THE MAINE GEOLOGIST

THE NEWSLETTER OF THE GEOLOGICAL SOCIETY OF MAINE

SEPTEMBER

1975

VOL. 2 NO. 1

ANNUAL MEETING CONVENED

The Annual Meeting of the Geological Society of Maine was held at Donaldson Koons' farm in Sidney on Friday, August lst, with something like So to 55 Members and guests in attendance. With Art Hussey officiating, and possibly aided by the anomalously warm and humid environment of the Great Heat Wave of 1975, business matters were handled with expeditious, if thoughtful, dispatch.

1. The proposed Bylaws of the Society, as published in small print in the July Newsletter (Volume 1 / Number 4) were discussed and affirmatively voted by a show of hands.

2. The following Officers and Councilors for the Society were nominated from the floor and duly elected by shows of hands:

President	A. M. Hussey II - Bowdoinham
Vice President	W. W. Rideout - Gardiner
Secretary	V. K. Vere - Houlton
Treasurer	J. R. Rand - Cundy's Harbor
Councilor to 1976	D. R. Kontio - West Rockport
Councilor to 1977	R. G. Doyle - Gardiner
Councilor to 1978	J. W. Skehan - Weston, Mass.

3. J. R. Rand read a summary of the Treasurer's Report for 1974-75, a detailed copy of which may be found elsewhere in this Newsletter.

4. J. R. Rand was continued in office as the Editor of the Newsletter, more or less by default. News items or other matters concerning the Society may be sent to him at Cundy's Harbor, for publication or for forwarding to the Executive council, as the case may be.

1975-76 DUES ARE DUE

The GSM operates on an August 1 to July 31 year, and dues for the 1975-76 Society year are NOW DUE. If you wish to continue to receive the Newsletter and such other benefits as may from time to time accrue to Members in good standing, please send us your check soon (with any desired address changes). Annual dues are $5 for Regular Members; $4 for Associate Members, and $2 for Student Members.

If you were not a Member in 1974-75, and wish to join now in some category, please send an additional $2 as Application Fee, and be sure to provide the mailing address and zip code where you prefer to receive the Newsletter.

PLEASE MAKE CHECKS PAYABLE TO THE GEOLOGICAL SOCIETY OF MAINE, and send to J. R. Rand, Treasurer, Cundy's Harbor, RD2-Box 210A, Brunswick, Maine 04011.

WE WILL NOT BE SENDING OUT INDIVIDUAL INVOICES

DONALDSON KOONS

In July, Donaldson Koons announced that he was resigning as Commissioner of the Maine Department of Conservation, and that he planned to return to the Department of Geology at Colby College in September. At the Annual Meeting of the Geological society of Maine on August lst, Brad Hall introduced a resolution, which was adopted unanimously, to express to Don the Society's respect and gratitude for his fine handling of a complex and difficult job. As a person and as a geologist, Don has represented our profession and the public interest as Conservation Commissioner, and earlier as Chairman of the Environmental Improvement Commission, in a manner which has been continually a source of great pride to us and of significant benefit to Maine people and their environment. And we thank him very much.

FALL MEETING QUESTIONNAIRE

At the Mid-Summer Meeting of the Society, we had some discussion as to the best time to hold the regular Fall Meeting this year. In 1974, the meeting was held at Colby College, Waterville, on Wednesday evening, November 6th. Since it seems that mid-week evenings (or days) may not be too convenient for those who have to travel some distance, and further since no good resolution of the problem could be effected under the warm late afternoon sun in Sidney on August lst, it was then RESOLVED that all Members who have definite preferences or constraints as to times or days of the week for attending the Fall Meeting should, at their earliest convenience, mail expressions of their desires to Art Hussey or J. R. Rand. Generally speaking, it seems that sometime in early November might be a reasonable target to shoot at.

