



THE MAINE GEOLOGIST

THE NEWSLETTER OF THE GEOLOGICAL SOCIETY OF MAINE

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THE PRESIDENT'S MESSAGE by Carol White

First off I would like to thank the summer field trip leaders - Bob Marvinney of the Maine Geological Survey and Hal Borns presently of Washington D.C. for providing the members with two enjoyable and educational trips. Also many thanks to Bob Johnston for his help in putting together the fieldtrip guide, organizing the trip and finding a terrific camping spot at Lily Bay. At the very brief business meeting we appointed a nominating committee to establish a new slate of officers - the nominees are listed elsewhere in the newsletter. For those of you who were unable to attend the summer field trip - a few copies of the guide are still available from Bob Johnston at the Maine Geological Survey.

Preliminary plans are for the Annual Fall Meeting to focus on the geologic aspects of solid waste disposal in Maine and the significance of the new state regulations. The election of new officers will also take place at the Fall Meeting. We have invited Stephen Jay Gould of Harvard University to be our evening speaker - its a long shot, but worth a try. The meeting will be hosted by Arthur Hussey of the Geology Dept. at Bowdoin College in Brunswick, Maine. If you have any suggestions or questions about the meeting please contact Carolyn LePage at 865-6138.

The Society has contacted the State Board of Certification for Geologists expressing our interest in establishing-facilitating-sponsoring a review session for the Geology Certification exam. Although review classes have been held on an informal basis in the past, several members thought that a formal and announced review session would be helpful to individuals studying for the exam. With the Board's approval we would like to hold the review sessions in Augusta sometime during the winter months, perhaps one evening a week for 4-6 weeks, with different topics being covered at each session. If you have any thoughts or suggestions on this proposal please contact me at 198 Main Street, Yarmouth, ME 04096.

I have received abstracts for six (and promises for two) papers for GSM Bulletin No. 3 which will focus on hydrogeologic topics in Maine. The due date for abstracts was July 31, 1989 - anyone else who is interested in submitting a paper should contact me pronto. Information on the format and illustration guidelines will be mailed to authors shortly.

Finally I would like to welcome the 32 new members who joined the Society this Spring in conjunction with Keely Lecture. We encourage you to attend our meetings and field trips, and to participate in the activities of the Society. If you are new to the area or interested in learning about the local geology you may want to join us at the 81st Annual New England Intercollegiate Geological Conference (NEIGC) on October 13,14 and 15th at the University of Maine at Farmington. The meeting consists of several surficial and bedrock fieldtrips to various sites in Maine and a banquet on Saturday night.

The NEIGC is perhaps the oldest continuously operated organization in North America whose sole purpose is sponsoring geological field trips. The first meeting was held in 1901 with a field trip to the Connecticut Valley of western Massachusetts led by William Morris Davis. NEIGC meetings are very informal and registration is open students and professionals interested in current problems of New England geology.

Summer Fieldtrip Reports

**Bedrock Geology of the Southeastern
Margin of the Connecticut Valley-
Gaspé Synclinorium in Somerset
County, Maine**
Led by R. G. Marvinney

by Bob Johnston

On what was one of the nicest weekends of the summer weatherwise, Bob Marvinney led interested GSM members into the Penobscot Lake region. This area northwest of Moosehead Lake was the subject of Bob's doctoral dissertation. He looked at the southeastern margin of the Connecticut Valley-Gaspé synclinorium, near two other major sequences - the Boundary Mountain anticlinorium and the Moose River synclinorium. The two areas are separated by fault zones. Most of the rocks in the area are members of the Seboomook Group (Northeast Carry Formation and the Ironbound Mountain Formation) and the Frontenac Formation.

