

The Engineering Geologist



THE
GEOLOGICAL SOCIETY
OF AMERICA

NEWSLETTER OF THE ENGINEERING GEOLOGY DIVISION OF THE GEOLOGICAL SOCIETY OF AMERICA

Volume 13, Number 1

April 1978

Chairman's Message

The Engineering Geology Division owes a considerable debt to David J. Varnes who has presided over the division during the most critical period of its 30-year history. It is largely through Dave's efforts that better direction has now been given the division through your Management Board by those of you who responded to the questionnaire in the July 1977 *The Engineering Geologist*. A year ago, after several years of discussion with a large cross section of the active membership, the Management Board began serious consideration relating to the possible phasing out of the division with its functions replaced by AEG as an associated society. To get better reaction from the membership at large, your feelings regarding this matter were solicited.

As a matter of statistics, out of the 15 percent of the division membership who responded to the questionnaire, 78 percent indicated existing or planned membership in AEG. Of the total respondents, 58 percent were in favor of maintaining the division, 37 percent were in favor of phasing out, and 5 percent were undecided. The results of this informal ballot indicate to the Management Board that the division should continue, emphasize good engineering geology publications, sponsor technical sessions and symposia at GSA meetings, and, when possible, participate in joint activities with AEG. Perhaps our most important reason for continuing, however, is to keep engineering geology in front of our 12,000 member Society.

The Seattle meeting was very successful. The symposium on Capable Faulting, organized by ASCE/GSA/AEG Joint Committee on Engineering Geology, was well attended, generally well presented, and stimulated much discussion. Our first annual dinner was well attended; it was delightful not to be rushed at the one EGD social gathering of the year. We shall probably continue to have an annual dinner in lieu of an annual luncheon. This will also allow additional time for technical papers. I was also pleased to welcome so many of you on the AEG field trips in Seattle. Back-to-back meetings are exhausting, especially for those involved in organizing both.

The division will sponsor technical sessions at the Toronto meeting. Robert F. Legget has agreed to organize a symposium titled *Geology and Space Beneath Cities*. As is traditional, our Chairman-Elect, Richard H. Jahns, will serve as our representative to the Joint Technical Program Committee. So plans for Toronto are well under way.

With respect to publications, our third Review Volume in Engineering Geology entitled *Landslides* has just hit the stands. I'm sure you will all agree that Donald R. Coates has edited an excellent publication. A volume on *The Preservation of Stone* (Winkler, editor) is presently in the hands of the GSA Editor; and the draft of *Geology in the Siting of Nuclear Power Plants* (Hatheway and McClure) is expected to be in the GSA Editor's hands by the time you read this. Christopher C. Mathewson is collecting papers for a volume on *Expansive Soils*. Thus, thanks to the efforts of many individuals, our publication production rate is increasing.

With respect to committees, only three standing committees are being kept active: Burwell Committee chaired by Lloyd B. "Spike" Underwood, the Long-Range Planning Committee chaired by Richard E. Gray, and the Nominating Committee chaired by David J. Varnes. Special committees will be appointed as required to organize symposia and prepare material for publication. When their purpose is complete, they will be disbanded. Individuals who wish to organize or prepare symposia or material for publication on any engineering geology related subject are encouraged to contact me or the Long-Range Planning Committee regarding your interests. Only by your efforts will the division remain viable and engineering geology be kept in front of the Society.

One further area of interest to the division membership is that of education. Perhaps this is an area where division influence may be most appropriately directed. To this end, and through the good offices of James W. Skehan, we have made tentative arrangements to have a joint symposium with the National Association of Geology Teachers at the San Diego meeting in 1979. The subject will be the "Academic Training of Engineering Geologists."

Finally, in the area of intersociety liaison, David J. Varnes will serve as liaison with the International Association of Engineering Geology, while I will serve as liaison with AEG.

I hope 1978 will be a successful year for all of you. Please contact me with your suggestions and ideas.

