

The Engineering Geologist



THE
GEOLOGICAL SOCIETY
OF AMERICA

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

Vol. 19, Number 1

March 1984

CHAIRMAN'S REPORT

The Management Board at its change-over meeting in Indianapolis was relieved to learn that the Division is once again financially solvent and our period of austerity can be loosened somewhat.

The main expenses of the Division are associated with printing and mailing of the Newsletter and ballots. The Management Board members do not receive expenses for travel to meetings or for communication, those expenses usually being borne by the member's institution.

The first order of business now will be to slightly enlarge the Newsletter and to publish at least two issues this year. The emphasis will be on Division news, reports, announcement of meetings and conferences of interest to members, and short news paragraphs.

Other publications will also be emphasized. We have a backlog of several manuscripts suitable for publication as Case History or Review Volumes and several more in the offing which we will move into print as fast as the system can handle them.

The most recent Review Volume, "Geology Under Cities" edited by Robert Legget, was released in early Fall 1983.

To expedite our publication effort the Management Board re-instated the Publications Committee as provided for in the By-laws. Past President Allen Hatheway, who has had considerable experience with GSA publications, has agreed to chair that committee for the coming year to get it organized and running.

The Board also reinstated the Nominating Committee which is to consist of the most recent three Past Presidents. The chairman will be the most recent, Past President, Erhard Winkler for the 1984 term.

The By-laws also provide for a Program Committee. I have asked Chairman-elect Robert Schuster to chair that committee next year. This is appropriate because the By-laws state that the Chairman-elect be the Division's representative to the Joint Technical Program Committee for the Annual Meeting. It will be his duty to arrange the Division's technical sessions based on ratings of submitted abstracts by a review panel. He also arranges for technical session chairmen.

I'd like to see the Division return to the By-law provision that all committee chairmen and member's terms expire at the annual meeting. The new Division chairman can reappoint committee chairmen or not, at his choice. Committee chairmen would be responsible for appointing members to their own committees. Ditto above on reappointments. It makes it easier on division chairmen and adds flexibility and the opportunity to clear deadwood.

I also intend to propose a minor change in the By-laws, changing the term of at-large Board representative to one year, thus possibly putting him in line for officership.

Two years ago the Management Board created two new awards in addition to the E.B. Burwell Award for best published paper or book. These are the Distinguished Practice Award; a plaque presented to an outstanding engineering geologist, not necessarily a member of the Society or Division; and a Meritorious Service Award for members of the Division who have performed mightily in Division and other affairs.

The first recipient of the Distinguished Practice Award was Neil B. Steuer, now retired but formerly the co-ordinator of seismic safety studies for the U.S. Nuclear Regulatory Commission. He was influential in conceiving and guiding a number of regional seismotectonic studies in the mid-continent and eastern U.S. which added much to our knowledge of that area's seismicity and geology.

Unfortunately, it was learned too late that the GSA Council had to authorize use of its logo on the plaque. This was approved at its 1983 Mid-year meeting in Reno.

This year's recipient was Thomas W. Fluhr, a long-time member of the Division. Mr. Fluhr could not attend to receive the award in person because of ill health. Robert Fakundiny, State Geologist of New York, read a summary of Mr. Fluhr's distinguished career and chairman Winkler read Mr. Fluhr's letter of acceptance and thanks. These appear elsewhere in the Newsletter.

The 1983 E.B. Burwell Award was presented to Peter W. Lipman and Donal R. Mullineaux for the 1981 U.S.G.S. Professional Paper, "The 1980 Eruptions of Mount St. Helens, Washington." Their acceptance will be published in the Bulletin.

In addition to the E.B. Burwell Award Committee, I am establishing a Distinguished Practice and Meritorious Service Awards Nominating Committee. Richard Gray has agreed to chair that committee for next year. Members who wish to nominate candidates for either awards should send their suggestions to Dick.

Plans for the 1984 Reno meeting are proceeding well. Gerald Wiczorek of U.S.G.S. is organizing a symposium on "Mechanics of Debris Flow/Avalanche Generation and Mitigation in the Western U.S."

