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NEW YORK GLACIOGRAM

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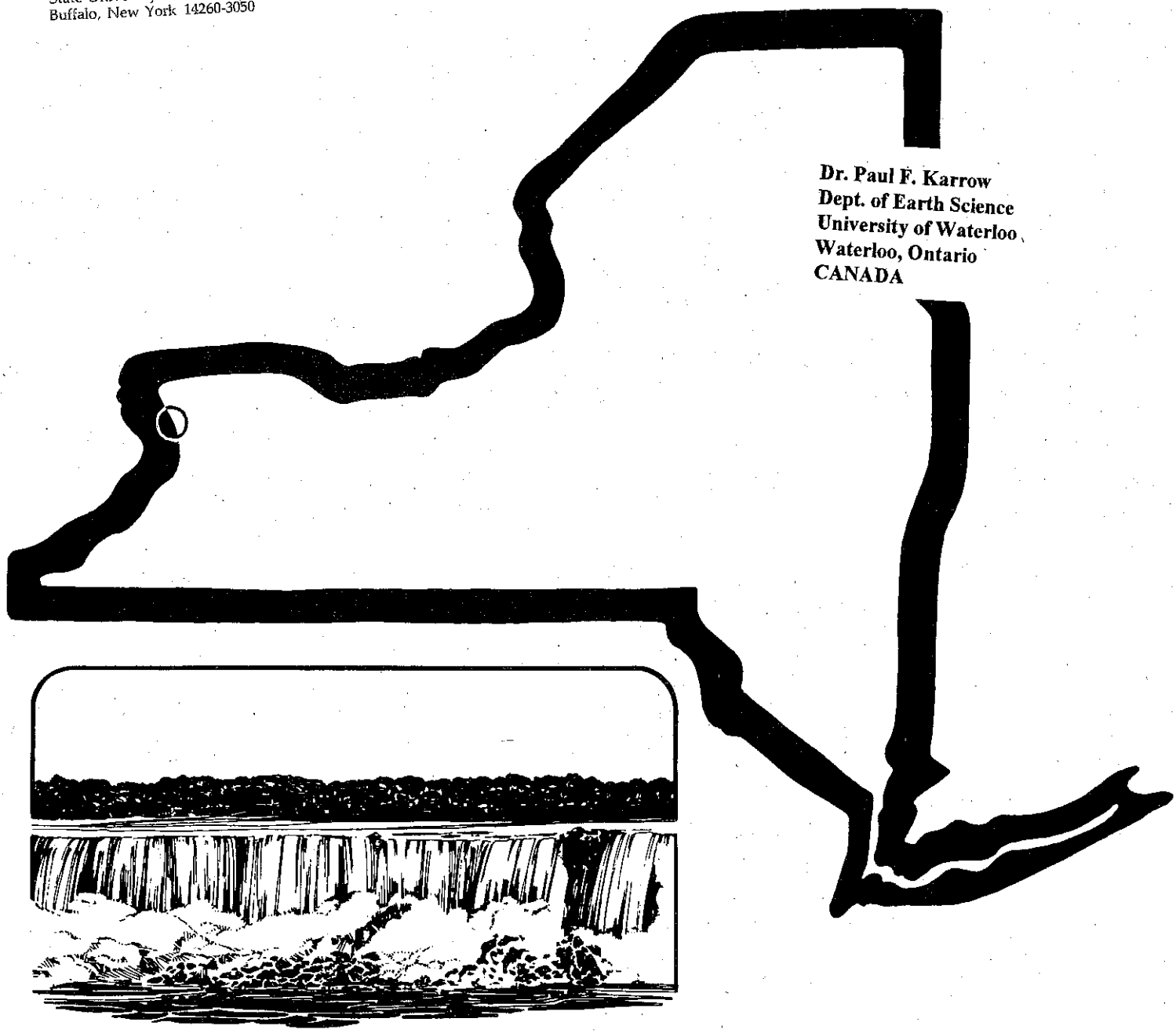

