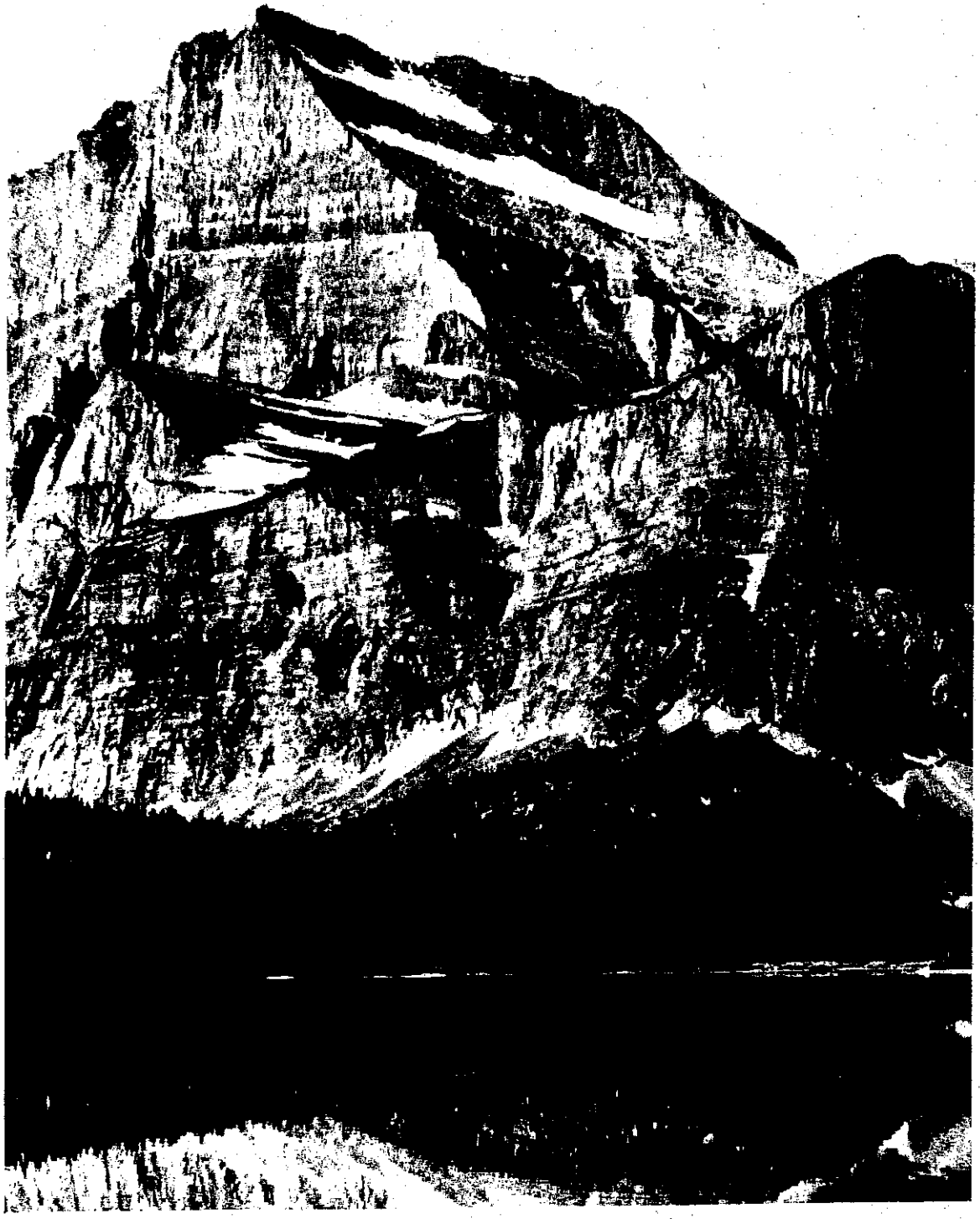
NEW YORK GLACIOGRAM

Volume 6, Number 1
May, 1971



Department of Geology
State University of New York at Binghamton
Binghamton, New York 13901

NEW YORK GLACIOGRAM

is published twice yearly, May 1 and November 1

For further information write to the editor:

Donald R. Coates

Department of Geology

State University of New York at Binghamton

Binghamton, New York 13901

GUEST EDITORIAL

TIME FOR OUR THING?

An Icelandic thing is an assembly. In saga-times, regional things convened in many parts of Iceland, but the annual Althing combined all assemblies in a social and judicial event which was at the heart of national existence. For centuries, each June, chieftains from all parts of the island gathered their supporters and rode up to Thingvellir ("Parliament Plains" in free translation) to listen to the law code, to prosecute claims for justice, and to settle the issues of the day.

****

The International Sea-Ice Symposium in Reykjavik, Iceland, May 10-14, 1971, had its analogies to an ancient Icelandic thing. Some 80 scientists from 11 nations were in attendance. In this community the chieftains are the investigators with access to icebreakers, nuclear submarines and reconnaissance aircraft, for sea-ice research requires expensive vehicles and sophisticated equipment.

As in an ancient thing, it was the chieftains, each with his own vassaldom, who moved the meeting forward, focussing attention on progress and problems of foremost concern each to his own scientific constituency. Untersteiner (U.Washington), Campbell (USGS) and Hibler (CRREL) reported on preliminary investigations and massive plans for consummation of AIDJEX (Arctic Ice Dynamics Joint Experiment) by Canadian and U.S. scientists in the North American sector of the Arctic. Ishida and Tabata (Japan) described radar monitoring of sea-ice movement north of Hokkaido. Aagard (U.Washington) and a majority of Scandinavian scientists dealt with recent pack-ice incursion into Icelandic waters after several ice-free decades. Dunbar (Canada) developed evidence of similar sea-ice fluctuations in Baffin Bay. A number of investigators examined the threat of sea-ice to petroleum production in the North American Arctic. Palosu (Finland) discussed sea ice and navigation in the Gulf of Bothnia. Though hampered by interpreters better acquainted with English than with sea ice, Volkov (USSR) described aspects of the program of the Arctic and Antarctic Institute at Leningrad. The Ewing and Donn construction received unsympathetic treatment even at the hands of atmospheric physicists who have been

receptive in the past.

