

GSA NEWS & INFORMATION

Monthly Newsletter of
The Geological Society of America

ISSN 0164-5854

VOLUME 12, NUMBER 6, June 1990

Report from Washington

Twenty-Seven Billion Dollars—and Not a Penny More

by Daniel R. Sarewitz
1989–1990 GSA Congressional Science Fellow

The federal budget process is the great equalizer. As Congress begins the struggle that will ultimately lead to the creation of a budget for fiscal 1991, the scientific community will find itself stripped bare and revealed for what it really is: just another special interest group.

A Brief History

Federal funding for “basic research” is not a birthright of the scientific community. Rather, it is a strategy that began to evolve during World War II, when academic research was harnessed directly to the national war effort in order to develop new technologies. As the war drew to a close, President Roosevelt recognized that federal support for academic science could be a potent catalyst in peacetime as well, leading to “improvement of the national health, the creation of new enterprises bringing new jobs, and the betterment of the national standard of living.” The task of articulating this concept more fully was given to Vannevar Bush, head of the wartime Office of Scientific Research and Development. In 1945, Bush produced a lengthy report entitled *Science—The Endless Frontier*, whose principles were ultimately embodied in the creation of the National Science Foundation (NSF) in 1950.

In *Science—The Endless Frontier*, Vannevar Bush argued that any national agency supporting scientific research must be entirely insulated from political pressures. “Research is the exploration of the unknown and is necessarily speculative. It is inhibited by conventional approaches, traditions and standards. It cannot be satisfactorily conducted in an atmosphere where it is gauged and tested by operating or production standards.” It is this principle which has formed the cornerstone—and the most commonly repeated justification—for federal support to academic science. However, it is not always recognized that Bush was articulating this principle within a broader context. He did not favor federal support of “science for its own sake,” or research detached from any conceivable practical application. Rather, Bush believed that technological innovation and the future prosperity and security of the nation would best be served if the research community was unfettered by political controls.

The point is that the federal budget for basic research has never represented a *carte blanche*, at least not in the eyes of the

government. The vision of “pure” research which is sometimes attributed to academicians—where the value of the science is inversely proportional to its usefulness—is not shared by Congress. If you want to get a sense of how Congress and the Administration feel about programs devoted exclusively to cultural and intellectual enrichment, consider federal funding for the National Endowment for the Arts, with a proposed budget of \$175 million for 1991, about 150 times less than the civilian research and development (R&D) budget of \$27 billion.

Science and Competitiveness

The need for the scientific community to demonstrate that its research programs are contributing directly to the common weal has never been stronger than it is now. One reason for this is the perceived crisis in U.S. economic “competitiveness.” This word is difficult to define but easy to use. It may, depending on who in Washington you talk to, have something to do with (among other things): Sony Walkmen, OPEC oil, too many business majors, too few science majors, an endemic decline in what President Bush has called “the vision thing,” or drugs.

There is a bipartisan sentiment that scientific research can play a significant role in addressing the “competitiveness” problem. This means that the government may be inclined to increase federal funding for research, but it is also hoping for a tangible return on its investment. The connection is explicitly stated in the Administration’s 1991 budget message: “Basic research is the wellspring of fundamental knowledge that can eventually lead to new products and processes.” This rather unromantic perspective should be borne in mind by any earth scientist who wants to communicate with legislators about the need for more federal research support.

Juggling the Money

Although the President has called for a 7% increase in R&D funds for 1991 (from \$67 billion to \$71 billion), and a doubling of the NSF budget by 1994, it is unlikely that Congress will be able to accommodate these requests if they must also reduce the budget deficit without increasing taxes. For a variety of political and legal reasons, about 85% of the \$1.3 TRILLION federal budget—

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including Social Security, Medicare, and veterans' benefits; interest on the national debt; and most defense expenditures—is off limits to budget cutters. All attempts to balance the budget must arise from manipulation of the remaining 15%. This meager residue of \$195 billion (slightly more than annual interest on the national debt) encompasses all nondefense R&D expenditures, as well as major programs in agriculture, environment, foreign aid, education, housing, social services, and transportation.* Any increases for science translate into decreases for one or more of the other programs.

In this environment of budgetary gridlock, the government is forced to assign priorities to its R&D expenditures. Congress is faced with the task of deciding which research programs will get increases, and which will get cut. One fundamental concern that will influence this process is the relative importance of defense and nondefense R&D. Of the \$67 billion allocated for R&D in 1990, about 62% is devoted to defense projects. From 1980 to 1988, total defense R&D funding rose by 130% while civilian expenditures increased only 31%. There is some feeling in Congress and the Administration that this imbalance may be contributing to the "competitiveness" problem, especially when contrasted with West Germany and Japan, whose governments have negligible defense commitments and can therefore devote their entire R&D establishment to civilian projects. In partial response to this concern, the Administration's proposed 1991 civilian R&D budget is slated for a 12% increase, whereas defense projects rise by only 4%. When Congress takes a crack at the numbers, this trend will probably become even more pronounced.

Big Science, Small Science

The other issue that will have significant impact on funding for research is the Big Science versus Small Science controversy. President Bush's desire to double the NSF budget in the next few years indicates the recognition by the Administration that relatively low-cost, peer-reviewed science is a critical part of our national research effort. Even so, between two-thirds and three-fourths of this year's proposed R&D funding increase will go to Big Science projects that are line items in the federal budget and are thus subject to Congressional approval. On the civilian side, these projects include the superconducting super collider, the space station, the Moon-Mars initiative, the Earth Observing System, the national aerospace plane, the human genome project, and HIV-AIDS

*For excellent discussions of how the budget process works, and how science funding is affected by this process, see previous *GSA News & Information* articles by Beth Robinson (v. 11, no. 6; June 1989) and Jim Evans (v. 10, no. 6; June 1988).

studies. The total proposed 1991 budget allocation for these seven programs combined comes to about \$5.7 billion, nearly three times more than the entire NSF budget. Yet these projects are dwarfed by defense-related Big Science projects such as the Strategic Defense Initiative (SDI, or Star Wars), which is slated by the Administration to receive \$4.7 billion next year.

The tendency for the government to favor Big Science projects is frequently attacked by some members of the scientific community. Many researchers contend that Big Science isn't really science at all, because the funding for such projects is extracted from Congress by the promise of achieving certain results. It is further argued that Big Science creates big bureaucracy, whose major interest is to perpetuate its own existence by satisfying Congress and the funding agency, with the consequence that serendipitous discovery and revolutionary innovation are stifled.

Still, there is no consensus among researchers in the Big Science-Small Science debate. Why, after all, does the government fund Big Science? The most important reason is that scientists ask it to do so. Congress did not come up with the idea of mapping the human genome. Most Members of Congress don't even know what a human genome is; the fact that they are willing to spend several billion dollars mapping it means that they were convinced by scientists that the results would benefit society.

They Listen to Scientists

Congress fully recognizes that it is not entirely competent to perform the task of determining priorities for the national R&D effort. For this reason, it calls on members of the scientific community to provide insight into the potential benefits and costs of ongoing and anticipated research programs. Several years ago, the House Subcommittee on Science, Research and Technology held a hearing on the problem of establishing research priorities. One of the witnesses was a world-renowned physicist, who submitted the following testimony:

"If I were King, I could take the budget of the National Science Foundation and spend it with ten times the effectiveness, and I could do this with little effort. I would find the top one thousand active scientists in the country. I could do this by asking all the scientists for their list of the best, and then asking these scientists for their list of the best. By the next iteration, I believe that most lists would agree. Next, I would give each of these 1000 scientists one million dollars per year to spend on whatever research they wanted. The money spent this way would, I believe, be far, far more productive in

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GSA NEWS & INFORMATION (ISSN 0164-5854) is published monthly by The Geological Society of America, Inc., with offices at 3300 Penrose Place, Boulder, Colorado. Mailing address is P.O. Box 9140, Boulder, CO 80301-9140, U.S.A. Second-class postage paid at Boulder, Colorado, and at additional mailing offices. **Postmaster:** Send address changes to GSA News, Membership Services, P.O. Box 9140, Boulder, CO 80301-9140.

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Prepared from contributions from the GSA staff and membership. Executive Director: F. Michael Wahl, Ph.D.; Managing Editor: Faith Rogers; Associate Editor: Lee Gladish; Production and Advertising Manager: James R. Clark; Advertising Coordinator: Ann H. Crawford; Production: Rochelle R. Blumenstein and Joan E. Manly.

Printed in U.S.A.

Advertising: Classifieds and display—contact Ann H. Crawford (303) 447-2020, 1-800-472-1988, or fax 303-447-1133.

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producing scientific innovation than by [sic] doing it out for proposals that achieved the consensus of their 'peers.' ”

This example may be somewhat extreme for its audacity and naïveté (kings are in short supply in this country), but it illustrates that scientists and politicians often occupy completely different systems of reality. A recent letter in *Chemical and Engineering News* (Dec. 4, 1989) concluded with an “appeal for listening to the teachings of science rather than to the preaching of moral values,” as if the two were completely separable. Politicians deal with “moral values” all the time. The decision about whether some of the \$8 billion necessary to build a superconducting super collider would be better spent on the human genome project, NSF, or the Head Start program for disadvantaged children cannot be made merely by “listening to the teachings of science.”

Scientists may feel that it is somehow impure to have to justify research on political grounds. Yet this sentiment is an oversimplification of the political process. Effective involvement in the development of science policy does not mean trying to convince elected representatives to give you more money for your research—

Members of Congress are very good at recognizing self-serving arguments. Rather, it means participating in an admittedly subjective debate about the merits of various research programs.

The fact is, Congress will be determining research priorities regardless of whether they have adequate and balanced input from the scientific community. Thus, to a large extent, the ability of the government to make informed decisions about science policy depends on the willingness of scientists to become involved in the process. Many scientists come to Washington and tramp the halls of Congress, meeting with elected officials and staff, and testifying at hearings. Many more write letters to their representatives. Those who have been most successful in gaining the support of Congress are the ones who have recognized that determining priorities for science funding is at least as much a political process as a scientific one.