Approximately 25 people assembled in Rockwood for the trip. Stop 1 looked at the Northeast Carry Formation, the original type section lithology of the former Seboomook Formation. Typical blue-gray graywackes are exposed with few thick beds. Next up were outcrops of the Ironbound Mountain Formation, starting

with a massive light weathering, fine to medium grained graywacke lithology. Some good discussions took place at this stop regarding the evidence of bedding or lack thereof; blueberries were also in good supply. Stops 3 and 4 also looked at the Ironbound Mountain Formation; Stop 3 looking at atypically poorly bedded siltstone and mudstone slates in a debris flow section, while Stop 4 looked at the typical slate which comprises 95% of the Ironbound Mountain Formation. Continuing north on the Rockwood/Pittston Farm Road we passed through the Great Northern Paper Company gate and then walked down to an outcrop of the Frontenac Formation (Stop 5). Here the graywackes were several meters thick, poorly graded, mildly calcareous, light gray weathering, fine grained rocks.

After passing by Pittston Farm, our next stop was at the western end of Seboomook Lake to look at well developed and variably sized pillow basalts of the Canada Falls Member of the Frontenac Formation. Lunch (Stop 7) was at Canada Falls Dam where the slates of the Ironbound Mountain Formation are exposed on one side and the volcanics of the Canada Falls Member are exposed on the other side of the outlet.

Probably the most interesting of all of the stops was the bridge over Leadbetter Falls (Stop 9). The rocks there are transitional in character between the Ironbound Mountain and Frontenac lithology. The structural setting is a large asymmetrical, northwest verging fold with a wavelength of several hundred meters. The changes in the bedding could be easily traced as one worked upstream. The final stop of the day, on Great Northern's famed "Golden Road", looked at more of the Frontenac Formation facing southeast in the upper plate of a thrust. Some good samples exhibiting the folding were collected at this site.

Thoughts of the social hour and banquet kept us going on the long and sometimes dusty ride back to Greenville. All in all, it was a very informative trip through a part of the "North Maine Woods". Many thanks to Bob Marvinney for the fine job he did in showing us the geology of the region.

Post-glacial Sedimentation
in the Upper Kennebec River
Valley

Led by H.W. Borns, Jr.

by Peter Garrett

How would it be, thought Hal Borns back in the early 1960's, to follow the valley fill from ice melt to deposition, in a deeply cut valley in which the entire stratigraphic sequence was well exposed? A good idea, and one which came to fruition with the publication of the Anson and Bingham surficial geology quadrangles in 1965, greatly revising the pioneer studies of George Stone, Leavitt and Perkins, Arthur Bloom, and Dabney Caldwell. Now here was Hal, back in his old stomping grounds, ready to lead us on a lecture tour.

The Anson-Bingham area is especially suited to Hal's suggested investigation, because earlier ice-contact gravels in

eskers and kames are separated from post-glacial deposits by the Presumpscot Formation, thanks to the happy circumstance that the Presumpscot sea extended as far as Bingham for a brief period about 13,000 years ago. The estuarine silts which were the sedimentological result of this transgression serve as a bookmark in the local stratigraphic section, and allow relatively easy separation of ice-contact gravels below from outwash gravels above.

On this trip we saw a little bit of the ice-contact gravels in an esker exposed beneath a silt layer in the Anson landfill. They were, as usual, well-rounded and mostly coarse cobbles.

The Presumpscot silts are well-laminated, with cut and fill structures evident in places. The site of their formation was clearly not a mucky estuary in which little happens save the slurping of mud by worms and clams. Instead it must have been the site of considerable sedimentation with little biogenic activity.

The silts are hydrologically important now. They are marked by a line of springs which emerge from perched water tables in the post-glacial sediments. They are hard to build on, and almost impossible to construct septic system drainfields on, because of high water tables. They are often marked by a band of alders on gentle slopes on the valley sides.

Gradational on the Presumpscot is the Embden Formation, which differs from it in being slightly coarser and fluvial, as opposed to estuarine. But the sedimentary structures seen are not characteristic of most modern-day fluvial environments, because they lack the very common cut and fill structures. Instead there are planar cross-beds in sand which extend clear across the visible part of a gravel pit. The only reasonable explanation is that the environment of deposition was a braided stream absolutely loaded with sediment, and with very low gradient. One has to presume that most of the Embden must have been deposited quickly in the few hundred years that the Presumpscot sea was in early retreat. All sedimentation must have been over and done long before the present gradients of the Kennebec had been adopted, because the present river moves boulders annually. There are no boulders or even cobbles in the Embden: such pebbles as there are could be ice-raftered dropstones.

