

The Maine Geologist

February 1994

Newsletter of the Geological Society of Maine

Vol. 20, No.1

PRESIDENT'S MESSAGE

by
Steve Pinette

We had a successful 1993 annual fall meeting in Orono at the University of Maine. I want to thank the University of Maine Department of Geological Sciences and Chairman Steve Norton for hosting the meeting. The meeting program, a symposium entitled "**Interpreting Maine's Complex Stratigraphy, Structure, and Tectonic History from Bedrock Mapping**", provided new insights into Maine's complex bedrock geology. I want to thank Bob Marvinney for organizing the symposium and for giving one of the presentations. I also want to thank Stephen Pollock, Mary Hubbard, David West, Mark Swanson, Arthur Hussey, and Henry "Spike" Berry for their fine presentations. I finally want to thank Dr. E-an Zen for continuing the bedrock theme with his provocative evening presentation entitled "**Chasing the Phantom Magma from Australia to Maine by Way of Nevada**".

Driving home from the meeting, I found myself lamenting the relatively few opportunities available for geologists to be involved in basic geological mapping, what lured some of us to geology in the first place. As a professional community, society and the economy have forced us to shift away from traditional mineral and energy resource exploration and development and to refocus our efforts on environmental and societal problems. This is not necessarily bad but it has required adjustments and some retraining. A recent publication by the National Research Council entitled **Solid Earth Sciences and Society** (National Academy of Sciences, 1993) explores these important new directions in earth sciences and how earth science researchers will influence society's de-

isions on resource development, waste disposal, environmental protection, natural hazards reduction, and land use. The report presents both broad and specific views of the changing field of earth science, emerging research issues, and scientific contributions and applications.

At a recent lecture in Augusta sponsored by the Maine Geological Survey, Dr. Jonathan Price from the National Research Council, suggested that academic institutions with earth science programs use this report to help them become more relevant to society's needs by developing courses and programs that train students to grapple with these emerging issues. Doing this will avert the low enrollment in earth science courses that schools experienced in the 1980's. At a minimum, this report will provide the aspiring earth science student with a comprehensive discussion of **fundable** and relevant critical research topics for the future. You may obtain a copy of this report (for a \$49.95 fee) by calling the National Academy Press at (800)-624-6242. A summary of the report is also available separately.

GEOLOGICAL SOCIETY OF MAINE 1994 SUMMER FIELD TRIP

Saturday, July 30, 1994

Dr. Joseph Kelley, Maine Geological Survey
"Sand dynamics and engineering structures in
Saco and Wells Bays, southwestern Maine"

Sunday, July 31, 1994

Dr. Arthur Hussey, Bowdoin College
"Geology of the Coastal Lithotectonic Belt -
southwestern Maine"

Field trip headquarters: Sebago Lake State
Park

**CALL FOR ABSTRACTS
GEOLOGICAL SOCIETY OF MAINE
SPRING MEETING
Friday, April 8, 1994
Bates College
Lewiston, Maine**

Students in Maine colleges and universities and students from other schools working on projects in Maine are encouraged to present papers in oral or poster form at the spring meeting of the Geological Society of Maine, Bates College, Lewiston, on Friday, April 8, 1994.

This program gives students working on Maine-related senior theses, independent studies or master's theses an opportunity to discuss their research before a professional audience. Abstracts will be published in the issue of the *Maine Geologist* following the meeting.

Oral presentations are 20 minutes in length which includes 5 minutes for questions. Slide and overhead projection facilities will be available. Those presenting in poster format will have available one poster board with a dimension of 8 feet x 4 feet.

Abstracts must be written in accordance with the Geological Society of Maine format and must not exceed 250 words. All of the text must fit within a 4-1/2" x 4-1/2" box. A sample abstract is available to serve as a guide in preparation; abstract forms are also available. The original and two copies of the form must be submitted. For abstract forms and/or submissions, contact:

Dr. Dykstra Eusden
Department of Geology
Bates College
Lewiston, Maine 04240

For more information, call (207) 786-6152 or email deusden@abacus.bates.edu.

