

●The Engineering Geologist



THE
GEOLOGICAL SOCIETY
OF AMERICA

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

Volume 7 Number 2

October 1972

25TH ANNIVERSARY OF THE DIVISION

The first meeting of the Engineering Geology Division was held in 1947 at Ottawa, Canada. In recognition of this event, a 25th Anniversary booklet listing the past meetings and chairmen of the Division has been prepared. At the Division's Annual Luncheon, scheduled for November 14, 1972, in the Leamington Hotel, Minneapolis, Minnesota, Dr. Robert F. Legget, a past chairman of the Engineering Geology Division and past president of The Geological Society of America, will review the development of engineering geology during the 25-year history of the Division and look to the future in a talk entitled "1947-1972-1997."

Come to Minneapolis and join the celebration of our 25th Anniversary.

GSA COMMITTEE ON NATURAL CONSTRUCTION MATERIALS

Among the topics discussed at its November 1, 1971, meeting was the compilation of an annual or biannual annotated bibliography for publication by the section. Volunteers as well as new committee members are welcome. For information write to the Chairman, Prof. Erhard M. Winkler, Department of Geology, University of Notre Dame, Notre Dame, Indiana 46556.

CERTIFICATION IN ENGINEERING GEOLOGY

The number of Engineering Geologists who have re-registered in California was 848, as the first biennial renewal period was completed. Of these, 518 are California residents, 315 give home addresses from other states, and 15 are listed from other countries than the U.S.

Requirements for Certification in Engineering Geology were recently clarified by action of the Registration Board. Only 36 months experience in the field of engineering geology in an "apprenticeship" category is now required for certification, rather than the 48 months previously called for.

Reappointments to four-year terms have been made by Governor Ronald Reagan for Board members Ted Bear, John Curran, and Wilferd W. Peak.

DIVISION MEMBERS ADVANCED TO FELLOWS

The following Members of the Division were advanced to Fellows by action of the Council at its Spring 1972 meeting.

Norman R. Anderson	F. Beach Leighton
Emery T. Cleaves	Russell A. Paige
Richard E. Gray	Samuel C. Sargent
Rae L. Harris, Jr.	Harry L. Siebert
Richard E. Kucera	George B. Stevens
Donald L. Lamar	Wilbur G. Valentine

PROCTOR RECEIVES BURWELL AWARD

Mr. Richard J. Proctor of Arcadia, California, has been designated by the Council of The Geological Society of America as the recipient of the E. B. Burwell, Jr., Memorial Award for his paper, "Mapping Geological Conditions in Tunnels," *AEG Bulletin*, Volume 8, No. 1.

The award is made to the author or authors of a published paper of distinction which advances knowledge concerning principles or practice of engineering geology, or of the related fields of applied soil or rock mechanics where the role of geology is emphasized.

The presentation of the award will be made at the Engineering Geology Division's business luncheon which will be held during the Society's Annual Meeting in Minneapolis, Minnesota, November 13-15, 1972.

NOMINATIONS NOW OPEN FOR E. B. BURWELL, JR., MEMORIAL AWARD

The E. B. Burwell, Jr., Memorial Award of the Engineering Geology Division is made to the author or authors of a published paper of distinction which advances knowledge concerning principles or practice of engineering geology or of the related fields of applied soil or rock mechanics where the role of geology is emphasized. Although the paper shall have been published not more than five years prior to its selection, there is no restriction as to the publisher or publishing agency. The author or authors of the selected paper need not be a member or members of the Engineering Geology Division or of The Geological Society of America and need not be residents or citizens of the United States. A certificate and cash award will be presented to the recipient at the annual Engineering Geology Division luncheon.

The recipient of the award is selected by a six-member committee appointed by the Management Board of the division; however, any member of the division may nominate a paper or papers for consideration by the Award Committee by sending the name of the nominee, the title of the paper, and its publication source not later than January 15, 1973, to the secretary of the division, Emery T. Cleaves, Maryland Geological Survey, 214 Latrobe Hall, Johns Hopkins University, Baltimore, Maryland 21218.

OREGON GROUND-WATER STUDIES

The Oregon State Engineer is working closely with the Oregon Department of Environmental Quality in the initiation of ground-water quality studies. Wells in the vicinity of selected sanitary landfills are being monitored as a means of evaluating extent and effects of percolation. A system of rating sanitary landfill sites by means of numbers given to several parameters shows promise of developing into a reliable and useful tool.

