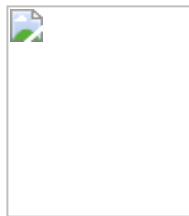


The Granite State Geologist



Newsletter of the New Hampshire Geological Society

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John B. Lyons, 1916-1998

John B. Lyons, Frederick Hall Professor of Mineralogy and Geology, Emeritus, at [Dartmouth College](#), for whom the mineral lyonsite was named in 1987, died of pancreatic cancer Thursday, February 19 at the Dartmouth Hitchcock Medical Center in Lebanon. Professor Lyons was 81 years old.

A member of the Dartmouth faculty since 1946, Professor Lyons conducted research in a variety of areas, including systematic chemical changes in metamorphic rocks and their relation to the origin of granite; the radioactivity, geochronology, petrogenesis and structure of New Hampshire granites, bedrock mapping throughout New Hampshire including the Hanover, Kearsarge and Penacook quadrangles, glaciological research for the Air Force Cambridge Research Center, and field studies in Greenland and at the Ellesmere Ice Shelf on the northern reaches of Ellesmere Island, Canadian Northwest Territories. Considered by many to be the decade's foremost New England geologist, Professor Lyons had recently completed work, in conjunction with others, on a new Bedrock Geologic Map of New Hampshire for the [U.S. Geological Survey](#). The map is now in press and expected to be available this summer.

He taught a core component of the earth sciences curriculum at Dartmouth, a three-course offering nicknamed the "Three Way Stretch" by students. A beloved teacher, he was honored, together with his colleague Richard Stoiber, by a geoscience symposium planned for them by former students in 1984. Richard W. Birnie, Chairman of the [Earth Sciences Department at Dartmouth](#), writes of Lyons: "His quiet sternness masked a warm heart and wonderful sense of humor. Who can forget a field trip with John? He knew every outcrop in New England and could cite every detail of the literature about the particular spot." Professor Lyons also served as chairman of the New Hampshire Mineral Resources Committee, on the Governor's High Level Radioactive Waste Task Force, and as a member-at-large on the board of directors for the [New Hampshire Geological Society](#).

Professor Lyons obtained his AB, AM and PhD degrees at [Harvard University](#) in 1938, 1939, and 1942, respectively, and was a member of Phi Beta Kappa and Sigma Xi. He served as a B-25 Mitchell bomber pilot in

in the Mediterranean Theater during World War II, achieving the rank of captain and was a group leader. He received two Distinguished Flying Crosses as well as the Air Medal with seven Oak Leaf Clusters, and flew a total of 78 missions during the war. His promotion and first medal came as the result of bombing a vital German-held supply bridge at Attigliano--during this mission the lead plane was shot down and Lyons immediately took up that position in order to complete the bombing run.

He leaves five children, six grandchildren and a brother. The family has requested that friends and colleagues who wish to remember him do so through contributions to the [Granite State Independent Living Foundation](#), Box 7268, Concord, NH 03301-7268. This foundation meant a lot to John and has been particularly helpful in accommodating one of his daughters who is disabled by cerebral palsy.

Geophysics Explained: Ground-Penetrating Radar

Paul Hague

Editors Note: This is the first in a series. Other articles will discuss [electromagnetic](#), magnetic, and seismic techniques.

Ground Penetrating Radar provides a rapid, high-resolution means of generating continuous graphic images of subsurface conditions. GPR is usually used as a surface-based reflection profiling technique, similar to seismic reflection. Depending on the electrical and geologic properties of the media being scanned, it is possible to locate buried tanks, drums and utilities,

measure depth to bedrock, delineate the boundaries of a landfill, locate subsurface cavities and map steel reinforcing in concrete. Other uses of GPR include ice thickness mapping, fracture detection, buried foundation mapping, lake and river profiling and pipeline mapping and leak detection. A newly developed high-speed radar system allows highway engineers to automatically track and determine the thickness and quality of pavement layers.

GPR systems work by irradiating the near subsurface with wide- band, short duration electromagnetic energy from a transmitting antenna, and intercepting energy reflected from various subsurface features with a receiving antenna and amplifying and processing the return signal to convert it to a graphic image for interpretation. Radar waves can typically resolve objects on the order of one-half wavelength or less.

Because electromagnetic energy attenuates rapidly in conducting materials, ground penetrating radar is a shallow-penetration technique. Penetration depths can be as much as a few tens of meters, but the majority of surveys provide useful information from the upper 3 to 5 meters. GPR works well in resistive materials, such as dry rocks or fresh water-saturated clean sand, and does not work in conductive materials, such as clay or rocks with conductive pore fluid. The presence of water, because of its high dielectric constant (81), radically alters the radar pulse velocity and can cause serious errors in estimating depth.