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EDITORIAL POLICY

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 Calkin - Dept. of Geology, University of Buffalo
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This has not been a good year for completion of local New York glacial geology projects. Nevertheless, one of my longest-term Masters students - Eric Pefley, a full time, self employed and (very successful) geologist in western New York, has recently logged and sampled (at 5 ft intervals) a well (the Countryside Sand and Gravel Wll No. 2)drilled through 790 feet of drift to bedrock in the Connewango Valley of Chatauqua County. This is the probable preglacial path of the Allegheny River. Eric's thesis study (in progress for several years) was based on an earlier nearby well that showed a pollen-rich zone in clay below till just above bedrock at 550 feet. This new well displays two till units separated by gravel over a pollen-rich lake clay unit which, in turn, overlies a compact stony till with well striated clasts and bullet boulders. This time many samples of the 20-30 pollen-rich zone are available and a reasonable portion has been sent this May to Jock McAndrews at the Royal Onrario Museum for initial pollen study. While the results of the earlier (550 ft) well indicated that there was a glacier-free interval of lake formation preceeding two intervals of till deposition, the pollen was exhausted before a climatic determination could be made. This time we may have an interstadial or even interglacial interval defined, or we may have nothing newer than evidence of three tills near the margin of the Late Wisconsin ice advance.

Paul Bierman - Dept. of Geology, University of Vermont
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We have had a busy winter coring. Sarah Brown and Dave Shaw, UVM MS and BS candidates respectively, with help from P. T. Davis and myself spent 5 days on the ice of Ritterbush Pond, Vermont this winter. We collected four, three-inch by five-meter cores with Tom's Reasoner coring device that we had outfitted with a very tight piston. We found that three-inch PVC is anything but constant diameter! The cores are in cold storage waiting for the semester to end so we can spilt and analyze them at a more relaxed and careful pace.

We've done extensive 14-C dating (fourteen AMS dates with replicates) of the original Ritterbush core that we collected two years ago. The results of these and numerous 13-C analyses made by Andrea Lini (UVM) and LOI analyses (P.T. Davis, Bentley) will, with any luck, appear in GSA Today before the year is out. The initial story is speculative but we find coherence between terrestrial sedimentation events in the lake and activity on the five alluvial fans we have so far studied in Vermont. The linkage to climate is even more speculative but it appears as though hillslopes were eroding more quickly both during the warmer drier early Holocene (9 to 6 14-C ka) and the wetter cooler late Holocene (2 ka to present).

We would welcome discussion with anyone who has other records of Holocene hillslope activity in New England!

This spring will see the new cosmogenic isotope extraction lab christened with three new HEPA filtered hoods, new counters, new floors and a bright yellow safety shower. After 6 months of quiet, we should be generating nuclide data again including a few measurements from the peaks of New England, more from the fans of Owens Valley and many stream sediments from around the world. Many thanks to the UVM provost for this one.

This has been a busy spring for my students: Mike Abbott finished his MS thesis examining the 18-O signature of groundwater and precipitation on Mount Mansfield, Amy Church finished her MS thesis on alluvial fans of Vermont, Kim Marsella has a Geology paper in review on her Baffin Island work and a thesis nearing completion, and Tim Whalen is pulling together his terrace story for selected parts of the Winooski River Basin and should complete his MS thesis this summer.

Julie Brigham-Grette - Dept. of Geosciences, University of Massachusetts
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Here it is:
CONNECTICUT VALLEY WORK
Controversies over the deglacial history of the Conn. Valley and the drainage history of Lake Hitchcock has inspired us to seek some local answers. In particular, recent scuba exploration of the Connecticut River by Ed Kiekowski, an avid diver and faculty member in the UMass biology department, has resulted in the discovery of large unstudied exposures of sedimentary varves dating back to the very end of the last glacial ice retreat about 15,600 to 12,300 years ago. Today, the modern Connecticut River flows across the ancient floor of the lake and, in places, cuts through the sediments to bedrock. However, recent periods of high run-off have elsewhere eroded new but submerged exposures of the lake sediments. In 1996, Ed explored a short stretch (<2 km) of the river in northwestern Massachusetts and discovered extensive exposures at depths of 10 and 20 meters. What was most unique about the submerged Pleistocene sequence was the discovery that the varves are providing a habitable substrate for larvae of the chironomid genus Axarus, a taxon previously unreported in this ecosystem.