Message From The Chairman

As the end of my one-year term as Chairman approaches, it is natural to reflect on the accomplishments of the past year. In an organization which functions through the activities of many individuals and committees working continuously over an extended period of time, it is difficult to identify and enumerate accomplishments on a short-term basis. However, the Division is effective, as evidenced in this 25th year, by the numerous sessions, symposia, and publications it has sponsored to aid in the continuing development of engineering geology. Less evident, but perhaps more important, are the pleasure and knowledge derived from talking with our peers at meetings.

One recent accomplishment which can be identified is the revision of the Bylaws to recognize current practices in The Geological Society and the Division. These revisions, prepared over a period of several years by the Long Range Planning Committee, particularly Past Chairman W. Harold Stuart, have been approved by the Management Board and hopefully will be approved by the GSA Council in November and submitted to the members of the Division for balloting early in 1973.

A change in the past year to improve the operation of the Division has been the appointment of reporters for technical areas (construction materials, dams and reservoirs, engineering seismology, river engineering, and underground excavation) which in the past have been covered by a technical committee. The reporters provide news items of interest to the Division's newsletter and keep the Management Board informed of important activities. When required, a reporter can serve as the nucleus for a committee to advise the Division on a particular topic or to organize a session.

The duties of the Division's Section Liaison Representatives have also been redefined to provide a closer contact between the Division and the GSA Sections. Currently, they keep the Management Board informed on Section activities pertinent to engineering geology, advise Section Chairmen in matters relating to engineering geology, and provide our Newsletter Editor with items of Division interest from their sections.

During the past year, considerable thought has been given to a suitable program to recognize the 25th Anniversary of the Division. The possibility of a full-day session on the history of engineering geology was studied. However, with the proliferation of papers and concurrent sessions at the Annual Meeting, it was decided to recognize our silver anniversary by the preparation of a booklet and to emphasize quality in planning a program. I am pleased to report that Dr. Robert F. Legget, a past chairman of our Division and a past president of GSA, has graciously agreed to present a 25th Anniversary address at our Annual Luncheon in Minneapolis.

In closing, let me say that this year, working with so many dedicated geologists, has been for me a remarkable experience. Thanks are due to the Management Board and all of those active in Division affairs for their enthusiastic help. May each of you become involved in Division activities so that our second 25 years can be even better than the first. I hope sincerely that the friendships we have formed during the past year will be remembered often and for a long time to come.

RICHARD E. GRAY
Chairman

SYMPOSIUM ON REGIONAL PLANNING DEMANDS FOR ENVIRONMENTAL MAPPING

This symposium will be presented at the GSA Annual Meeting in 1973 by the Joint ASCE-GSA Committee on Engineering Geology. Both planners and geologists will cover the following subject from their differing points of view: there is a great need for good engineering geology input to all regional planning, input that can be integrated with other planning elements. If the engineering geology input is not available in useable form at the appropriate time, the planning will go ahead without it.

LONG RANGE PLANNING COMMITTEE

The Division's Long Range Planning Committee was reorganized at the 1968 Annual Meeting to consider specific matters affecting the Division's future. The Committee membership consists of past chairmen who are familiar with the operation of the Division and can carefully evaluate changes affecting the Division based on their experience. The revised Bylaws of the Division, which it is hoped the GSA Council will approve in November so they may be submitted to the Division members for balloting, are the work of this Committee, particularly Past Chairman W. Harold Stuart.

Current members of the Committee are as follows: Howard A. Coombs, *Chairman*, H. Garland Hershey, Robert F. Legget, W. Harold Stuart, and Richard E. Gray (*ex-officio*).

DISASTER MITIGATION

Robert Wallace and James E. Slosson were the only geologists invited as participants in a National Workshop on Building Practices for Disaster Mitigation in Boulder, Colorado, on August 28–September 1, 1972. Its purpose was to define best current practice and ways to improve such practice; the approach was from discrete subject areas as well as from the interdisciplinary standpoint. Slosson's paper dealt with "Procedures and Criteria for Land-Use Planning."

SLOSSON WITH ARCHITECTS AND PLANNERS

James E. Slosson, professor of geology at Los Angeles Valley College, was one of five who conducted a short course entitled "Air Photographic Interpretation and Terrain Analysis" at Harvard University on July 17–21, 1972. Slosson's presentation on "Terrain Analysis Techniques" grew out of his extensive experience in this area, working directly with land planners. One of his recent papers, "Engineering Geology—Its Importance in Land Development," was written for the Urban Land Institute. He is also going to present a paper, "Urban Planning and Government Responsibility," at the International Conference on Microzonation at the University of Washington on November 3, 1972.

