



GSA NEWS & INFORMATION

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Do you have a publishable map?

GSA Maps and Charts Aid Geoscientists, Students

by Wallace R. Hansen
GSA Maps and Charts Editor

This winter hundreds of students across the nation will find it easier to grasp some of the mysteries of the geology of plate margins because a copy of Greg Wessel's chart will be hanging in their classroom. Other students will get a good look at the geology of the northwest Cascades because the map compiled by E. H. Brown and 14 of his graduate students will be in their hands. Still other students will get a close look at an active fault because Thom Davis's and Ernie Duebendorfer's strip map of the San Andreas fault will be in front of them.

Maps and charts make excellent teaching and study aids, not only for students but for their professors and other geologists as well, and the ones mentioned above are just three from the growing selection available through GSA's Map and Chart Series. How did they come to be?

Wessel's chart grew out of a course requirement at the Colorado School of Mines. Brown and his students, as a classroom and field project, built on earlier studies by taking advantage of new road access and improved base maps and geologic tools and cooperatively produced a geologic map. The San Andreas map is a result of Duebendorfer's M.A. thesis and Davis's Ph.D. thesis. Why didn't these efforts, like so many others, end up gathering dust on a top shelf somewhere? Because the authors knew of GSA's Map and Chart Series and submitted their work to be considered for publication.

Series Content

GSA's Map and Chart Series (formerly MC, now MCH series) provides an outlet for stand-alone "oversize" illustrations, such as the DNAG Geologic Time Scale (MCH050), The Geology of Plate Margins (MCH059), and a great variety of geologic, magnetic, gravity, and bathymetric maps. GSA's free publication catalog lists all of the maps and charts currently available. The Decade of North American Geology transects and continent-scale maps are series unto themselves and are not open to volunteer contributions.

GSA considers for publication maps and charts covering all fields of the earth sciences, preferably contributions of broad, general interest. The most common items submitted are geologic maps of areas larger than a 7½-minute quadrangle, but a great variety of other items, such as the Summary Sheets of Sedimentary

Deposits (MCH008), International Atlas of Ophiolites (MCH033), and the CLIMAP Seasonal Reconstruction of the Earth's Surface at the Last Glacial Maximum (MCH036), were also appropriate for consideration and publication.

How Big Can They Be?

Size is mainly a matter of convenience for the user: a sheet size of 30 × 40 inches with an image area about 1 inch smaller all around is about as large as one can handle easily, but when the nature of the material requires, sheets as large as 40 × 60 inches can be accommodated. Both sides of the sheet can be printed, when appropriate, to reduce the amount of bulk when the sheets are folded to fit a 9 × 12 inch file envelope. Maps and charts are also available flat (unfolded) and shipped rolled in a mailing tube. Flat maps of near maximum size may not be available to foreign purchasers because of shipping restrictions, another reason for designing close to the optimum size of 30 × 40 inches or smaller.

Who Does What in Preparation?

The author is responsible for all preparation work and costs through camera-ready art or color separation negatives. The Society will pay for printing the map or chart, the file envelope, and the text (if any) and for advertising and distribution.

Copy should be prepared on scale-stable base material, such as Mylar, and any necessary overlays should be carefully registered. Linework should be drafted in black ink on a blueline or greenline scale-stable copy of the base map. A screened blackline half-tone copy of the base should also be provided for combined printing. Authors, however, should not prepare final copy until after critical review and acceptance by the Society. Neat hand lettering is adequate for review purposes. Titles can be set later in suitable type by the Society.

Use of Color

The use of color where appropriate to enhance understanding is encouraged. Commonly, black is all that is needed, but in some cases a single-color overlay highlighting one or two particular map units is desirable for appearance and understanding. Maps or charts

(continued on p. 262)

Penrose Conference on Paleozoic–Early Mesozoic Cordilleran Paleogeography to Meet in June

A GSA Penrose Conference "Paleozoic–Early Mesozoic Paleogeographic Relations Between the Klamath Mountains, Northern Sierra Nevada, and North America" will be held June 5–10, 1988, in the Redding area of northern California. Conveners are David S. Harwood, U.S. Geological Survey, 345 Middlefield Road (MS 975), Menlo Park, CA 94025, and M. Meghan Miller, Division of Geological and Planetary Sciences, California Institute of Technology, Pasadena, CA 91125.

Paleozoic and lower Mesozoic volcanic-arc sequences in the Klamath Mountains and northern Sierra Nevada obviously formed outboard of the Cordilleran miogeocline and are thus suspect terranes in the sense of Coney et al. (1980). Whether these terranes are far-traveled oceanic fragments unrelated to each other and exotic to North America or whether they formed along our paleo-plate margin is a significant question with far-reaching consequences for Cordilleran geology. The accreted terrane concept began in the Klamath Mountains, yet controversy still exists about the origin of the Paleozoic volcanic-arc terranes, their relation to similar rocks in the northern Sierra Nevada, and the tectonic development of the western continental margin. Did the western margin grow by successive accretion of exotic island arcs or was it an active margin fringed by active island arcs and marginal basins

throughout the late Paleozoic and early Mesozoic? This question has been asked and answered many times, but none of the answers has been backed by a sufficiently broad array of data to be convincing.

In the past five years much new stratigraphic, structural, geophysical, geochemical, geochronologic, and biogeographic data have been gathered from these terranes as well as from allochthonous rocks in northwestern Nevada. The data have generated new conclusions about possible and impossible paleogeographic relations between the island-arc sequences, the allochthons, and the miogeocline. The purpose of this Penrose Conference is to provide a forum to stimulate lively discussions of these data and hypotheses.

The format of the conference will emphasize poster sessions for the presentation of data, formal and informal topical discussions, and one-day field trips to both the eastern Klamath and northern Sierra terranes. Technical sessions will cover the following topics:

- Basement rocks
- Volcanic and depositional histories
- Biogeography
- Geophysical correlations
- Relations to other Cordilleran terranes
- Paleogeography.

The conference will be limited to 60–70 participants, including graduate students and foreign scholars. Interested persons should write to David S. Harwood at the above address and state reasons for wishing to attend the conference. Include a brief description of past or present research relevant to any of the conference sessions. Deadline for application is **February 1, 1988**.

We hope to have available limited support for a few qualified graduate students. The registration fee has not yet been determined.

GSA Maps and Charts (continued from p. 261)

utilizing multiple colors may be beyond the abilities and pocket of some authors but, if expertly produced, are desirable additions to the GSA Map and Chart Series.

Text

A text as long as 50 double-spaced typewritten pages (no dot matrix, please) may be included, plus appropriate line drawings, tables, and photographs. The text should be designed as an expanded explanation of the map or chart; it should not be an alternative to publication in the *GSA Bulletin* or *Geology*. Style and format for text, citations, and references should conform with current usage in the *Bulletin* or *Geology*. References should be spelled out, not abbreviated.

How To Submit Your Work

Submit three ozalid (or equivalent) copies for consideration. A hand-colored copy should be included if map relations are complex or if color printing is intended. Scale-stable drafted original copy should be retained by the author until it is requested by GSA. All contributions to the series are subject to the same review standards as other technical publications of the Society. Contributions should be addressed to: Editor, Map and Chart Series, Geological Society of America, 3300 Penrose Place, P.O. Box 9140, Boulder, CO 80301.

If you have a map or chart you would like to submit, or for further information, write to the editor, Wallace R. Hansen, at Society headquarters in Boulder or phone (303) 236-1294.

In Memoriam

Conrad R. Burri
Bern, Switzerland

Milton W. Corbin
Huntsville, Texas
February 8, 1987

James M. Forgotson
Shreveport, Louisiana
May 18, 1987

William H. Gross
Toronto, Ontario
August 1987

W. Ernest Hale
Fredericton, New Brunswick
September 23, 1986

Stanton B. Keith
San Diego, California
September 5, 1987

Peter Misch
Seattle, Washington
July 1987

Thomas G. Payne
Eugene, Oregon

John S. Stevenson
Montreal, Quebec
September 7, 1987

Michael J. Woods
Hillsboro, Oregon
July 1987

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CENTENNIAL NEWS

by Allison (Pete) Palmer

Another Book Wrapped Up!

Congratulations to the authors and editors of *The Atlantic Continental Margin: U.S.*, who are listed below, for completing the third book of The Geology of North America. Because of all of the delays in obtaining the last two chapters from Kim Klitgord and John Grow and getting those chapters through the copy editing and typesetting

process, this book will now carry a 1988 date. It should be available by early February. Editors Bob Sheridan and John Grow are very pleased with the mass of good information that is now gathered in one place about the geology and geophysics of the U.S. Atlantic Margin, and the good work of all authors (listed below) is greatly appreciated.

J. G. Armbruster
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 D. F. Belknap
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 J. B. Diebold
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 D. Whittington

Other Books

We still await the last two chapters for the South-Central Section Centennial Field Guide. As soon as Jim Jones and Dave LeMone come through, the DNAG Centennial Field Guide series will be complete. This book is now also delayed to early 1988.

The long-awaited chapter by Charlie Collinson on the Illinois Basin for the volume *Sedimentary Cover of the*

Craton has been received completed. We can now begin to wrap that volume up.

Nineteen substantive chapters, all of which are more than 28 months overdue, are all that are needed to complete seven more volumes of The Geology of North America. More on some of those missing chapters next month. All of the authors received a special reminder in mid-October.

Beard Competition to Highlight Centennial Welcoming Party

What is a centennial without a beard contest? In conjunction with the 100th anniversary of GSA, prizes will be awarded for the longest beard, best field beard, and most unusual beard. Judging will take place during the evening welcoming party at GSA's Centennial Celebration, the annual meeting in Denver, on October 31, 1988.

Recognizing the inability of a significant number of our membership to grow a beard, Centennial awards will be given to the best dressed and most unusually dressed field geologists. These costumed geologists will represent the field explorer of 1888 and the modern, fully equipped field geologist of 1988.

Potential contestants should begin growing their beards now and assembling their collection of modern and ancient field gear in time for the 1988 GSA Centennial Celebration. Watch *GSA News & Information* for entry blanks, prize descriptions, categories, and further information regarding these traditional centennial events.

HAVE YOU PAID YOUR 1988 DUES?

Last year, most members remitted their annual dues payment before the November 30 deadline. As a result, they received their GSA publications without delay. This year, the timing is again critical because all section meeting *Abstracts with Programs* will be mailed to members early in 1988. If we do not receive your dues payment before mid-December, you may not receive that much-needed *Abstracts with Programs* in time for the section meeting that you plan to attend. Remember, back orders take 6 to 8 weeks to reach you! Please use the 1988 dues and publications selection form mailed to you earlier. Dues for 1988 are \$70 for Members and Fellows and \$32 for Students (the same as 1987).

Don't miss out on the excitement during 1988—GSA's Centennial Celebration year!

If you have any questions, please call or write the GSA Membership Department, P.O. Box 9140, Boulder, CO 80301, (303) 447-2020.

Two New Trustees Appointed by Robert L. Fuchs

F. Beach Leighton and Brian J. Skinner have been appointed to the board of trustees of the Geological Society of America Foundation. Leighton will begin a five-year term and Skinner will initially serve until 1988, filling the remaining term of former trustee Thomas D. Barrow.

Beach Leighton is chairman of the board and chief executive officer of Leighton and Associates, an engineering geology consulting firm located in the Los Angeles area. Leighton is well known for his work in engineering geology, particularly as it relates to urban planning and land use. He has published extensively on landslides, urban geology, and earthquakes. He is a recognized leader in the rapidly expanding application of geology to the urban environment.

Brian Skinner has been professor of geology and geophysics at Yale University since 1966, serving as chairman of the department for six years during that period. He is a well-known expert in economic geology and the geochemistry of ore deposits. Skinner has been editor of *Economic Geology* for 17 years. Currently he is chairman of the U.S. National Committee on Geology, the Board of Earth Sciences, and the board of overseers of the *American Journal of Science*. Skinner has held numerous important posts in the Geological Society of America, including president and chairman of the Special Publications and Path to 2000 committees.



F. Beach Leighton



Brian J. Skinner

Trustee chairman Harrison Jamison noted that the addition of Beach Leighton and Brian Skinner to the Foundation's board of trustees "is most significant, not only because they are renowned geoscientists but also because of their demonstrated leadership within their respective sectors of the profession."

The Taxman Cometh . . . But Perhaps Taketh Not!

Death and taxes are inevitable, but in the case of taxes, one can exercise some degree of control in the amount to be paid. In the November issue of *GSA News & Information*, we pointed out that charitable contributions in 1987 have a special importance. Because of changes in the tax law, 1987 is a transition year between higher income tax rates in the early 1980s and lower tax rates in the years

ahead. A charitable contribution this year will cause a greater reduction in an individual's taxes than one made next year.

Congress has removed or restricted the use of many former deduction items, such as interest and sales taxes. Thus, charitable contributions to the GSA Foundation and other such organizations are one of the few remaining ways to reduce one's tax bill.

Cash gifts are the most common form of charitable contribution. However, gifts of property are used effectively by many donors. Such gifts could be real estate; oil, gas, or mineral interests; works of art; or securities. The significance of making a gift of property is that the value of the gift for tax-deduction purposes is the market value at the time of the gift, *not* the donor's cost, which might be much lower. Further, there is no capital-gains tax payable by the donor on the appreciated value of the property. We have a booklet entitled "The Magic of Gifts of Appreciated Property" dealing with this subject. Call or write for a copy.

Because of the stock-market rise of the past few years, many GSA members hold securities that have appreciated greatly in value. A year-end gift of stock to the Foundation would provide you with a 1987 tax deduction in the amount of the market value of the stock on the day of the transfer, regardless of your original cost. The benefit is twofold: you receive a 1987 tax deduction and the Foundation's assets increase along with its ability to support geologic research.

There is not much time left in 1987 to make contributions to the Foundation. Checks can be mailed to the GSA Foundation, P.O. Box 9140, Boulder, CO 80301. We can assist you with gifts of property. A contribution of appreciated securities is handled through the company's transfer agent. If you will call the Foundation at (303) 447-2020, we will provide the instructions that will enable you to complete a stock transfer to the GSA Foundation.

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Charitable contributions are worth more in 1987, and I would like to support the GSA Foundation.
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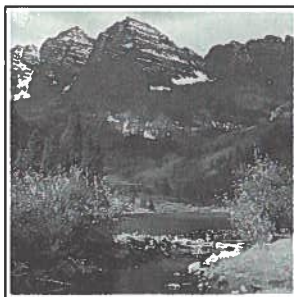
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Report from Washington

by Jennifer Hess
GSA Congressional Science Fellow

In past *GSA News & Information* articles, I have focused generally on how an individual geologist can make a difference on the Hill. In this article, I would like to report on how an individual geologist did make a difference.

The Issue

The high-level-waste disposal program has drawn increasingly intense political opposition as the Department of Energy (DOE) has narrowed the list of candidate sites for waste-storage facilities and permanent underground repositories. Under the 1982 Nuclear Waste Policy Act, DOE has selected three western sites—the federal Hanford nuclear reservation in Washington; Yucca Mountain, Nevada; and Deaf Smith County, Texas—as candidates for the nation's first permanent high-level-waste repository. Extensive shaft drilling and underground excavation, or "site characterization," is to be carried out at the candidate sites to determine which could best hold waste safely for thousands of years.

DOE is also required to search for a second repository site and has identified seven eastern and midwestern states as possibly suitable locations. After encountering intense hostility from those states, the department announced indefinite postponement of the search, angering some lawmakers. DOE now says it will resume the search for the second repository unless Congress approves the delay.

Currently, four bills are pending in the House and Senate which seek to amend the Nuclear Waste Policy Act. Two of the bills have been proposed by the House Interior Chairman Morris Udall. Udall's main bill (HR2967), introduced July 15, 1987, would halt Energy Department work at candidate waste sites for 18 months. That pause would give a congressionally appointed commission a year to study the program and would allow Congress six months to act on the commission's recommendations before DOE waste-site activities resumed. Besides setting up a study commission, the bill would require the president to appoint a "nuclear-waste negotiator" who would try to reach voluntary agreement with a state or Indian tribe to host a permanent high-level-waste repository, rather than have DOE select a site. An earlier Udall bill (HR2888), introduced July 1, would suspend DOE waste-site work until Congress voted to restart it.

Senate efforts to solve the nuclear-waste stalemate have focused on a bill (S1668) by Senate Energy Chairman J. Bennett Johnston and ranking Republican James McClure. The measure is intended to save \$140 million in fiscal 1988 by delaying excavation of exploratory shafts at the three candidate waste sites until 1989. At that time, DOE would be required to choose one of the three sites for detailed characterization.

The bill is designed to soften local opposition to nuclear-waste sites by offering \$100 million per year to a state agreeing to host a permanent repository and \$50 million per year to a state hosting a monitored retrievable storage facility. The bill would authorize construction of the facility, although DOE would have to start over again in its search for a site. DOE's search for a second permanent repository, planned for the East or Midwest, would be suspended.

Senators Reid, Sasser, and Adams have introduced legislation to block DOE's waste-disposal program and to impose a moratorium on choosing a site for the high-level-waste facility.

Both the site selection of the high-level nuclear-waste facility



and the above-mentioned changes to the Waste Policy Act are highly controversial issues.

A Geologist's Input

In October I received a call from a geologist working in the nuclear-waste field. He expressed two concerns with the current political climate as it affected the nuclear-waste facility. First, he had a general concern that political pressure to identify a site quickly would compromise the scientific characterization of the site, and the decision on where to locate a site would be made on some basis other than geologic characteristics. Second, he was worried that an 18-month stall or an indefinite moratorium in the waste program would result in the loss of capable scientists currently involved in the program. Thus, the costs to the program would be much greater than had previously been considered.

Since Environment and Public Works has jurisdiction over nuclear issues, I was able to refer him to a staff member working on the issue. The man's comments were considered so important that staff members are working to draft an amendment to the Johnston bill which would address and clarify both of these concerns.

For me, this experience was personally gratifying. I have always felt that a persistent individual with specific expertise could contribute to the legislative process. Now I have seen this work. This individual geologist, who cared enough to call, made a difference.

For those of you who would like to be involved, I reiterate that knowing the committee of jurisdiction is of utmost importance. Committees with jurisdiction over earth science issues are listed below. Remember that your Congressional Science Fellow can be a helpful first contact.

Committee Jurisdiction and Phone Numbers

Senate

Committee on Appropriations (202) 224-3471

Appropriations and spending authority

Committee on Commerce, Science and Transportation

(202) 224-5115

Science, engineering, and technology research and development and policy

Coastal zone management

Oceans, weather, and atmospheric activities

(continued on p. 268)

Report from Washington (continued from p. 267)

- Committee on Energy and Natural Resources (202) 224-4971
Strategic petroleum reserves
Outer continental shelf leasing
International energy affairs
Natural gas pricing and regulation
Nuclear waste and insurance programs
- Committee on Environment and Public Works (202) 224-6176
Environmental policy
Environment research and development
Ocean dumping
Environmental aspects of the outer continental shelf
Solid waste disposal and recycling
Water resources
Flood control
Water pollution
Air pollution
Nonmilitary environmental regulation and control of nuclear energy

House

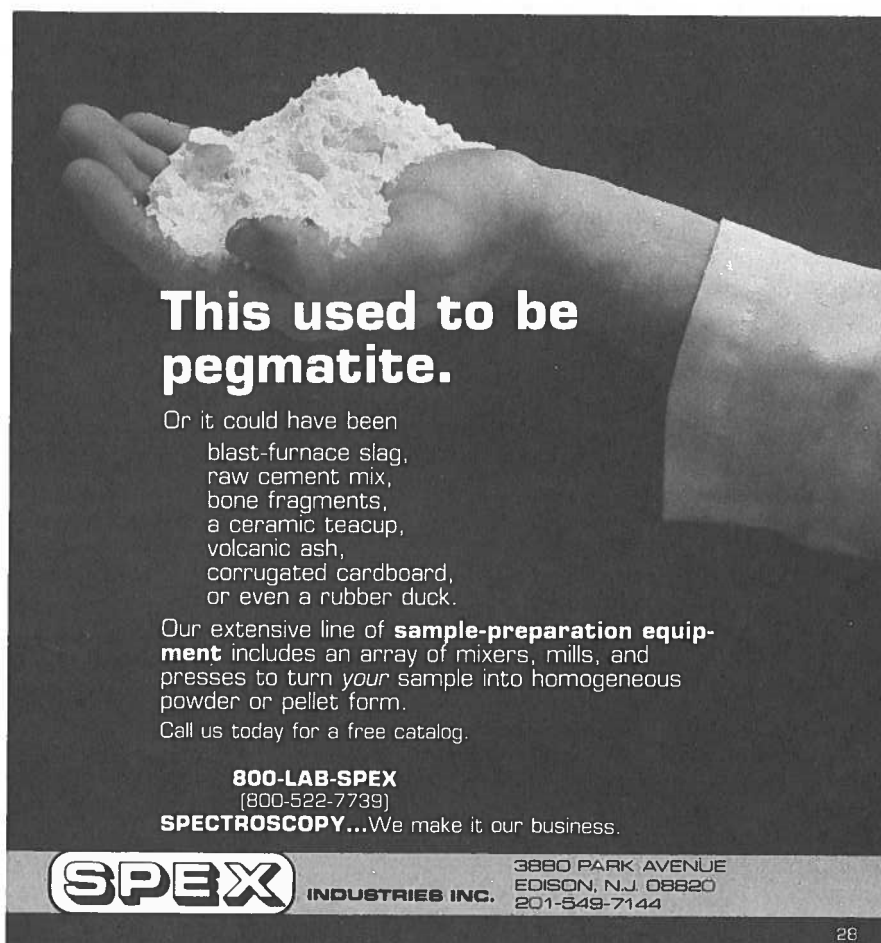
- Committee on Appropriations (202) 225-2771
Appropriations and spending authority
- Committee on Energy and Commerce (202) 225-2927
National energy policy
Measures related to exploration, production, storage, supply, marketing, pricing, and regulation of energy resources, including all fossil fuels and solar energy and other unconventional or renewable energy resources

- Conservation of energy resources
Measures related to commercial application of energy technology
- Committee on Interior and Insular Affairs (202) 225-2761
Forest reserves and national parks
U.S. Geological Survey
Mineral resources of public lands
Mining interests
Mining schools and experimental stations
Petroleum conservation on public lands
Regulation of domestic nuclear industry
- Committee on Science, Space and Technology (202) 225-6371
National Science Foundation
Scientific research and development
Energy research development

Memorial Preprints

The following memorial preprints are now available, free of charge, by writing to GSA, P.O. Box 9140, Boulder, CO 80301.

