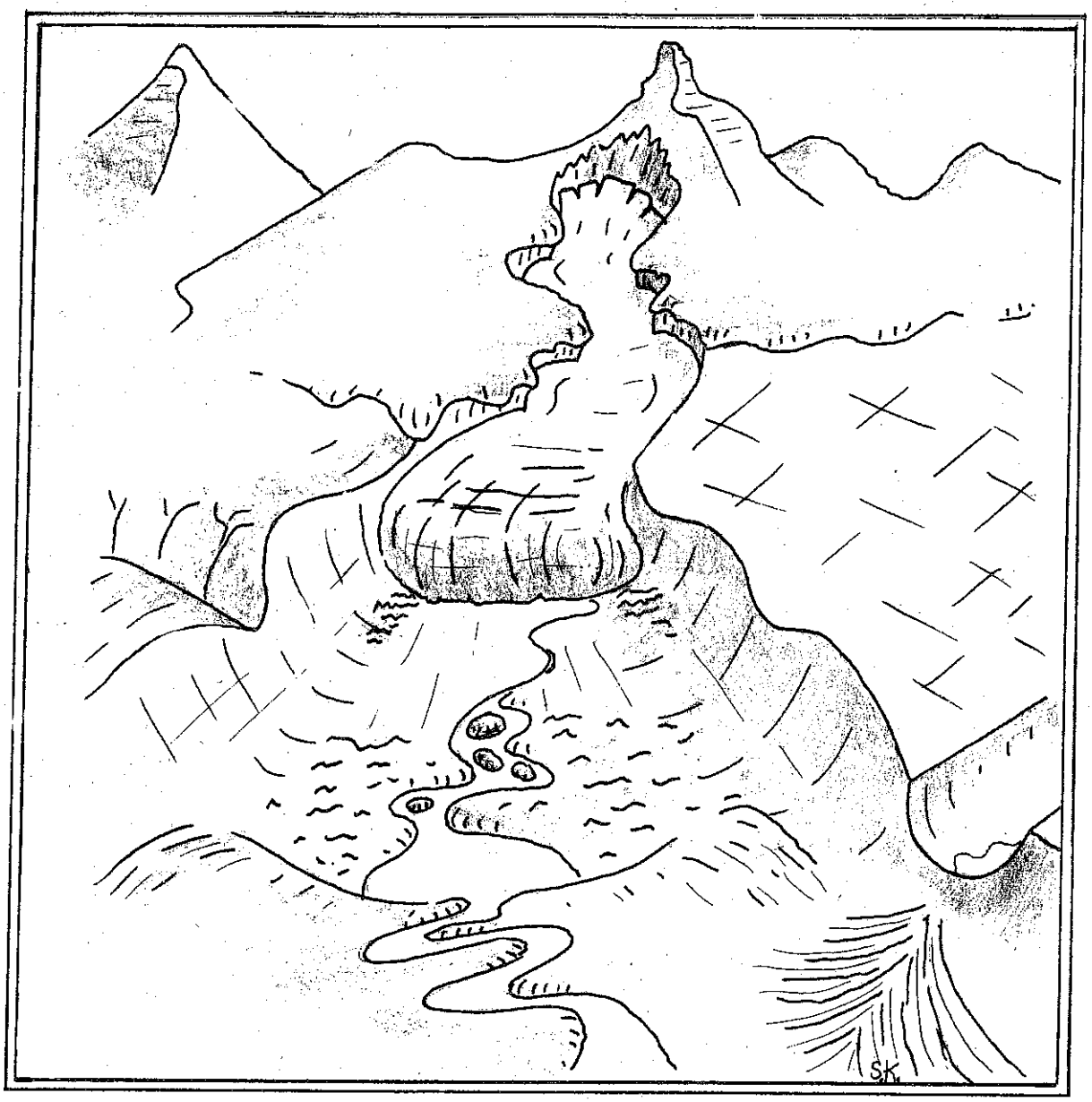
NEW YORK GLACIOGRAM



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For further information write to the editor:

Donald R. Coates

Department of Geology

State University of New York at Binghamton

Binghamton, New York 13901

GERARD H. JOHNSON 10/08/68

I appreciated receiving volume 3, no. 1 of the New York Glaciogram. It was forwarded to me in northern Indiana in June. At that time I was completing field work on the Michigan part of the Fort Wayne 1° x 2° Quadrangle. This map will be published by the Indiana Geological Survey in cooperation with the Ohio and Michigan Geological Surveys. I became involved with the mapping project this summer due to the death of F.W. Terwiliger of the Michigan Survey in April. He had been given the task of mapping the Michigan part of the quadrangle but died before he could complete the project. Since I mapped most of the Indiana part of the Fort Wayne Quadrangle I was called upon to complete the mapping and compilation. I finished the field work in mid-July.

Many interesting, and potentially important, glacial relationships between the Erie, Saginaw, and Lake Michigan Lobes were observed in the field area-central southern Michigan. The trend and continuity of several major moraines in this area were studied in detail and changed considerably from older maps. Truncation of moraines was documented in two cases where they had been thought to be contemporaneous by earlier workers. A brief description of a new small glacial lake is given below:

Sediments and physiographic features of an ice-marginal lake occur in central eastern Hillsdale and adjacent Lenawee Counties, Michigan. The extinct lake, called Glacial Lake Addison, was formed between the receding Erie Lobe and the proximal margin of the Mississinewa moraine during the late Wisconsin Age. Lake sediments, consisting of beach and nearshore sands and gravels and nodular and massively bedded clays, were deposited discontinously over a 12 to 15 square mile area. The lake was destroyed when stagnant ice that formed its northern margin wasted and allowed the lake to drain. Peat and marl deposits have accumulated in ice block depressions and in channels on the lake floor in post glacial time.

I will report more to you on the glacial relations between the Saginaw, Erie, and Lake Michigan Lobes in May.

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HAROLD W. BORNS, JR. 10/08/68

Parker E. Calkin and I spent this past summer investigating Pleistocene events in northwestern Maine. We covered a lot of ground, looked at a great number of exposures and find ourselves, at the end of this first summer, with a considerable amount of disconnected information. Nevertheless our findings do suggest that the last ice sheet thinned and separated over the Longfellow Mountains and that large masses stagnated and downwasted within the mountain basins as well as to the south of the mountains. We have also tentatively concluded that the cirques (?) of the Sugarloaf Mountain region, whose floors are at an altitude of approximately 3,500 feet, were not active subsequent to the dissipation of the last ice sheet.