These underwater exposures seem to represent some of the oldest varves in this part of the Lake Hitchcock sequence. Therefore several of us have launched into investigating parts of the story with the hope of correlating the local sequences with Jack Ridge's work to the north. We now have funding for a long core through the varve sequence here in the Amherst area and we have a grant pending with the National Geographic to core and explore the underwater varve sequences. Al Werner, Mt Holyoke College, has taken the lead on getting AMS 14C dates on a few of the concretions associated with the varves and Rich Little, Greenfield Community College, is preparing a new educational video on the history of Glacial Lake Hitchcock. In collaboration with Dena Dincauze and her students in the Anthropology Dept, we are also investigating the terrace history of the Connecticut Valley to determine the rate of river downcutting after Lake Hitchcock drained. It is hoped that this research we will allow us to determine the effects of isostatic rebound on the downcutting history.

James E. Bugh - Dept. of Geology, State University College at Cortland

Jim Bugh reports: Personnel and search committees have prevented recent field work, but mining of the sand and gravel continues to present opportunities for mine reclamation reports and EIS, not to mention a new wellhead protection law.

Donald Cadwell, New York State Geological Survey

This summer I have two projects. I will be working with Jay Fleisher and Ernie Muller at the Bering Glacier during June, continuing to work on surge related topics. I also will be working with the NYS Emergency Management Office and their Lifelines Program, during July and August, to develop the ability to conduct earthquake loss estimates for scenario events. Specifically, our work will help to determine expected damages, casualties, shelter needs, and secondary effects, as, fire and toxic releases, and then utilize this information on mitigation and response planning. Seismic shear-wave data collection is expanding the database for the projection statewide of seismic hazards and obtaining detailed information about the varied surficial materials across New York State. Specific site locations for interpretation of seismic data are chosen based on the type of surficial materials and the susceptibility to liquefaction and landslide. Onondaga County was selected for study this summer because (a) there is a high percentage of fine grained material, lacustrine sands, silts and clays, deposited in the 400 square mile Glacial Lake Oneida; and (b) Syracuse, with an urban population of greater than 200,000, is situated on this lake plain.

The NYSGS has provided SEMO with earthquake hazard maps based on the data sets from Columbia, Dutchess, Rensselaer counties, and portions of Greene and St. Lawrence Counties, New York. These maps factor probabilistic peak-acceleration values and soil amplification, and delineate hazard areas in terms of Modified Mercalli values. Major earthquake damage occurs from attenuation of S-waves (shear-waves) as they travel from bedrock into the surficial glacial sediments. As the shear-wave velocity decreases in the unconsolidated sediments (together with a shortened wavelength), there is a corresponding increase in wave amplitude. The increased amplitude produces greater ground shaking and, consequently, increased damage.

Donald R. Coates
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He reports two items: " (1) The 1997 Binghamton Geomorphology Symposium is being held in Bologna, Italy in September. The topic is GEOMORPHOLOGY AND ENGINEERING. (2) I will write the preface to the proceedings volume and am looking for ideas, suggestions, updates on relevant contributions, and interesting case histories that prove the interplay of the two disciplines. Therefore I solicit your help, and give prior appreciation for your input."

David J. DeSimone
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He reports : All research plans were cancelled,including a trip to the Beartooths where my thesis student was getting her research underway and the second year of our Keck project held here in Williamstown investigating the structural geology and its implications for geomorphology in the tri-state region. The latter project went along quite well by all accounts and reinforced the hypothesis generated during summer '95 about a basal Taconian floor thrust with imbricated splays carrying both carbonates and phyllites up to higher stratigraphic levels. The Stockbridge carbonates we see in the local valleys are indeed allochthonous and not in situ as has been traditionally held.

Locally, there is another 'Friends' group, the Friends of Grafton Lakes State Park in my home town. We are in the embryonic stage of putting together an interdisciplinary collection of data about the park geology,water resources and ecology. The compilation will be accompanied by some original data gathering. Our goal is to share these data with others and use them to further educate the users and general public about the park and its natural and cultural history.