- Alexander Kennedy Baird*, by Douglas M. Morton, William B. Wadsworth, and Donald H. Zenger
Earl F. Cook, by Allen F. Agnew
Wayne Everett Hall, by S. Warren Hobbs
Robert Abraham Laurence, by Thor H. Kiilsgaard
Ira Wendell Marine, by John K. Costain
William Samuel Strain, by J. M. Hoffer



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Geological Society of America



CONGRESSIONAL SCIENCE FELLOWSHIP 1988-1989

The Geological Society of America invites applications for the 1988-1989 Congressional Science Fellowship. The Fellow selected will spend a year (September 1988-August 1989) in the office of an individual member of Congress or a congressional committee advising on a wide range of scientific issues as they pertain to public questions. Guided by the American Association for the Advancement of Science, the Fellow selects a congressional staff position in which he or she can work on major legislative issues.

CRITERIA

The program is aimed at highly qualified earth scientists in early or mid-career. Candidates should have exceptional competence in some area of the earth sciences, cognizance of a broad range of matters outside the Fellow's particular area, and a strong interest in working on a range of public policy problems.

AWARD

The GSA Congressional Science Fellowship carries with it a \$28,000 stipend and a limited relocation and travel allowance.

TO APPLY

Procedures for application and detailed requirements are available in the geology departments of most colleges and universities in the United States or upon request from

Executive Director
Geological Society of America
P.O. Box 9140
Boulder, Colorado 80301



Deadline for receipt of all application materials is March 15, 1988

FINAL ANNOUNCEMENT
NORTHEASTERN SECTION, GSA, 23rd Annual Meeting
Portland, Maine
March 10-12, 1988

The Northeastern Section of the Geological Society of America will meet at the Holiday Inn by the Bay and the Sonesta Hotel, Portland, Maine, March 10-12, 1988, together with the Eastern Section of the Society of Economic Paleontologists and Mineralogists, the Northeastern Section of the Paleontological Society, and the Eastern Section of the National Association of Geology Teachers. The meeting is sponsored by the University of Southern Maine together with the University of Maine at Farmington, Bowdoin College, the Maine Geological Survey, and the Geological Society of Maine.

Local Committee: Chairman—Stephen Pollock, Department of Geosciences, University of Southern Maine, Gorham, ME 04038, (207) 780-5350; Vice-Chairman—Irwin Novak, Department of Geosciences, University of Southern Maine; Technical Program—Arthur M. Hussey II, Department of Geology, Bowdoin College, Brunswick, ME 04011, (207) 725-3000; Symposia—Carolyn LePage, Department of Environmental Protection, Augusta, ME 04033, (207) 289-2651; Poster Session—Mark Swanson, Department of Geosciences, University of Southern Maine; Treasurer—Walter Anderson, Maine Geological Survey, Augusta, ME, (207) 289-2801; Registration—William Berry and Thomas Eastler, Department of Geology, University of Maine, Farmington, ME 04938, (207) 778-3501, ext. 458; Exhibits and Short Course—John D. Tewhey, John D. Tewhey Associates, Inc., P.O. Box 86 DTS, Portland, ME 04112, (207) 839-6653; Student Volunteers and Audiovisual—James Pendleton, Department of Geosciences, University of Southern Maine; Nontechnical Activities—Gloria Tewhey, John D. Tewhey Associates.

REGISTRATION

All persons participating in any event of the meeting must be registered, and admission to all activities is by badge only.

Preregistration: You are encouraged to preregister at the reduced rate to assist the local committee. Preregistration forms, with payment, must be postmarked no later than **Monday, February 8, 1988**. Complete registration forms and payment should be sent to: NEGSA Registration, Geology Building, 120 Main St., Farmington, ME 04938.

On-Site Registration: Registration will be available at the Holiday Inn by the Bay during the meeting. Registration times will be Wednesday, March 9, 1988, 6-10 p.m.; Thursday and Friday, March 10 and 11, 7 a.m.-5 p.m.; and Saturday, March 12, 8 a.m.-noon.

TECHNICAL PROGRAM

General technical sessions, symposia, and poster sessions are scheduled from Thursday morning, March 10, through Saturday, March 12, 1988. Sessions will be held in the Holiday Inn by the Bay and the Sonesta Hotel. Walking time between the two hotels is about 3-5 minutes. The local committee is making every effort to balance the program and to minimize conflicts.

SYMPOSIA

1. **Human Occupation of Late Pleistocene Ice-Marginal Environments.** Sponsored by the GSA Archaeological Geology Division. Harold W. Borns, Jr., Institute for Quaternary Studies, University of Maine, Orono, ME 04469.

2. **The Bedrock Geology of Coastal New England and New Brunswick East of the Kearsarge-Central Maine Synclinorium.** Charles V. Guidotti and Daniel R. Lux, Department of Geological Sciences, University of Maine, Orono, ME 04469, and

Arthur M. Hussey II, Department of Geology, Bowdoin College, Brunswick, ME 04011.

3. **Glaciomarine Sedimentation: The Presumscot Formation of Northeastern North America and Analogues.** Sponsored by the Eastern Section of SEPM. Joseph T. Kelley, Maine Geological Survey, State House Station 22, Augusta, ME 04333, and Robert N. Oldale, U.S. Geological Survey, Woods Hole, MA 02543.

4. **Contaminant Transport in Glaciated Terrains in Northeastern North America.** Sponsored by the GSA Hydrogeology Division. Andrews L. Tolman, R. G. Gerber, Inc., 17 West Street, Freeport, ME 04032, and John S. Williams, Maine Geological Survey, State House Station 22, Augusta, ME 04333.

5. **Hydrogeologic Aspects of Radioactive Waste Disposal.** Michael F. Weber, U.S. Nuclear Regulatory Commission, MS 623-SS, Washington, DC 20555, and Frank J. Wobber, ER-75, GTN, U.S. Department of Energy, Washington, DC 20545.

6. **Epibionts on Paleozoic Fossils: Implications for Evolution and Paleoecology.** Sponsored by the Northeastern Section of the Paleontological Society. Richard Alexander, Geoscience Department, Rider College, Lawrenceville, NJ 08648, and Carlton Brett, Department of Geology, University of Rochester, Rochester, NY 14627.

7. **Landslides of the Northeastern United States.** Irwin D. Novak, Department of Geosciences, University of Southern Maine, Gorham, ME 04038, and Charles A. Baskerville, Branch of Geologic Risk Assessment, MS 922, U.S. Geological Survey, Reston, VA 22092.

8. **Stratigraphic and Structural Analysis of Mountain Belts: A Symposium in Honor of Leo M. Hall.** Rolfe S. Stanley, Department of Geology, University of Vermont, Burlington, VT 05405; Peter Robinson, Department of Geology, University of Massachusetts, Amherst MA, 01003; Philip H. Osberg, Department of Geological Sciences, University of Maine, Orono, ME 04469; Norman L. Hatch, Branch of Eastern Environmental Geology, U.S. Geological Survey, Reston, VA 22092. Parts I and II will consist of oral presentations; part III will be an evening poster session.

9. **Earth Science Applications of Geographic Information Systems.** Walter A. Anderson, Maine Geological Survey, State House Station 22, Augusta, ME 04333, and Hugo F. Thomas, Connecticut Geological Survey, State Office Building, Room 553, Hartford, CT 06106.

SPECIAL POSTER SESSIONS

1. **Coastal Zone Management Strategies in the Northeast: Regional Response to Changing Sea Level and Shorelines.** Stephen M. Dickson and Joseph T. Kelley, Maine Geological Survey, State House Station 22, Augusta, ME 04333.

2. **More Classic Field Sites for Teaching Earth Science in the Northeast.** Sponsored by the New England Section of NAGT;

(continued on p. 271)

Northeastern Section (continued from p. 270)

William Berry, Department of Geology, University of Maine, Farmington, ME 04938

SHORT COURSE

Hydrogeochemistry. Faculty: John D. Tewhey, John D. Tewhey Associates, Inc., P.O. Box 86 DTS, Portland, ME 04112. This one-day short course will be held on Wednesday, March 9, 1988, 8 a.m. - 5 p.m., in the Connecticut Room, Holiday Inn by the Bay. Preregistration is required. Fee: \$70 professional; \$35 student. Students must provide verification. Fee includes lunch at the Holiday Inn and course materials. This short course will provide an introduction to the broad spectrum of hydrology and hydrogeochemistry. Subject matter includes weathering and water chemistry, geochemical processes in groundwater (redox equilibria, mineral equilibria, clay mineral adsorption and desorption), and geochemical processes influencing the fate and transport of organic and inorganic solutes in groundwater.

This short course replaces the one announced in the September 1987 issue of *GSA News & Information*.

SPECIAL EVENTS

Welcoming Party. Wednesday, March 9, 1988, 8-11 p.m., Holiday Inn by the Bay. Reunions will be held in the same area. In order to schedule a reunion please contact Irwin Novak at (207) 780-5350.

Reception. Thursday evening, March 10, 1988, at the Holiday Inn.

Annual Banquet. Friday, March 11, 7:30-9 p.m. Cost: \$15.
Paleontological Society Northeastern Section Business Meeting. This will follow the Paleontological Society symposium.
Society of Economic Paleontologists and Mineralogists Eastern Section Business Meeting and Presidential Address.

Friday, March 11, 1988, following the afternoon technical sessions. A reception is planned.

Association for Women Geoscientists Breakfast. Friday, March 11, 1988. Everyone is invited. Cost: \$7.

National Association of Geology Teachers (NAGT) Special Poster Session: More Classic Field Sites in the Northeast. Saturday, March 12, 1988. This special poster session will follow up the last two years' sessions with more localities in the Northeast. One-half day registration is offered for teachers to attend this session. See registration form for details.

NAGT Eastern Section Business Meeting and Luncheon. Saturday, March 5, 1988. Optional luncheon: \$11.

Postmeeting Boat Trip (weather permitting). Saturday, March 12, 1988. This trip, featuring the "boat-side" geology of Casco Bay, will be in an enclosed passenger ferry. It will be led by Arthur M. Hussey II, Bowdoin College, and Joseph Kelley, Maine Geological Survey.

Guest/Spouse Activities will include gallery tours of the Portland Museum of Art and a shopping trip to L.L. Bean and other outlet stores in Freeport, Maine.

STUDENT PAPERS

Four cash awards will be made for papers, oral or poster, written and presented exclusively by students.

PROJECTION EQUIPMENT

All slides must be 2" x 2" format and must fit a standard 35-mm carousel tray. One projector and one screen will be provided in each of the technical sessions. Overhead projectors will not be available. Please bring your own loaded carousel tray, if possible. Please label
(continued on p. 274)

HOUSING REQUEST FORM

GSA 1988 Northeastern Section Meeting

Deadline: February 8, 1988

Please print or type to assure accuracy.

Complete each part in detail.

If more than one room is needed, attach additional completed copies of this form.

Confirmation will be sent by the hotel to the individual making the reservation request.

Please indicate first, second, and third choice. The housing bureau will be filling rooms on a first-come, first-served basis. If no alternatives are listed, and your first choice is filled, you will be placed on a space-available basis unless you indicate otherwise. NO telephone reservations can be accepted. AFTER FEBRUARY 8, 1988, hotels will accept reservations directly on a space-available basis.

Mark 1, 2, 3 for first, second, and third choice

- | | | |
|---|--|---------------------------------------|
| <input type="checkbox"/> Holiday Inn by the Bay | <input type="checkbox"/> Sonesta Hotel | <input type="checkbox"/> Best Western |
| <input type="checkbox"/> Single \$57 | <input type="checkbox"/> Single \$68 | <input type="checkbox"/> Single \$44 |
| <input type="checkbox"/> Double \$67 | <input type="checkbox"/> Double \$78 | <input type="checkbox"/> Double \$54 |
| <input type="checkbox"/> Triple \$72 | <input type="checkbox"/> Triple \$88 | |
| <input type="checkbox"/> Quad \$77 | | |
| <input type="checkbox"/> Quint \$82 | | |

A 7% room tax is not included in the above rates.

NOTE: Triples and quads are based on two double beds per room. A limited number of cots are available for triples. Quints are based on two double beds plus one cot. There are a limited number of quints available. There are a limited number of rooms in the Best Western.

If after making reservations, you find it impossible to attend, please contact the Housing Bureau immediately so that your space can be assigned to another.

Mail to: GSA Housing Bureau
Convention and Visitors Bureau
142 Free St.
Portland, ME 04101

Arrival Date _____ Departure Date _____

Person requesting housing (type or print)

last name first

name of institution or firm

street address or P.O. box number

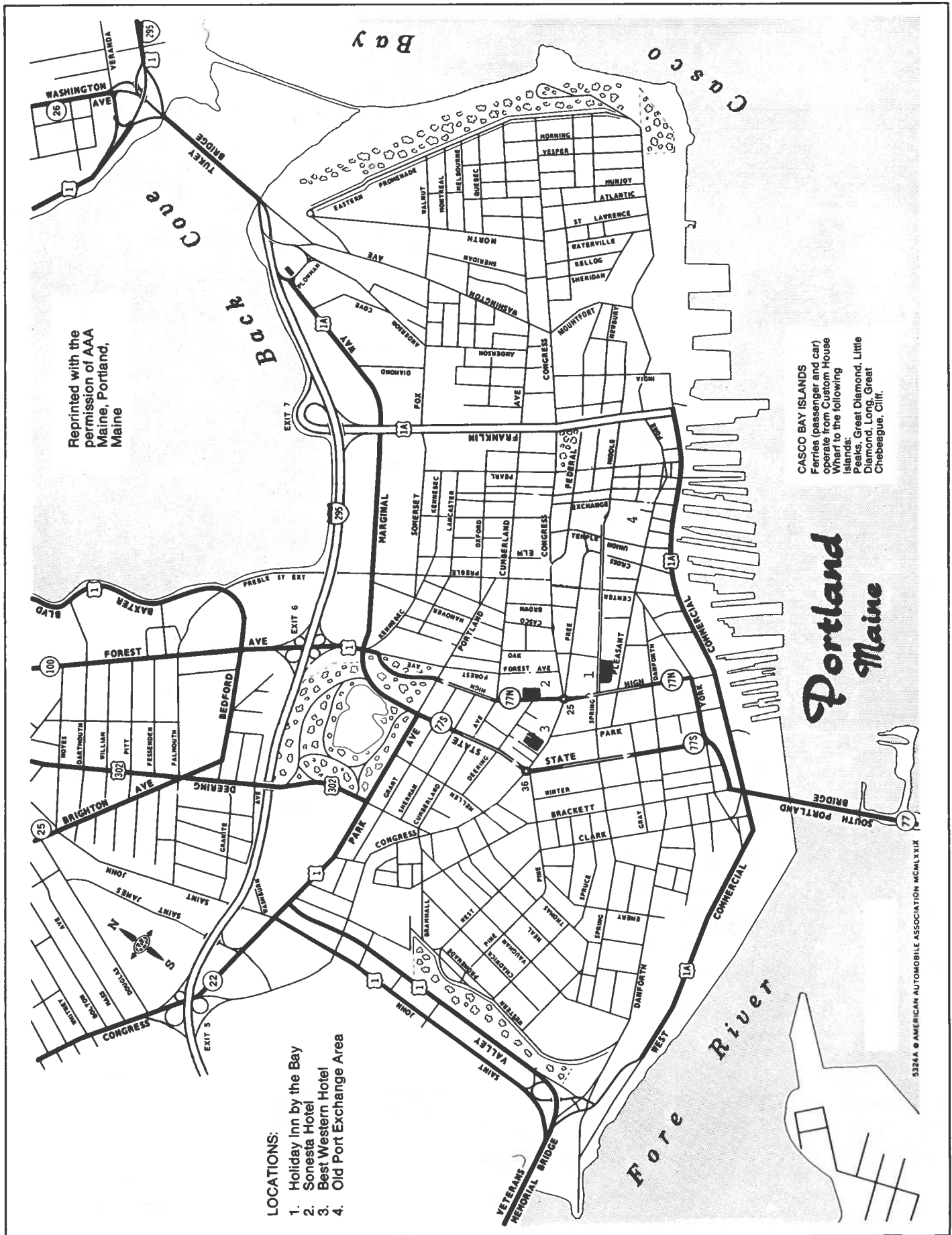
city state ZIP code

Phone () _____ day () _____ evening

Person requesting is responsible for acquiring roommate(s).
Remittance for one night must accompany this form.
Make checks payable to: Housing Bureau 1988 NEGSA.
If remittance is by credit card: Card number

_____ VISA
_____ MasterCard
_____ American Express

Expiration date _____



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CASCO BAY ISLANDS
 Ferries (passenger and car) operate from Custom House Wharf to the following islands: Great Diamond, Little Diamond, Long, Great Chebeague, Cliff.

- LOCATIONS:**
1. Holiday Inn by the Bay
 2. Sonesta Hotel
 3. Best Western Hotel
 4. Old Port Exchange Area

Portland Maine

PREREGISTRATION FORM
Northeastern Section, GSA , 23rd Annual Meeting
March 10-12, 1988, Portland, Maine

IMPORTANT

1. Preregistration **MUST BE POSTMARKED NO LATER THAN FEBRUARY 8, 1988.**
2. **FULL** payment and form **MUST** accompany all preregistration requests. Unpaid purchase orders are **NOT** accepted as valid registration.
3. Cancellation deadline: March 1, 1988. No refunds on cancellations received after this date.
4. Your check will be your receipt. Copy this form for your records.
5. Register one professional or one student per form.

Please print or type

Name _____
last first m.i.

Registered as (check one) Professional Student Guest

Member Affiliation GSA NAGT SEPM Paleontological Society

GSA Student Associate: yes no

Name for badge _____

Affiliation _____

Professional address _____

city state ZIP
 Phone: business () _____ residence () _____

Preregistration (before February 8, 1988)

GSA Member (or affiliate checked above)	\$40.00
Other professional	\$45.00
Student (see verification requirement below)	\$18.00
Guest or other nontechnical	\$15.00
-half-day (for earth science teachers attending NAGT Poster Session on Saturday, March 12)	\$10.00

Registration (after February 8, 1988)

GSA Member (or affiliate checked above)	\$45.00
Other professional	\$50.00
Student (see verification requirement below)	\$20.00
Guest or other nontechnical	\$18.00
-half-day registration as above	\$12.00

Special Events

Short Course	
Professional	\$70.00
Student (see verification requirement below)	\$35.00
GSA Northeastern Section banquet and business meeting (Friday, March 11)	\$15.00
Association for Women Geoscientists breakfast (Friday, March 11)	\$ 7.00
Casco Bay cruise (Saturday, March 12)	\$20.00
NAGT luncheon (Saturday, March 5)	\$11.00
Abstracts with Programs—reserved (on-site pick-up)	\$ 8.50

Total fees

Enclose check or money order in U.S. funds payable to Northeastern Section GSA

Student verification _____
Signature of dept. head or GSA Campus Representative

Mail completed meeting preregistration form and full payment to:

NEGSA REGISTRATION
Geology Building
120 Main Street
University of Maine
Farmington, ME 04938

Northeastern Section (continued from p. 271)

your tray with your name, session, and presentation number. A preview room will be available, and speakers are encouraged to use it to check their slides.

