

The Granite State Geologist

Newsletter of the New Hampshire Geological Society
PMB 133 • 26 South Main Street • Concord, NH 03301

Number 29 • Spring 2000



President's Message

Jack Jemsek

The New Hampshire Geological Society (Society) is excited to honor Dr. Gene Boudette's impending retirement as State Geologist this year in a forthcoming series of articles in *The Granite State Geologist*. The articles will chronicle his life, his achievements and his vision for geologic practice in New Hampshire. Dr. Boudette, as State Geologist, has essentially been the New Hampshire Geological Survey for the last 15 years. Considering the state geological survey programs administered by other states, Vermont and Maine, for example, it is hard to imagine what our State Geologist could have accomplished with a full-time support staff. This begs the question, which to me leaves a hole in the soul of New Hampshire geology, why isn't the "The Granite State" a leader among state geological surveys in the Northeast, or the nation for that matter.

As I am not a New Hampshire native, I can only speculate why. I came across the quote, "For geologists, life is a field trip" (Anonymous). This statement strikes me as characterizing the general attitude of geologists (no pun intended). Upon being exposed to the mysteries of the earth presented in a basic earth science textbook, the physical world could never be the same for the curious student and budding scientist, especially after participating in a field trip or two. The field trip allows geologists to indulge in individual discovery. Every piece of ground becomes a puzzle; every hill and valley becomes a page; the landscape turns into a three-dimensional palette; and every map a transcendental instrument to the experience of being in the field.

I suspect that the same spirit that carries us to the field makes geology attractive to scientists who are part individualist, part explorer and part artist. We revel in going to exotic, off-beat places where only rocks, trees and glaciers reside. We are nomads in a civilized world and just don't like a lot of structure in our life. Solitude is encouraged, as each outcrop requires some contemplation and study. We haven't really had to care too much about standardization of our geologic curricula. Instead,

"hands-on" field training and periodic mentoring has been the cornerstone of geologic education.

If you accept the "field trip" mentality, then it is no wonder that geologists have had some difficulties advancing their role in society. Take the near termination of the U.S. Geological Survey in 1995 as a case in point. Organization has not been one of our strong points. The Society is not even 10 years old, and before that there was no New Hampshire-based geological organization.

Perhaps the analogy of getting scientists together can sometimes be like herding cats is true. However, it seems that we are improving in this area. The Society looks to have some staying power and the creation of the New Hampshire Council of Professional Geologists has successfully taken on the task of gaining professional licensure status within the state. The Society has joined the American Geological Institute (AGI) Associates Program to participate more fully in the national movement to improve public awareness. That is why the AGI-sponsored Earth Science Week holds such promise for the future of geologic education.

The State Geologist is our technical leader and state ombudsmen for geologic information. He has the unenviable position of explaining difficult concepts to all kinds of people: variability of subsurface conditions; evolution; three-dimensional transport; episodic events like the extinction of dinosaurs, earthquakes, volcanic eruptions and landslides; and gradual changes like glaciation, climate change and structural deformation. He deals with public health, safety and welfare issues, which essentially revolve around water resources in New Hampshire, and oversees the bedrock and surficial mapping programs that New Hampshire sorely needs to complete in support of our resource planning.

It seems imperative that if the Society is to achieve the mission of advancing the science of geology in New Hampshire, if licensure for professional geologists is to be obtained, if geology is to move forward in the 21st

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Opinion Forum

Opinions expressed below, including those in the Editor's Note, are those of the authors and do not necessarily represent the views of the New Hampshire Geological Society.

Comment on Recent USGS Lineament Maps

Pat Barosh, Patrick J. Barosh and Associates

The USGS has released a series of lineament maps that cover most of New Hampshire within Open-File Reports. The USGS has a proud history in lineament studies which is not reflected in these maps. Lineament studies originated in New England nearly 100 years ago using topographic data, but were eventually discontinued as many universities emphasized folding in the region.

