published:

Glacial octahedron. Geografiska Annaler 75A, 35-39.

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P. Jay Fleisher - Geology, College at Oneonta

Since 1988, I've had the pleasure of working at the Bering Glacier with Ernie Muller and Don Cadwell, plus Chuck Rosenfeld (Oregon State), Palmer Bailey (CRREL), Austin Post (U.S. Geological Survey, retired), Cal Heusser (NYU, retired) and several students from our respective campuses. Recently we established an affiliation with the Prince William Sound Science Center, Cordova, as BERG - the Bering Glacier Research Group.

In early June, 1993, we observed several major changes at the Bering Glacier suggesting that the glacier might surge in the very near future. Broad areas of the main trunk glacier were heavily crevassed and thickened ice pressed against the adjacent Grindle Hills. Within days we were able to confirm the down glacier movement of a kinematic wave at an estimated rate of 50-60 m per day. We then radioed the news to Austin Post, who conveyed it to Bruce Molnia, U. S. Geological Survey. Bruce has since submitted summary media articles to EOS, Geotimes and Science News which many of you have already seen.

With support from NSF, BERG has return in October and November to monitor the effects of the surge. The results of our summer and fall field work were presented at GSA in Boston, including measured rates of advance of 6 m/day at the eastern ice margin of the piedmont lobe. This active ice margin is sliding forward as a high wall (20-50 m) of broken, unstable ice blocks up to 30 m in dimension. Low-angle basal thrusts and deformed subglacial sediment is dramatic evidence of surge-related dynamics. An overflight in November gave us GPS data from which the position of the entire glacier terminus will be mapped.

Cooperative data-sharing is underway that will combine USGS ice-penetrating radar data obtained from 1990-1992 with similar data collected in conjunction with CRREL personnel, under the direction of Commander Palmer Bailey.

At the present time our investigation calls for brief return visits in January and March, and a full month in early summer, 1994.

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Jon Harbor - Geology, Kent State University

A special issue of the journal *Geomorphology* is being produced in connection with the special session on glacial geomorphology taking place at the Fall (December) 1993 American Geophysical Union meeting in San Francisco. The theme of the session is "Glacial Geomorphology: Process and Form Development", and includes theoretical and empirical papers focused on glacial processes (mechanics, rates and patterns) and the relationship between process and form development over a range of spatial and temporal scales. I have included with this letter a short description of the session theme, as well as a current list of papers to be presented. However, submission of papers for the special journal issue is not limited to participants of the AGU session.

If you would be interested in submitting a paper for consideration for the special issue of *Geomorphology*, the deadline for manuscript submission is February 28th, 1994. Manuscripts must fit in with the theme of the AGU session, and submission of a manuscript signifies that you will be willing to review at least one other paper submitted for the issue. Three (3) copies of each manuscript (including figures, tables, photos, etc.) should be mailed directly to me by the deadline. You should follow Elsevier guidelines (attached) for manuscript preparation, however do not send figure originals or text on computer disk at this time. Manuscript review and decisions on acceptance should be completed by mid- May, 1994, with publication of the issue targeted for late 1994.

MAIL 3 COPIES OF THE MANUSCRIPT BY FEB 28TH, 1994, TO:

Jon Harbor
Geomorphology Special Issue
Department of Geology
Kent State University
KENT OH 44242-0001

If you have questions, please contact me at 216-672-3677 (telephone) 216-672-7949 (fax) or JHARBOR@KENTVM (email).

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H41E CA: 401 Thurs 0815h
Glacial Geomorphology: Process and Form Development
Presiding: J M Harbor, Kent State Univ

0815 h INTRODUCTION: **J M Harbor**, Kent State Univ
0820 h **H41E-01** INVITED
Unglaciated Dome Land Wilderness' Landscape Closely Resembles Glaciated Yosemite's Landscape: Glaciers Relatively Ineffective in Granitic Sierra Nevada: **J P Schaffer**
0840 h **H41E-02**
Insights From ^{36}Cl Buildup Dating Into the Development of Late Pleistocene Glacial Landforms in Mountains of the Western U.S.: M G Zreda, F M Phillips
0855 h **H41E-03** INVITED
Late Holocene Rates of Sediment Accumulation in East Greenland Fiords: Do They Indicate Sediment Retention in Fiord Basins on Glacial/Interglacial Time-Scales?: **J T Andrews**, A E Jennings, N Rynes, K M Williams, J D Milliman
0915 h **H41E-04**
Pre-Holocene and Holocene Erosional and Depositional History of Bering Trough and Vitus Lake, Bering Glacier, Alaska: **P R Carlson**, B F Molnia, A Post
0930 h **H41E-05**
Morphology and Sedimentary Processes: Ice-Marginal Vitus Lake, Bering Glacier, Alaska: **B F Molnia**, A Post, P R Carlson
0945 h **H41E-06** INVITED
Glacial Debris Fluxes - Some Progress?: **R B Alley**, D E Lawson, E B Evenson, J C Strasser
1000 h BREAK
1030 h **H41E-07** INVITED
Diversion of the Upper Bear River: A Case for Late Quaternary Sierra Nevada Glacial Transfluence: **L A James**
1050 h **H41E-08**
Rapid Geomorphic Change Caused by Glacial Outburst Floods and Debris Flows Along Tahoma Creek, Mount Rainier, Washington: **J S Walder**, C L Driedger
1105 h **H41E-09** INVITED
The Relationship of Drumlins to Other Subglacial Deformational Processes: **J K Hart**
1120 h **H41E-10** INVITED
Penetration of Ice Into Subglacial Sediment by Regelation: **N R Iverson**
1135 h **H41E-11**
The Development of Glacial-Valley Cross Sections Under Conditions of Spatially Variable Resistance to Erosion: **J M Harbor**