MID-SUMMER CONFERENCE

In connection with the Annual Meeting of the Society on August ist, morning and afternoon geological presentations by numerous geologists quite effectively summarized the technical programs and projects now going on or anticipated under State, Federal or academic auspices. There was a little on geologic investigations relative to nuclear power plant siting, and, as per their understandable propensity for a low-profile aspect, mining geologists among the group did not offer us any new insights into the probable location of Maine's mother lode.

Bob Doyle described briefly the historical development of the Maine Geological Survey during the past 20 years, with its primary efforts directed toward bedrock mapping and the development of some understanding of regional stratigraphy and complex structure and history. With the current' resolution of many stratigraphic and structural problems in Maine, the Maine Survey's bedrock program for the next 5 to 10 years is visualized to be restricted pretty much to the study of 3 areas: the Silurian/pre-Silurian/volcanic belt relationships in the wide area from Island Falls to Bangor to Penobscot Bay to the New Brunswick border; the pre-Silurian belt extending northeasterly from the Maine/New Hampshire/Quebec border through Moosehead to the Katahdin pluton; and the Casco Bay group between southwestern Maine and the Penobscot River. Because of other budgetary priorities, no new bedrock programs are contemplated at this time.

Geology and its important relationship to the things the general population wishes to do in, on or with the earth have arrived in the public eye in Maine, and both Don Koons and Bob Doyle noted that the public is now looking to us for immediate technical assistance with its daily and long-term problems in land use planning, zoning, sanitary waste disposal, water supplies, beach erosion and shoreline protection or preservation. Bob pointed out that the pressure on the Survey to supply the needed services to the public was very great, and that budget limitations required that the bedrock mapping program (which does not so directly relate to short-term human needs) be de-emphasized in order to provide relatively more of available funds for surficial mapping, groundwater studies and estuarine and shoreline studies, to serve the immediate public needs in Maine. Don Koons added that for the first time in memory, geologists and their talents are actively being sought out by the general public and its administrative agencies, and that we now have not only the opportunity but also the responsibility to provide thoughtfully presented, readily understandable and immediately usable technical service in the best interests of Maine people and their natural environment.

In connection with the emphasis on providing short-term, readily usable technical information for public use, Walter Anderson described the Survey's program relative to both public and technical geological publications. Cost considerations dictate that all maps be published henceforth in patterned black-and-white. The Survey will be issuing, particularly for the coastal lowland, surficial, lithologic and estuarine/shoreline maps with legends suitable for both popular and geologic uses. Also coming out soon will be a series of index maps defining available technical publications, quadrangle-by-quadrangle, for: bedrock geologic mapping; surficial mapping; geophysical coverage; and regional studies. These various map publications will be available over-thecounter in stable-base transparencies or blueline print form at a modest cost: something around $3 for transparencies and $1 for bluelines. Geologic bulletins will continue to be published, with black-and-white maps, through the Survey's publication fund. The Survey library is almost complete, and reproduction equipment is on hand to provide quick copying service. You should write to the Survey to have your name put on the mailing list to receive notice of new publications.

Brad Caswell discussed his work with the Maine Survey on bedrock groundwater in Hancock, Knox, Lincoln, Sagadahoc, Cumberland and Waldo Counties, as gleaned from welldrillers' records. Much of this information is now available for public use. Brad contours areas according to well yield, depth and overburden thickness, and the combination of these constructions may be found to be quite useful in selecting optimum sites for new wells. There seems to be a direct relationship between overburden thickness and well yield, with the higher-yield wells being associated with thick overburden. Ice-contact overburden generally overlies high-yield bedrock wells, while marine clay overburden overlies the lower-yield wells. Brad has also come up with map patterns of possible geologic/tectonic interest in two areas: his maps show an apparent N40W "trend" of high-yield bedrock wells extending from around Cumberland up toward the Bridgton area; and a N25-30W "trend" of relatively highyield, shallow (< 100' depth) bedrock wells between Small Point and Brunswick. The high-yield areas within each of these "trends" are not continuous, but they do appear to form attractive strings of beads.