EXHIBITS

Exhibits will be on display in the Ballroom of the Sonesta Hotel. The exhibit area is centrally located and secure. The morning and afternoon coffee breaks will be held in the exhibit area. Single and multiple 8' x 8' booths are available to educational and nonprofit organizations for \$135 per booth, and \$270 per booth to commercial exhibitors. An exhibit directory will be printed for the meeting and will be included within the registration materials distributed at the meeting. For additional information, contact John D. Tewhey Associates, Inc., P.O. Box 86 DTS, Portland, ME 04112, (207) 839-6653.

TRANSPORTATION AND PARKING

Portland is easily accessible by air and bus. Limousine and taxi services are available from the airport.

Delta Airlines, in cooperation with the Northeastern Section, is offering special rates, which afford 5% off Delta's published restricted round-trip fares within the United States and to and from San Juan, providing all rules and conditions of the air fares are met. If you can't meet the conditions for restricted fares, you can still get 40% off Delta's unrestricted regular round-trip coach rates (Canada-originating attendees will save 35%); seven days advance reservation and ticketing will be required. To take advantage of all of these discounts call Delta, or have your travel agent call 1-800-241-6760 between 8 a.m. and 8 p.m. Eastern time daily; the file no. for this offer is H0215.

Those driving to Portland should follow the Maine Turnpike (I-95) north to exit 6A, and connect with I-295 north. Follow I-295 north to Forest Avenue South (exit 6). Proceed on Forest Avenue South (also U.S. Route 1 South) to State Route 77 South. Proceed on Route 77 South, and turn left onto Spring Street. Follow Spring Street to the Holiday Inn. For those staying at the Sonesta, turn left from Spring Street onto High Street and proceed to the Sonesta. For those staying at the Best Western, turn left from High Street onto Congress Street and proceed to the Best Western. Those who are driving and are not staying in one of the designated hotels are cautioned to expect difficulty in securing all-day parking near the meeting hotels.

HOUSING

See the accompanying housing form to make reservations. Reservations will be accepted at the GSA Housing Bureau through February 8. After February 8, rooms may be secured on a space-available basis directly with the hotels. The GSA rate will prevail for all attendees from March 8 through March 13, 1988.

WEATHER

Early March weather in Portland varies from year to year. You should be prepared for winter weather. For those of you wishing to extend your stay, early spring skiing should be good at the numerous ski areas. Many of these are within an easy 2- to 4-hour drive from Portland. Depending on the temperatures, ice skating may be available in Portland's Deering-Oaks Park, approximately a 20-minute walk from the hotel. A commercial ice rink is available in South Portland at a nominal fee.

SHORT OF RESEARCH FUNDS? We're working on the problem.

For more information:
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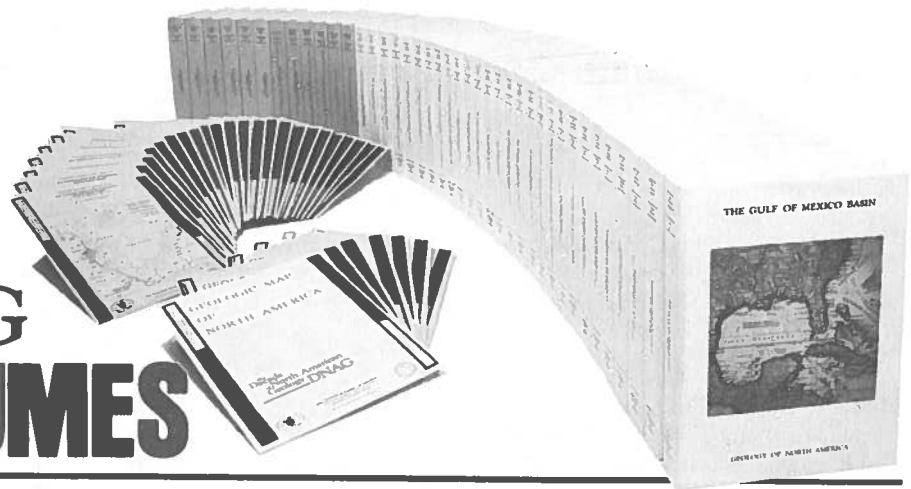
- check for \$100 is enclosed
- check for \$50 is enclosed. Please bill me for \$50 next year.
- check for \$25 is enclosed. Please bill me for \$25 in each of the next three years.
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Address _____

Signature _____

The Decade of North American Geology **DNAG** **VOLUMES**



CENTENNIAL SPECIAL VOLUMES

Four special, topical volumes prepared by four of GSA's Divisions as their contribution to the Society's centennial project, DNAG. The Divisions participating are: The History of Geology Division, the Quaternary and Geomorphology Division, the Engineering Geology Division, and the Archeological Geology Division. Volumes are hardbound, 8-1/2" X 11", with spines color coded as indicated.

edited by Ellen T. Drake and William M. Jordan, 1985

An unusually coherent, well-written volume. Prepared for DNAG by the History of Geology Division of GSA. Spotlights events, ideas, and people, and sheds light on the history of North American geology as a whole. With its many intellectual jewels on the evolution of scientific concepts, this book will provide many happy hours of entertainment and instruction for anyone interested in the history of science, especially that of the earth sciences. Thirty-four papers are organized into four categories: (1) The Evolution of Significant Ideas; (2) Contributions of Individuals; (3) Contributions of Organized Groups; and (4) Application of Significant Ideas. Excellent as a course-book or for additional reading for classes related to the history of geology or general science. Light blue spine.

CSV001, 520 p., Indexed, ISBN 0-8137-5301-5, CIP, hardbound, \$37.50.

Geomorphic Systems of North America

edited by W. L. Graf, 1987

New ideas, new techniques, new data, even new access to extraterrestrial worlds -- all these are in greater abundance now than ever, making this, the editor says, a marvelous time to be a geomorphologist! This 14-paper volume has been prepared by the Geomorphology Division of GSA as its contribution to DNAG. Subjects treated are Regional Geomorphology of N. America; Appalachian Mountains and Plateaus; Atlantic and Gulf Coast Province; Central Lowlands; Canadian Shield; Great Plains; Rocky Mountains; Colorado Plateau; Basin and Range; Central America and the Caribbean; Columbia and Snake River Plains; Interior Mountains and Plateaus; Pacific Coast and Mountain Systems; and Arctic Lowlands. Yellow spine.

CSV002, 661 p., Indexed, ISBN 0-8137-5302-3, CIP, hardbound, \$48.50.

GEOLOGY OF NORTH AMERICA

The centerpiece of the DNAG project. When complete, this modern synthesis of the geology and geophysics of North America and the adjacent oceanic regions will contain 28 matched volumes, in two sets: 19 U. S. and Mexican volumes, and nine from Canada. Both of these sets, and all single volumes will be available from GSA. All volumes are hardbound, 8-1/2" X 11" and most include separate slip cases containing oversized plates.

The Western North Atlantic Region

edited by P.R. Vogt and B.E. Tucholke, 1986

The award-winning first volume in this 28-volume series. Complete coverage of the geology and geophysics of the western North Atlantic Ocean basin in 41 chapters, organized into 8 sections: Introduction; Present Accretion Axis; Regional Geology and Geophysics; Plate Tectonic Evolution; Surficial Sedimentation; Biofacies; Paleoceanography; and Resources and Law of the Sea. The editors received the 1986 Alan Berman Research Publication Award for this volume. Includes 11 plates, several in color, in a separate, matching slipcase.

GNA-M, 720 p., 11 plates in slipcase, Indexed, ISBN 0-8137-5202-7, CIP, hardbound, \$47.50

COMING SOON...

GNA-K3: North America and Adjacent Oceans during the Last Deglaciation

edited by W. F. Ruddiman and H. E. Wright, Jr., 1987

Heritage of Engineering Geology

edited by George A. Kiersch, 1987

GEOLOGISTS AND IDEAS: A HISTORY OF NORTH AMERICAN GEOLOGY



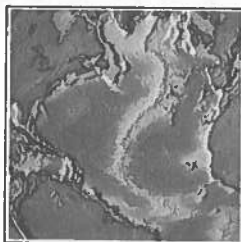
Centennial Special Volume 1

GEOMORPHIC SYSTEMS OF NORTH AMERICA



Centennial Special Volume 2

THE WESTERN NORTH ATLANTIC REGION



The Geology of North America

FINAL ANNOUNCEMENT
South-Central Section, GSA, 22nd Annual Meeting
Lawrence, Kansas
March 14-15, 1988

The South-Central Section of the Geological Society of America will meet at the Kansas Union on the campus of the University of Kansas. The meeting is sponsored by the Department of Geology of the University of Kansas and the Kansas Geological Survey.

LOCAL COMMITTEE

Chairman: Anthony W. Walton, Department of Geology, University of Kansas, Lawrence, KS 66045-2124, (913) 864-4974

Technical Program Chairman: Frank W. Wilson, Kansas Geological Survey, 1930 Constant Ave., Lawrence, KS 66044-2598, (913) 864-3965

Field Trip Chairman: Wakefield Dort, Department of Geology, University of Kansas, Lawrence, KS 66045-2124, (913) 864-4974

Publicity Chairman: Rex Buchanan, Kansas Geological Survey, 1930 Constant Ave., Lawrence, KS 66044-2598, (913) 864-3965

Meeting Treasurer: Roger Kaesler, Department of Geology, University of Kansas, Lawrence, KS 66045-2124, (913) 864-4974

Local Arrangements: Karl Kappleman, Division of Continuing Education, University of Kansas, Lawrence, KS 66044-2124, (913) 864-3284.

REGISTRATION

Registration is required for all participants in any event, including technical sessions, symposia, exhibits, planned social events, and field trips.

Preregistration. You are urged to register in advance to aid the local committee in making final plans. A discount is offered to those who preregister before **February 7, 1988**, using the accompanying forms. Preregistration is required for those who plan to attend premeeting or postmeeting field trips. Return completed preregistration forms with check or money order in U.S. currency (made payable to South-Central Section GSA Annual Meeting) to South-Central GSA, Department of Geology, University of Kansas, Lawrence, KS 66045-2124. Preregistration must be postmarked by February 7, 1988, to qualify for discounted registration rates. Refunds on canceled registrations will be made until February 7, 1988. After that date, no refunds will be made except for field trips or other events that are canceled or oversubscribed.

Registration for Students. Full-time students qualify for a lower registration rate. Students who agree to serve as projectionists or meeting assistants for ½ day will be able to register without paying the student fee (although they must pay to participate in such optional events as field trips and the banquet).

On-Site Registration. From 3 to 8 p.m. Sunday, March 13, participants can register and preregistrants can pick up meeting materials in the lobby of the Holiday Inn Holidome, 200 West Turnpike Access Road, Lawrence. On Monday and Tuesday, March 14 and 15, registration will be held in the Kansas Union from 8 a.m. until 4:30 p.m.

Partial Registration. In order to encourage broader public participation, single-event registration fees have been established for the symposium on Pollution and Contamination of Shallow Aquifers in the Midcontinent and the field trip on Mined-Lands Reclamation and Coal Geology in Southeastern Kansas. Preregistration will be necessary for the field trip.

WELCOMING PARTY

A welcoming party for those attending the meeting will be held Sunday evening, March 13, from 6 to 9 p.m., in the Holiday Inn Holidome, 200 West Turnpike Access Road, Lawrence.

TECHNICAL PROGRAM

Technical sessions on a variety of topics and symposia will be presented on Monday and Tuesday, March 14 and 15. In addition to general technical sessions, the following symposia will be presented during the meeting. Contact the convener(s) of symposia for further information.

1. **Geology and Geophysics of the Precambrian of the Midcontinent.** M. E. Bickford and W. R. Van Schmus, Department of Geology, University of Kansas, Lawrence, KS 66045.

2. **The Tippecanoe Sequence in the Western Interior.** W. Lynn Watney and John Doveton, Kansas Geological Survey, Lawrence, KS 66046.

3. **Geological Reconnaissance of the Trans-Mississippi West.** Rex Buchanan, Kansas Geological Survey, Lawrence, KS 66046, and Daniel Merriam, Department of Geology, Wichita State University, Wichita, KS 67208.

4. **Geology and Paleontology of the Unique Hamilton Quarry Locality.** Royal H. and Gene Mapes, Department of Geological Sciences, Ohio University, Athens, OH 45701, and Thomas Bridge, Department of Geology, Emporia State University, Emporia, KS 66801.

5. **Regional Geohydrology and Waste Isolation.** Donald Jorgensen, U.S. Geological Survey, Lawrence, KS 66046.

6. **Pollution and Contamination of Shallow Aquifers in the Midcontinent.** Margaret Townsend and Marios Sophocleous, Kansas Geological Survey, Lawrence, KS 66046. This symposium is planned to appeal to the educated and concerned general public as well as professional geologists and students. A fee of \$5 is charged for admission of individuals who do not register for the meeting.

7. **Cyclicality and Periodicity Throughout the Geologic Record.** Wakefield Dort and Edward J. Zeller, Department of Geology, and Larry D. Martin, Museum of Natural History, University of Kansas, Lawrence, KS 66045.

8. **Origin and Development of Large Cenozoic Lake Basins in the Southern Great Plains.** Thomas C. Gustavson, Bureau of Economic Geology, University of Texas, Austin, TX 78713.

STUDENT AWARDS

The South-Central Section will present three cash awards (\$200, \$100, \$50) for the best student papers. Only student-written and student-presented papers are eligible.

FIELD TRIPS

Participants in premeeting and postmeeting field trips must preregister for the meeting. Field-trip registration is on a first-come

first-served basis. Preregistration for field trips, accompanied by full payment, must be postmarked by **February 7, 1988**. Requests for refunds will be honored until that date. Trips may be canceled by South-Central GSA if registration is insufficient or for reasons beyond our control. If a trip is oversubscribed or canceled, the field-trip fee will be refunded. Notification of cancellation will be made if possible by March 1, 1988. All field trips will depart from the Lawrence Holiday Inn Holidome.

Preregistration is preferred for the trip to visit Allen Press during the meeting.

Premeeting

1. Regional Geology and Paleontology of the Unique Hamilton Paleochannel

In southeastern Kansas, limestone beds of the Hamilton paleochannel in the Topeka Group record local repetitive marine and terrestrial oscillations during late Pennsylvanian–Early Permian time. The carbonate-clastic sequence contains remains of aquatic and terrestrial vertebrates, marine, fresh-to-brackish water, and terrestrial vertebrates, and superbly preserved walcian conifers and associated upland plants. The field trip will examine the regional context of the Topeka Group and lithic and fossil variation within the channel deposit.

Leaders: Thomas Bridge, Department of Geology, Emporia State University, Emporia, KS 66801, and Royal H. Mapes, Department of Geological Sciences, Ohio University, Athens, OH 45701

Date: March 13, 1988

Cost: \$30 (includes transportation, guidebook, lunch, and refreshments)

Limit: 44

2. Cretaceous Lamproites of the Silver City and Rose Domes

The Silver City and Rose Domes are situated 9 km apart along a southwest-northwest linear trend in southeastern Kansas (Wilson and Woodson counties). The two domes were formed by nonviolent intrusion of lamproite magma into Paleozoic country rock. The lamproite is porphyritic and has phenocrysts of serpentinized olivine, augite, richterite, and phlogopite set in a groundmass of phlogopite and serpentine. The age of the bodies, dated by K-Ar methods, is about 90 Ma, Late Cretaceous. At Rose Dome, xenoliths of Precambrian granite (1100–1300 Ma) are common. Some partial melting of the granite occurred. The field trip will examine these structures in the context of origin and relation to the surrounding formations. Recent seismic data detailing the subsurface of the Silver City Dome will be available for inspection.

Leaders: Pieter Berendsen and Ralph Knapp, Kansas Geological Survey, University of Kansas, Lawrence, KS 66046, (913) 864-3965

Date: March 13, 1988

Cost: \$30 (includes transportation, guidebook, lunch, and refreshments)

Limit: 27

During Meeting

1. Allen Press, a Leading Publisher of Scientific Journals

Allen Press of Lawrence will hold tours during the late afternoon of Monday, March 14. Allen Press prints about 150 scientific journals, including the *Journal of Sedimentary Petrology* and the *Journal of Paleontology*. This is an opportunity to see how manuscripts are turned into articles. Two trips, limited to 20 participants, will leave the Kansas Union at 4 and 5 p.m. and last about 1 hour.

Cost: \$5 (includes transportation)

Postmeeting

1. Mined-Lands Reclamation and Coal Geology in Southeastern Kansas.

One hundred years of underground and strip mining of Pennsylvanian coals in southeastern Kansas have left large areas of abandoned mines. Strip mining continues today. Trip participants will see some of the economically important coals, abandoned unreclaimed mined lands, and reclaimed mined land that is now put to various productive purposes. In the extreme southeastern corner of the state, lead and zinc were mined by underground room-and-pillar methods in the Tri-State Mining District. Mines extend to depths of nearly 500 feet. Numerous cave-ins and open mine shafts dot the landscape, and contaminated water that has flooded the mines is a threat to surface and subsurface water supplies. Trip participants will view some of the few reclamation and remedial efforts that have been made and will also see the numerous physical and environmental hazards that remain.

Leaders: Lawrence L. Brady and James R. McCauley, Kansas Geological Survey, University of Kansas, Lawrence, KS 66046, (913) 864-3965

Date: March 16, 1988

Cost: \$30 (includes transportation, guidebook, lunch, and refreshments)

Limit: 27

CORE AND SAMPLE WORKSHOP

A workshop featuring cores and samples will be held during the meeting in Room 302 Lindley Hall, on the University of Kansas campus.

Precambrian of the Midcontinent—A Field Trip in a Room

A large part of the Proterozoic continental crust of North America is buried beneath Phanerozoic rocks of the U.S. Midcontinent. During an "in-house" field excursion, an extensive suite of drill cores and cuttings from the subsurface Precambrian will be displayed along with thin sections, sample location maps, analytical data, regional geophysical information, and interpretive geologic maps. During the "field trip" we will examine the data from the major subsurface Precambrian terranes and discuss their origin and evolution. Participants are encouraged to bring any samples, data, or maps that are relevant.

Leaders: M. E. Bickford and W. R. Van Schmus, Department of Geology, University of Kansas, Lawrence, KS 66045, (913) 864-4974

Date: March 15, 1988

Cost: \$7.50 (includes guidebook and refreshments)

Limit: Open to all interested persons

PUBLICATIONS

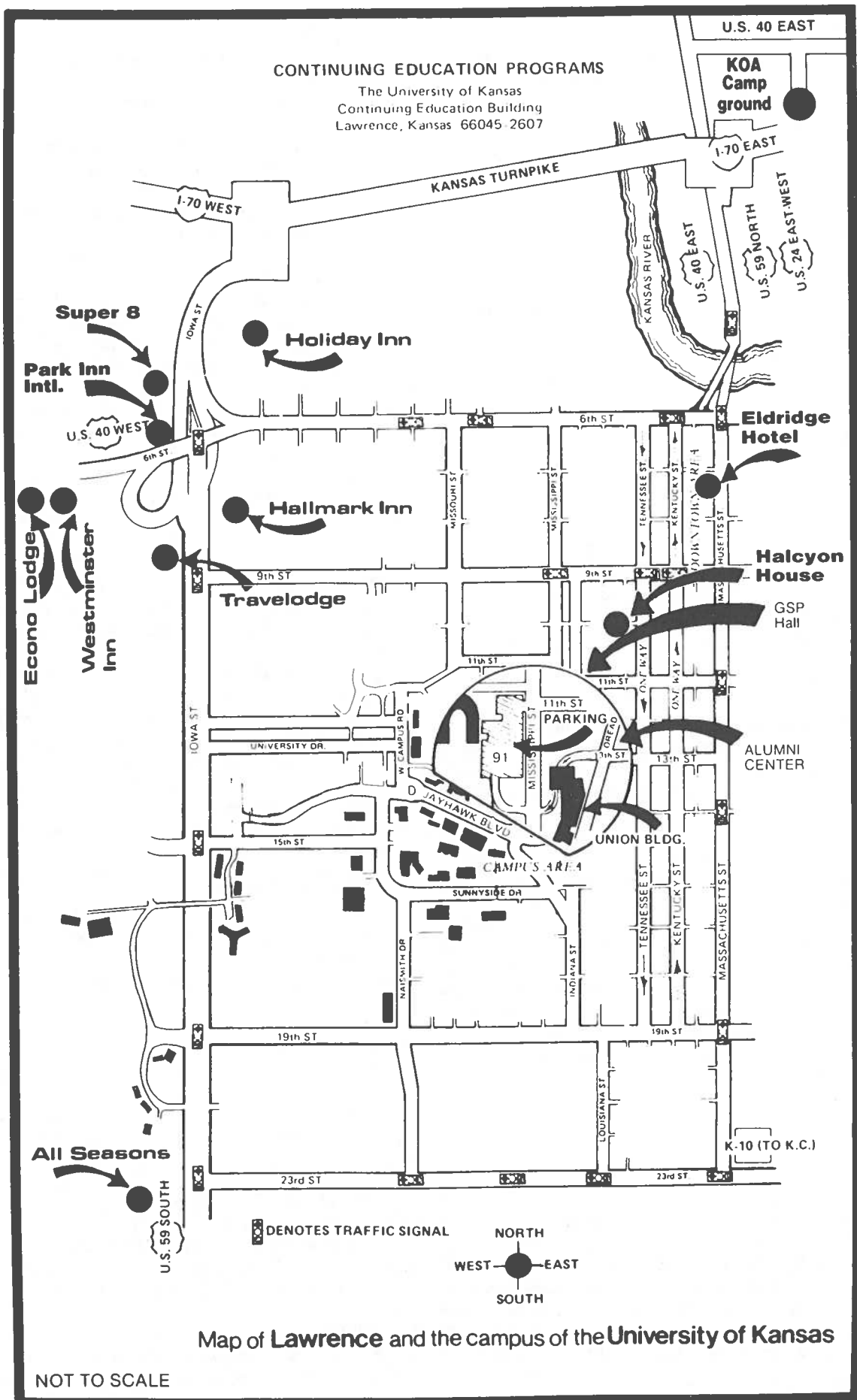
Abstracts with Programs for the meeting and copies of the field-trip guidebooks can be purchased at the registration desk. After the meeting, copies of guidebooks will be available from the Kansas Geological Survey, 1930 Constant Ave., Lawrence, KS 66046-2598, (913) 864-3965.