1145
Validation of a New Model of Glacial Abrasion of Hard Beds · B. HALLET

Paul Karrow - Earth Sciences, University of Waterloo

The rumours were true - the Stratford Conestogo report was published in March (O.G.S. Rept. 283, 104p.). This completes published coverage of the area around Kitchener-Waterloo with "final" full reports. In July O.G.S. further produced seven preliminary maps of bedrock topography for areas near Waterloo and north of Toronto, prepared 1989-1992.

Meetings attended this year included SE G.S.A. in Tallahassee, Midwest Friends in Wisconsin, IGCP-253 Termination of the Pleistocene in Winnipeg, MAGNEC (neotectonics) in Ottawa, and G.S.A. in Boston. A paper on Huron basin shoreline surveys was given in Winnipeg and one on the Waterloo moraine at Boston. Co-author John Coakley (CCIW, Burlington) presented a paper on the evolution of Hamilton Harbour at the Geomorphology meeting in Hamilton, which I didn't attend. Another long-delayed publication was the revision of Volume 1 of North American Stratotypes. This appeared as Publication No. 8 of the Quaternary Sciences Institute on behalf of INQUA.

Drilling continues as part of the study of hydrogeology of the Waterloo area. V. Paloschi completed his M.Sc. on the Waterloo moraine and work is continuing with new student Simon Gautrey. M.Sc. student R. Farvacque carried out study of archeological sites and former Superior lake levels at Pukaskwa National Park. Geoarcheology will also be the focus of the M.Sc. thesis by Andrew Stuart, who will concentrate on Paleo-Indian sites near Thunder Bay, also on Lake Superior. J. Yang is continuing her M.Sc. study of a marl swamp at Cambridge, Ontario. B. Buhay a Ph.D. student co-supervised with Tom Edwards is nearing completion of his isotopic study of tree ring climatic records in the last few centuries near Waterloo.

The Geological Association of Canada annual meeting will be at Waterloo May 15-18, 1994. There will be a local Quaternary trip and a longer one to the Oak Ridges moraine, north of Toronto. Owen White and I are organizing a symposium on urban geology of Canadian cities (coverage of 19 cities planned) and special sessions are planned on Quaternary paleoclimates, the Burning Tree mastodon site (of Ohio), and onshore-offshore geology. Owen is now Director of the Quaternary Sciences Institute here, while Alan Morgan is Deputy Director and Ian McKenzie is Secretary Treasurer.

With continued effort to finish and write up old work, little new field work was undertaken this year. One interesting foray was to Sucker Creek in the Meaford Tank Range on Georgian Bay to look at bank exposures described by George Stanley in the 30's. The passage of a half century makes quite a difference, with then cleared fields now grown up with scrub bush during the military occupancy. Long inaccessible, it has recently been opened up to us. More extensive field work is planned for the summer of '94 to study valley terraces and raised shorelines in southern Ontario.

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Ernest H. Muller - Geology, Syracuse University

The Tully Valley Earth Flow of April 27th has spiced up the lives of surficial geologists in this area since last spring. The slide buried a highway, destroyed three homes and disrupted additional households for several months.

Fortunately, Bill Kappel (WRD-USGS, Ithaca) was working in the area at the time and was able to provide immediate geologic expertise. With Dawit Negussey (C.E., Syracuse University) and others in the USGS, NYSGS and Syracuse University communities, he has continued to assist Town and County authorities in informal advisory capacity .

The review of numerical dating information on New York glacial and nonglacial episodes, which Parker Calkin and I have had in the works for some time is scheduled for the September issue of the Canadian Journal of Earth Science and therefore should appear in due course. This review is the evolutionary successor to previous abstracts with programs presented at NCGSA in Toledo (1991) and the NYSGS Mapping Symposium in Oneonta (1992).

Under duress, I presented a paper on the Central New York Drumlin Field at the International Geomorphology Conference in Hamilton, Ontario, August 23rd. Although I stated a case for progressive accretion as an important process in drumlin formation, clearly the last word remains to be written on the subject and New York drumlins afford a fertile field for further study.