Hopefully, by this time next year, after another field season, we will have solved most of the problems raised during this past summer.

Parker and I will both be doing field work in Antarctica this austral summer, but on separate projects.

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GEORGE W. WHITE 10/11/68

Attention should be called to a paper by Robert F. Sitler, "Glacial tills in oriented thin sections," XXIII Intern. Geol. Congress, Prague, vol. 8, p. 283-295, 1968, which deals with some Ohio and Pennsylvania tills. As his paper was scheduled for presentation the first day of scientific sessions at the Congress in Prague in August, 1968, he was able to give it, with his illustrations expertly and especially prepared for projection. It drew wide commendations; the Russian chairman was particularly enthusiastic. Bob's work on pyrite in till is of especial importance.

Dr. Stanley M. Totten of Hanover College is in Birmingham this year on an NSF senior post-doctoral fellowship to work with Professor F.W. Shotton and Dr. G.R. Coope on Pleistocene beetles. He took with him some of the very beetliferous peat from Titusville, Pennsylvania for study.

New C^{14} analyses of the peat below the Titusville Till at Titusville, Pennsylvania will be reported in detail in the now-in-press Pennsylvania Survey Bulletin G-55 on the Pleistocene stratigraphy of northwest Pennsylvania. The more recent analyses indicate the age reported by White and Totten in 1965 is somewhat too low.

A note in GSA Bulletin, vol. 79, 1968, p. 749-752, on Pleistocene deposits near Cleveland, Ohio, reports a probable age for Kent Till of 23,250 years and for an "upper loess" of 28,000 years. The following paper by G.R. Coope is the first report known to me on Pleistocene beetles in the U.S. They lived just before the advance of the Kent ice and are preserved in a lake shore (not bottom) deposit 23,750 years B.P. and record a fauna "similar to that which may be found close to the timber line of the present day. Though cooler than now, conditions were not really arctic and the fauna is not that of the true tundra." It will be interesting to compare this fauna and its climatic implications with the Titusville beetles which lived more than 15,000 years earlier, at the time of the advance of the Titusville ice.

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PETER P. HUDEC 10/14/68

A study is being completed on a rather unique project involving the Quaternary and bedrock of Wayne County. It involves delineating areas suitable for surface spreading of waste water. The study forms a part of a larger project in which the economic potential of Wayne County is evaluated, specifically for location of industrial sites and plants.

The method of approach was to interpret the landforms as seen on 7½ minute topo sheets, and in conjunction with available soil maps and field checks, establish the nature of the various glacial deposits found in the county. Published information on water wells was used to arrive at some idea of the thickness of the Quaternary, and bedrock topography and Quaternary isopach maps were prepared.

Since the areas most suitable for surface spreading are those with relatively high percolation (infiltration) rate, and those with suitable thickness of permeable material which will absorb relatively high volumes of water, the areas sought were essentially outwash plains, near-shore lake deposits and kame areas.

The work done was regional in nature. Selection of individual sites for possible waste water spreading usage will depend on detailed investigation of each area in question. The geomorphological interpretation of topo sheets was challenging, because this region has undergone a wide variety of glacial processes.

The study is an example of the type of work that we, as geologists, will be called upon to do with increasing frequency in the future. The population pressures will make a geologist who was hitherto associated with the extractive industry into a bird-loving, swamp-preserving, sophisticated conservationist.

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W. PHILIP WAGNER 10/16/68

The news here is a continuing program of study of glacial deposits in the Champlain Valley, Vermont. During this past summer, I completed a map covering the area between Lake Champlain and the Green Mountains and between Burlington and Middlebury. These findings show a complex pattern of ice frontal positions during deglaciation in the area, with numerous apparently isolated masses of continental ice acting as "valley glaciers". A variety of strand lines of Lake Vermont and the Champlain Sea have been recognized and delineated.

Chester A. Howard, Jr. has spent the summer mapping glacial deposits in the Champlain Valley north of Burlington. Mr. Howard has found a complex relationship between the ice margin, bedrock topography, and both local and regional ponded waters.

Another student, Mr. William Parrott, has begun a detailed investigation on numerous physical properties of tills in the Champlain Valley, based on a computer - statistical approach.

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CHAUNCEY D. HOLMES 10/20/68

I'm still wondering about the ecology of those late-glacial/ postglacial diatoms and sponges in the peat at Jam Pond. They are present also in the Quaker Basin Swamp peat, but in fewer numbers. Has anyone discovered similar fossils elsewhere?

For my recreational research during the winter, I have collected a new series of samples from the Quaker Basin Swamp. It's mainly a re-study for purposes of comparison with my earlier results from other places in the same swamp. Also, of course, the Law of Serendipity is applicable anywhere.

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ALEKSIS DREIMANIS 10/21/68

Last summer I was mapping the western portion of the Port Stanley map which includes part of the north shore of Lake Erie, for Geological Survey of Canada. A brief report will be published by GSC in the near future. The bedrock surface maps of the same sheet and the St. Thomas sheet (to the north) were published by Ontario Department of Mines as Preliminary maps No. 482 and 483.

Several new reports on mastodon occurrences have come in from S.W. Ontario.

A discussion group on the Quaternary investigations has been started by the faculty members and students of the Departments of Geology, Geography, and Soil Mechanics, and the meetings will take place in 1968/69 on every second Wednesday, beginning on October 30, 12:30 p.m. in Room 136 (Pleistocene Laboratory) of the Biology-Geology Building, University of Western Ontario, London, Ontario. Visitors are welcome.

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GEORGE H. CROWL 10/22/68

I was a temporary Geologist for the Pennsylvania Topographic and Geologic Survey this past summer, mapping the Pleistocene deposits of the Delaware Valley between Stroudsburg and Matamoras, Pa. The map is nearly complete (10/20/68), the report comes later.

The main valley flat is a low terrace ± 25' above river level. It is covered only by the greatest floods, such as that in 1956. River silts are characteristic deposits on the terrace. It is marked by a number of old channels, and one small dune area was mapped. Locally, outwash deposits are exposed beneath the silts.

At the base of the valley walls is a discontinuous series of kame terraces throughout the length of the valley. Longitudinal profiles show that they have steeper gradients than the alluvial terrace and plunge beneath the terrace. In some cases, the high end of a down-stream terrace overlaps the low end of an upstream terrace.

The Fisher School Moraine described by Salisbury (1902) in New Jersey may continue as a kame moraine on the hills above Milford, Pa.