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Bering Glacier field work to continue in 1997

This summer I will have two SUNY-Oneonta undergraduates (Peter Lissitschenko and Jason Dell) with me at the Bering Glacier. Each will be involved with a field project designed to document changes in the ice-contact lake environment since the end of the 1993-95 surge.

Ernie Muller and I will be looking at several new bluff exposures of eastern foreplain stratigraphy. Our focus this summer will be on several key locations where we hope to decipher subtle evidence of Neoglacial surge events.

Don Cadwell has a seismic survey planned from which we hope to get data on thickness of foreplain drift and possibly the configuration of bedrock that we think controls a persistent subglacial conduit system.

With continued National Geographic support, Ernie Muller, Dorothy Peteet and I will
return to the western Bering/Steller piedmont region for additional field work in the vicinity of Katalla Valley where we will be coring bogs and looking at upland slopes to determine Pleistocene extent and deglacial chronology.

Douglas Grant - Terracon Geoscience, Nepean, Ontario
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Kejimkujik National Park in southwestern Nova Scotia was established for its outstanding glacial features, notably drumlins, eskers, and rock basins, which produce a terrain famous for wilderness canoeing. The park's glacial features and general surficial geology were mapped to provide the basis for visitor information programs, as well as for various engineering activities and ecological research. Surficial geology maps at 10 000 scale, digitized into SPANS GIS, are based on photo-interpretation and extensive ground traversing and sampling. Physiographically, the area comprises two uplifted and tilted Tertiary planation surfaces; the lower is developed on metasedimentary rocks and the upper on granitic rocks. The latter has smooth summits mantled with sandy residuum or grus. It may contain corestones which would explain the anomalously well-rounded granite boulders that are mixed with the widespread blockfields and generally rubbly tills. Striation data and till pebble lithology document a fourfold ice-flow sequence which correlates with the general scheme for the Nova Scotia region. The glacial succession is documented primarily by superposed striations and intersecting glacial bevels on bedrock. It is also recorded in the morphology of till landforms as overprinted mega-drumlinoid ridges, drumlins, flutings, rogen moraine, and hummocks. Indicator erratics point to three different source areas. Ground penetrating radar of drumlins and drumlinoids reveals the complex internal structure inherited from successive flows. A weathered till in drumlin cores may be relict from a pre-Wisconsinan glaciation. Wisconsin glaciation began with westward flow from a local Nova Scotian ice cap. Next, the area was overwhelmed by an eastward-flowing regional ice sheet from New England, if nc beyond, which generated a thick till on the metasedimentary terrane. The second main movement was southeastward and evidently represents the outer reach of Laurentide Ice Sheet during the glacial maximum. It carved drumlins in the slate till, moulded long drumlinoid ridges from the granite till, and emplaced distinctive erratics from northern Nova Scotia, southern New Brunswick, and even a few coarse garnet gneisses from the Shield. Later, flow shifted southward evidently from a centre in Gulf of St. Lawrence, carving small drumlins and flutings and the drumlinoids and deforming the drumlins by oversteepening their western flanks and curving their tails. Eventually, marine calving along Bay of Fundy isolated an ice cap on southwestern Nova Scotia, inducing radial meltwater flow in subglacial tunnels and forming a fan of eskers. The ice cap shrank concentrically inland, pausing at the coast to build deltas at esker mouths. It culminated east of the park then readvanced northwestward ≈10–11 000 years ago, overriding organics deposited during the retreat. Postglacial crustal rebound up to the northwest has tilted the original Kejimkujik Lake shoreline up to about 2 m in the north and has generated many small faults along joint and cleavage planes. Images of the main features are available on the web at the "Canadian Landscapes and Landforms" site (http://sts.gsc.nrcan.gc.ca/page1/landf).

P. F. Karrow - dept. of Earth Sciences, University of Waterloo, Canada

In spite of two busy semesters with teaching and administration some progress has been detectable on the Woodbridge site paper (Toronto area) with plant, insect, mollusc, and stratigraphy parts mainly done but vertebrate, permafrost, and chronology parts still awaited. A time classification paper appeared in QR and the Mill Creek (Michigan) galleys have just been checked. Papers on marl molluscs and Waterloo moraine stratigraphy have been started. A fifth paper for the urban geology volume being edited with Owen White is just about completed, the last of the 25 papers it will contain.

