



THE MAINE GEOLOGIST

THE NEWSLETTER OF THE GEOLOGICAL SOCIETY OF MAINE

JUNE
1983

VOL.9 NO.4

PRESIDENT'S MESSAGE

John Tewhey

A few brief comments and announcements:

► A hearty THANK YOU to the officers and membership of the society for their terrific support of GSM during the past year. Special thanks to ROY FARNSWORTH for his great job with the newsletter this year...and next??

► SUMMER FIELD TRIP: Due to the fact that boat transportation is required on John Creasy's field trip on 7/30/83, we need to have advanced notice of how many people will be going on the trip. Please drop John a note at Bates or give John Tewhey a call at (207)775-5401 before July 15th.

► Overnight accommodations are available in the dorms at USM on the night of 7/30/83. Cost will be under \$10 but linen may not be available so bring a bag. Also available is tenting space on Tewhey's lawn. Please call Tewhey if you need a room at USM in that we have to commit for rooms.

► The nominating committee headed-up by Walt Anderson has recommended the following slate for the 1983-84 year. Voting will take place at the annual meeting on July 30, 1983.

President	Andy Tolman
Vice President	Dorothy Tepper
Treasurer	Robert Gerber
Secretary	Carol White
Director 1986	Stephen Pollock
Newsletter Editor	Roy Farnsworth

► Field trip descriptions are included in this newsletter and Art Hussey is working hard to have field logs available on the day of the trips.

ANNUAL MEETING

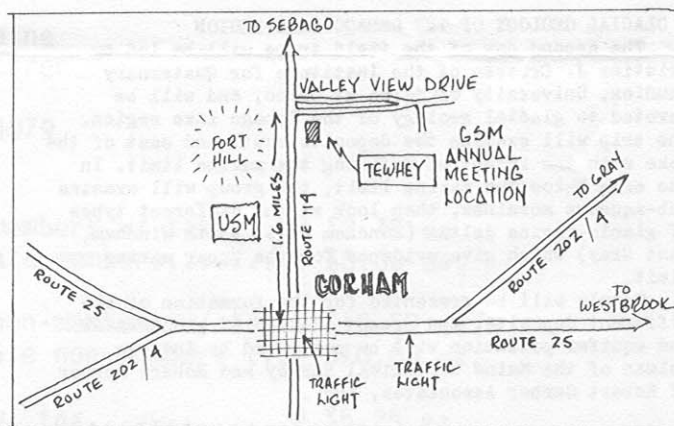
DATE: Saturday, July 30, 1983

PLACE: John Tewhey's house and yard
Valley View Drive (off Route 114)
Gorham, ME 04038

TIME: 6:00 Volleyball and Beer
7:00 Cookout
8:00 Annual Meeting

OTHER INFORMATION:

- \$4.00 will be charged to cover expenses of hamburgers, hotdogs, beer, wine, softdrinks etc.
- Cars will proceed to Gorham after last stop on Saturday field trip, therefore the starting time is approximate.
- Local map to Tewhey's house is shown below:



SUMMER FIELD TRIPS

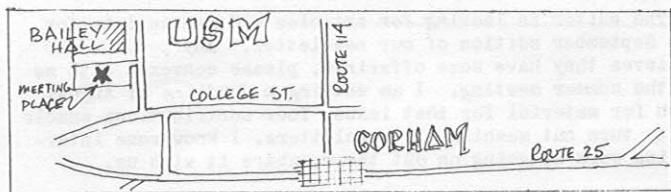
GLACIAL TRIP: Sunday, July 31, 1983

TRIP LEADER: Kristine Crossen, UMO

START TIME AND PLACE: 8:30 am in front of Bailey Hall at the University of Southern Maine campus in Gorham (see map below).

LUNCH INFO: Bring own or there is opportunity to buy one from grocery store on trip.

LAST STOP: Mayall Road in East Gray (near McKin site) at approximately 4:00 pm (3 miles from I-95).