Abstracts must be received by March 25, 1994. Late abstracts will not be accepted.

DEP TASK FORCE UPDATE
by
Carolyn Lepage

The Task Force met with the DEP's Senior Management Team (Commissioner, Deputy Commissioner, Bureau Directors) on September 28, 1993, to provide DEP leadership with an update of the Task Force's actions over the past year, as well as an opportunity to comment on the Task Force direction and actions as an independent advisory group focussing on technical issues. The Task Force's top priorities for future discussion will be:

1. Complete discussion of a peer review procedure.
2. Improve technical and administrative QA/QC approach.
3. Improve development, use, and communication of staff technical guidelines.

The Task Force is continuing its efforts to offer low cost opportunities to exchange technical information. The next offering will be the "Practical Applications of Soil Barrier Technology" symposium to be held February 9th at Jewett Hall, University of Maine at Augusta. The call for abstracts for the Second Annual Conference on "Lessons Learned in the Remediation of Petroleum-Contaminated Sites in Maine" was recently issued. The conference will be held in Augusta on April 27, 1994. Abstracts (up to 250 words) for either paper or poster presentations should be submitted to Cheryl Fontaine at the DEP's Bureau of Hazardous Materials and Solid Waste Control by January 28, 1994.

The Task Force will continue to meet on a monthly basis. Please give me a call at (207) 865-6138 if you would like additional information or have suggestions for future topics you would like the task force to consider.

THE MAINE NATURALIST IS SOLICITING ARTICLES

by
Steve Pinette

Many of you are aware of the new quarterly journal the *Maine Naturalist*. This journal is peer-reviewed and contains general interest articles, scientific research articles, research summaries, and special features. The publisher, Joerg-Henner Lotze, invites GSM members to submit both short and long articles on the geology and mineralogy of Maine and the surrounding region. Please call or write him if you are interested in submitting a manuscript or want to subscribe to the journal. He can be reached at the following address:

Eagle Hill Wildlife Research Station
P.O. Box 99
Steuben, Maine 04680

Correction -- The Maine Naturalist is published by Eagle Hill Wildlife Research Station, a non-profit corporation. The last issue of the Newsletter stated that this was a for-profit corporation -- my error.

GSM SPRING SHORT COURSE

by
Steve Pinette

We are in the process of organizing a one-day short course on "Remote Sensing for Geologists" to focus on satellite-based remote sensing techniques that are relevant to geologic application. We will offer the short course on April 15th at the University of Southern Maine on the Gorham campus. The course will be co-taught by Dr. Ben Rivard from the Canada Centre for Remote Sensing and Dr. Michael Collins from the University of Maine Department of Surveying Engineering. You will be receiving a detailed short course announcement by early March, but mark your calendars now. This promises to be an excellent opportunity for you to survey the field of satellite-based

remote sensing and to obtain information that may be useful in your work. The following tentative course outline is what Drs. Rivard and Collins propose.

Morning Sessions

9:00 - 9:20 Introduction and Background

Energy sources, creating digital data. Types of remote sensing data: LANDSAT, Spot, airborne Radar, geophysical.

9:20 - 12:15 Data Characteristics & Analysis

Data analysis - introduction to digital image analysis.

Spectral geology (LANDSAT, SPOT, airborne, thermal): basic characteristics; spectral geology (rocks/minerals, geobotany); examples (Egypt, southwestern U.S.A.).

Structural geology (LANDSAT, Radar): basic characteristics; structural geology; examples (Egypt, Saudi Arabia).

Computer systems: hardware/software; data formats and purchase.

12:15 - 1:30 Lunch

Afternoon Sessions

1:30 - 1:45 Geophysical Data

Basic characteristics; data analysis.

1:45 - 2:30 Data Combination/Integration

Theory; ancillary data (DEM, chemistry, maps); color systems (RGB, IHS); examples (Sudbury).