At the conclusion, the assembly enacted a resolution calling upon the Icelandic National Research Council to bring to the attention of all nations interested in the Arctic, or signatory to the Antarctic Treaty, the needs and concerns of the sea-ice community. Having thus made their voices heard, the chieftains presumably rode home to their respective fiefdoms with new energy and enthusiasm.

****

We of the northeastern Quaternary community tend to see ourselves as individuals pursuing independent courses of investigation as aggressively or as passively as we please. Unlike the sea-ice community, we are not completely dependent upon the establishment for either transportation or the sophisticated equipment with which to pursue our investigations. We have our organizational attachments, but for many of us, our contributions to Quaternary geology fall outside the pale of our official duties. Two such contributions of current pertinence to readers of the Glaciogram raise anew a number of questions.

Fullerton unveiled a correlation table in Albany before the Capital District Geologists and in Lake George at the Friends of the Pleistocene field conference which is by far the most complete and current correlation table available. But, is it as available to the Quaternary community as it should be? Such a table is a fine instrument which should be in use for testing and refinement by those working in the field even though it may not be ready for the permanence and rigidity of formal publication. The Glaciogram was established with broad guidelines, primarily to facilitate just such informal communication among field workers in the best possible position to test and refine interpretations before publication. It is to be hoped that the Glaciogram can increasingly be used to distribute such material, or at least to disseminate information as to its availability.

In previous issues of the Glaciogram, Connally solicited cooperation in compiling a map of New York moraines. This synthesis, too, was on display at the Lake George Friends meeting. It includes moraine borders as mapped by the more vehement among us and as accepted by various others who may have perused it critically. Presumably it will see publication by the New York State Museum when budgetary restrictions permit. In retrospect, one wonders

whether "pre-launch testing" in the Glaciogram might better have preceded formal publication and broad-scale distribution. Of course, photo-offset, or xerox or other appropriate means of reproduction would have cost something, but not so much as to be prohibitive.

This in turn raises questions regarding the future and the scope of the Glaciogram. It is uncertain how long we can impose upon the good will of our Editor. When the time comes, will a replacement be found? or has the Editor set standards too high to maintain gratis? An otherwise willing volunteer might well recognize that he cannot maintain these standards without the generous purse and willing assistance which have been available to the present. If a modest subscription fee is required to make possible the distribution of Fullerton's correlation chart and Connally's map, or to lighten the editor's load, we ought to face our responsibilities and impose the necessary subscription fee.

Inclusion of material as usable as Fullerton's chart, or Connally's map, or Bloom's Fernbank abstract, raises question as to the standing of information in the Glaciogram. The objective from the outset has been to facilitate rapid, but informal communication. To protect individuals willing thus to make preliminary and tenative information available for use, I have not favored distribution of the Glaciogram to libraries or to those not engaged, however indirectly it may be, 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. Exceptions certainly are warranted and the Glaciogram has already been cited in a Professional Paper of the U.S. Geological Survey.

****

Just as the proud and independent Icelanders in settlement days recognized the need for regular assembly, so also the vikings of the northeastern Quaternary community must sense the need for ready means of communication and coordination. Personal enthusiasm is essential, but progress in science requires both personal and organizational commitment.

Recently the International Field Year on the Great Lakes has been set up as a program of Canadian-U.S. cooperation. Seeking to include in its program the preparation of a Quaternary map of the

Ontario drainage basin, IFYGL found no agency nominally prepared to satisfy its needs. Within the community the knowledge and the ability exist, but the problem was one of identification both of competent individuals and responsible organizations. Much longer in the planning have been the New York Quaternary sheets on scale of 1:250,000 which hopefully will be coming out in the next few years. For the best possible data to appear on these maps will require not only the skill of the compiler, but also easy communication within the Quaternary community. The Glaciogram is one effective instrument for such communication but more is needed.

During informal discussion at the Hartford regional meetings of G.S.A. last March, Harold Borns solicited comments and expressions of interest in a possible Penrose conference on regional Quaternary problems. Such a conference is designed to provide "the best possible arrangements for informal discussions within groups of experts . . . . for their individual stimulation and for the advancement of the science by the interchange and development of new ideas and by the ensuing influences of the discussion."

Progress in mapping and interpretation of glacial geology in New York, New England and contiguous parts of Ontario and Quebec has been notable in recent years. Carried out under diverse sponsorship, it has been ineffectively integrated and correlated between areas of concentration. The massive effort of Canadian geologists preparing for the International Geological Congress and Congress field trips is bound to stimulate further progress and differences of opinion as well.

I wholeheartedly concur with Harold Borns that the time is ripe within the coming year for a working conference to define areas of accord and to focus attention on areas of disagreement and inadequate information, as well as to foster a sense of community and easy communication among those engaged in Quaternary investigations in this area.

Ernest H. Muller

G. MICHAEL CLARK 4/5/71

Title of the 1971 Geological Society of America Annual Meeting Field Trip No. 10 is:

SLOPE STABILITY AND DENUDATIONAL PROCESSES: CENTRAL APPALACHIANS*

Field examinations will center upon selected Central Appalachian sites south of the glacial border which bear on problems of slope stability and denudation. Evidence of varying degrees of relative slope stability (eg. sorted patterned ground, pedologic relationships) will contrast with extreme hillslope and floodplain changes associated with Hurricane Camille (August 1969). The discussion will treat geomorphic and pedologic interrelationships, slope stability and denudation-rate problems, and landscape evolution concepts. Evident relationships exist between the trip theme and the rates of denudation and sedimentation symposium planned for the 1971 Annual Meeting in Washington, D.C. on 1-3 November.

