

Wed. May 11th 9-10 A.M.

Talk to Brews

THE

Environmental Geol.

GREEN

Geology and Society

MOUNTAIN

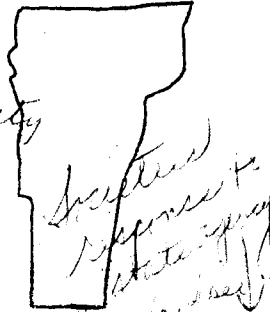
where does

GEOLOGIST

St. Esch.

fit into

Structural problem - How to deal



QUARTERLY NEWSLETTER OF THE VERMONT GEOLOGICAL SOCIETY

SPRING

Volume 4 Number 1

PROGRAM

VERMONT GEOLOGICAL SOCIETY
SPRING MEETING
MIDDLEBURY COLLEGE
Room 117, Science Center
23 April, 1977

<u>STUDENT PAPERS</u> - Brewster Baldwin and Rolfe Stanley presiding	
Coffee and doughnuts	0900-0930
1. C. A. White: Origin of the Newport Granodiorite: A Chemical and Petrographic Study	0930
2. T. Loken: The Petrography and Tectonic Implications of the Coleraine Breccia, Thetford Mines Area, Quebec	0950
3. D. A. Knapp: Dislocation within the Lower Paleozoic Section along the East Limb of the Berkshire Massif	1010
4. S. L. Kenyon: Hortonville Slate near Middlebury, Vermont	1030
Coffee Break	1050
5. P. Turner: Seismic Reflection Survey in Lake Champlain	1110
6. S. W. Bright: Origin of Laysan Island Basalt	1130
7. M. Jasinski and L. Waterhouse: Ground-Water Quality in the Rutland-Castleton Area, Vermont	1150
Award for best student paper	1215

In the afternoon there will be an Executive Committee meeting and/or meeting of the Society.

REPORT ON THE EXPOSITION ON VERMONT GEOLOGY - March 9

For those of you who didn't make the Exposition - you really missed something! Dick Willey and his staff really put on a big show. Many earth science teachers were among the crowd taking in the Exposition and the excellent talks. A number of the members of the Vermont Legislature took precious time away from committee meetings and hearings and ended up staying longer than they had planned. In fact a special presentation of the talks just for the legislature is being arranged.

A news short about the Exposition was shown the following evening on WCAX, and the following week Dr. Ratté was interviewed on the Vermont Report on Vermont ETV.

A B S T R A C T S

ORIGIN OF LAYSAN ISLAND BASALT

Bright, Stephen W., Middlebury College

Dredged samples from Laysan Island in the Hawaiian Chain were studied to determine whether they fit 1) the major shield building stage that produces silica-rich tholeiitic lavas; 2) the alkalic eruptive stage that fills in the collapsed caldera and caps the volcano with silica-poor lavas that are relatively enriched in magnesium and the alkalis; or 3) the post-erosional basalts that are very silica poor, rich in calcium and depleted in titanium; (Macdonald, 1968; Dalrymple, 1973).

The Hawaiian Islands form a linear chain of more than 50 volcanoes stretching west of Hawaii for 3500 kilometers. Wilson (1963) proposed that the volcanoes were formed by a single hot spot as the Pacific plate moved over it. Geochronological studies show that the volcanoes are progressively older to the west. Geochemical studies show similarities between Midway Island, the Hawaiian Islands and dredge samples from the Hawaiian Chain.

Preliminary petrographic and geochemical studies of 14 samples show them to be comparable to the alkalic stage of eruption in the Hawaiian Islands. Low magnesium and nickel content suggest extensive fractionation of olivine. Low totals of the analyses plus a significant clay content seen in petrographic studies point to a large amount of water in the samples which was not analyzed. Initial K/Rb data of ~460 is in the high range for Hawaiian lavas of the alkalic stage but lower than the ratio for alkali stage lavas from Koko Seamount in the Emperor Seamounts. This suggests some change in the mantle source composition or mineralogy through time.

GROUND-WATER QUALITY IN THE RUTLAND-CASTLETON AREA, VERMONT Jasinski, Michael, and Waterhouse, Lindsey; Norwich University

Rapid suburban and industrial expansion in the Rutland-Castleton area has resulted in increased use of ground water. The area is greatly dependent upon private wells as a source of potable water because there is no major central water supply.

Twenty-two parameters were measured on each of 47 samples from 26 streams, 14 bedrock wells, and 7 sand and gravel wells. This study relates to the analyses of water from the 14 bedrock wells.

The bedrock wells are located in three geomorphic-structural regions: (1) Vermont Valley (10 wells), (2) Green Mountains (3 wells), and (3) Taconic Klippe (1 well). In the Vermont Valley 6 wells are located west of the Pine Hill Thrust and 4 wells are east of the thrust.

Ground water in the Green Mountains and the Taconic Klippe is of superior quality compared to the water in the Vermont Valley. Water from wells in the Vermont Valley consistently has high concentrations of bicarbonate and chloride, high total hardness, and high conductivity. Calculation of Langlier and Ryznar indices show ground water of the Green Mountains and the Taconic Klippe to be high in corrosive tendencies.

The poor quality of ground water in the Vermont Valley is attributed to two major factors: (1) the soluble bedrock found in the Vermont Valley and (2) the contact time of the ground water with the bedrock. We suggest that before a private building lot is purchased or a large industrial site is proposed in the Rutland-Castleton area that a careful analysis of the ground water from the proposed site be made.

HORTONVILLE SLATE NEAR MIDDLEBURY, VERMONT

Kenyon, Susan L., Middlebury College

The Hortonville Slate is the youngest unit within the Middlebury synclinorium. It rests above the Cambrian to Middle Ordovician carbonate and quartzite shelf assemblage of the synclinorium and records a Trentonian shift from a western to an eastern source area. The Hortonville is a dark gray to black, low-grade metamorphosed mudstone with occasional silt interbeds and rare sandy beds. West of Middlebury, it contains a 5-meter block of graywacke, that in thin section resembles Pawlet graywacke. Both have grains of volcanic rock; evidently an island arc was active in Pawlet time. Presumably, the block was shed into the Hortonville from a now-eroded northern extension of the Taconic klippen.

Two deformational events are recorded in the Hortonville. The first resulted in isoclinal folding with the development of an axial planar slaty cleavage. The folds related to this slaty cleavage (S_1) are passive, ductile folds and there is indication that this isoclinal folding began when Hortonville was still partially unlithified. The second deformational event resulted in a crenulation (S_2) of the earlier slaty cleavage. S_2 generally occurs at a high angle to S_1 and results in a more brittle deformation of primary features. S_2 often fractures the silty beds, creating a silty breccia within the slate. Thin sections indicate that the same forces which created the early S_1 were also active during and after S_2 development. This is suggested by crenulations which affect S_2 crenulations but which do not affect underformed early slaty cleavage. Such a continual pattern of deformation implies that caution should be used in applying a Taconic or Acadian age to deformational features within the synclinorium, as it seems that development of the synclinorium was a long, continuous process.

DISLOCATION WITHIN THE LOWER PALEOZOIC SECTION ALONG THE
EAST LIMB OF THE BERKSHIRE MASSIF

Knapp, Douglas A., University of Vermont

Stratigraphic units in the Lower Paleozoic section along the east limb of the Berkshire massif in the West Granville quadrangle of southwestern Massachusetts are systematically eliminated along a surface designated the Prospect Hill thrust.

The Prospect Hill thrust is stratigraphically located at the base of the Cobble Mountain Formation (Hawley equivalent) and truncates units from both upper and lower plates. Detailed analysis of fold data indicates thrusting occurred after, and possibly during, formation of the regional schistosity of Early Acadian age. Blastomylonite gneiss, locally present adjacent to the Prospect Hill thrust consists of large (1-6 cm) porphyroblasts of microcline, muscovite with locally ragged margins, and thin (2 mm) stringers of quartz in a matrix of similar mineralogy but much smaller grain size. The regional schistosity overprints all earlier penetrative surfaces formed during cataclasis (fluxion structure). Cataclasis therefore pre-dates Acadian deformation and is probably Taconic in age. The Prospect Hill thrust probably developed during the Taconic orogeny and has been subsequently reactivated during Acadian deformation.

Lithic types similar to and in part continuous with the Stowe, Ottauquechee and Pinney Hollow Formations of southeastern Vermont are mapped as the Rowe Schist (Hatch 1966) in western Massachusetts because these lithic types are neither confined to one stratigraphic horizon nor are laterally persistent. It has been postulated this is a result of extensive dislocation within the Rowe interval (Hatch 1975). This may also correspond to initial movement along the Prospect Hill thrust.

THE PETROGRAPHY AND TECTONIC IMPLICATIONS OF THE COLERAINE
BRECCIA, THETFORD MINES AREA, QUEBEC

Loken, Trygve, Middlebury College

The Coleraine Breccia is located in the Thetford Mines Ophiolite Complex of Quebec, Canada. The breccia is poorly sorted and exhibits wet sediment deformation. A reconnaissance study of clasts found in the breccia was made to determine their provenance and evaluate their tectonic implications.

The clasts are interpreted as being derived from three distinct provenances. Clasts of quartzite and of biotite and muscovite-chlorite schists are probably derived from the Cambrian Caldwell series. On the basis of relict textures, metamorphosed clasts of peridotite, pyroxenite, gabbro, basalt, and stilpnomelane-rich chert were identified; these probably were derived from the Early Ordovician (?) ophiolite sequence. Texturally well-preserved clasts of andesite and diorite were derived from an island arc complex, probably

the Early-Middle Ordovician Ascot-Weedon Formation. The matrix, and therefore the entire unit, has undergone greenschist facies metamorphism, resulting in actinolite overgrowth on hornblende, chloritization of biotite, and development of stilpnomelane.

The sedimentary breccia is probably syn- or post-emplacement of the ophiolite and post-dates island arc activity, suggesting a late Middle Ordovician age. The unit fits in well with current tectonic models of the region.

SEISMIC REFLECTION SURVEY IN LAKE CHAMPLAIN Turner, Preston, University of Vermont

Seismic reflection surveys utilizing a Bolt model 600 air-gun acoustical source have achieved complete penetration of lake sediments and till (?) in the basins of northern Lake Champlain. The bedrock basin is deepest near Split Rock Point (1000 feet below sea level), and shallower in the northeast and northwest arms of the lake (300 feet below sea level). Sediment accumulation is greatest in the basins including Split Rock, Juniper, Colchester, and Burlington basins. Maximum average accumulation rates for basins is approximately 54 feet per 1000 years.

Fault traces which can be extended into the lake from mapped faults on adjacent shorelines, indicate no evidence of recent post-glacial displacements as evidenced by lack of overlying sediment displacement. Faults may have played a significant role in the origin of the basin, both due to actual displacements and in controlling glacial erosion of the incompetent Ordovician shales.

ORIGIN OF THE NEWPORT GRANODIORITE: A CHEMICAL AND PETROGRAPHIC STUDY

White, Carla A., University of Vermont

The Newport Granodiorite, an elongate pluton located west of Lake Memphremagog in northeastern Vermont, is generally considered to be Devonian in age. However, field relationships suggest a comagmatic relationship with Ordovician gabbros and volcanics. The Newport Granodiorite is divided in this study into two separate groups on the basis of petrography, chemistry, and geography. Newport Granodiorite I consists of zoned sodic plagioclase and microcline, has nearly equal percentages of sodium and potassium oxides, and is geographically located to the west of the southern tip of Lake Memphremagog. Newport Granodiorite II is composed primarily of zoned sodic plagioclase with minor amounts of sodic perthite, has a high $\%Na_2O/\%K_2O$ ratio, and is located at the northern extremity of the Newport Granodiorite pluton.

The chemistry and petrography of the Newport Granodiorite are compared with the albite granite of the Ascot-Weedon Formations in southern Quebec, and the Derby pluton and a pluton located on Route 2 near Plainfield, Vermont both of the New Hampshire Plutonic Series. Methods for comparing these three igneous rock associations include quartz-alkali feldspar-plagioclase diagrams (to define the

rock type), $3\text{Na}_2\text{O}-3\text{K}_2\text{O}-3\text{CaO}$ diagrams, Harker diagrams, AFM diagrams, degree of alteration (plagioclase alteration), and the degree of deformation. Distinct differences between each of these suites of igneous rocks using these methods indicate different modes of formation and subsequent deformation histories.

It is proposed that Newport Granodiorite I and II have a common origin in the basis of similarities of texture (reflecting an igneous origin followed by subsequent alteration), volume percentage of mafics, hydrothermal alteration products, and weight percentages of FeO^* , MgO , CaO , and TiO_2 . The Newport Granodiorite is believed to be a differentiation product of a developing ophiolite sequence originating in the spreading center of a back arc basin. In contrast, the Ascot-Weedon Formations albite granite is probably a plutonic equivalent of the calc-alkalic volcanics related to subduction whereas the New Hampshire Plutonic Series plutons were emplaced during the latter stages of the Acadian Orogeny.