STATEMENT OF FINANCIAL CONDITION
ENGINEERING GEOLOGY DIVISION
September 30, 1983

Fund Balance 12/31/82 (Deficit)	\$(3,100.58)
Division Dues Income (thru 9/30/83)	4,695.00
Other Income:	
R. Gray	40.00
S. Billo	69.89
GSA Foundation (contributions)	<u>50.00</u>
Total Division Resources & Income	\$1,754.31
Deduct:	
Division Expense:	
Member Labels	\$ 45.00
In-House Composition (Newsletter)	66.56
Printing & Folding Newsletter	240.89
Printing & Folding Ballot	76.40
Postage, Handling & Envelopes	209.47
(2) Eng. Div. Lunch Tickets ('83 Ann. Mtg.)	<u>24.00</u>
Total Division Expense	<u>662.32</u>
Division Fund Balance 9/30/83	<u>\$1,091.99</u>

Nominations for
Engineering Geology Division Awards

The Engineering Geology Division is seeking nominations for its Meritorious Service Awards and Distinguished Practice Award.

The Meritorious Awards are for outstanding service to the Engineering Geology Division and only Division members are eligible. Each nomination must be accompanied by a brief written statement indicating the outstanding service provided by the nominee.

The Distinguished Practice Award recognizes outstanding individuals for their continuing contributions to the technical and/or professional stature of engineering geology. A nominee need not be a member of the Engineering Geology Division, but must have made a major contribution to engineering geology in North America. Each nomination must be accompanied by a written citation.

Send your nominations by June 30, 1984 to:

Richard E. Gray
GAI Consultants, Inc.
570 Beatty Road
Monroeville, Pennsylvania 15146

DISTINGUISHED PRACTICE AWARD

TO THOMAS W. FLUHR

at the

Annual Division Luncheon - November 1, 1983
Indianapolis, Indiana

by

Robert H. Fakundiny

Thank you Chairman Winkler, Officers of the Engineering Geology Section, Awardees, Members of the Society, Guests. It is with great pleasure and deep honor that I present to you a few words of tribute to Thomas W. Fluhr, Engineering Geologist on the occasion of our awarding him for distinguished service. It is a pleasure because I have had a warm association with him over the last couple of years while we have been preparing for publication his manuscript on the Engineering Geology of the New York City Water Supply, which he is co-authoring with Vincent Terenzio. It is an honor because as State Geologist of New York I am intimate with the legacy that Tom Fluhr has left to our State.

For some time now many members of the Section have felt that a gesture should be made to recognize Tom's contributions. Tom is in semi-retirement and the writing of the New York City Water Supply manuscript is probably his last major publishing effort. Given the vicissitudes of the publishing business it will be a year or two before that work will be printed. Rather than wait until then we have decided to take the occasion of the annual Division Luncheon to say to Tom - Job Well Done.

Few of us have been involved so deeply, for so long, in so many large engineering projects. Few of us have had the opportunity to make such significant contributions to our profession. And none of us has so steadfastly stood up for our ideals and principles more than Tom. Thomas Fluhr stands out as one of the living legends of engineering geology and we would be remiss, if we waited for the formal publication of a manuscript or some other mechanically controlled event to dictate when we pay tribute to him - a tribute deserved, not for a single effort, but for a lifetime of service.

Thomas W. Fluhr was born in New York City on April 22, 1898. He received a Bachelor of Arts degree in 1924 and a Master of Arts degree in 1927, both from Columbia University. He is a licensed Professional Engineer in New York State - but his letterhead states: Thomas W. Fluhr, P.E., Engineering Geologist.

The best testimony to Tom's work and to the unpretentious way he views it is his professional vita: Allow me to read it verbatim.

Experience

1930-1963 Board of Water Supply of the City of New York, Assist and Senior Geologist on planning, investigation and construction of 140 miles of aqueduct tunnels and four earth-fill dams.

1963 to date: Board of Water Supply of the City of New York as Consultant on present and future water supply projects.

