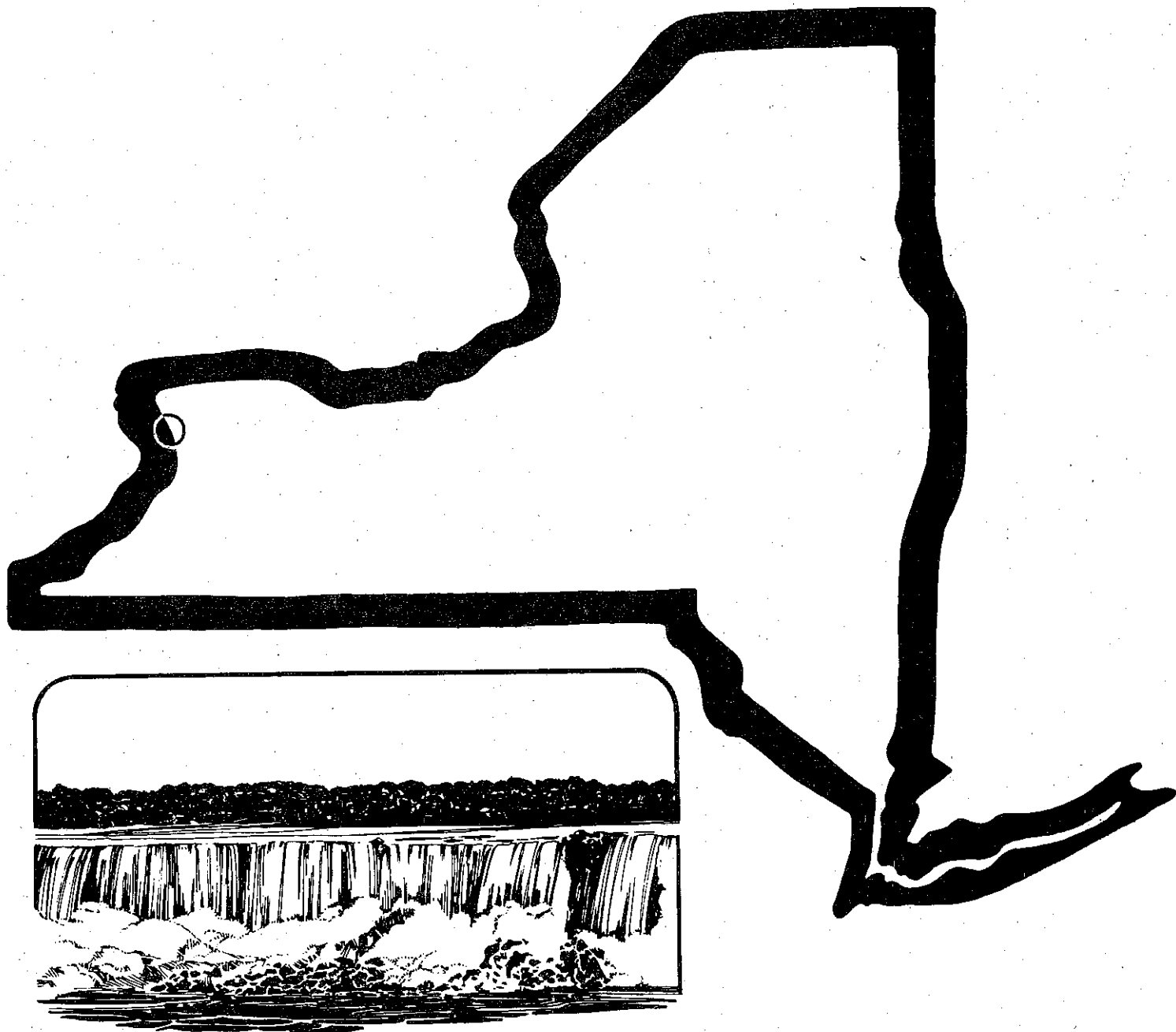


VOLUME 24, NO. 2 • DECEMBER 1989

P. F. KARROW

NEW YORK GLACIOGRAM



DEPARTMENT OF GEOLOGY

University at Buffalo
Buffalo, New York 14260

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

Parker E. Calkin

Harold W. Borns - Institute for Quaternary Studies. University of
Maine

I have been with NSF's Division of Polar Programs as Program
Manager for Polar Glaciology. My tour of duty will end in March
and I intend to return to my teaching and research professional
position in the Institute for Quaternary Studies at the
University of Maine.