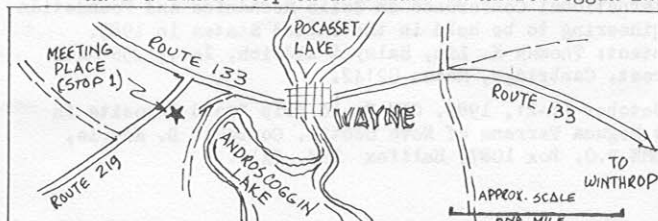


HARD ROCK TRIP: Saturday, July 30, 1983

TRIP LEADER: John Creasy, Bates College

START TIME AND PLACE: 8:30 AM at the outcrop located 0.3 miles west of the intersection of Routes 219 and 133 in Wayne (see map below)

LUNCH INFO: Everybody bring their own...we will have a lunch stop on an island in Androskoggin Lk.



Woody Thompson

On March 14, 1983, the Maine Geological Survey and the U. S. Geological Survey (Water Resources Branch) sponsored a one-day symposium entitled "Groundwater Investigations and Policies in Maine". A limited number of abstract sets from the symposium are available from the Maine Geological Survey for \$1.00 plus tax.

On May 14-15, 1983, the Maine Geological Society hosted the 46th Annual Friends of the Pleistocene meeting. Eighty Quaternary geologists from the northeastern US and Canada attended field trips led by Woody Thompson and Geoff Smith. Trip participants examined the till stratigraphy and glacial-marine deposits of the Augusta and Waldoboro areas. The guidebook for the trips will be available later this year as a Bulletin of the Maine Geological Survey.

FIELD TRIPS- ANNUAL MEETING 1983ANDROSCOGGIN LAKE COMPLEX

A bimodal suite of mafic/ultramafic and felsic alkalic igneous rocks occurs about Androscoggin Lake, Wayne and Leeds. These post-Acadian plutonic rocks and associated mafic dikes are the focus of the trip, Saturday. Objectives of the trip are to examine the lithologies, relative age relations and intrusive mechanisms of this igneous complex. One traverse of moderate difficulty and about a mile in length is planned; a traverse on Norris Island requires a motor boat ride. Field trip Leaders: John Creasy and Carole Johnson, Bates College.

GLACIAL GEOLOGY OF THE SEBAGO LAKE REGION

The second day of the field trips will be led by Kristine J. Crossen of the Institute for Quaternary Studies, University of Maine at Orono, and will be devoted to glacial geology of the Sebago Lake region. The trip will examine the deposits south and east of the lake with the intent of defining the marine limit. In the area below the marine limit, the group will examine sub-aqueous moraines, then look at the different types of glacio-marine deltas (Windham Hill, North Windham, East Gray) which give evidence for the upper marine limit.

Models will be presented for the formation of the different deposits, and recent studies of groundwater and aquifer pollution will be presented by Andrews Tolman of the Maine Geological Survey and Robert Gerber of Robert Gerber Associates, Inc..

NOTICE:

Andy Tolman of the Maine Geological Survey is working on a set of guidelines for monitoring wells. If you are involved with wells or are interested please contact Andy for a draft copy of these guidelines. He is looking for comments and suggestions.

MEETINGS:

July 9-11, 1984 "Geotechnical Engineering Practice" A lecture series at MIT to raise funds for the Eleventh International Conference on Soils Mechanics and Foundation Engineering to be held in the United States in 1985. Contact: Thomas K. Liu, Haley & Aldrich, Inc., 238 Main Street, Cambridge, Mass. 02142.

October 17-21, 1983. CIM Field Trip "Gold Deposits in The Meguma Terrane of Nova Scotia. Contact: D. Keppie, NSIDME P.O. Box 1087, Halifax B3J 2X1.

GSM SPRING MEETING AT BATES COLLEGE

The 5th Annual College Student Presentation Program of the GSM was hosted on March 11th by Bates College Geology Department. Prof. Donald Newberg chaired the meeting which offered the presentation of papers by students from 1:15 to 4:30 P.M.. Following the business meeting, social hour and dinner a presentation was given by Stephen Pollock, Professor from the University of Southern Maine. His paper entitled, "Archeological Significance and Geology of Chert from the Munsungun Lake Formation, Maine" is reported on below by Patricia O. Seaward of the University of Southern Maine.

Student Abstracts from this meeting are presented on the next page.