MEMBERSHIP DIRECTORY

The following are the current members of the Vermont Geological Society as of March 29, 1977. Those persons in the Honorary, Associate or Student membership category are indicated by a (H), (A), or (S) after their name. All other persons are full members of the Society.

Allinson, Eric	Box 195	Montpelier, VT.	05602
Anderson, Vernon H.	R. F. D.	Thetford Center, VT.	05075
April, Richard	3B Lantern Court Apts.	Sunderland, MA.	01375
Ashley, James W.	R. F. D.	W. Danville, VT.	05873
Bailey, Donald	67 Delmont Ave.	Barre, VT.	05641
Baldwin, Brewster	Science Center - Geology Middlebury College	Middlebury, VT	05753
Billings, Marland P.	Dept. of Geology, Harvard 24 Oxford Street	Museum Cambridge, MA.	02138
Brown, Paul M.	Gould Hill Road	Montpelier, VT	05602
Butterfield, David	R. F. D. # 1	Montpelier, VT	05602
Cady, Wallace	348 South Moore Street	Lakewood, CO	80226
Clark, Stewart, Jr.		East Calais, VT	05650
Connary, Stephen	Dodd Garage Road	Sunderland, MA	01375
Corneille, E. Stanley, Jr.	4 Terrace Street	Randolph, VT	05060
Cushman, Robert V.	20 Court Street	Middlebury, VT	05753
Davies, Thomas A.	Science Center - Geology Middlebury College	Middlebury, VT	05753
Detenbeck, Jeanne C.	R.F.D.#1-Box 210 (Collamer	Circle) Shelburne, VT	05482
Doll, Charles G. (H)	1 Mansfield Ave.	Essex Junction, VT	05452
Duzinski, Charles J.	8 Prospect St.	Brattleboro, VT	05301
Ebbett, Ballard	R. F. D. # 1	Lyndonville, VT	05851
Ebbett, Sandria	R. F. D. # 1	Lyndonville, VT	05851
Fischer, Richard	Montgomery 25 Liberty Street	Montpelier, VT	05602
Fox, J. Charles	P.O. Box 64, 6 Eastern Av.	Barre, VT	05641
Gatto, Lawrence		Ely, VT	05044
Gillespie, Richard P.	164 Harris Road	Nashua, NH	03060
Hepburn, John C.	Dept. of Geology and Geophysics Boston College	Chestnut Hill, MA	02167

Heyburn, Malcolm	Moore Way, Mountain View Estates	Washingtonville, NY	10992
Hodges, Arthur L.	P.O. Box 26	Camden, DA	19934
Lanza, Frank J.	38 Terrace Street	Montpelier, VT	05602
Larsen, Frederick D.	9 Slate Avenue	Northfield, VT	05663
Malter, John	23 Hubbard Street	Montpelier, VT	05602
Manning, Winona (A)	Route 1	Williamstown, VT	05679
McKim, Harlan L.	CRREL, Box 282	Hanover, NH	03755
Mento, Mary Ann	Route 1	Arlington, VT	05250
Merry, Carolyn J.	190 Hanover Street	Lebanon, NH	03766
Oski, John P. (A)	9 Oak Hill Road	Greenfield, MA	01301
Paris, Franklyn D.	Mutton Hill	Charlotte, VT	05445
Ratte, Charles A.	25 New England Drive	Brattleboro, VT	05301
Richter, Dorothy A.	R.F.D.#2, Apt. 8, Beckley Hill	Barre, VT	05641
Roberts, Joan King	42 Monument Ave.	Bennington, VT	05201
Schmitt, Harrison (H)	Senate Office Building	Washington, DC	
Schuele, Ethel	33 Clover Street	S. Burlington, VT	05401
Skehan, Rev. James W.	Weston Observatory, Boston College	Weston, MA	02193
Siok, William J.	R. F. D. #3	Montpelier, VT	05602
Stanley, Rolfe	Dept. of Geology, Univ. of VT	Burlington, VT	05401
Stewart, James B. II	R. F. D. # 1	Bristol, VT	05443
Tarbox, David L.	P.O. Box 435	Bristol, VT	05443
Thompson, Peter J.	Route 4, Box 77A	Granite Falls, NC	28630
Thompson, Roger B., Jr.	R. F. D. # 1	Woodstock, VT	05091
Thompson, Terry F.	R. F. D. # 1	Woodstock, VT	05091
Thompson, Thelma B.	Route 4, Box 77A	Granite Falls, NC	28630
Wagner, W. Phillip	48 Henderson Terrace	Burlington, VT	05401
Watson, Bruce G.	16 Scotsdale Road	S. Burlington, VT	05401
Willey, Richard E.	31 Waterman Street	Barre, VT	05641

SPECIAL OFFER TO SOCIETY MEMBERS

The State Geologist wishes to remind members of the Vermont Geological Society of the SPECIAL OFFER on Vermont Geological Survey Publications. For only \$ 50.00 a member (any category) of the Vermont Geological Society can obtain a complete set of all publications of the Vermont Geological Survey. This is a value of over \$200! To take advantage of this offer send your order with payment to:

Vermont Department of Libraries
 Geological Publications
 Montpelier, Vermont 05602

Indicate with your order that you are a member of the Vermont Geological Society.

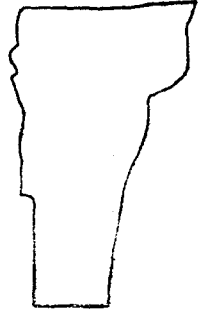
GEOLOGY TEACHERS TO HOLD MEETING - - APRIL 29-30

The New England section of the National Association of Geology Teachers will hold its 25th annual meeting at Lyndon State College in Lyndonville, Vermont on Friday evening, April 29th and all day Saturday, April 30. Goal of the conference is to build a plate tectonic model for New England. Those interested in more information on the meeting should contact Richard Eliot, Lyndon Institute, Lyndonville, Vermont 05851.

GREEN MOUNTAIN GEOLOGIST
Vermont Geological Society
Box 304
Montpelier, Vermont 05602

FIRST CLASS MAIL

THE GREEN MOUNTAIN GEOLOGIST



QUARTERLY NEWSLETTER OF THE VERMONT GEOLOGICAL SOCIETY

SUMMER

Volume 4 Number 2

THE PRESIDENT'S CORNER

Our Society is even more vigorous now than in its first 3 years, judging from its activities, membership, and the numbers of people who are actively involved in Society work.

The Executive Committee unanimously and strongly endorsed Chuck Ratte as State Geologist and at the same time stressed the need for funds to support Chuck's program; I transmitted these recommendations to Dr. Martin Johnson, Secretary of the Agency of Environmental Conservation.

This year's highlight has been "An exposition on Vermont geology", which Dick Willey and many others put together and which attracted 100 people. One benefit has been an increasing and more diverse membership.

Several Committees are laying groundwork for future efforts of the Society. Monty Fischer and his newly appointed special committee have already prepared a report on Nebraska Valley and on possible ways the Society can participate in future land-use decisions; the Executive Committee will look at this report soon. Jim Ashley and the Communications Committee are revamping G.M.G. Roger Thompson and the Membership Committee are active in recruiting new members and in recommending ways to re-define membership. Bill Siok and the Professionalism Committee are becoming active.

Brewster Baldwin

V.G.S. MEETING

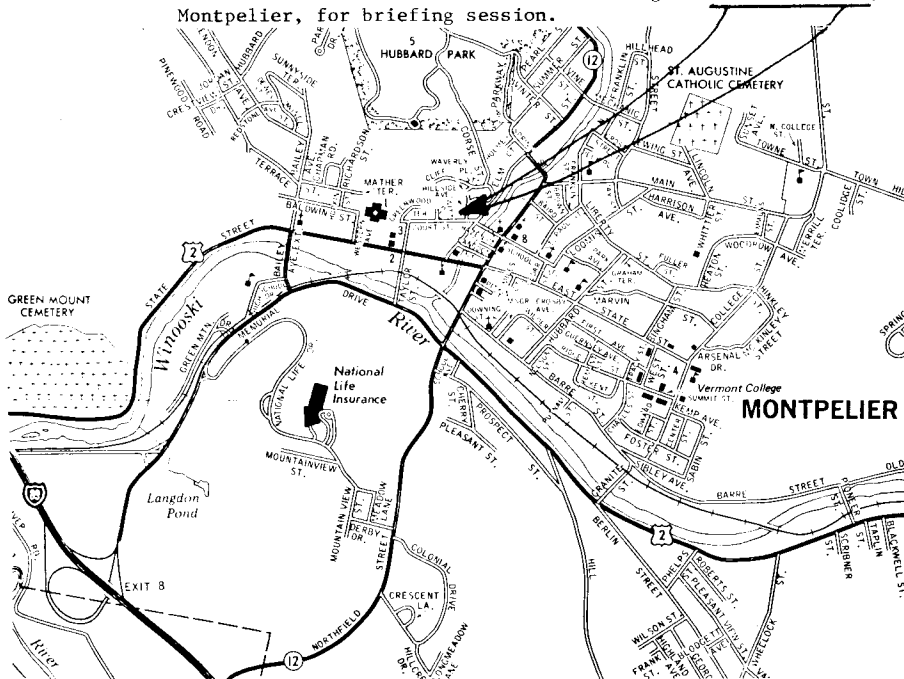
SUMMER MEETING:

DATE: Saturday, July 23, 1977

SUBJECT: Rock mechanics research being conducted by U.S.G.S. at
Barre Granite Quarries.

LEADER: Tom Nichols, U.S.G.S.

10:00 a.m.: Meet in second-floor conference room of the Agency of
Environmental Conservation Office Building on 5 Court Street,
Montpelier, for briefing session.



10:30 a.m.: Travel to Barre Granite Quarries.

11:00 a.m. to 1:00 p.m.: Guided field tour of Rock Mechanic Project.

1:00 p.m. to 2:00 p.m.: Lunch and Business Meeting.

2:00 p.m. to 6:00 p.m.: Camel's Hump hike for those interested.

OTHER MEETINGS

N.E.I.G.C.: Laval University, Quebec City; September 23-25, 1977. For
information, contact: Dr. Pierre Gelinis, N.E.I.G.C. Registration, Department
of Geology and Mineralogy, Université Laval, Cité Universitaire, Quebec
Canada, G1K 7P4 (telephone 418-656-2411).

NATIONAL WATER WELL ASSOCIATION: annual convention and exposition; September 12-14; Boston, Massachusetts. A series of professional papers will also be given on groundwater geology and techniques. For more information, contact: Kathy Butcher, N.W.W.A., 500 W. Wilson Bridge Road, Worthington, Ohio 43085 (telephone 614-846-WELL).

BURLINGTON GEM & MINERAL CLUB: ANNUAL ROCK SWAP. D.A.R. State Park, Addison, Vermont; August 6th from 10:00 a.m. on. Admission to the park is 75 cents per person over 14 years of age.

The 1977 Meeting of the Remote Sensing Group of Northern New England will be held on 16-17 September at Norwich University, Northfield, Vermont. Tentative plans include an opening session starting at 3:00 p.m. on Friday, September 16; followed by a social hour and dinner and another session or guest speaker that evening. The Saturday session will run from 8:30 to 4:30 with a leisurely luncheon break and business meeting. Titles for a paper, report, or display can be sent to Ms. Noel Ring, Earth Sciences Department, Norwich University, Northfield, VT 05663. Ms. Ring can also provide any necessary additional information regarding the meeting.

NEW YORK STATE GEOLOGICAL ASSOCIATION: meeting and field trips. September 16-18, Central New York. (P. Jay Fleisher, Earth Science Department, State University of New York, Oneonta NY 13820).

GEOMORPHOLOGY 8TH ANNUAL SUMPOSIUM: September 23-24, 1977; Binghamton NY. (Marie Morisawa, State University of New York, Binghamton NY 13901).

SOCIETY TO PUBLISH SELECTED BIBLIOGRAPHY OF VERMONT GEOLOGY

At the executive meeting in April, the communications committee recommended that the Society publish a Bibliography of Vermont Geology. Present plans call for the Society to utilize and publish the bibliography presently being developed by Dr. Ratte' and the State Geologist's Office. It is currently planned to include about 500 references in tabular form to include the following information:

1. sequence and cross-reference number
2. standard citation eg. Cady, W. M., 1945, Stratigraphy and structure of west-central Vermont: Geol. Soc. America Bull., v. 56, no. 5, p 515-587. Pl. 10, 1:62,500.
3. the content will be categorized for the area of geology covered by "x" in the appropriate column. Thirteen categories will be given.
4. location where available in the state and also if either printed photocopies are available for sale. eg. State Library*, UVM.
5. general location in state. eg. B-4

It will be our attempt to include many unpublished references in addition to standard published works.