Working with Brad on a detailed bedrock groundwater project, Jim Richard (Ohio State) described a research area at High Head, Harpswell, where the Survey has 30 observation wells in a housing development. 60 wells are strung out down a 7000' long peninsula on which no well is more distant from ocean waters than a few hundred feet. 30 of these wells now have dwellings hooked to them. Jim has mapped the bedrock structure of the peninsula, with emphasis on open joints and partings, and is attempting to correlate well yield, water quality, tidal fluctuations, etc., with his bedrock data. Some wells are instrumented to provide continuous water-level records. Some interesting results to date: both tidal and atmospheric fluctuations can be seen in most wells, with the greatest tidal effects found in a well farthest from the shoreline; one well is a watertable well, with a gradual lowering of level into the dry season, but no tidal fluctuations; one well, in a zone of close bedrock jointing, has shown salt intrusion during the dry season, but has purged the salt during times of aquifer recharge. There is some suggestion that in seeking bedrock water in areas near the shoreline, one might try to avoid

drilling in areas of ciose jointing.

Barry Timson described the work of the Survey's Marine Geology Division as generally taking three forms, all continually interrupted by the need to rush off and put down brush fires, as individuals and towns find themselves assaulted by the sudden and expensively destructive forces of the sea. His normal program involves mapping coastal-marine geologic/biologic units (over 48 units to interrelate) for use by planners, marine research people, etc.; a detailed research program on short- and long-term geologic processes in the Popham Beach area, including historical studies of the Beach and the possible effects on the Beach by dredging in the adjacent Kennebec River; and his studies of beach erosion and corrective procedures for beaches of the southwestern coast, where buildings, seawalls and jetties have, sometimes disastrously, modified natural shoreline processes of erosion and deposition.

Jeff Smith described his surficial mapping program for the Survey in Hancock, Knox, Lincoln, Sagadahoc and, at present, in Cumberland County. The most striking feature of his work throughout this wide area is the delineation, largely by air photo study, of swarms of poorly sorted sand/gravelAill washboard moraines, intergrouped between larger, stratified ice-contact/deltaic sand and gravel end moraines. Washboard moraines are about 5' to 10' high; have a concave-northward map pattern on hills and concave-southward pattern in valleys; are commonly discontinuous; and they do not extend above the marine limit on hills. Jeff noted that although there is some controversy among geologists as to the validity or significance of washboards, they appear to him to be real and to record subaqueous deposition at the ice front at a time when the ice front abutted the ocean. Art Hussey noted that he had experienced some good luck in predominantly clay terrane in finding gravel suitable for septic systems by look ing for washboard moraine land forms. If you may need a septic system in the clay-blanketed coastal lowland, a washboard by any other name will not be sweeter.

Dee Caldwell discussed his wide-area surficial mapping program for the Maine Land Use Regulation Commission in the Unorganized Townships of northwestern Maine. In the 1974 field season about 1~ million acres (ten 15' quads) were mapped from Flagstaff Lake westerly. In 1975, the program will cover from Moosehead Lake west to the Canadian border, with 13 geologists. Lakes in the area offer very good exposures, and a good network of woods roads provides inland coverage. Dee has extended the marine limit laterally from Bingham to Carratunk, and vertically to about 540' elevation in a delta which overlies marine clay and contains marine clay in the foreset beds. Evidence accumulated to date suggests that deglaciation of the Laurentide ice sheet in northwestern Maine occurred by stagnation, rather than by ice-front retreat, with an ice-sheet separation along the Boundary Mountains. Dee's program is designed to provide basic surficial geologic data for use in land use planning and zoning in the wildlands townships, and will be published on 1:250,000 or 1:125,000 scale maps.

