Message from the Chairman

Dear Colleagues,

I am pleased to present this second message as the Hydrogeology Division Chairman for 1991, but I am also most humble in the light of 32 years of growth and achievement of the Division and the successes of its past officers. It has been a special honor and a gratifying privilege to serve as Chairman.

The Management Board of the Hydrogeology Division has spent this year advancing our programs and wrestling with the new opportunities and challenges facing our Division and profession owing to their growth. Dave Stephenson, Bruce Cutright, and Bill Woessner addressed many of these concerns in "Hydrogeology: It Is," (GSA Today, May 1991), as did Bob Farvolden and John Cherry in "Are Geology Departments Prepared for the 21st Century?" (Geology, May 1991). We must become a mature Division of GSA to the point of exercising our new-found influence with clearly stated, definite goals. At the same time, we need to find ways of attracting hydrogeologists who are not members of GSA: How do we distinguish our brand of hydrogeology from that of others in the same line of work? What is our marketing strategy to convince these people to join GSA and contribute their talents to the Hydrogeology Division? Recruitment will be one topic for discussion at our business meeting following the luncheon at San Diego.

Elsewhere in this issue of The Hydrogeologist are the results of the survey conducted by the Publications Committee. The lifeblood of the Hydrogeology Division and the GSA are its meetings and publications. In the past we concentrated on meetings somewhat at the expense of publications, and as a result our members' contributions to meetings have grown and flourished. GSA publications also are successful, but articles relating to hydrogeology have lagged behind the others, even though our membership makes up 11% of the GSA and ours is the second largest division. Although only about 6.4% of our 1,871 members responded to the survey, they indicated that the Division (1) does not play an effective or appropriate role as a professional organization in advancing groundwater science and (2) needs revitalization. More encouragingly, respondents also believe that (1) a strong Hydrogeology Division is needed, (2) its growth and development will be linked to publications, and (3) Geology and the GSA Bulletin are appropriate places to publish papers of hydrogeological and environmental interest. Publication also will be a major topic for discussion in San Diego.

We desperately need a prestigious journal for publishing research dealing with hydrogeology and hydrogeochemistry in relation to groundwater flow. Every paper on subsurface water in the recent American Geophysical Union (AGU) publication, "Contributions in Hydrology, U.S. National Report 1987–1990," stated that the major problem facing hydrologists is the clear need to define quantitatively the hydrogeologic framework of the subsurface environment. Geology and the GSA Bulletin are or will be rewarding places for publishing hydrogeologic research, although the perception seems to be that currently they are not. These journals have a higher impact on readers than do other journals, such as Water Resources Research and Ground Water, as pointed out by Jack Sharp in the Spring 1991 issue of The Hydrogeologist.

Much is made of hydrogeology being an interdisciplinary science, as was again made clear in the 1988 DNAG volume, Hydrogeology. The contributions of geologists of various specialties can all advance the science of hydrogeology. I believe that the pendulum will swing back

Paul D. Seaber
1991 Chairman
Hydrogeology Division
from the current emphasis on flow and transport models in porous, solution, and fractured media to an equivalent emphasis on research about the geology needed to explain flow and transport. The splendid efforts of modelers and mathematicians may have outstripped the understanding of geology required for a "real" solution to our problems, but professors and research grantors and grantees will begin to recognize the importance of geologic research in hydrogeology. When this happens students will have more reason to join GSA; other, underemployed geologists will have input to our science; and Geology and the GSA Bulletin will become more attractive places to publish leading-edge research on groundwater flow and transport.

The San Diego meeting should be a great success—the response to our call for papers was a good one. There were 159 hydrotogology abstracts volunteered for five theme sessions (three of which are crosslisted with other disciplines) and two hydrotogology discipline sessions. The rejection rate for hydrotogology abstracts exceeded the general guidelines, given the number of slots available, so we should expect top-notch presentations. Of the 140 accepted abstracts, 91 will be given in oral sessions and 49 in poster presentations. Please see the San Diego hydrotogology program summary elsewhere in this newsletter.

I am delighted with the awards to be presented this year at the Division luncheon. The Meinzer Award goes to Christopher E. Neuzil for some truly significant hydrogeological work in low-permeability environments. Many fine candidates were nominated for the Meinzer Award, and I thank Don Siegel and his committee for their efforts. Next year, the Meinzer committee encourages every Hydrogeology Division member to submit recommendations for awards.

I also want to thank Jerry Meyer and his committee for their work in selecting recipients of our Distinguished Service Awards. I am especially pleased because the awardees are my friends and colleagues. Keros Cartwright was a Division Secretary-Treasurer and Chairman, Bill Wilson was the longtime newsletter editor of The Hydrogeologist, and Claire Davidson was our conscientious Secretary-Treasurer for 4 years and the person responsible for organizing the Division's current records and schedules.

