



The Hydrogeologist

NEWSLETTER OF THE HYDROGEOLOGY DIVISION OF THE GEOLOGICAL SOCIETY OF AMERICA, SEPTEMBER 1984

MESSAGE FROM THE CHAIRMAN

Dear Colleagues:

At the three-quarters mark of my tenure I am happy to report that all arrangements are moving forward toward what should be a bang-up Reno meeting. The program has been firmed up as reported elsewhere in this newsletter. Judging by the number of abstracts volunteered, the Reno meeting should set a new attendance mark. Some 1,827 unsolicited abstracts were received by the Society as compared to 1,103 for the Indianapolis meeting and 1,366 for the New Orleans meeting. Indeed, this great number of proposed papers forced the Society to impose a 28 percent rejection rate for unsolicited papers. However, by adroit management, Terry Katzer, our Program Chairman, was able to schedule more hydrogeology papers than the rejection rate called for. Also, do not overlook the two outstanding hydrogeology field trips arranged by Jack Hess, Pat Glancy, and Roger Jacobson--Truckee-Carson River Hydrogeology and Hydrogeology of the Nevada Test Site.

The O. E. Meinzer Award will be presented to Frank Schwartz and Leslie Smith for a body of papers on stochastic modeling of mass transport in ground water. Note that this will be the first award for a body of scientific work rather than a single paper, in line with recent changes in the Division By-Laws.

Frank Schwartz will finish his tour as Birdsall Distinguished Lecturer with presentation of his lecture immediately preceding the Annual Luncheon. Charles Kreittler, Texas Bureau of Economic Geology, will succeed him as Birdsall Lecturer for 1985.

The two ad hoc committees appointed in reponse to decisions at last year's Business Meeting have virtually completed their work and will present final reports. The Committee on a Meritorious Service Award, and under Darryll Pederson's leadership, has recommended that such an award be established. It will be called the Award for Distinguished Service in Hydrogeology. In accordance with the Committee's recommendation, and with the approval of the Management Board, the initial award will be made posthumously to G. Burke Maxey, one of the founders of the Division. This action is especially appropriate to the Reno meeting, as Reno was Burke's home base for many years.

The Committee on Hydrogeologist Certification has been studying this fast-breaking issue under Milt Hackett's leadership and will report their findings at the Business Meeting.

In closing, I wish to thank my fellow officers and members of Division Committees for their wholehearted cooperation and support during my term of office.

George H. Davis, Chairman
Hydrogeology Division

RENO

1984 GSA ANNUAL MEETING & EXPOSITION

1984 ANNUAL MEETING AT RENO

November 5-8, 1984

Terrance L. Katzer and John W. Hess, Hydrogeology Division members of the Joint Technical Program Committee, have organized an exciting program for our 1984 annual meeting. Division-sponsored activities and other activities of possible interest to Division members are:

Saturday-Sunday, November 3-4

Premeeting Hydrogeology Division Field Trip: **Truckee-Carson River Hydrogeology**. Patrick A. Glancy and Roger Jacobson. Limit 80; fee \$100 (includes lodging, two lunches, and one dinner). Departs morning November 3, MGM Grand Hotel. Preregistration deadline: October 5, 1984.

Friday-Sunday, November 2-4

Premeeting Field Trip: **Geology of the Nevada Test Site**. Holly D. Ander, Frank M. Byers, and Paul P. Orchild. Limit 90; fee \$215 (includes two nights lodging, one breakfast, two lunches, one dinner, and airfare to Reno). Reception in Las Vegas, November 2. Departs Las Vegas, November 3. Restricted to U.S. citizens; proof of citizenship required. Preregistration deadline: October 5, 1984.

Sunday, November 4

GSA Annual Welcoming Party. MGM Grand, 1800-2100. Registration desk will be open.

Monday, November 5

Hydrogeology Division Symposium on **Arid-Zone Isotope Hydrology**. Convenor: Alan H. Welch. MGM Grand, Bijou Complex, 800-1115. 11 papers, 15 minutes each.

Hydrogeology I. Janet S. Herman presiding. MGM Grand, Capitol I, 1045-1130. 3 papers, 15 minutes each.

Hydrogeology Division Symposium on **The Nevada Test Site: Geology, Geophysics, and Hydrogeology**. Convenors John W. Hess and H. Lawrence McKague. MGM Grand, Bijou Complex, 1400-1800. 15 papers, 15 minutes each.

Hydrogeology Division Cocktail Party. Guest of honor Jane Maxey. MGM Grand, Roxy A, 1815-2100.

Tuesday, November 6

Hydrogeology Division Management Board Meeting: MGM Grand, Parlor 450A, 830-1030.