ARCHEOLOGICAL SIGNIFICANCE AND GEOLOGY OF CHERT FROM THE MUNSLUNGUN LAKE FORMATION, MAINE.

Professor Stephen Pollock, University of Southern Maine.

On the evening of March 11, following the presentation of student papers, a talk on the geology of the Munsungun Lake cherts was given by Dr. Stephen Pollock of the University of Southern Maine.

In the mid-Ordovician the Munsungun Lake Formation was deposited on the sea floor, either as a volcanic eruption directly into a marine environment, or as volcanics that were eroded and redeposited into a marine environment. The cherts comprising approximately 10% of the Munsungun Lake Formation, were deposited in topographic lows on the Ordovician sea floor.

Structural deformation in the mid-late Devonian, and subsequent uplift, erosion, and continental glaciation produced the topography and surface exposures which facilitated exploitation of the chert.

The quarried cherts occur in outcrops at lower elevations near Munsungun Lake and along prominent northeast trending ridges northeast of the Lake.

Evidence shows the cherts have been extensively mined by human cultures, more or less continuously, for the last 10,000 to 12,000 years.

These cherts are cryptocrystalline and are found in a variety of colors ranging from laminated grayish reds or mottled greenish grays, to grays, grayish blacks and blackish reds, and dark gray with black laminae. These, and related lithologies were used to manufacture tools, weapons, and effigies.

Bedrock mapping, hand specimen analysis, mineralogical, and chemical analyses are used to correlate artifacts recovered at work-shop sites to known quarry localities. This information has tremendous possibilities for identifying migration routes and/or trade networks and points of origin.

REMINDER:

The Officers and Directors of the GSM express their disappointment in the lack of participation of many of our academic associates and their students in the annual Spring Student Presentation Program of our Society. Get your students prepped to have an abstract ready and a paper to give at next spring's meeting early in March.

The editor is looking for articles and manuscripts for the September edition of our newsletter. Any persons who believes they have some offerings, please converse with me at the summer meeting. I am setting a deadline of August 15th for material for that issue. Your contributions enable me to turn out meaningful newsletters. I know some interesting work is going on out there, share it with us.

The Geological Society of Maine announces the publication of Bulletin No. 3, Field Trips of the Geological Society of Maine, 1977-1983. This Bulletin is a 129 page collection of guidebooks for 12 Maine field trips which the Society began in 1977 as part of their annual summer meeting. The guidebooks include both bedrock and surficial trips, complete with discussions, road logs, maps and references. Several of these trips have been in areas where no previously published trips have been held. Bulletin No. 3 is an invaluable guide for all people planning geological field excursions in Maine.

The expected publication date for Bulletin No. 3 is October 1983. The price of Bulletin No. 3 is \$8.00 for members and \$10.00 for non-members postage paid (plus tax where applicable). Also still available are a limited number of copies of Bulletin No. 2 "Shorter Contributions to Maine Geology", 79p. for \$5.00, postage paid (plus tax where applicable). Bulletin No. 1, published by the Society in 1979 is out-of-print, and no longer available from the Society. Due to the financial constraints of the Society, only a limited number of copies of Bulletin No. 3 will be printed. The Society expects Bulletin No. 3 to be quite popular, and we urge you to obtain copies of this unique collection before the supply is exhausted.

Tear off here and return with payment

Make checks payable to: Geological Society of Maine, Inc.

and mail to: Geological Society of Maine
c/o Robert Gerber, Treasurer
RFD #1, Box 483
So. Harpswell, Maine 04079

No. _____ Bulletin No. 3 -- in State members w/ tax.....@ \$8.40 ea.
No. _____ Bulletin No. 3 -- out of State members.....@ \$8.00 ea.

No. _____ Bulletin No. 3 -- in State non-members w/ tax.@ \$10.50 ea.
No. _____ Bulletin No. 3 -- out of State non-members ...@.\$10.00 ea.

No. _____ Bulletin No. 2 -- in State w/ tax.....@.\$5.25 ea.
No. _____ Bulletin No. 2 -- out of State@.\$5.00 ea.