The student research grant winners for the Division are listed elsewhere in this issue of The Hydrogeologist. I again congratulate them and hope to see them and their supervisors in San Diego. I encourage each member to contribute to the Division Award Fund, which supports these grants.

I plan to meet with the newly appointed Long-Range Planning Committee comprised of former Division Chairmen. Of the 30 past Chairmen, 25 are alive today, 23 are still members of the Division, and at least 15 still are professionally active in hydrogeology. This group will give outstanding counsel to the Division, especially regarding what its long-range plans and policies should be.

I wish to close with appreciation to all the members of the Management Board and Division Committees for their work on the Division programs this year. Special attention must go to John Harsh, Secretary-Treasurer, Alan Dutton, newsletter editor, and Ken Hollett, Program Chairman. These three have the most time-consuming and demanding jobs in the Division. Without their efforts and those of the committee chairs, the things that keep the Division viable (and even in existence) just would not get done.

As with retirement, I will have a sense of both relief and nostalgia when I turn the gavel over to John Cherry in San Diego. A small warning: both the jurisdiction and responsibility of the Division have grown over the past 10 years. The 1992 officers are, however, more than qualified to respond effectively to the challenges and opportunities facing the Division. I have enjoyed my term as Chairman. It was a good job and something to do professionally between my return from Kuwait and my new position at the Desert Research Institute. Thank you for the confidence you have placed in this office.

Christopher E. Neuzil
O. E. Meinzer Awardee

Christopher E. Neuzil of the U.S. Geological Survey is the 1991 recipient of the O. E. Meinzer Award. The award is given to the author of a paper of distinction (or body of papers) that has advanced the science of hydrogeology or a related field. Chris Neuzil was awarded the honor on the basis of the following paper:


The O. E. Meinzer award has been conferred since 1965. Alan Dutton will have copies of the complete list of awarded papers at the Hydrogeology Division luncheon and business meeting in San Diego.

Keros Cartwright
Claire B. Davidson
William E. Wilson

1991 Distinguished Service Awardees

The Hydrogeology Division's Award for Distinguished Service in 1991 honors three persons, Keros Cartwright, Claire B. Davidson, and William E. Wilson, in recognition of their long and outstanding service to the discipline of hydrogeology.

The award was established in 1984 as a way of honoring George Burke Maxey, himself a distinguished hydrologist, co-founder of the Division, and enthusiastic teacher.
Shirley J. Dreiss
1992 Birdsall Distinguished Lecturer

Shirley J. Dreiss is the 1992 Birdsall Distinguished Lecturer. Dr. Dreiss received the Bachelor of Arts degree at The University of Texas at Austin, the Master of Arts degree under S. N. Davis at the University of Missouri, Columbia, and the Ph.D. under I. Remson at Stanford University. She has worked as a geophysicist for Texaco, an engineering geologist for Black and Veatch Engineers, and a hydrologist for Lawrence Livermore Laboratories and the U.S. Geological Survey. She is currently Professor of Earth Sciences at the University of California, Santa Cruz (UCSC).

Dr. Dreiss has long-standing research interests in karst hydrology and the influence of complex geologic settings on solute transport. At UCSC, she and her students have also worked on a variety of topics, ranging from a field study of chromium transport in variably saturated soils to a geostatistical characterization of the hydrostratigraphy of alluvial fan deposits. Dr. Dreiss has recently begun to work on fluid circulation in active submarine subduction zones and is currently a member of the Ocean Drilling Program’s Sedimentary and Geochemical Processes Panel.

Those interested in Dr. Dreiss visiting their institution during the Birdsall Lecture Tour for 1992 should contact her directly at the Earth Sciences Department, University of California, Santa Cruz, CA 95064; office phone: (408) 459-2225. Transportation is paid for by the Hydrogeology Division; the host institution pays the local expenses of the lecturer. Dr. Dreiss will speak on one or both of the following topics:

The Hydrogeology of an Active Subduction Zone

Only recently has the importance of groundwater flow in some geologic processes been fully recognized (for example, mineral depositional processes and tectonics). Dr. Dreiss will describe the hydrogeology of an active accretionary prism complex near the Lesser Antilles. Her study focuses on interpretations of recent deep ocean drilling data. These measurements indicate that pore pressures near the toe of the Barbados Ridge Complex may be close to lithostatic and that the décollement is a zone having relatively high rates of flow. The primary driving force for the flow is compaction of marine sediments as they are either accreted onto the overriding plate or carried downward with the underthrust plate. Fluids expelled from the compacting sediments influence many aspects of subduction zone geology, including heat and solute transport, sediment diagenesis, deformation features, and benthic biology. Although data are sparse, numerical models of fluid flow have proved useful for estimating intrinsic permeabilities of the sediments, pore-pressure distributions, and flow velocities.