The Boston Office of the USGS revived lineament analysis about 1970 as a part of field mapping and then extended by using geophysical data and LANDSAT imagery. The combination of lineament analysis and remote sensing was routinely used to locate faults in the field (e.g. Barosh and others, 1977). After the Boston Office closed in 1977, the New England Seismotectonic study expanded lineament studies across the region to locate faults and evaluate their seismic hazard (Barosh, 1978). More studies were done in the search for a site for radioactive waste in New England. These studies found the plutons in New Hampshire could be classified by the relative degree of fracturing and that a great zone of northwest-trending faults across the state is primarily responsible for the seismic activity (Barosh, 1992).

Lineament studies are now routinely done to find travel paths of water and contaminants in New England. The results of such studies by experienced personnel are found to be faults by field work and drilling. Drilling in the faults found generally produces roughly 10 times the water yield for bedrock wells, than for random sites. This success led consultants in the region to emulate the Survey's approach to find water.

The recent Open-File Report maps do not appear to reflect this history and the techniques developed. The maps bear little resemblance to the fault pattern in the region and many of the lineaments, considered to be fractures, in my opinion appear to be glacial features. Also, relatively few of the ubiquitous northwest-trending faults are depicted and other large faults are missed. It takes experience in both mapping faults and glacial features to be able to produce a good lineament map.

These open-file lineament maps may prove costly to the people of New Hampshire. Costs for drilling for water

where no fault exists, costs from being required by a regulatory agency to check out nonexistent features and costs from neglect of money-saving real lineament studies, because "one already exists", will add up. Meanwhile more detailed and accurate fault studies which have been field-checked languish in the USGS files. This author recommends that the open-file lineament maps be withdrawn in their current condition and that the experience and techniques developed by the Boston Office of the USGS be used to reissue more accurate maps.

Barosh, PJ, Pease, MH, Jr., Schnabel, RM, Bell, KG, and Peper, JD, 1977, Aeromagnetic lineament map of southern New England showing relation of lineaments to bedrock geology: US Geological Survey Misc. Field Studies, MF-855.

Barosh, PJ (editor), 1978, New England Seismotectonic Study Activities During Fiscal Year 1977, US Nuclear Regulatory Commission Report, NUREG/CR-0081 (see also reports for subsequent fiscal years).

Barosh, PJ, 1992, Northwest-trending Basement Fracture Zones in the Northeast U.S. and their role in controlling neotectonic movement and earthquakes, in Mason, R (ed), International Basement Tectonics Association Publication No. 7, Kluwer Academic Publishers, pp. 409-423.

Reply to "Comment on Recent USGS Lineament Maps"

Richard Moore, U.S. Geological Survey

We have received several questions at the USGS regarding our recent series of lineament maps that cover the entire State, and would like to answer them.

Q. Are the lineament maps the final product?

No. The USGS lineament maps are not the final product, but rather were created as a data layer to test statistical relations with well yields. More than 20,000 bedrock well yields, Statewide, are being related to site characteristics such as the mapped bedrock unit, topographic setting, surficial material, and proximity to lineaments. The report regarding these relations is now being prepared. Interpretive maps, based on the statistical relations, are also planned.

Q. Why do faults, which are shown on current published geologic maps, not necessarily coincide with lineaments?

Lineament location is based on geomorphic, vegetation, and soil tonal patterns (Clark and others, 1996). If a fault is present and no lineament-identification criteria existed then no lineament is drawn.

Q. Can the lineament maps form the basis for locating faults?

No, the lineament maps were not developed for the purpose of locating faults. Lineaments may assist with the identification of some faults, but geologic mapping identifies faults. Patterns in the distribution of lithologies and structural features observed at outcrops form the basis for identifying faults.

Q. Do the lineaments shown on the maps represent faults?

No. The present USGS project essentially applied the techniques developed at Penn State in the 1960s to locate brittle FRACTURE zones. Lineaments represent features in the landscape that are likely related to structural elements in the bedrock that may control the locations of fractures and may be indicative of potential fracture zones.

Some faults may result in a linear expression; however, brittle fractures and faults are geologic structures that are not mutually inclusive. Faults require displacement while many fractures are joints with no displacement. Also, older faults may be “healed” in that they formed at great depth and do not represent brittle fractures.

Q. How do the lineament maps relate to the old controversy between the bedrock mappers who favored folding versus those who favored faulting?

This is an old issue that does not involve the present USGS project. Again, the lineaments depicted represent patterns indicative of potential fracture zones. There are no claims about the presence or absence of displacement.