In the realm of geophysics, Jim Skehan discussed his newly-established New England seismic network tied to Weston Observatory, involving seismometers at Caribou, Milo, East Machias, Berlin, Hanover, Fall River and Weston. In addition, an instrument has been installed at Allagash to collect background noise patterns as a record to be compared with any future activity that may develop should a large reservoir be sited on the St. John River for hydro or flood-control purposes. A 3-component instrument will also soon be established at Allagash with telemetering to Weston. In Weston's 1975-76 fiscal year, starting this October, additional network installations will be placed at Jackman Station, Portsmouth/Kittery, Newport, Vt., Burlington or Rutland, and Pittsfield, Massachusetts.

Marty Kane, visiting from Denver, noted that his administrative load with USGS is decreasing somewhat, and that he can now redirect some of his attention to New England geophysics. He described three prominent gravity anomaly patterns shown on the bouguer gravity map of Maine (USGSGP-580; 1966) which seem to be of regional significance: a steep gravity gradient along the Maine coastal zone, with denser and apparently older (Precambrian?) rocks in the Gulf of Maine; a steep gravity gradient striking northeasterly south of the northwestern border of Maine, bounded on the southeast by a gravity low which reflects the Seboomook rocks; and a rather prominent linear gravity gradient which extends southwesterly from south of Linneus, Aroostook County, through Mattawamkeag, Howland and Hinckley to become somewhat diffuse in the high-grade metamorphic zone to the southwest of Waterville. on this latter anomaly, Marty noted that John Griffin's and Al Ludman's boundary of the "distal" and "proximal" turbidites generally follows the gravity gradient in eastern Maine, but that these near-suiface rocks are not the cause of the gravity anomaly. He suggested that the anomaly might reflect a contact of basement (crustal) rocks in a zone of early Atlantic closing. He visualized a dense oceanic plate under the turbidites and the Pennsylvanian rocks of the Maritime Basin, and suggested a model by which the closing plates just "touched" in eastern Maine and New Brunswick, and crushed together with force further to the southwest.

Back on details of the Maine Survey's bedrock mapping program, Gary Boone outlined his detailing of the pre-Silurian belt (OCu) northeasterly from the Maine/New Hampshire/Quebec border through Moosehead to Katahdin, and his hope to be able to relate this belt with the pre-Silurian in the Shin Pond/Munsungun areas. In his work so far, in The Forks and Brassua Lake areas, Gary has some sediments that either are, or resemble, m'elange, and has traced one such unit of diverse rock types from Spencer Lake to Moosehead.

Al Ludman and Dave Westerman reported on their investigations in eastern Maine on the dark and pale argillites of the "Charlotte group". They have found that these rocks cross the border into New Brunswick without disruption, and that since the group is comprised of rocks ranging in age from early Ordovician to Silurian in New Brunswick, the term "Charlotte group" must be abandoned. They also interpret three different tectonic elements

in southern Washington County. Sub-horizontal axial planes and other evidence suggest southeast-over-northwest low-angle thrust faulting of at least three major slices. There are also NNW faul zones with predominantly vertical displacements and with gabbro and granite plutonic rocks in them

John Griffin and Dave Roy reported briefly on their program just beginning in the 3000 square mile area of eastern Maine which lies north of the Norumbega fault, east of the Penobscot River and south of Patten to Linneus. Dave has started in the Sherman quadrangle, on differentiating Devonian and Silurian sediments. John has been working on the westerly extension of the post-Acadian red beds in northern Hancock County, and has carried them to a point about 10 miles east of Bangor The red beds are bounded on the south by a mylonite unit which lies to the north of, strikes more westerly than, and is distinct from that of Dave Wones' Norumbega fault.