ERTS FOR PERMAFROST

The U.S. Geological Survey has initiated a new project to evaluate the applicability of satellite-acquired (ERTS) remote sensing data to aid in the solution of critical engineering-environmental problems in Alaska. The principal objectives of this project are to determine the regional distribution and character of permafrost (perennially frozen ground), and to inventory and monitor large-scale geologic hazards. Some of the more important geologic hazards to be studied are volcanic activity, earthquakes, major landslides, aufeis development, flooding (including outburst floods from glacier-dammed lakes), and glacier surges. Oscar J. Ferrians, Jr., 345 Middlefield Road, Menlo Park, California, is in charge of this work.

INFORMATION TRANSFER

Allen F. Agnew, who wears two hats as professor of geology at Washington State University and as director of the State of Washington Water Research Center, has been active in information-dissemination matters for the past couple of years. He presented testimony before the Congressional Committees on Interior and Insular Affairs a year ago, which culminated in authorizing legislation being signed into law, and then he testified before the two Appropriations Committees in April, 1972, which led to increased appropriations to the Interior's Office of Water Resources Research for FY 1973. Agnew represented the National Association of State Universities and Land-Grant Colleges as chairman of its Committee on Water Resources. He is also a member of the newly formed Committee on Technology Transfer of the Universities Council on Water Resources, and presented his views on that subject on two occasions during September—one at the University of Nebraska's two-day seminar entitled "Technology Transfer in Water Research—The Interface Between Producers and Users," and the other at Colorado State University, entitled "First International Conference on Transfer of Water Resources Knowledge."

Publications

SPECIAL PROCEDURES FOR TESTING SOIL AND ROCK FOR ENGINEERING PURPOSES, 5th Edition (Special Technical Publication 479), 630 p. \$15.75
American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pa. 19103

This is a most useful volume containing 97 suggested methods of tests and recommended practices which were compiled under the sponsorship of ASTM Committee D-18, Soil and Rock for Engineering Purposes. (Standard methods and recommended practices are published in another ASTM volume, Part II of the Annual Book of Standards.) Most engineering geologists are likely to find the 22-page introduction well worth reading and many of the suggested procedures of particular interest. Among these are the procedures for measuring water levels in bore holes, making resistivity surveys, logging borings, a guide to the use of bore hole cameras, conduct of soil and foundation engineering investigations, x-ray diffraction of clays, permeability of undisturbed soil and rock specimens, load-deflection relationships of piles and in situ shear strength testing of rock.

Many of those engineering geologists who are not familiar with this volume and its companion, Part II, as well as the other 33 related ASTM publications, may be missing a very useful body of information. Some of those who do become acquainted with these publications may find that they can make some contribution to the work of Committee D-18. Standard and tentative procedures are subject to periodic review and revision; suggested procedures often advance to tentatives and then standards, usually after considerable revision. Additional procedures are needed.

ENGINEERING GEOLOGY IN SOUTHERN CALIFORNIA Reprint \$14.00
(California residents please add 5% tax). Association of Engineering Geologists, Geology Book, P. O. Box 1242, Arcadia, California 91006

This unique 39-author book is again available. First published in 1966, the original 1000 copies sold out rapidly. The 389-page book contains 12 chapters covering every major phase of engineering geology, with many case histories, illustrations, and extensive bibliographies. A new hard cover binding has been added.

More than half of the papers are concerned with principles of practice that are applicable anywhere in the world, such as earthquakes and faults, landslides, urban geology, groundwater, marine geology, legal aspects, rock mechanics, dams, tunnels, etc. The paper on "Landslides and Urban Development" won the Claire P. Holdredge Award for author F. Beach Leighton.

Three large maps in the pocket include an index map showing major geologic and engineering features (larger faults, earthquake epicenters, oil basins, dams, aqueducts, etc.), a soils distribution map, and a landslide location map with more than 3000 entries.

The purpose of the publication as stated by the editors, Richard Lung and Richard Proctor, is "... to enlighten and inform not only the technician and geological scientist, but the well-read layman who is interested in how engineering geology relates to the day-to-day affairs of society."

GEOLOGICAL AND GEOGRAPHICAL PROBLEMS IN AREAS OF HIGH POPULATION DENSITY, Symposium Proceedings, AEG Annual Meeting, 1970 \$5.00
With three field trip guides and meeting abstracts \$7.50
Copies may be purchased from: Mrs. Phyllis Cordes, Administrative Secretary, AEG, 2570 Oakwood Manor Drive, Florissant, Missouri 63031, 217 p.