The west slopes of the valley between Bushkill and Matamoras are mantled with colluvium, shale-chip fragments derived from outcrops of Mahautango shale on the slopes. There are a few alluvial fans at the mouths of tributary streams.

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WALTER S. NEWMAN 10/22/68

Expended 11 weeks this past summer mapping the surficial geology of the Ashley Falls (Massachusetts-Connecticut) Quadrangle, one line of quads east of the New York State border, with Dr. G. William Holmes of the U.S. Geological Survey. Never having mapped a quadrangle before, it proved quite a chore as well as a revelation. Frankly, I was frequently chagrined by my ignorance. Thanks to a great field assistant, Lester B. Smith, Jr., a recent graduate of Syracuse U., the constant encouragement of Bill Holmes, and helpful visits by George Kelley and Joe Hartshorn (to say nothing of a couple of good shoves by Linc Page), I survived and, perhaps, even prevailed. The published map will tell the final tale.

My colleague, David Thurber, and our students, Harvey Zeiss, Allan Rokach, and Lillian Musich, are continuing our study of the Quaternary History of the Hudson River Estuary. Both published and unpublish-d data (thanks especially to Tom Fluhr and the Hudson River Bridge Authority) find the valley's bedrock thalweg at inconsistently varying elevations: about -200 feet at Kingston,

more than -200 feet near Marlboro, at almost -400 feet at Newburgh, more than -700 feet at Storm King, a similar depth at the Tappan Zee Bridge, at about -300 feet opposite Manhattan Island, but only about -200 feet near the Narrows. The bedrock valley form confirms its identity as a fiord. However, the valley cutting age remains uncertain.

The sediment in the valley consists of till, outwash, lacustrine silt, fluvial sand, estuarine organic silt and tidal marsh peat. Paleontological analyses of bore samples adjacent to Iona Island, just south of the Bear Mountain Bridge, suggest the estuary has been in existence for at least 12,000 radiocarbon years. Archeological shell middens at Croton and Montrose Points indicate the estuary achieved salinities of 8 0/00 or more 4-6,000 years B.P. more than twice those presently obtained at these localities. Decrease in salinity is probably due to estuarine clogging by sediments in the sense of Emery (1967).

A marine transgression curve constructed from the Iona Island data implies the locality suffered post-glacial isostatic rebound followed by subsidence during the past few thousand years.

Visited the Montauk Peninsula once again (Rhodes Fairbridge, Wallce Broecker, and their students joined me for two days) and still believe the Montauk Till is Late Wisconsin in age.

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ROBERT F. BLACK 10/23/68

My last summer activities precluded a visit to New York. They included:

1) A trip in June to Amchitka Island in the Aleutians under the auspices of the U.S. Geological Survey and the Atomic Energy Commission, in the company of Professor William S. Laughlin of this University, to look at late glacial-Holocene history and ancient man;

2) Work in Wisconsin and Upper Michigan particularly on the Valderan glaciation; and

3) Another sojourn on the Juneau Ice Field for a series of lectures with the Michigan State Glaciological Field Camp.

My immediate plans call for:

1) Participation in GSA and Hal Malde's Valsequillo Field Trip, and

2) Another trip to Antarctica for servicing recording stations and collection of additional samples in my pattern ground studies.

Longer range plans involve specifically the preparation of a preconvention and a mid-convention Pleistocene field trip in Wisconsin for the 1970 GSA meetings in Milwaukee.

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WALTER M. TOVELL 10/23/68

CONFERENCE ON THE GEOBOTANY OF SOUTHERN ONTARIO AND ADJACENT AREAS

ROYAL ONTARIO MUSEUM

TORONTO, CANADA

In the tradition of last year's conference at Bowling Green University an informal interdisciplinary meeting is planned, where botanists and geologists with interests in plant geography, ecology, climatology, palynology, and Quaternary stratigraphy may discuss their problems. A limited amount of time will be available for oral presentations. Selection of the talks will be based largely on the time factor, and the order in which requests for time are received. Adjacent to a coffee urn will be several large bulletin boards for displaying maps and diagrams, with no limitation on coffee or bulletin board space.

Anyone interested should contact Dr. J.H. McAndrews, Associate Curator, Department of Geology, Royal Ontario Museum, 100 Queen's Park, Toronto 5, Ontario, Canada.

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JANICE M. WHIPPLE 10/25/68

During the past summer I continued surficial mapping and water well inventory in the western part of the Mohawk River basin (from St. Johnsville to Rome). More than twenty 7½' quadrangles comprise this area so the study has been of exploratory nature. Geologic interpretations will be under way this winter.

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DONALD R. COATES 10/28/68

During the 1968 summer I was involved in two rather dissimilar projects: (1) For one month I directed an NSF Summer Institute for Earth Science Teachers, and (2) for two months I was project director of a Joint Awards Council grant that involves three faculty and seven students. The title of our project is "A NEW INTERDISCIPLONARY APPROACH TO DRAINAGE BASINS AS ENVIRONMENTAL SYSTEMS AND THEIR RELATION TO WATER RESOURCE DECISION-MAKING".

My co-workers, as mentioned in the May GLACIOGRAM are Drs. Joseph Butler and Nicolay Timofeeff from the Department of Geography. This first summer was spent doing work in the Owego Creek drainage basin. We are going to use this 186 square mile area as a prototype study, and develop a simulation model which we hope will have wide applicability for other watersheds. My hydrogeology group J.J. Flint, R. Fessenden, J. Conners, and J. Kirkland spent most of the summer collecting the raw data for water regimen properties of Owego Creek and its tributaries. Channel morphology and sedimentology data were also accumulated. Computer programs have been written and we are just now starting to analyze the results. This preliminary phase should be completed in time for me to make a presentation at the American Geophysical Union annual spring meeting. I am particularly interested in working out the manner in which glaciation has affected the hydrologic regime of a drainage basin. If anyone knows of other studies that treat the hydraulic geometry of streams in northeastern United States, please let me know. I am finding that the geometry of hydrology and channel morphology in this glaciated region is quite different from that of non-glacial terrains.

The SUNY Binghamton Department of Geology was very fortunate to receive a $500,000 department developmental grant from the National Science Foundation. It provides for a doubling of our current teaching staff from nine to eighteen in a four-year period. A considerable part of the grant is aimed at accelerating our growth in the area of sedimentology and fluvial mechanics.