Art Hussey and Kost Pankiwskyj discussed their work in extending the Casco Bay group northeasterly from the type locality into the Liberty area and beyond. Art outlined the distinctive stratigraphy of the Casco Bay group. He also noted that on a recent field trip in Massachusetts with Pat Barosh, Mike Pease and Gene Boudette of USGS, he found that the Merrimack group of southwestern Maine and southeastern New Hampshire shows a one-for-one stratigraphic match with rocks in the Clinton, Massachusetts, area. A further apparent regional correlation may be the Nashoba formation of eastern Massachusetts and the Cushing formation of the Casco Bay group. Kost noted that there are some similarities between Casco BayCushing-Vassalboro rocks and Cambro-Ordovician rocks in Vermont, western Massachusetts and Connecticut. A major problem exists concerning what the contact between the Casco Bay group and the Merrimack group is really like. Although there are several major faults trending northeasterly through southwestern Maine, none seems to form the Casco Bay/Merrimack contact. In the Liberty area, Kost has metavolcanics interbedded with ..ribbon" rocks, which superficially suggests a gradational contact of the Cushing and Vassalboro formations. Since the presumed age relationships here are quite contradictory, and further since Kost reports the section here to be deformed by multiple shearing events and to lack bedding tops, no conclusion as to the contact can be offered.

Bob Neuman of USGS noted a perplexity in mapping northern Maine rocks, that you never find the same rocks on opposite sides of the same syn-cline or anticline. And he further offered an excellent thought for consideration by people working on the Appalachian-Caledonide program, to the effect that they might think in terms of what the terrane would have looked like at specific paleo-times, using time intervals still to be agreed on. A potentially valuable project would be to construct separate paleogeologic maps for areas all around the Atlantic for different stages in time, and then to try to marry the pieces from Maine, the Maritimes, Europe and Africa. Since different relationships between these various areas should have obtained during different geologic times, the successive regional fits of paleo-geologic constructions should provide insight into the chronology of plate wanderings.

And finally, Dee Caldwell also commented on the examination of surficial deposits in connection with siting and safety analysis for nuclear power plants. All proposed site studies are required by the Nuclear Regulatory Commission (formerly A.E.C.) to look at the surficial deposits in areas of known or suspected bedrock faults, to see if off sets in the bedrock pass through the overlying sediments. Any tectonic fault is presumed capable of producing vibratory ground motion if it has had one movement at ground surface in the past 35,000 years or recurrent movements within the past 500,000 years. J. Rand noted very briefly some radiometric dates that he has acquired in connection with site studies for Central Maine Power Company on a pro-posed nuclear power site on Sears Island, Sears port: 15,595 ± 400 years B.P. on calcareous con-cretions (probably formed from meteoric waters) in a marine unit interbedded at about 20' depth in lodgement tills on Sears Island7 166 ± 6 M.Y. on a fresh diabase dike on Flye Point, Brooklin; and 69.3 + 3.1 M.Y. on a spacially offset, but not fault7ed, ultrabasic dike on Jameson Point, Rockland. The 15,595-year age of the concretions may be of particular interest, in that it suggests a possible effect of the Erie interstadial in central coastal Maine. The marine unit is about 14" thick, and is comprised of thin-bedded, medium brown silts and
very fine sands. The concretions are in the sands.
(JRR)

MAINE SURVEY MAILING LISTS

In discussing the diverse (and valuable) publl-cations and maps`Which the Maine Geological Survey is gearing up to release over the coming months, Walter Anderson also noted that the Survey is completely revising and modernizing its mailing list into "user" categories. As we understand it, the Survey will henceforth bullet their notices of new publications to specific groups, such as planners, well drillers, municipal officers, industry people, geologists, etc., according to the applicability of the publication's content to the specific user's needs. If you wish to be on the Survey's mailing list, send in your name and address to the Maine Geological Survey, Department of Conservation, Augusta 04330. As a final comment on the usefulness of the Survey publications in Cundy's Harbor, your editor is requesting to be put on ALL the mailing lists, even though he hasn't drilled a well in years.

EARTHQUAKE FRIENDS

Jim Skehan reports that twice a year he con-venes an informal group known as "Friends of the Northeastern seismic Network", composed of users of seismic data from a wide variety of areas of interest. These Friends have been particularly helpful to the Northeastern Seismic Network in obtaining funding for the establishment and op-eration of the Network stations. Jim does not believe that his current mailing list includes all who might be interested in the Friends organ-ization, and requests that we advise our readers to get in touch with him if they should wish to know more about FNSN.