There are, however, ventifacts. Where chunks of rock from the underlying till were exposed within the upper layers of the Embden, they were sand-blasted by the post-glacial winds which swept the barren slopes of the Upper Kennebec about 12,000 years ago. Most of the ventifacts can be found on the eastern side of the valley, and careful study has shown that it was north-westerly winds which were the sculptor.

The sedimentological history closes with a mystery: the appearance of another mass of gravel, superficially similar to esker deposits, but overlying the Presumpscot, and lower in elevation than the Embden. Where did the gravels come from? That was the question posed by Hal for the rest of us to answer. Were they simply reworked segments of eskers and

kames? Or were they the result of the breakup of the glacial dam holding back an ancestral Flagstaff Lake? Or something else?

We didn't solve the problem. The day was too hot. It seemed more important to slake our appetites and thirsts by beating a retreat to the Skowhegan ice cream stand.

NEIGC

New England Intercollegiate Geological Conference - 81st Annual Meeting
October 13, 14 & 15, 1989
Farmington, Maine

The 1989 NEIGC is being held in Farmington, Maine and hosted by the Department of Sciences and Mathematics at the University of Maine at Farmington. Headquarters where additional information may be obtained will be in the Geology Center with a telephone number of 207-778-3501 Ext. 458. Registration fee for professionals is \$15 until September 30 and \$25 thereafter. Student registration fee is \$10 until September 30 and \$15 thereafter. Guidebooks are \$6 each (\$8 if mailed after the meeting). The banquet will be held at 7:30 pm on Saturday October 14 in the South Dining Hall in the Student Center at the University of Maine at Farmington. It will be a buffet including steamship round of beef, seafood Newburg, tortellini parmigiana, and "all the fixings" at a cost of \$8 per person.

A welcoming party will be held in the South Dining Hall on Friday October 13 from 7:00-9:30 pm; registration is available in the same place from 6:00-10:00 pm on Friday. Registration on Saturday will be in the Geology Center from 6:30-9:00 am and at the South Dining Hall from 6:30-7:30 pm. Registration is at the Geology Center on Sunday from 7:00-9:00 am. For all Friday trips, guidebooks should be obtained from trip leaders; for Saturday and Sunday trips, guidebooks should be obtained at registration prior to the trip. Preregistration checks should be made payable to NEIGC-89 and sent to:

NEIGC
c/o A. W. Berry Jr.
Geology, UMF
120 Main Street
Farmington, Maine 04938-1990

Friday Field Trips

Trip A-1: Geology and Geochemistry of the Mount Agamenticus Complex, York, Maine
John Brooks, David Gust and Arthur Hussey

Trip A-2: Illinoian and Late Wisconsinan Tills in Eastern New England: a Transect from Northeastern Massachusetts to West-Central Maine

T. K. Weddle, B. D. Stone, W. B. Thompson, M. J. Retelle, D. W. Caldwell and J. M. Clinch

Trip A-3: Hydrogeology and Development Pressures, Brunswick, Maine
Peter Garrett and Donald Newburg

Trip A-4: The Chain Lakes Massif and its Tectonic History
Eugene L. Boudette, Gary M. Boone and Richard Goldsmith

Trip A-5: Significance of Al-silicate in Staurolite-Grade Rocks, Central Maine
Michael Holdaway and Barbara Dutrow

Saturday Field Trips

Trip B-1: Mineralogic and Textural Evidence for Polymetamorphism along a Traverse from Phillips to Oquossoc, Maine
C. V. Guidotti

Trip B-2: Glacial Geology of the Androscoggin River Valley in Oxford County, Western Maine
Woodrow B. Thompson

Trip B-3: Melanges and Turbidite Facies of the Madrid Formation, Central Maine
Dwight Bradley and Lindley Hanson

Trip B-4: Continuation of Trip A-4

Trip B-5: Environmental Geology Along the Sandy River, Farmington, Maine
Tom Eastler, Joel Sproul and Andy Buckland

Sunday Field Trips

Trip C-1: Repeat of Trip A-1

Trip C-2: Repeat of Trip B-2

Trip C-3: Repeat of Trip A-3

Trip C-4: Bedrock Geology of the Southeastern Margin of the Connecticut Valley-Gaspe Synclinorium in Somerset County, Maine
Robert G. Marvinney

Trip C-5: Repeat of Trip B-5

GSM Annual Meeting

Friday, November 17, 1989

at 1:30 p.m.