This lecture is intended for an audience that has a broad geologic background.

Regional Scale Transport in a Karst Aquifer

In highly karstic aquifers, sparsely distributed solution features may control rates and directions of a large part of the regional groundwater flow. Water infiltrates quickly after storm events, and some of the infiltration moves rapidly through a network of solution conduits to spring outlets. The interaction and relative flow rates of water in conduits and secondary porosity lead to complex groundwater flow behavior. During times of rapid groundwater recharge, pressure heads increase in the conduits, and water flows rapidly through the conduits and enters adjacent pores and fractures. As pressure heads lower in the conduits, water migrates from the fine fractures and pores into the solution conduits. Under these circumstances, drainage from the pores and fractures controls flow rates in the conduits and at spring outlets. This type of flow cannot be described by means of continuum models for flow through porous media because the representative elementary volume of the conduit network is unknown and likely to be large. Similarly, models for flow in individual conduits are generally infeasible because the location and geometry of the conduits are unknown. However, travel time distributions of water or tracers in conduit-type karst aquifers can be found readily from tracer test data or from naturally occurring fluctuations in springflow chemistry. Statistical moments and effective transport properties computed from these distributions may prove to be a convenient means for studying and comparing regional scale transport in karst aquifers.

This lecture is intended for an audience that is familiar with groundwater hydrology.

Hydrogeology Program

1991 GSA Annual Meeting in San Diego

Submitted by Ken Hollett

The Joint Technical Program Committee (JTPC) representatives for the various GSA Divisions met in Boulder, Colorado, on August 2 and 3. Ken Hollett, 1991 Hydrogeology Division Program Chairman, Frank Schwartz, 1992 Program Chairman, and Paul Seaber, 1991 Hydrogeology Division Chairman, kept busy collating the three peer reviews of abstracts and organizing the meeting schedule. Of the more than 150 abstracts submitted for hydrogeology-related sessions, 19 were rejected. Sessions were scheduled so as not to conflict with other sessions of interest to hydrogeologists. The final program of Division-sponsored sessions and associated nonsponsored sessions is listed here. The August issue of GSA Today gives details of these theme sessions, symposia, short courses, and field trips.

Thursday–Sunday, October 17–20

- Field Trip 16: Groundwater basins along the eastern Sierra Nevada: tectonics, water, and politics
Friday–Sunday, October 18–20
- **Short Course 1**: Concepts, strategy, and software for practical three-dimensional transport modeling
- **Short Course 12**: Contaminant hydrogeology: Practical monitoring, protection, and cleanup

**Sunday, October 20 (afternoon)**
- **Symposium Session S-4 (I)**: Depositional environments and the development of aquifers (7 presentations)

**Monday, October 21**
- **Theme Session 14**: Site characterization studies related to groundwater and surface-water contamination at sites operated by the U.S. Department of Energy (19 presentations and 3 posters)
- **Theme Session 15**: Geology, hydrogeology, and tectonics of southern Nevada in relation to the potential storage of high-level nuclear waste (16 presentations)
- **Theme Session 21**: Geophysical exploration for groundwater in arid and semiarid regions (10 presentations)

**Tuesday, October 22**
- **Hydrogeology Division Management Board Meeting**
- **Theme Session 15**: Posters (5 posters)
- **Theme Session 16**: Characterization and monitoring of groundwater contamination at hazardous-waste sites: research and case histories (7 presentations and 9 posters)
- **Birdsall Distinguished Lecture**: “Groundwater in the world’s largest city,” to be presented by Robert N. Farvolden
- **Hydrogeology Division Luncheon, Awards, and Business Meeting**
- **Special Presentation**: “Trials and tribulations of a hydrogeologist as a hostage in Kuwait,” to be presented by Paul and Gerda Seaber following the Division luncheon and program (about 30 minutes)
- **Hydrogeology Posters I**: (10 posters)

**Wednesday, October 23**
- **Hydrogeology Posters II**: (10 posters)
- **Symposium Session S-4 (II)**: Continued from Sunday (16 presentations)
- **Hydrogeology I**: (16 presentations, including an introductory talk on San Diego County hydrogeology)
- **Hydrogeology Posters III**: (9 posters)

**Thursday, October 24**
- **Hydrogeology II**: (16 presentations)
- **Theme Session 22**: Multivariate statistical methods in the geosciences (8 presentations and 3 posters)

Friday–Sunday, October 25–27
- **Field Trip 29**: A hydrogeologic overview of the regional groundwater flow system in relation to Yucca Mountain, Nevada

Owing to the number of invited papers submitted for the Division’s symposium entitled, “Depositional Environments and the Development of Aquifers,” GSA has agreed to add a session at the San Diego Annual Meeting on Sunday afternoon, October 20. This added session will be held from 3 to 5 p.m. in the convention center. There will be 7 papers on Sunday (Session I) and 16 papers on Wednesday (Session II). Many of you will be arriving before 3 p.m. on Sunday, so why not come to the first half of our symposium before attending the welcoming reception that begins at 6 p.m.?