MEMBERSHIP LIST

At the Annual Meeting in Sidney, some interest was expressed in having a current listing of Society Members and their addresses published in the Newsletter, and we are planning to publish just such a list in the Fall issue. Since the list can be comprised of only 1975-76 Members, if you wish to be on the list and to receive your copy of the Newsletter containing the list, please send us your check for 1975-76 dues along with your current preferred address. There will be no individual invoicing for 1975-76 dues.

MARGARITE IN MAINE

Chuck Guidotti has sent us a news break that ,.at least some of the spectacular chiastolite in the Small's Falls formation (at the type locality) has been completely replaced by coarse plates of margarite. This should be the first record of that mineral in Maine." For further information on this, you may write to Chuck at the University of Wisconsin - Madison, or watch your upcoming issues of American Mineralogist, to which he has submitted a short note on the occurrence.

GSM FIELD EXCURSION ?

It was brought up at the Mid-Summer meeting that maybe the Society ought to think about organizing a field trip of several days' duration in which a number of areas, mapping projects, or features of particular geologic significance may be examined and discussed. The program might involve some kind of a unified .'package", wherein all ride together in a chartered bus, wired for sound; travel light, with notebook, sleeping bag and toothbrush; stay overnight at pre-set

shelters; and carry on running commentary or technical presentations on the bus between stops. Other technical groups are known to do this sort of thing, and they are said to find it to be convenient, educational, easy, entertaining, and apparently not expensive. Any possible programs or useful ideas which Members might wish to offer along this line will be very welcome. Sounds like a good idea which ought to be pursued by GSM. Let's have your thoughts.

THE CEOLOGICAL SOCIETY OF MAINE

TREASURER'S REPORT

For the year ended July 31, 1975

The Membership at July 31, 1975 includes 98 members:

Regular	80
Associate	8
Student	10

(Six Regular members and I student member still owe $2 application fee)

YEAR-END BALANCE *SHEET*

RECEIPTS -	*Dues* and Application Fees		$636.00
EXPENSES -	Printing, 4 Newsletters	$114.82	
	P. ı tage	42.50	
	Lett e rhead	28.74	
	Addressograph Plates	21.25	
	S upplies, Ledger Book	2.91	
	Refund to Harold R. Pestana	2.00	
			$212.22
BANK BALANCE, CANAL BANK @ July 31, 1975			$423.78

RECORD OF DISBURSEMENTS

08/26/74	Check #	1	J.H. French $ Son – Printing	$45.05
08/26/74		2	Color-Ad, Inc. - Photo Neg's.	2.73
09/03/74		3	J. R. Rand - Postage, Supplies	24.87
11/04/74		4	Harold R. Pestana - Refund	2.00
11/04/74		5	Bowdoin College - Postage	7.30
il/18/74		6	Brunswick Publ. Co. - Printing	68.55
01/17/75		7	J. R. Rand - Postage	10.00
01/25/75		8	Brunswick Publ. Co. - Printing	40.92
07/31/75		9	J. R. Rand - Postage	10.80
			Total	$212.22

NOTE: On August 9th, a bill for $51.05 was paid to Brunswick Publishing Company to cover printing and other charges for the July 1975 Newsletter, leaving a bank balance of $372.73 as of August 10, 1975.

August 10, 1975 John R. RandTreasurer

THE MAINE GEOLOGIST is upblished four times a year, generalIVOI'a ~ember, October, January and June or July, for Members of The Geological Society of Maine, a non-profit, non-incorporated educational society interested in all aspects of the geology of Maine.

Correspondence about this Newsletter or about membership in the Society may be addressed to John R. Rand, Cundy's Harbor, RD2-Box 210A, Brunswick, Maine 04011.

DON’T FORGET: 1975-76 DUES ARE NOW DUE & PARABLE