Daggett Lounge in the Tower
Bowdoin College
Brunswick, Maine

The topic of the afternoon meeting will be the geologic aspects of solid waste disposal in Maine and the significance of the new State regulations. Carolyn Lepage is scheduling speakers for the afternoon session. A social hour with drinks and munchies will follow the afternoon session and dinner will be about 6:00 p.m. The meeting will reconvene at 7 p.m. with the yet to be determined evening speaker. If you have any questions about Fall Meeting contact Carolyn LePage at 865-6138.

Nominating Committee Report

The Geological Society of Maine Nominating Committee was chosen at the summer meeting; Jim Hillier, Bob Johnston and Tom Weddle agreed to serve. The slate of GSM officers nominated for 1989-1990 consists of Carolyn Lepage for President, Arthur Hussey for Vice President, Bob Johnston for Secretary, Mike Foley for Treasurer and Susan Corderman Weddle for Newsletter Editor. The candidates will be voted upon at the Fall meeting at Bowdoin College on November 17, 1989.

Major Amethyst Discovery at Sweden, Maine

Woodrow Thompson
Maine Geological Survey

The Plumbago Mining Corporation of Rumford, Maine, has resumed work this summer at the site of a new amethyst discovery in the town of Sweden. The original find was made in the fall of 1987, when a borrow pit was being excavated in glacial till. About five feet below the original ground surface the workmen encountered bedrock. What they found was not the ordinary Sebago granite that has been mapped throughout the surrounding area, but a large network of milky quartz veins. Immediately upon hitting the ledge, the pit operator broke into cavities in the quartz that contained some of the finest deep-purple amethyst (quartz) crystals ever found in the Northeast.

Rumors of the Sweden discovery spread quickly, and often erroneously, as some reported that the "lost" amethyst locality on Pleasant Mountain in Denmark had been relocated at last! Faced with a mounting security problem, the land owner closed the site until its significance could be assessed. When he realized the potential of the deposit, negotiations began that resulted in awarding of a lease to Plumbago Mining Corporation, who are well known for their production of gem tourmaline from the 1970's discovery at the Dunton Mine in Newry.

Preliminary work by Plumbago's Phillip McCrillis in the fall of 1988 indicated that the amethyst pockets might have considerable lateral and vertical extent. These excavations uncovered a modest number of good crystal specimens, some material suitable for faceting, and two very large crystal groups of museum quality. With the assistance of the Maine Geological Survey, one of these two-foot clusters was acquired by the Maine State Museum. The other can be seen at Cross Jewelers in Portland.

This summer's work has continued to reveal amethyst crystals of superb quality. Some of them are so deeply colored that they appear nearly black. Visitors are not allowed at the site because mining is actively in progress, and the geology of the locality has not been studied in detail. However, a brief examination by MGS indicates that the quartz veins have probably been injected along a fault zone in the Sebago Pluton. They strike northeast, parallel to other major faults in the region.

The quartz veins contain brecciated granite fragments which in many cases are silicified or otherwise altered. Cavity walls and breccia plates in the fractured veins are encrusted with drusy milky quartz crystals, upon which the larger amethyst crystals are implanted. This contrast produces very aesthetic specimens that are popular with mineral collectors. Many amethysts are perched on the edges of breccia plates and are doubly-terminated. Some of the crystals are over one inch in diameter.

Dark red hematite (?) staining and a few botryoidal goethite (?) overgrowths are the only other minerals that this writer has seen in the amethyst pockets. It will be interesting to see how the geological history of this locality is interpreted as mining progresses. The Sweden mine, though presently very small, may become a specimen and gem producing locality of national stature if present trends continue.