Julie Brigham-Grette, University of Massachusetts

David Lindbo is in the unusual position this year of
trying to complete both his PhD disseration (Plant and Soil
Science Dept) and masters thesis (Dept. Geology/Geography)
on the soil stratigraphy and geochemistry of glacial tills
throughout central Massachusetts. His research represents
one of the most thorough studies of till facies in the
region and builds upon the work of Bob Newton in the late
seventies. Dave's master's thesis, at least, is being
written in a "paper format" to speed publication.

Further afield, master's student Maria Uhle is
collecting cores from a transect of lake basins that lie
perpendicular to and cross the marine limit in southern
Maine. This research will better characterize the
transgressive/regressive sedimentology of the Presumpscot
Formation and provide more accurate numerical dates on the
deglacial marine to non-marine transition in the region.
Mike Retelle, Bates College, has been assisting with the
coring operations.

Parker E. Calkin - Geology. University at Buffalo

I have been busy putting together (with Peter Barnett of the
Ontario Survey) a field trip guide for the three-day
AMQUA/CANQUA Meeting at Waterloo University in June (See P.
Karrow this Glaciogram). Our trip will start at Waterloo on June
1st and return on June 3rd. During the first day we will view
sections through a drumlin as well as examine a new Middle
Wisconsin interstadial site in Ontario. In addition, sediments

of two contrasting end moraine types, and two sites on the central north shore of Lake Erie will be examined. These are spectacular exposures. The second day will take us southward from the lake plain at Niagara Falls to clarify relationships of the glacial Great Lake strands, ice marginal deposits on the Allegheny Plateau, and interstadial and/or interglacial sections along river cuts within and marginal to the Plateau. Day three will combine an overview of the development of the Niagara Falls and related glacial features in New York and Ontario, with an archeological prospective of the historic, old Ford Niagara. Youngstown, N.Y. See you on 1 June at Waterloo?

One of the sites to be examined on the trip (above) will be the Lord Hill site mentioned in this Glaciogram by Norton Miller. This latter tends to support the St. Davids Gorge deposits as well as others in N.Y. (See Miller).

Some initial results of the work graduate students Eric Pefley and Andrew Smith are doing on the buried Allegheny drainage and Niagara County respectively, (see last Glaciogram) will be presented at the GSA Northeast sectional meeting in Syracuse. I am looking forward to this meeting.

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

Below is a brief report of our recent research activities in southern Ontario.:

The summer was spent at conferences, writing, and re-writing papers on topics discussed in the Spring Glaciogram. I am changing some of my time-stratigraphic assignments mentioned in Glaciogram 23, No. 2 (1988) to:

Tyrconnell Formation,	Member C and D	= Middle Wisconsinan
"	" , Member B	= Early Wisconsinan
"	" , Member A	= Eowisconsinan
Bradtville Drift		= Illinioan

These age assignments are still tentative because of lack of absolute dates, however, TL and FL dating of some soils is planned for next year.

Steve studied boulder pavements at Bradtville (Lake Erie), Vancouver Island, and Graham Island (Queen Charlottes). He is also investigating the relationships between deformation till, lodgement till, till fissility, grain size, stones, and ice streams. Steve's graduate students are studying the interaction between Cordilleran and Queen Charlottes ice on the west coast, glaciation and geochemical dispersal in Nahanni National Park in the Yukon, and ice marginal events and facies in ancestral Lake Erie.

George M. Haselton - Earth Sciences. Clemson University

Last summer I had the good fortune to be able to assist the New York Geological Survey with the reconnaissance mapping in the northern Adirondacks. During the summer of 1990. I plan to continue this work. spending more time the the details of the stratigraphy and analysis of glacial landforms as they "relate to" active vs. stagnant ice. I would welcome any ideas or information from other colleagues working in this area.

Paul F. Karrow - Geology Department, University of Waterloo

First of all I would draw to readers' attention that the Geological Association of Canada has announced a special price offer of their Special Paper 26 (Glacial Lake Agassiz), S.P.30, (Quaternary Evolution of the Great Lakes), and S.P.35 (The Late Quaternary Development of the Champlain Sea Basin), all three for \$110 instead of the regular \$136 for non-members. Members can get it for \$90 instead of \$113. Checks in Canadian dollars or equivalent U.S. funds should be payable to G.A.C. and mailed to Dept. of Earth Sciences, Memorial University of Newfoundland, St. John's, Newfoundland, A1B 3X5, Canada. There is a postage and handling charge per volume of \$3.50 in Canada and \$5.00 in the U.S. The separate price for S.P.35 is \$50 to members and \$60 to non-members.