_____ TOTAL NUMBER TOTAL COST _____

Name _____

Address _____

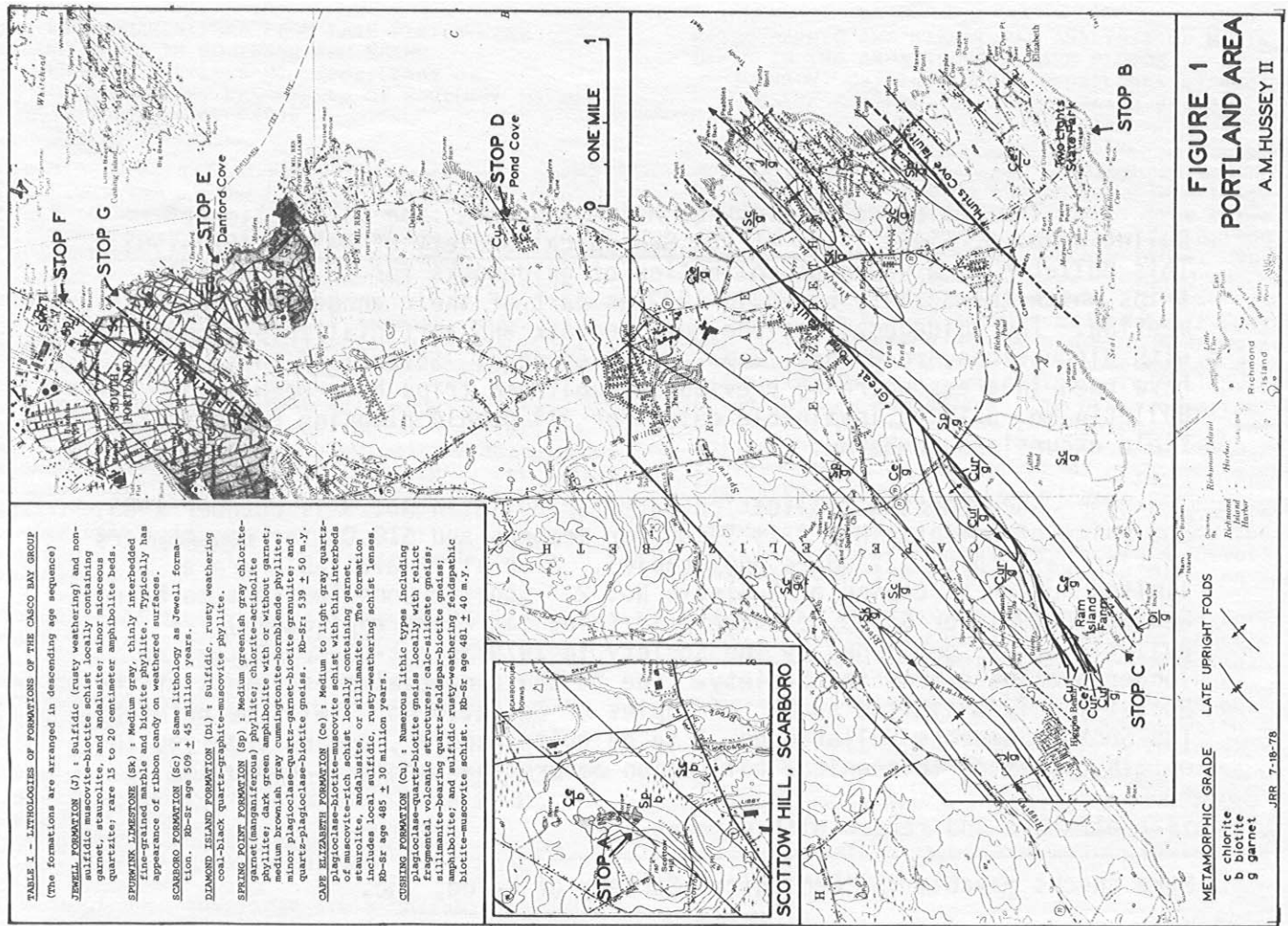


FIGURE 1
PORTLAND AREA
A.M. HUSSEY II

TABLE 1 - LITHOLOGIES OF FORMATIONS OF THE OASCO MAY GROUP
(The formations are arranged in descending age sequence)

JEWELL FORMATION (J): Sulfidic (rusty weathering) and non-sulfidic muscovite-biotite schist locally containing garnet, staurolite, and andalusite; minor siliceous quartzite; rare 25 to 40 centimeter amphibolite beds.