Birdsall Distinguished Lecture: A Case Study of Ground-Water Contamination from a Chemical Spill by Franklin W. Schwartz. MGM Grand, Goldwyn A and B, 1100-1200.

Hydrogeology Division Luncheon, Awards, and Business Meeting: MGM Grand, Goldwyn A and B, 1230-1500 (cash bar 1200-1230). Luncheon cost \$14 (luncheon tickets available by preregistration or at GSA registration desk up to 24 hours before luncheon).

Wednesday, November 7

Hydrogeology II. Gilbert F. Cochran and David Nichols, presiding. MGM Grand, Bijou Complex, 1330-1730. 16 papers, 15 minutes each.

GSA Night at the MGM Grand Ziegfeld Theatre, "Hello Hollywood, Hello." Dinner and show. Cost \$30. Preregistration recommended.

Thursday, November 8

Geomorphology Division Symposium on **Ground-Water Geomorphology: Role of Underground Water in Earth Surface Processes and Landforms**. Convenors: Charles G. Higgins and Donald R. Coates. MGM Grand, Cinema 11, 800-1200.

Hydrogeology Division Poster Sessions: MGM Grand, Fronton Foyer, 1300-1700. 13 posters.

Thursday - Saturday, November 8-10

Postmeeting Field Trips: **Hydrogeology of the Nevada Test Site**. John W. Hess and Roger Jacobson. Limit 90; fee \$209 (includes two lunches and two nights lodging). Limited to U.S. citizens; documentation required. Flight to Las Vegas early evening of November 8; ends at the Las Vegas airport late afternoon on November 10.



REMEMBER TO VOTE ABSENTEE IN THE NATIONAL AND LOCAL ELECTIONS. CHECK WITH YOUR COUNTY ELECTION BOARD.

FRANKLIN W. SCHWARTZ AND LESLIE J. SMITH,
1984 MEINZER AWARD RECIPIENTS

Franklin W. Schwartz and Leslie J. Smith of the Universities of Edmonton and British Columbia, respectively, are the recipients of the 1984 O. E. Meinzer Award. The two scientists were recognized for their papers on stochastic modeling of mass transport in ground water that were published in Water Resources Research. The papers cited by Meinzer Award Panel were:

- Schwartz, F. W., and L. Smith, 1980, Mass transport. 1. A stochastic analysis of macroscopic dispersion: Water Resources Research, v. 16, p. 303-313.
- Smith, L., and F. W. Schwartz, 1981, Mass transport. 2. Analysis of uncertainty in prediction: Water Resources Research, v. 17, no. 2, p. 351-369.
- Smith, L., and F. W. Schwartz, 1981, Mass transport. 3. Role of hydraulic conductivity data in prediction: Water Resources Research, v. 17, no. 5, p. 1463-1479.
- Tang, D. H., F. W. Schwartz, and L. Smith, 1982, Stochastic modeling of mass transport in a random velocity field: Water Resources Research, v. 18, no. 2, p. 231-244.
- Schwartz, F. W., L. Smith, and A. S. Crowe, 1983, A stochastic analysis of macroscopic dispersion in fractured media: Water Resources Research, v. 19, no. 5, p. 1253-1265.

The award was made for the first time this year for a body of papers rather than a single paper in accord with changes in the Hydrogeology Division Bylaws. The 1984 Meinzer Award Panel consisted of Bruce B. Hanshaw (Chairman), Richard L. Cooley, Grant Garven, Richard R. Parizek, and John M. Sharp, Jr.

Presentation of the award will be made during the Hydrogeology Division luncheon-business meeting on Tuesday, November 6, 1230-1500, in Goldwyn Rooms A and B, MGM Grand Hotel, Reno, Nevada.

DECADE OF NORTH AMERICAN GEOLOGY
HYDROGEOLOGY VOLUME

The co-editors of the DNAG Hydrogeology Volume, William Back and Paul Seaber, are convening an informal meeting for volume authors and coordinators following the Hydrogeology Division Reno Business Meeting, 1230-1500, November 6. The meeting is tentatively scheduled for the MGM Grand, Goldwyn A and B. The DNAG volume has four major sections: Introduction, Regional Synthesis, Comparative Hydrogeology, and Ground Water and its Relationship to Other Aspects of Geology.

CHARLES W. KREITLER
EIGHTH BIRDSALL LECTURER, 1984-1985

Charles W. Kreitler of the Texas Bureau of Economic Geology, Austin, Texas, is the Eighth Birdsall Distinguished Lecturer. The 1984 Birdsall Lecturer Committee, consisted of Patrick A. Domenico (Chairman), Richard R. Parizek, and Franklin W. Schwartz.