Recent software developments allow GPR signals to be processed into 3D images, allow semi-automated layer interpretation, velocity estimation, target recognition and pipe finding. Other software available allows GPR users to digitally construct various situations and test GPR response by forward-modeling using ray-tracing.

NHGS Scholarship and Grant Program

The New Hampshire Geological Society offers scholarships and grants of up to \$300 through two programs, funded with the proceeds from mineral raffles at NHGS meetings and other contributions, as well as NHGS Membership Dues:

1. The [Lincoln R. Page Scholarship](#) helps NH Earth-Space Science teachers, and students, attend regional or national conferences.
2. The **Classroom Equipment/Materials Grant** helps fund purchases of Earth-Space Science equipment and supplies for use in classrooms.

Of course, the NHGS is flexible. Teachers and others having a particular need should write up their request and submit it to: The New Hampshire Geological Society, Scholarship Requests, Suite 133, 26 South Main St., Concord, NH 03301.

NHGS Members: Please help spread the word about these programs by talking with the teachers in your local school district!

Recent Award Winner Acknowledged

The Society wishes to congratulate Ms. Debra Ames Kimball, a recipient of the Society's Classroom Equipment/Materials Grant. Ms. Kimball teaches eighth grade science at Northwood School. She will be receiving \$300.00 to help defray costs associated with taking her students to the Appalachian Mountain Club's "Mountain Classroom." Ms. Kimball and approximately 30 students will be attending a 3- day outdoor classroom at the AMC's Pinkham Notch and Crawford Notch centers. The focus of the trip will be to learn about mountain geology, orienteering, backpacking, and the history of the White Mountains.

Mineral Raffle Results

We wish to thank Vince Valade and Bob Pomeroy for their donations to the mineral raffle held at the last meeting. \$37.00 was raised for the start of the new year. The proceeds have been earmarked for [Lincoln R. Page Scholarship](#) and the Classroom Equipment/Materials Grant funds, to benefit secondary school earth science programs. We are now soliciting donations for the April and October mineral raffles. For those who wish to donate, please contact Greg Kirby at 603-271-3624.

An Ad Hoc Committee on the Professional Registration of Geologists

Walter Carlson

Editors Note: Any opinions expressed below are those of the author, and do not necessarily reflect the position of the New Hampshire Geological Society or The Granite State Geologist.

An ad hoc committee has convened as a result of discussions begun at the first quarterly meeting of the NHGS in Bedford on Jan. 8, 1998. At that meeting, about nine NHGS members agreed to meet in Salem on Jan. 19 at the offices of Hager-Richter Geoscience. The committee discussed the current situation of geologists in New Hampshire. It was generally agreed that in order to raise the professional stature of geologists practicing in the state, it would be necessary to pursue legislation which would regulate the practice of geology as a profession (under the auspices of RSA 310- A [Professional Engineers, Architects, Land Surveyors, Natural Scientists and Foresters](#)).

In 1988, RSA 310-A was expanded to include "natural scientists" in part 310-A:75 by establishing the "[board of natural scientists](#) and the profession of soil scientists." Although the main thrust of this legislation was to certify soil scientists, it did create the board of natural scientists and described its constituency. The board included five members appointed by the governor and council; four to be professional soil scientists and one public member. The board's duties and responsibilities are also defined in the RSA.

In 1989, an association was formed in recognition of the need to register/certify geologists and to amend RSA 310-A:75 by adding the profession of geologist to the board of natural scientists. This association called itself

"New Hampshire Association of Professional Geologists." Although it had a very small constituency, probably less than a dozen, it had established a monumental task for itself. The Association drafted House Bill 185-F and Representative Sheila Roberge sponsored it. The bill was referred to Executive Departments Committee for study. The bill did not usurp any of the already established responsibilities of the board of natural scientists, but rather added to it four geologists and the description of the practice of geology. It did not, however, explain how the people of the state would benefit from establishing Professional Geologists.

Although supported by many geologists and other professionals and agencies, the bill apparently was not favorably supported by enough to get support of the committee and it died there. However, what followed (non-legislatively) was a coming together of enough people with interest in geology to form the [New Hampshire Geological Society](#).

Upon reflection, there were several errors committed during the attempt to get legislative approval. First and foremost, the proposal should have come from a recognized association with a proven track record. Such association now exists and NHGS has enough professional geologists to receive the recognition from the New Hampshire legislature.

Second, those who worked so hard to formulate a plan of attack and create the proposed legislation were, unfortunately, a very small work force. If our effort is to be successful, it will undoubtedly require the commitment of a large number of enthusiastic workers completing a number of tasks.