SPRING POINT FORMATION (SP): Medium gray, thinly interbedded fine-grained marble and biotite phyllite. Typically has appearance of ribbon chert on weathered surfaces.

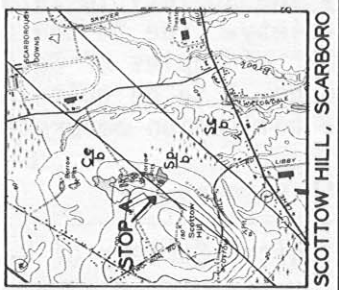
SCARBORO FORMATION (Sc): Same lithology as Jewell formation. Rb-Sr age 509 ± 45 million years.

DIAMOND ISLAND FORMATION (DI): Sulfidic, rusty weathering coal-black quartz-graphite-muscovite phyllite.

SPRING POINT FORMATION (sp): Medium greenish gray chlorite-garnet (manganiferous) phyllite; chlorite-actinolite phyllite; dark green amphibolite with or without garnet; medium brownish gray cummingtonite-hornblende phyllite; medium brownish gray hornblende-garnet schist and quartz-plagioclase-biotite gneiss. Rb-Sr 519 ± 50 m.y.

CAPE ELIZABETH FORMATION (Ce): Medium to light gray quartzite and quartz schist. Contains thin beds of muscovite-rich schist locally containing garnet, staurolite, andalusite, or sillimanite. The formation includes local sulfidic, rusty-weathering schist lenses. Rb-Sr age 482 ± 30 million years.

CUSHING FORMATION (Cu): Numerous lithic types including plagioclase-quartz-biotite gneiss locally with relict fragmental volcanic structures; calc-silicate gneiss; sillimanite-bearing quartz-feldspar-biotite gneiss; and biotite-muscovite schist. Rb-Sr age 481 ± 40 m.y.



83 - 84 SOCIETY YEAR STARTS - AUGUST 1st - PLEASE SEND IN YOUR DUES

THE GEOLOGICAL SOCIETY OF MAINE
c/o Arthur M. Hussey, Dept. of Geology,
Bowdoin College, Brunswick, Maine 04011

THE MAINE GEOLOGIST is published four times a year, more-or-less, in early Fall, late Fall, late Winter, and maybe June or July, 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 Robert G. Gerber, Ash Point Rd., South Harpswell, 04079. Items for inclusion in the newsletter may be directed to Roy L. Farnsworth, Dept. of Geology, Bates College, Lewiston 04240.

President	Andrews Tolman
Vice President	Dorothy Tepper
Treasurer	Robert Gerber
Secretary	Carol White
Director - 1984	Roy Farnsworth
Director - 1985	Arthur Eggleston
Director - 1986	Stephen Pollock
Newsletter Editor	R.L. Farnsworth
Postal Chairman	A.M. Hussey, II

Nonprofit Org.
U. S. POSTAGE
PAID
Permit No. 20
BRUNSWICK, MAINE
04011

Address correction requested

Please send your dues and current mailing address today

BENTHIC FORAMINIFERA FROM LATE PLEISTOCENE
MARINE CLAYS IN SOUTHWESTERN MAINE

SEAWARD, Patricia O., Department of
Geosciences, University of Southern Maine,
Gorham, Maine 04038

Benthic foraminifera recovered from a 1.0 meter thick horizon of the Presumpscot Formation exposed at the Blanchard Pit in Cumberland, Maine, include the genera Elphydium, Cassidulina, Quinqueloculina, Triloculina and Lagena. This horizon consists of interbeds of gravel, sand and mud with detrital shell material. Additionally this locality includes several genera of Pelecypoda, Bryozoa, Ostracoda, with fragments of Echinoidea and Cirripectida, and unidentified vertebrate skeletal remains.