Travel distance and schedule will make this a demanding, but rewarding, three-day preconvention trip (29-31 October). From Pittsburgh, Pennsylvania the route will traverse the Appalachians generally southward to the Blue Ridge east of Lexington, Virginia, and will terminate at GSA convention headquarters (Shoreham Hotel and Motor Inn).

Trip leaders are Edward J. Ciolkosz (Penn State), G. Michael Clark (University of Tennessee), John T. Hack (U.S.G.S.), Robert S. Sigafoos (U.S.G.S.), and Garnett P. Williams (U.S.G.S.).

Trip registration will be handled exclusively by The Annual Meeting Department of GSA Headquarters (P.O. Box 1719, Boulder, Colorado 80302). Cost and registration details will be in Circular 2 (an insert) in the September 1971 issue of Geotimes. Additional copies of Circular 2 can be obtained by writing The Annual Meeting Department at the above address.

*written by all Trip Leaders

Field trip participation by Soil Science Society of America members is strongly encouraged; significant portions of time at several stops will be devoted to examination and discussion of soil exposures and their relationships with present and past environments.

****

P. F. KARROW 4/6/71

This summer I will be mainly trying to catch up on writing up work of the last 15 years. Some field time will be spent on collecting fossils from the Toronto interglacial, extending studies on Lake Algonquin sediments southward from Kincardine, and in refining till sheet boundaries near Waterloo.

Dr. Anne Morgan, post-doctoral fellow, continues her study of fossil beetles from Toronto and Port Talbot.

Owen White (Civil Engineering) and I will present a paper at the Toronto Great Lakes meeting on the major bedrock valley (Spencer's Laurentian valley) joining Georgian Bay and Lake Ontario. Also this month Thane Anderson (Biology) and I will give a paper at the North-Central G.S.A. on the paleontology and radiocarbon dating of Lake Algonquin sediments from Kincardine and Alliston, Ontario. Pollen information forms part of Anderson's Ph.D. thesis just completed. Also jointly with Owen White is a study of the urban geology of the Kitchener-Waterloo area.

The Quaternary Discussion Group is just completing its fourth season of monthly meetings during the school year.

The strength of our department will be increased this summer in our area of specialization, environmental geology, with the addition of Dr. J. Cherry, hydrogeology (from U. of Manitoba), Dr. P. Fritz, geochemistry (from U. of Alberta), and Dr. E. Frind, geomathematics (from U. of Toronto). We expect about 15 graduate students, the majority in groundwater, next fall. To support the program, we have acquired a drilling rig and driller, and will add a geophysical truck and stable isotope geochemistry lab within the next few months.

****

FORREST DURHAM 4/8/71

For many years as a good many of you know, I have been interested in pre-glacial divides with particular application to the Tully Valley, and the Valley Heads Moraine.

More recently my attention has been drawn to the Owasco Valley from Freeville to the lake itself. I don't know of any valley in the Central New York Area that offers more diversified features and puzzling geomorphic problems than the Owasco Valley. You will be able to find me here this summer and I hope to have some of my ideas better established by the time of the next issue of the GLACIOGRAM

As a native central New Yorker, boy it's great to be kicking around in the "Hills of Home" again!

****

GEORGE W. WHITE 4/13/71

The Glacial Geology of Trumbull County, Ohio, by George W. White, Ohio Division of Geological Survey Report of Investigations No. 80, has just appeared. This is a map at a scale of 1/62,500, a base reduced from the new 1/24,000 maps with accompanying diagrams and text. It is printed on interesting plastic paper. (Trumbull County adjoins Pennsylvania on the east and is on the northern border of Youngstown.) The map shows geomorphology of the deposits by color, the age by varying overprints, and the bedrock surface underneath the drift by red contour lines. The brief text includes a section on mineral resources and on environmental implications of the different drift units.

****

JANE L. FORSYTH 4/14/71

Not much research has been done this last year because I have been travelling. I was in Europe last summer (as an ordinary tourist) and thrilled to the glaciers and glaciated terrain of Switzerland, Austria, and southern Germany. Then, this winter, with a sabbatical during the winter quarter, went first to East Africa (on a tour, as a tourist, to see the animals) and then to New Zealand. The New Zealand trip, though made in a rather casual, touristy way, did result in seeing some magnificent glacial and Pleistocene features, partly in

the company of Max Gage and Jane Soons of Canterbury University in Christchurch and partly in the company of Pat Suggate and some of his associates with the NZ Geological Survey in Wellington. It was exciting to see active fault scarps passing right through the greater Wellington area; there are many faults there with Pleistocene activity registered. Even more thrilling was seeing the two big glaciers on the west side of South Island, glaciers which originate in the NZ Alps, on top of the uplifted side of the active Alpine Fault and which tumble down the eroded scarp right into rainforest at a rate of 5-7 feet per day! Summer plans call for spending most of the time writing, trying to get the backlog of incomplete papers done, probably while at Ohio State University's summer biology lab on a Lake Erie island, but hopefully before the year is out, field work on three other projects will be completed: the nature and distribution of the post-glacial, pre-Maumee ice-marginal lakes near Lima, Ohio; the nature of the geological substrate in areas of (wet) prairie in northwestern Wood County; and the distribution of a small cinquefoil (Potentilla) which seems to be choosey about where it lives, relative to the glacial boundary.