A federal employment insurance program is allowing three of us to get a lab assistant each to pare away at sample backlogs. Mine processed the last samples from the Woodbridge site (one additional terrestrial gastropod species recovered) and is now dealing with marine samples from Victoria, B.C. A third component will be the remainder of a series of samples from Fernbank (NY). Previous processing of Fernbank samples yielded a good assortment of plants, poorly preserved molluscs, ostracodes, and microvertebrates. Further interesting discoveries are anticipated.

As part of the same lab assistance program, Jim Warren is analysing clay and Proterozoic shale from Thunder Bay (Lake Superior) to assess the source of anomalous dark clays; Bob Drimmie is doing geochemical work on the same samples with his lab assistant as well as recovering fossils from Lake Ontario cores for other geochemical work.

In mid-March, Peter Annan of Sensors and Software gave a one-day workshop on ground penetrating radar (GPR) to 35 people on campus. The organization was mainly through the efforts of John Johnston, one of my M.Sc. students. The variety of applications of this geophysical method is truly astonishing, with new ones appearing frequently in the literature.

Most of my summer will be in the lab working on fossil identifications and, with some luck, writing up some of the results. It will start with a couple of weeks field work completing (?) shoreline surveys on Manitoulin Island and the north shore of Lake Huron. I'm looking forward to sabbatical leave next year in the south and west on a mixture of new and old projects. I see you are listing email addresses, so here is mine: <pfkarrow@sciborg.uwaterloo.ca>.

Mike Lewis
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My main activity this year consists of continued compilation and interpretation of the Quaternary sedimentary history, neotectonics and paleoseismology of Lake Ontario and eastern Lake Erie based on an extensive data base of seismic profiles and piston cores collected since 1992. Gordon Cameron, Brian Todd and I will present a poster at the forthcoming meeting of the Geological Association of Canada in Ottawa, Ontario, May 19-21, in the session on Regional Geology and Hydrogeology of Quaternary Sediments. The poster illustrates the seismostratigraphy of western Lake Ontario with six cross-basin regional seismic (airgun) profiles. Of interest, is evidence for a regional unconformity cut in places into a reflective basal diamict (stiff, polymictic till where sampled); in other places, the reflective unit is completely removed (eroded to bedrock). The unconformity is relatively deeply buried in the western area by a complex sequence of seismic units about 15-20 m thick, representing late glacial and periglacial deposition.

During the last week of May I will be involved with a submersible diving program to investigate high-relief (10-30 m), west-southwest trending ridges in the deeper parts of the lake, northeast of Rochester. Are they drumlins or faults? We will also core and sample sediments in pockmarks to analyse pore water geochemistry to identify possible lakebed venting fluids.

I have noticed on topographic maps south of eastern Lake Ontario that a distinct line trending west-southwest from Sodus Bay marks the northern boundary of north-south drumlins in New York. I wonder if anyone knows whether this boundary has been discussed or explained informally or in the scientific literature?

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During the winter, I finished an investigation of fossil mosses recovered from Holocene alluvial sediments in the Wood Creek valley, northeast of Comstock, in Washington County, just west of the New York/Vermont border. I summarized this project briefly in previous Glaciograms (29(2), 30(1)). A series of radiocarbon ages show that there are three distinct organic beds, 4000, 3500, and 2800 C-14 years old, as revealed in studies of terrace sediments by Bob LaFleur and me in 1994. The moss assemblages are more or less consistent in composition, and they also uniformly contain species that are represented in the contemporary flora of the Wood Creek valley, suggesting stability in the vegetation and environment during the late Holocene at the scale represented by these plants. The results of the study are to be published later this year.