Publication of the Bibliography is planned for late summer. Any suggestions, comments, additions, etc. which you may have should be set to the V.G.G. Box 304, Montpelier, or contact Jim Ashley or Dr. Ratte'.

GEOLOGICAL NATURAL AREA IN JEOPARDY?

During the past month or so, a furor has erupted in the normally peaceful Miller Brook Valley--often referred to as Nebraska Valley--in the town of Stowe. The controversy surrounds what was first a proposed and later a consummated sale of property by the Stowe School (a private, alternative school) to a local entrepreneur with announced plans for expansion of an existing gravel pit. Local residents in the Valley and perhaps others as well were stirred into vehement protest by the proposal. One of the principal arguments of the opponents has been the potential destruction of geological features on the now-former Stowe School property. According to reports in the press, other interests such as aesthetics, serenity, and (reading between the lines) emotion also contributed fuel to the anti-forces

At the heart of the issue are some old heaps of dirt, specifically an end moraine, outwash plain, and delta which together mark the terminus of a late Pleistocene glacier in the Valley. More notably, the evidence indicates that the glacier was not a part of the then-dwindling Laurentide ice sheet, but rather was an independent valley glacier such as found in Alaska or elsewhere today. Not only are such features as these rare in the eastern U.S. (comparable moraines can't be found east of the Rocky Mountains) but they also offer strong evidence, nowhere else in the region so well documented, of an important prehistoric climatic episode.

While the history recorded in Miller Brook Valley is ancient, scientific awareness of their existence came about fairly recently. Several years ago, I conducted a field survey of selected locales in Vermont, looking for just such evidence. It is worth noting that the Miller Brook features were first discovered by myself and a group of students during a geomorphology field trip. Since then, large numbers of students periodically have visited the area in connection with their courses. In addition, the Valley has been the subject of professional geological field trips, attracting notable geologists on a national level. Over a period of several years, geological research in the Miller Brook Valley has developed an extensive history of the local glacier and associated events. Anyone interested in learning more about this history is referred to the Geological Society of America Bulletin, Volume 81, 1970.

The Miller Brook glacial deposits are not unique, at least in the sense of being one of a kind. The statewide survey also turned up similar features in the vicinities of Ritterbush and Belvidere Ponds to the north, and Lakota Pond in south-central Vermont. But, without any question, the glacial remains in Miller Brook Valley are unique in terms of completeness, geological development, and preservation of these features. In these respects the Miller Brook deposits are an endangered specie. If destroyed, whether by gravel excavation or whatever, a key scientific element of recorded natural history could be erased. Also at stake are education and museum pieces of "textbook quality."

As a consequence of their uniqueness, the glacial features in Miller Brook Valley, including those now involved in the controversy, were identified in the Vermont Natural Resources Council's statewide inventory of "Natural Areas." Although the inclusion of a feature in the inventory does not prevent development which would conflict with the natural feature, it should bring the matter of a proposed development to the attention of concerned

parties. (Even this is not assured, as in the case of a development now located on top of the "Essex esker," another natural area in the VNRC inventory.) In this particular case, whether by dint of the inventory or other means, the presence of a geological natural area in the vicinity of the proposed gravel pit received great attention and fanfare in the press and elsewhere. As might be expected, I received calls from both sides in the dispute wanting to know more about "the natural area." "Just what is it? Where is it? How unique is it? What is its value or worth?"

The Stowe case is an interesting current geo-event. Thus, I gladly agreed to write a brief description of the case for the Society newsletter. In addition to the surface issue, the case involves a variety of subtle, yet nevertheless important facets that bear on geologists in the social milieu. Having had the good fortune (?) of identifying the natural features in the first place, how should I further get involved? In what capacity, in whose behalf, and in what manner? Should I be as unbiased and professional as possible, or should I freely allow my personal prejudices to influence my involvement? To what extent should I advocate one particular point of view or oppose another? These are important questions that are not unique to this specific case. In varying degrees and in different forms, such questions are always present in any situation outside of the classroom.

In the final analysis, I decided to remain neutral in order to preserve as great a sense of objectivity and credibility as possible, and to remain free of any "conflicts of interest." I have tried to inform any interested party on the geological character of the area without taking sides on the issue. I have not come out in favor of or in opposition to the development. I have met with or talked to representatives of the Stowe School, the developer, the opponents, the state, the press, and the Vermont Geological Society, and in all cases have attempted to represent the geological story clearly without prejudice to one course of action or another.

All of this is not to say that I have no particular preference for what happens. But, I also see that there are different ways of looking at the issue. Two particular questions have proven to be especially difficult to resolve. First, what is the value of the natural area? Obviously, this depends on who is making the determination and for whose interests. Value to me, to geologists in general, to students, to the local residents, or to future generations? Perhaps the value of the glacial features to the public, if such value could be measured, would be greater than that derived from gravel excavations, but perhaps not. As some have pointed out, the economic well-being of the Stowe School, which undoubtedly has a value to the community and region, is at stake. The School stands to recover needed monies by the sale, all the more so for a commercial tract. Likewise, the availability of sand and gravel, possibly at a lower price than other sources would allow, adds a positive public benefit. My point is not to support any of these viewpoints, but simply to point out some of the conflicting issues involved in the public "good." Partly as a result of these conflicts, I chose not to oppose the development actively, but instead to try to make as clear as possible the geological character of the area and its use for educational and scientific purposes. Hopefully, a wise decision can then be made in some public forum.

The second thorny question involves whether or not the proposed gravel pit would conflict with the natural area. Any, furthermore, in the event that such a conflict would result, would it be significant or unacceptable? There

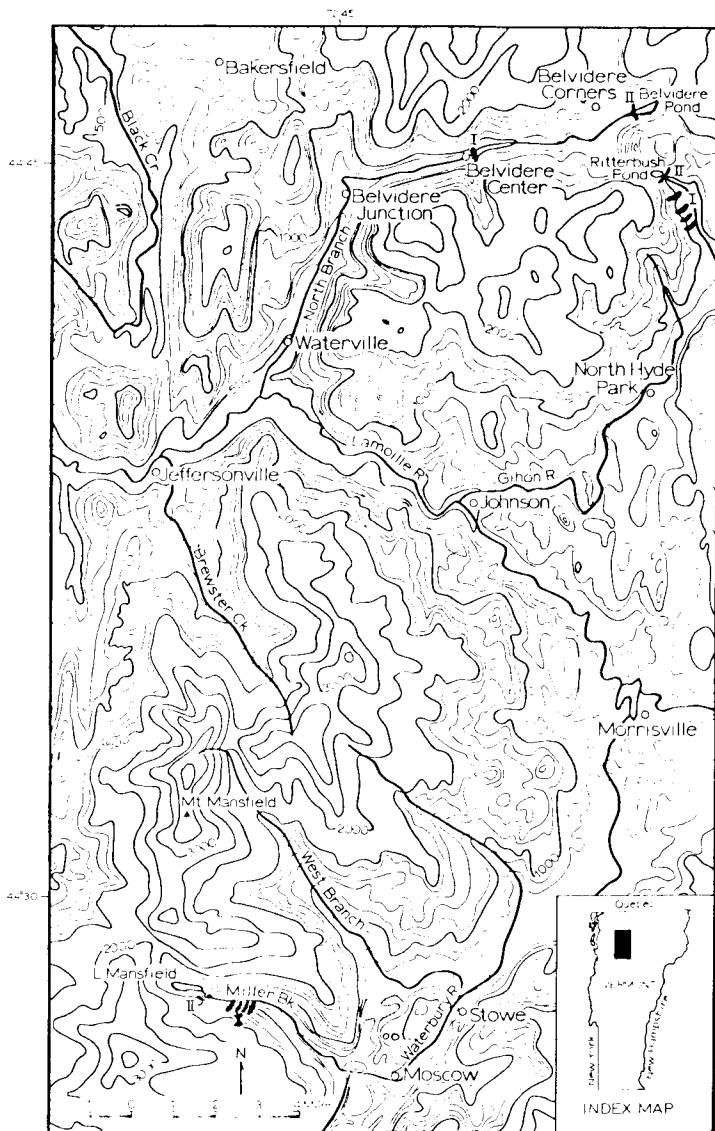
can be little doubt that, if the gravel pit excavations were to coincide with the glacial features, the latter would be destroyed and lost forever. However, the developer seems amenable to the establishment of a buffer zone which would preserve the critical glacial deposits. But even this might represent a kind of geo-aesthetic conflict. For the purist or the student of glacial geology, the Miller Brook deposits can best be enjoyed in their natural setting (or given the extent of existing development, with as little additional change as possible). But who is to say that this is a criterion and who should decide? Once again, the question of conflict, as with value, needs to be resolved socially.

As I previously noted, the Stowe case is also of interest for the larger questions it raises. For example, it seems to me that the manner of professional involvement in any case can be in any one of three forms: advocacy, adversary, or neutral. On a personal level, one should feel free (indeed, obligated as a matter of social conscience) to stand up and be counted for or against any issue--the advocacy and adversary positions. Or, one can remain neutral, conceivably for any of a number of reasons. Neutrality does not necessarily imply inaction or abstention from the decision-making process (as in the case of my involvement in Stowe).

I suppose I am drawn to this aspect of the Stowe case precisely because I see it as illustrative of a larger professional dilemma. Framed as a question--how can a professional best provide service to society, whether in the form of a private client or a sector of the public? For some individuals, this becomes a matter of doing the client's bidding; in other words, to take on an advocacy or adversary role. In some cases, almost any means, including the loss of objective and honest frames of reference, are justified by the end. Under highly competitive atmospheres, large numbers of professionals can and do succumb to the pressures ultimately stemming from economic forces driven by private interests. And this problem is not restricted to professionals and advocacy interests. Opponents, too, often lose their objectivity particularly under the pressure of heated argument. This may include lay persons as well as professionals, but it is the latter especially who stand to lose the most.

My point is not that we geologists should refrain from jumping into the fracas. It is how we jump that is important. I would like to think that it is possible to maintain high standards of professional conduct without becoming a "hired bun" to shoot down the "bad guys" and ramrod a particular point of view through the political channels. I see this issue in the Stowe case, and transcending so many others as well. In the next several years, I foresee a great expansion of the geological profession in Vermont. In my opinion, the geological profession is now at a critical stage where certain precedents affecting the future of the profession are being established. Because the line separating true service and professional prostitution is sometimes a fine one and is often blurred by circumstances, I think it is essential that we in the profession give new impetus to initiatives dealing with the matter of professional ethics already undertaken by the Society. This is a subject affecting all geologists in Vermont.

As a final note, I sense an undercurrent of still another question prompted by the Stowe case. Should the Society take an active role in current events involving geology around the state, including the taking of positions or sides in controversial situations? From a personal point of view, I would



Miller Brook Valley and the locations of various glacial deposits associated with a local mountain glacier are shown here. The particular features in the vicinity of the proposed gravel pit are designated by the roman numeral I. Other mountain glacial deposits found elsewhere in northern Vermont are also shown.

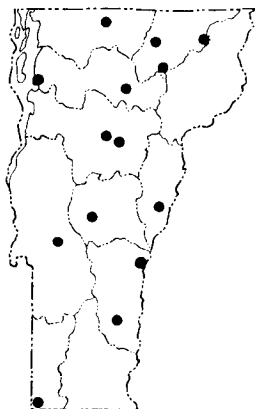
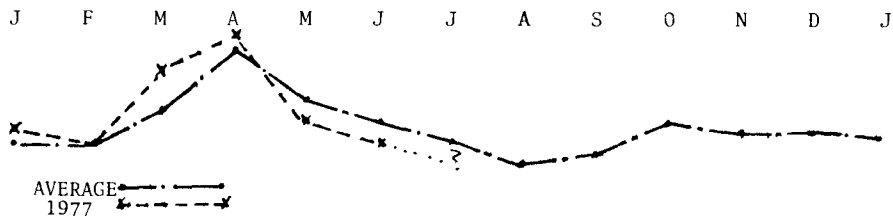
like to have an outlet for expressing my personal views, as in the Stowe case. But, I would like to see the Society represent the collective views of its members, which is no simple matter. I would like to see the Society take a stand on any issue only after a full and objective review of the fact involved. Moreover, it is imperative that the Society take care so as not to give the impression of representing a particular point of view--such as conservation, environmentalism, growth, or whatever. As the only independently organized body of geologists in our state, the Society has both a tremendous role and responsibility in affecting the future of geology in Vermont.