Richard W. Galster
Chairman, Engineering Geology Division
18233 Thirteenth Avenue, NW
Seattle, WA 98177

Women in Engineering Geology

Women geologists have long been a scarce breed. There are approximately 35,000 geoscientists in the U.S., of which only 1,225—or 3.5%—are women. Engineering geology traditionally has had almost no women practitioners. Student enrollments, however, are slowly closing this gap. In 1975, women made up 17% of all degree candidates. Of the students enrolled in an engineering geology curriculum in 1976, 13.1% were women.

Two major professional societies cater to the engineering geologist—GSA and AEG. Women make up 3.9% of the Engineering Geology Division of GSA and 2.3% of the membership of the Association of Engineering Geologists (AEG). This lack of visibility may mean that many promising women are missing out on an enjoyable career because they are unaware of opportunities available.

What can be done to offer encouragement to women who want to pursue—or are already involved in—careers in engineering geology? Open houses have been sponsored by the Women Geoscientists Committee of the American Geological

Institute (AGI). These are scheduled for each annual meeting and for many of the regional GSA meetings. There was a breakfast meeting at the national AEG meeting for members attending that meeting.

To help alleviate the lack of visibility, I am attempting to establish contact and open communications among women engineering geologists. I think it is important for us to get to know each other, learn what we are doing, develop a network to help each other professionally, and become established and recognized in the field.

If you have any suggestions or wish to become involved in furthering the role of women in engineering geology, be you male or female, please contact me.

Denise D. Pieratti
Woodward-Clyde Consultants
P.O. Box 1149
Orange, CA 92668

1978 Burwell Award Committee and Former Recipients

The Burwell Award Committee for 1978 will be made up of the following, with their terms indicated:

Lloyd B. Underwood, Chairman (1976–1978)
Bernard W. Pipkin (1976–1978)
Charles A. Baskerville (1977–1979)
Erhard M. Winkler (1977–1979)
Raymond T. Throckmorton, Jr. (1978–1980)
Alan L. O'Neill (1978–1980)

Former recipients of the E. B. Burwell, Jr., Memorial Award are

1969 Lloyd B. Underwood, *Classification and Identification of Shales*
1970 David J. Varnes and Glenn R. Scott, *General and Engineering Geology of the United States Air Force Academy Site, Colorado*

1971 Edwin B. Eckel, *The Alaska Earthquake, March 27, 1964: Lessons and Conclusions*, USGS Professional Paper 546
1972 Richard J. Proctor, *Mapping Geological Conditions in Tunnels*
1973 Murray R. McComas and J. E. Hackett, *Geology for Planning in McHenry County, Illinois*, Illinois Geological Survey Circular 438 (1969)
1974 Robert F. Legget, *Cities and Geology*, McGraw-Hill, 1973
1975 Erhard M. Winkler, *Stone: Properties, Durability in Man's Environment*, Springer-Verlag, 1973
1976 David J. Varnes, *The Logic of Geological Maps with Reference to Their Interpretation and Use for Engineering Purposes*, USGS Professional Paper 837 (1974)
1977 Richard E. Goodman, *Method of Geological Engineering in Discontinuous Rocks*, West Publishing Company, St. Paul, Minnesota, 1976

Penrose Conference on Landslides

An interdisciplinary Penrose Conference on landslides was held at Vail, Colorado, during the week of October 9–14, 1977. The conference was cosponsored by the Geological Society of America and the American Society of Civil Engineers.

The keynote address by Ralph Peck provided a framework for the discussion sessions by challenging both disciplines with a list of things they do well and not so well. Discussion sessions focused on problems of (a) recognition and classification; (b) instrumentation, sampling, and testing; (c) analysis and design; and (d) remedial techniques. The discussion leaders, two to each session (David J. Varnes, John Hutchinson, William Dearman, Frank Patton, Barry Voight, Mike Duncan, George Sowers, Steve Wright, Chuck Brawner, and Masasuke Watari), opened each session with a summary of the subject topic or a statement about special problems. The open discussion which followed was lively, sometimes heated, and produced some very worthwhile exchanges among and between engineers and geologists.

On Wednesday, October 12, Chuck Robinson led an all-day field trip from Vail to Leadville and back, which examined construction of Interstate 70 through areas of failed slopes, the Climax open pit mine and tailings ponds, landslide features on

Bald Eagle Mountain, and geologic hazard mapping in Eagle County.