Daniel R. Sarewitz, GSA Congressional Science Fellow for 1989-1990, is working in the office of Congressman George E. Brown, Jr., 36th District of California, 2188 Rayburn House Office Building, Washington, DC 20515; (202) 225-6161. The fellowship, which is for a one-year term, is jointly sponsored by funds from GSA and a grant from the U.S. Geological Survey.

AAAS/Westinghouse Award Nominations Invited

Nominations are due August 1, 1990, for the American Association for the Advancement of Science/Westinghouse Foundation 1990 Award for Public Understanding of Science and Technology. Scientists and engineers from all disciplines who make outstanding contributions to public understanding of science and technology, but who are not members of the media, are eligible for nomination. The prize of \$2500 will be awarded during the AAAS

Annual Meeting in Washington, D.C., in February 1991. The 1989 awardee was GSA Fellow Robert D. Ballard, Woods Hole Oceanographic Institution.

For information, contact Patricia S. Curlin, AAAS Committee on Public Understanding of Science and Technology, 1333 H St., NW, Washington, DC 20005; (202) 326-6600.

GSA in Education

by Allison R. (Pete) Palmer

On Creationism and Creationists

Many of us have a tendency to lump all creationists scornfully in one basket. This may be counterproductive to constructive dialogues.

The troublesome creationists are those who insist on a young Earth in the face of massive evidence to the contrary, and they were part of the incentive for the preparation of our video and film “The Earth *Has* a History.” They tie up courts, confuse school boards, and contribute to the problem of poor-quality pre-college textbooks. If we did an effective job of public education, we would not have “educated” citizens such as judges, school board members, and textbook commissions paying any attention to the militant ignorance of that group.

On the other hand, there is a large number of intelligent citizens who represent what I will call “old Earth” creationists. They recognize the evidence for global antiquity but are still troubled by the whole system running without some guiding hand, and by the perception of humans as a part of the processes incumbent to a changing Earth, rather than the goal of these processes. Many of these are our neighbors. Some patient and appropriate guidance by each one of us may help members of this group grow in their cosmologic understandings. They will benefit more from a positive approach than from a put-down.

More on the Sad State of Geoscience Knowledge in the Public Domain

My March column has produced some fan mail with some more examples of why we need to pay attention to the geoscience education of the American public.

Bob Sheridan, from Rutgers, shared a copy of a letter to an editor which states, “We are directly creating earthquakes all over the world by extracting too much crude oil, which is predesigned to lubricate the rock strata of the earth”!!

Worse than this, and a reason why every member with children in elementary or secondary schools should look through the texts the children are using, is an example from a third-grade social studies text sent by Richard Leary of the Illinois State Museum. This book tells us that coal, oil, copper, gold, iron, and silver are minerals! It then tells the teacher to review the definitions of mineral, coal, and oil, and to ask the students, “What are the 6 minerals listed on this page?”

Maybe we should begin a little publisher-bashing. Check the note in my April column about the National Center for Science Education, Inc., and get involved.

GSA Divisions and Sections—1990

DIVISIONS

GSA's eleven specialty divisions provide a focus for members interested in a particular discipline. The divisions hold annual business meetings in conjunction with the Society's annual meeting, and each division publishes a newsletter periodically. Division membership totals are as of December 31, 1989.

Archaeological Geology Members: 518
Officers: Robert M. Thorson, chairman; Julie K. Stein, first vice-chairman; E. Arthur Bettis III, second vice-chairman; C. Reid Ferring, secretary-treasurer; Fekri A. Hassan, past chairman.
Newsletter editor: Vance T. Holliday.

Coal Geology Members: 363
Officers: James C. Cobb, chairman; Robert B. Finkelman, first vice-chairman; Timothy A. Cross, second vice-chairman; Susan M. Rimmer, secretary; Peter J. McCabe, past chairman.
Newsletter editors: James C. Cobb, Susan M. Rimmer.

Engineering Geology Members: 1313
Officers: Jeffrey R. Keaton, chairman; Perry H. Rahn, chairman-elect; Charles W. Welby, secretary; Thomas L. Holzer, past chairman.
Newsletter editor: Robert J. Larson.

Geophysics Members: 717
Officers: Clement G. Chase, chairman; Laurie L. Brown, first vice-chairman; Laura F. Serpa, second vice-chairman; G. Randy Keller, secretary-treasurer; Walter D. Mooney, past chairman.
Newsletter editor: Henry Spall.

History of Geology Members: 425
Officers: Robert H. Dott, Jr., chairman; Alan E. Leviton, first vice-chairman; Donald M. Hoskins, second vice-chairman; Michele L. Aldrich, secretary-treasurer; Clifford M. Nelson, past chairman.
Newsletter editor: Michele L. Aldrich.

Hydrogeology Members: 1976
Officers: Joseph S. Rosenshein, chairman; Paul R. Seaber, first vice-chairman; John A. Cherry, second vice-chairman; Darryll T. Pederson, secretary-treasurer; Robert N. Farvolden, past chairman.
Newsletter editor: William E. Wilson.

International Members: 201
Officers: Nicholas Rast, president; William R. Greenwood, first vice-president; Bruce B. Hanshaw, second vice-president; John S. Oldow, secretary-treasurer; Albert W. Bally, past president.

Planetary Geology Members: 485
Officers: Ronald Greeley, chairman; Theodore A. Maxwell, first vice-chairman; Baerbel K. Lucchitta, second vice-chairman; Larry S. Crumpler, secretary-treasurer; Raymond E. Arvidson, past chairman.
Newsletter editor: Larry S. Crumpler.

Quaternary Geology and Geomorphology Members: 1554
Officers: Kenneth L. Pierce, chairman; Richard F. Madole, first vice-chairman; David M. Mickelson, second vice-chairman; John E. Costa, secretary; Dale F. Ritter, past chairman.
Newsletter editor: William E. Scott.

Sedimentary Geology Members: 1189
Officers: Julia M.G. Miller, chairman; Donald R. Lowe, first vice-chairman; W. Calvin James, second vice-chairman; Mary J. Kraus, secretary-treasurer; James R. Steidtmann, past chairman.
Newsletter editor: Robert Raymond.

Structural Geology and Tectonics Members: 2413
Officers: Peter J. Hudleston, chairman; Mark P. Cloos, first vice-chairman; Darrel S. Cowan, second vice-chairman; Donald T. Secor, Jr., secretary-treasurer; Arthur W. Snoke, past chairman.
Newsletter editors: Roy Kligfield, Gary Couples.

SECTIONS

GSA has six regional North American sections, generally including GSA members who live within the geographical limits of each section. (Members who live in one section but have a professional interest in another section can become members of the section of interest.) Each section holds annual technical and business meetings. The number of voting members shown for each section is as of December 31, 1989.

Cordilleran Voting members: 3809
Geographic area: Alaska, Arizona south of lat 35°N, California, Hawaii, Nevada, Oregon, Washington, British Columbia, Yukon, Northwest Territories
Officers: Martin L. Stout, chairman; Patrick L. Abbott, vice-chairman; Bruce A. Blackerby, secretary; Mary Lou Zoback, past chairman.

Rocky Mountain Voting members: 1930
Geographic area: Arizona north of lat 35°N, Colorado, Idaho, Montana, New Mexico, North Dakota, South Dakota, Utah, Wyoming, Alberta, Saskatchewan
Officers: John W. Geissman and Wolfgang E. Elston, co-chairmen; Kenneth E. Kolm, secretary; Ronald W. Marrs, past chairman; James E. McClurg, past vice-chairman.

North-Central Voting members: 1226
Geographic area: Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Nebraska, Ohio, Wisconsin, Manitoba, Ontario west of 89th meridian
Officers: Lon C. Ruedilsili, chairman; Mark J. Camp, vice-chairman; George R. Hallberg, secretary; John S. Klasner, past chairman; Richard C. Anderson, past vice-chairman.

South-Central Voting members: 1377
Geographic area: Arkansas, Kansas, Oklahoma, Texas
Officers: Scott M. Ritter, chairman; G. Randy Keller, vice-chairman; Rena M. Bonem, secretary-treasurer; Charles I. Smith, past chairman.

Northeastern Voting members: 2268
Geographic area: Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, New Brunswick, Newfoundland, Nova Scotia, Prince Edward Island, Quebec, Ontario east of 89th meridian
Officers: Gary M. Boone, chairman; Gail M. Ashley, vice-chairman; Kenneth N. Weaver, secretary; Nicholas M. Ratcliffe, past chairman.

Southeastern Voting members: 1622
Geographic area: Alabama, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, West Virginia
Officers: Vernon J. Henry, chairman; Juergen Reinhardt, vice-chairman; Michael J. Neilson, secretary-treasurer; Harry Y. McSween, Jr., past chairman; William A. Thomas, past vice-chairman.

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June 1990



The Geological Society of America

BULLETIN

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CALL FOR APPLICATIONS & NOMINATIONS

FOR GEOLOGY CO-EDITOR

GSA solicits applications and nominations for the position of co-editor of **Geology**, to serve with current Editor H. T. Mullins for a three-year term, beginning in December 1990, as one of a two-editor team. Desirable characteristics for the successful candidate include:

1. Broad interest and experience in geology
2. Iconoclastic
3. International stature
4. Willing to take risks and try innovations
5. Sense of humor
6. Sense of perspective
7. Organized and productive
8. Willing to work closely with GSA headquarters staff.

This is not a salaried position, but GSA pays the expenses for secretarial assistance, mail, telephone, and travel to GSA headquarters.

If you wish to be considered, please submit a resume and a brief letter describing why you should be chosen. If you wish to nominate another, submit a letter of nomination and the individual's written permission and resume. Send nominations and applications to F. Michael Wahl, Executive Director, Geological Society of America, P.O. Box 9140, Boulder, CO 80301, by **July 1, 1990**.

THE GEOLOGICAL SOCIETY OF AMERICA

Geologists Win with 1989 Answers

Approximately 3000 geologists responded to the surveys taken in conjunction with the 1989 St. Louis Annual Meeting. Each participant was eligible for prizes that ranged from airfares to mugs. The survey results will appear in the July issue of *GSA News & Information*.