My investigations of Pleistocene organic deposits along Sixmile Creek south of Ithaca, Tompkins County, New York, carried out in collaboration with Vic Schmidt, continue. Samples of wood collected by Vic in 1941 from a thin gravel bed just above his varve unit III, which also is above the plant bed I described at the 1996 Northeastern GSA meeting (Abstracts with Programs 28(3): 82) proved datable by the AMS method. The ages are Middle Wisconsinan, 33,950 +/- 220 and 35,210 +/- 240 yr BP (corrected), and were run on samples of conifer twigs. These new ages compare well with the age of a small wood sample from the the plant bed (33,940 +/- 710 yr BP; uncorrected), but differ significantly from the age of a plant of Dryas integrifolia (27,000 +/- 360 yr BP; uncorrected), also from the plant bed. Field work by Vic last autumn led to the discovery of another exposure of the plant bed, and I will be obtaining additional AMS ages for plant fossils extracted from the new samples in an effort to shed further light on the intriguing series of ages obtained so far from the Sixmile Creek valley. My preliminary assessment is that there has been redeposition of woody plant fragments from deposits only a few to several thousand years different in age but perhaps derived from the same general vegetation type. Allan Ashworth (North Dakota State University) and his students have joined us, and they are using the beetle remains in the plant bed as environmental proxies.

Recently, John Tedrow, Department of Natural Resources, Rutgers University, sent me a sample of a peat bed that was uncovered during excavations in a housing development near Francis Mills, Ocean County, central New Jersey, at a depth of about 10.5 ft below the soil surface. The site is about 50 mi south of the Wisconsinan terminal moraine. Paleobotanical analysis of the peat is nearly complete. It consists largely of mosses and associated seeds, fruits, and leaves of an impressive array of arctic-alpine plants, including Dryas integrifolia, Arctostaphylos alpina, Empetrum nigrum, and others, with a modest macrofossil signal of spruce (twigs and needles). The pollen assemblage is dominated by sedges. A conventional beta-

decay age determination on the peat, 26,310 +/- 180 yr BP, is confirmed by an AMS age of 26,720 +/- 120 yr BP for a small piece of wood, possibly willow, in the peat. This deposit documents the existence of middle Wisconsinan tundra vegetation south of where was previously known to occur. Reconstructions of the Middle Wisconsinan continental ice sheet show the southern edge to have been well north of present-day Lake Ontario. Additional work on the sedge macrofossils is underway with Tony Reznicek of the University of Michigan Herbarium as a collaborator.^Z

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I am gradually getting out several publications which should have been out some time ago and actively pursuing ways of re-submitting several others that have been sitting on colleagues' shelves for three or four years.

The NATO volume which I co-edited with Brian Huntley and others appeared just before year-end, but is dated 1997. The full tile is:

"Past and Future Rapid Environmental Changes: The Spatial and Evolutionary Responses of Terrestrial Biota." (Eds, Huntley, B., Cramer, W., Morgan, A.V., Prentice, H.C. and Allen J.R.M). NATO ASI Series, Volume I; 47: Springer-Verlag, Berlin. 523 pp. I participated in three chapters:

(a) Introduction. pp. 1-8.
(b) Predicting the response of terrestrial biota to future environmental changes. pp. 487-504., and:
(c) Fossil Coleoptera assemblages in the Great Lakes region of North America: Past changes and future prospects. pp. 129-142. (This was a formal contribution to the NATO ARW).

In addition, a number of papers are in press dealing with different aspects of fossil insect research:

Morgan, A.V. 1997. Aphodius holdereri Reitter (Coleoptera: Scarabaeidae): - Some ecological notes and new localities. Coleopterists Bulletin (In Press for May). (This deals with modern finds in Tibet of a fossil beetle which has turned up frequently in western Europe).

Bain, A.L., Morgan, A.V., Burns, J.A., and Morgan A. 1997. Palaeoentomology of Rat's Nest Cave, Grotto Mountain, Alberta, Canada, In Quaternary Proceedings No. 5, John Wiley & Sons Ltd., Chichester. (In Press). (Describes a late Holocene assemblage from a cave near Banff in Alberta).

Bajc, A.F., Morgan, A.V., and Warner, B.G., 1997. Age and paleoecological significance of an early postglacial fossil assemblage, near Marathon, Ontario, Canada. Canadian Journal of Earth Sciences (In press - March? issue). (Fossil insects and plants from the Marathon area: - includes species resident in northern New York several thousand years earlier, but which today are located in western North America).