Be sure to use the preregistration and housing request forms in the August issue of *GSA Today*. Preregistration deadline is September 20. You don’t want to miss this meeting; it may be the largest and finest in the history of GSA. See you in San Diego!!

**Birdsall Lecture Series 1991**

Dr. Robert N. Farvolden of the University of Waterloo made four Birdsall Lecture trips between January 16 and April 9, 1991, visiting 23 cities and presenting 27 lectures. The following table lists institutions or groups visited and the approximate number attending the lectures. Two lectures were offered. Lecture 1 was titled “Groundwater in Human Societies,” and Lecture 2 was titled “Groundwater in the World’s Largest City” (which Dr. Farvolden will deliver at the San Diego meeting before the Division luncheon). Dr. Farvolden also presented Lecture 1 at the joint meeting of the NE and SE sections of GSA in Baltimore, and he gave a special lecture in Toronto to a group of about 30 at the Annual Meeting of the Geological Association of Canada and Mineralogical Association of Canada.

<table>
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<tr>
<th>Institution/Group</th>
<th>Lecture 1</th>
<th>Lecture 2</th>
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<tr>
<td>University of Wisconsin at Milwaukee</td>
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<td>30</td>
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<tr>
<td>University of Minnesota at Minneapolis St. Paul</td>
<td>35–40</td>
<td>45</td>
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<tr>
<td>Western Inter-University Geological Conference, Saskatoon</td>
<td>90–100</td>
<td>—</td>
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<tr>
<td>University of Alberta, Edmonton</td>
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<tr>
<td>University of Calgary, Alberta</td>
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<td>—</td>
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<tr>
<td>Groundwater Society of Ottawa, sponsored by Carleton University and Université d’Ottawa</td>
<td>—</td>
<td>60</td>
</tr>
<tr>
<td>University of New Mexico, Albuquerque</td>
<td>57–60</td>
<td>—</td>
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<tr>
<td>New Mexico Institute of Mining and Technology, Socorro</td>
<td>—</td>
<td>70</td>
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Desert Research Institute at the University of Nevada 20
University of Nevada at Las Vegas 20
Interdisciplinary Program in Surface and Subsurface Hydrology, University of California at Berkeley — 30
University of California at Santa Cruz — 50
Stanford University, Stanford — 28
Mackay School of Mines, University of Nevada at Reno — 30
Iowa State University of Science and Technology, Ames 50 30
University of Western Ontario, London 20
Wright State University, Dayton 20 35
Kent State University, Kent — 35
Duke University, Durham — 25
North Carolina State University at Raleigh — 20-25
Université du Québec à Chicoutimi — 35
Université Laval, Quebec — 45-50

Trials and Tribulations of Hydrogeologists in Peril

As many of you know, Paul and Gerda Seaber were in Kuwait last August 2, at the beginning of the Iraqi invasion. Their fate was still unknown at the time of the GSA Annual Meeting in Dallas. Paul and Gerda have both agreed to speak about their experiences as "guests" of Saddam Hussein in Kuwait. Their talk will focus on their personal experiences and those of their friends during their internment and release. Afterward they will answer questions and perhaps give their firsthand opinions on the Middle East fracas. The presentation is scheduled for Tuesday, October 22, after the Division luncheon and business meeting.

Long-Range Planning Committee to Meet in San Diego

The Division Chairman has appointed a Long-Range Planning Committee made up of former Hydrogeology Division Chairmen to help deal with Division programs and policies. The committee will meet for breakfast in San Diego on Monday, October 21, with the Management Board, along with Al Freeze, the Division Representative of GSA's Long-Range Planning Committee. Invitations have been sent to the 23 past chairmen who are still members of the Division. These former chairmen, boasting a wealth of talent and experience, should be able to make recommendations to the present and future Management Boards.

Bring a Friend to GSA

Please invite a hydrogeologist friend to attend the San Diego meeting (or to join the Hydrogeology Division of GSA without attending the meeting)! Note that first-year GSA membership dues are met when your friend attends the meeting—see the preregistration materials in the August 1991 issue of GSA Today. The GSA and the Hydrogeology Division have put together a worthwhile meeting for hydrogeologists centered on the themes of Global Challenge and Global Perspective. See you all in San Diego!