Q. Were aeromagnetic maps used when drawing lineaments?

No. There already exists healthy skepticism regarding the origin of linear patterns in topography. To extrapolate further, to base lineaments on changing patterns of magnetic susceptibility introduces additional uncertainty. Well-documented techniques, using conventional aerial photography, Landsat imagery, and side looking radar (SLAR), were employed. For a discussion of the techniques employed, see Clark and others (1996).

Q. Should the lineament maps alone be used to locate sites for potential high-yielding wells?

No. Clark and others (1996) state that geologic mapping, geophysical surveys, and other site-specific activities should be conducted to confirm the existence of fracture zones.

Clark, S.F., Jr., Moore, R.B., Ferguson, E.W., and Picard, M.Z., 1996, Criteria and methods for fracture-trace analysis of the New Hampshire bedrock aquifer: U.S. Geological Survey Open-File Report 96-479, 12 p.

Editor's Note on Comment and Reply

Tim Allen

This discussion reminds me of a criticism that was once levelled by a senior member of the NHGS against the Stratified Drift Aquifer Mapping project: that the maps produced were not proper Surficial Geologic Maps—they would have been much more useful, in the critic's opinion, if they had been. It seems to me that the essence of Barosh's argument is the same—that the current lineament maps are not proper geologic maps showing faults and that a map of faults would be much more useful than a map of lineaments. Barosh is right that the lineament maps are not maps of faults; Moore plainly states this.

Precision of language is important in the sciences. All parties to any discussion must have some common understanding of the terms used if progress is to be made. Barosh and Moore appear to me to be talking about different things. Clark and others (1996) initially made the mistake of calling their work “Fracture-Trace Analysis.” Clearly the maps produced so far are only “lineament” maps (and have been titled only as such), where the term lineament is strictly defined to mean only an observed photolinear interpreted by the observer to meet criteria which are based solely on the visual appearance of the photolinear in the image (Clark and others, 1996). I get the sense that to Barosh the term lineament connotes something else—specifically a fault. It is not clear to me to what extent Barosh distinguishes between (or co-mingles) the terms “fault” (*sensu stricto*) and “joint,” both of which are “fractures.” Clearly water can be transmitted through any open fractures, not just faults (*sensu stricto*). None-the-less, the extent to which the lineaments mapped do indeed correlate to actual fractures, and thus the extent to which this work can reasonably be called “Fracture-Trace Analysis,” remains to be tested. I don't think that Moore and Barosh really disagree on that point.

News from the NH Department of Environmental Services (DES)

Great New Publication Late in 1999 the USGS published a major contribution to northeastern geology many years in preparation: "Tectonic lithofacies, geophysical, and mineral-resource maps of the Sherbrooke-Lewiston area, Maine, New Hampshire, and Vermont, United States, and Quebec, Canada" (I-1898-E; pamphlet, 107 p. and 3 sheets, scale-1:250,000). This work is unique because it shows coextensive geology between the two countries involved in adjacent 2-degree quadrangles (Sherbrooke and Lewiston) at a major orogenic "elbow" centered on the Quebec-Vermont-New Hampshire common corner. The maps compliment the "Sher-Lew" classical geologic map (I-1898-D) published in 1995 and brings one of the USGS "CUSMAP" projects to fruition. The only other CUSMAP project in the northeast was the Glens Falls 2-degree quadrangle. The principle purpose of these projects was to provide substrate data for national resource analysis purposes (hence: Conterminous US Mineral Appraisal Program or CUSMAP).

The maps in I-1898-E emphasize the distribution, depositional or emplacement history, and boundary relationships of the major rock units in the context of plate tectonics. This information provides for: (1) recognition of environments of deposition favorable for selected mineral deposits, (2) application of genetic models in mineral exploration, and (3) classification and computation of potential mineral reserves. Volcanogenic massive sulfide (VMS) deposits were given special attention in this work. The maps show the regional distribution of known VMS deposits as well as other types.