PROJECTION EQUIPMENT

All slides must be 2" x 2" and fit in a standard carousel tray. Two projectors and two screens will be provided in each technical session. Please bring your own loaded carousel, if possible. Overhead projectors will not be available.

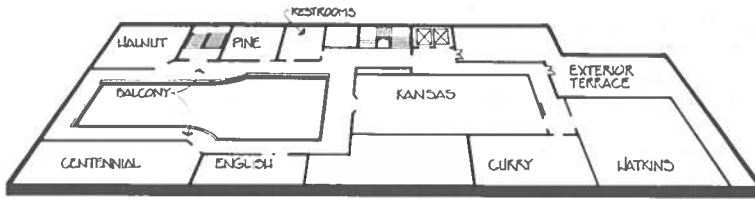
EXHIBITS

Exhibits will be adjacent to the technical session rooms. The cost of booths will be reduced for educational and nonprofit
(continued on p. 281)

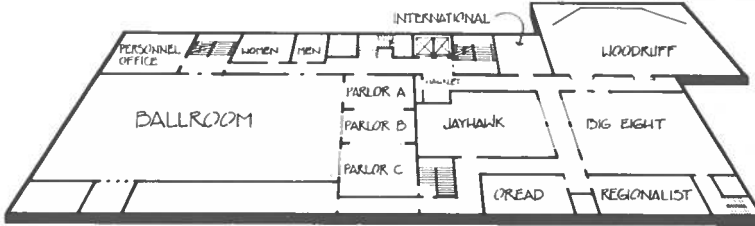


THE KANSAS UNION

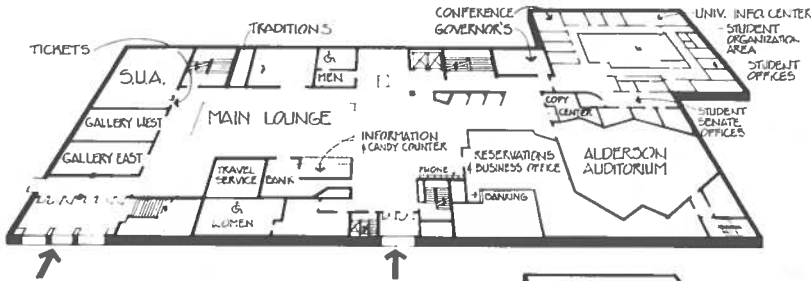
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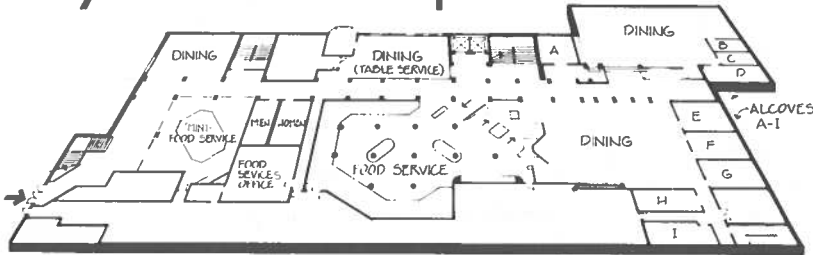
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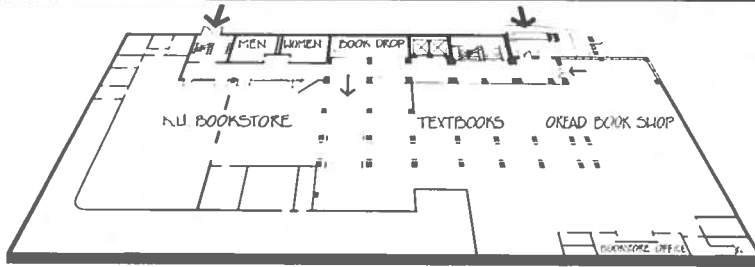
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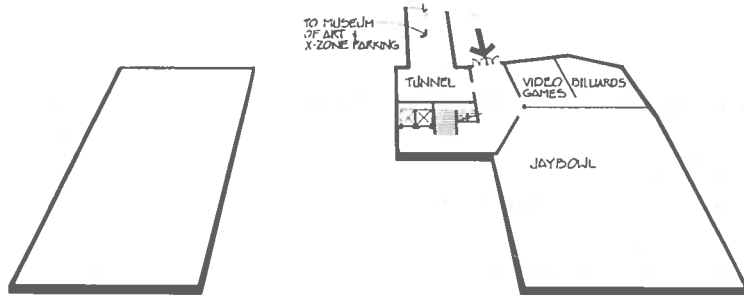
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Level - 1988

- 3 Alcoves: A through I
- 4 Alderson Auditorium
- 4 Bank
- 5 Ballroom
- 6 Ballroom Balcony
- 1 Billiards
- 2 Bookstores
- 2 Bookstore Office
- 4 Business Office, Union
- 4 Conference Room
- 3 Dining Areas
- 6 Centennial Room
- 4 Copy Center, University
- 6 Curry Room
- 6 English Room
- 3 Food Service
- 3 Food Service Office
- 4 Gallery East
- 4 Gallery West
- 4 Governor's Room
- 4 Information/Candy Counter
- 5 International Room
- 1 Jaybowl
- 5 Jayhawk Room
- 6 Kansas Room
- 2 KU Bookstore
- 4 Lounge
- 2 Oread Book Shop
- 4 Organization and Activities
- 5 Parlors: A, B, C
- 5 Personnel Office
- 4 Phones
- 6 Pine Room
- 4 Reservation Office
- 4 Student Offices
- 4 Student Organization Area
- 4 Student Senate
- 4 Student Union Activities
- 6 Terroce
- 2 Textbooks
- 4 Ticket Counter, SUA
- 4 Traditions Room
- 4 Travel Service
- 1 Tunnel Entrance
- 1 Video Games
- 4 University Information Center
- 6 Walnut Room
- 6 Watkins Room
- 5 Woodruff Auditorium

PREREGISTRATION FORM
South-Central Section, GSA, 22nd Annual Meeting
March 14-15, 1988, Lawrence, Kansas

Important

1. Full payment must accompany registration.
2. Register one professional or student per form.
3. Your check will be your receipt. Copy this form for your records. If you wish acknowledgment of your preregistration, please enclose a self-addressed, stamped envelope.
4. Preregistration deadline: **Must be postmarked no later than February 7, 1988.** Preregistration deadline for premeeting or postmeeting field trips is also February 7, 1988.

For Office Use Only	
Ck or MO# _____	
Amount _____	
Issued by _____	

Name _____
(last or Family name) (first) (middle)

Registered as: Professional Student Spouse or Guest

Affiliation (abbreviate for badge) _____

Professional address _____
(street)

(city, state, ZIP)

Telephone: () _____ Nickname for badge _____

GSA Member: yes no GSA Student Associate: yes no

Students only: I am willing to serve as a student assistant _____.
 (If you are needed to serve as an assistant for ½ day, you will be notified before the meeting and your registration fee will be returned. You must preregister.)

Preregistration (postmarked by Feb. 7, 1988)

GSA Member	\$35 _____
Other professional	\$40 _____
GSA Student Associate	\$12 _____
Other student	\$15 _____

Registration (postmarked after Feb. 7, 1988)

GSA Member	\$40 _____
Other professional	\$45 _____
GSA Student Associate	\$15 _____
Other student	\$18 _____

Spouse or guest registration \$10 _____

Partial Registration

Symposium: Pollution and Contamination of Shallow Aquifers in the Midcontinent \$ 5 _____

Registration for Special Events

South-Central Section Banquet (March 14)	\$18 _____
Texas and Oklahoma-Kansas Sections NAGT Luncheon (March 14)	\$ 8 _____
Chairmen's Breakfast (March 15)	\$ 6 _____

Field Trips

(Preregistration must be postmarked by February 7, 1988)

Premeeting

1. A Visit to Hamilton Quarry (Sunday, March 13)	\$30 _____
2. Cretaceous Diatremes of Wilson County, Kansas (Sunday, March 13)	\$30 _____

During the Meeting

1. Allen Press (Monday, March 14)	\$ 5 _____
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(Preregistration recommended, not required)

Postmeeting

1. Mined-Lands Reclamation and Coal Geology in Southeastern Kansas (Wednesday, March 16)	\$30 _____
Mined-Lands trip without a meeting registration	\$35 _____

Core and Sample Workshop (preregistration recommended)

Precambrian of the Midcontinent—A Field Trip in a Room (Tuesday, March 15) \$ 7.50 _____

Total Fees \$ _____

Enclose check or money order (U.S. funds) payable to **South-Central GSA**

Mail completed registration form and full payment to

South-Central GSA
 Department of Geology
 University of Kansas
 Lawrence, KS 66045-2124

South-Central Section (continued from p. 277)

institutions. For further information contact A. W. Walton, Department of Geology, University of Kansas, Lawrence, KS 66045-2124.

SPECIAL EVENTS

Annual Banquet of the South-Central Section of the Geological Society of America. Monday, March 14, 1988, 7 p.m. (appetizers and cash bar, 6 p.m.), Holiday Inn Holidome, Lawrence.
National Association of Geology Teachers, Texas Section and Missouri-Oklahoma Section Luncheon. 12 noon, Monday, March 14, 1988, Kansas Union, University of Kansas.
Breakfast for Department Chairmen. 7:30 a.m., Tuesday, March 15, 1988, Holiday Inn Holidome, Lawrence.

TRAVEL

Lawrence is located between Kansas City and Topeka, along Interstate 70, the Kansas Turnpike, and easily accessible by car or bus. Excellent air service is available from all points in the south-central area into Kansas City International Airport, about 52 miles from Lawrence. Corporate Coach of Lawrence [(913) 841-5466 or (816) 891-7770] operates a scheduled limousine to Lawrence four times daily. Reservations for limousine service must be made in advance.

HOUSING

Blocks of rooms have been reserved at the Holiday Inn Holidome and the Park Inn, at special rates. The welcoming party and banquet will be held at the Holidome, and the registration desk

will be located there on May 13. Meeting attendees should contact the motels directly to make reservations.

	Holiday Inn Holidome	Park Inn
Single	\$46	\$26.55
Double	\$52	\$30.15 (one bed) \$33.75 (two beds)
Additional person	\$ 4	\$ 4
Telephone	(913) 841-7077	(913) 842-7030

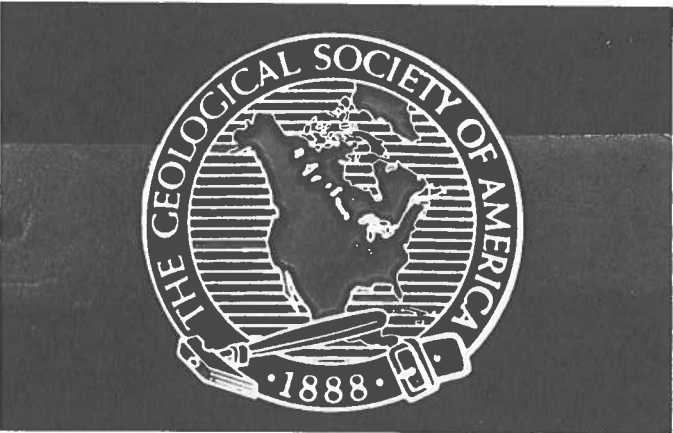
Motels listed below are shown on the accompanying map but will not be served by the shuttle and have not been asked for reduced rates.

- All Seasons (913) 843-9100
- Econo Lodge (913) 843-6611
- Eldridge Hotel (913) 749-5011
- Halcyon House (bed and breakfast) (913) 841-0314
- Hallmark Inn (Best Western) (913) 841-6500
- Super-8 Motel of Lawrence (913) 842-5721
- Travelodge (913) 842-5100
- Westminster (913) 841-8410

SHUTTLE SERVICE

Shuttle buses and vans will operate between motels (Holiday Inn Holidome and Park Inn) and the Kansas Union. They will operate from 7:30 a.m. to 5 p.m. on March 14 and 15. In the event of inclement weather, vans will operate between the Park Inn and the Holiday Inn Holidome for the welcoming party (March 13) and the banquet (March 14).

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The distinguished GSA seal rendered as a husky, solid-brass belt buckle. This gold on black DynaBuckle® is a deeply etched casting, 2-3/4" diameter, slightly curved for comfort, for belts to 1-7/8" wide at buckle loop, and has an angled adjusting tooth.

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THE GEOLOGICAL SOCIETY OF AMERICA



POWELL REVISITED

A Trip Down the Grand Canyon

April 29-May 6, 1988

DATES:
Friday, April 29 through Friday, May 6, 1988

SCHEDULE

April 28, Thursday Travel day from home to Las Vegas

April 29, Friday Depart Las Vegas, 6:00 a.m. for overflight of Grand Canyon and arrival at Lee's Ferry put-in. On the river by 10:00 a.m.!

April 29-May 6 River days

May 6, Friday Arrive Pierce Ferry (Lake Mead) and be transported by speedboat and bus back to Las Vegas

May 7, Saturday Travel day from Las Vegas to home

DEPOSIT AND PAYMENT

\$150 is due with your reservation. It will be applied to the balance. The balance is due on February 22, 1988.

If you make your reservation	You will pay
Before December 31, 1987	\$50 less per person
Between January 1 and February 22, 1988	\$1025 for GSA members*
	\$1125 for nonmembers
February 23 or after	\$100 more per person

*Members must be in good standing with current, paid membership.

RESERVATION FORM

Deposit of \$150 per person is due with the reservation. You will be invoiced for the balance.

Name _____
Last First
 Institution/Employer _____
 Mailing address _____

 City _____ State _____ ZIP _____
 Business phone _____ Home phone _____
 Guest name _____
Last First
 GSA Member #(s) _____

On the occasion of its Centennial Celebration, GSA is providing an experience in the Grand Canyon for GSA members and their friends. As a happy circumstance, we will also be celebrating John Wesley Powell as an early GSA member and explorer/geologist in the grand old tradition.

SCIENTIFIC LEADERSHIP

The trip will be led by geologists who have had extensive research experience in the Grand Canyon.

Stanley S. Beus, Scientific Leader
Northern Arizona University, Flagstaff, Arizona

William K. Hamblin
Brigham Young University, Provo, Utah

Ivo Lucchitta
U.S. Geological Survey, Flagstaff, Arizona

These geologists will be joined on the trip by several expert interpreters. They will represent other interesting aspects of the Grand Canyon, such as archaeology, biology, or ornithology. Having this array of scientific expertise on hand is an opportunity planned just for this GSA trip. It will be an enriching and unusual experience for learning in a unique and adventurous environment.

GREAT RATE

Fee of \$1125. \$100 less for GSA members, plus early registration discounts.

GREAT RATE Includes . . .

- Knowledgeable, expert scientific leadership and interpretive advisors, and passengers who have interests similar to yours.
- Knowledgeable and well-trained river guides with experience in the Grand Canyon.
- Convenience in getting to and from the canyon. No gear to carry, mules to ride, or strenuous hikes.
- Waterproof edition of one of the river's best general guidebooks: Larry Steven's *Guide to Grand Canyon*.
- Transportation:
 - At the start of the trip: By air from Las Vegas to Lee's Ferry (1½ hours overflight of the Grand Canyon).
 - At the end of the trip: From Pierce Ferry (Lake Mead) to Las Vegas by speedboat and bus.
- Waterproof bags for your clothes.
- Waterproof ammo can for your camera and other small personal items.
- USCG-approved life jacket.
- Duffel package (camping gear).
 - Two-person dome tent and ground cloth.
 - Sleeping bag.
 - Inflatable foam sleeping pads (very comfortable).
 - Eating utensils, cups, and plates.
- Continental breakfast before put-in on the first day.
- All meals (breakfast, lunch, and dinner).
- Lemonade, water, softdrinks, and beer on the river.
- Wine with evening meals.

Mail reservation form and check to:
 1988 Grand Canyon Trip
 GSA Meetings Department
 P.O. Box 9140
 Boulder, CO 80301

1888 Geological Society of America 1988



CALL TODAY FOR MORE INFORMATION: GSA MEETINGS DEPT., P.O. BOX 9140, BOULDER, CO 80301, (303) 447-2020

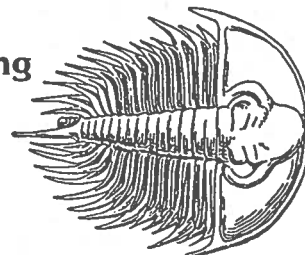
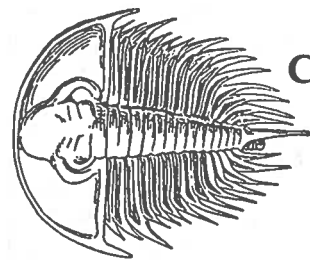
FINAL ANNOUNCEMENT

Cordilleran Section, GSA, 84th Annual Meeting

Las Vegas, Nevada
March 29-31, 1988

HOUSING DEADLINE: *February 26, 1988*
PREREGISTRATION DEADLINE: *February 26, 1988*

The 84th Annual Meeting of the Cordilleran Section of the Geological Society of America, hosted by the Department of Geoscience, University of Nevada, Las Vegas, will meet at the Las Vegas Hilton Hotel, March 29, 30, and 31, 1988. The meeting will be held jointly with the Paleontological Society, Pacific Coast Section. The Local Committee (all members of the Department of Geoscience, University of Nevada, Las Vegas, NV 89154, phone (702) 739-3262) includes: General Chairman—David L. Weide; Program Committee—Frederick Bachhuber, Ernie Duebendorfer, Margaret Rees, Stephen Rowland, and Eugene Smith; Treasurer—Anne Wyman.



REGISTRATION

For your convenience, general information and registration for the meeting (including all field trips) are being handled by the Meetings Department, GSA Headquarters, P.O. Box 9140, Boulder, CO 80301. Send preregistration forms to the Boulder office. For information about registration, call the Registration Coordinator at (303) 447-2020 between 8:30 a.m. and 4:30 p.m. MST.

GENERAL INFORMATION

Las Vegas, the focal point of southern Nevada, lies in the heart of the southern Great Basin, midway between the Colorado Plateau and the Mojave Desert of California. Because of its location, the city is a natural center for geological research. Tertiary volcanic and Paleozoic sedimentary rocks, Cenozoic structures, deposits, and landforms, all of fascinating complexity, combine to give the region a unique lithologic and tectonic framework that has attracted geologists for more than 70 years. The climate during the last week in March is excellent for field work; temperatures range between 45 and 70 °F. Precipitation during the month is negligible. In addition to geologic attractions, the city offers a broad spectrum of entertainment and recreational activities. Affordable housing, a wide selection of inexpensive meals, well-appointed meeting rooms, and an interesting roster of geological exhibitors promise to make the 1988 Cordilleran Section Meeting a rewarding event for all geologists.

SHORT COURSE

Waste Disposal Geology

Monday, March 28, 1988, 9 a.m. to 4:30 p.m. Sponsored by Science Applications International Corporation

This course is designed to teach participants the principles of applied waste disposal geology. The course content is geared toward those with a general background in geology but with limited experience in waste disposal applications and strategies. This course will be structured around case histories, practice problems, group discussion, and demonstrations, and it will be of interest to working professional geologists and graduate students. Topics will include geologic constraints on waste disposal sites, interactions between wastes and the geologic environment, hydrogeologic problems and applications, and case histories of waste-disposal-site investigations.