The first survey concentrated on the technical program and on site preferences. Responses came from 915 registrants and 838 member nonregistrants. The second survey concentrated on GSA's exhibits. Responses came from 1186 registrants.

Congratulations to the winners, and many thanks to all of you who participated. We appreciate your comments and will use your suggestions to the best of our abilities. We are always glad to hear from you, and we do our best each year to serve your needs.

Sue Beggs, Meetings Manager

Winners from the 1989 Annual Meeting Survey

Prize: Roundtrip airfare to anywhere within continental United States.

Winner: Charles Ronald Seeger, Western Kentucky University, Bowling Green

Prize: Roundtrip airfare to 1990 GSA Annual Meeting in Dallas

Winner: David B. Duane, NOAA, Bethesda, Maryland

Prize: Registration for 1990 GSA Annual Meeting in Dallas

Winners: J.F. Donoghue, Florida State University, Tallahassee
Janet S. Herman, University of Virginia, Charlottesville
Gary Strathearn, University of California, Los Angeles

Winners from the 1989 Exhibits Survey Questionnaire

Prize: Complete set of Decade of North American Geology field guides

Winner: James R. Craig, Virginia Tech, Blacksburg

Prize: Six-pack of GSA mugs

Winner: Charles Prewitt, Geophysical Laboratory, Washington, D.C.

Prize: \$50 GSA publications gift certificate

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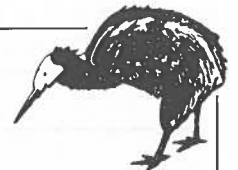
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GSA New Zealand Trip 1991

North and South Islands

March 3-23



The response to the New Zealand trip has been excellent, and the trip is currently filled. With 9 months to go before departure, it is likely there will be a few cancellations. *We are still accepting standbys.*

If you would like a brochure, contact GSA Meetings Dept., P.O. Box 9140, Boulder, CO 80301, or call 1-800-472-1988.

GSA Annual Meetings

1990

GSA Annual Meeting • Dallas, Texas • October 29–November 1, 1990

Abstracts due
July 11

Program, housing, and registration information
August 10

Joint Technical Program Committee
August 10–11

Preregistration due
September 28



For information: GSA Meetings Department, P. O. Box 9140, Boulder, CO 80301, (303) 447-2020

1991

GSA Annual Meeting • San Diego, California • October 21–24, 1991

Call for field trip proposals

The deadline for submitting a field trip proposal is *June 15, 1990*. Selection of trips will be made shortly thereafter, leaving 16 months for preparing guidebooks and making arrangements. To submit your proposal or for further information, contact the 1991 Field Trip Chairman:

Michael J. Walawender
Dept. of Geological Sciences
San Diego State University
San Diego, CA 92182
(619) 594-5586

Call for short course proposals

GSA members and nonmembers are encouraged to submit short course proposals to be reviewed by GSA's Short Course Committee. All proposals are due by *December 1, 1990*. For short course proposal guidelines contact:

Edna Collis
Short Course Coordinator
GSA, P.O. Box 9140
Boulder, CO 80301
(303) 447-2020

FUTURE

Dallas	October 29–November 1	.....	1990	Boston	October 25–28	.....	1993
San Diego	October 21–24	.....	1991	Seattle	October 24–27	.....	1994
Cincinnati	October 26–29	.....	1992				

GSA Section Meetings

1991	<u>Section, Location, Dates</u>	<u>Contact</u>
	Cordilleran, Cathedral Hill Hotel, San Francisco, California, March 25–27	Raymond Sullivan, Dept. of Geosciences, San Francisco State University, San Francisco, CA 94132, (415) 338-2061
	North-Central, University of Toledo, Toledo, Ohio, April 18–19	Lon Ruedisili or Mark Camp, Dept. of Geology, University of Toledo, Toledo, OH 43606, (419) 537-2009
	Northeastern-Southeastern, Omni Inner Harbor Hotel, Baltimore, Maryland, March 14–16	Emery Cleaves, Maryland Geological Survey, 2300 St. Paul Street, Baltimore, MD 21218, (301) 554-5504 Juergen Reinhardt, U.S. Geological Survey, 926 National Center, Reston, VA 22092, (703) 648-6789
	Rocky Mountain–South-Central, University of New Mexico, Albuquerque, New Mexico, April 22–24	G. Randy Keller, Dept. of Geological Sciences, University of Texas at El Paso, El Paso, TX 79968-0555, (915) 747-5501 John Geissman or Wolfgang Elston, Dept. of Geology, University of New Mexico, Albuquerque, NM 87131, (505) 277-4204
1992		
	Cordilleran	Eugene, Oregon
	North-Central	Iowa City, Iowa
	Northeastern	Bethlehem, Pennsylvania
	Rocky Mountain	Ogden, Utah
	South-Central, February 24–25	Houston, Texas
	Southeastern, March 18–20	Winston-Salem, North Carolina

new from GSA...

SPECIAL PAPERS

GSA Centennial Articles from Vol. 100 of *GSA Bulletin*

forward by R. D. Hatcher, Jr., and W. A. Thomas, 1990

In 1988, the editors of volume 100 of the *GSA Bulletin*, R.D. Hatcher, Jr., and W. A. Thomas, invited prominent and respected earth scientists in several fields to prepare special Centennial articles to consist partly of review, and partly of new data and/or current ideas. The resulting articles were so outstanding that GSA has rereleased them in this special volume for classroom and symposia use. The subject matter is as diverse as this impressive list of authors: D. F. Ritter, M. Morisawa, V. R. Baker, J. M. Coleman, L. L. Sloss, R. V. Ingersoll, G. C. Bond, M. A. Kominz, E. M. Moores, F. J. Vine, K. Aki, W. B. Hamilton, R. Van der Voo, W. W. Hay, R. A. Price, H. Laubscher, A. G. Sylvester, B. Wernicke, G. J. Axen, J. K. Snow, J. McCarthy, G. A. Thompson, E. R. Decker, H. P. Heasler, K. L. Buelow, K. H. Baker, J. S. Hallin, D. D. Pollard, A. Aydin, R. H. Groshong, Jr., M. E. Bickford, J. A. Whitney, B. D. Marsh, G. R. Keller, R. E. Zartman, J. M. Guilbert, E. L. Yochelson, J. T. Dutro, Jr.
SPE253, 470 p., 1 pocket-plate, paperback,
ISBN 0-8137-2253-5, \$24.50

Volcanism and Tectonism in the Columbia River Flood-Basalt Province

edited by S. P. Reidel and P. R. Hooper, 1990

The Columbia River basalt (CRB) in the Pacific Northwest is the youngest continental flood-basalt province on Earth. Because of its pristine state and accessibility, it has become the most extensively studied area to have hosted continental flood-basalt volcanism. This volume contains 25 papers covering many aspects of what is known about the volcanic and tectonic evolution of the province. The first chapters discuss the volcanic stratigraphy; topics include the age, areal extent, and volume of flows, detailed stratigraphy of volcanic units, chemical variation within flows, internal flow features, emplacement mechanisms, and the nature of sedimentary units coeval with the eruptions.

Later chapters discuss the tectonic evolution of the province, emphasizing the synvolcanic structural development of the province as well as pre-CRB and post-CRB events and a structural analysis of folds within the Yakima fold belt. Final chapters of papers discuss the petrogenesis of the flows; topics include the nature of the mantle source, pre-eruptive and post-eruptive processes, and the cause of the flood-basalt volcanism.

SPE239, 400 p., 1 pocket plate, indexed, paperback,
ISBN 0-8137-2239-X, \$52.50

Establishment of a Geologic Framework for Paleoanthropology

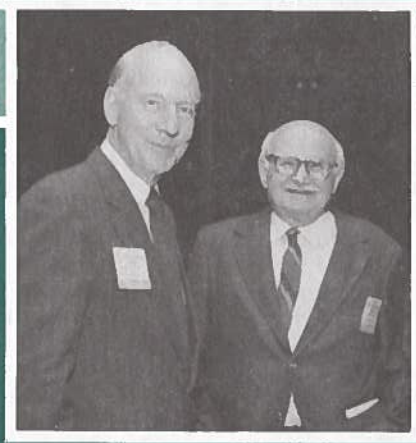
edited by L. F. Laporte, 1990

A representative history of the ways that geology has, over the last 200 years, established a stratigraphic framework for human evolution. In the late 18th and early 19th centuries an impassioned debate took place about whether humans did, indeed, have a fossil record at all. Once such a record was established, it then was necessary to know where different pieces of that record fit within both the relative and absolute geologic time-scales. Geology also has contributed to the interpretation of the environments that our early human ancestors inhabited, as was first done at Olduvai Gorge, following a half-century of debate. With respect to more recent human prehistory, the collaboration of geologists with archeologists has been critical in determining a Paleoindian chronology in the New World. Of special interest to geologists, archeologists, and anthropologists.

SPE242, 82 p., paperback, ISBN 0-8137-2242-X, \$22.50

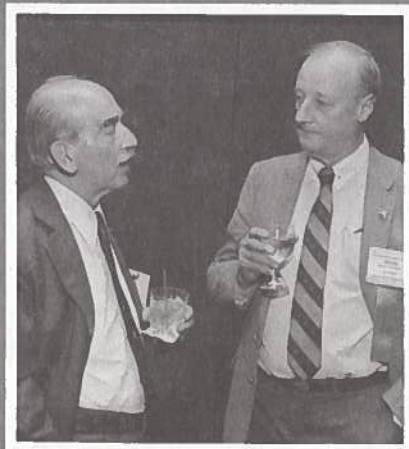
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GEO STAR
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GSA Foundation

1989 Annual Report



1989 CHAIRMAN'S MESSAGE



In 1989 GSA celebrated its 101st anniversary. The Society had an extremely important and successful annual meeting at St. Louis, and the Foundation was proud to add to the numerous events with a cocktail party

honoring GSA's Senior Members and the Foundation's major contributors. This report has a sprinkling of photos from that well-attended event.