Third, although their aims were just, they were politically unsophisticated. In order to secure passage of proposed legislation, it is necessary to create it and be there to monitor its movement through committee, hearing(s), and floor vote. Members of the state committee need to be called by some of this large number of enthusiastic workers in order to explain what we're trying to do, why, what we would like them to do, and ask whether they have enough information to make a decision. We need to have many attend hearings and testify as to what professional geologists do, our high moral standards for practicing our profession, and the need for establishing a procedure for legal recognition of professional geologists, and--most importantly--how this will benefit the people of New Hampshire. When the bill comes to the floor for a final vote, the large number of workers would need to call ALL representatives and solicit their support and approval. Ibid when the bill goes to the Senate (hearings and floor vote). Only after the Governor has signed the bill would there be reason for celebration.

One of the most important activities which would undoubtedly be necessary is assisting the [Executive Departments Committee](#) in understanding the proposed legislation and perhaps even retaining a lobbyist to help us whenever and wherever possible. Such a lobbyist may present a significant financial burden, but would undoubtedly be worth the expense. In my opinion, with the organization and recognition which NHGS has received, now is the optimum time to pursue this legislation. Please become involved in this effort.

Letter to the Editor: Geologists Deregulated

Pierre W. Bruno

Editors Note: Any opinions expressed below are those of the author, and do not necessarily reflect the position of the New Hampshire Geological Society or The Granite State Geologist.

I read with interest the "[President's Message](#)," [The Granite State Geologist, January, 1998 \(No. 21\)](#). Geologists seem to be between the proverbial rock and a hard place with respect to environmental employment; but, geology has had a reputation to be a boom and bust.

It seems that the Professional Geologist stamp is not worth much compared to that almighty Professional Engineer stamp. How soon we have forgotten that advanced degrees were at one time perceived as the credential

that we now seek. Mr. Kirby opines that geologists must stick together and I concur; however, there is another issue at stake. What does a PE represent versus what does an advanced degree in geology represent?

The PE requires an engineering baccalaureate and passing a grueling test. An advanced degree in geology requires the baccalaureate, the GRE, about 2 years of study, field work, and thesis preparation. An oral examination, refereed by Professors of Geology, demonstrates overall geological competency. Lastly, the thesis must be presented and defended. The effort required is no less than for a law degrees. The PhD geologist commands even more respect because it is, frankly, the MS times three and equals, at minimum, medical degree training. The public can identify that engineers design things, doctors heal them, and lawyers, well, they are lawyers. PhD and MS geologists seem to fall low on the public perception scale.

Most employers hire geologists as if each discipline were interchangeable. Geologists who study chondrites have quite a different background from hydrogeologists. I suggest that therein lies the problem. Would any of you go to a proctologist for an aneurysm? Is there only ambivalence in our ranks?

Mr. Kirby suggests that undergraduate programs require classes in environmental geology and hydrogeology. I agree that this would round out a modern geology student's background; however, it does not supplant graduate study. There was a time when an advanced degree was the proof of ability and the credential. For some reason, the value of a MS geologist has been diminished in the environmental business.

Perhaps a certification test might help; but, it may be too late. Engineers who have studied hydraulics are self-certified to interpret hydrology, which has become synonymous with hydrogeology. Who needs a geologist to assign the limiting factors and assumptions to a model when anyone can tweak data on the computer--and, unless it has an engineers stamp, the work is unacceptable to the State anyway? When I relocated here from the Midwest about 5ybp, I was appalled that boring log forms of most consultants contained the word "Engineer" for the logger/geologist, and drillers (etc.) continue to address me as the "engineer" when I am on site.

Geologists don't lack credentials, we just don't market our skills. A few years ago, geologists were at the forefront of the environmental business. We tried new things because little was known. I was fortunate to have worked with the geologist who invented the screened-auger technique and the Keck-pump. We designed vapor extraction and pump and treat systems in the garage. Those days have been replaced with turn-key engineering operations having slick marketing appeal and glossy tri-folds. I suggest that we must explore ways to market our expertise with respect to a mature environmental industry without compromising the value of advanced degrees.

Editor's Comment: In discussing Professional Registration of Geologists, I think we need to keep in mind the distinction between the means and the ends. Surely most members of the NHGS can agree that "the ends" are to have geology be practiced by geologists, presumably in order to best meet the needs of the public, protecting them from unnecessary danger and/or expense (not necessarily to ensure future employment for geologists!). Professional Registration of Geologists by the State is just a means to obtain these ends, but might not be the only means.