Field work this summer was again limited by eye surgery but the planned survey of glacial lake shorelines on Manitoulin Island and collecting of till samples in northeastern Ontario was carried out in May. Indoor work emphasized writing, with the final report on the Brampton area completed, and progress continued on revision of the INQUA stratotypes volume 1. A discussion of the Eyles paper on the Toronto Brickyard appeared in the Canadian Journal of Earth Sciences and a paper on Quaternary neocatastrophism is in press in Quaternary Science Reviews. A poster paper on rock popups is being presented at the G.S.A. in St. Louis.

More samples were collected from the middle Wisconsin Mill Creek site in Michigan and additional rodent and fish bones have been recovered.

My M.Sc. student A.Heath is studying lake history in the Sudbury basin, with several post-Algonquin levels surveyed. Jill Sacre completed her M.Sc. project on New Brunswick tills. A.Bajc, now employed by the Ontario Geological Survey in Toronto, is writing his Ph.D. thesis on glacial and Lake Agassiz history of the Fort Frances area.



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Glacial Lake Agassiz J.T. Teller and L. Clayton (Eds.), 1983, 451 p. (+2 maps in pocket) \$28/34*

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- Science

SPECIAL PAPER 30

Quaternary Evolution of the Great Lakes P.F. Karrow and P.E. Calkin (Eds), 1985, 257 p. \$35/42*

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- Science

SPECIAL PAPER 35

The Late Quaternary Development of the Champlain Sea Basin N.R. Gadd (Ed.), Papers from a 1986 Symposium held at the GAC annual meeting in Ottawa. An ideal companion volume to Special Papers 26 and 30. 1989, 312 p. \$50/60*.

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Barry Warner, our palynologist, is engaged in many projects between British Columbia and New Brunswick. Projects around the Great Lakes area include a joint study with Barry Miller and me of the Fernbank section in New York (molluscs and plants), and a joint study with Dave Nobes (UW) and M.Sc. student B.Theimer of radar profiling of bogs in southern Ontario. Barry Warner's M.Sc. students are: Karen Hanf just completed her thesis on bog development near Woodstock in southern Ontario and is now employed here as a palynology technician; Steven Marsters is comparing bog history below and above the Algonquin shoreline near Huntsville; Barbara Nagy is studying the history and management of the Wainfleet (Welland) bog near Fr. Erie; and Lisa Belyea is studying long-term carbon dynamics of peat deposits of the Rainy River area. Barry, with Helen Kubiw and me recently submitted a ms. on kettle bog development near Georgetown, Ontario.

Geochemist Tom Edwards with Ph.D. student Bill Buhay is continuing study of isotopes of wood cellulose compared to tree rings for paleoclimate interpretation. One of the aims of this work is to relate paleoclimates and past Great Lakes water levels.

Geophysicist and Department of Earth Sciences Chairman John Greenhouse is using seismic reflection profiling to establish subsurface Quaternary stratigraphy in the city of Waterloo. A profile has been completed across the Waterloo interstadial site (mid-Wisconsinan, see Boreas, 1984), surmized to be a channel fill deposit inset into older tills.

The Quaternary Sciences Institute will host the AMQUA/CANQUA meeting in June 1990. Second Circulars are going out in the mail imminently. We look forward to your submission of papers and the opportunity to welcome you to Waterloo. Please contact Alan Morgan here for further information.

Donald W. Lovejoy - Palm Beach Atlantic College

I am making a detailed study of glacial meltwater pathways in the southern Adirondacks (particularly the Lake Pleasant and Piseco Lake quadrangles) and would be glad to hear from others interested in the glaciology of the same area. Contact me at P. O. Box 3353, West Palm Beach, FL 33402-3353 or at 407-835-4423.

Norton G. Miller - Biological Survey, New York State Museum

An NSF-supported project was begun at the State Museum this year by Jim Clark to assess the changes in fire regimes that have occurred over the last 2000 yr in the Northeast and Upper Midwest. Varved lake sediments are being analyzed by charcoal and pollen analysis to determine how fire regimes have changed through the past with climate change in different types of forests. Several sites in New York have been cored, and analysis has begun on sediments from a small basin in a mixed hardwoods forest near Rochester. Preliminary results suggest that fire has been infrequent in the region. Quantitative data will soon be available for this site and for one in the Adirondacks. By comparing the fire regimes from these New York forests with those from New England and the Lake States we plan to assess the relative importance of fire for influencing tree species composition and the impact of climate change.