- 1933-1943 Associated with Dr. C.P. Berkey in geologic work on: Lincoln, Queens-Midtown and Brooklyn-Battery subaqueous tunnels, Wards Island Interceptor Sewer Tunnel, and on foundations for Triboro and Whitestone Bridges.
- 1935-1939 With John J. Murphy organized and operated W.P.A. project, Rock Data Map of Manhattan; a collection and compilation of some 27,000 records of borings and other subsurface data.
- 1936-1939 As representative of Board of Estimate of City of New York, organized and operated W.P.A. project Mapping of Earth and Rock Borings. A collection of some 17,000 borings and other subsurface data in boroughs of the Bronx, Brooklyn, Queens and Richmond.
- 1944-1945 Borough of Manhattan Consultant on East River Drive and Harlem River Drive Improvement.
- 1947-1978 Consultant for Buck Seifert & Jost on water supply and sewer tunnel for San Juan, Puerto Rico.
- 1954-1964 Consultant to O.H. Ammann and Ammann and Whitney on foundations for Unionport Bridge, 104th Street Footbridge, Throgs Neck and Verrazano-Narrows Bridges.
- 1959-1965 Consultant to State of New Jersey Department of Conservation on Round Valley and Spruce Run Dams.
- 1967-1976 Consultant for Metropolitan Transit Authority on East 63rd Street Rapid Transit Tunnel.
- 1976-1978 Consultant to Teetor-Dobbins on Cross-Irondequoit Interceptor Sewer Tunnel.

Publications and Societies:

- Fluhr, T.W.; Geologic Features of Recent Engineering Projects in New York City. J. Municipal Engineers, Vol. 25, 1st Q, 1939. (Prize Paper of 1938).
- Fluhr, T.W. & Robert Legget: Reviews in Engineering Geology, Vol. 1, G.S.A. 1962.
- Fluhr, T.W.; Geology of Metropolitan New York and its Environs. Met. Section Construction Group, A.S.C.E. Tunnel Construction Seminar, Feb. 1974.
- Fluhr, T.W. & V.C. Terenzio; Geology of the Work of the Board of Water Supply. 1973 Open File: N.Y. State Museum & N.Y. Public Library.
- Am. Soc. of Civil Eng. - Fellow (Life Member)
- Municipal Engineers of the City of New York (Life Member)
- Geological Soc. of Amer. - Fellow
- Am. Geophysical Union
- Nat. Soc. of P.E. and N.Y.S.S.P.E.

The work listed in that abbreviated, succinct vita is important to all of us involved in engineering geology. Fluhr, along with his mentor and colleague Charles P. Berkey, placed geology in partnership with engineering as a vital consideration for any major construction project.

Tom laments in his paper on the New York City Water Supply about the lack of awareness of the public to the long-term water supply problems we face and the fact that public support for many engineering projects and almost all geologic projects comes only after disasters and catastrophes - most of which were predictable. The last paragraph of his paper read:

"Throughout the 73 years of existence of the Board of Water Supply of the City of New York, the Board and its engineering staff have tried to look into the future so that they might provide a good and adequate supply of water for the city and its environs. To that end they have developed plans, trying to foresee what will be needed in the next forty years.

Water supply has always depended on crisis. The New Croton System came about because of a shortage of good water and an epidemic of cholera. The Catskill System was built only because the Merchants committee realized the inadequacy of the previous supply. The Delaware System came about because of a drought. The Richmond Tunnel was built because of rapid development of the Borough of Richmond as a result of the building of bridges which provided access to the borough. Shortage of water at times in Brooklyn, and the need to supply Richmond have led to the beginning of City Tunnel No. 3.

We have had droughts and consequent water shortages in the past. We can expect them in the future. The final question is: "WILL THE PUBLIC HAVE THE FORESIGHT TO ANTICIPATE WATER EMERGENCIES, AND PROVIDE A SYSTEM WHICH WILL AVOID THEM?"

Even at this stage of his life, Tom Fluhr continues to fight ignorance and naivete. Tom Fluhr stands as a role model for us both in his work and in his concern for society.