Tim Allen

Letters to the Editor Invited

[The Granite State Geologist](#) welcomes letters and other contributions from members and non-members alike. Send submissions to Tim Allen, Mailstop 2001, Keene State College, Keene, NH 03435-2001, FAX 603-358-2897, or by e-mail to: tallen@keene.edu Electronic submissions (by e-mail or on diskette) in the form of plain ASCII text are preferred. We reserve the right to edit submissions for length, grammar or spelling. Material published in the newsletter will also appear on the NHGS website at <http://nhgs.org/>

Call for Case Studies

In particular, in keeping with our mission of public education, the Society asks members working in the Environmental community to submit case studies of their remedial activities, successes or failures, throughout the State. These case histories can deal with the experiences of the consultant in conducting subsurface investigations, in remediation, working within the [NH-DES](#) corrective action program, or simply with using an innovative technology. We feel that by doing this, NHGS can provide added exposure to the accomplishments of its members, while at the same time giving value-added information regarding the relationships of the community. Articles may be up to 2000 words, and will be published in whole or as a series depending on space available.

New Members

The Society wishes to welcome new members that have signed on since the last dinner meeting in January:

Glenn Carlson, Hugh Donaghy, Keith Robinson, and Kevin Verville.

Call for Volunteers: Annual Elections

We are now seeking volunteers to run the October 1998 election for the NHGS Board of Directors. Volunteers must be members of the Society but cannot be nominated for any of the Directors' positions. Responsibilities include soliciting nominations of candidates for positions on the Board and ensuring that candidates' biographies are available for publication in the fall newsletter.

Members of the current Board include: Greg Kirby, President; Gene Simmons, Vice-President; Lee Wilder, Secretary; Gretchen Rich, Treasurer; Dorothy Richter, Member-at-Large (term to expire in 1998); and Tim Allen, Member-at-Large (term to expire in 1999).

Please contact Lee Wilder (447 Putney Hill Road, Hopkinton, NH 03229, 603-746-3205) if you would like to volunteer to run the election, or if you would like to be nominated to run for office! The Deadline for receipt of nominations is September 1, 1998. Those nominating themselves should provide a brief biography

Upcoming Events

April 9:

[NHGS Spring Meeting](#)

April 25:

Vermont Geological Society Spring Meeting, featuring the presentation of student papers, at Middlebury College.

May 2:

By the shores of Lake Pigwacket: a workshop on glacial geology in the Mount Washington Valley with Woody Thompson, sponsored by the [Mount Washington Observatory](#). Course fee is \$25 (\$20 for Obs members). For more information, contact the Obs at 603-356-8345 or PO Box 2310, North Conway, NH 03860.

May 12:

NHGS Board of Directors Meeting, 6 PM, Merrimack Town Hall.

June 13:

Annual Meeting of the [Mount Washington Observatory](#), North Conway.

July 18:

[NHGS Geological Field Trip](#)

August 9:

[NHGS Family Outing & Picnic](#), North Conway, NH

October 9:

[NHGS Annual Meeting](#), Bedford, NH

NHGS News and Events

Carl Francis, Curator of the [Harvard Mineralogical Museum](#), will be our guest speaker for the Society's **Spring Meeting**, April 9, 1998, at the Wayfarer Inn in Bedford, NH. Carl will discuss the geological framework of the Polermo Pegmatite in North Groton, NH (past setting for several NHGS field trips), and its relationship to other pegmatites in the area and to the Sebago Batholith. The meeting will begin at 6:00, with a cash bar followed by dinner at 7:00 pm, with a choice of scrod almandine or baked lasagna. Costs for members will be \$17.00 and \$18.00 for non-members. Don't forget that there is a \$2.00 charge for paying at the door. Students (with ID) are half-price.

Carol Hildreth, assistant to the State Geologist, has been recruited to lead a **Geological Field Trip** to south-central New Hampshire to observe the deposits of Glacial Lake Souhegan and Glacial Lake Contoocook. The trip has been scheduled for Saturday, July 18, 1998. The excursion will be for the entire day. Lunches will not be provided. Since it will be a road-side geology field trip, you are encouraged to car pool.

The annual **Field Trip and Family Outing** has been tentatively scheduled for Saturday, August 9, 1998. John Fitzgerald (Haley and Aldrich) has graciously volunteered to lead us to North Conway where he completed an undergraduate thesis at Bates College in 1985, studying the Moat Mountain Volcanics. A morning field trip to observe the eastern portions of the White Mountain Batholith will be followed by an afternoon ride on the [Conway Scenic Railway](#). A lunch will be provided. The field trip and train ride will last approximately 5 hours. Please note the date on your calendar!

The **1998 Annual Meeting** of the Society is scheduled for Thursday, October 8, 1998. The meeting will feature the election of officers. Volunteers to run the election are being sought, as are nominations of candidates for the new Board of Directors (see story inside). Openings include President, Vice-President, Treasurer, Secretary, and one Member-at-Large.

Details on these and other upcoming events can be found in future issues of [The Granite State Geologist!](#)

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