The compilers of the maps are Robert H. Moench (USGS, Ret., Denver, CO), Eugene L. Boudette (USGS, Ret., and N. H. State Geologist), and Wallace A. Bothner (UNH). The substance of the map drew upon many combined years of geologic experience in the Sher-Lew region, not only on the part of the compilers, but many contributing colleagues. The publication contains an extensive list of cited references, and provides a comprehensive situation report on one of the major driving forces of geology--mineral resources. This report will be available soon from USGS Information Services, Box 25286, Federal Center, Denver, CO 80225 (<http://pubs.usgs.gov/publications/>)

Two New Pilot Programs The DES has begun work to develop two new programs associated with electronic

submittal of information: 1) Electronic Document Submittal; and 2) Water Quality Data Base. As the number of documents retained by DES increases, document storage and retrieval becomes more critical. The volume of files in the Oil Remediation and Compliance Bureau alone, grows by over one-file drawer per month. A more space efficient file storage and retrieval method, which can allow access by both DES staff and the public, is at the forefront. In response to this need, DES has initiated a pilot program in which documents will be submitted in both electronic format and traditional hardcopy for a limited trial period. A full-scale program is anticipated to be implemented by the fall of 2000.

In the full-scale program, most documents submitted to Oil Remediation and Compliance Bureau and Hazardous Waste Remediation Bureau will be in electronic format. Also, DES retains a massive amount of spatial and quantitative data associated with analyses of soil, surface water and groundwater. Currently all of this data is stored solely on paper, in individual reports kept with the site files. The data is organized in many different ways in the reports, depending on the preference of the authors. Consequently, retrieval and analysis is usually time consuming and sometimes infeasible.

Electronic storage of site investigation, drinking water and other soil and water quality data would make retrieval and analysis much easier. This would promote analyses of individual sites or statewide temporal trends, bivariate relationships, frequency distributions and other relationships. Linking the database with the GIS system could allow examination of spatial relationships. The database would be available to both DES staff and the public. DES hopes to establish a preliminary database by Fall of 2000. Mr. Richard Levergood is the point contact for both programs and if you wish to participate or have any question or comments, he can be reached at 271-2183.

Bottled Water The DES' Source Water Protection Program now regulates new groundwater sources of Bottled Water, while Bottled Water products continue to be regulated and monitored by the Department of Health and Human Services. To obtain DES approval of a Bottled Water source, the applicant must complete various hydrogeologic investigations and water quality samplings, and provide other pertinent information similar to that required for approval of community drinking water wells. Call (603) 271-3303 to obtain more information regarding Bottled Water. What's New from the USGS

An Update on NHCPG Activities

Dorothy Richter & Tim Stone

As most members of NHGS are aware, a bill to license professional geologists is making its way through the New Hampshire legislature. NHCPG, which grew out of an ad hoc committee of the NHGS, has been actively pursuing the bill. Previous articles in *The Granite State Geologist* have chronicled the history of the bill since it was introduced in the Senate in January, 1999 through the amendments made at the suggestion of a Joint Working Group of geologists (including Jack Jemsek, NHGS President) and engineers last fall, and the Senate committee's vote to recommend the bill as "ought to pass as amended" in September, 1999. Officially known as SB181, the bill was unanimously passed as amended by the NH Senate on February 3, 2000.

The bill then crossed over to the NH House and was assigned to the Executive Departments and Administration (ED&A) Committee. The House ED&A Committee held its first hearing on the bill on Wednesday, March 8. Tim Stone, Chair of the NHCPG Legislative Committee, testified on behalf of the professional geological community and distributed an information package containing letters of support (including one from NHGS), information about what geologists do, and why the profession should be licensed where it impacts public health, safety, and welfare. The bill's sponsors, Sen. Burton Cohen and Rep. Francine Wendelboe, Phil O'Brien of the NHDES, Francesca Latawiec of the Office of State Planning, and Bill Straub of the Consulting Engineers of NH, also gave testimony supporting the bill. No one appeared in opposition to the bill. The members ED&A Committee asked a lot of questions about what professional geologists do, how we differ from other professions, why should we be licensed, whether such a licensing program would shut out other professionals, and what good will it do for the citizens of NH.