RECENT GEOLOGIC REPORTS FROM THE MAINE CRITICAL AREAS PROGRAM

A new Critical Areas report, third in the bedrock series, Significant Bedrock Features of Maine Coast from Boothbay to Calais by Carol White and Arthur M. Hussey II will be available this fall from the Maine State Planning Office in Augusta (contact Hank Tyler, Critical Areas Program, 289-3261). The report covers eastern coastal Maine and includes Pre-Cambrian rocks from the Rockland-Islesboro Sequence to the Devonian conglomerates and volcanics of the Perry Formation. Several geologists provided assistance by identifying and recommending sites for consideration including Ollie Gates, Dave Stewart, Fred Beck, Bruce Bouley, and Dick Gilman. The report recommends 51 bedrock sites to be reviewed for inclusion on the Register of Critical Areas based on their educational or scientific significance. A few of the sites described in the report are the Lincoln Sill in Boothbay Harbor; Spruce Island, Cradle Cove and Lime Island Pre-Cambrian Rocks in Penobscot Bay and Holmes Cove Keratophyre in Cutler.

And just out - A Preliminary Listing of Significant Bedrock Localities in Western and Central Maine by Beth Lewis and Carol White. This compilation of 170 sites, taken from NEIGC guidebooks and GSM fieldguides, is presently being sent out for review by interested geologists. We are also seeking additional sites that you feel may be of interest. We would like to acknowledge the Maine Geological Survey for its assistance with this project. If you would like a copy of this listing and/or have sites to recommend please contact: Carol White, 198 Main Street, Yarmouth, ME 04096 or Hank Tyler at the Maine State Planning Office, 184 State St, Augusta, ME 04333. The final report will be similar to the Maine Coast Boothbay to Calais report and will recommend significant inland bedrock sites for inclusion in the Register of Critical Areas.

MEMBERSHIP DUES STATEMENT

The GEOLOGICAL SOCIETY OF MAINE, INC. is a non-profit corporation established as an educational Society to advance the professional improvement of its members, to inform its members and others of current and planned geological programs in Maine; to encourage continuing social contact and dialogue among geologists working in Maine; and to further public awareness and understanding of the geology of the State of Maine, and of the modern geological processes which affect the Maine landscape and the human environment.

The Society holds three meetings each year, in the late fall (Annual Meeting), early spring, and mid-summer (usually field trips). A newsletter, THE MAINE GEOLOGIST, is published for all members four times a year (more or less), approximately on a quarterly basis starting in September. The Society year runs from August 1st to July 31st. Annual dues and gift contributions to the Society are tax deductible. There are three classes of memberships:

- \$7.00 REGULAR MEMBER Graduate geologists, or equivalent, with one year of practice in geology, or with an advanced degree.
- \$6.00 ASSOCIATE MEMBER Any person or organization desirous of association with the Society.
- \$4.00 STUDENT MEMBER Persons currently enrolled as college students.
- \$2.00 APPLICATION FEE A one-time fee to all new members, payable when applying for membership.

ANNUAL RENEWAL or APPLICATION FOR MEMBERSHIP - THE GEOLOGICAL SOCIETY OF MAINE

NAME	_____	Regular Member	\$7.00/year	\$ _____
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	(Permanent mailing address)	Application Fee	\$2.00 one time	\$ _____
	_____	TOTAL ENCLOSED		\$ _____

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Please make checks payable to: THE GEOLOGICAL SOCIETY OF MAINE, INC.
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89/90 SOCIETY YEAR STARTED - AUGUST 1

PLEASE SEND IN YOUR DUES

THE GEOLOGICAL SOCIETY OF MAINE
 c/o Arthur M. Hussey, II, Department of
 Geology, Bowdoin College, Brunswick, ME 04011.

THE MAINE GEOLOGIST is published four times a year, more-or-less, in early Fall, mid-Winter, Spring, and maybe Summer, for members of the Geological Society of Maine, a non-profit educational Maine corporation interested in all aspects of the geology of the state of Maine.

Correspondence about membership in the Society should be mailed to Irwin Novak, Department of Geosciences, University of Southern Maine, Gorham, ME 04038.

Items for inclusion in the newsletter may be directed to Susan Corderman Weddle, 11 Beech Drive, Brunswick, ME 04011.

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