The most important news that I bring you this year is the final total of our annual contributions and gifts. In 1989 donations from GSA members increased a whopping 86%, to \$363,000. This reflects the strong and increasing interest that our members are showing in supporting the research and educational activities of GSA through gifts to the Foundation.

Increasing contributions mean an expanding endowment. This generates more income, which allows the Foundation to step up the amount of its disbursements. During 1989 we spent \$67,000 on non-DNAG GSA activities such as research, student travel grants, medals and awards, and Penrose conferences. This is double 1988's \$33,000 expenditure.

More good news—the trustees have ap-

proved a \$78,000 net disbursement budget in 1990. The first result of this is a 50% increase in student travel support to the six GSA sections.

A word about the Decade of North American Geology. Historically, the Foundation's main source of income has been industry contributions to DNAG. Most commitments to this program were made in 1981, so by now the \$3.3 million in pledges have largely been completed. At the end of 1989, 96% of the DNAG money had been received and paid to GSA to finance publication of that epic series of books and other materials. It is gratifying to see the Foundation's income from member contributions increasing significantly as the DNAG gifts wind down.

I encourage you to keep up and increase your support of the Foundation in 1990. The Society has much to do in research, education, and new program initiatives relating to the global environment. These can't be done without funding, so it is important for all GSA members to become contributors to the Foundation. We need many more contributors than the 1,195 who gave in 1989. It is particularly important for geologists to include the Foundation when making long term estate plans.

The trustees are optimistic, enthusiastic, and pleased to contribute their

energies and support to the continued success of GSA and its Foundation. We were delighted to see the large increase in member contributions, which signifies your involvement with the Society. Thanks to you, it's working.

Philip E. LaMoreaux
Chairman

FUND DISBURSEMENTS 1989

Student Travel Grants	9,988
Research Grants	25,685
Scholarships, Medals, & Awards	30,246
Penrose Conferences	1,000
	66,919

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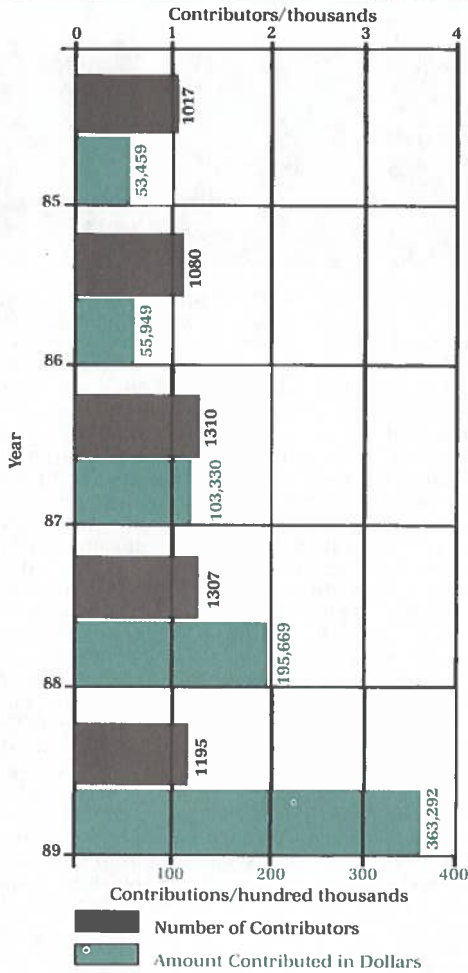
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Philip E. LaMoreaux is Chairman of the Board of P. E. LaMoreaux & Associates, Inc. He is a past president of American Geological Institute, the American Association of State Geologists, and the International Association of Hydrogeologists. He received his B.A. from Denison University and his M.A. from the University of Alabama, both in geology. Until January, 1989, he served as Director of the Environmental Institute for Waste Management Studies, University of Alabama. A Fellow and former councilor of GSA, he is the author of many professional publications.



Fred A. Donath is a consultant located in Long Beach, California. Until recently, he had been Corporate Vice President for R&D in the Earth Technology Corporation. He had previously been Head of Geology at the University of Illinois and, before that, Professor of Geology at Columbia University where he became well-known for his contributions to experimental rock deformation and structural geology. He is a Fellow of the Geological Society of America and served as Acting Editor for the Society during 1964.



Peter Flawn received a B.A. Degree from Oberlin College and a M.S. and Ph.D. from Yale University. Flawn was Director of the Bureau of Economic Geology, a faculty member and president of the University of Texas. He is a member of the National Academy of Engineering, an honorary member of AASG and AAPG, and past-president of AGI. He received the Wilbur Lucius Cross Medal from Yale University and the Ben H. Parker Medal from AGI. A Fellow of the Geological Society of America, Flawn was Councilor from 1972-74 and President in 1978.



McLain J. Forman is president and chief executive officer of Forman Petroleum Corporation located in New Orleans, Louisiana. He received his bachelor of science degree in geology at Tulane University, and his M.A. and Ph.D. at Harvard University. A Fellow of the Geological Society of America and a member of the American Association of Petroleum Geologists. Forman has authored several publications dealing with subsurface geology of southern Louisiana.



William B. Heroy earned a geology degree from Dartmouth and his Ph.D. from Princeton. His professional career included serving as a geologist at Texaco, as geologist, vice president and president of Geotech, and as a group executive of Teledyne. He was vice treasurer and professor at Southern Methodist University. He belongs to AAPG, SEG, SEEG, and AIPG, and AGI where he has served as treasurer, vice president, and president. A fellow of GSA, he has been a councilor, treasurer, and has served on numerous committees.



Roy M. Huffington is chairman of Roy M. Huffington, Inc., an independent international oil and gas company based in Houston. He received a B.S. degree in geology from S.M.U. and M.A. and Ph.D. degrees from Harvard. He is a director of the American Petroleum Institute, a fellow of the Geological Society, and a member of the National Petroleum Council and many other professional institutions. He is also the author of several articles on petroleum geology.



F. Beach Leighton is currently Chairman Emeritus Leighton & Associates, an engineering geology consulting firm located in southern California. Before retirement in 1981, Dr. Leighton was the chairman of the board and chief executive officer and devoted his attention to the rapidly expanding application of geology to urban environment. He has published extensively on urban geology, earthquakes and landslides. He received his Ph.D. from the University of Virginia and his Ph.D. from Caltech.

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1989 PRESIDENT'S MESSAGE



The GSA Foundation is in transition, from an organization established to finance through industry contributions the Centennial project of GSA (The Decade of North American Geology), to a growing, member-sup-

ported source of funding on-going GSA programs in research, education, and earth studies. As Phil LaMoreaux points out in his message, member contributions and disbursements to programs have increased dramatically this past year.

Under a less conservative method of accounting the investment in books would be capitalized and carried as an asset in the form of inventory or work in process. Note that the asset side of the balance sheet lists cash, receivables and investments. There is no inventory even though there are completed DNAG volumes in GSA's warehouse and manuscripts awaiting final review and printing.

The other side of the transition saw new records in member contributions. We were particularly gratified to record several large gifts and bequests and sharp increases in the endowment balances for some of the special named funds such as the Medlin and Dillon scholarship funds. There has also been a larger number of requests for information about the special tools and techniques of philanthropy and estate planning, such as charitable remainder trusts and revocable living trusts. GSA members are thinking more about supporting their science and their profession, and acting upon their thoughts. In short, it seems to be working.

Robert L. Fuchs
President

Charles J. Manin, director of the Oklahoma Geological Survey, received his B.S., M.A., and Ph.D. in geology from the University of Texas. He served as President of the American Institute of Professional Geologists, the American Geological Institute, the Association of American State Geologists and the Mid-Century Section of the Society of Economic Paleontologists and Mineralogists. A Fellow of GSA, he has served on the GSA Council and Executive Committee.

Brian J. Skinner is a professor at Yale University where he works on the geochemistry of mineral deposits. He is editor of *Economic Geology*, chairman of the Board of Overseers of the American Journal of Science, chairman of the U.S. National Committee on Geology, and of the Board on Earth Sciences and Resources (NAS/NRC). A Fellow of the Society, he was President in 1985 and chairman of the Committee on the Path to 2000.

As in any transition mode, we continue to retain vestiges of the old. In this case, the Foundation's 1989 audited financial statement which is a part of this annual report reflects the past strong domination of DNAG. Growth in member gifts and program disbursements are overshadowed by the costs and revenues of DNAG.

The fund balance of the Foundation dropped 19%, from \$354,317 to \$288,658. This is directly attributable to the excess of DNAG expenditures—\$673,130, over DNAG revenues and contributions—\$344,280. This very significant cash deficit in DNAG reflects the front end loading of the publication costs. All of the

costs of all of the books and materials incurred by GSA each year are charged to the Foundation, but revenues are only taken into income at the time a book is distributed.

1989 Annual Report

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(continued)

Foundation Mission Statement

The GSA Foundation operates under the following mission statement:

The GSA Foundation exists to fund those research, student support, and publication programs of the Geological Society of America that the Society deems necessary to accomplish its purpose of promotion of the science of geology.

To accomplish this mission, the Foundation's long-term policy is to raise money from members, individuals, companies, and institutions. Funds received are invested for income, preservation of capital, and growth of principal. GSA program funding requirements are met out of income and such principal as is necessary. The Foundation's financial goal is to build a fund balance in the \$5-10 million range.

The Foundation's annual reception for Senior Fellows.

This popular GSA annual meeting event was well attended in St. Louis as the photos show. Each year the Foundation hosts a party that immediately follows the Board of Trustees meeting, for GSA's Senior Fellows, the Foundation's major contributors, and GSA Council. The affair provides a unique opportunity for GSA's longest-standing members to remember the past, discuss the present, and look toward the Society's future.

ANNUAL TRUSTEE'S MEETING



The Foundation's Board of Trustee's annual meeting.

At GSA's annual meeting Foundation trustees meet to elect officers, appoint new Trustees, review the progress of the Foundation, and plan for the future. Officers and staff of GSA also attend the meeting, thus providing a forum for the coordination of GSA programs and Foundation financing activities.