Philip Wagner
 Burlington, VT
 June 10, 1977

WHERE HAS OUR GROUND WATER GONE?

Are we headed into a drought? Maybe! The United State Geological Surey and the Vermont Department of Water Resouces measures and publishes ground water levels in 14 observation wells in the state. These wells are located in a variety of unconsolidated aquifers ranging from sand and gravel to till. Many are not completely representative of local water conditions. These observation wells still tell a lot about ground water conditions in Vermont.

First, the average of the monthly water levels help describe the change in the ground water table throughout the year, as shown below.



So that while 1977 shows higher levels from February and into April as a result of spring melting, the lack of rainfall in the northern half or two-thirds of the state during late April and all of May dropped the water table at 3½ times the normal April to May drop. At the end of May 8 of the 14 wells equalled or set new lows for May records. In June four wells set new lows for the month record (one of which equalled the low of record for the well).

Rainfall and temperature will determine the trend continues or we return to normal

submitted by James Ashley

REPORT FROM THE VERMONT STATE GEOLOGIST:

The 1977 General Assembly has clarified the legislation concerning the appointment of the Vermont State Geologist. The position is an appointed position carrying the status of a director. The appointment is to be made in cooperation with and on the recommendation of the Executive Committee of the Vermont Geological Society. Secretary of the Agency of Environmental Conservation, Martin L. Johnson, has received a reconfirmation of Dr. Charles A. Ratte. Dr. Ratte was appointed as Vermont's permanent, full-time State Geologist effective July 1, 1977.

The Vermont Task Force on Nuclear Waste Disposal requested that the study of Vermont's potentially favorable rock formations for deep disposal of nuclear waste be postponed indefinitely until such time as ERDA follows through on its earlier agreement to clarify and answer questions already posed regarding the state's responsibilities and controls in matters of health, transportation, accident abatement and control, security, management and administration of a site once inactivated, etc.

The State Geologist is working cooperatively with the Vermont Geological Society in establishing a bibliography of Vermont geology. The Vermont Department of Libraries, Document Section, has agreed to serve as the official repository for Vermont geological publications. Reprints or copies of published and unpublished geological work are presently being sought. Anyone having access to or knowledge of written work on any aspect of Vermont geology is requested to send copies to or notify Dr. Ratte.

A questionnaire concerning Vermont's map and mapping needs has been developed by the State Map Advisory Committee. It will be sent out soon. If you receive a copy, please cooperate by filling out the questionnaire and returning it promptly. If you do not get a copy and would like to be involved, call or write the State Geologist, 5 Court Street, Agency of Environmental Conservation, Montpelier, VT 05602. It is hoped that this will emphasize the needs of all Vermonters and will enable priorities to be established which in turn will give strength to appropriation requests.

A cooperative program with the U.S. Bureau of Mines has been initiated to investigate secondary uses for the waste created by the slate quarrying industry in Vermont. Also to be investigated are new techniques for slate quarrying which may cut down the high percentage of waste now created by the drilling, blasting techniques. This program is being conducted at the request of Governor Snelling.

Dr. Ratte will assist the Soil Conservation Service in its assessment of the geological resources in the Whetstone Brook watershed in Brattleboro-Marlboro Vermont. This study will be part of the flood prevention program being developed by S.C.S. for this watershed.

Recent meetings attended:

Association of American State Geologists Review Group to ERDA Nuclear Waste Terminal Storage Program in Albuquerque, New Mexico. Received briefing on the Sandia Corporation's Waste Isolation Pilot Project at Los Medanos bedded salt deposit. Met with ERDA official for comment and discussion of project. Requested that groups' function be primarily concerned with an interaction with field studies personnel and field inspection of actual sites under consideration.

Association of American State Geologists Annual Meeting in Newark, Delaware. Main thrust of the meeting was devoted to a review of the relationship of state geological surveys to federal agencies. A major concern was voiced by the organization over the withdrawal of mineral exploration rights from federal lands. The organization will look into means of bringing back into focus the value of mineral exploration and exploitation to the nation's well-being. It was emphasized that environmental concerns could not be overlooked and must be incorporated in the refocussing process.

U.S.G.S. GEOLOGIC DIVISION ACTIVITIES IN VERMONT

ENVIRONMENTAL GEOLOGY ACTIVITIES

Geomorphology of New England, C. S. Denny, start: 1975, completion: continuing. Revise geologic map of New England, and study comparisons between topographic elements and selected bedrock characteristics.

Reactor hazards research, in-situ stress, T. C. Nichols, Jr., start: 1974, completion: 1977. Laboratory testing of granite specimens and additional field measurements of deformation, thermal gradients, and sonic velocities will be made on a quarried granite block that has been previously mapped and tested. Field investigations were conducted in the Wetmore and Morse quarry.

GEOCHEMISTRY AND GEOPHYSICS

New England geophysics, M. F. Kane, start: 1963, completion: continuing. To relate the seismicity of the northeastern United States to the lithology and structure of the earth's upper crust as manifested in the gravity and magnetic fields. To analyze these structures in order to understand the causes and periodicity of earthquakes.

EARTHQUAKE STUDIES

Northeast seismic network, Paul Pomeroy, start: 1975, completion: continuing. As resources permit, network will be expanded to approximately 85 seismic stations in northeastern United States. Current ongoing studies include: location and identification of sources of ground vibrations, particularly earthquakes; identification of zones of seismic activity; and evaluation of regional geologic structure and tectonics throughout the area of the network.

Summaries of significant results of most current projects are contained in U. S. Geol. Survey Prof. Paper 1000.

MINERAL OF THE QUARTER **GARNET**

Quartz, feldspar, mica, pyroxene, amphibole, and garnet were named as the most common minerals by the eminent crystallographer, Sir William Lawrence Bragg. All of these, of course, represent groups of minerals that are closely related structurally rather than a single species. Garnet has been selected as the mineral of the quarter as it is common in the state.

The garnets are found in highly metamorphosed rocks and are a family of silicates of aluminum with other metals: calcium (grossular), magnesium (pyrope), iron (almandine), or manganese (spessartite); also iron and calcium (andradite) or calcium and chromium (uvarovite). Actually, a field specimen of a single type is rare--most are a combination of some sort. The name garnet comes from the Latin granatum (pomegranate), because the dark red color of many types was suggestive of the seeds of this fruit.

Garnets crystallize in the isometric system. The 12-sided dodecahedron (a) and the 24-sided trapezohedron (b) and combinations of these are the most common. Since they are found most commonly in crystal form, have a high specific gravity (3.4--4.3), high hardness (6.1--7.5), and no cleavage, they are relatively easy to identify. As any gold panner knows, garnets weather out of the metamorphic rocks in which they formed and accumulate in stream gravels along with magnetite and gold flakes. In general, the rocks of the Green Mountain core and the Connecticut River Valley have undergone high enough metamorphism to produce garnet.

Almandine, $\text{Fe}_3\text{Al}_2(\text{SiO}_4)_3$, has the largest industrial use. It is treated to increase its hardness, crushed, sieved and separated according to grain size, and used to make garnet paper and cloth for the woodworking industry. In the past, almandine was mined for use as an abrasive at the McGurry Mine, north of the village of Gassetts, where Route 103 crosses the Williams River. The mineral assemblage here consists of muscovite mica, chlorite, quartz, garnet, tourmaline, staurolite, and kyanite. This garnet-studded mica schist is silvery grey in color and quite attractive when it contains gemmy blue kyanite prisms.

Grossular, $\text{Ca}_3\text{Al}_2(\text{SiO}_4)_3$, and uvarovite, $\text{Ca}_3\text{Cr}_2(\text{SiO}_4)_3$, are found in the Belvidere Mountain Mine of the Vermont Asbestos Group near Eden Mills, Vermont. Good specimens of the garnets from this location are sought after by avid collectors throughout the United States and Canada. Grossular can be found here in shades from straw color through honey to orange and reddish brown (essonite) and green. The small, perfect, dark blue-green uvarovite crystals occur here because of the chromite in the ultrabasic rocks which were altered to form the serpentine being mined here for its asbestos content. Beautifully crystallized specimens of these garnets, calcite, diopside, idocrase, etc. from this location collected by Clement Mason of Hyde Park are presently in the Harvard Museum.

Approximately 50 collecting localities are listed for garnet in "Vermont Mines and Mineral Localities" by Morrill and Chaffee in a Dartmouth College Museum publication. Eleven sites are listed in "Mineral Collecting in Vermont" by Raymond Grant, a publication of the Vermont Geological Survey.

submitted by Ethel Schuele

FOR THE TEACHER

The Champlain Thrust

Perhaps the most magnificent bedrock feature in Vermont is the Champlain Thrust. The thrust fault strikes north-south for 110 miles along western Vermont from the Canadian border to Rutland. Cambrian quartzites, dolostones, and marbles have been thrust to the west over the Ordovician shales and limestones. The following three stops are appropriate for all geology students from middle school to college age.

Mt. Philo State Park in No. Ferrisburg is a detached piece of the upper plate of the Champlain thrust composed of Monkton Quartzite. Besides seeing a panoramic view of the Champlain Valley and the Adirondacks; there is a path that leads along an over-hanging piece of the quartzite. In the outcrop sedimentary features, vertical faults, and a small thrust fault can be seen. Additional information about the geology of the park can be found in the following publication from the Vermont State Library in Montpelier: Dodge, H.W., 1969, "The Geology of the D.A.R. State Park, Mt. Philo Forest State Park, Sand Bar State Park", Vermont Geol. Survey Publication, Dept. of Water Resources, Montpelier, Vermont.

After leaving Mt. Philo, drive north on route 7. Stop at the outcrop on the east side of the road just south of the intersection of route F5 in Charlotte. This outcrop of Iberville Shale is Ordovician in age and is part of the lower plate of the Champlain Thrust. In the outcrop there are faults, a recumbent fold, and smaller folds; as well as, a Permian or Triassic bostonite dike.

The final stop is a view of the fault zone of the Champlain Thrust at the classic area: Lone Rock Point. Continue north on route 7 to route 127. Turn west at Burlington High School and continue past the Rock Point School. To see this locality permission must be obtained prior to the visit and all vehicles must stop at the business office and obtain a parking ticket. Call the Episcopal Diocese at Rock Point in Burlington. Walk along the path that leads to the view point and then south down to the water's edge. Here is a superb view of the Cambrian Dunham Dolostone that has been thrust over the Ordovician Iberville Shale. The students will be able to crawl right up to the fault zone and put their hands on the mullions in the Dunham Dolostone. In addition, there are many unusual erosional features due to the nature of the two rock types and the proximity to the lake.

Have you seen.....?

"The Rise and Fall of the Great Lakes"

This is an excellent film depicting the origin and glacial history of the Great Lakes using animation as well as some rather unusual photographic techniques. Besides the movie being very informational, it is also entertaining. It is a must for every geology student. The film is produced by the Canadian government and can be obtained from any of several rental film companies in the United States.

Submitted by Terry Thompson

MEMBERSHIP NEWS

The Vermont Geological Society would like to welcome the eight new members who have joined since the Annual Meeting last October.

Stephen Connary: Assistant Professor of Geology, Windham College,
Putney, Vermont

Mary Crandall: Earth Science Teacher, Rutland, Vermont

Thomas Davies: Assistant Professor of Geology, Middlebury College,
Middlebury, Vermont

Charles Duzinski: Science Department Chairman and Earth Science Teacher,
Wilmington, Vermont

Dorothy Richter: Chief Geologist for the Rock of Ages Corp.,
Barre, Vt.

Joan Roberts: 1977 Graduate of the College of William and Mary,
Bennington, Vermont

Ethel Schuelle: President of the Burlington Gem and Mineral Club,
Burlington, Vermont

Vermont Institute of Natural Science: Woodstock, Vermont

It is important that the number of members of V.G.S. be increased. The more members the larger the voice V.G.S. will have when there is an issue of importance to be dealt with. In working towards this goal each member should be looking for new members. Remember that a person need not be a professional geologist to join and that with our associate and student memberships we can accomodate everyone who is interested in geology and the Vermont environment. If you know of people who might be interested contact the membership committee and an application will be sent to the individual. Also, the Society needs to retain present members so encourage your friends to keep their membership current so they will continue to receive the Green Mountain Geologist and their other rights and privileges.

REPORT TO EXECUTIVE COMMITTEE
OF THE
VERMONT GEOLOGICAL SOCIETY
BY THE
SPECIAL SUBCOMMITTEE ON NEBRASKA VALLEY

At the Executive Committee Meeting on June 8, 1977, a special subcommittee was created and charged with investigating the circumstances surrounding the proposed excavation of gravel from a glacial outwash area in Nebraska Valley in Stowe. The special subcommittee, consisting of four members--Charlie Fox, Bill Siok, Dick Willey, and Monty Fischer, was also asked to present findings and recommendations, if appropriate, on how the Vermont Geological Society might better participate in the decision-making process concerning proposed alterations of identified important geologic sites. In the following paragraphs are the findings and recommendations of this special subcommittee.