The bill was assigned to a Subcommittee on Licensing. The Chair of the Subcommittee asked that a lengthy "sunrise questionnaire" be completed for the Subcommittee's consideration. A quickly assembled informal committee, consisting of Dorothy Richter, Tim Stone, Walter Carlson, Paul Sanborn, Chip Crocetti, Ken Milender, Ken Richards, and John Regan, was organized to respond to the 62-item questionnaire. The results, not surprisingly, make a very strong case for the licensing of professional geologists in NH. The Subcommittee on Licensing will meet on the bill in late

March/early April. You can follow the bill's progress by logging onto the NHCPG website at www.nhcp.org and following the links from the Senate Bill button.

New Publications from the USGS

The following recently published U.S. Geological Survey Circulars are available at no charge by calling 1-888-ASK-USGS:

- Sustainable Growth in America's Heartland—3-D Geologic Maps at the Foundation, Circular 1190
- Ground Water and Surface Water, A Single Resource, Circular 1139
- Sustainability of Ground-Water Resources, Circular 1186
- Estimating Areas Contributing Recharge to Wells, Lessons from Previous Studies, Circular 1174
- The Quality of our Nation's Waters, Circular 1225

The following are now available from the USGS, New Hampshire/Vermont District office by contacting Debra Foster at (603) 226-7837 or dhfoster@usgs.gov:

- USGS programs in New Hampshire: Fact Sheet 030-99, December 1999
- USGS programs in Vermont: Fact Sheet 047-99, March 2000
- Tessler, Steven, Coles, J.F., and Beaulieu, K.M., 1999, Inventory of selected freshwater-ecology studies from the New England Coastal Basins (Maine, New Hampshire, Massachusetts, Rhode Island), 1937-97: U.S. Geological Survey Open-File Report 99-467, 30 p.

Recently published journal articles on global change by USGS scientists. More information can be obtained by contacting the New Hampshire/Vermont District:

- Scherbatskoy, Timothy, Shanley, J.B., and Keeler, G.J., 1998, Factors controlling mercury transport in an upland forested catchment: Water, Air, and Soil Pollution, v. 105, p. 427-438.
- Kendall, K.A., Shanley, J.B., and McDonnell, J.J., 1999, A hydrometric and geochemical approach to test the transmissivity feedback hypothesis during snowmelt: *Journal of Hydrology*, v. 219, p. 188-205.

Another Publication of Interest

“LATE QUATERNARY HISTORY of the White Mountains, New Hampshire and Adjacent Southeastern Quebec” Edited by Woodrow B. Thompson, Brian K. Fowler, and P. Thompson Davis. Special printing of *Geographie physique et Quaternaire*, Volume 53, Number 1, 1999

The volume includes an article on the history of glaciological research in the White Mountains by Woody Thompson, who gave a talk on this subject at the 1996 Annual Meeting of the NHGS. This special issue is available from the Mount Washington Observatory for \$24.95. See item #99156 at <http://www.mountwashington.org/catalog/books-history/index.html>.

John Humphery Memorial Fund

AEG-New England Section is setting up a memorial fund on behalf of John Humphery, a long-time NHGS member. At John's request, the fund will support geology student trips or other geology projects. Donations may be made by writing a check to “AEG-NE Section”, noting in the memo section “for John Humphery Memorial Fund”. Please mail the donation to AEG-NE Section, c/o Brad Miller, Haley & Aldrich, Inc., 465 Medford St. – Ste. 2200, Boston, MA 02129

Maine Events

The **Geological Society of Maine Spring Meeting**, Friday April 7, 2000 at Bowdoin College in Brunswick, Maine will feature student oral and poster presentations in the afternoon and a keynote address after dinner. Contact Midji Walter (mwalter@bowdoin.edu) for more information.

A special **Symposium on Appalachian Geology** honoring Art Hussey and sponsored by Dr. and Mrs. Frank Kibbe will follow on Saturday, April 8, 2000 at Bowdoin College. A complete schedule and other information is available at <http://academic.bowdoin.edu/geology/announcements/html/kibbe.shtml>

The Lincoln Page Scholarship is open to any and all individuals who seek to continue their earth-science education in a manner consistent with the purposes of the NHGS. See www.nhgs.org for more information.