The assemblage present indicates an intertidal to shallow water environment interpreted as a possible prograding glaciomarine delta or a shallow marine embayment (estuary). The meltwaters would have caused a decrease in the salinity as evidenced by the presence of assemblages containing great numbers of Elphydium which occur in environments with variable salinities.

Preliminary results indicate that these Foraminifera show closer affinities to those which occur in arctic environments than those of present coastal Maine. The two most numerous species found at this locality, E. orbiculare and C. barbara, are relatively common in arctic fauna.

PRELIMINARY MAPPING OF THE STRATIGRAPHY AND
STRUCTURE OF WOLF'S NECK AND FLYING POINT,
FREEPORT, MAINE

KETTLE, Nancy F., Department of Geology,
Bates College, Lewiston, Maine 04240

Lithologies in this area are a variable sequence of metamorphosed volcanic, volcanoclastic and sedimentary rocks, probably correlative with the Cushing and Cape Elizabeth Formations. A major fault separates Flying Point and Goose Neck from the mainland; it's trace is oriented N 55° E. Slickensides, offset lithologies and isograds, drag and kink folds indicate episodic displacement involving both strike and dip slip. Rocks to the west of the fault are hornblende ± biotite, plagioclase, quartz gneisses and schists with numerous amphibolite intervals. They are regionally metamorphosed to sillimanite or higher grade, and contain abundant pegmatites. Rocks to the east are fine-grained very feldspathic, amphibolitic or calc-silicate gneisses, occasionally prophyroclastic. They appear to be of lower grade, possibly a result of retrograde metamorphism imposed by extensive shearing. With one exception, pegmatites are lacking. Three regional fold events have occurred in this area. F₁ is recorded only by traces of older foliation surfaces. F₂ resulted in isoclinal folds with axial surfaces striking NNE to NE and dipping moderately steeply to the east. F₃ consists of a late gentle warping of earlier foliation surfaces. The stratigraphic and structural relationship of the two terranes is puzzling. The primary question is whether or not the rocks exposed at Flying Point are in their original stratigraphic position. Three possibilities are suggested: 1., that the lithologies represent a depositional sequence, across the area, of the Cushing formation; 2., that the rocks on the southeast side of Flying Point correlate with the Cape Elizabeth and Cushing Formations and the rocks on the northwest side are a fault-bounded extension of the Macworth Formation; 3., that the rocks on Flying Point correlate with the Cape Elizabeth and Spring Point Formations and are downfaulted to the east.

PETROGRAPHIC AND STRUCTURAL ANALYSIS OF MAFIC
DIKES IN THE ANDROSCOGGIN LAKE PLUTON

JOHNSON, Carole Dianne, Department of Geology,
Bates College, Lewiston, Maine 04240

Approximately 300 diabase, lamprophyre and hornblende dikes intrude the Androscoggin Lake Pluton, in Leeds and Wayne, Maine. The dikes are unique to the complex; they do not extend into the Silurian metasedimentary rocks. The dikes were K-Ar dated and were assigned an averaged age of 280 my (Montague, 1976).

The dikes strike at an averaged N24°E, parallel to the layering of the plutonic host rocks, and dip at 70°W. The dike orientation is similar to regional, Mesozoic dike orientations in Maine and New Hampshire. The dikes comprise 8 - 10% of a traverse across the pluton, perpendicular to the strike of the dikes. This value is representative of the amount of extension along that line.

A histogram of dike widths indicates an inverse relationship between dike width and the frequency of occurrence. There is no correlation between dike widths and their location within the pluton.

Diabase and lamprophyre dikes are characterized by a fine-grained, porphyritic texture of hornblende, orthopyroxene, clinopyroxene, plagioclase, magnetite and ilmenite. Their mineral composition is similar to the hornblende gabbro units they intrude. The distinction of a diabase unit and a lamprophyre unit is supported by whole rock analysis. These dikes are more common than the hornblende dikes.

The mineralogic and chemical compositions and structural evidence suggest that the dikes represent basaltic magmas cogenetically related to the complex.