****

LESLIE A. SIRKIN 4/27/71

One of last years NAGT field trips introduced a number of people to the extreme conditions of pollution in Jamaica Bay. Since a field trip guide was not supplied for this meeting and since a number of colleagues have written requesting information concerning this particular trip, I would like to offer the site descriptions. I am not, however, including the road log since it varies considerably depending upon the route followed and the kind of vehicle. Permission to enter the Wildlife Refuge with a group may be obtained from the Parks, Recreation and Cultural Affairs Administration, City of New York, 830 5th Avenue, New York, New York 10021. I would also like to credit Mr. John Spagnoli of the New York State Department of Environmental Conservation who initiated this trip for the NAGT meeting and Dr. Anthony E. Cok of Adelphi University who has refined this trip for the undergraduate classes.

Environmental Field Trip-Jamaica Bay-Route Nassau Blvd.

STOP 1. South end of Lefferts Blvd., southeast of John F. Kennedy Airport. a. Illegal and uncontrolled trash disposal and stolen car stripping. b. Oil and kerosene pollution from JFK jets, tankers carrying special fuels - note high water oil slick on marsh, no encrusting life on piles, "dead" beach with oil slick. c. Land fill on bay by JFK, most recently 747 hangar construction. d. Noise pollution.

STOP 2. New York City Incinerator - Stanley St. off Linden and Elderts, behind TSS. Incinerator designed for 80% volume reduction, gas and smoke discharge "cleaned" by electrostatic precipitator; ash and carbon residue used for "sanitary land fill" (note gulls on dumped fill). Glass shard and metallic refuse (ideal materials for reclamation) make up most of the fill. Homes built on fill of former marshland between incinerator and JFK, and on landing and take off lanes. Note distinctive grass (or reed) colonizing fill.

Route: Stanley to Fountain

STOP 3. New York City Land Fill of Marsh Fountain Avenue and Belt Parkway - 3.5 million cubic yards of hydraulic sand fill (source - Bay muds and sands) for construction site; on one side sanitary land fill on the other (including unburned materials from demolished buildings, old garbage trucks and new garbage) creating a mountain on former marsh (consider load effect on "plastic" muds). Belt Parkway now in valley; site of eventual "new" city. Adjacent marshland and tidal inlets covered with layer of refuse and floating organic detritus. Oil and other unidentified chemicals and petroleum products coat the edges of the tidal channels - slowly destroying all evidence of animal life.

Route: Wertman to Flatlands to Hendrix St.

STOP 4. New York City Flatlands Sewage Treatment plant - combined sewer (during heavy rains) and sanitation. Rain runoff impoundment area on left. Treatment (primary) removes 80% of solids - note apparently untreated effluent into channel and hence to Bay. Site (7) of Experimental Tertiary Treatment using bacteria which can convert 500,000 gallons of raw sewage to usable water in one

hour (check NYC for details). Existing secondary treatment - cooks solids prior to dumping in NY harbor, effluent run off to Bay. Large aeration tanks contain "activated" sludge which does not appear to remove detergents (as evidenced by large foam mats in tank and near outfall).

Route: Flatbush Avenue to Floyd Bennett Fd.

STOP 5. Marine Parkway - Air field (now closed) on filled marsh - site to be used for housing. Marine Parkway Bridge - USA Corps of Engineers propose to close Bay with dam, dunes and barrier at bridge with flood gates to prevent flooding above the 10 ft. contour. Proposal based on working model at Corps HQ at Vicksburg. Sand for fill to be taken from ocean floor.

Route: Beach Channel Drive to Cross Bay Blvd.

STOP 6. Optional stop - urbanization of barrier, pollution of beaches.

STOP 7. Jamaica Bay Wildlife Refuge attempt to present unpolluted natural marsh and marsh plants, promote and harbor endangered species (egrets, various ducks, herons ibis, total over 100 species of wild fowl), note nesting posts for snavy egret whose egg shells break when laid due to DDT. Note "fresh water" pond on left and drift trash. Note - source of water for "natural" area.

****

GEORGE CROWL 4/26/71

I plan to work in northeast Pennsylvania this summer, in the general area of Wilkes Barre, tracing the terminal moraine towards the northwest. I'd like to see if I can find early Wisconsin and Illinoian in front of the moraine and trace the whole thing towards the Salamanca re-entrant.

****

JOSEPH A. CAGGIANO, JR. 4/26/71

Your idea of a comprehensive listing of all new publications on glaciation east of the 97° meridian sounds great. Personally, I would be very happy to receive such information. However, my time commitments are such that I would have almost no time to contribute

to such an undertaking. Several years ago I suggested a similar idea to AMQUA, but apparently no such activity has been undertaken.

Hopefully, I shall complete mapping the surficial geology of the Belchertown quadrangle for the U.S.G.S. during the upcoming field season. Emphasis this season will be on mapping tills and stratified drift sequences along the walls and lowlands of the Connecticut valley.

Continued work last fall indicates that three groups of stratified drift sequences occur in the Belchertown quadrangle--one north and two south of the Holyoke Range. Higher sequences south of the Holyoke Range drained southeastward around the Belchertown intrusive complex. After melting of an obstructing ice block, meltwater was able to drain southwestward around the Belchertown complex at lower elevations. Several sequences occur within each group. Drainage during each episode of deposition eventually reached the large delta of the Chicopee River to the southeast. Further investigation of meltwater drainage may provide evidence as to why only Group I varves (Ashley, 1971) occur in the Amherst embayment of Lake Hitchcock which is rimmed by sand and gravel.

Several exposures of a pinkish, sandy till which is texturally very similar to the gray, crystalline-rich upland upper till have been found along the Triassic border fault. Such till seems to be transitional westward to a decidedly gray upper till.

Textural analyses are presently being run on 40 till samples using the sieve and hydrometer method. Data have as yet not been plotted or interpreted. Clay slides are being made (using the slurry technique) and will be run through an X-ray diffractometer. Heavy mineral analysis on the sand fraction will be run next winter.