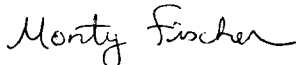
1. THE SPECIAL SUBCOMMITTEE CONCLUDES THAT FROM A STRICTLY GEOLOGICAL PERSPECTIVE, THE CURRENT GRAVEL REMOVAL PROPOSALS ARE SATISFACTORY. The proposed gravel excavation limits as of May 27th and as outlined by the operator (Percy) appeared to be satisfactory to the members of the special subcommittee. Subsequent to conversations with Phil Wagner (UVM) and Chuck Ratte (State Geologist), the proposed excavation limits were revised a number of times by the operator. Although a sizable chunk of outwash plain will be excavated according to the proposal, the important geologic features, which are educationally valuable, will remain intact. Bob Klein from the Vermont Natural Resources Council has also reviewed the proposal and concurs with Wagner and Ratte. However, the excavation permit will probably be granted for a period of six years, and the State Geologist and/or members of the Vermont Geological Society should continue to monitor the progress of the excavation. Throughout the course of excavation, a photographic record should be maintained so that as new features are exposed we can have a permanent record of them. At the completion of this phase of gravel removal activities, the operator intends to reclaim the land, including replacement of topsoil, reseeding, and maintenance of a 30-degree slope or less where possible. If further excavation is requested, it should be carefully reviewed by the Vermont Geological Society and the State Geologist.

The above paragraph represents the conclusions and findings of the special subcommittee as specifically charged by the Executive Committee. However, as a result of our looking into this particular "crisis" situation, a number of other longer-range implications emerge concerning the Vermont Geological Society involvement in important geological site protection.

2. THE SPECIAL SUBCOMMITTEE RECOMMENDS THAT THE VERMONT GEOLOGICAL SOCIETY CONTINUE TO ACTIVELY MONITOR PROPOSALS RELATING TO CHANGES IN IMPORTANT GEOLOGIC AREAS. This approach implies that members of the Vermont Geological Society become involved in these matters as early as possible, and that they work closely with other organizations such as the Vermont Natural Resources Council, Audubon, Sierra Club, and anyone else. This involvement to protect or suggest guidelines for development should be determined to whatever extent necessary depending upon the individual case and should be based on the extent that the Vermont Geological Society sees fit.

3. COMPILATION OF GEOLOGICALLY UNIQUE FEATURES OR AREAS SHOULD BE UNDERTAKEN BY THE VERMONT GEOLOGICAL SOCIETY. An official list of important geologic sites should be prepared in conjunction with the State Geologist and should be presented for adoption by the Vermont Geological Society membership. Clearly, much work in this area has already been undertaken through the office of the State Geologist, the Vermont Natural Resources Council's activities, especially the Natural Areas Inventory, as well as other studies. However, an official list including documentation of each of these sites needs to be completed and then officially adopted.
4. IN FUTURE SITUATIONS SIMILAR TO NEBRASKA VALLEY, INTERESTED VERMONT GEOLOGICAL SOCIETY MEMBERS OR OTHERS SHOULD WORK THROUGH THE REGULATORY PROCESS TO PROTECT SITES OR TO ENHANCE SITE DEVELOPMENT FOR EDUCATIONAL PURPOSES. Primarily, this would imply working at the local level through the zoning permit process or on the state level through the Act 250 permit process. In addition to working through the regulatory process, whenever possible individual landowners or developers should be directly contacted. By having informed members of the Vermont Geological Society (especially the State Geologist) contact the landowner, in many instances valuable information can be discussed which may help to avoid ill-conceived development of the site.
5. THE VERMONT GEOLOGICAL SOCIETY SHOULD CONSIDER ESTABLISHING ON A PERMANENT BASIS A COMMITTEE TO DEAL WITH THE MANAGEMENT OF SIGNIFICANT GEOLOGIC SITES. This committee should work closely with the State Geologist.

Respectfully submitted,

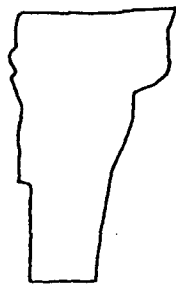


R. Montgomery Fischer

GREEN MOUNTAIN GEOLOGIST
Vermont Geological Society
Box 304
Montpelier, Vermont 05602

FIRST CLASS

THE GREEN MOUNTAIN GEOLOGIST



QUARTERLY NEWSLETTER OF THE VERMONT GEOLOGICAL SOCIETY

FALL

Volume 4 Number 3

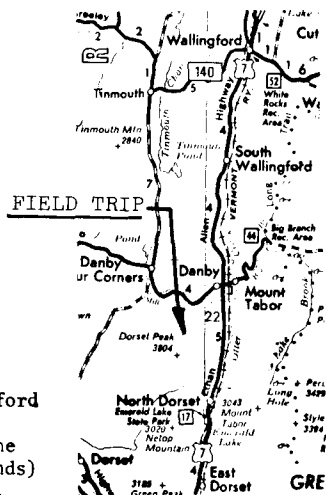
ANNUAL MEETING --- OCTOBER 22, 1977

The Vermont Geological Society is very pleased to announce that our annual meeting and fall field trip are scheduled for Saturday, October 22nd. The field trip will be at Vermont Marble's underground quarry in Dorset Mountain. (See the special article on the Dorset Mountain Quarry in the center of this issue.) The annual meeting and banquet will follow at the Royal's Hearthside Restaurant in Rutland (see map).

The field trip will begin at 1:00 P. M. at the quarry entrance. However, due to Federal Mine Safety Regulations for underground quarries, we have been required by Vermont Marble Company to limit those participating in the underground portion of the field trip to MEMBERS ONLY! The company will be issuing special safety gear to the field trip participants, but hard hats and normal field gear is recommended.

Since there is only a limited amount of extra safety gear available at the quarry we would like an accurate count of the number of members that will be participating in the field trip. We therefore ask that you return the special enclosed form as soon as possible, but no later than October 14th. We regret that spouses and children will not be able to participate. An effort will be made to provide some interesting activities for those not going underground. The underground portion of the field trip will last for between one and two hours following which there will be a briefing above ground on the regional geology. Everyone is invited to attend this briefing.

To get to the quarry from the north, follow route 7 south from Rutland. Nine miles south of Wallingford at Danby "four corners" take a right at Crosby's Feed Store. Go about 300 yards and turn left at the General Store. Go about 1/2 mile (past two small ponds) and turn right at the barn. Proceed to the quarry.

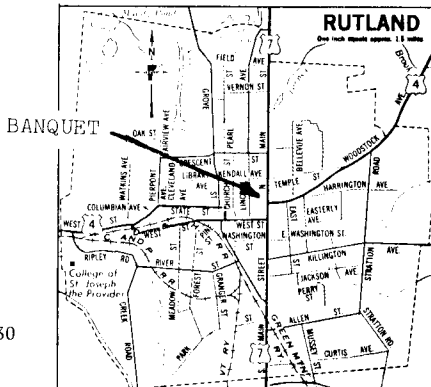


The Annual Meeting and Banquet will follow the field trip and will be held at the Royal's Hearthside Restaurant just north of the junctions of routes 4 & 7 in Rutland. There will be an open cash bar starting at 5:30 P.M. and also following the banquet. Dinner will be served at 6:30. The menu for the banquet will be as follows:

Ham Steak or Chicken
 Hot Popover
 Fresh Vegetable - Baked Potato
 Fresh Fruit and Melon Cup
 Celery and Olives - salad
 with Hearthside Dressing
 Assort. Fresh Breads
 Beverage - Light Dessert

All those planning on attending the Banquet should return the special enclosed form by October 14th.

The Annual Meeting will start about 7:30
BE PRESENT!!



OTHER MEETINGS

N.E.I.G.C.; Laval University, Quebec City; September 23-25, 1977. For information, contact: Dr. Pierre Gelinas, N.E.I.G.C. Registration, Department of Geology and Mineralogy, Université Laval, Cité Universitaire, Quebec, Canada, G1K 7P4 (telephone 418-656-2411).

GEOMORPHOLOGY 8TH ANNUAL SYMPOSIUM: September 23-24, 1977: Binghamton, N.Y. (Marie Morisawa, State University of New York, Binghamton, N. Y.)

GEMS AND MINERALS 8TH ANNUAL SHOW: Poughkeepsie, N. Y. (Gordon L. Kenney, 24 Wodell St. Beacon, New York 12508) September 24 - 25, 1977.

BURLINGTON GEM & MINERAL CLUB: regular meetings and activities. Contact Ethel Schuele, 33 Clover St., S. Burlington 05401 (863-5980) for more info.

SYMPOSIUM ON ANCIENT VERMONT: October 14-16, 1977. Castleton State College, Castleton, Vermont. A review of evidence of European culture of pre-Columbus time. For information contact: Dr. Warren L. Cook, Castleton State College, Castleton, Vermont 05735.

VERMONT GEOLOGICAL SOCIETY FIELD TRIP AND BANQUET - OCTOBER 22nd - C O M E !

GEOLOGICAL SOCIETY OF MAINE: Fall Meeting - December 2, 1977, Bowdoin College, Brunswick, Maine. (John R. Rand, Cundy's Harbor, RD-2-Box 210A, Brunswick 04011)

N O M I N A T I O N S

NOMINEES for the 1977-1978 V.G.S. officers, to be voted on at the Annual Meeting:

PRESIDENT:	James Ashley or Monty Fischer
VICE PRESIDENT:	Terry Thompson
TREASURER:	Charles Fox
SECRETARY:	Jeanne Detenbeck
PUBLICATIONS COMMITTEE:	James Ashley Carolyn Merry John Malter
MEMBERSHIP COMMITTEE:	Roger Thompson
MEETINGS COMMITTEE:	Robert Cushman Richard Willey
PROFESSIONALISM COMMITTEE:	Chuck Ratte William Siok Philip Wagner
BOARD OF DIRECTORS: (2 year term)	Rolf Stanley or Fred Larson

Signed: John A. Malter, William Siok, and David Tarbox.

E D U C A T I O N - F O R T H E T E A C H E R

EAGLE CAMP: The Champlain Islands are an excellent site for fossil collecting and, therefore, a prime field trip area. One location particularly worth noting is the beach front at Eagle Camp in South Hero, a privately owned family camp. This Ordovician reef will keep the young paleontologist busy for hours. Samples of algal mounds, brachiopods, bryozoans, pelmatozoans, cephalopods, sponges and trilobites can be found.

Eagle Camp is located at the junction of Eagle Camp Road and West Shore Road 2 miles from the ferry dock. The property is owned by the Eagle Camp corporation and permission to collect must be obtained from the Larrow family, the managers who live at the camp for longer excursions. Lodging facilities are available for school groups at the camp.

HAVE YOU SEEN?

"This Land" is an excellent film produced by the Shell Company. The film discusses the geological history of the North American Continent. The combination of animation and outstanding photography is extremely graphic and impressive. "This Land" is a very useful teaching aid.

Submitted by Terry Thompson

REPORT FROM THE STATE GEOLOGIST

SOIL CONSERVATION SERVICE-STATE GEOLOGIST COOPERATIVE PROGRAM. The State Geologist has been conducting geological studies (erosion, sedimentation, groundwater, mineral resources) as part of a total natural resources assessment of the Whetstone Brook watershed in the Brattleboro-Marlboro area. This study is in conjunction with and precedes proposals for and implementation of flood control measures to protect the floodplain and the structures (and their inhabitants) which have been built on the floodplain prior to this age of consciousness of the imminent danger of such practice.

U.S. BUREAU OF MINES-STATE GEOLOGIST COOPERATIVE PROGRAM. Research is being conducted on waste slate at the U.S.B.M. research laboratory in Tuscoloosa, Alabama for the purpose of finding a productive use for this waste material which scars the landscape in southwestern Vermont. Ninety-five percent of the slate quarried ends up as waste. The waste dumps continue to grow. A preliminary report from the Tuscoloosa laboratory indicates the waste slate has excellent potential (when combined with limestone) as a ceramics raw material. Also encouraging are the results of the studies for light-weight concrete aggregate. A light-weight aggregate industry did exist in the West Rutland area a few years ago. Transportation costs to get the product to a market apparently became so prohibitive that the company went out of business.

LAKE CHAMPLAIN "LEVEL B" STUDY. The State Geologist has recently been notified that their budget includes funds for consultation and expenses incurred in the re-evaluation of natural areas in Vermont towns bordering Lake Champlain, and assistance in the selection of hazardous waste disposal sites, particularly material from oil spills on the lake. This portion of the study will be conducted in cooperation with John Malter, Hazardous Waste Specialist, and Alex Logan, a student intern at the Rutland Regional Planning & Development Commission.