Along with Bill Kirchgasser from SUNY-Potsdam, Dave Steadman is studying a fossil beluga whale (Delphinapterus leucas) from Champlain Sea sediments in Norfolk, St. Lawrence County, New York. Radiocarbon dates on bone (whale rib) and marine pelecypods place the age of the whale at about 10,700 yr BP. Dave is also studying late Pleistocene and Holocene vertebrate faunas from Joralemon's Cave (Albany Co., NY), Dutchess Quarry Cave (Orange Co., NY), and Chipman Point Rockshelter (Addison Co., VT). With support from NSF, he is continuing his investigations of late Holocene extinction of birds in the South Pacific as well.

Dave Steadman, Dave Franzi (SUNY-Plattsburgh), and Norton Miller are collaborating on a study of four articulated muskox vertebrae from varved sediments in a gravel quarry near Elizabethtown, New York. Pollen from the varve couplets matches pollen assemblages tallied by Don Whitehead and associates at Indiana University from late Pleistocene sediments in lakes in the High Peak Region of the Adirondacks. Accelerator radiocarbon dating of organic extracts from the bones is underway. The Elizabethtown muskox is only the second record of this bovid from New York, the other being from gravels near Binghamton.

Norton Miller has continued to work in the Mendon Ponds County Park area near Rochester, New York, on pollen stratigraphy in lakes of different size. A pollen diagram for Hundred Acre Pond is nearing completion, and radiocarbon dates have been obtained for a series of bulk sediment samples along the core. Unfortunately, many of the dates appear to have been influenced by the "hard-water" effect. In an effort to obtain an accurate chronology for the palynostratigraphic changes, a partial core was raised last winter from a small, deep kettle-hole in the Park. Its sediments are laminated, and pollen and charcoal diagrams will be prepared for this site.

Bob Dineen of Roy F. Weston, Inc., consultants, and Norton Miller have completed a study of organic sediment that inter-fingers with lake sands and is overlain by dune sand, all of the Quaker Springs stage of Glacial Lake Albany. Pollen assemblages in the organic sediment consisted of 30-50% spruce, 10% pine, 13-25% sedge, plus interesting mixtures of pollen of various deciduous trees and shrubs and of herbs. Plant macrofossils included spruce needles and twigs and an assemblage of nine wetland mosses that indicate the presence of open (non-forested) areas such as shallow ponds flushed by calcareous ground water. The radiocarbon age of a bulk sample of the organic sediment was $11,050 \pm 450$ y B.P., and a small sample of plant material from the same depth (1 twig plus 4 needles of spruce) gave an accelerator date of $11,770 \pm 115$ y B.P. These dates are the first that relate directly to the age of the Quaker Springs stage of Lake Albany. They and botanical data provide new information on the origin and paleoenvironments of the Albany Pine Bush, a large area of late Pleistocene sand dunes.

Work has continued on two interstadial deposits in New York. AMS dates are now available for the Lord Hill Lacustrine Bed (see recent issues of the Glaciogram and AMQUA Abstracts, 1988, p. 146, for further information). Both dates ($24,180 \pm 900$ and $24,900 \pm 1000$ y B.P.) help confirm Parker Calkin's and my interpretation that the deciduous tree pollen in the lacustrine bed was recycled from an unrecognized interglacial deposit in western New York. The Sixmile Creek tundra bed (Tompkins County, New York) has been dated by the AMS technique at $27,000 \pm 360$ y B.P., using the woody base of a plant of Dryas integrifolia, and a supplementary age determination on willow twig is pending. My collaborator on this project, Vic Schmidt, has shown that the organic bed is beneath four separate varve series. We have a pollen diagram for the organic bed (sedge pollen high; tree pollen low) and the overlying 8 cm of lacustrine silty clay (sedge pollen low, tree pollen high), as well as identifications of the large assemblage of mosses and associated plant fossils preserved in the organic bed. Some of the moss species are restricted at present to arctic North America. This project is nearing completion.

Ernest H. Muller (Geology), Syracuse University, Syracuse.

My retirement, effective last May, has afforded me welcome freedom from a teaching schedule, allowing time for other things -- such as a two-week fall holiday in Scotland and driving to GSA in St. Louis by way of Houston to renew acquaintance with a 2-yr old grandson.