New Geology Programs at the Squam Lakes Natural Science Center

The Squam Lakes Natural Science Center is noted for its excellence in educating residents and visitors about New Hampshire's wildlife. We are happy to announce that we are expanding our programming and exhibits to include Geology! We have several projects in development including:

- A week-long day-camp for kids 10-13 years old which introduces kids to the geologic history of the Lakes Region. (available Summer 2000)
- A Geology Garden to be constructed on the Gephart exhibit trail which will display large specimens of classic NH rocks
- Training/technical assistance to staff and docents on geologic issues by geologists
- Potential development of on-site and traveling programs on NH geology

The Science Center is a non-profit organization and is presently fundraising for these programs. Interested donors can or send a check payable to

Squam Lakes Natural Science Center
P.O. Box 173
Holderness, NH 03245

Please note that your gift is intended for the Gephart Memorial.

We would also appreciate input from the geology community regarding suggestions for programs and potential funding sources. Volunteers are also welcome! Diane Hanley is a local geologist & volunteer coordinating these projects for the Science Center. She can be contacted at home (603) 524-7821 or by email to splib@together.net.

FYI: The Science Center of New Hampshire changed its name as of 1/1/2000 to Squam Lakes Natural Science Center. We are still located on Route 113 in Holderness, NH. (<http://www.slncs.org/>)

National Ground Water Awareness Week

The second annual National Ground Water Awareness Week, organized by the National Ground Water Association, is scheduled for May 7-13, 2000. Go to <http://www.ngwa.org/education/aware.html> for more information.

Hutton and Uniformitarianism

from John Playfair, 1802, *Illustrations of the Huttonian Theory of the Earth*. Cadell and Davies, Edinburgh.

“On us who saw these phenomena for the first time, the impression made will not easily be forgotten... What clearer evidence could we have had of the different formation of these rocks, and of the long interval which separated their formation, had we actually seen them emerging from the bosom of the deep. We felt ourselves necessarily carried back to the time when the schistus on which we stood was yet at the bottom of the sea, and when the sandstone before us was only beginning to be deposited....An epocha still more remote presented itself, when even the most ancient of these rocks, instead of standing upright in vertical beds, lay in horizontal planes at the bottom of the sea, and was not yet disturbed by the immeasurable force which has burst asunder the solid pavement of the globe. Revolutions still more remote appeared in the distance of this extraordinary perspective. The mind seemed to grow giddy looking so far into the abyss of time...”

Questionnaire Results

Tim Allen

The Board of Directors, in need of some direction, conducted a survey at the 1999 Annual Meeting in October. Although there were about 50 in attendance at that meeting, only 25 questionnaires were completed and returned. In general it seems that the Society is on the right track with our quarterly dinner meetings, family outing and picnic, field trip, and this newsletter, all popular with those responding to the questionnaires. 64% feel that the family outing picnic should include a geologic field trip component; 24% would be happy if it were just in a geologically interesting place. Of new ventures you would like to see the Society pursue, publications and conferences or symposia on the geology of New Hampshire topped the list, although no one stepped forward to volunteer. For our dinner meetings, respondents were most interested in hearing speakers talk about bedrock geology, and were least interested in student presentations and mineral shows. Newsletter articles on the history and personalities of New Hampshire Geology did not rate very highly in this survey, although the editor recalls that a series of such articles by the late Linc Page in early issues of the *The Granite State Geologist* seemed to have been quite popular. Complete results of the questionnaire can be found on the NHGS web site at <http://nhgs.org/NHGS/>.

President's Message, *continued from page 1*

century, then the stature and funding of the State Geologist position must significantly increase. In other words, the State Geologist position should not be a second-class one within our state government, and the New Hampshire Geological Survey should become a responsive resource for the general public.

So if we are to continue to have fun on our field trips, we must first take care of business at home. And now is a good time as the state seeks a replacement for Dr. Boudette, whom many say is irreplaceable. I look forward to seeing you all at the Society's April 13 dinner meeting.