Dr. Ratte is working in cooperation with Dave Butterfield, Hydrologist of the Water Quality Division of the Water Resources Department, and Richard Willey, Hydrologist, U.S.G.S., in the procedures to initiate a Vermont-U.S.G.S. cooperative program on groundwater protection. The initial document outlining the intent of the program and the areas of responsibility has been sent to U.S.G.S. for their approval.

In the development stage is a cooperative project with the Vermont Agency of Transportation. This project will involve the inspection and geological analysis of rock slide potential along the state's interstate highway system. It is intended that recommendations to alleviate the situation will be forthcoming and priorities established for corrective maintenance.

GEOLOGICAL STUDIES GOING ON IN VERMONT. U.S. Bureau of Mines and U.S. Geological Survey geologists will be conducting a geological and mineral resources assessment of Vermont's Lye Brook and Bristol Cliffs Wilderness areas later this summer.

The C. B. Adams (1845-50), first Vermont State Geologist, collection of Vermont Rocks has been donated to the Fairbanks Museum in St. Johnsbury. The collection will be used for display, instruction and study purposes.

THE FOSSIL OF THE QUARTER

For this quarter, instead of a mineral, we will discuss a South Hero location where well-preserved marine fossils can be found in late Ordovician age rocks. The quarry in which they are found is situated in the pasture of the Lessor farm on Sunset View Road. It can be reached by taking Route 2 west through the town of South Hero. After the road makes a full right turn, turn left (just beyond the new part of the road) from the paved surface onto the packed dirt road labelled "Sunset View Road." The quarry will be on your left as you drive toward the lake. Ask permission to collect at the last farmhouse on your left as you approach the lake.

Here are found fossil remains which illustrate the past history of this area, when the rocks were still sediments on the continental shelf of North America under shallow water at the edge of a narrow Cambrian sea. This formation abounds with evidence of the type of animals that lived in the coral reef environment of that time. Twig-like bryozoa, biscuit-like bryozoa, brachiopods, trilobites, colonial corals and gastropods are abundant. The fossils show best on the weathered surfaces of the rock. It is also possible to find specimens that have weathered out of the rock lying exposed in the soil.

Preserved here is a moment in geological time (around 500 m.y.a.) when the continental plates on which North America and Europe were situated lay close together in the tropics. At that time, North America was rotated so that what we know as the east coast ran roughly parallel to the equator. The bare rocks of the two continents were separated by a shallow, narrow ocean somewhat like the Mediterranean of today. The coral reef formations that grew in this environment are the source of the extensive band of limestones and marbles that run parallel to the eastern seaboard of North America today. At this South Hero location it is easy to visualize the life in those extensive coral reefs. We are most fortunate that the fossilized remains of these animals can be found at many locations in the undistorted limey shales and limestones exposed along the shores of Lake Champlain and the Champlain Islands.

Submitted by Ethel Schuele

A CALL FOR PAPERS

The winter meeting of the Vermont Geological Society will be held at Norwich University on a Saturday in January or February for the presentation of papers or reports by members of the Society on Vermont Geology. Any member interested in presenting a paper should submit an abstract to the Society no later than December 15th. Abstracts may be mailed to: Abstracts; Vermont Geological Society; Box 304; Montpelier, Vt. 05602.

About 15 minutes will be allotted for each talk followed by 5 minutes for questions.

Complete abstracts will be published in the Winter issue of the Green Mountain Geologist.

MINUTES - SUMMER MEETING

July 23, 1977, Granite Quarry, Graniteville, Vt.

The meeting was called to order at 2:05 p.m. by President Brewster Baldwin. A quorum was present including more than the minimum number from the Executive Committee.

Report from the nominating committee by John Malter included the nominees for the 1977-1978 slate of officers. Members of the committee were John Malter, Bill Siok, and Dave Tarbox. (See separate Nominating Committee Report)

By-Laws: Several motions were made for changes in the by-laws. (See separate article on by-laws). These will be voted on at the Annual Meeting.

Annual Meeting: The Annual Meeting will be at the Danby Marble Quarry in the Rutland area.

Treasurer's Report:	\$323.52	Savings
	\$143.80	Checking account

Publications Committee: Jim Ashley asked for input and suggestions about the Green Mountain Geologist. In addition, A Vermont Geology Bibliography is being prepared by the State Geologist, Chuck Ratte. Please send new entries to the office of the State Geologist, Montpelier.

The meeting was adjourned at 2:45 p.m.

MEMBERSHIP NEWS

The Vermont Geological Society would like to welcome the six new members accepted at the summer meeting.

Richard Elliot: Chairman of the Science Department, Lyndon Institute

Brian Fowler: Geological Engineer for Pike Industries

Peter Northrop: Assistant Geological Engineer for Pike Industries

Pierre Sargent: Water Quality Planner for Windham Regional Commission

William Stockwell: 1977 graduate of Castleton State College

Chris White: Teaching Assistant at the University of Massachusetts

The Society would also like to welcome a member who joined this spring and was not mentioned in the last Green Mountain Geologist.

Anthony Brainerd: Earth Science Teacher at Missiquoi Valley U.H.S.

The last quarter was a good one for memberships. If the Society can continue to attract new members at this rate reasonable growth can be maintained. The goal should be for each current member to recruit one new member during the coming year. The Society has very few student members making this a priority. The Society is trying to increase the number of student members but in many cases it takes a personal contact to convince a person to join. Remember, this is sign up a friend year!

BY-LAW REVISIONS TO BE VOTED ON

The MEMBERS of the Vermont Geological Society are hereby notified that the following by-law revisions and additions have been submitted in accordance with the CONSTITUTION OF THE VERMONT GEOLOGICAL SOCIETY to be voted upon at the Annual Meeting of the Society to be held at the Royal's Hearthside Resturant in Rutland, Vermont on October 22, 1977 at 7:30 P. M.

BY-LAWS:

ARTICLE I: MEMBERSHIP

B. Associate Member

"Associate membership shall be open to any person *or organization* interested in geology and its related branches whose application, filed in the proper manner, has been approved by the Executive Committee . . . "

D. Lifetime Member

A lifetime membership may be bestowed by the Executive Committee upon an individual who has made a significant contribution in Vermont geology.

E. Honorary Non-Voting Member

An honorary membership may be bestowed by the Executive Committee on an individual who has made a significant contribution to the Society.

ARTICLE II: DUES

- F. *Memberships approved after July 1 shall be effective until the annual meeting of the following year.*

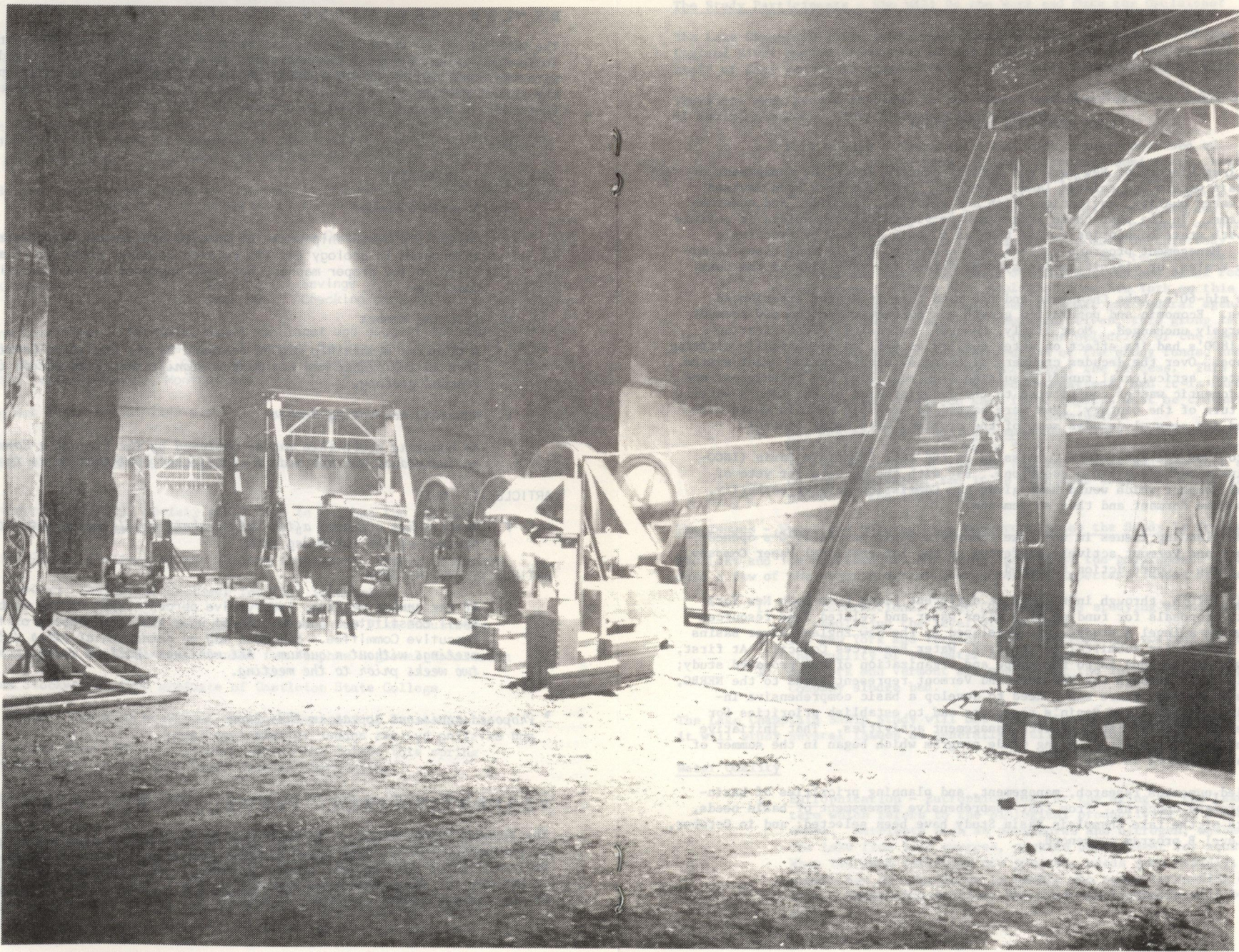
ARTICLE X: VOTING BODY

- C. *At the annual meeting, twenty-five percent (25%) of the membership shall constitute a quorum, two of whom shall be members of the Executive Committee. Business may be conducted at other duly warned meetings without a quorum. All meetings shall be warned no less than two weeks prior to the meeting.*

* *Proposed revisions appear in this type*
and existing by-laws appear in this type face.

VERMONT MARBLE INSTALLS BIG SAWS

The Vermont Marble Company, as part of a \$1.7 million modernization program, is purchasing six new high speed diamond gang saws. Three of these saws will be installed at the Imperial Quarry in Danby - which the Society will visit on October 22. These saws have reported helped Vermont Marble to receive one of the largest single contracts in history for marble dimension stone.



A SPECIAL REPORT

LAKE CHAMPLAIN BASIN STUDY

There is a long history of New York and Vermont concern about the management of Lake Champlain waters and related land resources. Programs have been devised to address water quality, navigation, fish and wildlife, flooding, and numerous other problems. In the past these programs have viewed Lake Champlain in political terms with state boundaries rather than as a basin defined by hydrologic boundaries. Management programs reflect this approach, and in many cases terminology, map scales, or classification systems differ for each side of the Lake.

Through the mid-60's, Lake Champlain and the land that it drains experienced many changes. Economic and population growth was moderate, and the environment remained largely unchanged. Most likely, however, extensive forest clearing during the 1800's had its effect on water quality as well as dramatically altering the landscape. Over the decades creamery discharges, manufacturing plant wastes, sawmill wastes, agricultural runoff resulting from poor land use techniques, and increasing domestic wastes contributed to the deterioration of the Lake's waters. Around the turn of the century, laws were passed to prohibit certain waste discharges, and for several decades some of the problems were under control.

From 1947 to 1969 the Interstate Commission on the Lake Champlain Basin (INCO-CHAMP) actively addressed basin questions. But with the Rockefeller veto of the official Compact which would have given the Commission greater authority, INCOCHAMP became dormant and thus so remains.

Resource and planning issues in the Lake Champlain Basin in the 1970's opened with New York and Vermont actively differing on the International Paper Company sludge bed issue. Court action followed.

In the early 1970's, through initiative at different times from both New York and Vermont, proposals for funding of a major water and related land resources study--known as a Level B study--were developed by the New England River Basins Commission (NERBC) for submittal to the U. S. Water Resources Council. At first, agreement was not reached as to the scope and organization of the proposed study; but in early 1974, through the New York and Vermont representatives to the NERBC, it was determined that there was a need to develop a basic comprehensive inventory and analysis of the Basin's resources and to establish priorities for future water and related land resource management activities. That initiative produced the Lake Champlain Planning Guide program which began in the summer of 1974 and was completed in June, 1976.