Jack Conners is finishing his masters degree by writing his thesis on the Genegantslet region. This area has a great variety of periglacial landforms, patterned ground, and unusual drainage pattern anomalies.

Steve Kowall, who drew the front cover, has started his Ph.D. thesis study of several areas in Pennsylvania. He will compare the geomorphic differences that evolved from glaciated, non-glaciated, and folded terraines.

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ROGER M. WALLER 10/28/68

I moved to Madison, Wisconsin, in September to compile a groundwater geology report for the USGS as part of the Great Lakes Basin Commission's water resources plan. My Black River, New York, basin ground-water report is about ready for review. I have nothing new to report on the glacial-deposit aspects of the area.

I would like to remain on your mailing list as my interests will remain with glacial geology and my new project includes a portion of New York. My new address is USGS, 1815 University Avenue, Madison, Wisconsin 53706.

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MICHAEL H. FRIMPTER 10/29/68

During a study of the water resources of the Allegheny River basin in southwestern New York, it was observed that geochemical differences between the glaciated and nonglaciated terrane in the area of the Salamanca reentrant are reflected in the chemical composition of stream water. Although the entire study area is underlain by interbedded sandstone and shale, stream water from the glaciated parts of the basin is generally twice as mineralized as stream water from the nonglaciated areas. Water from streams draining valley train deposits south of the Wisconsin terminal moraine is also relatively high in dissolved solids concentration. Although the concentrations of most dissolved constituents are only slightly greater in streams draining glaciated areas, the concentrations of calcium, magnesium and bicarbonate are much greater. This difference is primarily due to the presence of calcite, dolomite, and perhaps gypsum in the glacial drift that was carried southward by glacial ice from outcrops of Silurian and

Lower Devonian limestone, dolostone and gypsum found farther to the north. Rainwater falling on glaciated terrane comes in contact with more of these soluble minerals and, therefore, becomes more mineralized than rainwater falling on non-glaciated terrane.

The glacial drift also contains a larger amount of finely ground unweathered rock than is found in the residual unconsolidated rocks and soil of the nonglaciated area. Because of this difference, water that flows over or through the glacial drift is in contact with a much greater quantity of unweathered soluble minerals than water that flows over or through the residual deposits. As a result, water draining glaciated terrane is more mineralized than water draining nonglaciated terrane.

Streams draining both glaciated and nonglaciated areas, such as Fivemile Creek and Wrights Creek, yield water with a mixed quality and intermediate amounts of dissolved solids. These relationships between stream-water mineralization and glacial geology held true throughout the 2,200 square mile study area except for those streams polluted with oil-field brine.

Unfortunately, the objectives of the water-resources study did not allow defining the limit of continental glaciation in the upland areas by these geochemical means. Rather, existing maps showing the southerly limit of glaciation were used as guides in preparing a regionalized map of the chemical quality of surface water for the water resources report. It would appear, however, that stream-water quality could be used as a geochemical tool for locating the southerly limit of Pleistocene glaciation in upland areas in southwestern New York, and in other areas with similar geologic conditions.

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JAMES E. BUGH 10/29/68

Quaternary investigations at Cortland for 1968 have been three undergraduate projects and one M.S. thesis.

(1) Jack Lambert did work on "Terrace Topography of South-Central New York". He studied the non-fluvial terraces that range in length from less than 100 feet to more than one mile. Their width is usually less than 100 feet and heights that range from 5 to 60 feet. The terraces studied are mostly lateral moraines.

2. R.E. Laudenslager's project is titled "An Analysis of the Glacial drift in and around Cortland, New York". The main focus of the work is an attempt to distinguish glacial drift of different ages in the area.

3. Barbara Skerky did work titled "Analysis of Glacio-fluvial Deposits in South Cortland, New York". She interprets the gravels as resulting from ice-contact conditions.

The title and abstract of James Kirkland's M.S. thesis is as follows:

"Location of the Valley Heads Moraine in the Tully Valley Region, New York"

Heavy mineral studies and field investigations indicate that the terminus of the Valley Heads glacier occupied not only the area of the Tully Moraine but also a previous advance position south of Song Lake. Hills to the northwest of the Tully Moraine remained unglaciated by Valley Heads ice. The duration of the Valley Heads ice at the Tully Moraine was short as evidenced by stagnant ice and glaciofluvial features.

WILLIAM D. SEVON 10/30/68

Pleistocene geology in northeastern Pennsylvania took several significant steps forward this summer as a result of projects contracted by the Pennsylvania Geological Survey with Mrs. Milena F. Bucek, formerly with the Czechoslovakia Geological Survey, and Dr. George H. Crowl, Ohio Wesleyan University. Their reports are elsewhere in this GLACIOGRAM. I completed mapping of the Christmans 7½' quadrangle and did a lot of reconnaissance.

As mapping progresses, I continue to modify the Illinoian (?) glacial boundary. The Illinoian (?) ice on the Pocono plateau in the Christmans quadrangle appears to have been too overextended at the point of maximum advance to build any real terminal moraine. Rather, it appears that the ice stopped without build up of any moraine almost at positions where it had a down gradient into the Lehigh River valley. The Pennsylvania Turnpike Northeast Extension marks the approximate position of the maximum Illinoian (?) advance in the Christmans quadrangle, the actual limit being just west of the turnpike.

The most significant 'find' this summer was igneous and metamorphic pebbles and boulders in the Lehigh River gravels. They have been derived from the Wisconsin glacial deposits, but a complete suite of comparable lithologies has not yet been extracted from the glacial deposits. The occurrence of these lithologies partially confirms a suspicion that the present Lehigh River gravels are Wisconsin outwash gravels which are currently being eroded and reworked. These lithologies are particularly interesting since Crowl found only two gneiss pebbles during his Delaware River valley work, Bucek found no igneous material in the East Stroudsburg quadrangle and J. Epstein reports finding no igneous material in the Stroudsburg quadrangle.

Crowl and I made a quick reconnaissance of some roadcuts on the new Interstate 84 which is under construction west of Milford, Pennsylvania. We noted excellent bedrock control of the till character in that area. Where underlain by the Delaware Flags, the till is grey and perhaps slightly clay deficient. Where underlain by the red shales of the Shohola Formation, the till is red, high in clay content and brick hard when dry.

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MILENA F. BUCEK (Mrs.) 10/30/68

Under contract to the Pennsylvania Geological Survey, I spent the summer studying the glacial deposits of the East Stroudsburg 7½' quadrangle, Monroe County, northeastern Pennsylvania, and am currently preparing a report for publication by the Survey.