Motz, J. and Morgan, A.V. 1997. Late-glacial climate and ecology of a kettle section at Brampton, Ontario, Canada, as determined from fossil Coleoptera. Canadian Journal of Earth Sciences (In Press - July? issue). (Long overdue description of the late glacial insect assemblage from Brampton).

Morgan, A.V., and Pilny, J.J. 1997. Elaphrus parviceps Van Dyke (Coleoptera: Carabidae): A First Collecting Record For Quibec. Coleopterists Bulletin (In Press for May). (Modern collecting of a species found in the Scarborough Formation).

Motz, J. and Morgan, A.V. 1997 Morphological variation in Elaphrus clairvillei Kirby (Coleoptera: Carabidae) from fossil sites in the Great Lakes Region. Coleopterists Bulletin (In Press for May). (Fossil finds of this species in Canada and the northern United States and some climatic conclusions).

In addition I have several other papers in press dealing with Education conferences and one being reviewed on shorelines and paleo-indian movements co-authored with Chris Ellis and Jock McAndrews.

I have also recently finished a CD-ROM entitled "Careers in Geoscience" (we burned 5,000 copies) which will be distributed to high school counsellors across Canada, and this includes a short section on Quaternary and related topics. I am currently organising a number of functions for the GAC's 50th Anniversary celebration, to be held in Ottawa May 19-21, as well as working on the final stages of papers with Paul Karrow and others on Woodbridge, Ontario, the Rack site in Cincinnati, Ohio, and the Burning Tree site in Newark, Ohio.

Ernest H. Muller - Syracuse University, (retired)

While my own field work in New York has languished for the past year, I look forward to joining Jay Fleisher, Dorothy Peteet and Don Cadwell in Alaska for the 10th year of BERG activity around Bering Glacier.

The program for NYSGA-97 (hosted by Hamilton College) calls for a couple of events that focus on glacial geology and geomorphology in the Syracuse area:

Saturday (9/27/97) a morning workshop on Holocene climatic change and afternoon field trip in the Green Lake Sate Park area will be led by Gene Domac, Hank Mullins and Martin Hilfinger.

Saturday and Sunday (9/27/97), a 2-day field trip on Glacial Geology, Hydrogeology and Mass Wasting will be conducted by an all-star cast including Don Pair, Dawit Negussey, Garry Wiecsorek, Sarah McCulloch, Bill Kappel and Bob Fakundiny.

In case she doesn't submit a note on the subject, I would call attention to articles by Terryanne Maenza-Gmelch that appear in "Holocene" and "Journal of Quaternary Science" on "Holocene vegetation, climate, and fire history of the Hudson Highlands, southeastern New York, USA" as being of interest to New York Quaternarists.

Richard A. Young
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I have just received the results of 25 new radiocarbon samples collected along the Genesee Valley floodplain. The project is intended to provide data on the relative rates of postglacial meander migration and/or vertical accretion within the floodplain for comparison with modern rates. Preliminary impressions of the data suggest that:

1) Randomly located wood fragments buried in point bar deposits generally are thousands of years older than seasonally deposited leaf mats; implying much reworking of older buried trees and logs within the floodplain sediments. This suggests caution in the interpretation of floodplain wood sample dates of any age.

2) The current rates of lateral migration of meanders across the floodplain appears to have been much more rapid during the historic period than previously. Current rates of meander migration suggest the floodplain would be entirely reworked on the order of every 1000 years. However, where meanders are actively migrating, the older point bar deposits being uncovered are from 1500 to 2300 years old. Downstream erosion rates probably have increased recently, following the Mt. Morris Dam construction and due to the loss of stabilizing vegetation that formerly lined the channel banks.

3) Radiocarbon dates from one sample locality indicate that an individual point bar could accumulate as little as 2 vertical feet of sediment (net) in 450 years during the period between 1500 and 2000 BP. This implies relative channel stability in areas where modern lateral channel migration has exceeded 100 feet/year since 1950 AD.

CONTRIBUTORS