It identified numerous research, management, and planning priorities of basin-wide or shoreland concerns. From that comprehensive assessment of basin needs, the elements of the Lake Champlain Basin Study have been selected; and in October, 1976, the Level B program commenced.

The Study Participants - Who Will Do the Work and Make the Decisions?

The Lake Champlain Basin Study was organized under the auspices of the New England River Basins Commission at the request of New York and Vermont. A staff of five people is responsible for the daily coordination of activities.

There are many people involved in the Study, and there are four basic levels of decision-makers. They include the following.

1. Work Groups - There are three work groups comprised of technical people from regional planning commissions, state and Federal agencies as well as university consultants who will gather information and write the technical reports.
2. Plan Formulation Team - Representatives from state and Federal agencies whose jobs are policy and program oriented as well as university representatives make up this body. The members of this group will receive the technical materials and draft the range of alternatives and final recommendations. (There is a geologist from New York on this team.)
3. Steering Committee - Comprised of state and Federal agency heads or their designated representatives, this group is the policy body responsible for the selection of the issues being addressed, the distribution of the study funds, and the guidance of the Study throughout the process. This body must adopt the final recommendations, and it is through the Steering Committee that final reports must be transmitted to the New England River Basins Commission.
4. New England River Basins Commission - This is the parent body to the Lake Champlain Basin Study. Representatives selected by the Governors of the New England states and New York sit on the Commission, and it is with this body that final approval of the Study rests.

The Issues - Water and Related Land Resource Issues the Study Is Trying to Resolve

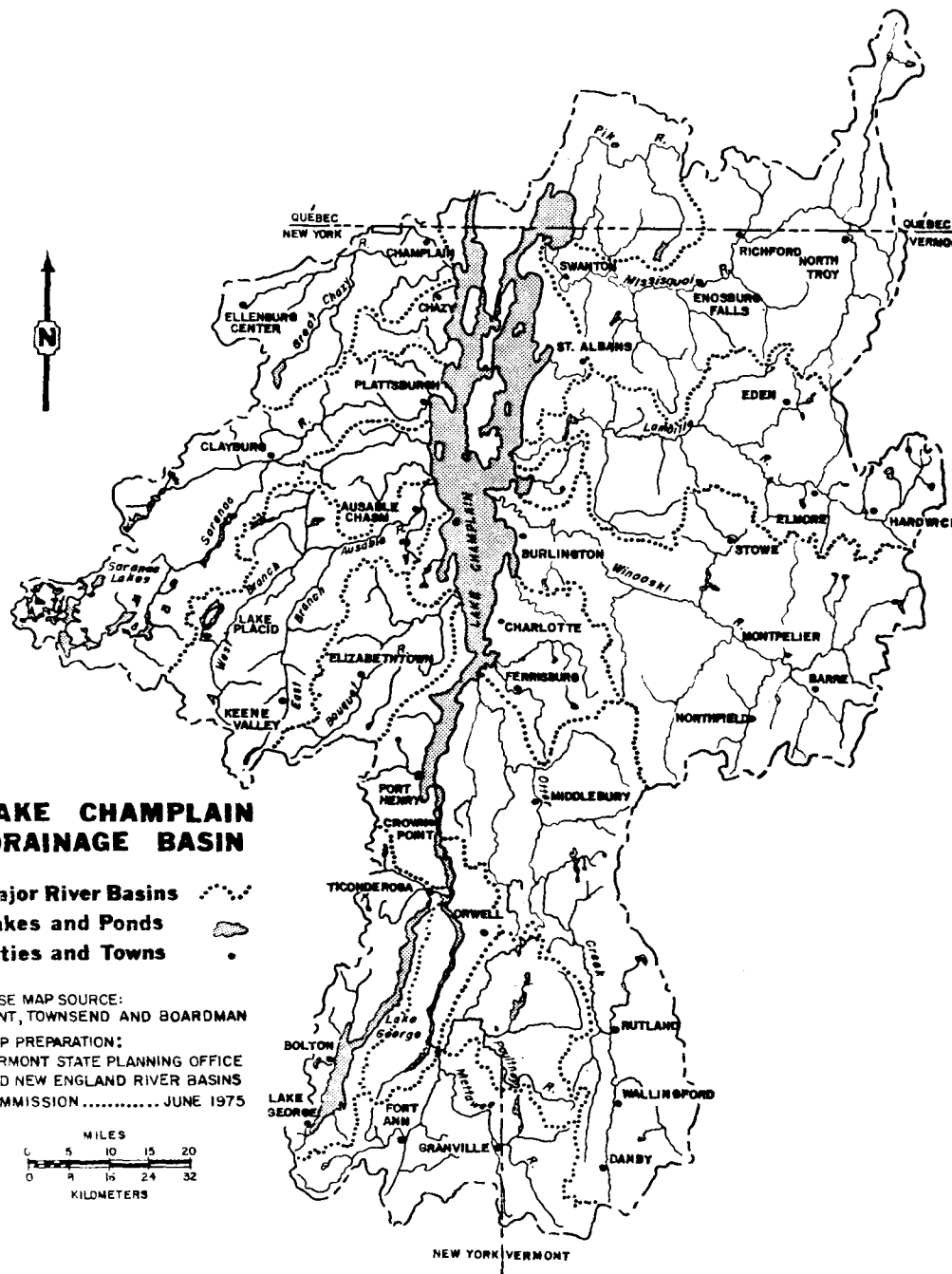
The Lake and its problems are not being ignored by the governments or the public. Just a few of the other programs now addressing important issues are as follows.

1. The International Joint Commission is studying possible effects of regulating the level of the Lake.
2. The New York and Vermont "208" programs are working to improve the quality of the water of the Lake.
3. New York and Vermont are monitoring the International Paper Company sludge bed.

The Lake Champlain Basin Study will not duplicate these specific efforts. Rather it will study several issues as generally outlined below.

Water Quality

1. Eutrophication - Eutrophication, or the aging of the Lake, is a term which refers to the biological productivity of a body of water. Nutrients such as phosphorus and nitrogen, washed into the Lake from land sources, provide nourishment for aquatic life. When too many nutrients are present, weeds grow rapidly, and such growth can be a nuisance to people who enjoy recreating on the Lake. Under this section, the study participants will be looking at:



- . phosphorus loading of the Lake, where it contributes to the major problems such as restricted recreational access to piers, marinas, and channels, restricted swimming, and changes to fish populations; and
 - . nuisance aquatic weeds - Some weeds are more disturbing than others. Some even restrict beach use because they may be painful or displeasing when stepped on. Such plants as the water chestnut and Eurasian milfoil are beginning to spread in the Lake. This element will look at where they exist as well as what is being done to control them.
2. Nonpoint Source Pollution - As much as 60% of the phosphorus reaching the Lake comes not from a pipe connected to a sewage treatment plant, but runs off the land, off construction sites, off city streets as well as other areas. Another type of nonpoint pollution is sediment which fills up bays and mouths of rivers. It is caused when rain washes loose soil--left by building or road construction, timber harvesting, or other land disturbing practices--into the rivers and then into the Lake. The nonpoint task force will examine:
- . timber harvesting and its contribution to nonpoint pollution; and
 - . soil conservation and farm practices that add to rural runoff.
3. Toxic Substances - It is not known if toxic substances are in Lake Champlain waters. There is relatively little industry along the lake shore, and only modest amounts throughout the Basin. Just what they discharge, if anything, will be studied in this element.
- . Toxic substances of concern in Lake Champlain.
 - . Identification of areas where toxic substances exist if they do. (This will result in a map of those stress areas. Management strategies will be considered if necessary.)

Shoreland Use and Management

1. Lands in Transition - The impacts created by changing settlement patterns and lifestyles on the lands in the Basin have a direct relationship to the quality of the Lake and its uses. In this section, the task force will document what we know about past and current land usage, and look specifically at:
- . shoreline erosion;
 - . economic viability of agricultural lands; and
 - . changes in shoreland use over the last decade.

2. Water-Oriented Outdoor Recreation - One of the primary uses of the Lake is for recreation, and as the demand on the resource increases, different pressures will come to bear on some of the unique and special lands around the Lake. This element will look at them as well as access to them and the water itself.
 - . Shoreland critical areas such as natural areas, geological sites, major wildlife habitats, and archaeological and historic sites will be mapped, and strategies to protect them will be studied.
 - . The Lake Champlain Islands (not the major, large islands), the seventy or so smaller islands which serve as important bird and wildlife nesting areas and also have great recreational potential, will be studied. The study will describe vegetative cover, wildlife populations, current use(s), and ownership.
 - . Assessment of existing physical and visual access to the Lake. Determine future needs for such access.

3. Energy and Power - There is a considerable amount of energy resources throughout the Basin. Numerous rivers provide hydroelectric energy, and wood which is in abundant supply is increasingly being used for space heating. The time could not be more appropriate and indeed critical to assess the potential existing energy reserves, project future energy needs, and determine if existing facilities will be able to meet those needs. This task force will take a long and hard look at all the alternatives, focusing most attention on:
 - . assessing existing energy facilities and their potential to meet future energy demands;
 - . summarizing environmental and economic considerations in siting a large fossil or nuclear generating facility on the shores of Lake Champlain;
 - . reporting on government approaches to determining location of new power-producing installations;
 - . reporting on alternative power supply modes; and
 - . examining possible role of forest resources available to meet future energy needs of the residents of the Basin.

4. Wetlands - Wetlands play an important role in the life cycles of fish populations in the Lake. In addition, they may also act as filters for cleaning the waters draining the communities back from the Lake. Wildlife find refuge in these areas. The importance of wetlands to the ecology of the Lake will be looked at with special attention to the following.
 - . Wetlands will be identified and classified. (For those familiar with the IJC Richelieu Dam proposal, this effort will be based on and expanded from it.)
 - . A historical trend of usage of fifteen wetlands will be prepared, analyzing change in size and use since 1940.
 - . A management strategy for the wetlands will be developed.

5. Petroleum Transport Concerns - More than 500 oil barges, each carrying between 650,000 and 1 million gallons of product, navigate Lake Champlain for New York and Vermont ports each year. Spills have occurred, with the largest occurring in 1971 when 80,000 gallons of fuel oil overflowed a storage tank and ended in the Lake. The Coast Guard has a procedure to follow in cleaning up the oil, but there exists no place currently designated within the Basin for the disposal of the oil-soaked debris. This element will examine methods of disposing such debris which are appropriate for the climate and lands in the Champlain Basin. This will result in guidelines for the selection of disposal sites.

Institutional Arrangement and Implementation Strategy

Many levels of government and numerous agencies currently regulate the use and protection of the Lake and the lands around it. This section will try to assess how effectively these institutions are satisfying the needs and concerns of the residents of the Basin. As a first step in that process, this work group will carry out a basinwide public perception survey to determine how people view the Lake and its problems. Putting together the survey results with existing management programs will be one of the major challenges facing the study staff.

The final result of the Study will be a policy document which will provide information to decision-makers at all levels of government and to the general public on recommended solutions to various critical water and land resource problems, opportunities, and needs.

What Role Will Geology Play in the Lake Champlain Basin Study?

Several critical issues to be addressed by the Study, as described above, will call on geologists for their knowledge and help in understanding them. Task forces will examine shoreline erosion, shoreland significant geological site identification, criteria for power-generating facility siting, and criteria for disposal sites for oil-saturated debris. In each case, involvement of geologists is essential. One of the products envisioned to be produced as part of the Study will be a Lake Champlain Shoreline Erosion Control Brochure for shoreline property owners.

Five Vermont geologists are directly involved in one or another aspect of the Study, and they are Chuck Ratte, the State Geologist, John Malter from Water Resources Department, Al Hunt and Larry Becker from UVM, and Craig Heindel from Charlotte.

Monty Fischer
Montpelier, Vt.
August 22, 1977

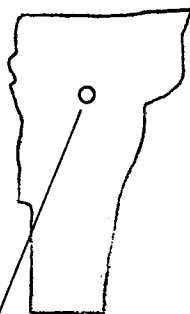
GREEN MOUNTAIN GEOLOGIST
VERMONT GEOLOGICAL SOCIETY
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FIRST CLASS

THE GREEN MOUNTAIN GEOLOGIST



QUARTERLY NEWSLETTER OF THE VERMONT GEOLOGICAL SOCIETY

WINTER 1977

Volume 3 Number 4

AN EXPOSITION ON VERMONT GEOLOGY:

The winter meeting of the Vermont Geological Society will be held on Wednesday, March 9, 1977 from 9:30 a.m. to 4:30 p.m. at the Tavern Motor Inn in Montpelier.