1992 Annual GSA Meeting in Cincinnati

The 1992 GSA Annual Meeting will be held October 26-29 in Cincinnati, Ohio. Frank Schwartz and E. Scott Bair at Ohio State University are serving as Hydrogeology Division Technical Chairmen for the meeting. They should be contacted as soon as possible with suggestions for symposia and theme sessions. As noted elsewhere in this issue, Gary Robbins is coordinating the hydrogeology program for the 1993 meeting in Boston. It is not too early to begin discussing field trip and symposia possibilities for that meeting.

GSA Travel Grant Program, 29th IGC in Kyoto, Japan—1992

GSA is accepting applications for the 29th International Geological Congress (IGC) Travel Grant Program. The 1992 IGC will be held in Kyoto, Japan, August 24-September 3.

This program was established as a final act of the Organizing Committee for the United States-hosted 28th IGC held in Washington, D.C., in July 1989. Surplus funds available at the conclusion of the 28th IGC were transferred to the GSA Foundation with the stipulation that income from the fund be used to support the attendance of young geoscientists at future IGC's, until such time as the United States would again host an IGC. Travel grants will consist of economy airfare to Japan and prepayment of the registration fee.

To be eligible, applicants (including students) must be residents or citizens of the United States; must have birth dates after August 31, 1952; and must have submitted an abstract for inclusion in the program of the 29th IGC. Qualifying applications and letters of support must be postmarked no later than October 31, 1991. Applicants will be notified of results early in 1992.
Results of Survey of Opinion on Hydrogeology Publications

Submitted by Frank Schwartz

Following are the results of a questionnaire survey printed in the Spring 1991 issue of The Hydrogeologist. We received 119 responses, approximately 6 percent of the mailing. The results indicate a need to revitalize the Hydrogeology Division by means of publications. Our publication strategy, however, is not clear. Many respondents feel the GSA Bulletin is the place to publish hydrogeological papers and favor it over a new journal. At least a third, however, feel that a new journal is required. Few thought that special projects such as DNAG could meet publication needs. The Committee on Publications will continue to examine the survey results and share them with interested groups. Any suggestions for our strategy for change should be directed to Frank Schwartz, Department of Geological Sciences, The Ohio State University, 125 South Oval Mall, Columbus, OH, 43210-1398, U.S.A.

1. The Hydrogeology Division, as it now operates, plays an effective and appropriate role as a professional organization in advancing groundwater science:
   5. strongly agree 2%
   4. 21%
   3. neutral 26%
   2. 40%
   1. strongly disagree 11%

2. The Hydrogeology Division is in need of revitalization:
   5. strongly agree 27%
   4. 40%
   3. neutral 22%
   2. 9%
   1. strongly disagree 2%

3. With other professional societies growing and flourishing (e.g., NWWA, and AGU), there is no real need for the Hydrogeology Division to be strong:
   5. strongly agree 2%
   4. 5%
   3. neutral 8%
   2. 31%
   1. strongly disagree 54%

4. The growth and future development of the Hydrogeology Division is strongly linked to GSA publications:
   5. strongly agree 25%
   4. 49%
   3. neutral 15%
   2. 8%
   1. strongly disagree 3%

5. The GSA Bulletin is an appropriate place to publish papers of hydrogeologic and environmental interest:
   5. strongly agree 21%
   4. 37%
   3. neutral 21%
   2. 15%
   1. strongly disagree 6%

6. I currently pay to receive the GSA Bulletin:
   a. yes 55%
   b. no 45%

7. With respect to journals, indicate which one of the following strategies should be followed:
   a. Encourage members to publish in GSA Bulletin and Geology and avoid creating yet another journal 43%
   b. Develop a creative strategy for publication that is based upon a series of special publications like DNAG 9%
   c. Start a GSA-sponsored journal that may include groundwater as a major area of interest 30%
   d. Create formal links to other organizations (e.g., IAH or Association of Engineering Geologists) to strengthen an existing journal 18%

8. If we promote a journal, what would be its character?

   Frequency:
   a. monthly 17%
   b. bimonthly 26%
   c. quarterly 56%
   d. yearly 1%

   Total coverage:
   a. broad, including environmental geology, hydrogeology, engineering geology, etc. 33%
   b. focused on groundwater topics 9%
   c. broad as in (a), but with articles focusing on groundwater 58%

   Feature articles:
   a. yes 92%
   b. no 8%

   Review articles:
   a. yes 82%
   b. no 18%

   Groundwater topics:
   a. all topics 39%
   b. geologically oriented 51%
   c. all topics, excluding ones well covered by Water Resources Research and Ground Water 10%
Advertising:
- none: 12%
- some but restricted: 71%
- considerable: 17%

Reviews of Books:
- yes: 90%
- no: 10%

Job ads:
- yes: 71%
- no: 29%

9. I would contribute articles to a journal as outlined in 8:
- yes: 86%
- no: 14%

10. With respect to special publications (e.g., Case History Volume) what strategies should be followed:
- Aggressively initiate and push along interesting projects according to a well-defined plan: 68%
- Wait for volunteers to initiate projects: 13%
- Avoid these projects altogether: 19%