FINANCIAL STATEMENTS



370 Seventeenth Street
Suite 2600
Denver, CO 80202-5626
Telephone: (303) 861-4462

INDEPENDENT AUDITORS' REPORT

Board of Trustees
The Geological Society of America
Foundation, Inc.
Boulder, Colorado

We have audited the accompanying combined balance sheets of The Geological Society of America Foundation, Inc. as of December 31, 1989 and the related combined statements of operations and fund balances and cash flows for the year then ended. These financial statements are the responsibility of the Foundation's management. Our responsibility is to express an opinion on these financial statements, based on our audit.

We conducted our audit in accordance with generally accepted auditing standards. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the combined financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audit provides a reasonable basis for our opinion.

In our opinion, such combined financial statements present fairly, in all material respects, the financial position of The Geological Society of America Foundation, Inc. as of December 31, 1989, and the results of its operations and its cash flows for the year then ended in conformity with generally accepted accounting principles.

We have previously audited the financial statements of the Foundation for the year ended December 31, 1988, and comparative financial information from which is presented herein. In our opinion, such comparative financial information has been properly extracted from the prior year's financial statements.

Deloitte & Touche

March 16, 1990

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FINANCIAL STATEMENTS

COMBINED BALANCE SHEETS

(with comparative totals for 1988)

ASSETS	OPERATING	UNRESTRICTED	RESTRICTED	TOTALS	
				YEARS ENDED	
				DECEMBER 31,	
	1989	1988		1989	1988
Cash	\$ 16,828	\$ 1,914	\$ 82,816	\$101,558	\$152,563
Contributions receivable	--	9,681	19,333	29,014	22,945
Due from other funds	188	5	--	193	35,190
Investments, at market (Note B)	951	205,702	616,636	823,289	665,895
Furniture and equipment, net of accumulated depreciation of \$24,986 and \$20,583	12,489	--	--	12,489	15,685
	<u>\$ 30,456</u>	<u>\$217,302</u>	<u>\$718,785</u>	<u>\$966,543</u>	<u>\$892,278</u>
LIABILITIES AND FUND BALANCE					
Accounts payable	\$ 6,487	\$ 202	\$ 18,410	\$ 25,099	\$ 6,854
Due to Geological Society of America (Note C)	200,000	--	440,898	640,898	495,917
Due to other funds	--	--	193	193	35,190
Accrued vacation and sick leave	11,665	--	--	11,665	--
Fund balances (deficit):	(187,696)	217,100	--	29,404	12,297
Unrestricted	--	--	240,693	240,693	323,706
Restricted	--	--	18,591	18,591	18,314
Held in trust for others (Note D)	(187,696)	217,000	259,284	288,688	354,317
	<u>\$ 30,456</u>	<u>\$217,302</u>	<u>\$718,785</u>	<u>\$966,543</u>	<u>\$892,278</u>

See notes to combined financial statements.

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* Second Century Club
(Gifts of \$100 or more)

COMBINED STATEMENTS OF CASH FLOWS

	TOTAL	
	YEARS ENDED	
	DECEMBER 31,	
	1989	1988
CASH FLOWS FROM OPERATING ACTIVITIES:		
Deficiency of revenue over expenses	\$ (65,629)	\$ (33,100)
Adjustments to reconcile deficiency of revenue over expenses to net cash provided by operating activities:		
Depreciation	4,444	5,120
Increase in contributions receivable	(6,069)	(14,424)
Decrease (increase) in due from other funds	34,997	(34,999)
Increase in due to Geological Society of America	144,981	112,746
Increase in accounts payable	18,245	3,467
(Decrease) increase in due to other funds	(34,997)	34,999
Increase in accrued vacation and sick leave	11,665	--
Net cash provided by operating activities	107,637	73,809
CASH FLOWS FROM INVESTING ACTIVITIES:		
Additions to furniture and equipment	(1,248)	(7,906)
Purchase of investments	(1,739,192)	(1,635,787)
Proceeds from maturity of investments	1,581,798	1,539,706
Net cash used in investing activities	(158,642)	(103,987)
NET DECREASE IN CASH	(51,005)	(30,178)
CASH, beginning of year	152,563	182,741
CASH, end of year	<u>\$ 101,558</u>	<u>\$ 152,563</u>

See notes to combined financial statements.

FINANCIAL STATEMENTS

COMBINED STATEMENTS OF OPERATIONS AND FUND BALANCES (with comparative totals for 1988)

				<u>TOTALS</u>	
				YEARS ENDED	
	<u>OPERATING</u>	<u>UNRESTRICTED</u>	<u>RESTRICTED</u>	<u>1989</u>	<u>1988</u>
REVENUES:					
Contributions	\$ --	\$ 13,296	\$ 460,545	\$473,841	\$499,714
Decade of North American Geology Program	--	--	228,153	228,153	217,728
Interest and dividends	89	17,944	49,634	67,667	38,544
Other	<u>50,188</u>	<u>--</u>	<u>4,055</u>	<u>54,243</u>	<u>10,447</u>
	50,277	31,240	742,387	823,904	766,433
EXPENDITURES:					
Operating expenses	136,190	788	4,296	141,274	140,214
Decade of North American Geology Program	--	--	673,130	673,130	625,891
Distribution of assets held in trust	--	--	1,100	1,100	1,518
Other	<u>--</u>	<u>8,779</u>	<u>59,000</u>	<u>67,779</u>	<u>31,127</u>
	<u>136,190</u>	<u>9,567</u>	<u>737,526</u>	<u>883,283</u>	<u>798,750</u>
EXCESS (DEFICIENCY) OF REVENUES OVER EXPENDITURES	(85,913)	21,673	4,861	(59,379)	(32,317)
INVESTMENT ACTIVITY:					
Realized loss on investments	--	--	(6,250)	(6,250)	(783)
TRANSFERS IN (OUT)	<u>81,347</u>	<u>--</u>	<u>(81,347)</u>	<u>--</u>	<u>--</u>
EXCESS (DEFICIENCY) OF REVENUES OVER EXPENDITURES, including investment activity	(4,566)	21,673	(82,736)	(65,629)	(33,100)
FUND BALANCE (DEFICIT), beginning of year	<u>(183,130)</u>	<u>195,427</u>	<u>342,020</u>	<u>354,317</u>	<u>387,417</u>
FUND BALANCE (DEFICIT), end of year	<u><u>\$(187,696)</u></u>	<u><u>\$217,100</u></u>	<u><u>\$ 259,284</u></u>	<u><u>\$288,688</u></u>	<u><u>\$354,317</u></u>

See notes to combined financial statements.

NOTES TO COMBINED FINANCIAL STATEMENTS

YEAR ENDED DECEMBER 31, 1989
(with comparative totals for 1988)

A. Summary of Significant Accounting Policies:

The Geological Society of America Foundation, Inc. (the Foundation) was established in December 1980 to promote the science of geology.

A primary objective of the Foundation is to provide funds for the Decade Program, which was established to publish a series of geological references in celebration of the 100-year anniversary of the Geological Society of America (the Society) in 1988. Revenues are recorded by the Decade Program when its qualified expenses are incurred.

The financial statements of the Foundation have been prepared on the accrual basis of accounting. The accounts of the Foundation are maintained in accordance with the principles of fund accounting which classify funds, for accounting and reporting purposes, according to the Foundation's activities or objectives.

Donor-restricted funds may be used only in accordance with purposes established by the donor, in contrast to use of unrestricted and operating funds. The Foundation board has full authority to use donated unrestricted funds for operational purposes.

The Foundation records investments at fair market value. The difference between cost and fair market value is reflected in the combined statements of operations and fund balances as unrealized appreciation or depreciation on investments.

The Foundation is exempt from federal income taxes pursuant to Section 501(a)(3) of the Internal Revenue Code of 1954, as amended.

Furniture and equipment are stated at cost. Depreciation is provided by the straight-line method over the estimated useful lives of various classes of assets.

In-kind contributions are recorded at fair value at date of gift.

The Foundation defines cash and cash equivalents as immediately accessible funds held in bank checking and savings accounts.

B. Investments:

Investments held are summarized as follows:

	<u>DECEMBER 31, 1989</u>		<u>DECEMBER 31, 1988</u>	
	<u>COST</u>	<u>MARKET</u>	<u>COST</u>	<u>MARKET</u>
U.S. Treasury bills	\$192,699	\$192,699	\$382,367	\$382,367
Demand notes	627,628	627,288	280,000	280,000
Stocks	170,000	2,813	170,000	2,813
Other	<u>149</u>	<u>149</u>	<u>715</u>	<u>715</u>
	<u>\$990,476</u>	<u>\$823,289</u>	<u>\$833,082</u>	<u>\$665,895</u>

C. Due to Geological Society of America:

The amount due to the Society includes a non-interest-bearing advance to the Foundation to enable it to begin operations. The advance is to be repaid from unrestricted funds of the Foundation as they become available.

Also due to the Society at December 31, 1989 is \$440,898 for reimbursement of expenses incurred by the Centennial Program in excess of designated 1989 contributions received from the Foundation.

D. Assets Held in Trust:

The Foundation has an agreement with the Symposium of the Geology of Rocky Mountain Coal (the Symposium) whereby the Foundation will manage the assets of the Symposium. The Foundation receives a management fee equal to 1% per year of the market value of the funds. The agreement can be terminated by either party upon 90-day written notice.

E. Pension Plan:

Employees of the Foundation participate in a discretionary pension plan covering substantially all employees. Contributions to the plan are made at the discretion of the Foundation's Board of Directors, and totaled \$2,080 and \$2,671 in the years ended December 31, 1989 and 1988, respectively.

F. Related Party Transaction:

The Foundation leases its office space from the Geological Society of America under a month-to-month agreement. Total rent expense paid in 1989 was \$3,600.

People

GSA Member **Kelton D. Barr**, Minneapolis, Minnesota, has been appointed Director, Hydrocarbon Services, Midwest Region by Geraghty & Miller, Inc. The company has appointed Member **Joseph Reed**, Midland Texas, Director of Water Supply Development and Technology.