The glacial history of the area is expressed especially in the deglaciation features. The fluctuating retreat of the ice margin resulted in the deposition of a sequence of recessional morainic ridges with NE-SW trend and ice-contact deposits. Their formation and the development of the glacial drainage was partly controlled by preglacial topography. Kames, crevasse fillings, and kame terraces in the vicinity of East Stroudsburg were dissected by stream erosion associated with the development of a valley train of a younger recessional phase. The conspicuous topography of a kettled deltaic terrace formed in a standing body of water occurs near the borough of Marshall Creek. The lithology of the glacial drift is closely related to the character of the underlying rocks. Fragments of Catskill sandstones are predominant and occur in a

matrix of mainly sand size particles. The slight amount of post-glacial erosion and unweathered character of the drift exclude the possibility that the drift is older than the Wisconsin stage.

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ERNEST H. MULLER* 10/30/68

Arrived in Iceland, July 1st, the Muller family enjoyed an unexpectedly pleasant spell of weather that enabled us to get around the island quite readily, visiting outlet glaciers of the principle ice-caps. Since onset of fall weather and shorter days, I have divided my time between Natturugripasafnid (Natural History Museum) for its reprint files and contact with Sigurdur Thorarinsson and Gudmundur Kjartansson, and Landmaelingar Islands (Iceland Survey) for study of air photos.

For only the second time since 1918, Arctic pack ice pressed close against the northwestern headlands of Iceland well into the summer this past year, arousing speculation as to possible implications on continuing climatic deterioration. Jardfraeda-felag Islands (Icelandic Earth Science Society) and other professional societies and departments in Iceland are joining to plan a three-day symposium this winter to examine the history, relationships and implications of sea ice changes, ocean currents and climate with special reference to Iceland.

In focussing on Langjokull and small neighboring ice caps, I have been interested to visualize the successive stages in initiation of an ice sheet by coalescence of highland glaciers, thinking of course, of the Adirondacks both during onset and waning of the continental ice sheet.

As stressed by Sigurdur Thorarinsson in a paper prepared for the recent symposium on glacier surges, occasional rapid expansion followed by similarly rapid thinning and retreat has been normal behavior for the broad, low-gradient outlet glaciers of Iceland's ice-caps. Closer attention to details of New York glacial geology may well substantiate that similar behavior was characteristic of the margin of the North American ice sheet.

An analog to the situation involved in the primitive pro-glacial lakes in New York is afforded by glacial diversion and imponding of a meltwater lake by Hagafellsjokull Eystri

(Sigbjarnarson, 1967 in "Jokull", Journal of the Icelandic Glaciological Society). Recession of 4 kms. during recent decades has uncovered a sequence of outlets, each change being accompanied by a limnogenic hlaup as lake level lowered.

The University of Iceland, established in 1911, but only really developing since the Second World War, is moving to establish a nucleus of competence in Geology for the first time with appointment of Sigurdur Thorarinsson as Professor. Geologic mapping of Iceland continues under Kjartansson at the Natturugripasafnid, with four of nine sheets published now at 1:250,000 scale.

*(Syracuse University, on leave) (address until July 31, 1969 -- Hjardarhagi 26, Reykjavik, Iceland.)

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CALVIN J. HEUSSER 10/31/68

During the past year since leaving the American Geographical Society and establishing a palynology lab at New York University's center in Sterling Forest, we have continued to process Pleistocene material for the purpose of environmental reconstruction. With the aid of Mrs. Rosemary Fitch, the collection of pollen and spore types has grown along with our reference card catalogue. It is our hope to eventually have all material on punch cards including a photo record of all types.

Although my research continues on the Pleistocene of the Olympic Peninsula of western Washington, and of Alaska and Chile as well, plans have been formulated to begin next year a detailed study of the history of the estuarine marshes of the Hudson River. This program will take into account some ten sites, treating existing plant community-environmental relationships and reconstructing past environments and chronology through examination of the macroscopic and microscopic plant remains in cores taken from the marshes.

Two graduate students in the Department of Geology, who are working out of our laboratory, are involved with Pleistocene palynological problems. Mr. Robert Berman is finishing up an M.S. thesis dealing with kettle lake sediments at three sites on Staten Island. Mrs. Linda Florer is beginning a study leading to a Ph.D. of the postglacial vegetation and environments of the New Jersey "Pine Barrens".

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WILLIAM D. LIPE and DOLORES ELLIOTT 11/2/68

Archeological salvage excavations were completed in September at the Engelbert Site, Nichols, New York, and most of the site is now incorporated in the new Southern Tier Expressway. As reported a year ago in the Glaciogram, this site was discovered in the spring of 1967 when a contractor began removing gravel from a knoll in the Susquehanna Valley near Nichols, as part of the construction of the new Expressway. The entire top of the knoll, an area of about 400 by 600 feet, was found to be rich in archeological remains, including human burials and numerous artifacts. The contractor, Perini Corporation, agreed to reschedule the work so that salvage archeology could be carried out; this eventually resulted in over a year's delay in the removal of all the gravel from the knoll.

The excavation project during both seasons was directed by W.D. Lipe of the SUNY-Binghamton Anthropology Department, with Dolores Elliott, graduate student, as full-time field supervisor. Labor, much of it volunteer, was provided by SUNY-Binghamton graduate and undergraduate students, by members of the Triple Cities Chapter of the New York State Archeological Association, and by interested local citizens. Funds were provided by the Tioga County Historical Society, the New York State Museum, the National Geographic Society, the SUNY Research Foundation, and the Graduate School of SUNY-Binghamton.

The knoll upon which the site is located has been identified by Don Coates of the SUNY-Binghamton Geology Department as a glacial kame (although all of the gravel is not strictly ice-contact) with a Binghamton drift lithology. The first human occupation of the site was in the Archaic Stage (a major temporal subdivision of Eastern United States prehistory) and can be assigned to the Lamoka culture of about 2000-2500 B.C. These people lacked agriculture and pottery, and probably followed a seasonal cycle of hunting and collecting wild plant and animal foods. The Lamoka remains consist principally of numerous projectile points and coarse stone tools such as choppers, hammerstones, milling stones, and net sinkers, plus a number of small hearths. No burials of this period were found.