NHGS 1999 Treasurer's Report

Gretchen Rich

Starting Balance, January 1, 1999	6,553.02
Income	
Dues	3,100.00
January 1999 Meeting	926.00
April 1999 Meeting	455.00
Summer 1999 Picnic	237.00
Dividend/Interest Income	117.73
Mineral Raffle	116.00
October 1999 Meeting	903.50
Directory Advertisements	425.00
Total	6,280.23
Expenses	
January 1999 Meeting	944.50
April 1999 Meeting	553.61
Summer 1999 Picnic	229.35
October 1999 Meeting	1,185.13
Postage/Copying	6.60
Bank Fees	29.67
Newsletter Publication	630.69
Insurance	206.00
Post Office Box Rental	195.00
Scholarship	368.81
Internet Services	70.00
Environmental Booth	321.69
Total	4,741.05
Ending Balance, 31 December, 1999	8,092.20
Bank Account Balances, 31 December, 1999	
Savings Account	6,938.43
Checking Account	685.15
Oppenheimer Money Market	468.62
Total	8,092.20



New Hampshire Geological Society
PMB133
26 South Main Street
Concord, NH 03301

The broad purpose of the New Hampshire Geological Society is to advance the science of geology in New Hampshire.

We hope to pursue this goal by contributing to public education, strengthening the role of geology in environmental concerns, and disseminating knowledge about the geology of the Granite State.

Membership in the society is open to all, including professional geologists in all areas and interested lay people.

NHGS News and Events

The **2000 Spring Meeting** of the NHGS will be held Thursday, April 13 at the Wayfarer Inn in Bedford, New Hampshire. Tim Allen, Associate Professor of Geology and Environmental Studies at Keene State College, will show slides and discuss his past and current work on the geology of the Karakorum Mountains in northern Pakistan. Metamorphic and structural features observed there are in many ways very similar to those we find right here in the New Hampshire Appalachians, although much younger in age. The festivities will be begin at 6:00 PM with a social hour and cash bar, followed by dinner at 7:00 PM. **Reservations are necessary** and will be accepted until Wednesday afternoon, April 12, 2000. Please use the enclosed form to pre-pay and make your dinner selection. The cost is \$17 for NHGS Members and \$19 for non-members paid in advance. An additional \$2 surcharge will be collected from those paying at the door. For more information, contact Charlie Balyeat at (603) 763-7402 or Gretchen Rich at (603) 679-6775.

The **2000 Annual Meeting** of the Society will be held Thursday, October 12, during Earth Science Week (October 9-13, 2000), with featured guest Dr. Samuel Adams of the American Geological Institute. Our summer **Field Trip** is tentatively scheduled for July 15, with the **Family Outing** set for August 12. More details will be published in the next *The Granite State Geologist*. The **Board of Directors** will be meeting 6 p.m. on May 8, 2000 at the Manchester offices of Jaworski GeoTech. The agenda includes revisions to the NHGS by-laws and preparation for Earth Science Week. All are welcome. Please call Jack Jemsek at 647-9700 ext 111 or e-mail jemsek@tiac.net for directions.

The NHGS is seeking volunteers for the **Nomination Committee**. New board members and committee members are being sought. If we don't contact you first, please call Jack Jemsek, Tim Allen or one of the other Board of Directors for more information.

The deadline for the next newsletter is May 20. Send material to Tim Allen (tallen@keene.edu).



New Hampshire Geological Society Spring 2000 Meeting



Guest Speaker:

Tim Allen

Keene State College

past and current work on the geology of the

Karakorum Mountains, northern Pakistan

Metamorphic and structural features observed there are in many ways very similar to those we find right here in the New Hampshire Appalachians, although much younger in age.

When: Thursday, April 13, 2000

Cocktails @ 6:00 pm Dinner @ 7:00 pm

Where: Wayfarer Inn

"behind" Macy's at the intersection of Routes 3 and 101 in Bedford, NH

Information: call Charles Balyeat @ 603-763-7402

or Gretchen Rich @ 603-679-6775

<http://nhgs.org/NHGS/>

NHGS Winter 2000 Meeting, Thursday, April 13, 2000

Reservations: members @ \$17.00 non-members @ \$19.00 (by April 12, 2000)

Half-price for students (must show student ID card)

Reservations will be taken until Wednesday afternoon, April 12, 2000

There will be a \$2.00 surcharge for those paying at the door without reservations

Choose: **Chicken Roulade** **New England Baked Scrod**

Make checks payable to: New Hampshire Geological Society

Mail to: Gretchen Rich, Coastal Environmental, PO Box 10, Epping, NH 03042

Name: _____

Address: _____

Half the cost of dinner may be tax-deductible as a business expense