Penrose Conference participants are provided the opportunity for exchange of ideas and information through loosely organized and informal discussions intended to stimulate individual research and develop new ideas. As there is no recording or publication of proceedings, the open discussions create an exciting atmosphere for free exchange of ideas. Conference attendance was limited to 70 participants, about equally divided between geologists and geotechnical engineers.

Convenors for the conference were Robert W. Fleming, Geological Society of America; Don C. Banks, Chairman, ASCE Committee on Rock Mechanics; and Robert L. Schuster, Chairman, Joint ASCE-GSA-AEG Committee on Engineering Geology. From the convenors' viewpoint, the meeting was a stimulating and rewarding experience; they hope that those who participated will share their impressions of the meeting with their colleagues.

Robert L. Schuster
Chairman, Joint ASCE-GSA-AEG Committee
on Engineering Geology

Book Review

Engineering Geology; by Quido Záruba and Vojtech Mencl. 1976, 504 p., 380 fig., Elsevier Scientific Publishing Company, Amsterdam, Oxford, New York (U.S. \$38.95/Dfl 97.00).

Contents: Introduction, Cooperation of geologists with engineers. Chapters. 1. Geological Investigations. 2. Geological Maps and Sections. 3. Mechanical Properties of Rocks. 4. Subsurface Exploration. 5. Geophysical Methods. 6. Weathering of Rocks. 7. Slope Movements, Landslides. 8. Excavation and Workability of Rocks. 9. Geological Investigation of Building Material Deposits. 10. Foundations of Buildings and Industrial Structures. 11. Roads and Railways. 12. Tunnels and Underground Power Plants. 13. Engineering-geological Investigations for Hydraulic Structures. 14. Tasks of Geological Investigation in Regional Planning and Environmental Policy. Bibliography. Index.

This is a most welcome work, in English translation, by two of Europe's most distinguished men in the field of engineering geology. It is based on the third Czech edition, reworked and complemented, which draws for the most part on the authors' rich experience and practice. It is directed particularly toward students of civil engineering and engineering geology. The primary intent of the book is to create an understanding of the relations between the geology of a building site and the engineering structure both by describing geological features so that they are comprehensible to engineering students and by explaining construction problems intelligibly to geology students. Within the scope of the work, the authors' intent will be very successfully attained. The relations of geology to site requirements are clearly

developed for a large number of well-illustrated examples. Although the examples are predominantly from Europe, they illustrate general principles and recurring problems in a variety of geologic settings.

Those familiar with the German language version of the second Czech edition will note a number of rearrangements, additions, and improvements. For example, Chapter 3 on mechanical properties of rocks contains much new material; Chapter 7 on slope movements and landslides has been substantially shortened and rewritten with new illustrations. Chapters 10, 12, and 13 on foundations, tunnels, and hydraulic structures, respectively, have been recast with considerable reference to new examples. These five chapters, which together make up about two-thirds of the text and illustrations, are particularly well done. Chapter 13 is a major work containing abundant and detailed information on dams and other hydraulic structures, principally in Central Europe.

For use as a text in a comprehensive course in engineering geology the book would need to be supplemented by readings in some subjects treated briefly or not at all, such as shoreline and harbor engineering, seismic and volcanic hazards, and problems of perennially frozen ground.

While reading this volume, one is simply not aware that it has been translated into English, such have been the perceptive skills of Helena Zárubová and Professor Mencl.

David J. Varnes

International Association of Engineering Geologists

At its annual meeting, the Management Board of EGD charged David J. Varnes with investigation of ways of organizing a U.S. National Group for Engineering Geology, as a working part of the International Association of Engineering Geologists. IAEG is represented in the United States by individual members only, and has striven for some years to secure a counterpart

national group such as exists in Rock Mechanics and Soil Mechanics and Foundation Engineering. The excellent *Bulletin* of the Association is included with membership (\$12 per annum). Varnes will send along an application form to those who are interested. His address is: Engineering Geology Branch, Box 25046, Mail Stop 903 KCG, Denver, Colorado 80225.