11. With a few notable exceptions, our division has not been active in producing special publications. Why do you think this is the case:
- Apathy: 44%
- Lack of unique ideas or any real purpose for many of these special publications: 44%
- No appropriate reward for effort (e.g., commercial publishers will pay authors for special publications): 12%

Recent GSA Hydrogeology Articles

The GSA Bulletin and Geology seek more papers in hydrogeology. Of particular interest are those that relate hydrogeology to other theoretical or applied geological processes or those in which the geology serves as a controlling factor of the hydrogeology. Following are hydrogeology-related articles published in these journals during the past 6 months:


Hydrogeopinion

Don’t Let the Information Explosion Get You

by Jay H. Lehr

A half century ago, an individual could be a true renaissance man—one who wasmultitalented and conversant in many areas of science and the liberal arts. But just as the multisport athlete has disappeared (hence the publicity accorded the unique emergence of Bo Jackson as both a professional baseball and football player), so too has the intellectual having a depth of knowledge in multiple disciplines. Why? For the last 50 years, the world’s knowledge base has been growing exponentially.

Keeping current in even a single discipline amid the world’s knowledge explosion is almost impossible. Groundwater monitoring and remediation, which drive hydrogeology today, are changing even more quickly than other fields. Staying up to date with rapidly evolving practices, equipment, and procedures is thus difficult.

Can we know it all? No. Can we expect to know our chosen field of science and remain conversant in other fields? We can and we must, although it is not easy. Yet no matter how difficult we may find it to keep up in our profession, we must make an additional effort to appreciate what is going on in the world around us.

We in groundwater science are fortunate in being exposed to a multidisciplinary field of study. We all recognize the impact of biology, chemistry, mathematics, geology, computer science, geophysics, and hydraulics on our own projects.

But beyond that, we should be motivated to maintain a level of general knowledge in other areas, too. To do so enhances the credibility of our work and our ability to sort out inconsistencies in the hypotheses of others—particularly for those of us in environmental fields.

Unfortunately, most scientists limit their range of thought to their immediate field and thus give up the guidance of scientific investigation to the few whose goals are more basic. Too often, these few are administrators and not scientists. As a result, many scientists support the current environmental agenda by default rather than reason.

Dr. Richard Sanford, writing in Rational Readings on Environmental Concerns (Lehr, 1991), pointed to “a modern tendency in science to prove a proposition rather than to discover the truth.” Science philosopher Thomas Kuhn (Lennox, 1981) described the progress of science as a series of paradigms. Whether or not Kuhn was accurate, many scientists and much of society seem to believe that science consists of attempts to prove or disprove the prevailing paradigm. Thus, too often, the environmental view is considered correct despite the many data that cloud the issues.

Implicit in this widespread view is the idea that the content of one’s mind is somehow more valid than the products of observation and reason. Lack of confidence in the individual mind to know reality has become widespread. Reason is passively discarded in favor of appeals to authority, consensus, or intuition. For example, when the
head of the EPA recently declared that the ozone layer is thinning faster than previously thought, his assertion was accepted uncritically and broadcasted worldwide before the data and results appeared in a published journal and were reviewed critically by peer scientists. The implicit assumption is that such an authority cannot be wrong. Appealing to consensus is another invalid substitute for reason—polls of the general public by scientific organizations on questions such as global warming are valueless.

The dominant source of unreason is the reliance on intuition or feelings as the ultimate source of knowledge. Intuition leads one to start with a conclusion one feels is correct and then find evidence to support it. Rationalization is another term for this approach.

Overt appeals to intuition are rare among scientists, although they are common among intellectuals and philosophers. However, one must wonder now how much the private, personal views of many scientists are ruled by intuition. Even if reason is not explicitly rejected by those who hold intuition as important, the two approaches are mutually exclusive, and acceptance of intuition as a basic means of obtaining knowledge necessitates the rejection of reason [Sanford (Lehr, 1991)]. Thus it is imperative that we, as earth scientists, keep abreast of a wide range of knowledge, lest we become persuaded by ideas about science that have been generated in a scientific vacuum.

Because of time demands, without exception, not one of us can keep up with our professional reading to the extent that we would like. The solution to the dilemma is to be selective in our reading habits. We must decide in advance which journals, newsletters, and periodic reports we need to review to keep abreast of the happenings in our field.

We must reject, on a regular basis, an inclination to broaden our reading habits, but at the same time periodically evaluate our reading menus to make sure we're satisfied with the knowledge we are gaining. If not, we must adjust accordingly, always leaving room for educational reading outside our immediate specialties. I am not, unfortunately, speaking of the funny papers, dime novels, or Sports Illustrated, although all of these may have a place in the fabric of life. Rather, I am speaking of the kind of reading that truly broadens the foundation of one's professional expertise, without being directly related to it.