Meanwhile, I have continuing commitments sufficient to keep me occupied for a long time. Syracuse continues to be my home base. and, at least for the time, I retain an office in Heroy Geological Laboratory.

My New York field work since the last newsletter has involved reconnaissance quadrangle mapping on the west side of the Tug Hill Plateau. This work is in support of Don Cadwell's and Don Pair's continuation of the effort begun by Bob Dineen toward compiling a glacial map of the Adirondacks -- the final sheet needed to complete the N.Y. Geological Survey's 1:250,000 surficial geology map of the state.

During the summer I benefitted, too, from a second season on Bering Glacier, Alaska with Jay Fleisher, Don Cadwell and Dave Franzi. We continued to find unexpected analogs to situations earlier encountered in mapping in New York State. Most interesting were dramatic drainage events (hlaupar) involving sudden release of impounded meltwater bodies on, next to and in front of the piedmont lobe. Wood from trees overridden during neoglaciation is under study. We will continue to report on this work in papers at NEGSA.

The upcoming spring season promises unusual opportunities for New York glacialists. Among them, one can expect both stimulation and controversy at John Shaw's symposium on Subglacial Meltwater at NEGSA in Syracuse in March. I am particularly excited by plans which Ralph Stea and Bob Mott are developing for the Friends of the Pleistocene meeting in Halifax, Nova Scotia, May 25-28 (see announcement elsewhere in this issue).

During the coming term, I welcome the presence of Bob Ridky as visiting professor, returning from the University of Maryland to teach Geomorphology. Bob has stimulating ideas both on science teaching, and on Finger Lakes geomorphology. It will be good to have another viewpoint with which to interact as well as those of Don Pair and the Hank Mullins research group.

Robert Mott (Geological Survey of Canada) and Ralph Stea (Nova Scotia Department of Mines and Energy) will host the Friends of the Pleistocene in north central Nova Scotia, May 25-28, 1989.*** The proposal is to meet friends arriving by ferry in Yarmouth for travel to Halifax in a group. Registration will be at Dalhousie University on Friday, May 25th. Regarding these plans, they have written as follows:

"The focus of this trip will be on the Interglacial and Late glacial organic records in Nova Scotia. Featured most prominently will be the record of the Younger Dryas-Allerod climatic oscillation. Twenty-four sites have to date been discovered, revealing a widespread organic horizon covered by a variety of sediments relating to remnant glaciers and periglacial solifluction activity. The beds record changing plant communities relating to drastic climatic changes. During this period there is a record of human settlement at the Debert site. Climate change during the period from 12,500 to 10,000 yrs B.P. is of unique interest to the Quaternary community of North America because of the likelihood of non-orbital forcing mechanisms. Nova Scotia provides a unique laboratory for the study of this important time in Earth's history.

"Forest beds of the last Interglacial period are well exposed in Nova Scotia. Marine deposits of the same age are also found buried under several till sheets. During this trip you can compare the onshore record with the offshore stratigraphic sequence displayed at Dalhousie University. Pollen analysis of the beds reveals three separate events believed to represent separate warm phases during the last interglacial and perhaps including the Mid-Wisconsinan as well. The onshore sequence has been dated using Amino acid ratios, Radiocarbon, U/Th and ESR.

"The distribution of ice in the Late Wisconsinan in eastern Canada has been a source of continuing controversy. Two models have emerged, the minimum and maximum models. In the minimum model, nunataks exist in Nova Scotia during the Late Wisconsinan; while in the maximum there is envisioned a complete ice cover out to the edge of the continental shelf stemming from a center in Hudson Bay. The lack of direct dates on glacial deposits, however makes some of the assumptions in these models tenuous at best, especially the age of these ice sheets. Recent mapping and dating have shown that more complicated configuration of ice existed during the Late Wisconsinan stage and perhaps earlier. Terrains formerly believed to be nunataks during the Late Wisconsinan have revealed complicated ice flow histories, with evidences of the advance and retreat of ice sheets from external sources and local centers.

"Nova Scotia has excellent examples of drumlins, with hundreds of seacliff exposures freshly renewed every year by thaw and violent storms. Many diverse theories have been advanced to explain these enigmatic landforms. We will examine some Nova Scotia examples and debate how they fit into the myriad of drumlin theories.