****

GARRETT G. HOLLANDS 4/26/71

For a number of years I have been interested in the Gowanda Moraine of Western New York. Last summer reconnaisance mapping of the Gowanda Moraine was completed from the village of Gowanda in western Erie County to the township of Sheldon in eastern Wyoming County. The moraine was mapped in detail in Erie County from 1 1/2 miles southeast of East Eden eastward to 2 miles east of South Wales.

Work was begun on mapping the surfical geology of the Colden Quadrangle, which the Gowanda Moraine divides into halves.

A summary of my observations concerning the Gowanda Moraine are the following:

1. The upland portions of the Gowanda Moraine is composed primarily of till derived from local shales. In the Colden Quadrangle the moraine is expressed as a thickening of ground moraine and by the presence of small hills composed of till and oriented parallel to the ice front.

2. The valley portions of the Gowanda Moraine is expressed as kame terrace deposits found on the valley sides and as heads of outwash on the valley floors. Tongues of ice must have extended southward in the north-south valleys from the southwest-northeast trend of the ice front.

3. Drainage was prevented from flowing south into Cattaraugus Creek by the Valley Heads Moraine in the valleys of Hunter's Creek, the East and West Branches of Cazenovia Creek, and in Eighteenmile Creek and its drainage was along the ice margin between the above listed valleys and flowed from east to west. This drainage is suggested by a number of drainage channels that connect the north-south valleys. The most pronounced are the Pipe Creek drainage channel connecting the two branches of Cazenovia creek and the Hampton Brook channel connecting the two branches of Eighteenmile Creek. Final drainage along the suggested drainage system was through the North Branch of Clear Creek and into Cattrugus Creek. As the ice retreated from the position of the Gowanda Moraine drainage was developed at a lower level through Franklin Gulf and possibly into Lake Whittlesey.

I beleive that the answer to the question of the Gowanda Moraine's relationship to the other Western New York moraines and to the glacial lake levels in the Erie basin may be solved by further investigations of the hypothesized drainage of the Gowanda moraine. In conjunction with my Master's thesis work in the Colden Quadrangle this summer I hope to find time to work further on this problem.

****

ALLAN RANDALL 4/26/71

Reports evaluating the water resources of several large areas of New York have been completed by the USGS over the past 2 years, and are or soon will be approved for publication by New York State. Three were published in 1970, and are listed here for the benefit of anyone who missed them:

1. Ground-water basic data, Orange and Ulster Counties (Frimpter)
2. Ground-water resources of the eastern Oswego River basin (Kantrowitz)
3. Water resources of the Champlain and upper Hudson basins (Giese and Hobba)

All contain well records and other data; the last 2 also contain interpretive aquifer maps and text. Tables of well records, logs, and chemical analyses for the Susquehanna River basin are now in shape for Xerox reproduction; hopefully this report and others will be published in 1971, but a state publication freeze has been in effect since January, and at this writing we do not know what to expect for the rest of the year.

This summer I'll be spending part of my time studying pollution due to some very recent sediments in eastern New York, sanitary landfills. I'm also still working on several interpretive reports on aspects of Susquehanna River basin hydrology.

During field work in the Susquehanna basin I described quite a few temporary exposures. I think especially of two interesting pits in ice-channel fillings where I sketched and photographed internal structure. One side of each feature was subparallel to much of the bedding, whereas the other side was formed by a series of normal faults. By now, both features have been entirely removed, and my hydrology reports will not include any account or photo of them. It seems a shame there is no way of filing and preserving descriptions of important exposures where future geologists are likely to find them; most of us could think of examples from our private archives. I hope the State of New York may someday have the strength to provide such a repository, perhaps through the State Geologist or the Division of Water Resources, perhaps in conjunction with water-well and engineering test boring records, perhaps on a regional or urban-area basis.

****

KERNAN W. DAVIS 4/28/71

I have very little to report for Glaciogram. Our investigations have been of limited scope being directed toward the answering of specific questions about specific locations. We have relied upon the research efforts of the profession at large to supply us with supporting information, but have not been able to provide to the profession, any measure of new information. Our role has been that of consumer, not producer of information.

By the way, the Environmental Geology Digest, published by the Kansas Geological Survey has been discontinued as a clearing house for information about research in that field. These newsletters are highly vulnerable to fluctuations in budgets and in popular moods. The Glaciogram is a nice size, is informational and informal. I trust it will continue for quite some time.

****

DOANLD R. COATES 4/28/1971

My summer plans can be summarized as follows: doing field research, editing manuscripts, preparing personal manuscripts, and advising student theses projects. It looks like a very busy summer.

The field studies range from Binghamton west to Salamanca and my principal interests are: (1) studying the >100 "drumlinoid" hills (Tarr (1909) Watkins Glen - Catatonk Folio) (2) making hydrogeology comparisons of various basins. I am especially open to comments on the unusual hills in the valleys.

The manuscripts for the book being prepared for publication, Environmental Geomorphology which resulted from our symposium last fall, will receive final editing this summer and hopefully the book will be out before the end of the year. You will be kept posted on the publication date. We hope that many of you can make our second annual symposia on October 15-16, 1971. Marie Morisawa is the director and the topic is "Quantitative Geomorphology and Its Applications". Several of the papers will be using data from glaciated regions.