GSA Fellows **George R. Gibson**, Midland Texas, and **Willis G. Meyer**, Dallas, Texas, are recipients of the Society of Independent Professional Earth Scientists' Outstanding Service Award for 1990.

Memorial University of Newfoundland this spring conferred honorary degrees of Doctor of Science on GSA Fellows **William S. Fyfe**, University of Western Ontario; **E. R. Ward Neale**, retired vice-president (academic) of Memorial University; and **Raymond A. Price**, former Director General of the Geological Survey of Canada and current president of GSA.

The Institute for the Study of Earth and Man, at Southern Methodist University, has named GSA Fellow **Jack E. Oliver**, Cornell University, and COCORP Executive Director Sidney Kaufman winners of the Hollis D. Hedberg Award in Energy for 1990.

Fellow **Sherman A. Wengerd** presented the 1990 J. R. Berg Distinguished Petroleum Lecture at Wichita State University.

Tyler Prize Nominations Due in October

Nominations for the 1991 Tyler Prize for Environmental Achievement are due by October 15, 1990. Individuals or institutions whose work has benefited humanity in environmental fields, including resource management, radiation, pollution, and hazardous materials, are eligible for nomination for the \$150,000 prize.

For information, contact Jerome B. Walker, The Tyler Prize, Office of the Provost, University of Southern California, Los Angeles, CA 90089-4019; phone (213) 743-6343 or 740-6719; fax 1-213-746-9527 or 740-7606; telex 674803 UNIVSOCAL LSA.

In Memoriam

Charles G. Doll
Essex Junction, Vermont
March 12, 1990

Richard S. Sears
Tucson, Arizona
January 1, 1990

Cathy F. Wellendorf
Phoenix, Arizona
1990



DNAG NEWS
by Allison R. (Pete) Palmer

DNAG Progress

Each month we move a little closer to completion. Ken Bird's chapter on the Arctic North Slope for the Economic Geology volume and the chapter by Max Suter on the state of stress in Mexico and western Central America for the Stress section of the Neotectonics volume are now in production, and one of the two chapters by Norm Foster needed to complete the Economic Geology volume has been received for review.

Both Transect H-3 (Acapulco Trench to Gulf of Mexico), and DNAG Special Volume 4 on Archaeological Geology should be available for purchase by the time you read this. If things go smoothly with the final details of the Hatcher and Osberg Appalachian plates, this volume should also have been released by now. Both the Arctic and Surface Water volumes are at the printer.

The section on Neotectonics in the volume of the same name has been reduced in scope because four of the five planned chapters have not been started yet! Dave Schwartz (the Neotectonics coordinator), George Plafker and co-authors, Bob Bucknam and co-authors, and Tony Crone and co-authors are off the hook for this volume. Burt Slemmons, volume editor, will be writing an overview chapter, promised by early summer, so this book is now back on track for completion this summer. Both the Stress map and Geothermal map are in the final production stages.

NAS Booklet Addresses Practice of Science

The National Academy of Science has issued a booklet, *On Being a Scientist*, that addresses professional conduct. The two parts of the booklet are titled "The Nature of Scientific Research" and "Social Mechanisms in Science." The booklet can be ordered from the National Academy Press, 2101 Constitution Ave. NW, Washington, DC 20418. Price is \$5 for a single copy.

MOVING?

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GSA Employment Service

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When was the last time you hired a new employee? Did you waste time and effort in your search for a qualified geoscientist? Let the GSA computerized search file make your job easier.

How does it work? Complete the Employer's Request for Earth Science Applicants form on the following page. Remember to specify educational and professional experience requirements as well as the specialty area or areas of expertise your applicant should have. The GSA computer will take it from there.

You will receive a printout that includes the applicants' names, addresses, phone numbers, areas of specialty, type of employment desired, degrees held, years of professional experience, and current employment status. Résumés for each applicant are sent with each printout at no additional charge. In 1990, the cost of a printout of one or two specialty codes is \$150. (For example, in a recent job search for an analyst of inorganic materials, the employer requested the specialty codes of geochemistry and petrology.) Each additional specialty is \$50. A printout of the entire applicant listing in all specialties is available for \$350. (Specialty codes printed in boldface type are considered major headings. If you select a specialty code printed in boldface type, your listing will contain applicants within the related subspecialties as well. If you request a listing of one of the subspecialties, applicants coded under the major category will be included but not those coded under the other related subspecialties.) If you have any questions about your personalized computerized search, GSA Membership Services will assist you.

The GSA Employment Service is available year long. However, GSA also conducts the Employment Interview Service each fall in conjunction with the Society's Annual Meeting (this year in Dallas, Texas, Oct. 29-Nov. 1). You may rent interview space in half-day increments from GSA. Our staff will schedule all interviews with applicants for you, the recruiter. In addition, GSA offers a message service, complete listing of applicants, copies of résumés at no additional charge, and a posting of all job openings.

Looking for a New Job?

Are you looking for a new position in the field of geology? The GSA Employment Service offers an economical way to find one. Potential employers use the service to find the qualified individuals they need.

You may register any time throughout the year. Your name will be provided to all participating employers who seek individuals with your qualifications. If possible, take advantage of GSA's Employment Interview Service, which is conducted each fall in conjunction with the Society's Annual Meeting. The service brings potential employers and employees together for face-to-face interviews. Mark your calendar for Oct. 29-Nov. 1 for the 1990 GSA Annual Meeting in Dallas, Texas.

To register, complete the application form on the following page, prepare a one- to two-page résumé, and mail it with your payment to the address given below. One-year listing for GSA Members and Student Associates in good standing: \$30, non-members: \$60.

NOTE: If you plan to interview at the GSA Annual Meeting, GSA must receive your material **no later than August 15, 1990**. If we receive your materials by August 15, your record will be included in the information the employers receive prior to the meeting. Submit your forms early to receive maximum exposure! Don't forget to indicate on your application form that you would like to interview in November. Good luck with your job search!

For additional information and submission of forms, please contact

T. Michael Moreland
Manager, Membership Services
Geological Society of America
P.O. Box 9140
Boulder, CO 80301
(303) 447-2020

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THE APPALACHIAN-OUACHITA OROGEN IN THE UNITED STATES
(completion expected in June 1990)
edited by R.D. Hatcher, Jr., W.A. Thomas, and G.W. Viele., 1990
GNA-F2, 781 p., 12 plates in slipcase, ISBN 0-8137-5209-4, \$75.00

GEOLOGY OF NORTH AMERICA-AN OVERVIEW
edited by A.W. Bally and A.R. Palmer, 1989
GNA-A, 629 p., 12 plates in slipcase, 2 microfiche cards, ISBN 0-8137-5207-8, \$60.00

QUATERNARY GEOLOGY OF CANADA AND GREENLAND
edited by R. J. Fulton, 1989
GNC-K1, 848 p., 5 plates in slipcase, indexed, ISBN 0-660-13114-5, \$82.50

COMING SOON...

Centennial Special Volume 4: **Archaeological Geology of North America**
edited by N.P. Lasca and J. Donahue, 1990



The Geological Society of America

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EMPLOYER'S REQUEST FOR EARTH SCIENCE APPLICANTS

(Please type or print legibly)

NAME _____ DATE _____

ORGANIZATION _____

MAILING ADDRESS _____

CITY _____ STATE _____ ZIP CODE _____ TELEPHONE () _____
area code

SPECIALTY CODES (see list below)

List the specialty code numbers that you wish to order, or check here if you want the entire file of applicants in ALL specialties.

1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____

POSITION DATA: What position(s) do you expect to fill? _____

In what area(s)? _____

Degree requirements _____ Number of positions available _____

SPECIALTY CODES

100 Economic Geology	223 low temperature	350 Mathematical Geology	454 paleobotany	620 Remote Sensing
101 coal geology	224 stable isotopes	351 computer science	455 paleoecology	621 photogeology
102 geothermal, etc.	225 geochronology	352 statistical geology	500 Petroleum Geology	622 photogrammetry
103 metallic deposits	250 Geomorphology	400 Mineralogy	501 exploration	630 Science Editing
104 nonmetallic deposits	300 Geophysics	401 crystallography	502 subsurface strat.	650 Sedimentology
105 mining geology	301 seismic	402 clay mineralogy	520 Petrology	651 sed. processes
120 Engineering Geology	302 gravity/magnetics	410 Museum (curator)	521 igneous	652 sed. environments
150 Environmental Geology	303 seismicity	420 Oceanography	522 metamorphic	720 Stratigraphy
160 Public Education & Communication	304 paleomagnetism	421 marine geology	523 sedimentary (clastic)	750 Structural Geology
200 General Geology	320 Hydrogeology	422 coastal geology	524 sedimentary (carb.)	751 tectonics
220 Geochemistry	321 hydrochemistry	450 Paleontology	525 experimental	752 tectonophysics
221 organic	322 ground water	451 invertebrate	550 Planetology	753 rock mechanics
222 high temperature	323 surface water	452 vertebrate	575 Quaternary Geology	800 Volcanology
	330 Library	453 micropaleontology	600 Regional Geology	

Applicants seeking employment in:

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Minimum degree required:

None B.A. or B.S. M.A. or M.S. Ph.D.

Minimum professional experience:

None 1-5 years 6-plus years

Employment in: U.S. only U.S. with foreign assignments Either

Foreign Languages: French German Russian Other _____ Not required

Experience desired (years):

	None	1-5	6-plus
Administrative	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exploration/Production	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Field	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Teaching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

I am interested in interviewing applicants through the GSA Employment Service at the 19 _____ Annual Meeting
in _____.

- I agree to use this service for valid recruiting purposes.
- I agree that no placement charges will be assessed to any applicant participating in the GSA Employment Matching Service.