Faculty: James D. Crabtree, Science Applications International Corporation (SAIC) Las Vegas, Nevada. Crabtree has more than 10 years experience in the field of applied hydrogeology at disposal sites for hazardous high-level nuclear and conventional waste throughout the United States. He has received special commendation from the U.S. Army Corps of Engineers for his studies at Rocky

Mountain Arsenal, Conservation Chemical Company in Kansas City, and Petro Processors of Louisiana, Inc. Additional faculty will be drawn from SAIC staff scientists and will include experts on mixed hazardous and nuclear wastes as well as low-level nuclear wastes. Limit: 50. Cost: \$100 for professionals, \$25 for students (with verification). (Includes lecture notes and handouts; lunch will not be included.)

For further information contact Cecelia McCloy, SAIC, 101 Convention Center Drive, Suite 820, Las Vegas, NV 89109, (702) 733-9958.

TECHNICAL PROGRAM

The technical program will include the topics listed on the GSA abstract form and will consist of volunteered papers presented in oral or poster sessions and invited papers presented in symposia.

Symposia

1. **Suspect and Exotic Terranes, Synthesis and Application to Undergraduate Education.** Greg R. Wheeler, California State University, Sacramento.
2. **Paleogeography of the Great Basin.** Linda B. McCollum, Eastern Washington State University; Cal Stevens, San Jose State College.
3. **Application of Quaternary Geology to Neotectonic Problems in the Basin and Range.** John Dohrenwend, U.S. Geological Survey, Menlo Park; John Bell, Nevada Bureau of Mines and Geology.
4. **Progress in Quaternary Dating Methods.** Dan Muhs and Barney Szabo, U.S. Geological Survey, Denver.
5. **Geology and Geophysics of Basin Interiors in the Southern Basin and Range Province.** Larry McKague, University of California, Lawrence Livermore Laboratories.
6. **Chronology and Style of Laramide and Early Tertiary Geologic Events in the Eastern Great Basin and Adjacent Plateau Transition Zone.** Dick Young, State University of New York, Geneseo; Edwin H. McKee, U.S. Geological Survey, Menlo Park.
7. **Cenozoic Crustal Evolution of the Mojave Desert.** Roy Dokka, Louisiana State University; Michael McCurry, New Mexico State University; Eric Frost, University of California, Santa Barbara; Michael Woodburne, University of California, Riverside.
8. **Basin and Range Extensional Tectonics near the Latitude of Las Vegas, Nevada.** Brian P. Wernicke, Harvard University.
9. **Mid-Tertiary Sedimentation in Relation to Tectonism in the Southern Great Basin and Eastern Mojave Desert.**

(continued on p. 284)

Cordilleran Section (continued from p. 283)

Rowland H. Brady III, California State University, Fresno; James Schmidt, Montana State University.

10. **Volcanology of the Mojave Desert.** Greg A. Valentine, Los Alamos National Laboratory; Michael McCurry, New Mexico State University.

11. **Pre-Cenozoic Crustal Evolution of the Eastern Mojave Desert and Adjacent Regions.** Calvin Miller, Vanderbilt University; Joseph Wooden and Keith Howard, U.S. Geological Survey, Menlo Park; Karl Karlstrom, Northern Arizona University.

12. **Oil and Gas Exploration in the Great Basin.** Alan K. Chamberlain, Cedar Strat Corporation, Reno.

13. **Characterization of Yucca Mountain, Nevada, for Assessing the Suitability of the Site for a High-Level Nuclear Waste Repository.** Maxwell B. Blanchard, U.S. Department of Energy, Las Vegas.

14. **Paleobiology of Reefal Organisms.** Sponsored by the Pacific Section of the Paleontological Society. Phil Signor, University of California, Davis.

In addition, we are planning an evening meeting of all geologists interested in the CALCRUST program. For information, contact Eric Frost, University of California, Santa Barbara.

PROJECTION EQUIPMENT

One projector for standard 2" x 2" slides will be in each meeting room. In addition, a limited number of overhead projectors will be available for informal and postpresentation discussions. *Speakers are expected to bring their own preloaded slide carousels.* A preview room next to the meeting rooms will be open beginning on Monday morning.

FIELD TRIPS

Registration. Field-trip registrants must register for the meeting. If you do not plan to attend the meeting but do plan to participate in a field trip, you may register using the one-day registration fee. This will entitle you to a one-day badge for the day of your choice.

Owing to extremely tight housing and transportation limitations (many of the trips are designed for 4-wheel-drive vehicles), attendance is limited and will be determined on a first-come, first-served basis.

Registration procedures, deadlines, and forms are provided in this announcement. Preregistration is *required* for all premeeting trips. Registration *at the meeting* for postmeeting field trips may be possible if trip logistics and space permit.

All trips originate and end at the Las Vegas Hilton Hotel unless otherwise specified. Information on specific departure points and times will be sent to participants three to four weeks in advance of each trip. Trips are technical in nature and can be physically rigorous.

Cancellation deadline for field trips is *March 4, 1988*. All refund requests must be made in writing and postmarked by this date. No refunds for cancellation will be given after this date.

If the Cordilleran Section is forced to cancel a trip after March 4 because of logistical problems or insufficient registration, full refunds will be given to those who have preregistered. Please be aware of cancellation deadlines and penalties imposed by airlines if you wish to change your flight arrangements because a trip you have registered for is canceled. It is a good idea to plan alternatives ahead of time.

The Field Trip Chairman is Dave Weide (702) 739-3118 (office) or (702) 739-3262 (department). *General field trip information and registration are being handled by the GSA Registration Coordinator, GSA headquarters, Boulder, CO 80301, (303) 447-2020.*

Guidebooks. Field-trip guidebooks are included as part of a

field-trip package. Copies may also be purchased on-site in the registration area. After the meeting, contact David L. Weide, Department of Geoscience, University of Nevada, Las Vegas, NV 89154.

Premeeting

1. **Tertiary Tectonics Along a Transect from Pioche to Railroad Valley, Nevada.** Leaders: John Bartley and Wanda Taylor, (801) 581-6553, University of Utah, Salt Lake City; Gary Axen and Joan Fryxell, Harvard University. *Note: This trip will leave from Las Vegas at 6 p.m. Friday, March 25. Three and one-half days, March 25-28.*

On this trip we will examine a 150-km transect across the eastern Great Basin near lat 38°N. The first two days will focus on style and timing of Tertiary extension around Dry Lake Valley, including the nature and role of low-angle faults, evidence for several discrete periods of extension, and the temporal relations between extension and volcanism. We will also examine "anomalous" structural geometry caused by multiple, discrete extension events, including highly extended but gently dipping strata and locales in which dip *increases* up section. On the third day we will visit the Quinn Canyon and Grant Ranges, where polyphase extension was superposed on Mesozoic deformation, plutonism, and metamorphism.

Limit: 30. Cost: \$260, including guidebook, meals, lodging (3 nights), and transportation.

2. **Cenozoic Crustal Evolution of the Mojave Desert.** Leaders: Roy Dokka, (504) 388-3353, Louisiana State University; Michael McCurry, New Mexico State University; Eric Frost, University of California, Santa Barbara; Michael Woodburne, University of California, Riverside. *Note: This trip departs from Los Angeles International Airport on the morning of Saturday, March 26. Participants are responsible for arranging their own transportation to Los Angeles. Three days, March 26-28.*

This field trip provides an overview of the crustal structure across the Mojave Desert from the intersection of the San Andreas and Garlock faults east to the Colorado River. The trip will form an introduction to an all-day symposium on Cenozoic evolution of the Mojave Desert.

Limit: 40. Cost: \$220, including guidebook, meals, lodging (2 nights) and transportation.

3. **Detachment Surfaces in the Southern Great Basin** Leaders: Bennie Troxel, (702) 253-7083, University of California Davis; Mike Carr, U.S. Geological Survey, Menlo Park, California; Brian Wernicke, Harvard University. *Note: This trip will start in Beatty, Nevada. Transportation from Las Vegas McCarran Airport will leave at 4 p.m., Friday, March 25. Three and one-half days March 25-28.*

This trip will feature major low-angle faults that separate Precambrian to upper Tertiary rocks in the upper plates from mainly Precambrian rocks beneath the faults. Mike Carr will guide the group through the Bare Mountains near Beatty, where a low-angle fault separates Tertiary sedimentary and volcanic rocks (above) from late Precambrian and Paleozoic rocks (below). In the Funeral Mountains, Bennie Troxel will show results of deformation and metamorphism of upper Precambrian rocks beneath a low-angle fault that underlies upper Precambrian to Pliocene rocks. Brian Wernicke will show the effects of transportation of rocks on low angle faults in the Tucki Mountain part of the Panamint Mountains. Parts of the trip are physically strenuous. You will be away from vehicles for several hours in the Funeral Mountains.

Limit: 37. Cost: \$270, including guidebook, meals (except dinner March 25), lodging (3 nights), and transportation.

(continued on p. 28)

Cordilleran Section (continued from p. 284)

1. Gold Deposits of the Las Vegas Region. Leaders: Peter Drobeck, (602) 753-1100; R. R. Kern, S. L. Jenkins, D. McClure, C. Ausburn, H. Linder, E. F. Huskinson, F. L. Hillemeier, and W. T. Dodge. *Note: All participants must provide their own hard hat and safety glasses.* Three days, March 26-28.

This trip will visit a spectrum of gold deposits typical of the Mojave Desert region. At the Nelson District, Nevada, and the Frisco Mine, Arizona, we will examine the interrelations between volcanic-style epithermal alteration and gold mineralization in a zone of detachment faulting. At the Colesseum Mine we will see a Cretaceous breccia pipe. We will also visit the Morningstar Mine, where mineralization may be related to thrust faulting. At the Hart District we will see a Miocene, rhyolite-hosted gold deposit with newly discovered reserves now in excess of one million ounces. At the Van Deemen Mine, we will see a detachment-hosted gold deposit. Limit: 45. Cost: \$130, including guidebook, lunches, lodging (2 nights), and transportation.

2. Mesozoic Thrusts and Superposed Cenozoic Low-Angle Faults, Spring Mountains, Nevada, to Clark Mountains, California. Leaders: B. C. Burchfiel, Massachusetts Institute of Technology; Greg Davis, (213) 743-2717, University of Southern California. Three days, March 26-28.

On this trip we will study the Mesozoic contractional and Cenozoic extensional tectonics of the eastern foreland, fold, and thrust-belt region of southern Nevada and adjacent California. Topics to be emphasized include the complex geometry and interrelations of Mesozoic structures in the eastern part of the Spring Mountains; basement-involved thrust faulting in the Clark Mountains, California; contrasts between brittle and ductile thrust-related deformation; and the distribution and style of superposed Miocene extensional tectonics.

Limit: 35. Cost: \$150, including guidebook, lunches, lodging (2 nights), and transportation.

3. Mid-Miocene Volcanoes in the Lake Mead Area, Nevada and Arizona. Leader: Eugene I. Smith, (702) 739-3971, University of Nevada, Las Vegas. Two days, March 27-28.

Emphasis will be on the nature of volcanism during regional extension. During the mid-Miocene, the eruption of andesite to rhyolite lavas produced several stratovolcanoes and small calderas. The trip will examine the Hoover Dam "sag graben" caldera, the River Mountains stratovolcano, and the McCullough Pass caldera and will focus on the geometry of volcanoes produced during crustal extension, the volcanic stratigraphy, and the rock petrogenesis. There will be several hikes of moderate length.

Limit: 35. Cost: \$165, including guidebook, lunches, lodging (1 night), and transportation.

4. Great Basin Precambrian and Early Paleozoic Bioturbation: Paleobiological and Sedimentological Implications. Leaders: Mary L. Droser, (216) 775-8353, Oberlin College; David Bottjer, University of Southern California. Two days, March 27-28.

During this two-day trip we will explore the paleobiological and sedimentological implications of early infaunal metazoan activity as recorded in upper Precambrian through Ordovician strata. To do this, we will examine ichnofabric and discrete trace fossils in a variety of terrigenous clastic and carbonate nearshore and shelf environments. On the first day, we will examine bioturbation in Lower Cambrian nearshore sandstones (Nopah Range) and Ordovician shelf sandstones (Talc City Hills). On the way to these stops we will pass through Death Valley and near Mount Whitney. The first night will be at Big Pine, California. On the second day, we will examine thick Precambrian to Lower Cambrian sequences in the White-Inyo Mountains of California that contain a variety of

carbonate and terrigenous clastic facies. This will provide an opportunity to observe some of the earliest known discrete trace fossils as well as ichnofabric. At the end of the second day we will return to Las Vegas through scenic southwestern Nevada.

Limit: 27. Cost: \$85, including guidebook, lunches, lodging (1 night), and transportation.

8. Geomorphology and Pedology on the Kyle Canyon Alluvial Fan, Southern Nevada. Leader: Janet Sowers, (415) 329-4960, U.S. Geological Survey, Menlo Park. Two days, March 27-28.

Visit a classic area of southwestern Quaternary geology. Recent work, using techniques of quantitative pedology, focuses on the geomorphology and Quaternary geology of this large fan and on the development of caliche soils as a function of time and climate. *Note: Fresh exposures in several backhoe trenches will be available for close inspection.*

Limit: 40. Cost: \$180, including guidebook, meals, lodging (1 night), and transportation.

9. Late Cenozoic Volcanism and Tectonism in the Coso Range Area, California. Leaders: Glenn Roquemore, (619) 939-3356, Naval Weapons Center, China Lake, California; Wendell Duffield, U.S. Geological Survey, Flagstaff. Three days, March 26-28.

This field trip will explore the late Cenozoic volcanic and tectonic development of the Coso Range, California, and some of the surrounding areas. This is a rare opportunity to visit areas that are normally closed to the public. *Note: Foreign visitors are required to bring visas with them.* Also, the area is subject to closure, although this is considered unlikely.

Limit: 24. Cost: \$170, including guidebook, lunches, lodging (2 nights), and transportation.

Postmeeting

10. Depositional Environments and Paleotectonic Setting of Triassic and Jurassic Sediments and Volcanic Rocks, Southwestern Colorado Plateau to Eastern Mojave Desert: Implications for Cenozoic Extension. Leader: John Marzolf, (618) 453-3351, Southern Illinois University, Carbondale. *Note: This trip will leave from Las Vegas at 4 p.m., Thursday, March 31.* Three and one half days, March 31-April 3.

Following a line from the Kanab area of southwestern Utah to the Baker area of the Mojave desert, we will observe tectonic and stratigraphic relations that include the westward overstepping of the Lower Jurassic from Upper Triassic to Lower Triassic to deformed and thrust-faulted Paleozoic rocks; the interfingering of the Moenave/Kayenta-equivalent strata and the Aztec Sandstone with arc-derived volcanics; the Aztec Sandstone depositionally crosscutting deformed, thrust-faulted Paleozoic carbonates; and evidence for the correlation of volcanic rocks with the Middle Jurassic Carmel Formation of the Colorado Plateau. Trip participants will also examine evidence for a narrow tectonic moat lying west of the present Colorado Plateau and east of the Jurassic volcanic arc.

Limit: 25. Cost: \$285, including guidebook, meals, lodging (2 nights), and transportation. *Note: For participants wishing to camp out and who can bring their own camping gear and provide their own meals, the cost is \$185.*

11. Neogene Timing of Gravity Slides in the Halloran Range, Mojave Desert, California. Leaders: Bob Reynolds, (714) 792-1334, San Bernardino County Museum; Matt MacMackin, Pennsylvania State University. Two days, April 1-2.

The mid-Tertiary Shadow Mountain basin was developed, deformed, and covered with upper Tertiary gravity slide blocks and

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Cordilleran Section (continued from p. 285)

fanglomerates consisting primarily of Paleozoic carbonates, but with other distinct lithologies that suggest their source was the Mescal Range. Faulting and basaltic eruption attributed to crustal extension began at about 7 Ma. Pleistocene lacustrine sediments have been offset 65 m vertically in the past 0.4 Ma.

Limit: 28. Cost: \$125, including guidebook, meals, and transportation. *Note: This is a camping excursion for the night of April 1. All participants must have their own camping gear.*

12. Geology of the Nevada Test Site. Leader: Richard V. Wyman, (702) 739-3940, University of Nevada, Las Vegas. One day, April 1

This field trip will be organized to visit sites of geological interest. A probable itinerary will include a visit to Yucca Mountain, site of a proposed major high-level nuclear-waste storage facility. Visitors will also see the collapse craters on Yucca Flat, visit the Sudan explosion crater, and go underground in one of the tunnels at Ranier Mesa. A no-host buffet lunch at 1967 prices will be served at Area 12. This is an all-day trip. Hiking shoes should be worn. *Note: Because of federal regulations, this trip is restricted to U.S. citizens. No cameras are allowed on the Nevada Test Site.*

Limit: 84. Cost: \$20, including transportation.

13. Geology of the Waterman Hills Detachment Fault, Central Mojave Desert, California. Leaders: Alan Glazner, (919) 966-4516, University of North Carolina, Chapel Hill; John Bartley, University of Utah. One day, April 1.

The newly recognized Waterman Hills detachment fault, located about 5 km north of Barstow, California, is the first documented example of "core-complex-like" crustal extension in the Mojave Desert. Field trip participants will examine, on three hikes, (1) development of intense mylonitic lineation near the fault in footwall granodiorite and gneiss; (2) evidence for Miocene and pre-Miocene deformation in footwall gneiss; (3) intense extensional deformation and hydrothermal alteration of Miocene rocks in the hanging wall; and (4) exotic clast assemblages in hanging-wall debris flows.

Limit: 42. Cost: \$50, including guidebook, lunch, and transportation.

14. Tertiary Extensional Basins of Northwestern Clark County, Nevada. Leaders: Peter Guth, (609) 866-9565, PETMAR Trilobite Breeding Ranch; Dwight Schmidt, U.S. Geological Survey, Denver; Jim Yount, U.S. Geological Survey, Menlo Park; Jack Deibert, University of Nevada, Las Vegas. Two days, April 1-2.

On this trip we will examine the interaction between Miocene normal faulting and basin development in the Sheep Range detachment. We will look at two extensional basins, the Gass Peak basin in the Las Vegas Range and the Quijinup basin west of the Sheep Range, which include clastic carbonate and detrital volcanic fill with interbedded landslides of brecciated Paleozoic bedrock. We will also look at the relation between sedimentation, landsliding, and faulting in the Hoodoo Hills Havoc along strike with the Quijinup basin. The second day involves a hike with an elevation gain of 2000 feet.

Limit: 35. Cost: \$160, including guidebook, lunches, lodging (1 night), and transportation.

15. Correlation of Early Mesozoic Thrusts in the Southern Great Basin and Their Possible Indication of 25-300 km of Neogene Crustal Expansion. Leaders: Brian Wernicke, (617) 495-2351, Harvard University; J. Douglas Walker, University of Kansas; J. Kent Snow, Harvard University. Three days, April 1-3.

Recent mapping in the southern Great Basin suggests that fragments of thrust faults, including the Wheeler Pass, Chicago Pass, Nopah Peak, Shovelton (new name), Butte Valley, and Winters Pass faults, represent a single Mesozoic thrust. Because the thrust cuts through bedding in hanging wall and footwall, its

original trajectory through the miogeoclinal prism could have been no wider than a few kilometres in an east-west direction; yet the fragments of the thrust are now scattered across an east-west distance in excess of 120 km. The purpose of this trip is to examine these thrust fragments and other data and to assess their implications for the style and magnitude of Neogene extensional tectonism in the southern Great Basin.

Limit: 40. Cost: \$195, including guidebook, meals, lodging (2 nights), and transportation.

16. Tectonic History of the Last Chance Thrust System, Inyo Mountains and Last Chance Range, California. Leaders: Kevin Corbett, (213) 825-3880, and Clem Nelson, University of California, Los Angeles; Chet Wrucke, U.S. Geological Survey, Menlo Park. Two and one-half days, April 1-3.

The Last Chance thrust is the largest and best exposed thrust of the early Mesozoic thrust belt in eastern California. Excellent exposures of the upper and basal plates, as well as of the sole thrust, occur in the eastern Inyo Mountains and western Last Chance Range. The tectonic significance of the Last Chance thrust lies in the additional constraints it offers for the nature and paleoplate tectonic setting of the Sonoma orogeny. On this field trip we will examine the deformation history and kinematics of the Last Chance thrust in light of the continuing controversy concerning the Sonoma orogeny and its role in the early Mesozoic orogenic evolution of western North America. This will be a 2-day, 2-night trip with lodging at the University of California White Mountain Research Station. *Note: This trip will begin at Las Vegas and will end at Los Angeles International Airport.*

Limit: 24. Cost: \$180, including guidebook, meals, lodging (2 nights), and transportation.

17. Geometry and Kinematics of a Miocene Accommodation Zone in the Central Black and Southern Eldorado Mountains, Arizona and Nevada. Leaders: James E. Faulds, (505) 277-3214, University of New Mexico; F. L. (Bud) Hillemeier, Fischer-Watt Mining Co.; Eugene I. Smith, University of Nevada, Las Vegas. Two days, April 1-2.

On this trip we will examine a major exhumed accommodation zone in highly extended terrane joining the central Black Mountains in northwestern Arizona and the Eldorado Mountains in southernmost Nevada. Accommodation zones facilitate reversals in the direction of block tilting and possibly inversions in the dip of detachment systems. We will examine a well-exposed accommodation zone in the highly extended Colorado River trough and inspect low-angle normal faults and attendant mylonites, and we will discuss the overall kinematics of detachment terranes.