Future Engineering Geology Division Symposia

The Management Board asked Robert F. Legget, former division chairman, to organize and chair the EGD symposium at the 1978 annual meeting in Toronto. Dr. Legget agreed and is well along in planning the symposium entitled *Geology and Space Beneath Cities*.

At the same meeting of the Management Board, the second symposium topic considered, *Academic Training of Engineering*

Geologists, was selected as the tentative symposium for presentation at the 1979 annual meeting in San Diego. James W. Skehan was appointed chairman and now investigating the possibilities of conducting an all-day symposium in conjunction with the National Association of Geology Teachers' activities there.

The EGD annual symposium is now an established feature of the GSA annual meeting.

NRC-Sponsored Regional Tectonics Reports Available

The results of Nuclear Regulatory Commission-Sponsored regional tectonics and seismicity research are now beginning to become available to the profession. Under the direction of Neil B. Steuer, long-time GSA member, the Commission has released the following documents, available through NTIS, Springfield, Virginia 22161.

A Tectonic Overview of the Central MidContinent, by W. J. Hinze, L. W. Braile, G. R. Keller, and E. G. Lidiak, November 1977, 106 pages, illustrated, with bibliography, available for

\$6.50 (paper) or \$3.00 (microfiche) as publication no. NUREG-0382 R6A.

New Madrid Seismotectonic Study, by T. C. Bushbach, November 1977, 61 pages, available for \$5.25 (paper) or \$3.00 (microfiche) for NTIS, as publication no. NUREG-0379 R6A.

The reports are well written and contain discussion of theories applied toward explanations of assumed seismotectonic relationships. They are certainly well worth reading for those who wish to continue their self-education in seismotectonic analysis.

Reviews in Engineering Geology, Volume 4

Coeditors Allen W. Hatheway and Cole R. McClure report that the 17 collected manuscripts making up Reviews in Engineering Geology Volume IV, *Geology in the Siting of Nuclear Power Plants* have been sent to the GSA Editor in Boulder. The volume will be similar in format to Donald R. Coates's new review Volume 3, *Landslides*, available now from Boulder, the table of contents of which is as follows:

CONTENTS: PART 1. OVERVIEW includes Landslide perspectives by D. R. Coates and Regional landslide types in Canada by J. D. Mollard. PART 2. REGIONAL STUDIES includes Causes of rock-slope failure in a cold area: Labrador-Ungava by K.-H. Wyrwoll; Large landslides of the Columbia River Gorge, Oregon and Washington by L. Palmer; Regional slope-stability controls and engineering geology of the Fraser Canyon, British Columbia by D. R. Piteau; and Complex mass-movement terrains in the western Cascade Range, Oregon by F. J. Swanson and D. N. Swanson. PART 3. SPECIFIC AND LOCAL STUDIES includes Landslides and the weathering of granitic rocks by P. B. Durgin; Problems with Lake Albany "clays" by J. R. Dunn and G. M. Banino; Large submarine slide in Kayak

Trough, Gulf of Alaska by B. F. Molnia, P. R. Carlson, and T. R. Bruns; Large, Holocene low-angle landslide, Samar Island, Philippines by J. A. Wolfe; and Martinez Mountain rock avalanche by C. G. Bock. PART 4. ENGINEERING GEOLOGY AND HIGHWAY ENGINEERING includes Utiku landslide, North Island, New Zealand by M. L. Stout; Engineering geology of the Woodstock rockslide, New Hampshire by B. K. Fowler; Relationship between morphology, hydrology, geotechnics, and vegetation on an old northern Ohio landslide by H. F. Krist and M. R. McComas; Engineering geology of the slope in stability of two overconsolidated north-central Texas shales by R. G. Font; Engineering geology of multiple landsliding along I-45 road cut near Centerville, Texas by C. C. Mathewson and J. H. Clary; and Three major California freeway landslide areas by F. B. Leighton. PART 5. ENVIRONMENTAL PLANNING includes Slope-stability studies in the San Francisco Bay region, California by T. H. Nilsen and E. E. Brabb; Landslides in West Virginia by P. Lessing and R. B. Erwin; and Landslides at Sardis in western Turkey by G. W. Olson.