Perusing various science and engineering journals is one way of broadening our base knowledge, and reading new popular science books in other fields is another. The American Association for the Advancement of Science (AAAS) magazine, Science, is a good source of information. Whereas many of us belong to AAAS, too few of us read its outstanding weekly publication. The time to read it thoroughly is frequently unavailable, but even 30 minutes' perusal a week will net wonderful insights into what is new in all fields of science. The latest scientific breakthroughs show up first in Science as news articles or peer-reviewed papers, and subjects of broadest interest to all of us are the focus. As a writer, lecturer, and editorialist, I cannot spend time more valuably than to review the latest in Science. I am confident more of us could benefit as well. (AAAS, 1333 H Street NW, Washington, DC 20005.)

The commercial magazine, American Scientist, is also excellent, as are others of this genre. We must read book reviews in respected newspapers and check nonfiction, best-seller lists for tips on literary choices. We must not allow ourselves to be confined to a narrow band of technology, no matter how great the pressure may be to do exactly that. (If you read only one book outside your profession this year, consider The 100 by Michael H. Hart.)

Finally, we can avoid being intimidated by the pile of reading material accumulating somewhere in our office or study if we don’t create a pile in the first place. We will only let it build to a particular height, after all, at which point we will know it’s hopeless and throw it all out. If the odds of reading a particular item are slim, we can do ourselves a favor and pass it along. We must face reality and keep only that which we have a 70 percent chance of reading in the next 6 weeks and then reduce the pile every 6 weeks using the same 70 percent assessment. We must evaluate those publications that we always eventually discard and stop keeping them so that our stack will shorten and thus become less intimidating.

I have mixed in this opinion piece some very cerebral concerns. I hope we can carefully ponder them all and in so doing, better arm ourselves as scientists in today’s highly complex world.

References

Hydrogeology Division Historical Committee
The Division Chairman has appointed a Hydrogeology Historical Committee to prepare a report on the history of the Division. The Committee consists of Bill Back (Chairman and Division historian), Claire Davidson, Phyllis Carman, Darryll Pederson, and the Division Secretary-Treasurer and past Chairman as ex officio members.

GSA Sectional Hydrogeology News
North-Central
The 25th annual meeting of the North-Central GSA section, held April 18–19, 1991, in Toledo, Ohio, was extremely successful. Lon Ruedisili, chairperson of the meeting, convened a symposium titled “Consultants/Industries Innovative Applications in Hydrogeological/Geophysical/Engineering Geological Techniques in...
Environmental Investigations." Area consultants donated $2,880 to sponsor the 2-day symposium, which included 36 speakers, and hospitality events.

Southeast

Richard Johnston reports that tentative plans for the Southeastern GSA sectional meeting in Winston-Salem, NC, March 18–20, 1992, include two sessions in hydrogeology: a symposium on contaminant hydrogeology convened by Paul Washington and a hydrogeology technical session chaired by Richard Johnston.

Northeast

Gary Robbins is coordinating the hydrogeology program at the national GSA meeting in Boston in 1993. Anyone with ideas for field trips, symposia, and/or short courses and wishing to participate in developing the program should contact Gary as soon as possible at the Department of Geology and Geophysics, The University of Connecticut, U-45, Room 207, 354 Mansfield Road, Storrs, CT 06269-2045, or phone (203) 486-4435.

Student Research Grant Awards

The Management Board of the Hydrogeology Division selected six graduate students to receive the Division’s second annual Research Grant Award. The graduate students submitted grant applications to the GSA Committee on Research Grants, which selected candidates within our field of interest for awards by the Hydrogeology Division. The Division then helped in the financing of the grants. The six grant recipients and their research topics are:


Michael B. J. Foster, Ph.D. candidate, "Identification of septic system effluent in groundwater by deconvolution of small catchment hydrochemistry," supervised by E. Calvin Alexander, Jr., Department of Geology and Geophysics, University of Minnesota.

Karen S. Keith, Ph.D. candidate, "The effect of selected chemical pollutants on the hydraulic conductivity of smectite, palygorskite, and sepiolite clay blends," supervised by Haydn H. Murray, Department of Geology, Indiana University.

Teri R. Smith, M.S. candidate, "The relationship of iron bacteria geochemistry to trace metal distribution in an acid mine drainage stream, NE Ohio," supervised by Timothy P. Wilson and Frederick N. Ineman, Department of Geology, Kent State University.

Matthew A. Stuck, M.S. candidate, "Temporal variations of nitrogen in a shallow aquifer impacted by irrigated agriculture," supervised by Alan A. Kehe and W. Thomas Straw, Department of Geology, Western Michigan University.