Limit: 28. Cost: \$90, including guidebook, meals, lodging (1 night), and transportation.

18. Cretaceous Interarc and Forearc Basins of Baja California, Mexico. Leaders: Cathy Busby-Spera, (805) 961-4068, and William Morris, University of California, Santa Barbara; Patrick Abbott, San Diego State University. Three days, April 1-3.

On this field trip we will view coastal exposures of Cretaceous marine strata between Ensenada and El Rosario, Mexico (230 miles south of the border). Paleodepositional environments include deep-sea fan, submarine canyon, shallow marine and nonmarine forearc sedimentary rocks of the Rosario Group, and intra-arc marine volcanic rocks of the Alisitos Group. The effects of magmatism, tectonics, and global sea-level fluctuations on sedimentation will be discussed. We will also consider provenance and paleomagnetic evidence for or against large-scale translation of the Baja California Peninsula since Late Cretaceous time.

Limit: 40. Cost: \$230, including flight from Las Vegas to San Diego, (continued on p. 288)

PREREGISTRATION FORM

GSA Cordilleran Section, 84th Annual Meeting, March 29-31, 1988, Las Vegas, Nevada
held jointly with the Paleontological Society, Pacific Coast Section

Preregistration **MUST BE POSTMARKED BY NO LATER THAN February 26, 1988**. FULL payment and form **MUST** accompany all preregistration requests. Unpaid purchase orders are **NOT** accepted as valid registration. One form per registrant, please. All field-trip registrants must register for the meeting. **CANCELLATION** deadline: March 4. No refunds on cancellations received after this date. A confirmation card will be your receipt.

REGISTRATION INFORMATION: GSA HEADQUARTERS (303) 447-2020

Type or print—Copy for your records

Name (Last)		(First)	
Institution/Employer		Nickname for badge	
Mailing Address			
City		State	ZIP code
Country	Business phone	Home phone	
Guest/Spouse Name (Last)		(First)	
City		State/Country	

Member Affiliation: (1) GSA _____ (2) PS _____

PREREGISTRATION FEES

	Fee	Qty	Amount
Professional Member (member affiliation checked above)	(1) \$ 50	1	\$ _____
Member, one-day (circle day: W T F)	(2) \$ 30	1	\$ _____
Professional Nonmember	(3) \$ 65	1	\$ _____
Nonmember, one-day (circle day: W T F)	(4) \$ 30	1	\$ _____
Student Member (member affiliation checked above)	(5) \$ 15	1	\$ _____
Member, one-day (circle day: W T F)	(6) \$ 30	1	\$ _____
Student Nonmember	(7) \$ 25	1	\$ _____
Nonmember, one-day (circle day: W T F)	(8) \$ 30	1	\$ _____
Guest (fill in name above for badge)	(9) \$ 0	—	n/c
Abstracts with Programs—reserved (on-site pick-up)	(10) \$ 6	—	\$ _____

SPECIAL EVENTS

Business Meeting Luncheon	March 30	(11)	\$ 20	\$ _____
Yucca Mountain Overflight	March 30	(12)	\$ 148	\$ _____

FIELD TRIPS (meeting registration required)

Premeeting

1. Tertiary Tectonics, Pioche to Railroad Valley	March 25-28	(20)	\$ 260	\$ _____
2. Cenozoic Crustal Evolution, Mojave Desert	March 26-28	(21)	\$ 220	\$ _____
3. Detachment Surfaces, Southern Great Basin	March 25-28	(22)	\$ 270	\$ _____
4. Gold Deposits, Las Vegas Region	March 26-28	(23)	\$ 130	\$ _____
5. Mesozoic Thrusts and Cenozoic Low-Angle Faults	March 26-28	(24)	\$ 150	\$ _____
6. Mid-Miocene Volcanoes, Lake Mead	March 27-28	(25)	\$ 165	\$ _____
7. Great Basin Precambrian and Paleozoic Bioturbation	March 27-28	(26)	\$ 85	\$ _____
8. Geomorphology and Pedology, Kyle Canyon	March 27-28	(27)	\$ 180	\$ _____
9. Volcanism and Tectonics, Coso Range	March 26-28	(28)	\$ 170	\$ _____

Postmeeting

10a. Depositional Environments and Paleotectonics, Colorado Plateau-Mojave Desert	March 31-April 3	(29)	\$ 285	\$ _____
10b. Depositional Environments (camping)	March 31-April 3	(30)	\$ 185	\$ _____
11. Gravity Slides, Halloran Range	April 1-2	(31)	\$ 125	\$ _____
12. Geology of Nevada Test Site	April 1	(32)	\$ 20	\$ _____
13. Waterman Hills Detachment Fault	April 1	(33)	\$ 50	\$ _____
14. Tertiary Extensional Basins, Clark County	April 1-2	(34)	\$ 160	\$ _____
15. Mesozoic Thrusts and Neogene Crustal Expansion, Southern Great Basin	April 1-3	(35)	\$ 195	\$ _____
16. Last Chance Thrust System	April 1-3	(36)	\$ 180	\$ _____
17. Geometry and Kinematics, Black and Eldorado Mountains	April 1-2	(37)	\$ 90	\$ _____
18. Cretaceous Inter-arc and Forearc Basins, Baja California	April 1-3	(38)	\$ 230	\$ _____

SHORT COURSE

Waste Disposal Geology (preregistration required)	March 28	(40)	\$ 100	\$ _____
			Total:	\$ _____

Remit in U.S. funds, payable to: 1988 CORDILLERAN MEETING

or charge: American Express VISA MasterCard

Diners Club/Carte Blanche

Card expires: ____/____/____
mo. yr.

Signature _____

Mail to: 1988 GSA CORDILLERAN MEETING, GSA HEADQUARTERS,
P.O. BOX 9140, BOULDER, CO 80301

FOR OFFICE USE ONLY

Deposit date _____	Comment _____
Balance Due \$ _____	_____
Refund \$ _____	_____
Refund Ck # _____	_____
Refund date _____	_____

Cordilleran Section (continued from p. 286)

guidebook, meals, and transportation. *Note: This trip terminates in San Diego. Nights in Mexico will be spent camping. All participants must bring their own sleeping bags and pads. Tents will be furnished.*

Special Excursion—Yucca Mountain Reconnaissance Flight.

Leaders: Cady Johnson, (702) 798-0402, Mifflin and Assoc. Inc., Las Vegas; Carl Johnson, State of Nevada Nuclear Waste Project Office; Eugene Smith, Department of Geoscience, University of Nevada, Las Vegas.

Arrangements have been made to secure a slow, high-winged aircraft with large windows for a geological overflight of the proposed high-level nuclear-waste repository at Yucca Mountain. The suitability of Yucca Mountain as a high-level repository is the focus of a major site-characterization effort that is currently under way. Technical issues that must be resolved include estimation of ground-water flow paths and travel times, assessment of ground breakage, seismic and volcanic hazards, and evaluation of geologic evidence bearing on paleoclimate.

Participants will observe, from a relatively low altitude, the surficial features in the Yucca Mountain area that bear on technical issues in the field setting. Emphasis will be on faulting and volcanism in the Yucca Mountain-Crater Flat area, ground-water conditions between Yucca Mountain and Ash Meadows, and paleohydrologic features at Corn Creek Springs, Indian Springs, and Pahrump Valley.

Participants on the trip (and others attending the GSA Cordilleran Section meeting) may purchase a videotape (from the field trip leader) of the area made on an earlier reconnaissance flight. The tape will be available in Beta, VHS, or 8-mm format. The trip will leave from the Las Vegas Hilton at 5:30 a.m., Wednesday, March 30, and will return in time for the 8 a.m. start of the technical sessions. Limit: 17. Cost: \$148, including air transportation and ground transportation to North Las Vegas airport and return.

SUPPORT FOR STUDENTS

Funds are available to assist GSA Student Associates planning to travel to Las Vegas to present a paper at this meeting. Deadline for receipt of requests is January 26, 1988. Contact Bruce Blackerby, GSA Student Support, Dept. of Geology, California State University, Fresno, CA 93740, (209) 294-3086.

BUSINESS MEETING

The Cordilleran Section will hold its business meeting luncheon at the Hilton Hotel at 12 noon on Wednesday, March 30, 1988.

EXHIBITS

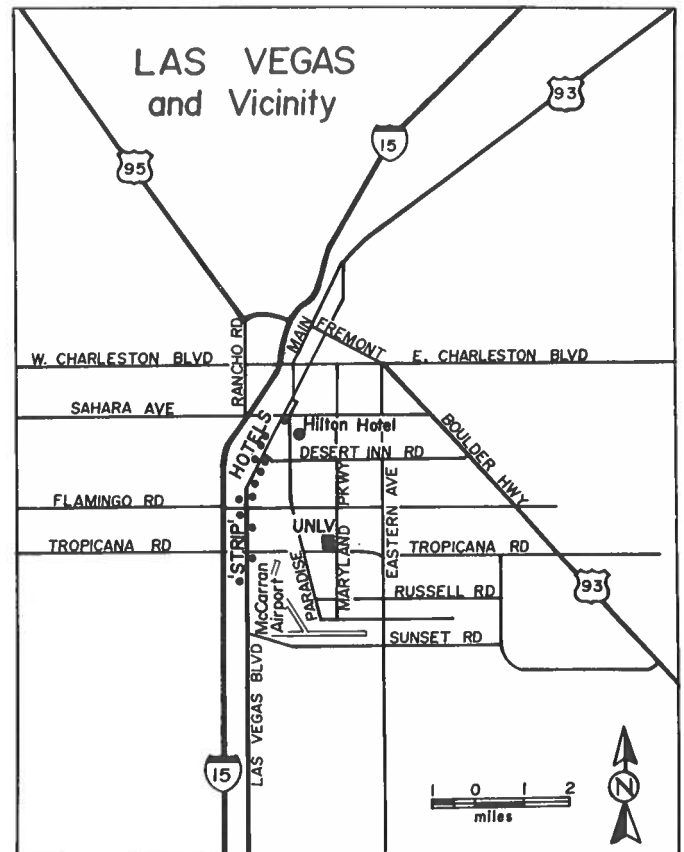
Exhibits of educational and commercial organizations will be on display at the Hilton Hotel in proximity to the poster session area. Exhibit space must be reserved by *January 15, 1988*. For exhibitor information, contact the General Chairman.

SPECIAL EVENT

A reception of bacchanalian proportion will be held on the evening of Monday, March 28, 1988, at the Hilton Hotel.

TRAVEL

The official travel agency for the 1988 Cordilleran Section is Ambassador Travel, Las Vegas. For travel information, please call Bob Conway (collect) (702) 385-7805. As part of the Ambassador travel package, we have also selected American Airlines as the official carrier. American has set up toll-free reservations number **1-800-433-1790** for participants in the Las Vegas meeting. By calling that number, you can arrange all air travel, even non-U.S.



connecting flights. **NOTE:** American will make every effort to price your flight package at a 40% discount. When calling for reservations you should identify yourself as a participant in the 1988 Geological Society of America Las Vegas meeting. Participants in field trips that do not begin or end in Las Vegas may find this service of great value. To facilitate ticketing via American's toll-free number, (1) state that you are a member of GSA, (2) ask for the "star number" for the 1988 Cordilleran Section meeting, and (3) have a valid credit card number and expiration date available. Because air traffic is extremely heavy, we suggest that you make your travel arrangements early. For other travel arrangements at the lowest possible rates, contact Bob Conway at Ambassador Travel (phone number above).

Car Rental. Special daily and weekly low rates are offered by Allstate Auto Rental, the Cordilleran Section's official rental car agency for the 1988 Las Vegas meeting. For information, call toll-free **1-800-634-6186**. Be sure to state that you are attending the GSA Cordilleran Section meeting.

HOUSING

Host Hotel

Las Vegas Hilton
P.O. Box 93147, Room Reservations
Las Vegas, NV 89109
1-800-732-7117 (toll free)

For the meeting, the Las Vegas Hilton has guaranteed a single rate for *all* rooms. These rooms are king-size bed or double/double bed (which can be shared). The flat rate for all rooms is \$60 per night. To reserve your room please complete the room registration form and send it to the Las Vegas Hilton. **Deadline for room reservations is February 26, 1988.**

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Alternate Hotels and Motels

Information regarding other hotels and motels can be obtained by calling the Las Vegas Convention Authority, (702) 733-2363.

REGISTRATION

Preregistration deadline: Must be postmarked no later than February 26, 1988.

REGISTRATION INFORMATION: GSA headquarters, (303) 447-2020.

1. There is a savings in registration fees if you register before February 26, 1988. Advance registration is suggested because of possible participation limits on the special activities. There will be no charge for spouse or guest registrants. Use the preregistration form provided in this announcement.
2. Registration is required for all attendees, including field trip participants.
3. Registration discounts are given to GSA and Paleontological Society members.
4. Full payment **MUST** accompany all registrations. Unpaid purchase orders are not accepted as valid registration. Credit cards are accepted as indicated on the preregistration form. If using a credit card, please recheck the card number given—error will delay your registration.
5. Register one professional or student per form. Copy the form for your records. One day registrants **MUST** indicate the day they plan to attend on the registration form.
6. Current student ID is required to obtain student rates for both preregistration and on-site registration.

REGISTRATION FEES

	Advance	On-Site
Professional:		
GSA/Paleo Society Member	\$50	\$70
Nonmember	65	70
One day (all professionals)	30	40
Student:		
GSA/Paleo Society Member	\$15	\$25
Nonmember	25	35
One day (all students)	30	40
Guest	n/c	n/c

ON-SITE REGISTRATION SCHEDULE

On-site registration will be in the Hilton.

- Monday, March 28—5:00 p.m. to 8:00 p.m.
- Tuesday, March 29—7:00 a.m. to 5:00 p.m.
- Wednesday, March 30—8:00 a.m. to 12:00 noon
- Thursday, March 31—8:00 a.m. to 12:00 noon

CANCELLATIONS AND REFUNDS

GSA will refund advance registration fees for cancellations received in writing by March 4, 1988. NO refunds will be made on cancellation notices received after this date. Refunds will be mailed from GSA after the meeting; a \$10 processing fee will be charged. Refunds for fees paid by credit card will be credited according to the card number on the preregistration form. NO refunds will be made on-site for registration or ticket sales.

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THE GEOLOGICAL SOCIETY OF AMERICA

Annual research awards program

1988

The Geological Society of America will continue its annual research awards program in 1988. Eligibility is not restricted to GSA members. New application forms for the current year and detailed requirements are available each fall in the geology departments of colleges and universities offering graduate degrees in earth sciences. Forms are mailed annually to GSA Campus Representatives and department secretaries and chairmen in the United States and Canada. They are also available upon request from the Research Grants Administrator, Geological Society of America, P.O. Box 9140, Boulder, Colorado 80301. PLEASE USE ONLY THE 1988 APPLICATION AND APPRAISAL FORMS.

The primary role of the research grant program is to provide partial support of master's and doctoral thesis research for graduate students at universities in the United States, Canada, Mexico, and Central America. If necessary, applications may be submitted in Spanish or French.

The Geological Society of America awarded \$176,000 in grants in 1987. The awards went to 199 students doing research for advanced degrees. The average amount awarded was \$885. The largest award was \$1,230, but there is no predetermined maximum amount.

Confidential evaluations from two faculty members are required from master's and doctoral candidates and must accompany applications submitted. PLEASE USE THE "APPRAISAL OF APPLICANT" FORMS, WHICH ACCOMPANY THE 1988 APPLICATION FORMS.

Applications will also be accepted for the Harold T. Stearns Fellowship(s). These grants are awarded periodically in support of research on one or more aspects of the geology of Pacific Islands and of the circum-Pacific region. They are distinct from the GSA Penrose research grants and are restricted in their use to the particular region. The awardee(s) will be selected by the Research Grants Committee. Applications must be postmarked by **February 15**. Application forms are the same as those used for the Penrose research grants.

The Committee on Research Grants will meet in April to evaluate applications and award grants. In April, all applicants for grants will be informed of the committee's actions by the Executive Director of the Geological Society of America.

ALL APPLICATIONS MUST BE SUBMITTED ON THE 1988 FORMS

AND POSTMARKED BY FEBRUARY 15, 1988

New GSA Fellows

The following candidates were elected to Fellowship by Council action at the October 1987 meeting.

James W. Clarke	René A. DeHon	Lucy McCartan	Jack M. Rice
Kenneth D. Collerson	Richard S. Fiske	Warren J. Nokleberg	Eugene A. Shinn
Claire B. Davidson	Robert C. Jachens	R. J. Norris	Robert C. Thunell
Howard W. Day	Gail Mahood	Richard R. Parizek	Robert L. Wesson

New GSA Members

The following 301 Members have been elected to Membership by Council action during the period from February 1, 1987, through August 31, 1987 (* indicates transfer from Student Associate to Member).

Nelson J. Abrams Nooreddin Alavi-Tehrani Hassan A. Al Hazmi Dan C. Alred Jr. Jeffrey C. Alt Gary D. Andersen Julian M. R. Anderson Richard L. Anderson Martin J. Andrejko David R. Annis Richard G. Ashe John H. Ashton Barbara C. Atkin Steven A. Atkin John E. Axelson Steven N. Balone Michael F. Barilar Douglas B. Barnett John E. Beane Cathleen M. Beaudoin Theodore E. Bedell III William E. Bell Victoria C. Bennett Timothy B. S. Berge Robert J. Beyke Karen L. Bice Robert I. Birnie David B. Bodnar Lorene D. Boeckler Kevin M. Bohacs David C. Booth Scott G. Borg Alfonso Bosellini Michael G. Boston Ronald J. Bowers Bryan R. Bracken Don R. Braun William C. Brice Corey B. Brinkema Craig W. Brougher Damon F. Brown Douglas W. Brown Jeffrey D. Brown Julia T. Brown Melinda M. Brugman ... Taras Bryndzia William V. Bush George E. Campbell Cindy K. Carney Paul E. Carrara Charles H. Carter Donn Charnley William G. Childs William H. Chilner III Philip R. Christensen Mike Clarke John P. Clinkenbeard Jeffrey A. Coe John S. Comegys	K. Douglas Cook Leo M. Coombs *John O. Costello *Mark P. Cotter Peter F. Cowell Bruce Cowie James H. Craft Donald H. Cramer *Greg T. Cranham *Robert J. Creed Laura J. Crossey Colin E. Cunningham William G. Cutler *John E. Czarnomski Harold W. Dailey *William W. Danforth Richard L. Dart Ricky J. Dautat Phreadde J. Davis *Edmilson Santos De Lima *Anne Demitrack Timothy M. Demko Jean F. Demouthie Jan-Arco De Reus Stephen M. Dickson Robert M. Difilippo *Ross A. Dimmick E. James Dixon Thomas N. Dixon Hugh A. Douglas Rayburn L. Dye Gerald I. Eidenberg *John M. Elder C. Stewart Eldridge Michael A. Ellis George F. Engelmann Dean B. Eppler William Estavillo Wayne D. Estill *Kathleen M. Farrell Charles C. Ferrall, Jr. Pamela P. Fisco William P. Fitzpatrick Alfred J. Fleming Anthony H. Fleming Raymond E. Flood Karl B. Follmi Mimi J. Freeman Michael Freiheiter Harald Fritz Tod A. Frolkine James D. Garry *Beth C. Geiger Eric L. Geist Arthur L. Geldon *J. Bruce Gemmell Sheri M. George Catherine S. Gibbons David Gibson	Emily B. Giffin John P. Gilfeather John A. Golden, Jr. Basil Gomez Glenn S. Goodman Bruce Gordon Elizabeth A. Gordon *Timothy L. Gorey William D. Gosnold James T. Goyich Eric C. Grimm Christian J. Gross Paul F. Gutmann William E. Halbert Robert Hall John W. Happ W. Douglas Harrison William J. Harrison Margaret A. Hart *Robert C. Hazlett Nancy Healy-Williams Mohamed T. Heikal Jan G.H. Hertogen David C. Hetherly *Lee Higgins *Elizabeth Hill *Kenneth M. Hinkel *Michael M. Hobby Steven B. Hoffman *R. Wade Holder *Thomas J. Hollis John W. Hopkins Kevin S. Hopson David R. Hose *Eric J. Hubbard Nazila E. Hummer Charles D. Hunt, Jr. Gregory L. Hunt Craig C. Hyde Yoshio Inouchi Marie D. Jackson Mary L.W. Jackson Arthur F. Jacob Sharon J. Jaffess Thomas R. Jake Nancy O. Jannik James H. Jensen Carla Johnson Clarence R. Johnson James S. Johnston Susan B. Jones Thomas E. Jordan A.J. Timothy Jull Teresa L. Kaktins Bruce D. Kay *Jonathan R. Kelafant *Timothy J. Kelly George L. Kennedy Thomas R. Kilbey Ollie P. Kimbrell	Kevin A. Kincare David A. King *Dwight M. Kinnes *Michael X. Kirby Michael J. Kocurko Andrew M. Koenigsberg *Ronald J. Kofron Robert J. Kondelin *Doris J. Kovanen Jess B. Kozman Maurice Krafft Lee R. Kump Chikao Kurimoto Anthony F. Kurpaska Colette Marie Kussel Patrick M. Lannon Richard A. Laws *Jeff M. Legato John F. Lerbekmo Edie T. Lewis Nathaniel A. Lifton John F. Ligon *Ronald J. Litwin Richard S. Lively Charles L. Lo Bue Clarence S. Long, Jr. Thomas D. Longley Steven L. Losh Mervin F. Lovenburg Huan-Zhang Lu Richard S. Luker Thomas R. Lyons Betti M. MacGregor Robert H. MacWilliams Rosemary E. Manty *Andrew J. Marino Brian C. Martinek Elizabeth L. Mathieson Mario M. Mazzoni Randall L. McAlister Sandy G. McAllister Anne E. McCafferty Marlene L. McCauley John R. McGann *Mary L. McHugh Kenneth J. McMillen Richard B. McMullen Kevin McSweeney Mark E. Meek Brian H. Mende Serge J. Menicucci Christine M. Mennicke *Paul A. Merewether Michael J. Meyer David W. Mittlefehldt Douglas W. Middleton Martin D. Mifflin Robert W. Milam *Elizabeth J. Miller	*Scott H. Miller Elaine C. Mims Miguel A. Miranda-Gasca Stuart D. Mitchell Takashi Miyano Charles A. Montero Keith J. Moore Sergio C. Mora William F. Mulligan III Stuart E. Munro Diane K. Murbach Monte L. Murbach Ralph A. Murphy Nathan C. Myers Daniel E. Nedland Mark E. Nelson Kent D. Newman Mark S. Newton Michael L. Nicholas Peter A. Nielsen *Daniel C. Oliver, Jr. *Randolph F. Olms *Ronald J. O'Neill P. R. Oppenheimer Mark R. Owen Matthew G. Pajerowski William K. Parrish Jimmie R. Parsley Suzanne S. Paschke John Pastor Colin J. Paterson *Hannah F. Pavlik Kenneth Perry Colen R. Peters *Randall F. Pfahler Sam E. Phifer Charles David Phillips *Karl F. Pohlmann William C. Pooler Thomas L. Prather Edwin H. Price *Cynthia L. Pridmore Cecilio Quesada-Ochoa Leslie D. Reed David J. Reynolds Michel Rheault Bruce L. Rhoads Scott A. Rice Thomas Rice Susan S. Richards *Scott M. Ritter *Francis W. Robinson David A. Rodriguez Robert P. Rogero Allan B. Rogers Timothy E. Rogers Alessandro Rottura Vincent J. Ruggiero (continued on p. 292)
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New GSA Members (continued from p. 291)