"Nova Scotia has been involved in Quaternary mapping programs that have been specifically designed to aid the Mineral Exploration Industry. In addition to surficial mapping, till sampling programs have been carried out in the mainland. A regional till mapping and sampling program designed to evaluate the mineral potential of the South Mountain Batholith has just been completed. Over 2000 samples were taken with analysis of 18 elements and detailed pebble counts of the different granite types as well as exotic lithologies. Glacial dispersal fans of pebbles, and trace element levels have been delineated from various mineralized bodies, both known and recently discovered.

"And last, but not least, you will get to sample some of the famous Nova Scotia lobster?"

***Persons who have attended a northeastern Friends of the Pleistocene field conference within the past 2-3 years may expect the first announcement in February. Other persons interested in first-hand examination of field evidence for existing interpretations and unanswered questions in this area are invited to contact Robert Mott (Geological Survey of Canada, 601 Booth St. Ottawa, Ontario, K1A 0E8, CANADA) or Ralph Stea (Nova Scotia Dept. of Mines and Energy, Halifax, Nova Scotia, B3J 2X1, CANADA).

Rick Pavey - Ohio Geological Survey

New initiatives by the Eleventh State Geologist (Tom Berg) are the source of new excitement at the Ohio Survey. Priority One is producing a new "Bedrock Geology of Ohio" map, to replace our antique 1920 product. Rapid production of a new series of Open File Quadrangle maps by six OGS bedrock geologists has begun; the results of "The Quad Factory" will be compiled into 1:100,000 quad maps and a new state map at 1:250,000.

Bedrock Topography Open File Quads are an integral part of this new effort, which will also result in a new compilation map of Ohio's most important unconformity, replacing a 1959 effort. To this end, the bedrockers are enlarging and revising the available (1:62,500) BT maps. Joel Vormelker (OGS) is currently working on BT quads in west-central Ohio over the Teays valley, as part of our cooperative work with the USGS/WRD's new RASA study in Ohio. J. Michael Clinch at Univ. of Dayton (formerly at Lehigh) is doing BT quads in the Dayton area, in cooperation with the Survey, as part of a larger computerized Quaternary effort. These new detail and compilation efforts will allow us to address questions on the path of the "real" preglacial Teays; new work in Indiana argues that it should head north through Ohio and bend east toward the heart of Glaciogram country.

News items from further up the geologic column:

We are investigating the ways & means of producing a new Ohio glacial map with Dick Goldthwait and Garry McKenzie (Ohio State Univ.), with a possible publication goal of 1990.

Quaternary staff at the Survey has shrunk from seven in 1988 to three at present. Diminished state funding currently prevents hiring of replacements. A prime objective is to turn this situation around.

Scott Brockman (OGS), who spent two weeks in Iceland studying real ice this summer, is completing Open File Glacial Quads for the Cincinnati area. Several recent county glacial maps with reports by Stan Totten are in hand, and will be published as quickly as time and funds will allow. All recent OGS glacial mapping depicts all surficial deposits to a depth of five feet, including shallow bedrock.

Brockman and Pavey are preparing papers on Ohio glacial stratigraphy for a special issue of the Ohio Journal of Science; this issue is the result of a symposium on Ohio stratigraphy held at the April, 1989 Ohio Academy of Science meeting at Cuyahoga Community College.

Pavey, Quaternary coordinator, was cloned in July and is now also acting head of the Survey's Lake Erie Section, based in Sandusky. Our research vessel, the GS-1, was the work platform for a NOAA remotely-operated submersible for ten days in August, in cooperation with Kent State U. and U. of Connecticut. Equipped with a video camera, this vehicle provided the first "visually-truthed" samples from the bed of Lake Erie.

The Lake Erie Section will be moving in early December, 1989, to 1634 Sycamore Line, Sandusky, OH 44870.

John P. Szabo - Department of Geology, The University of Akron

I am continuing to work on the till stratigraphy of north-central Ohio. Heavy minerals may help in distinguishing between deposits of the Erie lobe and those of the Huron lobe. Work is beginning on the stratigraphy of a complex kame and outwash area which is about 5 km east of the Cuyahoga valley. I think that the Cuyahoga valley was filled by preWisconsinan deposits and that most of the Wisconsinan meltwater went through this adjacent valley. Two MS students will attack the problem. One will examine the groundwater resources, and the other will work with the tills. Work was completed this summer on environmental geology of northeastern Ohio which will be published as part of a geographic atlas of the area.

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