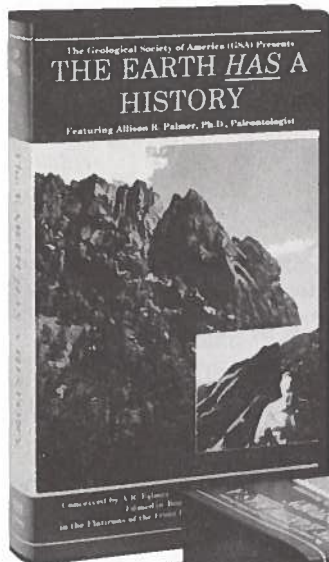
See attached sheet for current fee schedule

Total fee enclosed\$ _____

or invoice requested\$ _____

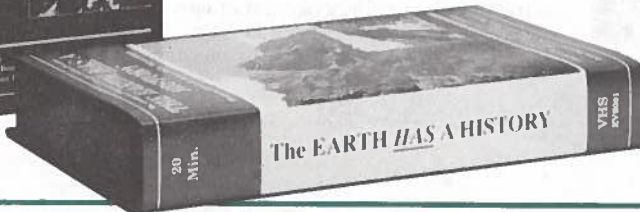
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Date _____



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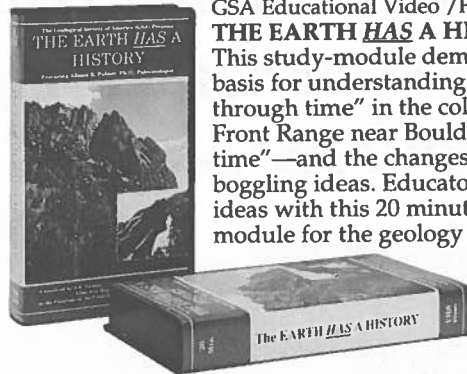
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A trim, pocket calculator, business-card size, with new "Sunceram II" solar cells that are five times more powerful than common calculators. Only 2mm thick, weighing only 14 grams, this handy calculator comes in white, emblazoned with the GSA seal, and includes a genuine leather business card case. **CAL001, \$9.75**



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MEETINGS

(Asterisk indicates new or changed information)

1990

American Association of Petroleum Geologists Annual Convention, June 3-6, 1990, San Francisco, California. Information: Jim Baroffio, Chevron Canada Resources Ltd., 500 5th Ave., SW, Calgary, Alberta T2P 0L7, Canada.

1st Joint Meeting of the Canadian Quaternary Association and American Quaternary Association, June 4-6, 1990, Waterloo, Ontario, Canada. Information: Alan V. Morgan, Quaternary Sciences Institute, Dept. of Earth Sciences, University of Waterloo, Waterloo, Ontario N2L 3G1, Canada.

Dinosaur Quarry Field Trip, June 7-9, 1990, Colorado and Utah. Information: Museum of Western Colorado, P. O. Box 2000-5020, Grand Junction, CO 81502; (303) 242-0971.

5th Symposium on the Geology of the Bahamas, June 15-19, 1990. Information: R. J. Bain, Dept. of Geology, University of Akron, Akron, OH 44325-4101; (216) 375-7659.

USA/USSR Joint Conference on Global Environmental Hydrology and Hydrogeology, June 18-21, 1990, Leningrad, USSR. Information: Helen Klose, American Institute of Hydrology, 3416 University Ave., S.E., Minneapolis, MN 55414; (612) 379-1030.

International Symposium on Mapping and Geographic Information Systems, June 21-22, 1990, San Francisco, California. Information: Ivan Johnson, A. Ivan Johnson, Inc., 7474 Upham Ct., Arvada, CO 80003; (303) 425-5610.

National Environmental Health Association Education Conference, June 23-28, 1990, Charlotte, North Carolina. Information: NEHA, 720 S. Colorado Blvd., South Tower, #970, Denver, CO 80222; (303) 756-9090.

4th International Conference on Geoscience Information (GeoInfo IV), June 24-29, 1990, Ottawa, Ontario. Information: David Reade, Conference Secretary-Treasurer, GEOSCAN Centre, Geological Survey of Canada, 601 Booth St., Ottawa, Ontario K1A 0E8, Canada; (613) 992-9550; fax 613-996-9990; telex 0533117 EMAR-OTT.

9th International Conference on Basement Tectonics, July 2-6, 1990, Canberra, Australia. Information: IBT9 ACTS, GPO Box 2200, Canberra, A.C.T. 2601, Australia; phone 062-49-8015; fax 062-573256.

1990 Watershed Management Symposium, July 9-11, 1990, Durango, Colorado. Information: Robert Riggins, USACERL, P.O. Box 4005, Champaign, IL 61824-4005.

International Association on the Genesis of Ore Deposits 8th Symposium, August 12-18, 1990, Ottawa, Ontario. Information: L. M. Cumming, 8th IAGOD Symposium, Geological Survey of Canada, 601 Booth St., Ottawa, Ontario K1A 0E8, Canada.

Rocky Mountain Friends of the Pleistocene Field Trip, August 16-19, 1990, southwestern Montana. Information: Robert D. Hall, Dept. of Geology, Indiana University-Indianapolis, 425 University Blvd., Indianapolis, IN 46202-5140; (317) 274-3795 (direct), (317) 274-7484 (dept.).

Wyoming Geological Association 41st Annual Field Conference, August 17-23, 1990, Casper, Sheridan, Cody, Jackson, and Riverton, Wyoming. Information: Kent A. Sundell, P.O. Box 1543, Casper, WY 82602; (307) 266-4760.

Cretaceous Resources, Events and Rhythms, SEPM Research Conference, August 20-24, 1990, Denver, Colorado. Information: Michael A. Arthur, Graduate School of Oceanography, University of Rhode Island, Narragansett, RI 02882-1197; fax 401-792-6160.

International Symposium on Geothermal Energy, August 20-24, 1990, Kailua-Kona, Hawaii. Information: Geothermal Resources Council, P.O. Box 1350, Davis, CA 95617-1350; (916) 758-2360; fax 916-758-2839.

Western Pacific Geophysics Meeting, August 21-25, 1990, Kanazawa, Japan. Information: Western Pacific Geophysics Meeting, American Geophysical Union, 2000 Florida Ave N.W., Washington, DC 20009; (202) 462-6900; fax 202-328-0566.

International Sedimentological Congress, August 26-31, 1990, Nottingham, England. Information: C. P. Summerhayes, Institute of Oceanographic Sciences Deacon Lab., Brook Rd., Wormley, Godalming, Surrey GU8 5UB, England.

International Conference on Water Resources in Mountainous Regions, August 27-September 1, 1990, Lausanne, Switzerland. Information: Aurèle Parriaux, Laboratory of Geology EPFL, 1015 Lausanne, Switzerland; phone 021-47-23-55; telex 454478 EPFV CH.

AEG General Meeting and 14th International Geochemical Exploration Symposium, August 29-31, 1990, Prague, Czechoslovakia. Information: Frantisek Mrna, Geological Survey of Prague, 118 21 Praha 1, Malostranske nam. 19, Czechoslovakia.

Conference on Evolution of Upwelling Systems since the Early Miocene, September 3-4, 1990, London, England. Information: C. P. Summerhayes, IOS Deacon Lab., Wormley, Godalming, Surrey GU8 5UB, England; 042-879-4141; fax 042-879-3066.

IGCP Cretaceous Field Conference, September 5-15, 1990, Jerusalem, Israel. Information: G. Gvirtzman, Geological Survey of Israel, 30 Malkhe Yisrael St., Jerusalem 95501, Israel; telex 26362 ENER IL; fax 972-2-381444.

Geological Association of Canada Nuna Research Conference, Late Proterozoic Rifting, Glaciation and Eustasy, as Illustrated by the Windermere Supergroup, September 8-14, 1990, Windermere and Valemount, British Columbia. Information: J. D. Aitken, Geological Survey of Canada, 3303 33rd St. NW, Calgary, Alberta T2L 2A7, Canada.

Society for Organic Petrology Annual Meeting, September 9-14, 1990, Calgary, Alberta, Canada. Information: Wolfgang Kalkreuth, Institute of Petroleum and Sedimentary Geology, 3303-33 St., N.W., Calgary, Alberta T2L 2A7, Canada; (403) 292-7119; fax 403-292-5377.

GOLDTech 4, September 10-12, 1990, Reno, Nevada. Information: Meetings Department, Society for Mining, Metallurgy, and Exploration, P.O. Box 625002, Littleton, CO 80162-5002; (303) 973-9550; fax 303-973-3845; telex 881988.

New Mexico Geological Society Annual Field Conference, Sept. 12-15, 1990, Red River, New Mexico. Information: Paul Bauer, New Mexico Bureau of Mines, Socorro, NM 87801; (505) 835-5106.

AAPG-SEPM-EMD Rocky Mountain Section Meeting, September 16-19, 1990, Denver, Colorado. Information: Matt Silverman,

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MEETINGS (continued from p. 169)

Gustavson Associates, Inc., 5757 Central Ave., Suite D, Boulder, CO 80301.

3rd International Archaean Symposium, September 17-21, 1990, Perth, Western Australia. Information: Susan E. Ho, P.O. Box 435, Nedlands, Western Australia 6009, Australia.

***82nd Annual New England Intercollegiate Geological Conference**, with field trips in the Gaspé Peninsula, Quebec, September 21-22, 1990. Information: Walter Trzcienski, Dept. of Geology, University of Montreal, C.P. 6128, Succ. A, Montreal, Quebec H3C 3J7, Canada.

7th International Conference on Geochronology, Cosmochronology and Isotope Geology, September 24-29, 1990, Canberra, Australia. Information: Organizing Committee, ICOG 7, Research School of Earth Sciences, Australian National University, G.P.O. Box 4, Canberra, A.C.T. 2601, Australia; phone 062-49-3406; fax 61-62-490 738; telex 62693.

European Geological Societies, September 29-October 7, 1990, Lisbon, Portugal. Information: MEGS 6, Sociedade Geológica de Portugal, Apto. 2361, P1109 Lisboa Codex, Portugal.

Association of Engineering Geologists 33rd Annual Meeting, October 1-5, 1990, Pittsburgh, Pennsylvania. Information: 33rd AEG Meeting, MEMS, One Northgate Sq., Suite 211, P.O. Box 270, Greensburg, PA 15601; (412) 836-6813; fax 412-836-6817.