Therefore, Mr. Chairman, ladies and gentlemen, this plaque is being awarded to Thomas W. Fluhr, P.E., Engineering Geologist. The plaque reads:

Engineering Geology Division
Geological Society of America

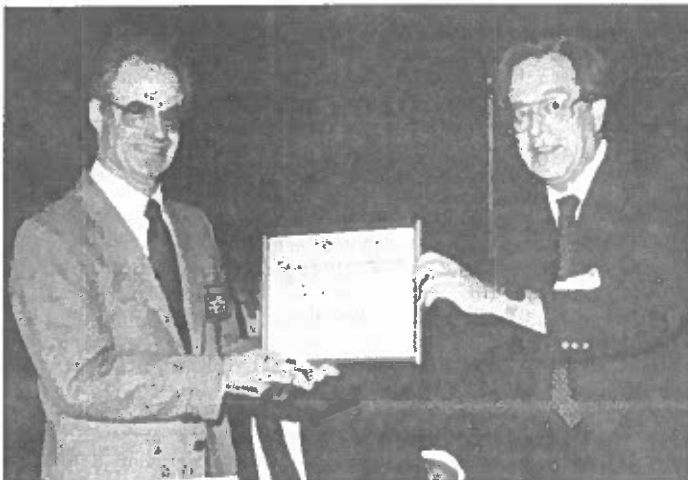
DISTINGUISHED PRACTICE AWARD

to

Thomas W. Fluhr

for a long and distinguished
career in the practice and
advancement of the profession
of engineering geology.

Tom, we salute your life of service to the Engineering Geology profession, to the Engineering Geology Section of the Geological Society of America, and to the geologist in the field, who daily wrestles with those construction projects that benefit mankind. May we learn from you and carry forward the work you have begun.



Don Mullineaux (left) accepts Burwell Award certificate from Chairman Erhard Winkler.

1983 E. B. Burwell, Jr., Memorial Award
Presented to Lipman and Mullineaux

Peter W. Lipman and Donal R. Mullineaux of the U.S. Geological Survey were the organizers and editors of the highly acclaimed 1981 U.S. Geological Survey Professional Paper 1250, "The 1980 Eruptions of Mount St. Helens, Washington." In recognition of this distinguished contribution to the Engineering Geology Profession, the E.B. Burwell, Jr., Memorial Award for 1983 was presented to Messrs. Lipman and Mullineaux at the annual Engineering Geology Division Luncheon in Indianapolis this past November. Chairman Winkler presented Award certificates; Mullineaux accepted them on behalf of Lipman who was in China at the time.

Proceedings of In-Situ Course Reviewed

Ervin, M.C., (ed.), 1983, In-Situ Testing for Geotechnical Investigations: Proc. Extension Course at Sidney, Australia (1983), held under auspices of Australian Geomechanics Soc., A.A. Balkema, Rotterdam, 131 p., hardbound, \$26.00, available in the U.S. from A.A. Balkema, 99 Main Street, Salem, New Hampshire 03079.

Balkema is continuing its service of publishing the proceedings of engineering geological and geotechnical congresses and symposia, and doing so at a competitive cost; especially in terms of prices now associated with NTIS hardcopies of Government research reports.

Ervin's edited Proceedings contains nine papers designed to bring the practicing geotechnical engineer and engineering geologist into a better awareness of the use of in-situ testing. The book is typeset and has been placed in press in a timely fashion, only four months after completion of the extension course in Sidney. A significant number of drawings are used, however, the book is entirely without photographs.

The authors are the original course lecturers. As such, they were chosen for present or past experience in geotechnical practice; eight of the ten are presently practicing; two are university faculty.

Ervin has attempted to keep a high element of practicality in the text. The book is arranged as follows:

Why in-situ testing?, by I.W. Johnston, sets the stage for the following papers, drawing upon the practitioner's need to identify strength and deformability as key engineering parameters and to detect why these parameters are affected by in-situ stresses and permeability. Johnston's reference list is current to 1982, with many 1970s citations.

D.J. Douglas, in his The Standard Penetration Test, relies heavily on the excellent treatment of the subject, as presented in the Second European Symposium on Penetration (ESOPT; 1982) and deals with such critical facets as the Australian need to accommodate their many departures from standard North American geotechnical practice, which does not readily accommodate weak rock and residual soil.