I am currently working on several of my own manuscripts and they are in various stages of readiness. The new Soils Survey of Broome County, N.Y. (U.S.D.A., March 1971, 95 p. with 88 air photo sheets)

has just been published. It offers some new approaches and the soils are depicted on air photos, making for one of the best such surveys I have seen. Perhaps I am partial because I wrote the section on "Geology, Physiography and Water Resources". I believe the gap is finally being narrowed on the drift problems we have in southern New York. Calkin (Ohio Jour. Sc. 70 (2), 1970) and Connally (GSA Abstracts 3 (1), 1971) provide important help. I have an article which will appear in the July GSA Bulletin. In addition our group at Binghamton is finally finding some datable materials. I should receive analyses for three new radiocarbon dates any day, and will add these to the big study I am doing on the Binghamton Problem, which I would like to finalize by early fall 1971.

I have been granted research leave for the fall semester. About two months will be spent in Europe, viewing the glaciers in Switzerland and comparing Scotland's glacial terrane with that of New York. The latter visit would also include some time being spent with Professor Cuchlaine A.M. King.

Several of my Ph.D. students will wind up field work this summer. Don Cadwell will finish deglaciation chronology of the Chenango Basin, and Jim Kirkland will complete his work on glaciation in the western Catskills. Steve Kowall is nearly into the writing phase of his thesis on a hydrogeology comparison of Appalachian Plateau and Folded terranes. Bob Newton will start an M.A. thesis on glacial geology in the Ossipee area, New Hampshire. In addition I have two undergraduate majors who are doing independent research projects. Therefore, because of these various activities I am afraid our Cape Hatteras home will not receive the use it should.

The photograph on the cover is of course in Glacier National Park.

****

JAMES E. BUGH 4/27/71

Since the November issue of the New York Glaciogram, four students have worked on the local scene. Two of our graduate students, Steven Maslansky and John Attig, will present some of their findings under the title: Interrelationships of Surface and Ground Water and Some Environmental Implications Near the National Fish Hatchery, Cortland, New York, at the NYSGA on May 7. According to Maslansky and Attig, this area is believed to be typical of glaciated terrane with high water tables in central New York, and thus the results of this study should prove useful in future hydrogeologic investigations in areas of this type. Two undergraduate students, Joseph Tuminello and Robert Ellis, completed a geophysical study of the "Valley Heads" Moraine in the Cortland area.

I am currently working on two papers of some interest to glacial geologists. One paper to be submitted in May on forest fires and climate relates smoke to reduced solar radiation and increased precipitation to the hydrologic regime of Juneau, Alaska. The second treats supra-glacial lakes and their drainage considering the origin of eskers and regional snowlines.

****

WILLIAM D. SEVON 4/29/71

The winter months were spent putting together maps and text material for the Christmans, Pohopoco Mountain, Hickory Run and Blakeslee 7 ½' quadrangles - a task nearing completion. Field work is now starting on the Pocono 15' quadrangle which Tom Berg and myself hope to complete this field season. Completion of this 15' quadrangle, along with other in progress or completed work, will give a reasonable picture of the Pleistocene sediments in all of Monroe County and will complete mapping of the Wisconsinan 'terminal moraine between the Delaware and Lehigh Rivers. George Crowl will be back in northeastern Pennsylvania again this summer to start a new Pleistocene study. His report on the 'Surficial Geology of the Delaware Valley from Port Jervis to Delaware Water Gap' should be sent to the printer within a month and should be published by early fall. Milena Bucek's 'Surficial Geology of the East Stroudsburg 7½' Quadrangle' is currently in galley proof and should be published within a month. Jack Epstein and Gordon Connally expect to finish

the Saylorsburg 7½' quadrangle surficial geology early this summer and should present some very interesting material when their report is published.

****

ROBERT K. FAHNESTOCK 4/30/71

I plan to spend the summer with INSTAAR in the Colorado Front Range learning something about Alpine geomorphology. Projects on Lake Erie "ice volcanoes", The ancestral Allegany River, and buried topography and the morphology of the Lake Erie shore continue.

Bill Metzger and I are hoping that Donald (Mike) Peterson's geophysics students are going to be able to give us some answers to the location or absence of some of the buried valleys that we have not been able to trace on the surface.

****

SAM G. COLLINS 5/4/71

FIELD RESEARCH
Fox Glacier-Summer 1970

Early in August, Mr. Sam G. Collins of the Department of Exploration and Field Research returned to home base at the Society after spending his fourth summer in fieldwork on the Fox Glacier, Yukon Territory, Canada.

The Fox Glacier Project, in which I have participated since its inception in 1967, is an interdisciplinary effort with the goal of adding to our knowledge of how and why glaciers "surge." A few glaciers, most of them located in arcuate groups in Alaska and Western Canada, do not flow at the same, steady speed year after year as other glaciers do. Such "surging" glaciers flow extremely slowly during a long inactive or stagnating phase that may last for many decades; then, for no clearly understood reason, they suddenly accelerate to ten, fifty, or even a hundred times "normal" velocity. Huge volumes of ice from the upper and middle valleys move down in only a few years to overfill the lower valleys and extend the tongues by as much as a third of the total length of the glaciers.

Surging glaciers have clearly recognizable characteristics and are easily distinguishable from their non-surging neighbors, even in

aerial photographs. A good many of these glaciers have been studied either after they have completed a surge that went unnoticed because of the remoteness of the area, or while the surge was still in progress. No one has ever witnessed, knowingly, the beginnings of a surge.

The Fox Glacier Project is the first of its kind to be undertaken with the specific mission of anticipating a surge and learning what changes take place in conditions just before the rapid movements of a full-fledged surge begin.

My part in the effort has been in keeping careful account of the movements of the glacier, looking for increases in rate of motion that may mark the beginning of a new surge. Among the other things that are not known about the beginning phase of a surge are exactly what part of the glacier begins to accelerate first and how rapidly the adjacent ice, upstream and downstream from the beginning point, becomes entrained in the accelerating mass.

Other members of the project have measured the glacier's mass balance, thickness, temperature, and oxygenisotope distribution. Now we hope that the glacier will cooperate and make all the work worthwhile by surging within the next few years.