NEW EVIDENCE FOR A PREMETAMORPHIC FAULT,
FREEPORT, MAINE

KUTRUBES, Doria L., Bates College, Lewiston,
Maine 04240

New evidence has been found supporting the presence of a premetamorphic thrust fault (Hussey, 1981) within the Freeport 7.5' quadrangle. Total field magnetometer traverses covering an area in immediate proximity to the fault revealed a characteristic high-low-high sequence of magnetic intensity, signifying the presence of a zone of lower magnetic susceptibility within the Torrey Hill Member (Hussey, pers. com.) of the Cushing Formation. Petrographic analysis within the zone of low susceptibility reveals a sharp transition in lithologies. Assemblages characterizing the outer portions of the Torrey Hill are sil-mag-graph-gt-bio-qtz-orth-plag. Inclusions of pyrrhotite are found within the graphite. The composition of the low susceptibility zone is similar except magnetite, garnet, and sillimanite are absent, and graphite and pyrrhotite are more abundant. The compositional change within the Torrey Hill is hypothesized as being fault related. Metasomatism occurring along an ancient fault would change the bulk composition of those rocks within the immediate vicinity of the fault so that later prograde metamorphism, associated with the Acadian Orogeny, would produce different mineral assemblages. The presence of a fault would be masked, leaving only an accumulation of sulfides within the Torrey Hill, especially within the zone of low susceptibility, a fault contact between the Cushing and Vassalboro Formations, and a lithologic change within the Torrey Hill as proof.

Evidence supporting the recent activity of this fault is not conclusive, though minor cataclasis is seen. The presence of five bedrock wells at the base of Torrey Hill, producing each a minimum of seventy gallons per minute, suggests some sort of permeability within the Torrey Hill Member which may be fault related.

MEMBERSHIP DUES STATEMENT

THE GEOLOGICAL SOCIETY OF MAINE, INC. is a non-profit Maine corporation established as an educational Society to advance the professional improvement of its members; to inform its members and others of current and planned geologic 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 geologic processes which affect the Maine landscape and the human environment.

The Society holds three meetings each year, in the late fall, early spring and (with the Annual Meeting and sometimes field trips) in mid-summer. 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 annual memberships:

\$5 REGULAR MEMBER - Graduate geologists, or equivalent, with 1 year of practice in geology, or with an advanced academic degree in geology

\$4 ASSOCIATE MEMBER- Any person or organization desirous of association with the Society

\$2 STUDENT MEMBER - Persons currently enrolled as students in college who are interested in geology

\$2 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 _____
(Please print or type)

ADDRESS _____
(Permanent Mailing Address)

Zip Code

Regular Member \$5 per year \$ _____

Associate Member \$4 per year \$ _____

Student Member \$2 per year \$ _____

Application Fee \$2 One-time \$ _____

TOTAL ENCLOSED : \$ _____

MAIL TO: **ROBERT G. GERBER, TREASURER**
Ash Point Road
South Harpswell, Maine 04079

Please make checks payable to:

THE GEOLOGICAL SOCIETY OF MAINE, INC.

83-84 SOCIETY YEAR STARTS - AUGUST 1st - PLEASE SEND IN YOUR DUES

THE GEOLOGICAL SOCIETY OF MAINE
c/o Arthur M. Hussey, Dept. of Geology,
Bowdoin College, Brunswick, Maine 04011

THE MAINE GEOLOGIST is published four times a year, more-or-less, in early Fall, late Fall, late Winter, and maybe June or July, 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 Robert G. Gerber, Ash Point Rd., South Harpswell, 04079. Items for inclusion in the newsletter may be directed to Roy L. Farnsworth, Dept. of Geology, Bates College, Lewiston 04240.

President	J. D. Tewhey
Vice President	F. C. Hoar
Secretary	A. W. Berry
Treasurer	R. G. Gerber
Director - 1983	W. A. Anderson
Director - 1984	R. L. Farnsworth
Director - 1985	A. E. Eggleston
Newsletter Editor	R. L. Farnsworth
Postal Chairman	A. M. Hussey, II

Nonprofit Org.
U. S. POSTAGE
P A I D
Permit No. 20
BRUNSWICK, MAINE
04011

Address correction requested

ROBERT A. JOHNSTON 82/83
25 WINTER STREET

WATERVILLE ME 04901

Please send your dues and current mailing address today