After the Lamoka occupation, the site was little used for several thousand years. In the Late Woodland Stage, however, it once again became a favored place for Indian occupation. Between about A.D. 1200 and the early 1600's, three successive periods of occupation can be recognized: middle to late Owasco, early prehistoric Iroquois, and historic Susquehannock. It has not yet been determined whether these occupations were entirely separate or represent a continuum; it does seem fairly likely that at least the Susquehannock period was separated from the others by some years.

During the Owasco-Iroquois periods, the Indians were probably living at the site the year around. Although they still used wild foods to a considerable extent, they also were dependent on maize farming. Most of the hundreds of large pit features found at the site relate to these two occupations. Many of these pits were probably dug for storing food or other items, but were used as garbage pits or burial places after the original contents had been removed. In addition to the pit features, several rows of post molds were encountered; these probably are traces of the walls of longhouses.

In the last period of occupation, the site was used only as a cemetery. The distinctive shell-tempered pottery and items made from trade copper that accompanied the burials identify them as Susquehannock. This was an Iroquoian-speaking group known to have occupied parts of the Susquehanna River Valley in the early historic period. The location of the village for which the Engelbert Site was the cemetery is still unknown.

The most outstanding feature of the Engelbert Site was the large number of burials found there. In the two seasons of excavation, remains of 131 individuals were recovered. Twenty-nine of these, however, had been to some extent disturbed by earth-moving machinery.

Approximately 525 Late Woodland pit features, including burial pits, were excavated during 1967 and 1968. This figure includes 30 features dug in June, 1967, by a crew from SUNY-Buffalo that initiated the salvage archeology at the site. Approximately 500 to 600 more features were recorded, but were not excavated, before their destruction by gravel removal. Most of these pits did not contain burials; this was confirmed by observation of the features during their destruction by earth-moving machinery.

The skeletal material from the Engelbert Site is being studied by Dr. Audrey Sublett, physical anthropologist, of Florida Atlantic University. Dr. Sublett and two graduate assistants spent the month of June with us this year, and Dr. Sublett will return early next summer to complete the study. On the purely archeological side, washing and cataloging of the artifacts is progressing rapidly, and analysis, classification, and interpretive studies should get underway by late winter.

In addition to directing the Engelbert Site Project this summer, I (Lipe) made a small contribution to Pleistocene geology by recovering part of the pelvis of an extinct elephant from a gravel pit located just south of the village of Chemung, New York. This find also was the result of the construction of the Southern Tier Expressway. The bone was uncovered by a machine operator and reported to me by New York State Transportation Department personnel. After visiting the site and obtaining the specimen, I contacted Don Coates, who was later able to visit the location, which the Project Engineer, Mr. Flahive, had kindly preserved for his visit. In Don's opinion, the deposit was part of the late Wisconsin valley train of the Chemung River. Stewart Landry of the SUNY-Binghamton Biology Department is studying the bone from the zoological point of view, and has tentatively identified it as a species of mastodon. As soon as Landry's study is complete, we will attempt to have a C-14 determination made, using part of the bone.

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RICHARD P. GOLDTHWAIT* 11/2/68

By now those of you in states from Ohio to Iowa know that the call for papers at the North Central Section meeting of GSA to be held here at Columbus on May 15-17, 1969 has gone out from Boulder.

Our symposium will begin on Thursday, May 15th, after the opening session (say afternoon). Is this good for you, or, is <u>just</u> a Friday-session better? Of course if we have enough good papers, we might need parts of both!

Do we get consistent or random orientation, or no fabric at all, in the ablation till of an end moraine? Thin tills, rates and time of subglacial till accretion, buried moraines, products of glacial surges, boulder belts, subglacial erosion versus deposition, - all these and more are topics we might consider, hopefully. Obviously you can't afford to miss it!

Oh yes: would you like a one-stop half-day collecting and arguing trip to a new (temporary: interstate highway) road locality? On Friday afternoon this would conflict with NAGT. Or, should this be one of 3 or 4 stops on the all-day Saturday Pleistocene-glacial field trip? If I know soon we can arrange both; a Pleistocene trip is already "on schedule". For the sake of NAGT people, and student types, should the glacial trip on Saturday revisit an old stop or two (like Rocky Fork, Gahanna multiple drift creek cut, INQUA Conference G, Stop #9-4, Midwest Friends Trip 1962 Stop #1) or should we dive into a new area <u>in progress</u>? (e.g. Highland Co.: with Illinoian, Sangamon, possible Early Wiscon, 18000 BP Wisconsin and 17,650 BP readvance).

Hope to hear of your tentative plans soon, Deadline for your title and abstract to me is Jan. 6, 1969.

*Selected parts of a letter to the Editor.

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JOSEPH A. CAGGIANO, JR. 11/2/68

Like a late Wisconsin ice margin, I have oscillated within the past year--waxing south to Philadelphia thence waning north to Amherst where I am currently working on my Ph.D. at the U. Mass.

My summer was spent (in the words of one of my former colleagues) "honing down the edges of barbarism". Rephrased, I spent the summer dispensing Care packages of Physical and Historical Geology to the novitiates of Temple University summer school. After a hasty move to Massachusetts, I quickly transferred robes from that of pedagogue to student.

My dissertation topic has not been narrowly defined, but I hope to do some work on petrographic and sedimentologic aspects of tills and glaciolacustrine deposits under Joe Hartshorn. To date, my familiarity of local geology and its problems is restricted to that which I have gathered from leading field trips in introductory geology.

Of interest to those of you working on drift lithology in central New York, might be my M.A. thesis results of the Valley Heads in the Vernon Quadrangle: 54.4% carbonates, 8.8% Medina, 1.2% crystallines, and 34.6% clastics. Interesting comparison can be made with previous workers such as Holmes (1952), Coon (1960), Moss and Ritter (1962), and Kaiser (1962).

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J. PHILIP SCHAFER 11/5/68

A major interest for the last few years has been the two-till problem in southern New England. Fred Pessl and I have just displayed this situation in the Naugatuck valley of western Connecticut on a New England Intercollegiate field trip. What drift in New York is equivalent to our lower, deeply oxidized drift?

I was interested to discover that tills in the Naugatuck valley contain a few fragments (totalling a small fraction of a percent) of distant visitors from New York -- sedimentary and low-grade metamorphic rocks of the Taconic terrane. Kinds represented include graywacke (Rensselaer?), black chert (Mt. Merino?), red chert, red quartzite of several types, red and green argillite, gray and green phyllite. Minimum distance of transport for any of these is 40 miles, and for some probably more than 75 miles. I haven't yet tracked down precise bedrock sources for these, but on a visit with Gordon Connally last year I was able to match many of them in gravel pits near Cambridge, New York.