The seven symposium papers discuss mine subsidence, numerical methods in rock mechanics, underground openings, new towns, urban expansion, and solution cavities. The authors are from western Europe and Japan.

The field trip guides cover four dams, one pumped storage facility, the Chesapeake and Ohio Canal, and the engineering geology of Puerto Rico.

MINING AND GROUND-WATER GEOPHYSICS, 1967
Queens Printer for Canada, Ottawa, Canada \$12.75

This volume contains fifty-eight papers presented at the Canadian Centennial Conference on Mining and Groundwater Geophysics held at Niagara Falls, Canada, in October 1967. It was edited by L. W. Morley, Chief of the Exploration Geophysics Division, Geological Survey of Canada. The authors are from Canada, U.S.A., England, France, Germany, Denmark, the U.S.S.R., Israel, South Africa, India, and Australia. Fifteen of the papers are specifically on groundwater. All but two of the papers are in English.

ORGANIC COMPOUNDS IN AQUATIC ENVIRONMENTS
Marcel Dekker, Inc., 95 Madison Avenue, New York, New York 10016
No price reported.

This volume originated in the Fifth Rudolfs Research Conference held at Rutgers University in July 1969. This book is directed to the researcher and teacher of environmental problems and is considered to be a contribution to an understanding of organic pollutants.

INVESTIGATION OF HEAVE IN BILLINGS SHALE BY MINERALOGICAL AND BIOGEOCHEMICAL METHODS
Penner, E., Gillott, J.E., and Eden, W. J., 1970. Canadian Geotechnical Journal, volume 7, no. 3, p. 333-338.

The basement floor of a recent addition to a telephone building showed domal heaving up to about four inches. Continual realignment of generating and switching equipment was required in addition to disconnecting a partition wall to avoid damaging the floor above. The bedrock is 20 feet of black, pyritiferous and fissile shale, the Ordovician Billings Formation.

Beneath the heaved areas the shale is moist, soft, and acidic. This altered shale contains weathered pyrite, jarosite, gypsum and bassanite; as well as expansive, mixed layer clays and *Ferrobacillus-Thiobacillus* bacteria. These bacteria were shown to be capable of oxidizing ferrous iron to ferric iron in an acidic environment.

UNESCO PUBLICATIONS

Among the publications listed in "Scientific maps and atlases and other related publications, Catalogue 1971-1972" that may be of particular interest to members of the Division are the following:

HYDROLOGY OF FRACTURED ROCK: PROCEEDINGS OF THE DUBROVNIK SYMPOSIUM, OCTOBER, 1965
Composite: English/French, 1967, Vol. I, 420 p.; Vol. II, 269 p. Two volumes: \$22.00

The description indicates particular emphasis on Karstic regions.

LAND SUBSIDENCE: PROCEEDINGS OF THE TOKYO SYMPOSIUM, SEPTEMBER, 1969
Composite: English/French, 1970, Vol. I, 324 p.; Vol. II, 337 p. Two Volumes: \$26.50

Comprehensive coverage regarding both geographical location and types of subsidence.

GROUND-WATER STUDIES. AN INTERNATIONAL GUIDE FOR RESEARCH AND PRACTICE
Paper: \$8.50 Cloth: \$12.00

Contains recommendations concerning the organization of and methods for undertaking ground-water investigations, the procedures for establishing ground-water balances, the forecasting of ground-water conditions, the selection and location of ground-water stations, the choice of instruments and equipment, and methods for collecting, processing, and analyzing data.

These publications, as well as the catalog, may be obtained from UNIPUB, Box 433, New York, New York 10016

ENVIRONMENTAL GEOMORPHOLOGY, PROCEEDINGS OF THE FIRST ANNUAL GEOMORPHOLOGY SYMPOSIA SERIES, held at Binghamton, New York, October 16-17, 1970

Donald R. Coates, ed., 262 p., Publications in Geomorphology, State University of New York, Binghamton, New York 13901

\$3.00

This volume contains fourteen papers. Among those of particular interest to this reporter discussed the effects of straightening river channels, beach erosion control, permafrost problems, hydrogeology and highways, terranes in East St. Louis, and determining "just compensation" when eminent domain took the gravel pit.

THE SLIDE AT BRILLIANT CUT (PITTSBURGH, PA.)