International Earth Sciences Congress on Aegean Regions, October 1-7, 1990, Izmir, Turkey. Information: IESCA-1990, D.E. University Dept. of Geology, P.K.74 (E.U.-PTT) Bornova, Izmir, Turkey; phone 51-182919 or 180680 or 181088; telex 52407 dbte tr; fax 51-220978.

Soils and Landscape Evolution, Binghamton Symposium in Geomorphology, October 6-7, 1990, Binghamton, New York. Information: Peter L.K. Knuepfer, Dept. of Geological Sciences, SUNY, Binghamton, NY 13901; (607) 777-2389; Leslie D. McFadden, Dept. of Geology, University of New Mexico, Albuquerque, NM 87131; (505) 277-2307. (Abstracts deadline: August 1, 1990.)

Clay Minerals Society 27th Annual Meeting, October 6-11, 1990, Columbia, Missouri. Information: W. D. Johns, Dept. of Geology, University of Missouri, Columbia, MO 65211; (314) 882-3785.

Federation of Analytical Chemistry and Spectroscopy Societies 17th Annual Meeting, October 7-12, 1990, Cleveland, Ohio. Information: Charles J. Belle, Lucas Aerospace, PEC, 4259 W. 192 St., Fairview Park, OH 44126.

International Symposium on Environmental Studies on Tropical Rain Forests, October 7-13, 1990, Manaus, Brazil. Information: Organising Committee-Forest '90, P.O. Box 3591, 2001 Rio de Janeiro, RJ, Brasil. Phone 55-21-211-5581; telex 55-21-22395; fax 55-21-252-9269.

Petroleum Computing in the '90s Symposium, October 8-9, 1990, Midland, Texas. Information: Permian Basin Graduate Center, P.O. Box 1518, Midland, TX 79702; (915) 683-2832.

5th Australasian Remote Sensing Conference, October 8-12, 1990, Perth, Western Australia. Information: Golden West Conventions, P.O. Box 411, West Perth, W.A. 6005, Australia; phone 619-3227922; telex AA 95380; fax 619-4814029.

American Institute of Professional Geologists Annual Meeting, October 9-12, 1990, Long Beach, California. Information:

Stephen M. Testa, 6695 E. Pacific Coast Highway, Long Beach, CA 90803; (213) 430-6500.

***Association of Ground Water Scientists and Engineers Annual Meeting**, September 25-26, 1990, Anaheim, California. Information: Jacqueline Mack, National Water Well Association, 6375 Riverside Dr., Dublin, OH 43017; (614) 761-1711; fax 614-761-3446.

***Conference on Eastern Regional Ground Water Issues**, October 17-19, 1990, Springfield, Massachusetts. Information: FOCUS Eastern Conference, National Water Well Association, P.O. Box 182039, Dept. #017, Columbus, OH 43218; (614) 761-1711.

Geodynamics of the Arabian Plate, October 20-25, 1990, Kuwait. Information: Waris E.K. Warsi, Dept. of Geology, University of Kuwait, P.O. Box 5969, Safat 13060, Kuwait; or Muawia Barazangi, INSTOC, Snee Hall, Cornell University, Ithaca, NY 14853-1504.

Geological Society of America Annual Meeting, October 29-November 1, 1990, Dallas, Texas. Information: GSA, Meetings Department, P.O. Box 9140, Boulder, CO 80301; (303) 447-2020. (Abstracts deadline: July 11, 1990.)

***Petroleum Hydrocarbons and Organic Chemicals in Ground Water: Prevention, Detection and Restoration**, October 31-November 2, 1990, Houston, Texas. Information: Petroleum Hydrocarbons Conference, National Water Well Association, P.O. Box 182039, Dept. #017, Columbus, OH 43218; (614) 761-1711.

Eastern Oil Shale Symposium, November 6-8, 1990, Lexington, Kentucky. Information: Geanita H. Caylor, Symposium Coordinator, University of Kentucky/OISTL, 201 Porter Bldg., Lexington, KY 40506-025; (606) 257-2820. (Abstracts deadline: June 8, 1990.)

Supercomputing '90, November 12-16, 1990, New York, New York. Information: Joanne L. Martin, IBM T. J. Watson Research Center, P.O. Box 218, Rte. 134, Yorktown Heights, NY 10598; (914) 945-3285.

Penrose Conferences 1990

Transpressional Tectonics of Convergent Plate Margins, August 25-30, 1990, Bellingham, Washington. Information: Vicki L. Hansen, Dept. of Geological Sciences, Southern Methodist University, Dallas, TX 75275-0395; (214) 692-4179.

Large Lakes and Their Stratigraphic Record, September 9-13, 1990, Lake Tahoe, California. Information: Andrew S. Cohen, Dept. of Geosciences, University of Arizona, Tucson, AZ 85721; (602) 621-4691 (direct), (602) 621-6024 (dept.).

New Methods for Dating of Geomorphic Surfaces, October 12-17, 1990, Mammoth Lakes, California. Information: Fred M. Phillips, Dept. of Geoscience, New Mexico Tech, Socorro, NM 87801; (505) 835-5540 (direct), (505) 835-5634 (dept.).

1991

***Society for Mining, Metallurgy, and Exploration Annual Meeting**, February 25-28, 1991, Denver, Colorado. Information: Meetings Department, Society for Mining, Metallurgy, and Exploration, P.O. Box 625002, Littleton, CO 80162; (303) 973-9550; fax 303-979-3461.

***Second International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics** (including special session on the Loma Prieta [San Francisco])

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earthquake of October 17, 1989), March 11-15, 1991, St. Louis, Missouri. Information: Shamsheer Prakash, Dept. of Civil Engineering, 308 Butler Carlton Hall, University of Missouri, Rolla, MO 65401-0249; (314) 341-4489; fax 314-341-4729. (Abstracts deadline for Loma Prieta session is July 15, 1990.)

International Conference on Environmental Pollution, April 15-19, Lisbon, Portugal. Information: ICEP Conference Office, ICTR Secretariat, 11-12 Pall Mall, London SW1Y 5LU, England; phone 01-930-6825; telex 925312 REICO G; fax 01-976-1587. (Abstracts deadline: July 15, 1990.)

International Symposium on Geophysical Hazards in Developing Countries and Their Environmental Impacts, April 21-27, 1991, Cairo, Egypt. Information: T. S. Murty, Hazards-91, c/o Institute of Ocean Sciences, P.O. Box 6000, Sidney, B.C. V8L 4B2, Canada; (604) 356-6311; telex 04-97281; fax 604-356-6390; Mohammed I. El-Sabh, Hazards-91, Dept. Océanographie, Université du Québec, 300, Allée des Ursulines, Rimouski, Québec G5L 3A1, Canada; (418) 724-1707; telex 051-31623; fax 418-723-7234.

European Geophysical Society XVI General Assembly, April 22-26, 1991, Wiesbaden, Federal Republic of Germany. Information: EGS Office, Postfach 49, 3411 Katlenburg-Lindau, Federal Republic of Germany; phone 49-5556-1440; fax 49-5556-4709; Telex 965564 zil d.

***Eighth Thematic Conference on Remote Sensing for Exploration Geology**, April 29-May 2, 1991, Denver, Colorado. Information: Robert H. Rogers, ERIM Thematic Conferences, P.O. Box 8618, Ann Arbor, MI 48107-8618; (313) 994-1200.

International Symposium on Land Subsidence, May 12-18, 1991, Houston, Texas. Information: Ivan Johnson, A. Ivan Johnson, Inc., 7474 Upham Ct., Arvada, CO 80003; (303) 425-5610.

***Geological Association of Canada—Mineralogical Association of Canada Annual Meeting**, May 27-29, 1991, Toronto, Canada. Information: J. J. Fawcett, Dept. of Geology, Earth Sciences Center, University of Toronto, 22 Russell St., Toronto, Ontario M5S 3B1, Canada; (416) 978-3027.

SEPM Midyear Meeting—Continental Margins, Tectonics, Eustacy and Climate Change, August 15-18, 1991, Portland, Oregon. Information: Sam Boggs, Jr., Dept. of Geology, University of Oregon, Eugene, OR 97403; (503) 686-4573.

***1st International Meeting of Young Geologists**, August 22-28, 1991, Budapest, Hungary. Information: Anna Balog, Dept. of Geology, Technical University of Budapest, H-1521 Budapest, Hungary; phone (36-1) 16-67-370; fax 36-1-16-66-808; telex 225931.

Third U.S. Conference on Lifeline Earthquake Engineering, August 22-23, 1991, Los Angeles, California. Information: American Society of Civil Engineers, Specialty Conference Dept., 345 East 47th St., New York, NY 10017; (212) 705-7139.

International Symposium on Fossil Cnidaria including Archaeocyatha and Porifera, September 9-14, 1991, Münster, Federal Republic of Germany. Information: Fossil VI. Cnidaria, Pferdegasse 3, D-4400 Münster, Federal Republic of Germany.

American Institute of Professional Geologists Annual Meeting, October 16-19, 1991, Gatlinburg, Tennessee. Information: Lawrence I. Benson, ERC/EDGE, P.O. Box 22879, Knoxville, TN 37933-0879; (615) 966-9761; fax 615-966-4155.

Geological Society of America Annual Meeting, October 21-24, 1991, San Diego, California. Information: GSA, Meetings Department, P.O. Box 9140, Boulder, CO 80301; (303) 447-2020.

***5th International Circum-Pacific Terrane Conference**, November 11-28, 1991, Santiago, Chile. Information: D. G. Howell, U.S. Geological Survey, MS 902, 345 Middlefield Rd., Menlo Park, CA 94025; (415) 329-5430.

Mining Indonesia '91, December 4-7, 1991, Jakarta, Indonesia. Information: Eileen M. Lavine, Information Services, Inc., 4733 Bethesda Ave., #735, Bethesda, MD 20814; (301) 656-2942; fax 301-656-3179.

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ISSN 0164-5854