****

JOSEPH H. HARTSHORN 5/4/71

Being chairman of a large and active department full of individualistic professors takes a lot of time away from one's own research. However, I managed to put in some time on glacial geology in the proglacial foreland of the Malaspina Glacier, Alaska, last summer. Some of the work there included till-fabric analyses on varied types of till ridges, both parallel to the direction of ice advance and at right angles to it. A summary of the work of my students follows:

Gail M. Ashley has completed her Master's thesis on rhythmic sedimentation in glacial Lake Hitchcock from the Rocky Hill Dam to the northern border of Massachusetts. She gave a report on her work at the Northeastern GSA meeting at Hartford.

Jon C. Boothroyd, while primarily a coastal processes man, has been working on the outwash in front of the Scott Glacier, Alaska. His Master's thesis is nearly complete and will add considerably to

the knowledge of processes of stream action and sediment movement on such glacial alluvial fans.

Kerry Campbell has turned in the first draft for a U.S.G.S. GQ map on the surficial geology of the Northfield quadrangle, Massachusetts. His work here included till upland, ice-contact deposits, and lakebottom areas. Among his discoveries were outcrops of wind-abraded bedrock below the level of Lake Hitchcock.

William F. Carroll will commence a study of tills in northwestern Massachusetts this summer.

Sherman Clebnik will complete a study of the surficial geology of the Willimantic Quadrangle in Connecticut this summer. Of particular interest here will be some ideas on tills.

Dee Goulding is working in the Thompson Quadrangle in the remote reaches of northeastern Connecticut. It is a difficult quadrangle to map because of the lack of highways and exposures, but she should complete it this summer. Some periglacial phenomenon are visible in the area.

Thomas C. Gustavson has completed a summer's field work on the proglacial foreland of the Malaspina Glacier, with especial reference to the proglacial sediments. He has made studies of several of the outwash plains, and will do so again this summer, but his particular study is of the proglacial Malaspina Lake. A great deal of interesting information from this study might be applicable to proglacial lakes in New England and New York.

Eugene Rhodes, also primarily a coastal processes man, has made a study of the correlation between seismic work and wash borings and drill holes on Plum Island and Crane Beach, Massachusetts. There is no doubt that this work will enable us to get a much better hold on the glacial and postglacial stratigraphy of Plum Island. The first draft of this thesis is also in.

****

JAMES R. DUNN & ASSOCIATES, INC. 5/5/1971

A number of our staff have been dealing with problems involving Pleistocene geology during the past year and several projects are in the offing.

Jim Dunn, Dave Sommers, and Bob Fickies have been studying ice movement and ice lobe locations in the upper Hudson River Valley.

Ice movement generally paralleled the strike of the underlying bedrock, so drift was collected along rather than across specific rock units. As noted by Bob LaFleur, reworking of the drift by glacial and outwash streams running across rock units created influxes of neighboring material within the deposits.

Bob Fickies has begun a petrographic study of outwash material to establish a rapid, visual means of determining the relative soundness of sand deposits. The portion of the samples being examined ranges from 1 mm to 0.5 mm in size since this will give a better estimate of the amount of shale and soft, weathered grains in the sample, both of which tend to break down in the magnesium sulphate soundness test, used by the New York State Department of Transportation.

George Banino has been embroiled in a study of Lake Albany clay deposits in relation to a proposed home development complex of over 2,000 acres. A number of test holes were put down to establish the composition and continuity of the deposit and to gain some knowledge of the thickness of the deposit.

Of primary concern has been the stability of steep clay slopes which will be inundated by a proposed lake. One method of assessing stability was to examine existing lakes in similar geologic settings. While each of the lakes examined showed evidence of sloughing of the banks and creation of a narrow bench just below the water surface, there was no indication of largescale slumping or sliding of blocks of clay into the lakes.

Jim Dunn recently studied a similar stability problem in Troy where a large block of Lake Albany clay has been slowly moving down hill. This slide, located on Thompson Street, apparently was activated by construction of a large garden apartment and fill loading at the crest of a slope which reportedly already had indications of slump topography. Not only has the slide case doubt on the use of the apartment, it also has imperiled houses across the street from the toe of the slide.

David Sommers is investigating the water-bearing properties of glacial deposits in Fulton County as part of a county-wide ground water study being conducted by James R. Dunn & Associates, Inc. Seismic refraction is being used to help define the boundaries of the

ancestral Sacandaga River system which may contain important supplies of potable groundwater near Gloversville and Johnstown.

The engineering properties, stratigraphic sequence, and distribution of the glacial deposits of a portion of the north shore of Long Island, and the position of the water table are being studied by David A. Sommers as part of an investigation of landslides that have occurred on the north shore. The effects of jetties, beach profile, offshore topography, and wave refraction are also being investigated and evaluated.

****

ALEKSIS DREIMANIS 5/6/71

This coming summer I will try to catch up with last year's unfinished work on the last ice age deposits along Lake Erie south of London. During the last months three theses have been completed on Quaternary topics at our Department.

A. A. Berti's Ph.D. thesis, "Palynology and stratigraphy of the Mid-Wisconsin in the eastern Great Lakes Region, North America".