- | | | | | |
|----------------------------|----------------------|---------------------------|-----------------------|--------------------|
| *Alexander M. Rummell | Mark W. Shuster | *Jay A. Stravers | *James W. Vallance | Fred E. Winkler |
| Francesc Sabat | Richard H. Sibson | *Manfred R. Strecker | *Glenn A. Van Derpoel | Gerhardt M. Witt |
| Joseph M. Sadlik | Mark A. Silverman | *Jacqueline G. Strickland | Steven M. Vinci | Lyons Witten |
| John R. Sammon | Richard B. Silverman | Thomas C. Sullivan | Martin W. Walker | Thomas E. Wonacott |
| Dewey D. Sanderson | Toni J. Simo | Mohammad A. Sultani | Jeanne S. Wallberg | *Mark R. Wood |
| Francisco C. San Juan, Jr. | *Stephen J. Simpson | Thomas F. Terranova | Virginia M. Walsh | Roy Woodall |
| David A. Sawyer | *John D. Skalbeck | *E. Eilene Theilig | *Constance Ward | George B. Wyatt |
| *Deborah C. Saxton | *Raymond C. Slagle | Todd M. Thornburg | William C. Ward | *Timothy J. Young |
| Janine M. Schiavone | Robert L. Slamal | Susan Timm | *Jo Ann T. Weber | *Cheong-Yip Yuen |
| Allan T. Schmidt | Braven R. Smillie | William R. Tingle | Roger N. Weller | Craig E. Zamzow |
| Bennetta L. Schmidt | James R. Smitherman | Christopher A. Toles | Kaylea White | Ivar Zemmels |
| Timothy D. Schneider | Patrick K. Spencer | Garrie L. Tufford | Russell E. White | Michael W. Zillmer |
| Marcia K. Schulmeister | Howard J. Spero | Jack L. Umbaugh | C. D. Whiteman, Jr. | Jay Zimmerman |
| Maria Sgavetti | Herbert M. Spitz | Garland R. Upchurch, Jr. | Rick H. Whitney | |
| Sultan J. Shawly | *Pamela J. Stella | *Joanne Urquhart | Perry B. Wigley | |
| Mark A. Shellhorn | David J. Steyaert | H. Leonard Vacher | Nancy A. Wildman | |
| *Darcia A. Short | Julie K. Stratton | Robert M. Valentine | Michael L. Williams | |

New GSA Student Associates

Listed are 378 Student Associates who became affiliated with the Society during the period from February 1, 1987, through August 31, 1987.

- | | | | | |
|---------------------------|-----------------------|-----------------------|------------------------|----------------------------|
| Eric R. Adams | William W. Chadwick | Jeffrey G. Feehan | Michele M. Hluchy | Peter J. Lemiszki |
| Ibrahim Akpinar | Nilanjan Chatterjee | Alan V. Ferra | John R. Hoaglund III | Robert M. Lent |
| Laurelle S. Alford | Guo Neng Chen | Peter S. Fiske | Teresa C. Hobbs | Sally L. Letsinger |
| Kurt D. Allen | John K. Chesnut | Jeffrey W. Fitzgerald | Sarah E. Hoffman | Beth A. Lettman |
| Kristin M. Alvarez | Barbara D. Chinn | Michael J. Foote | Steven M. Hoffman | David F. Link |
| Evan R. Anderman | Matthew B. Clark | James L. Foreman | Laura A. Hofgesang | Angela R. Linse |
| Suzanne E. Andrews | Tonia J. Clement | Greg Forman | Peter F. Holterhoff | Carolina Lithgow-Bertellor |
| Robert F. Andrie | William P. Colby | Brent D. Foster | Kerry S. Howard | David J. Little |
| Theodore G. Apotria | Maurice Colpron | Charles D. Frederick | William L. Hughes | Christina L. Livesey |
| Mark W. Armstead | E. Ann Compton | Katherine H. Freeman | Michael D. Hylland | Ching-Hua Lo |
| Valerie A. Armstrong | Linda M. Conlan | Gina M. Frost | Timothy J. Jackson | Mark A. Loesch |
| Kirk M. Auer | Mark E. Conrad | Sharon L. Gabel | Noreen A. Jasek | Cary M. Loggins |
| David G. Bailey | Nicholas D. Cook | Jose S. Galeazzi | John D. Jeffers | John D. Long |
| Dan M. Baker | Stephen J. Cook | Carol L. Gallatin | Thomas F. Jenkins | David S. Lucas |
| Alan Barta | Michael J. Cornelius | Dora M. Gallegos | Leslie A. Johnson | Barry L. Lumpkin |
| George T. Basabilvazo | Deanna C. Couch | Jeffrey M. Gardemal | Lynn E. Johnson | Carl E. Lundgren, Jr. |
| Christopher M. Baugues | Donna L. Courington | Peter E. A. Gardes | Steve Jones | Kevin Mallin |
| Steven J. Baumgardner | Jeff P. Crabaugh | M. Ishaq Ghaznavi | Frank F. Jordan, Jr. | Joseph A. Marchesani |
| Bobby J. Beaman | Andrew B. Cullen | Fabio Giannetti | Richard D. Kaiser | Vanadis M. Mares |
| Lawrence E. Bean | Ben B. Curry | Maurice B. Gisler | Susana Kalafatovich | Robert M. Markoff |
| Steven C. Bearce | John P. Dadoly | Melanie J. Givan | Sanjeev M. Kalaswad | Robert Marquis |
| Rudolf P. Beintner | Margaret S. Daniel | James D. Gleason | Kenneth S. Kendall | Vito P. Marrone |
| Gaboury Benoit | Kimberley A. D'Arcy | Gayle C. Gleason | Robert L. Kendall | James R. Martin |
| Ray H. Bernhardt | Bradley R. Davis | Ian R. Gordon | Lawrence E. Keyte | Linda G. Martin |
| Patrizia Bianconi | Daniel W. Davis | Ellen R. Graber | Peter J. Kindle | Kevin M. Matheis |
| Alan R. Billingham | Michel G. Debiche | Kristin A. Grady | Jon R. Kirkpatrick | Richard G. Matson |
| Dan A. Billman | Hugo Delgado-Granados | James C. Granahan | Robert Z. Kline | Jerald R. Maughan |
| Janet M. Blabaum | Robert A. Demetron | Gay N. Gutierrez | Michael P. Klisch | Peter Mazzone |
| Curtis W. Black | Donald N. Dickey, Jr. | Polly A. Haessig | Jason L. Knowlton | Michael E. McClain |
| Gale C. Blackmer | Steven J. Di Lella | Gregory D. Hall | Bernhard C. Koch | Jeanne M. McClure |
| Peter K. Blomquist | Pamela E. Dimmock | Dann M. Halverson | Mark S. Koellner | James McDonald |
| Margaret C. Bobb | Joseph L. Domagalski | Willis E. Hames | Michal J. Kowalewski | Gail A. McGarry |
| Mark A. Bogina | David J. Donovan | Douglas O. Hamilton | Cynthia L. Kramer | Kim McIver |
| Marvin K. Booker | Dale F. Doughty | Debra L. Hanneman | Kathy E. Kretzer | Peter P. McLaughlin |
| Barbara A. Bowles | Joe D. Dragovich | Richard D. Harwood | Rebecca J. Krieg | Richard D. McLerran |
| Julia M. Branch | Eric A. Draper | Redwan N. Hassan | Michael A. Krol | Michael D. McVey |
| Stephen A. Bresett | Cynthia D. Dresser | Roger B. Haston | Michael E. Lamar | Andrew J. Meigs |
| Jeffrey P. Brislaw | Mark A. Du Bois | Stanley C. Hatfield | Lance L. Lambert | Katherine A. Milla |
| Rebekah Brooks | Thomas S. Dunham | Joan N. Hayashi | Mark R. Lambert | Daniel M. Miller |
| Terry L. Browand | Eva M. Dupuis-Nouille | Elizabeth M. Hayes | Ricky E. Lambert | Jerry R. Miller |
| Patti J. Burkett | Laurie A. Dutton | William A. Heins | Carol Lamoureaux-Rison | Charles V. H. Mims |
| Stephen M. Byrnes | Clay P. Dyer | George R. Helffrich | Cynthia M. Lampe | Timothy D. Mock |
| Jonathan Caine | Denton S. Ebel | James V. Hengesh | James R. Lang | Vanessa Monell |
| Judith A. Calem | Ellen M. Eberhardt | Janet A. Henley | Daniel Larsen | Isabel P. Montanez |
| Angel F. Callejon | Cheryl R. Emerson | Stephen W. Herman | David C. Lawrence | David J. Moss |
| John B. Callihan | Marc C. Ericksen | Margaret J. Herron | Sybil M. Leatham | Ralph D. Mueller |
| Edward M. Calvin | Chuck A. Ernst | Christoph E. Heubeck | Jeffrey A. Lee | Fred Murphy |
| Curtis J. Cappellano, Jr. | Carole J. Estes | Glenn B. Hieshima | Todd Leeds | Michele Murray |
| Dana W. Carson | Colombo Fabrizio | Jerri L. Higgins | Ben H. Le Febvre | Halim Mutlu |
| Paul J. Carter, Jr. | Peter J. Fawcett | Tom W. Hill | Richard L. Lehman | (continued on p. 293) |
| Mario Castaneda | Dolly Fazeli | John M. Hillenbrand | Kathleen M. Leibold | |

New GSA Student Associates (continued from p. 292)

David D. Nelson	David C. Potratz	Kristine L. Saboda	Michael J. Soreghan	Monica C. Ward
David K. Nicholson	David E. Price	Scott D. Samson	Michael J. Spicuzza	Jeff J. Weatherly
Martha Nicholson	Diane M. Pupa	David A. Sauer	Linda J. Stanton	Stephen G. Weaver
Shang-You Nie	Mohammed Y.H.T. Qari	Wayne C. Schanck	Carola H. Stearns	J. Michael Weinberg
Francis B. Nimick	Ali S. Rahbari	Carl D. Scharpf	Martin Stefflik	Carol A. Weinstein
Paula J. Noble	Merion E. Ransom	John W. Scheetz	Kurt R. Sternlof	Gary S. Weissmann
John E. Nordenstam	Gregory A. Rapp	Linda M. Schieber	David C. Still	Eric R. Wells
Jeffrey C. Nytech	Michael G. Rasmussen	Robert Scholger	David V. Stockar	Kenneth S. Werner
Eric A. Oches	Thomas L. Ratliff	Kim E. Schroeder	Paul R. Stoddard	Kelin X. Whipple
Kevin M. O'Dea	Gordy W. Rattray	Benjamin C. Schuraytz	Linda Stone	David N. Wilcots
Eric H. Oellcers	Robert L. Rau	James S. Scoates	Gary D. Storrick	Rane A. Wilson
Kimberly A. Ogle	Deborah E. Rausch	Allan Scott	James P. Strayton	Barbara M. Winsborough
Christopher D. Olson	Jin-Han Ree	Gadi Shamir	Marc W. Sullivan	Kenneth W. Wisian
John L. Olson	Jayne A. Reichhoff	Judy P. Shaw	Cathy A. Summers	Channa D. Witanachchi
Naomi Oreskes	Joseph B. Renk III	Suzanne A. Shelley	John P. Tandarich	Donna L. Woelfel
Terry E. Osborne	Steven W. Riddle	Paul F. Short	Kenneth B. Tankersley	Ellen E. Wohl
Andrew J. Oventile	Catherine A. Rigsby	Linda S. Sickel	Paul L. Templett	Michael B. Wolf
Lawrence L. Page	Patrick W. Riseley	Paul J. Sikora	Alan D. Thompson	Marvin O. Woods
Glen P. Parsley	Anna Marie P. Ristich	Sandra L. Simigian	Harold J. Tobin	David J. Wronkiewicz
Carolyn P. Peddy	Michael G. Roark	Antonio Simonetti	Cynthia A. Torzynski	Astrid K. Wuersten
Jeffrey R. Perrine	Kevin L. Robinson	Tapio H. Sirkka	Daniel B. Uldall	Ming Qin Yang
Eugene M. Peters	Antoni L. Roca	Deanna L. Skapiak	John B. Wagner	James R. Young
Jonathan W. Peterson	Roque A. Rokovich	Kevin P. Slapp	James F. Wait	Andrew P. Zdinak
Leonard E. Petrocelli	Nicholas M. Rose	Mike J. Slebodnick	Brooks H. Wallin	Jie Zhang
Daniel R. Pingel	Nina D. Rosenberg	Eric L. Sleipnes	Robert W. Wallin	Andrew T. Zimmerman
Norbert Plass	Timothy M. Ross	Gregory L. Small	Gregory J. Walsh	
Ellen S. Platzman	Michele J. Rosteck	Daniel J. Smith	Stan Walthall	
Mark J. Pontius	Robert G. Rowe III	Walter O. Soechting	Stan Walthall	
Michael J. Portwood	Randy K. Ruff	Indroyono Soesilo	Laura L. Walton	
			Michael D. Waltz	

GSA Divisions, Sections Announce Grant Awards

Quaternary Geology and Geomorphology Division

The Quaternary Geology and Geomorphology Division awarded Mackin grants to three students in 1987. Master's degree candidate Kevin M. O'Dea, Humboldt State University, Arcata, California, received a grant for "Quaternary Terrace Formation and Deformation on Yager Creek, Humboldt County, California." Two Ph.D. candidates were selected to share a Mackin grant: Leal A.K. Mertes, University of Washington, Seattle, for "Morphology and Construction of the Solimoes-Amazon River Flood Plain in Brazil" and Jim E. O'Connor, University of Arizona, Tucson, for "Hydraulics and Sediment Transport of Pleistocene Lake Bonneville Flooding on the Snake River."

The first Mackin grant was awarded by the Division in 1974; 24 awards have been presented.

Sedimentary Geology Division

The Sedimentary Geology Division presented its first annual award for an outstanding student research proposal, submitted to the GSA Research Grants Program, to Jay S. Noller, a Ph.D. candidate at the University of Colorado, Boulder. The award was for his research project titled "History of El Niño in Soil Chronosequences of the Peruvian Desert."

Structural Geology and Tectonics Division

The second student research award to be presented by the Structural Geology and Tectonics Division went to Mark H. Anders of the University of California, Berkeley, for "Episodic Late Cenozoic Faulting in the Overthrust Belt: Implication for the Origin of the Parabolic Distribution of Seismicity and Active Faulting, Idaho-Montana-Wyoming."

North-Central Section

The North-Central Section of GSA awarded six research grants to students in the section this year. Each \$500 award is given

to qualified students to support field work leading to a thesis or dissertation completion. To be eligible for an award, a student must be attending a college or university in the North-Central Section geographic area. Recipients are selected from students who have submitted applications to the GSA Research Grants Program. This is the third year that the North-Central Section has awarded student grants. Sixteen awards have been presented by the section.

The recipients and the titles of their research projects are:

Vee Ann Atnipp, University of Michigan, "An Evaluation of Fluid Migration During Deformation of the Wyoming Overthrust Belt"; Scott J. Carpenter, University of Michigan, "High-Resolution Secular Variation of Paired C, O, and Sr Analyses of Marine Carbonate Cements: The Devonian-Carboniferous of the Alberta Basin, Alberta, Canada"; Manrico Delcore, Michigan State University, "Hydrodynamics of Fractured Crystalline Rock Aquifers"; David James Lepse, University of Iowa, "Metamorphic Petrology of a Precambrian Quartzite-Schist Sequence near Canon City, Colorado"; Richard E. Terry, University of Cincinnati, "Paleo-community Analysis of Carbonate Buildups in the Fort Payne Formation (Mississippian), Dale Hollow Reservoir, Pickett County, Tennessee"; J.G.M. Thewissen, University of Michigan, "Phylogeny, Ecology, and Evolution of the Phenacodontidae (Condylarthra) and Their Relationship to Other Mammals."

Southeastern Section

GSA's Southeastern Section has awarded research grants to the following students:

Ph.D. students: Clark Alexander, North Carolina State University, "Thin-Section Examination of Stratification and Clinoform Setting Within Shales and Mudrocks"; John Beuthin, University of North Carolina, "Paleogeomorphology Across the Mississippian-Pennsylvanian Boundary in Northwestern West

(continued on p. 293)

Grant Awards (continued from p. 293)

Virginia"; Robert Britt, University of Florida, "Correlation Between Marine and Terrestrial Chronologies Along the Cape Hatteras Axis, and the Evolution of Southeastern United States Faunal Provinces"; Steven Campbell, Florida State University, "Isotopic and Geochemical Investigation into the Petrogenesis of Tertiary Volcanics of the Rio Grande Rift in South-Central Colorado."

M.S. students: Steven Bearce, Auburn University, "Characterization of Fracture Patterns in the Area in and Between Bartlett's Ferry and Goat Rock Fault Zones, Lee County, Alabama"; Dan Billman, West Virginia University, Alleghenian Cover Strain in the Central Appalachians of Virginia and West Virginia"; John Callihan, University of Southwestern Louisiana, The Quaternary and Environmental Geology of Northwestern Iberia Parish, Louisiana"; Timothy Goist, University of Georgia, "Petrology and Geochemistry of the Serra de Lagoinha Pluton, Northeastern Brazil"; Ron Linton, West Virginia University, "Slack-Water Deposits Along the Cheat River in East-Central West Virginia"; Katherine Milla, Florida State University, "Geochemistry of the Gay Dike, Georgia: Implications for Relationship Between Dike Compositions and Regional Tectonics"; Mark Peebles, Auburn University, The Taphonomy of Benthic Foraminifera in Modern Reefs and the Pleistocene Cockburn Town Reef, San Salvador, the Bahamas"; Patricia Renwick, Emory University, "Paleoecology of Floodplain Lakes in the Durham Sub-basin of the Deep River Basin (Late Triassic), North Carolina."

The 1987 Southeastern Section awards totaled more than \$4000 to qualified students to support research leading to a thesis or dissertation completion. The average award in 1987 was \$333, and the success rate was 25%.