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JOHN E. HARRISON 11/9/68

During a recent visit to Binghamton, I was pleased to learn that the Glaciogram was being expanded to include material from beyond the confines of New York State. This past summer I began a project, for the Canadian Geological Survey, to study some of the outlets to the late glacial lake sequence in the Huron basin. I certainly can appreciate how impossible it sometimes is to study a problem within the confines of a specific geographical area.

In the Huron basin, progressivley lower, warped strand lines of glacial Lake Algonquin have been described. These were believed to indicate the existence of new outlets to the east, through the Algonquin highlands. Chapman (1954) showed that following the Kirkfield stage (drainage through present Trent canal into Lake Iroquois), no outlet across the highland exists, and the next route by which water left the basin was past Fossmill and into the upper Petawawa River system. With the opening of an outlet North Bay and drainage down the Mattawa and Ottawa systems, the lake level dropped and the Fossmill outlet dried up. Uplift due to glacial rebound slowly raised the North Bay outlet, eventually tilting the water out through Port Huron and the North Bay route was abandoned.

The purpose of the North Bay - Mattawa project is to investigate the Fossmill and North Bay drainage routes in detail. Problems which I hope to look into include the following:

1. Relationships between known lake levels, as marked by beaches and scarps developed to the south and west, and outlets.

2. An explanation of why the beaches described outnumber the outlets known. (This problem involves the convergence and parallelism of beaches as well as multi-level outlets.)

3. How did the ice front retreat in the Fossmill area? Was the retreat such that only one route was available for drainage or was the drainage evolution more complex?

4. How was drainage through the North Bay - Mattawa area initiated and controlled?

5. When were these routes opened up and how do they correlate with events in the Ottawa Valley (Champlain Sea) and the other Great Lakes Basins?

6. How do the beaches in the North Bay area correlate with those to the south and west?

During this past summer an excellent start was made in answering these questions. Field evidence shows that as the ice front retreated from the Fossmill area, Lake Algonquin drained through three progressively lower routes. Although the regional direction of ice movement was from the NNE, as the ice retreated the front pivoted so that in the Mattawa va-ley, at Rutherglen, a moraine trending north-south was built from valley wall to valley wall. Retreat of the ice from this moraine position opened a still lower outlet up the Amable du Fond River valley, over a sill at Mink Lake and into the upper Petawawa River.

With continuing retreat, a route or series of routes through the Mattawa valley opened and Lake Algonquin drained to a low level called Lake Stanley by Hough.

Several sets of beach scarps have been surveyed in, south of North Bay. A number of these are higher than any previously reported. Beach scarps also are developed on the moraine at Rutherglen indicating that water must have dropped in steps to the Stanley level.

A six foot log found between varved clays and sands in the Amable du Fond River may allow the dating of the last drainage prior to the opening of the Mattawa River. Small chips of wood found mixed with gravel and rounded stones in the bottom of an eleven foot deep pot hole might also give a C^{14} date of the last drainage of Great Lake waters over the North Bay sill.

Next year I hope to finish this project and get my report written. A brief summary of the summer's work will appear in the Canadian Geological Survey's Report on Field Activities for the 1968 season.

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MAILING LIST

Black, Dr. Peter, State University College of Forestry, Syracuse 13210

* Black, Dr. Robert F., Department of Geology, University of Wisconsin Madison, Wisconsin 53706

Bloom, Dr. Arthur L., Department of Geological Sciences, Cornell University, Ithaca 14850

* Borns, Dr. Harold W., Jr., Department of Geological Sciences, Orono, Maine 04473

Broecker, Dr. Wallace, Lamont Geological Observatory, Palisades 10964

Broughton, Dr. John, State Geologist, New York State Museum and Science Service, Albany 12224

Brown, Jr. Jerry, U.S. Army Coald Regions Research and Engineering Laboratory, Hanover, New Hampshire 03755

Brown, Mr. Severn, James R. Dunn & Associates, Box 187, Averill Park 12018

* Bucek, Mrs. Milena F., 300 E. Queensdale Drive, York, Pa. 17403

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

Calkin, Dr. Parker E., Department of Geological Sciences, State University at Buffalo, Buffalo 14214

Carlston, Dr. Charles W., U.S. Geological Survey, Washington, D.C. 20242

Cazeau, Dr. Charles J., Department of Geological Sciences, State University at Buffalo, Buffalo 14214

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

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

Coch, Dr. Nicholas K., Department of Geology, Queens College of C.U.N.Y., Flushing 11367

Connally, Dr. G. Gordon, Department of Geology, Lafayette College, Easton, Pa.

Cox, Dr. Donald, Department of Biology, Oswego State College, Oswego 13126

Craft, Mr. Jesse L., Department of Geology, University of Western Ontario, London, Ontario, Canada

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

Davis, Dr. James F., New York State Museum and Science Service, Albany 12224

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

Denny, Dr. Charles S., U.S. Geological Survey, Building 420, Agricultural Research

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

Durham, Dr. Forest, Department of Geology, Hofstra University, Hempstead 11550

Eagen, Mr. Chris, Department of Geology, Michigan State University, East Lansing, Mich. 48823

Ellis, Bernard, U.S. Soil Conservation Service, Room 400 Midtown Plaza, 700 East Water Street, Syracuse 13210

Eschner, Dr. Arthur, State University College of Forestry, Syracuse 13210

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

Fairbridge, Dr. Rhodes, Department of Geology, Columbia University, New York City 10027

Faust, Dr. Mildred, Department of Botany, Syracuse University, Syracuse 13210

Fleisher, Dr. P. Jay, Science Department, State University College, Oneonta

Flint, Dr. Richard F., 2161 Yale Station, New Haven, Conn. 06520

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

Franklin, Wesley, Baltimore District, U.S. Army Corps of Engineers P.O. Box 1715, Baltimore, Md. 21218

*Frimpter, Dr. Michael H., U.S. Geological Survey, Box 948, Albany 12201

Frye, Dr. John C., Chief, Illinois State Geological Survey, Natural Resources Bldg., Urbana, Ill. 61801

Fullerton, Mr. David S., Department of Geology, Princeton University Princeton, N.J. 08540

Funk, Mr. Robert, New York State Museum and Science Service, Albany 12224

Gillett, Dr. Lawrence B., Division of Science and Mathematics, State University College, Plattsburgh 12901