2:30 - 2:45 Break

2:45 - End: Case Histories

Brazil: combination of Radar and LANDSAT for lithologic mapping in tropical forest. Greenland: limitations of LANDSAT for lithologic mapping. Gaspé: combination of geochemistry, geophysics, and radar for mineral exploration and structural geology. Guyana: coastal geology. Northern Quebec: geophysics and LANDSAT to map earthquake surface faults. Possible workstation demonstration.

GSM TREASURER'S REPORT
For the period 9/10/93 to 1/14/94

Beginning balance: \$5426.37

Income:

Dues, application fees, etc.	649.00
Publication sales	110.00
Education fund	240.00
Bank interest	11.28
Subtotal: 1010.28	

Expenses:

State sales tax	11.28
Bank charges	14.12
Fall '93 newsletter	251.36
Fall '93 meeting	972.00
Postage, supplies	116.41
Subtotal:	1362.41

Ending balance: \$5074.48

A note on dues: The society year began August 1; a 1993 date on your newsletter mailing label means you are delinquent in your dues. Please pay your dues promptly.

A note on mailing addresses: More returned newsletters means more expense to the Society in postage due to the post office. Please notify Treasurer Marc Loiselle if you change your address - all it takes is a post card!

The Society wishes to thank the following members for their contributions to the Education Fund: Olcott Gates, Kristin Gregory/ Poland Spring Bottling Company, Barbara L. Hennig, Rebecca L. Hewett, Alan E. Kehew, Vic Kral, Alex Mann, Ellen O'Brien.

submitted by,
Marc Loiselle
Treasurer

GSM FALL MEETING MINUTES
NOVEMBER 5, 1993

submitted by
Marita Bryant, Secretary

The fall meeting took place on the University of Maine's Orono campus. The reading of the Treasurer's report, which opened the Business meeting, appears above in this newsletter. It should be noted that the voluntary check-off on the membership dues form yielded over \$200 in education support funds.

After the election of the next year's officers, listed below, the following items were presented to the membership by GSM President Steve Pinette:

1. The GSM Bulletin IV will contain four, possibly five papers. The review process should be completed by the end of December and publication is scheduled for early 1994.

2. The Spring GSM meeting date was tentatively set for Friday, April 8, 1994. It will take place at Bates College and feature the traditional student presentations.

3. Arthur Hussey reminded members to notify him of any address changes as returned newsletters will no longer be forwarded.

4. The 1994 short course is scheduled for April 15 at USM. Irwin Novak and Tom Easler have offered to organize it. The subject will be remote sensing and satellite imagery as applied to earth science with a morning session devoted to methods and an afternoon session spent examining case histories.

5. The next summer field trip will cover the bedrock and coastal geology of southern Maine from Kittery to Portland. The trip's co-leaders will be Art Hussey and Joe Kelley. Overnight accommodations will be at the campground at Sebago Lake State Park.

6. A one day symposium sponsored by the Maine Section of the American Society of

Civil Engineers, the University of Maine Department of Civil Engineering, the Maine DEP, and the DEP Task Force will take place in Augusta on Wednesday, February 9, 1994. The title is **PRACTICAL APPLICATION OF SOIL BARRIER TECHNOLOGY, An Inventory of Resources for Responsible Technical Policy in Maine**. Topics will include: Characterization and availability of soil barrier material; alternate barrier materials; construction inspection; QA/QC; method versus performance specifications; construction methods; defining technical roles in the regulatory and private sector; relating environmental risk to risk management. For details contact Harrison Bispham at Maine DEP (207) 287-2651.

7. Joe Kelley announced that he will be teaching a course on Maine geology on ITV next spring, Mondays and Wednesdays from 1:00 to 2:20 pm.

After dinner, GSM members had the pleasure of listening to E-an Zen, University of Maryland, speak on "Chasing the Phantom Magma from Australia to Maine by Way of Nevada".

Dr. Zen has examined the thermal conditions under which the peraluminous granitic plutons of the Lachlan Fold Belt (LFB) of Australia formed. This belt, approximately 1100 km long and 700 km wide is composed of I-type rocks in the east and S-type rocks in the west. The latter rocks represent in-situ anatexis of midcrustal material for which there are several possible tectonic scenarios. The most plausible one is a regime in which there is crustal thinning, that is extension, and mafic underplating.