James V. Hamel, Presented at 13th Symposium on Rock Mechanics, University of Illinois, August 30-September 1, 1971

Reviews the 1904-to-1941 history of the slide movement and the probable cause of its final, major movement—frozen, natural seepage zones caused high hydrostatic pressure in the slope and in the open joint at the rear of the slide. Residual shear strengths were calculated or measured for the seven rock groups cut by the failure surface. It is concluded that the pre-1941 movement did not reduce the shear strengths to their residual value. However, the material along the failure surface after the 1941 slide had a true residual strength. The slide mass rotated slowly and continuously as the toe was excavated during the remedial work.

UTILIZATION OF MARGINAL LANDS FOR URBAN DEVELOPMENT

Rutledge, Philip C., Journal of the Soil Mechanics and Foundations Division, ASCE, January, 1970.

An excellent article that should be read carefully by anyone involved in the development of wetlands for building sites, especially geologists who assist in urban planning around coastal cities. The author summarizes both the problems and the solutions and gives examples of site development costs. He points out the high variability in the subsurface conditions of marginal lands and that the specific locations of structures within a site may make a great difference in cost.

ASPHALTIC CONCRETE BLANKETS AND CORES FOR FILL DAMS AND PUMPED STORAGE RESERVOIRS

Lohr, A., and Feiner, A., 10th Congress on Large Dams, Montreal, Canada, 1970

A summary of about twenty years' experience with the use of asphaltic concrete in the cores of six dams and as blankets on twenty-one dams and six pumped storage reservoirs. Through the use of asphaltic concrete, water-impounding embankments can be built where the natural, impervious materials are not available locally. The effects of seepage, settlement, and earthquake shocks are minimized by appropriate design of the structure and of the asphaltic concrete mixture.

IAN CAMPBELL SUCCEEDS WILFERD PEAK

At a meeting of the State Board of Registration for Geologists held in Santa Barbara on July 13, 1972, Wilferd W. Peak concluded his third term as President of the Board, having served since its inception in 1969. Mr. Peak, Chief Geologist, Division of Safety of Dams, Department of Water Resources, will continue to serve as a member of the Board.

Mr. Peak was presented with a plaque on behalf of the Board's recognition of his untiring efforts and dedication to Board activities.

Mr. Peak's successor is Dr. Ian Campbell, formerly the State Geologist of California before his retirement in October 1969. Dr. Campbell is also currently serving as President of the California Academy of Sciences in San Francisco. Both Mr. Peak and Dr. Campbell are certified Engineering Geologists in California.

CORDILLERAN SECTION MEETING

Cordilleran Section, GSA, 69th Annual Meeting, Portland, Oregon, March 22-24, 1973. Three items of note:

1. Special Session on *Urban & Environmental Geology*. Convener: Dr. Leonard A. Palmer, Department of Earth Sciences, Portland State University, P. O. Box 751, Portland, Oregon 97207.
2. Field Trip, March 25 (one day), *Environmental Geology of the Portland Area*. Leaders: Palmer, Redfern, Dodds.
3. *Engineering Geology Division Business Meeting and Luncheon*, Thursday, March 22.

1973 SECTION MEETINGS

NORTHEASTERN SECTION MEETING – March 22-24, Bethlehem, Pa., Richard Faas, Program Committee Chairman, 214 Porter Street, Easton, Pa. 18042. Abstract deadline is November 22, 1972.

CORDILLERAN SECTION MEETING – March 22-24, Portland, Ore., Richard E. Thoms, Program Committee Chairman, Dept. of Earth Sciences, Portland State University, Portland, Ore. 97207. Abstract deadline is November 22, 1972.

SOUTH-CENTRAL SECTION MEETING – April 5-7, Little Rock, Ark., Norman F. Williams, Program Committee Chairman, 8490 Rodney Parham Rd., Little Rock, Ark. 72205. Abstract deadline is December 5, 1972.

NORTH-CENTRAL SECTION MEETING – April 11-14, Columbia, Mo., Jerry D. Vineyard, Program Committee Chairman, Missouri Geological Survey, Box 250, Rolla, Mo. 65401. Abstract deadline is December 11, 1972.

SOUTHEASTERN SECTION MEETING – April 11-14, Knoxville, Tenn., Kenneth R. Walker, Program Committee Chairman, Dept. of Geology, University of Tennessee, Knoxville, Tenn. 37916. Abstract deadline is December 11, 1972.

ROCKY MOUNTAIN SECTION MEETING – May 3-6, Boulder, Co., Edwin E. Larson, Program Committee Cochairman, Dept. of Geological Sciences, University of Colorado, Boulder, Co. 80302. Abstract deadline is January 3, 1973.

Abstracts must be submitted to the Program Committee Chairman four months before the meeting. Obtain forms from the Program Committee Chairman or from Headquarters.