Quasi-Static Penetration Testing is the subject of the G. Sutcliffe-C. Waterton presentation, in which the reader is acquainted with the 135-year history of this technology, with reference to the literature through 1982. Interpretation and presentation of results are stressed, along with advice on applications in various soil types and under various ground conditions, including offshore applications. Most references in the paper are in the 1974-1982 range.

Editor Ervin concentrates on The Pressuremeter in Geotechnical Practice, in which he recognizes the relative youth (since about 1954) of the technique. The Australian regional geologic bias toward weak rock profiles (deep weathering and residual soil accumulation) again appears. The author cleverly inserts commentary towards the use of various instruments in actual field practice. There is an excellent section on interpretation of test results. Nine, self-developed cautionary remarks are provided concerning appropriate use of the instruments. There are six brief case histories from the author's practice. Most of the references are in the 1975-1982 time frame.

B.F. Walker's paper dealing with Vane Shear Strength Testing is essentially a manual on the general use of such instruments. The elements of a generic vane shear test provide most of the discussion, backed up by a section on interpretation of test results. References are limited to benchmark papers and are current to 1982.

Plate Loading Tests on Soil and Rock is the subject of P.J.N. Pells' contribution, which is limited to considerations of assumptions relating to presumed elasticity of the tested material and to proper interpretations of test results. References are complete through 1982.

R.J. Whiteley deals with Recent Developments in the Application of Geophysics to Geotechnical Investigation, presenting a tutorial overview that is not new itself, but which contains an excellent set of generalized plots relating the effect of physical and engineering properties on geophysical parameters. References are current to 1982.

Insitu Permeability Testing in Soil and Rock is the subject of the P.J. Burgess paper, which does not address the complex problem of the unsaturated zone, preferring instead to take a deeper-borehole approach

limited to foundation engineering usage. The reference list is limited and cannot be assumed as up-to-date.

L.K. Walker, in Instrumentation in Soil has undertaken a hopeless task for such limited coverage. Generalizations are made, concerning the use of in-situ instrumentation in foundation engineering, with applications toward foundation modeling, coal-mine water inflow estimation, test embankments on alluvial clay, and excavation strut loads. GSA Fellow/EGD member Ralph Peck's Observational Method is embraced. References are limited to those necessary to substantiate the author's commentary.

All-in-all, the symposium presents a very handy review of the general subject of in-situ geotechnical testing, short of the instrumental aspects and the necessary gloss-over of engineering geophysics. The book has its strengths in the straight-forward advice from geotechnical practitioners who use the in-situ test devices, and running commentary on their applicability to weak-rock and residual soil application. The book should apply directly to some aspect of the practice of Engineering Geologists who are field-testing specialists. After all, how far does \$26.00 go these days toward collection of sound advice...?

Review by: Dr. Allen W. Hathaway
Univ. of Missouri, Rolla

INTERNATIONAL ASSOCIATION OF ENGINEERING GEOLOGY

The United States Committee for the International Association of Engineering Geology invites U.S. citizens and residents to join the IAEG.

The International Association of Engineering Geology is affiliated with the International Union of Geological Sciences. Membership includes more than 4,000 geologists from over 40 countries. Its aims are to promote and encourage the advancement of engineering geological research and technology; and to collect, evaluate, and disseminate records of results and failures in engineering geological activities from all over the world. To this end, it sponsors international symposia on all aspects of engineering geology; and publishes the results and failures, and papers from the symposia in the excellent Bulletin of the IAEG, which is generally published twice a year. Reports of working commissions of the IAEG may also be published by UNESCO.

International symposia sponsored by IAEG during the last five years have explored the following topics: engineering geological mapping (held in England); soil and rock investigation by in situ testing (France); engineering geological problems of construction on soluble rocks (Turkey); engineering geological problems in hydrotechnical construction (Tbilisi, USSR); and engineering geology and underground construction (Portugal). IAEG is a sponsor of the 4th International Conference on Landslides scheduled for Toronto, Canada, 16-21 September, 1984. An IAEG symposium on hazardous chemical wastes will be held in the United States in October, 1985, in conjunction with the annual meeting of the Association of Engineering Geologists (AEG) in Winston-Salem, North Carolina.