Following graduate studies in hydrogeology at the University of Texas at Austin, which he completed in 1974, Dr. Kreitler joined the full-time staff of the Texas Bureau of Economic Geology. He is presently a Research Scientist. His current research interests include the hydrology of deep basins, evaporite deposits, and isotope hydrology. He has been involved on behalf of the U.S. Department of Energy in investigations of salt deposits in the State of Texas for their suitability for nuclear waste isolation. He previously has conducted research on nitrogen-isotope geochemistry, subsidence and faulting in Houston, Texas, and Gulf Coast hydrology.

Each visit at host institutions consists of two formal presentations, one each for general and technical audiences, and informal discussions with faculty and students. Abstracts of Dr. Kreitler's lecture follow:

HYDROGEOLOGY: THE INTERACTION BETWEEN HYDROLOGIC AND GEOLOGIC PROCESSES

Hydrogeology is the study of the interaction of water and rock. It integrates the methods and ideas of two different fields of study: hydrology and geology. Too often, the geologist forgets that the rocks and geologic processes occur within a ground-water-saturated environment. Conversely, the ground-water hydrologist too often forgets that ground-water flow is controlled by the chemical and physical properties of the rocks as well as the hydraulic boundary conditions. More geologic input into hydrologic studies is needed and more hydrologic input into geologic studies is needed. The following examples show how these two disciplines interact. (1) Anhydrite and calcite cap rock on salt domes is the product of ground-water dissolution of the salt dome. Petrographic and geochemical studies of the cap rock can be used to characterize fluid flow conditions. (2) Ground-water flow and solute transport in sandstone aquifers are partially controlled by aquifer heterogeneity. Ground-water flow paths can be effectively characterized by integrating sedimentary facies mapping with numerical flow models. (3) Evaporite deposits result from the evaporation of ground water as well as the evaporation of surface-water flooding. Chemical and isotopic studies from coastal and continental evaporite deposits show the importance of ground-water evaporation.

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cont'd

**THE GEOLOGICAL SOCIETY
OF AMERICA**

**NOVEMBER 5-8, 1984
MGM GRAND • RENO, NEVADA**



97TH ANNUAL MEETING

(cont'd)

HYDROLOGIC CHARACTERIZATION OF A SEDIMENTARY BASIN:
THE PALO DURO BASIN AS AN EXAMPLE

Sedimentary basins are large-scale, complex, hydrogeologic systems. Most basins are composed of both fresh and saline waters. Fluid pressures may be overpressured, hydrostatic, or subhydrostatic. Fluid flow in some basins may be driven by compaction and thermal convection(?), whereas fluids in other basins are driven by topographic gradients. Young basins may contain original formation waters, while older ones have been flushed by continental waters. Understanding the hydrodynamics of a sedimentary basin is an exciting challenge to the hydrogeologist interested in large-scale, regional, hydrologic systems.

Understanding the hydrogeology of the Palo Duro Basin, a sedimentary basin in the Texas Panhandle, provides that challenge. The Palo Duro Basin contains both fresh and saline waters and has both hydrostatic and subhydrostatic pressures. The basin contains a shallow, hydrostatically-pressured, fresh-water aquifer separated from a deep, subhydrostatically-pressured brine aquifer by a leaky evaporite aquitard at intermediate depths. Because of uplift and tilting, the basin has been flushed by continental ground waters. The brines in the deep aquifer result from dissolution of evaporites by these waters being recharged at the outcrop, as well as leakage through the evaporite aquitard.

Characterization of the complex hydrology of a basin requires the integration of data and techniques from several hydrologic and geologic disciplines. This study includes chemical and isotopic data, DST, and pump-test data from specially designed wells down to depths of 8,000 feet, kriging of potentiometric data, numerical ground-water modeling, and petrographic studies.

A complete itinerary has not been established at this time, but it will coincide with the 1984-85 academic year. If you would like your institution to be included in Dr. Kreitler's Birdsall Lecture tour, inquiries should be directed to Dr. Charles W. Kreitler, Texas Bureau of Economic Geology, University Station, Box X, Austin, TX, 78713-7508, (512) 471-7721. Transportation expenses are paid by the Division; the host institution pays local expenses of the lecturer.

The Birdsall Lectures are funded by an endowment from the late John M. Birdsall, hydrogeologist, to acquaint students with distinguished professionals in the field of hydrogeology. Former recipients of the annual award are: **Jacob Bear**, TECHNION, Israeli Institute of Technology, Haifa, Israel; **William Back**, USGS, Reston, Virginia; **David A. Stephenson**, Woodward-Clyde Consultants, San Francisco, California; **Irwin Remson**, Stanford University, Stanford, California; **Patrick A. Domenico**, University of Illinois, Urbana, Illinois; **Richard R. Parizek**, Pennsylvania State University, University Park, Pennsylvania; and **Franklin W. Schwartz**, University of Alberta, Edmonton, Alberta.