*Goldthwait, Dr. Richard P., Department of Geology, Ohio State University, Columbus, Ohio 43210

Gooding, Dr. Ansel M., Department of Geology, Earlham College Richmond, Indiana 47374

Habib, Dr. Daniel, Department of Geology and Geography, Queens College, Flushing 11367

Hack, Dr. John T., U.S. Geological Survey, Washington, D.C. 20242

*Harrison, Mr. John E., Department of Geology, Syracuse University, Syracuse 13210

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

Haugen, Mr. Richard K., U.S. Army Cold Regions Research and Engineering Laboratory, Hanover, New Hampshire 03755

*Heusser, Dr. Calvin, Sterling Forest P.O. Box 608, Tuxedo 10987

Hobba, Mr. William A., Jr., U.S. Geological Survey, Box 948, Albany 12201

*Holmes, Dr. Chauncey D., P.O. Box 277, Tully 13159

*Hudec, Dr. Peter P., James R. Dunn & Associates, Box 187, Averill Park 12018

Jacobs, Dr. Alan M., Illinois State Geological Survey, Natural Resources Bldg., Urbana, Ill. 61801

*Johnson, Dr. Gerald H., Department of Geology, College of William and Mary, Williamsburg, Va. 23185

Johnson, Dr. W. Hilton, Department of Geology, University of Illinois, Urbana, Ill. 61801

Ketchledge, Dr. E.H., State University College of Forestry, Syracuse 13210
Krinsley, Dr. David, Dean of Faculty, Queens College CUNY, Flushing 11367
LaFleur, Dr. Robert G., Department of Geology, Rensselaer Polytechnic Institute, Troy 12181
Langway, Chester C. Jr., Department of Army Cold Regions Research and Engineering Laboratory, Hanover, N.H. 03755
Lewis, Mr. Donald, New York State Museum and Science Services, Albany 12224
*Lipe, Dr. William D., Department of Anthropology, State University at Binghamton, Binghamton 13901
MacClintock, Dr. Paul, Department of Geology, Princeton University Princeton, N.J. 08540
MacNish, Dr. Robert D., U.S. Geological Survey, Box 948, Albany 12201
McAndrew, Dr. J.H., Royal Ontario Museum, Toronto 5, Canada
McCarthy, Mr. Richard, Chestnut Street, Lockport
McDonald, Barri, Room 138, Geological Survey of Canada, Department of Mines and Technical Surveys, Ottawa, Canada
Melhorn, Dr. Wilton N., School of Civil Engineering, Purdue University, Lafayette, Indiana 47907
Miller, Mr. Norton, Department of Botany, Natural Science Bldg., Michigan State University, East Lansing, Mich. 48823
Ming, Mr. Roger W., Bureau of Science Education, The State Education Dept., Albany 12224
Moss, Dr. John H., Department of Geology, Franklin and Marshall College, Lancaster, Pa. 17604
*Muller, Dr. Ernest H., Department of Geology, Syracuse University Syracuse 13210
*Newman, Dr. Walter S., Department of Geology and Geography, Queens College, Flushing 11367
Nicholas, Mr. John, Department of Geology, CUNY City College, New York City 10031
O'Bryan, Mr. Deric, U.S. Geological Survey, Water Resources Division Washington, D.C. 20242
Oliver, Dr. Jack, Lamont Geological Observatory, Palisades 10964
Ouellet, Monsieur Marcel, Department de Biologie, Faculte des Sciences, Universite d'Ottawa, Ottawa 2, Canada
Page, Mr. Ronald C., Soil Conservation Service, Room 400, Midtown Plaza, 700 East Water Street, Syracuse 13210
Parizek, Dr. Richard R., College of Mineral Industries, Pennsylvania State University, University Park, Pa. 16802
Parker, Mr. Gerald, District Chief, U.S. Geological Survey, P.O. Box 948, Albany 12201
Randall, Mr. Allan D., U.S. Geological Survey, Library Tower, G-30 SUNY at Binghamton, Binghamton 13901
Ritchie, Dr. William A., State Archeologist, New York State Museum and Science Service, Albany 12224
Ritter, Dr. dale, Department of Geology, Franklin and Marshall College, Lancaster, Pa. 17604
Russell, Dr. Richard J., Coastal Studies Institute, Louisiana State University, Baton Rouge, Lo. 70803
Salwen, Dr. Bert, Department of Archeology, New York University, New York 10003
*Schafer, Mr. J. Philip, U.S. Geological Survey, 80 Broad St., Boston, Mass. 02110
Schmidt, Dr. Victor E., State University College, Brockport 14420
*Sevon, Mr. William D., Pennsylvania Geological Survey, Harrisburg, Penn. 17120

Sirkin, Dr. Leslie A., Department of Physics, Adelphi University, Garden City 11530

Socolow, Dr. Arthur A., State Geologist, Pennsylvania Geological Survey, Harrisburg, Pa. 17120

Strahler, Dr. Arthur N., P.O. Box 851, Orleans, Mass. 02653

Street, Dr. James, Department of Geology, St. Lawrence University Canton 13617

Thurber, Dr. David, Department of Geology and Geography, Queens College, Flushing 11367

Toung, Mr. George, Bureau of Materials, N.Y. State Department of Public Works, State Campus, Albany

*Tovell, Dr. Walter M., Department of Geology, University of Toronto, Toronto 5, Canada

*Wagner, Dr. W. Philip, Department of Geology, University of Vermont, Burlington, Vt. 05401

Walker, Dr. Philip, Science Department, State University College Plattsburgh 12901

*Waller, Dr. Roger M., U.S. Geological Survey, 1815 University Ave., Madison, Wis. 53706

Weertman, Dr. Johannes, Department of Materials Science, Northwestern University, Evanston, Ill. 60201

Weyl, Dr. Peter, Department of Earth and Space Sciences, State University at Stony Brook, Stony Brook 11790

*Whipple, Janice M., Department of Geology, Rensselaer, Polytechnic Institute, Troy 12181

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

White Dr. William A., Department of Geology, University of North Carolina, Chapel Hill, N.C. 27514

White, Dr. Sidney, Department of Geology, Ohio State University, Columbus 43210

Winters, Dr. Harold A., Department of Geography, Michigan State University, East Lansing, Mich. 48823

Yasso, Dr. Warren E., Natural Science Division, Teachers College, Columbia University, New York City 10027

Yeager, Mr. Donald R., Monroe County Department of Parks, 375 Westfall Road, Rochester 14620