R. W. May's Ph.D. thesis, "Cu, Ni, Zn, Cr, CaO and MgO content of Wisconsin tills in southern Ontario", and

R. W. Dalrymple's B.Sc. thesis, "A study of Late Wisconsin varved sand unit, Port Stanley area, Ontario".

****

DONALD H. CADWELL 5/18/71

Description of Olean and Valley Heads drifts of Wisconsinan glaciations occur in several reports of central New York State. Current research suggests there may have been a third, less noticeable, advance. The terminus of this advance is tentatively located south of Binghamton, New York. Retreat of this ice sheet was by backwasting and downwasting of the ice in marginal positions. During late stages of deglaciation the upland areas became exposed, leaving valley remnants of ice filling the valleys. The valley tongues of ice also retreated by backwasting and downwasting depending upon such factors as the relationship between the frontal ice margins of the valley tongue and the ice in the uplands. There are, therefore, two different aspects of the ice margin: the valley margin and the upland margin. Seventeen upland ice retreatal margins have been mapped on the basis of surface morphology, thickness of upland drift, and the association of upland meltwater deposits. Nine of these positions have been correlated with 4 valley ice margins. Thus, the upland ice margin retreated through at least 9 distinct positions whereas only 4 valley retreatal phases can be identified.

Each valley ice margin position became a large area of downwasting ice, yielding massive stagnant ice topography. Ice occupying this marginal position became separated from the main valley ice tongue and was transformed into broken and pitted ice that served to dam the valley forming two types of lakes: lakes occupying a lateral position between the valley wall and the ice tongue; large lakes filling the entire valley width between the ice tongue and the ice marginal dam. Temporary base levels may have been established on older glacial deposits, on ice, or on bedrock. Common lacustrine deposits include lake bottom silts and clays, and different types of deltaic sequences. The deltaic units deposited in the lateral positions are prograding kame deltas. The lacustrine units, as well as braided stream deposits, are morphologically represented as planar features.

Outwash units indicate escape routes that became available to meltwaters during deglaciation. The presence of till incorporated in valley deposits of unstratified to poorly stratified meltwater sequences is occasionally associated with upland till units at ice marginal positions. The complete depositional sequence for the valley

margin position is: outwash, stagnant ice or kame moraine topography, kame terrace or kame delta units, and valley or upland till sequences.

In conclusion, the recognition of this style of glacial retreat in central New York State, that includes the use of hypothetical time equivalent surfaces, deltaic units, stagnant ice areas, reconstructed planar surfaces and upland morphology, suggests 4 valley and 17 upland retreatal ice positions.

****

ERNEST H. MULLER 5/26/71

It has been a pleasure to hand over the reins of the Department of Geology to Daniel F. Merriam who arrived in Syracuse in March. In early May I attended the International Sea-Ice Conference in Reykjavik, Iceland. I propose now to tend the home pastures this summer. If all goes well, the Niagara 1:250,000 sheet of the New York Quaternary map will be completed and work begun on the Finger Lakes sheet before September. In September or October we plan to move to the new Heroy Geology Laboratory which is in late stages of construction along the north side of Archbold Stadium.

William A. Newman defended his dissertation on "Wisconsin Glaciation of northern Cape Breton Island, Nova Scotia, Canada" and continues on the faculty of Northeastern University.

John E. Harrison defended his dissertation on the glacial geology of the North Bay - Mattawa area, Ontario and continues on the faculty of the University of Calgary.

Steven W. Forster completed his dissertation on the Pleistocene geology of the Carthage 15-minute quadrangle, New York, but had no opportunity to defend it before going into the service. His most recent address was at Fort Belvoir, Maryland.

George C. Kelley has completed mapping of the Kent and Ellsworth quadrangles, Connecticut for the U.S. Geological Survey.

Frank M. Wright is beginning dissertation research in the area between Rome, Camden and Oneida Lake, including the outlet of Late Iroquois.

****

CONTRIBUTORS

Page

12 Bugh, Dr. James, Department of Geology, State University Coll. Cortland, New York 13049

18 Cadwell, Mr. Donald H., Department of Geology, State University of New York at Binghamton, Binghamton, New York 13901

6 Caggiano, Mr. Joseph A., Jr., Department of Geology, University of Massachusetts, Amherst, Massachusetts 01002

1 Clark, Dr. G. Michael, Department of Geology, University of Tennessee, Knoxville, Tennessee 37916

5 Coates, Dr. Donald R., Department of Geology, State University of New York at Binghamton, Binghamton, New York 13901

6 Collins, Sam G., Department Head, World Data Center A, Glaciology, American Georgraphical Society, Broadway at 156th Street, New York, New York 10032.

6 Crowl, Dr. George H., Department of Geology, Ohio Wesleyan University, Delaware, Ohio 43015

10 Davis, Mr. Kernan W., State of New York Environmental Conservation Department, Division of Water Resources, State Office Building Campus, Albany, New York 12226

17 Dreimanis, Dr. Aleksis, Department of Geology, University of Western Ontario, London, Ontario, Canada

15 James R. Dunn and Associates, Box 187, Averill Park, New York 12018

3 Durham, Dr. Forrest, Department of Geology, Hofstra University, Hempstead, New York 11550

13 Fahnestock, Dr. Robert K., Department of Geology, State University College, Fredonia, New York 14063

3 Forsyth, Dr. Jane L., Department of Geology, Bowling Green State University, Bowling Green, Ohio 43402

14 Hartshorn, Dr. Joseph H., Department of Geology, University of Massachusetts, Amherst, Massachusetts 01002

7 Hollands, Mr. Garrett G., Department of Geology, University of Massachusetts, Amherst, Massachusetts 01002

2 Karrow, Dr. P.F., Department of Earth Science, University of Waterloo, Waterloo, Ontario, CANADA

19 Muller, Dr. Ernest H., Department of Geology, Syracuse University, Syracuse, New York 13210

Page

9 Randall, Mr. Alan D., U.S.G.S., P.O. Box 948, Albany, New York 12224

12 Sevon, Dr. William D., Pennsylvania Geological Survey, Harrisburg, Pennsylvania 17120

4 Sirkin, Dr. Leslie A., Depart. of Earth Science, Adelphi University, Garden City, New York 11530

3 White, Dr. George W., Department of Geology, University of Illinois, Urbana, Illinois 61801