An IAEG International Congress is held every four years, and major meetings are held in the interim in association with the International Geological Congresses.

The IAEG will participate in the ICG to be held in the United States in 1989.

An ad hoc Panel on the "Status/Progress of Research Activities in Engineering Geology-USA" has been formed. The Panel will compile, review and identify the varied and diverse research efforts and projects that are relevant to both the training and the practice of engineering geology; representatives are from academic, government, and industrial organizations. The Panel will act as an unbiased reviewer and endorse neither attitude in the long-standing debate as to whether an engineering approach to research is better than a scientific-geological one and visa-versa. An informal report will be prepared for distribution to the U.S. Committee of IAEG by mid-1985.

Cost of membership in IAEG is \$12.00 per year. Half of this nominal sum covers a subscription to the Bulletin, which provides a compendium of the most recent world-wide developments in engineering geology. As such, it is an invaluable practical reference to the latest theories and techniques in engineering geology in all parts of the world. The cost of the bulletin to non-members is \$30.00 annually. Although the official languages of the IAEG are English and French, most papers published in the bulletin are in English.

To join the AIEG, send your check for \$12.00 to David J. Varnes, MS903, Box 25046, Denver, Colorado, U.S.A., 80225.

Canadians and Mexicans should direct enquiries to their own National Groups of IAEG through the North American Vice President, D.J. Varnes.

DIVISION TECHNICAL SESSION POSTPONED

A one-half day technical session sponsored by GSA/EGD was planned for the 25th Annual Symposium - U.S. National Committee on Rock Mechanics, June 1984. The session was titled "Deterministic and Probabilistic Properties in Rock Mechanics Practice." Because of the overwhelming response to the call for papers for the entire meeting, EGD was asked to reduce its session to two-hours, with 10-12 minute papers. The Division Committee felt this would be an inadequate manner to present such a complex subject and agreed to withdraw their session. It is likely that the Division will be reinvented to sponsor the same subject in 1985.

THE ENGINEERING GEOLOGIST is published several times a year at the Geological Society of America Headquarters in Boulder, Colorado. Manuscript typing is done by Katherine Keicher, New York State Geological Survey. News items, reviews and meeting notices for publication should be sent to:

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January 1, 1984

THE GEOLOGICAL SOCIETY OF AMERICA - ENGINEERING GEOLOGY DIVISION

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Distinguished Practice and Meritorious Service Awards

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Robert Schuster



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The first issue will be mailed to subscribers on March 1, 1984. Each issue will contain approximately 200 abstracts of articles from 31 core journals plus Masters and PhD theses from North American colleges and universities. In addition, each issue will include from the GeoRef database complete bibliographic citations of selected current books, maps, reports, and other publications. Those entries will be without abstracts.

For easy scanning, the abstracts and citations will be arranged by title under the following subject headings with cross-references to related entries appearing at the end of each section.

- | | |
|--|---|
| 01 General Engineering Geology | 12 Highways, Railroads, Pipelines |
| 02 Rock Mechanics | 13 Tunnels, Underground Installations |
| 03 Soil Mechanics | 14 Nuclear Facilities |
| 04 Earthquakes, Faults, Seismicity | 15 Waste Disposal |
| 05 Landslides, Slope Stability | 16 Waterways, Rivers, Fluvial Geomorphology |
| 06 Permafrost, Frost Action, Ice | 17 Ground Water |
| 07 Coastal Processes, Marine Engineering Geology | 18 Land Use Planning, Environmental Impact |
| 08 Subsidence, Karst Problems | 19 Mapping Methods and Cartography |
| 09 Construction Materials, Testing | 20 Remote Sensing |
| 10 Foundation Excavation, Treatment; Grouting | 21 Geophysical Methods, Instrumentation |
| 11 Dams, Reservoirs | 22 Miscellaneous |

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