The thermal activity of just such an extensional regime has been modelled for the Basin and Range of NW Nevada. Applying the same model to the LFB above the detach-

ment zone suggests that a little over 400 million years ago there was a major extensional event before the emplacement of the Australian granites. The range of depth of melting would have been 14-32 km. The I-S line may record the limit of extensional tectonics in the LFB.

If this model is applied to the peraluminous, two-mica granites of Maine, the results suggest early Silurian to early Devonian, or early Acadian, extension in New England with anatexis occurring a bit below and then caught up in Guidotti's M_2 and M_3 events. Since the thermal lag is shorter for extensional events than for compressional ones there is a small window for melting available before melting below the detachment zone could get involved. The occurrence of some I-type rocks (granodiorites and tonalites) may be due to magma from a different source, for example, one below the detachment zone.

Officers elected for 1993-1994:

President - Steve Pinette

3 Heather Lane, Cumberland, ME 04021
home (207) 829-4395; work (207) 287-3901

Vice President - James Hillier

c/o Robert G. Gerber, Inc.
17 West Street, Freeport, ME 04032-1133
(207) 865-6138

Secretary - Marita Bryant

Department of Geology, Bates College
Lewiston, ME 04240
(207) 786-6473

Treasurer - Marc Loiselle

Maine Geological Survey
State House Station 22, Augusta, ME 04333
(207) 287-2801

Newsletter Editor - Susan C. Weddle

11 Beech Drive, Brunswick, ME 04011
(207) 729-6122

CALLING ALL SLIDES!

The construction of the Maine Geology Teaching Kit has begun. Patti Millette has put together a temporary collection of slides for the kit, but could use additional ones. The following is a list of slides that would be useful: *Himalayan Mts. showing mountainside folds; part of any volcanic arc system; Mt. Washington (aerial view if possible); Mt. Katahdin (aerial view if possible); overall aerial view of New England Appalachians; rift volcanos in Iceland; ice tunnels; aerial view of eskers, drumlins, moraines, kettles; land view of eskers, drumlins, moraines, kettles; deltas; Basin Pond moraine; either basin at Katahdin; view facing west towards Mt. Blue; blueberry barrens-paleo-beach; Pineo Ridge-kame/kettle; aerial view of Cape Cod and/or Long Island; and Antarctic glacier.* All slides will be copied and returned as soon as possible.

EARTH SCIENCE EFFORTS OF THE NATIONAL RESEARCH COUNCIL, NATIONAL ACADEMY OF SCIENCES

by

Robert Johnston

On December 29, Dr. Jonathan Price, Staff Director of the Board of Earth Sciences and Resources at the National Research Council, spoke at the Maine State Arboretum in Augusta on the earth science efforts of the National Research Council, National Academy of Sciences. Dr. Price, who is on leave to the National Academy of Sciences from his position as State Geologist of Nevada, assisted in the publication of "*Solid-Earth Sciences and Society*", a critical assessment of research and education in the solid-earth sciences. His presentation to state government scientists and university educators discussed the results of the report on where the earth-sciences are headed

and how to prioritize research. Copies of the report are at the Maine Geological Survey library.

The main message of both the presentation and report is that the earth sciences are alive and well and, because of societal impacts, the earth-sciences have a bright future. The National Research Council is a non-governmental agency made up of the nation's leading scientists who are asked by the federal government for advice on scientific matters. The group is funded by private sources.

Objectives and priorities for research are identified in the report. Various scientific disciplines are integrated. For example, geochemical, biological and geological processes need to be integrated to understand the carbon cycle. The focus of the report is on the development of global paleoenvironments over the last 2.5 million years. It was during this time period that the near surface geology and related issues that affect us today developed, such as seismicity, mineral extraction, and climate change.

Earth science education is another important discussion in the report. Basic geology courses still need to be taught in our schools. However, in order to satisfy the need for scientists in specialty areas, more detailed courses should be offered that are integrated with the other physical sciences.