Minutes

Engineering Geology Division combined Management Board Meeting, Seattle, Washington, November 6, 1977

Present:

David J. Varnes (Chairman)
Richard W. Galster (Chairman-Elect)
James W. Skehan (Past Chairman)
Allen W. Hatheway (Secretary-Treasurer)
Frank W. Wilson (Management Board Representative)
Richard H. Jahns (1979 Chairman-Elect)

Meeting convened at 0900.

1. RELATIONS BETWEEN EGD-GSA AND AEG

The results of the informal questionnaire sent out with the last newsletter are as follows:

To phase out the Engineering Geology Division	44
To retain the Division	70
Undecided	6
Total votes	120

A motion was made by R. W. Galster to continue the Division; J. W. Skehan seconded; motion subscribed to by those present.

Discussion was held concerning activities which the Division should undertake to insure a continued useful existence.

2. CLOSER ASSOCIATION WITH NAGT

Jim Skehan will attend meeting of management of NAGT in P.M. of November 6; will discuss proposed joint Symposium of EGD/NAGT on engineering geological education. Resolved that J. Skehan will investigate the feasibility of a half-day session in Toronto (1978) on Academic Training of Engineering Geologists or a one-day session at San Diego (1979). N.B. This symposium was later definitely scheduled for 1979 in San Diego.

3. EGD LIAISON REPRESENTATIVE AT THE SECTIONS

The Division Chairman will contact selected Section Chairmen (in sections and areas where AEG is not particularly active) and recommend a Liaison Representative to act also as a member of the Section Technical Program Committee, for purposes of constituting a sectional session on engineering geology from those unsolicited papers submitted for consideration.

4. CAPABLE FAULTING SYMPOSIUM

R. Galster will seek coverage through convenor R. Schuster in *Geotimes*, with proper credit to EGD.

5. 1978 BUDGET

Burwell Award	\$125.00
Newsletter	300.00
Symposium Abstract Fees	100.00
Luncheon VIP Guests	50.00
Travel	900.00
Miscellaneous	25.00
	<hr/>
	\$1,500.00

Abstract fees for the Capable Faulting Symposium. Question was up for approval of the \$120 fee as assessed by Boulder. It was agreed to underwrite this and appropriate share of the Toronto and/or San Diego symposia.

6. PUBLICATIONS

Erhard M. Winkler has compiled the case history volume on Decay and Preservation of Stone, and wishes to accept a new assignment.

Suggestions offered were:

Concrete Aggregates (Galster)
Pozzolon Materials (Galster)

(continued on p. 5)

Energy-Efficiency Uses of Stone (F. Wilson)
Crushed Stone Respiratory Hazards (Skehan)
Modern Dimension Stone Quarry Practice (Hatheway)

The Long-Range Planning Committee will be reactivated with a primary membership of past chairmen, to identify areas of interest for future division activity:

R. Gray (Chairman)
D. Varnes
P. Hilpman

7. LIAISON WITH IAEG

Chairman Varnes proposed that the Division establish a Liaison Representative to the International Association of Engineering Geologists. After discussion, it was determined that David Varnes would be the representative and proceed in whatever manner he feels necessary to further the cooperation between EGD and IAEG, subject to concurrence of the Society management.

December 13, 1977, as reviewed by the Board members and appropriately revised.

Allen W. Hatheway, *Secretary-Treasurer, EGD*

Events of Interest

May 1-2, 1978

Pacific Southwest Minerals and Energy Conference (SME-AIME and LACES)

Topic, "Self-Sufficiency in Minerals and Energy"

Contact: J. F. Scholtz, 251 Lake Avenue, Suite 800, Pasadena, California 91101

Director of the Work Group of Hydrogeology, Universidad de Granada, Apartado de Correos 556, Granada, Spain

October 16-21, 1978

Association of Engineering Geologists Annual Meeting
Hershey, Pennsylvania

September 18-22, 1978

International Symposium on Water in Mining and Underground Works—Granada, Spain

Contact: Prof. Dr. Engineer Rafael Fernández-Rubio,

October 23-26, 1978

Geological Society of America Annual Meeting
Toronto, Canada

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