REPORT ON
THE 1984 BIRDSALL LECTURE TOUR

One of the real treats of the Birdsall Lecture Tour is the opportunity to become acquainted with a variety of university programs operating in the United States and Canada. I spoke, listened, renewed old acquaintances or made new ones, and discussed research in hydrogeology in Canada at the University of British Columbia, Carleton University and Laval University; and in the United States at Syracuse University, the University of Wisconsin, the University of Minnesota, Texas A&M, University of Texas, Louisiana State University, and the University of New Orleans. I spoke to geological societies in Regina, Saskatoon, in Baton Rouge; and to the Kansas Geological Survey.

Another important fringe benefit of the tour is the opportunity to "eat your way across North America." Forgetting the plastic airline food, the culinary highlights of the tour included sampling a bottle of the new Beaujolais in Quebec City; Chinese food in Madison; crawdads along Lake Pontchartrain, Texas; chili in Austin; and too much Bourbon in College Station. In summary, the tour was successful, the hospitality along the way outstanding, and for me a great way to spend 1984.

Frank Schwartz

WANTED: SYMPOSIUM CONVENERS AT NATIONAL MEETINGS

Each year the Division is invited by GSA to sponsor a half-day symposium at the Annual Meeting. If you have a topic in hydrogeology of broad interest and are willing to put together a symposium of the caliber demanded by a national meeting, here is your opportunity. Please contact the Chairman or the Secretary-Treasurer of the Division for a copy of "Instructions to Symposia Organizers." Selections are made a year in advance by the Division Management Board at the Annual Meeting. GSA meetings are scheduled for:

1985 - Orlando, October 28-31
1986 - San Antonio, November 10-13
1987 - Phoenix, October 26-29
1988 - Denver, October 31-November 3
1989 - St. Louis, November 9-12

If you are interested in proposing a symposium for the 1985 Orlando Annual Meeting, the proposal should be submitted to the Chairman in time for the Division Management Board Meeting on November 6, 1984, in Reno, Nevada. The deadline for receipt of symposium proposals from the Division to the Joint Technical Program Chairman is January 1, 1985.

"GROUND-WATER REGIONS OF THE UNITED STATES"

PUBLISHED BY U.S. GEOLOGICAL SURVEY

The U.S. Geological Survey has published a 78-page summary of the ground-water resources of the United States. The publication, Water Supply Paper 2242, divides the country into 15 regions and includes a description of basic ground-water concepts and terminology. The report is entitled "Ground-Water Regions of the United States" and was authored by Ralph C. Heath. It is available for \$4.25 from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., 20402.

GSA FOUNDATION DONORS

The trustees of the GSA Foundation are seeking donations to the Foundation as well as names of potential donors. The Foundation was established in 1981 to solicit and administer funds for special GSA activities. At present, its principal activity is to provide financial support for the Decade of North American Geology to celebrate the centennial of GSA. If you are interested in contributing to the Foundation or know of potential donors, please contact Dwight V. Roberts, President of the GSA Foundation, at GSA headquarters.

INTERNATIONAL ASSOCIATION OF HYDROGEOLOGISTS

The International Association of Hydrogeologists is a nonprofit, international, scientific, and educational organization that was established to exchange hydrogeologic information and to advance the science of hydrogeology. IAH, which promotes cooperation between scientists who are working on hydrogeologic problems, is affiliated with the International Union of Geological Sciences (IUGS).

The IAH will accept for membership an individual engaged in hydrogeologic investigations, research, or management. Membership is granted on the basis of scientific qualifications, experience, and publications. Dues are \$17.00 per year. For membership applications contact F.L. Doyle, Secretary-Treasurer, IAH, 4875 Wheatstone Drive, Fairfax, VA 22030.

HYDROGEOLOGY DIVISION MEMBERSHIP

GSA members affiliated with the Hydrogeology Division stood at 869 as of June 30, 1984. This included 188 Fellows, 540 Members, and 141 Student Members.

HYDROGEOLOGY DIVISION

1984 Management Board

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John W. Hess, Field Trip Chairman

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Arthur Socolow

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1984 Committees

O.E. Meinzer Award Panel
Bruce B. Hanshaw, Chairman
Richard L. Cooley Grant Garven
John M. Sharp, Jr. Richard R. Parizek

Birdsall Lecturer Committee
Patrick A. Domenico, Chairman
Richard R. Parizek, Coordinator
Franklin W. Schwartz, Lecturer

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Ad Hoc Committee on Hydrogeologist Certification
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THE GEOLOGICAL SOCIETY OF AMERICA

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