The linking of earth sciences with societal needs is an important issue for those who wish to maintain or increase government funded research. The National Research Council has laid out goals and objectives in the search for continued successes in the earth sciences.

AWG FOUNDATION OFFERS CHRYSALIS SCHOLARSHIP

The Association for Women Geoscientists Foundation will award at least two Chrysalis scholarships on March 31, 1994. The \$750 awards will be given to geoscience Masters or Ph.D. candidates to cover expenses associated with finishing their theses. The scholarship is for candidates who have returned to school after an interruption in their education of one year or longer. The support can be used for anything necessary to assist the candidate in completing her thesis, such as typing, drafting expenses, field work, or child care.

Applications should be made by March 1, 1994. The applicant should write a letter stating her background, career goals and objectives, her involvement in both the geosciences and her community, how she will use the money, and explain the length and nature of the interruption to her education.

The applicant should also submit two letters of reference. The letters should include a statement of the applicant's prospects for future contributions to both the geosciences and her community. Her thesis advisor should also include when the candidate will finish her degree and what requirements are as yet to be completed.

For obtaining an application or additional information, please contact:

Chrysalis Scholarship
Assoc. for Women Geoscientists Fdn.
Macalester College Geology Dept.
1600 Grand Avenue
Saint Paul, MN 55105-1899
(612) 696-6448 or FAX (612) 696-6183

1994 MAINE MINERAL SYMPOSIUM

Geological Society of Maine members are invited to attend the fifth annual Maine Mineral Symposium, which will be held in Augusta on the weekend of May 6-8. This educational event is organized by mineral hobbyists and dealers, with assistance for the Maine Geological Survey (Woody Thompson has been elected to chair the Symposium committee). Indoor activities will be held at The Senator Inn and Conference Center, located just off I-95 on Western Avenue.

The weekend will start with an auction of mineral specimens on Friday night, with proceeds to benefit the symposium. Saturday features a series of talks and mineral exhibits. An exciting speaker program has been planned, including talks on last summer's big *amethyst strike at Deer Hill* (Dennis Creaser, Intergalactic Mining); *New England pegmatites* (Carl Francis, Harvard University); the *Cleveland mineral collection* (Art Hussey, Bowdoin College); *minerals of the Thetford Mines ophiolite complex in Quebec* (George Robinson, Canadian Museum of Nature); *gold mining and placers in Maine* (C.J. Stevens); and others.

Dealers will have a large selection of quality minerals and gems for sale at The Senator on both Friday and Saturday evenings. (Cruising the dealer rooms is a learning experience in itself!) One or more field trips to Maine mines will be held on Sunday, so you can collect your own specimens. Registration for the entire weekend is only \$8.00. For details, contact Robert Hinkley, Yarmouth Road, Route 115, Gray, ME 04039; phone (207) 657-3732. Or call Woody Thompson at the Maine Geological Survey at (207) 287-7178.

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 dialoge 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 three times a year. 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.

A \$2.00 APPLICATION FEE is a one-time fee for all new members, payable when applying for membership.

THE GEOLOGICAL SOCIETY OF MAINE ANNUAL RENEWAL / APPLICATION FOR MEMBERSHIP

Application Fee	\$2.00	\$ _____	Name _____	Checks payable to:
Regular Member	\$7.00	\$ _____		The Geological Society of Maine
Associate Member	\$6.00	\$ _____	Address _____	Marc Loiselle, Treasurer
Student Member	\$4.00	\$ _____		c/o Maine Geological Survey
				State House Station 22
				Augusta, ME 04333
TOTAL ENCLOSED		\$ _____		

1993/94 SOCIETY YEAR BEGINS 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

Non-profit Organization
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Address Correction Requested

THE MAINE GEOLOGIST is published three times a year, in early fall, mid-winter, and summer, for members of the Geological Society of Maine.

Correspondence about membership in the Society should be mailed to Marc Loiselle, Maine Geological Survey, State House Station 22, Augusta, ME 04333.

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

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|-------------------|-------------------------|
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