The 1988 competition is open to all qualified students (i.e., student associate members of the Geological Society of America who are enrolled in a university or college within the Southeastern Section). Ph.D. students must also apply to the Geological Society of America research awards program; the deadline for applications for 1988 awards is February 15, 1988. Deadline for receipt of

applications by the Southeastern Section is March 1, 1988. Awards will be made in April 1988.

Application forms are available from: Michael J. Neilson, Dept. of Geology, University of Alabama at Birmingham, Birmingham, AL 35294; (205) 934-5102.

GSA Officers and Councilors for 1988

Albert W. Bally, President
Houston, Texas

Randolph W. Bromery, Vice-President
Amherst, Massachusetts

Jack E. Oliver, Past President
Ithaca, New York

Robert L. Fuchs, Treasurer
Denver, Colorado

1986-1988 Councilors

David L. Jones; Berkeley, California

C. Barry Raleigh; Palisades, New York

E-an Zen; Reston, Virginia

Mary Lou Zoback; Menlo Park, California

1987-1989 Councilors

William W. Hay; Boulder, Colorado

Marcus E. Milling; Austin, Texas

John S. Scott; Ottawa, Ontario

Stephen H. Stow; Oak Ridge, Tennessee

1988-1990 Councilors

Zoltan de Cserna; Mexico City, Mexico

Priscilla C. Grew; St. Paul, Minnesota

Donald C. Haney; Lexington, Kentucky

Richard W. Hutchinson; Golden, Colorado

New GSA Congressional Science Fellow Chooses Assignment

Congressional Science Fellow James E. Evans has chosen assignment in the office of Congressman Michael E. Lowry (D, Washington).

Lowry is chairman of the Oceanography Subcommittee, part of the Merchant Marine and Fisheries Committee of the House of Representatives.

Evans expects not only to work on district issues in Lowry's office but also to be involved in committee and subcommittee issues. District issues include siting of the Hanford Nuclear Waste Repository, and old-growth timber. Oceanography Subcommittee issues include hard-mineral mining of the Economic Exclusion Zone (EEZ), which includes the 200 miles off the coast of the United States or the continental shelf (at present there are no laws governing how to mine from the EEZ, and legislation is expected to be initiated); the Arctic National Wildlife Refuge and whether or not drilling is to be allowed; and revision of the 1972 Coastal Zone Management Act.

Evans may be contacted through the office of The Honorable Michael E. Lowry, House of Representatives, 2454 Rayburn House Building, Washington, DC 20515. The general office telephone number is (202) 225-3106.

NEW! REVIEWS IN ENGINEERING GEOLOGY VII

DEBRIS FLOWS/AVALANCHES

Process, Recognition, and Mitigation

edited by John E. Costa and Gerald F. Wieczorek

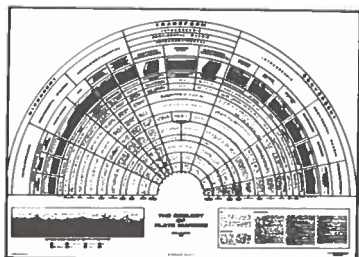
Debris flows and debris avalanches are among the most dangerous and destructive natural hazards that affect humans. They claim hundreds of lives and millions of dollars in property loss every year. The past two decades have produced much new scientific and engineering understanding of these occurrences and have led to new methods for mitigating the loss of life and property. These 17 papers pull together much of this recent research and present it in these categories: (1) process, (2) recognition, and (3) mitigation. Much of this work results from cooperative efforts between GSA's Engineering Geology Division and Quaternary Geology and Geomorphology Division.

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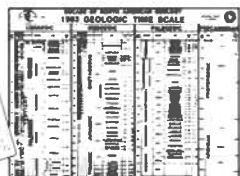
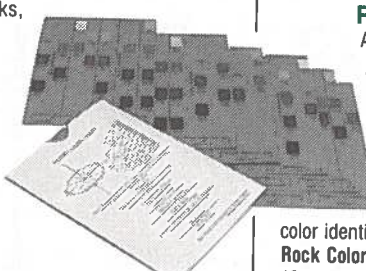
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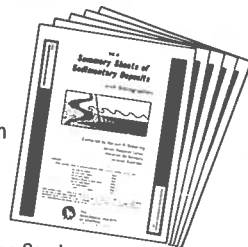
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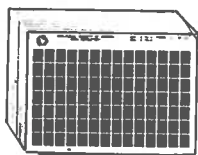
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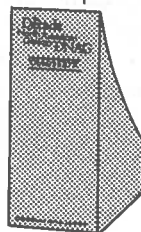
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MEETINGS

(Asterisk indicates new or changed information)

1987

Nature and Composition of Surface Units on Mars Workshop, December 4-5, 1987, Napa, California. Information: Pamela Jones, LPI Projects Office, 3303 NASA Rd. 1, Houston, TX 77058; (713) 486-2150.

Society of Economic Paleontologists and Mineralogists Gulf Coast Section 8th Annual Research Conference, Paleontological Applications in Petroleum Exploration, December 6-9, 1987, Houston, Texas. Information: Charles L. McNulty, Dept. of Geology, University of Texas, UTA Box 19049, Arlington, TX 76019; (817) 273-2979.

American Geophysical Union Fall Meeting, December 7-11, 1987, San Francisco, California. Information: Ann E. Singer, American Geophysical Union, 2000 Florida Ave., N.W., Washington, DC 20009; (202) 462-6903.

National Symposium on Mining, Hydrology, Sedimentology and Reclamation, December 7-11, 1987, Springfield, Illinois. Information: Juanita Graves, University of Kentucky Office of Continuing Education/Engineering, 223 Transportation Research Bldg., Lexington, KY 40506-0043; (606) 257-3973.

First Arab Conference on Geological Education, December 12-14, 1987, Baghdad, Iraq. Information: Conference Secretariat, Arab Conference on Geological Education, Arab Geologist Association, P.O. Box 1247, Baghdad, Iraq; Telex 212197 JAMIT IK.

1988

Restoring the Earth, National conference on natural resource restoration and environmental planning, January 13-16, 1988, Berkeley, California. Information: Kathleen Ferguson, 1713 C Martin Luther King Jr. Way, Berkeley, CA 94709; (415) 843-2645.

***American Institute of Mining, Metallurgical and Petroleum Engineers-Society of Mining Engineers-Metallurgical Society Annual Meeting**, January 25-28, 1988, Phoenix, Arizona. Information: Meetings Dept., Society of Mining Engineers, P.O. Box 625002, Littleton, CO 80162.

***Symposium on Geologic and Geochemical Evidence for Segmentation of Continental and Oceanic Rifts**, January 26-27, 1988, Woods Hole, Massachusetts. Information: Janet M. Johnson, Dept. of Geology and Geophysics, Woods Hole Oceanographic Institution, Woods Hole, MA 02543; (617) 548-1400, ext. 2623.

Australian Association of Exploration Geophysicists-Society of Exploration Geophysicists International Geophysical Conference and Exhibition, February 14-21, 1988, Adelaide, Australia. Information: ASEG/SEG Adelaide '88 Conference, c/o Ellisservice Convention Management, P.O. Box 753, Norwood 5067, SA, Australia; phone (08) 332-4068; Telex AA87129.

American Association of Petroleum Geologists Southwest Section, February 21-23, 1988, El Paso, Texas. Information: Robin Hoffer, Dept. of Geology, University of Texas, El Paso, TX 79968; (915) 747-5501.

Central Canada Geological Conference, February 22-23, 1988, London, Ontario. Information: Brett Norris, Dept. Geology, University of Western Ontario, London, Ontario N6A 5B7, Canada; (519) 661-3187. (Abstracts due December 1, 1987.)

***Fourth Annual V. E. McKelvey Forum on Mineral and Energy Resources: Roles of Geological Research in Assessment of Energy Resources**, March 1-2, 1988, Denver, Colorado. Information: Buhler and Abraham, Inc., 8700 First Ave., Silver Springs, MD 20910; (301) 588-4177.

***Prospectors and Developers Association of Canada 56th Annual Convention**, March 6-9, 1988, Toronto, Ontario. Information: Susan Sikala, Suite 1002, 74 Victoria St., Toronto, Ontario M5C 2A5, Canada; (416) 362-1969.

Second International Symposium on Geotechnical Applications of Ground-Penetrating Radar, March 6-10, 1988, Gainesville, Florida. Information: Gregg Schellengrager, U.S.D.A.-SCS, 701 SE First Ave. Gainesville, FL 32601; (904) 377-1092.

***Environment '88 seminar and exhibition**, March 7-8, 1988, Milwaukee, Wisconsin. Information: Federation of Environmental Technologists, P.O. Box 185, Milwaukee, WI 53201; (414) 251-8163.

American Association of Petroleum Geologists Annual Meeting, March 20-23, 1988, Houston, Texas. Information: AAPG Convention Dept., P.O. Box 979, Tulsa, OK 74101; (918) 584-2555.

Anadarko Basin Symposium, April 5-6, 1988, Norman, Oklahoma. Information: Kenneth S. Johnson, Oklahoma Geological Survey, University of Oklahoma, Norman, OK 73019; (405) 325-3031.

American Association of Petroleum Geologists Pacific Section, April 17-19, 1988, Santa Barbara, California. Information: Jack Cunningham, Celeron Oil & Gas, 111 West Micheltorena, Santa Barbara, CA 93101-3018; (805) 966-0831.

***First Catamarca International Mining Exposition and Fair**, May 7-15, 1988, Catamarca, Argentina. Information: FEMICA, Uruguay 435, 3° piso, Of. E, Buenos Aires (1015), Argentina; Telex 17808 ANCYA-AR.

V. M. Goldschmidt Conference for geochemistry, May 11-13, 1988, Baltimore, Maryland. Information: Goldschmidt Conference Coordinator, Pennsylvania State University, 410 Keller Bldg., University Park, PA 16802.

Sixth Thematic Conference on Remote Sensing for Exploration Geology, May 16-19, 1988, Houston, Texas. Information: Thematic Conference, Environmental Research Institute of Michigan, P.O. Box 8618, Ann Arbor, MI 48107; (313) 994-1200, ext. 3382 Telex 4940991 ERIMARB.

American Geophysical Union Spring Meeting, May 16-20, 1988, Baltimore, Maryland. Information: Ann E. Singer, American Geophysical Union, 2000 Florida Ave., N.W., Washington, DC 20009; (202) 462-6903.

Bicentennial Gold 88, May 16-20, 1988, Melbourne, Australia. Information: R. R. Keays, Dept. of Geology, University of Melbourne, Parkville, Victoria 3052, Australia; telephone (03) 345 1844 Telex AA35185.

Geological Association of Canada-Mineralogical Association of Canada-Canadian Society of Petroleum Geologist Joint Annual Meeting, May 22-25, 1988, St. John's, Newfoundland. Information: John Fleming, Newfoundland Dept. of Mines and

(continued on p. 29)

Meetings (continued from p. 296)

Energy, P.O. Box 4750, St. John's, Newfoundland A1C 5T7, Canada; (709) 576-2768.

Case Histories in Geotechnical Engineering 2nd International Conference, June 1-5, 1988, St. Louis, Missouri. Information: Shamsheer Prakash, Room 308, Dept. of Civil Engineering, University of Missouri, Rolla, MO 65401; (314) 341-4461.

WaterTech China '88, International exposition and congress of water technologies, June 3-8, 1988, Beijing, China. Information: Management Committee, WaterTech China '88, c/o MartLink Communications Group, GPO Box 13477, Hong Kong; phone 5-225705; Telex 72091 HX.

Second International Symposium on Rockbursts and Seismicity in Mines, June 8-10, 1988, Minneapolis, Minnesota. Information: Charles Fairhurst, Dept. Civil and Mineral Engineering, University of Minnesota, 500 Pillsbury Dr. S.E., Minneapolis, MN 55455-0220.

29th U.S. Symposium on Rock Mechanics, June 13-16, 1988, Minneapolis, Minnesota. Information: Jan Becker, Dept. Professional Development, University of Minnesota, 315 Pillsbury Dr. S.E., Minneapolis, MN 55455; (612) 626-1358.

Fourth Symposium on the Geology of the Bahamas, June 17-22, 1988, San Salvador Island, Bahamas. Information: Donald T. Gerace, CCFL Bahamian Field Station, 270 Southwest 34th St., Fort Lauderdale, FL 33315.

Shelf Sedimentation: Events and Rhythms (SEPM research conference), June 26-July 1, 1988, Santa Cruz, California. Infor-

mation: M. Field or E. Clifton, USGS, 345 Middlefield Rd., Menlo Park, CA 94025; (415) 354-3088 or 3112.

Seismic Probing of the Continents and Their Margins International Symposium, July 6-8, 1988, Canberra, Australia. Information: Jim Leven, Bureau of Mineral Resources, P.O. Box 378, Canberra, ACT 2601, Australia; telephone (062) 499111; Telex AA62109.

International Working Meeting on Soil Micromorphology (meeting of Subcommittee B of the International Society of Soil Science), July 10-15, 1988, San Antonio, Texas. Information: L. P. Wilding, Dept. of Soil and Crop Sciences, Texas A&M University, College Station, TX 77843-2474; (409) 845-3604.

First International Conference on Radiolaria, July 18-20, 1988, Marburg, Federal Republic of Germany. Information: Joyce R. Blueford, U.S. Geological Survey, MS 144, 345 Middlefield Rd., Menlo Park, CA 94025; (415) 329-4004, or R. Schmidt-Effing, InterradConference, Dept. of Geosciences, Philipps-Universität, Lahnberge, D-3550 Marburg, Federal Republic of Germany.

5th International Symposium on Fossil Cnidaria, including Archaeocyatha and spongiomorphs, July 25-29, 1987, Brisbane, Australia. Information: John Jell, Uniquet Ltd., University of Queensland, St. Lucia, QLD 4067, Australia; phone (07) 344 2733.

Permafrost 5th International Conference, August 2-5, 1988, Trondheim, Norway. Information: V International Conference on Permafrost, Norwegian Institute of Technology, Studies Administration, N-7034 Trondheim-NTH, Norway.

Fifth International Symposium on the Ordovician System, August 9-12, 1988, St. John's, Newfoundland. Information: Chris R.

(continued on p. 298)

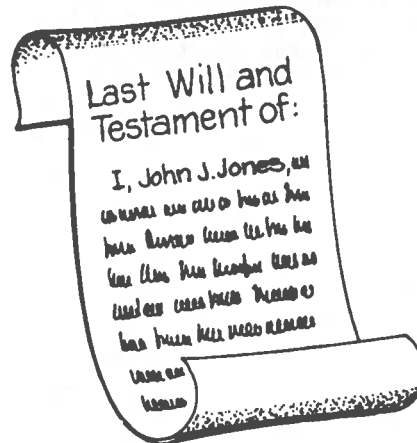
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Meetings (continued from p. 297)

Barnes, ISOS, Dept. of Earth Sciences, Memorial University, St. John's, Newfoundland A1B 3X5, Canada; (709) 737-8143.

***Paleozoic Biogeography and Paleogeography**, August 14-19, 1988, Oxford, England. Information: C. R. Scotese, Shell Development Co., P.O. Box 481, Houston, TX 77001, (713) 663-2688, or W. S. McKerrow, Dept. Earth Sciences, Parks Rd., Oxford OX1 3PR, England.

***39th Annual Highway Geology Symposium**, August 15-17, 1988, Park City, Utah. Information: Highway Geology Symposium, T. Leslie Youd, 368 Clyde Bldg., Dept. Civil Engineering, Brigham Young University, Provo UT 84602; (801) 378-6327. (Abstracts due February 1, 1988.)

American Association of Petroleum Geologists Rocky Mountain Section, August 21-24, 1988, Bismarck, North Dakota. Information: Roger N. Borchert, Box 5006, Bismarck, ND 58501; (701) 223-3588.

Society of Economic Paleontologists and Mineralogists Fifth Midyear Meeting, August 21-24, 1988, Columbus, Ohio. Information: SEPM, P.O. Box 4756, Tulsa, OK 74159-0756; (918) 743-9765.

6th International Fission Track Dating Workshop, September 5-9, 1988, Besançon, France. Information: J.-L. Janier-Dubry, Lab. de Microanalyses Nucléaires, U.F.R. des Sciences et Techniques, 16 Route de Gray, 25030 Besançon cedex, France; telephone 81.53.81.22.

International Symposium on Geochemistry and Mineralization of Proterozoic Mobile Belts, September 6-10, 1988, Beijing, China. Information: Proterozoic Geochemistry Symposium, c/o Prof. Sun Dazhong, Tianjin Inst. Geology and Mineral Resources, CAGS No. 4, 8th Rd., Dazhigu, Tianjin 300170, People's Republic of China.

***International Symposium on Rock Mechanics and Power Plants**, September 12-16, 1988, Madrid, Spain. Information: ISRM Symposium, Sociedad Española de Mecánica de las Rocas, Paseo Bajo de la Virgen del Puerto, 3, 28005 Madrid, Spain.

International Symposium on Engineering Geology: Study, Preservation and Protection of Ancient Works, Monuments and Historical Sites, September 19-23, 1988, Athens, Greece. Information: Paul G. Marinos, Greek Committee of Engineering Geology, 1988 Symposium Secretariat, P.O. Box 19140, GR-117 10 Athens, Greece; Telex 45 4312 POLX.

Fourth International Tectonostratigraphic Terrane Conference, September 23-October 7, 1988, Nanjing University, Nanjing, People's Republic of China. Information: Tom Wiley, U.S. Geological Survey, MS 999, 345 Middlefield Road, Menlo Park, CA 94025; (415) 354-3067.

***Mediterranean Basins Conference**, September 25-28, 1988, Nice, France. Information: AAPG Convention Dept., P.O. Box 979, Tulsa, OK 74101-0979; (918) 584-2555. (Abstracts due February 1, 1988.)

American Geophysical Union Fall Meeting, December 5-9, 1988, San Francisco, California. Information: Ann E. Singer, American Geophysical Union, 2000 Florida Ave., N.W., Washington, DC 20009; (202) 462-6903.

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- Northeastern Section**, March 9-12, Portland, Maine
- South-Central Section**, March 14-15, Lawrence, Kansas
- Cordilleran Section**, March 29-31, Las Vegas, Nevada
- Southeastern Section**, April 6-8, Columbia, South Carolina
- North-Central Section**, April 21-22, Akron, Ohio
- Rocky Mountain Section**, May 16-18, Sun Valley, Idaho
- Annual Meeting**, October 31-November 3, Denver, Colorado

Penrose Conferences

***Paleozoic and Early Mesozoic Paleogeographic Relations Between the Klamath Mountains, the Northern Sierra Nevada, and North America**, June 5-10, 1988, Redding, California. Information: David S. Harwood, U.S. Geological Survey, MS 975, 345 Middlefield Rd., Menlo Park, CA 94025; (415) 329-4932.

Origin of Massif Anorthosites and Related Rocks, August 14-19, 1988, Chugwater, Wyoming. Information: B. Ronald Frost, Dept. of Geology and Geophysics, University of Wyoming, Laramie, WY 82071; (307) 766-4290.

Volcanic Influences on Terrestrial Sedimentation, August 28-September 3, 1988, Crystal Mountain, Washington. Information: Gary A. Smith, Dept. of Geology, University of New Mexico, Albuquerque, NM 87131; (505) 277-4204.

***Criteria for Establishing the Relative Timing of Pluton Emplacement and Regional Deformations**, September 11-17, 1988, California. Information: Othmar T. Tobisch, Earth Science Board, University of California, Santa Cruz, CA 95064; (408) 429-2504.

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THE DEPARTMENT OF GEOLOGICAL SCIENCES AT THE UNIVERSITY OF SOUTH CAROLINA is soliciting applications for an anticipated tenure-track faculty position in Groundwater Hydrology/Modeling to begin in August 1988. Areas of related interest within the 23-member department include hydrogeology, low-temperature geochemistry, isotope geochronology, and environmental chemistry. The successful candidate is expected to develop a strong research program and teach groundwater modeling-related

graduate and undergraduate courses to complement the existing hydrogeology-low-temperature geochemistry areas of specialty.

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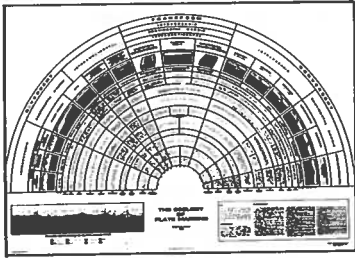


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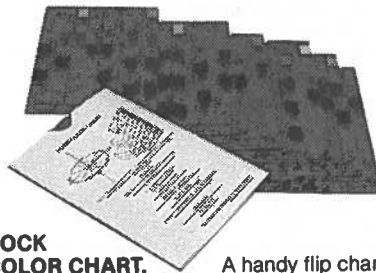
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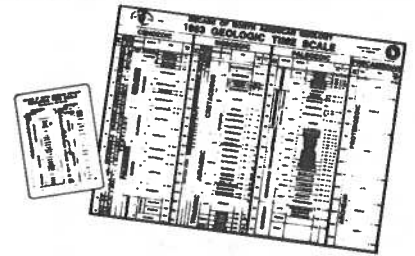
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