There will be displays from the asbestos, granite, marble, and slate industries as well as many federal, state, and private organizations that are involved in various aspects of Vermont geology. Also, there will be short presentations dealing with bedrock and surficial geology, hydrology, and the economic and environmental impact of geology in Vermont. The talks will be about 30 minutes each and will be presented once in the morning starting at 10:30 a.m. and again in the afternoon at 3:00 p.m. They will take place in a portion of the Champlain Room in the Motor Inn and the displays will be exhibited in Vermont Hall which is directly behind the Motor Inn.

There will be no official meeting convened during this exposition, but there should be plenty of opportunity to meet a lot of people and find out what's going on in geology within the state. Coffee will be available during the exposition and lunch can be obtained at the Motor Inn.

SPRING MEETING SET FOR APRIL 23:

The spring meeting of the Society will be held on April 23rd at Middlebury College with the presentation of student papers. Graduate and undergraduate students interested in participating should submit an abstract to Dr. Brewster Baldwin; Dept. of Geology; Middlebury College; Middlebury, Vt. 05753. Deadline for abstracts is April 2nd. A \$ 25.00 prize will be given for the best paper presented.

All those interested in hearing about some very interesting research into Vermont Geology are urged to attend. Full details on the meeting will be given in the next issue of the Green Mountain Geologist to be mailed April 8th. Complete abstracts will be included.

DR. DOLL HONORED FOR OUTSTANDING SERVICE

Dr. Charles G. Doll, who retired as Vermont State Geologist on July 1, 1976 was honored by the Vermont Geological Society at the annual meeting held at Constitution House in Windsor in October. President John Malter presented Dr. Doll with a special honorary Life Membership in the Society and made special note of Dr. Doll's many years of devoted service and for his very significant contribution to a better understanding of the geology of Vermont. The extensive series of bulletins, two special state geologic maps and many other publications remain as testimonials to Dr. Doll's efforts.

Mrs. Doll was also a special guest of the Society at the meeting.

PROFESSIONALISM COMMITTEE

The primary objective of this committee is the legal recognition of geology and geologists as members of the professional community. To this end, we hope to develop and promote sponsorship of legislation in 1978 which will provide a legal basis for practising geology in government and industry which is on the same foundation as other registered professions including engineering.

As you may know, the State of Georgia has enacted legislation requiring the registration of all geologists practising in areas of geology impacting directly on the public health and well-being. The committee of three: C. Ratte, W. Siok, and D. Tarbox, is using the Georgia legislation as model from which a draft of a similar legislation will be prepared for Vermont. Further, the committee will have the draft ready for distribution prior to the annual meeting so that all members will have the opportunity to comment.

It is anticipated that a final draft will be developed after the annual meeting. That draft to be sponsored by legislators who will be requested by this committee to act in our behalf.

If any member wishes to contribute or comment at any time prior to the annual meeting, please do not hesitate to contact me at the address shown on the front page of this issue.

Respectfully

William Siok, Chairman
Professionalism Committee

→ N. E. SECTION MEETING - G.S.A. - Binghamton - March 31 - April 2
Contact: James R. Beerbower, SUNY, Binghamton, N. Y. 13901

VERMONT GEOLOGICAL SOCIETY: EXPENDITURES FOR 1975-76

Publications:

G.M.G. Vol. II, No.	\$22.05
" " " No. 3	19.69
" " " No. 4	19.99
" Special Issue	46.76
" Vol. III No. 1	31.01
" " " No. 2	12.26
" " " No. 3	25.91
Miscellaneous Sir Speedy	7.73
Subtotal	<u>\$182.40</u>

Meetings:

Misc. Winter Meeting	3.00
W.D. Silvey, meals	11.00
Tavern Mtg. Room., coffee	31.95
Recording Tapes	10.00
Subtotal	<u>\$55.95</u>

Spring Meeting Awards	25.00
SAGA coffee and donuts	20.50
Subtotal	<u>\$45.50</u>

D.A.R. Shelter	10.00
Balance, Summer Meeting	5.00
Subtotal	<u>\$15.00</u>

Frame for Certificate	14.00
Dr. & Mrs. C. Doll, meals	15.80
Subtotal	<u>\$29.80</u>

Postage:	46.34
Post Office Box:	14.00
Subtotal	<u>\$60.34</u>

Miscellaneous:

Index cards	.62
Envelopes	.92
Clasp envelopes	.62
Extra postage	1.05
Typing newsletters	12.00
Subtotal	<u>\$15.21</u>

GRAND TOTAL \$394.20

INCOME FROM DUES: \$414.00

BALANCE 19.80

REPORT FROM THE STATE GEOLOGIST

In the Fall 1976, vol. 3, number 3 issue of the GMG, goals were established for FY 1976-77. I would like to take this opportunity to inform you of the progress and/or current activities in each of these 7 areas.

1) LEGISLATION--Legislation has been written to formally create an organization within the Agency of Environmental Conservation known as the Division of Geology and Mineral Resources to be administered by the State Geologist. In addition, the legislation describes the qualifications of the State Geologist, the mechanism for his appointment, and the responsibilities of his office and the division he will administer.

Also, an advisory council is established by legislation to aid in the performance of the State Geologist responsibilities.

The legislation has been written by me largely with the help of legislation provided by other state, my short familiarity with the state's geological needs, and the help of numerous reviews including those of the Vermont Geological Society's ad hoc committee. Further revisions are likely to occur.

The legislation has been presented to Senator Sanborn Partridge. Its status at this point is not known. However, since the Environmental Agency itself is presently in the process of being reorganized to more closely represent its real functions, it is likely that my legislation will be worked into the Agency reorganization and be presented to the legislators as part of the bigger package.

2) Familiarization with Vermont's geology and geologic problems is an everyday occurrence in dealing with the many questions directed to this office concerning Vermont's geology. It is gratifying to know that geologic information is, in fact, being sought by many different private, public, and governmental organizations.

Specifically, I am gradually (1) building a file on geologic data for the state on a county-township basis. This information will be on open-file for public use; (2) in cooperation with the Vermont Department of Libraries, I am building a Vermont Geology Library. I am seeking reprints of all published articles from geologists who have worked in the state, I am attempting to obtain bibliographies of all unpublished senior projects, thesis, etc. that have been conducted in the state, and eventually xerox copies of these unpublished reports. Also I am sending out a questionnaire seeking information on all current geologic work being conducted in the state; and (3) on a more personal note, I set aside a few hours each week to read about, write about, or actually get out and see some of Vermont's geology. In March, I will in cooperation with Dallas Rhodes of UVM be presenting a short paper on the "Hurricane Induced Debris Slides at Dorset Hollow, Vermont--August 1976" at the Northeast G.S.A. meetings in Binghamton, NY.

3) In the fall while travelling was still pleasurable I did meet with some of the Regional Commissions, District Environmental Coordinators, talked to the Burlington Gem & Mineral Club, talked at the A.V.M.E. Adirondack Sect. meeting in Middlebury, and met with some of the mineral industry officials in the state. I have received some press coverage and have been interviewed on WJOY radio, Burlington. For the future I have been invited to present two lectures to Phil Wagner's Environmental Geology class and I will be presenting talks to the Rutland Mineral Club and the Northeast Kingdom Audubon Society. Also, I am in the process of writing a series of articles for the layman on Vermont Geology to be published in the state's newspapers.

4) My involvement in programs of the Environmental Agency and state government have been extensive. You might say I am available when needed and my services and geological knowledge hopefully have been of some help. Specifically, I am involved in Act 250 permit application reviews, state mapping advisory committee, technical advisor to the Vermont Natural Resources Council. I have been working with solid waste engineers on site selection in Whitingham, have assisted with the analysis of the disposition of an oil spill in Brattleboro, participated in an interdisciplinary study (by the Agency) of the Dorset Hollow Debris Slide resulting from Hurricane Belle and wrote the geological portion of the report, and perhaps the most important Agency program I have been involved with to date is my membership on the Nuclear Waste Disposal that is attempting to identify and clarify all the problems that will be associated with having such a site in Vermont. ERDA has announced that Vermont is one of 36 states under consideration for a high level nuclear wastes terminal storage facility. Among other rock types, Vermont has been selected for this deep burial technique due to the presence of potentially massive, dry and seismically inactive granitic and metamorphic rock formations. I am actively involved: (1) as a member of the 7 member Association of American State Geologist Review Group that will oversee and advise ERDA as it conducts its search for these deep burial sites; and (2) I am, with the help of my advisory council, developing a proposal to do the initial geologic literature-reconnaissance work on potentially favorable rock formations in Vermont.

5) I have developed and submitted a \$51,306 budget for FY 78-79. Each item in the budget has been justified at great length in writing. It includes the following items: Salary (a) State Geologist \$18,500 (b) Assistance \$5,000 (c) Insurance, Social Security \$1,506--total \$25,006. Expenses (travel, office, vehicle, maintenance, library materials, reproductions, etc. \$4,300. Grants and Programs (a) Basic mapping grants \$7,000 (b) In-house program \$5,000 (c) USGS Coop Programs \$10,000--total \$22,000. In light of Governor Snelling's serious efforts toward fiscal responsibility and demands that each agency seriously stick to its most critical priorities, it is likely that this budget will be cut by at least 50%. The following items will be the first to be affected: Salary (b) Assistance \$5,000; Expenses \$4,300; and the entire Grants and Programs area \$22,000. The latest budget to go to the Governor: Personal Services \$18,500; Operating Expenses \$3,500--Total \$22,000.

I am presently working on a long range plan for programs and financing with a look toward seeking outside money for programs. I am looking for input from my advisors and others concerning these long range efforts. Until a tentative plan is established, no long range budget will be forthcoming.

6) The communications lines are always open. I am receiving excellent cooperation on all fronts and I am especially pleased with the cooperation, suggestions and help provided by you, my geological colleagues. With Jim Ashley as initiator and coordinator, we are having monthly informal lunches with geology types and other interested parties in the Montpelier area. So far I have interacted with success with geologists for USGS, ERDA, Exxon, and private consultants interested in Vermont geology for reasons of research, mineral exploration, legal and environmental problems; and just a general wide range of contacts with people seeking information on mineral collecting, location of caves, etc.

An advisory council has been established and is functioning. The membership and area of specialization of each member is as follows:

ADVISORY COUNCIL

Philip Wagner Dept. of Geology-Perkins Hall University of Vermont Burlington VT 05401 656-3396-----656-4055	Geologic Hazards and Environmental Considerations peculiar to Vermont geologic conditions
Fred Larsen Earth Sciences Norwich University Northfield VT 05663 (O) 485-5011----- (H) 485-7715	Glacial and Surficial Geology
David Butterfield Water Resources Division Agency of Environmental Conservation Montpelier VT 05602 828-2393	Hydrology and Geohydrology
Duncan Ogden General Manager Vermont Talc, Inc. Chester VT 05143 875-2820	Mineral Deposits and Mining Geology
David Bucke Dept. of Geology-Perkins Hall University of Vermont Burlington VT 05401 656-3396	Seismology and Earthquake Potential

Rolfe S. Stanley
Dept. of Geology-Perkins Hall
University of Vermont
Burlington VT 05401
656-3396

Bedrock and structural geology
Northern VT, Academic advisors

J. Christopher Hepburn
Dept. of Geology & Geophysics
Boston College
Chestnut Hill MA 02167
617-969-0100

Bedrock and structural geology
Southern Vermont

Brewster Baldwin
Dept. of Geology-Middlebury College
Middlebury VT 05753
(O) 388-7956----- (H) 462-2211

Vermont Geological Society
(President 1976-77)

The duties of the advisory Council are as follows:

- (1) Advise the State Geologist of all geologic activity in the state which may come to their attention;
- (2) be available for consultation and advice in their areas of expertise;
- (3) suggest, advise, help develop and approve programs to be implemented by the State Geologist and the Division of Geology and Mineral Resources;
- (4) preview and critique documents submitted to the Division for publication.

Submitted by

Dr. Charles Ratte
State Geologist

PROFESSIONAL OPENING FOR HIGHWAY GEOLOGIST

The present geologist for the New Hampshire Highway Department has resigned his position as of February 24, 1977. He has contact the VGS to ask that the opening be publicized.

The interested applicant must have a degree with a major in geology and a minimum of 3 years experience beyond the degree in engineering or structural geology. The position involves the evaluation of structural stability of rock slopes and determining the availability of highway construction materials. Salary range is \$12,000 to \$14,500 plus overtime.

Contact: A. D. Fiskan, Highway Personnel Officer, Highway Personnel Division, John Morton Office Building, 85 Loudon Road, Concord NH 03301

GREEN MOUNTAIN GEOLOGIST
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