At a Symposium on New York Geology honoring Bob LaFleur on his retirement last May, I gave a descriptive paper on glacial meltwater channels on the west flank of the Tug Hill Plateau. In a note submitted subsequently to Northeastern Geology, Don Cadwell and I interpret the origin of these features by analogy to modern horseshoe channels (Mickelson's "in-and-out channels") eroded during recent recession of Bering Glacier, Alaska.

In a sense the horseshoe channels ms was timely, for on June 3rd when Jay Fleisher, Don Cadwell, Charles Rosenfeld and I returned for our 6th season in the vicinity of Bering Glacier we found it wracked and in labor due to passage of a kinematic wave. Whereas the glacier margin had receded 4 to 6 kms in the previous 25 years, all evidence promised that the terminus would soon begin a surging advance.

We returned October 18-20, (reported at GSA in Boston, 10/26) for aerial reconnaissance of the glacier and ground survey of changes in the Grindle Hills area on the eastern

edge of the piedmont lobe where we have focussed recent work. In reconnaissance on November 20-21 we found that ice advance of about 500 m has again blocked an outlet channel whose opening we witnessed in August, 1989. As a result, Tsiu Lake was rising at 3 - 4 m/day and has probably returned now to its pre-1989 level.

The Bering Glacier studies continue to suggest by analogy just how rapid and drastic changes may have been along the Pleistocene ice sheet margin in New York.

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William D. Sevon- Pennsylvania Geological Survey

I am still mapping surficial deposits in southern PA, mainly York County at present. That mapping will be concluded within the next year and a report with 12+ 7.5-minute quadrangle maps will be produced. The mapping done years ago in north central PA has not been published and may end up as open file material only.

Some significant work done or being done by others in PA. Duane Braun, Bloomsburg U., is working with PA Geol. Survey and U. S. Geol. Survey on the geology of the Allentown 1:100,000 quadrangle. That work will further define the Illinoian and pre Illinoian boundaries in PA. Frank Pazzaglia, Penn State PhD graduate, did some fine work on the terraces of the lower Susquehanna River. That work includes correlation of the terraces with the coastal plain which pushes the age of the highest terraces back into the Miocene and also development of a tectonic model for the development of the strath terraces. That work will be published in the near future. Tom Gardner, Penn State, has been working with a sequence of pre Illinoian lodgement till and overlying lacustrine beds at Antes Fort near Jersey Shore along the West Branch Susquehanna River. The lacustrine beds have yielded a strong cleanly reversed polarity. Tentatively the sequence is assigned to the early Pleistocene pre Illinoian-G event, oxygen isotope stage 22, at about 820-860 ka. The sequence could be as old as pre Illinoian-K at about 2.1 Ma. Publication of this information is forthcoming. Tom also has a student working on the Pleistocene terraces along the Susquehanna.

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Richard Young - Geology, College at Geneseo

Drilling in the Irondequoit Bay sand bar at Rochester has apparently defined the base of the postglacial lake sequence record for Lake Ontario at approximately 42.7 meters (140 ft) below modern lake level. Two ages from separate drill holes give ages near 40 meters of 11,340 and 11,790 BP (ave. 11,565 BP), which is essentially the age for Early Lake Ontario argued by Pair and Rodrigues (GSA v. 105, Sept. 1993) and by Pair et al., (GAC Special Paper 35). The transition from postglacial to glacial sediments below this depth is also supported by resistivity, self potential and gamma logs in several test holes, as well as pre late Wisconsin ages on the much compacted and overridden lacustrine sediments and intercalated tills below. However, this 42.7 m datum below modern Lake Ontario is 40± meters above the level of Early Lake Ontario that has previously been proposed for this longitude (GAC Special Paper 30).

If this elevation is accepted as a minimum elevation for Early Lake Ontario at Rochester and is projected to either the Duck-Galloo or Cape Vincent Sills outlet controls discussed in the literature, the resulting slope (using published isobases) of the Early Lake Ontario surface cannot be parallel to the older Lake Iroquois shoreline in this region (as sometimes assumed). The Lake Iroquois shoreline slope is about 0.49 m/km projected from Rochester to the St. Lawrence, whereas the projected Early Lake Ontario slope could be no greater than 0.18 m/km. Given the possible 1000-year gap between the Lake Iroquois and Early Lake Ontario stages, and the relative lack of precise elevation data for the area west of the St. Lawrence Valley, these new figures suggest that there was a significant time period between Lake Iroquois and the establishment of Early Lake Ontario, and that the uplift curves flatten significantly to the west of the St. Lawrence Valley. Much of the elevation control previously used to construct the lake elevations to the west are based on assumptions of water depth above dated horizons in lake bottom cores. These new dates near Rochester have the advantage of being tied to the building of the Irondequoit Bay bar (as the lake rose) and of being minimum elevations for Early Lake Ontario at the site.

The new data imply there was a "gradual" drop in lake levels from Lake Iroquois to Early Lake Ontario over some significant time, which is demonstrated by the significant differences in shoreline slopes (uplift rates).

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CONTRIBUTORS PAGE