We congratulate these students and their thesis advisors on their research submissions. The Management Board has invited the winners and their advisors to be our guests at the Hydrogeology Division luncheon at the annual meeting in San Diego. More graduate students are encouraged to apply to the GSA for research grants in the field of hydrogeology next year.

We wish to remind the members of the Hydrogeology Division of our Student Research Grant Fund. The GSA will add $3,000 for every $6,500 we raise, which Phil LaMoreaux has offered to match. This is a worthwhile effort and can only help the Division grow in effectiveness and visibility. Please seriously consider contributing $10 or more to the fund this year.

Biographies of Candidates

Following are biographies of the slate of officers for the Hydrogeology Division presented by the Nominating Committee. Please fill out attached ballot and return no later than October 1, 1991. Election results will be announced at the Division Business Meeting in San Diego on October 22.

Nominee for Chairman

JOHN A. CHERRY has been a professor at the University of Waterloo since 1971. He has degrees in geological engineering from the University of Saskatchewan and the University of California at Berkeley and in hydrogeology from the University of Illinois. He has received awards for groundwater research from the Geological Society of America (GSA), the American Geophysical Union (AGU), the National Water Well Association (NWWA), the Canadian Geotechnical Society, and the Province of Ontario. His professional service includes 6 years as Director of the Institute for Groundwater Research at the University of Waterloo and 2 terms as Secretary-Treasurer of the Hydrogeology Division of GSA.

Nominee for First Vice-Chairman

FRANKLIN W. SCHWARTZ, born in London, Ontario, on August 24, 1946, has been a member since 1972. Educated at the University of Western Ontario, he was graduated with honors in 1968. He received the Master of Science degree at the University of Manitoba in 1970 and the Ph.D. at the University of Illinois in 1972. He served as professor at the University of Alberta from 1972 to 1989; he has been the Ohio Eminent Scholar in Hydrogeology, The Ohio State University from 1989 to the present. Publications include more than 70 hydrogeology articles and one book in press. Service to the Hydrogeology Division includes numerous committees, the 1984 Birdsall Distinguished Lectureship,
short courses in contaminant hydrogeology at the San Antonio and Phoenix annual meetings, and contribution to the DNAG Hydrogeology volume. Other recent activities include serving as chairman of the NRC panel on Ground Water Modeling Assessment, associate editor of the Journal of Hydrology, and chairman of the Ground Water Committee, AGU.

Nominee for Second Vice-Chairman

LEONARD F. KONIKOW, born in Far Rockaway, New York, on January 26, 1946, has been a member since 1974. Educated at Hofstra University, he received the Bachelor of Arts degree in 1966. He received the Master of Science degree at Pennsylvania State University in 1969, as well as the Ph.D. in 1973. He has been a U.S. Geological Survey research hydrologist from 1972 to the present. A member of the headquarters staff from 1978 to 1980, he also served as a part-time lecturer, Department of Environmental Sciences, University of Virginia in 1991. Publications include more than 50 technical reports on hydrogeology. He is a fellow of GSA and member of AGU, GSW, IAH, and NWWA/AGWSE, as well as a member and former chairman of the AGU Groundwater Committee; he was the AGU Spring Meeting Program Chairman for Hydrology from 1984 to 1987; a member of the U.S. Committee for IAH, Executive Committee, from 1986 to 1990; and Associate Editor of Water Resources Research from 1981 to 1984. He was the 1986 Birdsall Distinguished Lecturer, and he received the NWWA Science Award in 1989.

Hydrogeology Division Organization

1991 Management Board

Chairman
Paul Seaber, Reno, NV

First Vice Chairman
John Cherry, Waterloo, ON

Second Vice Chairman
Frank Schwartz, Powell, OH

Secretary-Treasurer
John Harsh, Exton, PA

Past Chairman
Joe Rosenshein, Reston, VA

Division Liaison to Council
John M. Sharp, Jr., Austin, TX

1991 Committees

Past Chairmen's Long-Range Planning Committee
Joe Rosenshein, Chairman

Representatives to Other Societies

Joe Weihaupt, American Association for the Advancement of Science, Section W
John M. Sharp, Jr., U.S. Committee for the International Association of Hydrogeologists
Jack Hess, American Institute of Hydrology

Section Meeting Representatives

Shirley Dreiss - Cordilleran
Lon Ruedisili - North Central
Gary Robbins and Jeffrey P. Sgambat - Rocky Mountain
Roy E. Williams - South Central
Joe C. Yelderman - Southeastern
Richard Johnston

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CALL FOR SHORT COURSE PROPOSALS

1992 Annual Meeting—Cincinnati, Ohio—October 26–29


Proposals for the Cincinnati meeting must be received by December 1, 1991.