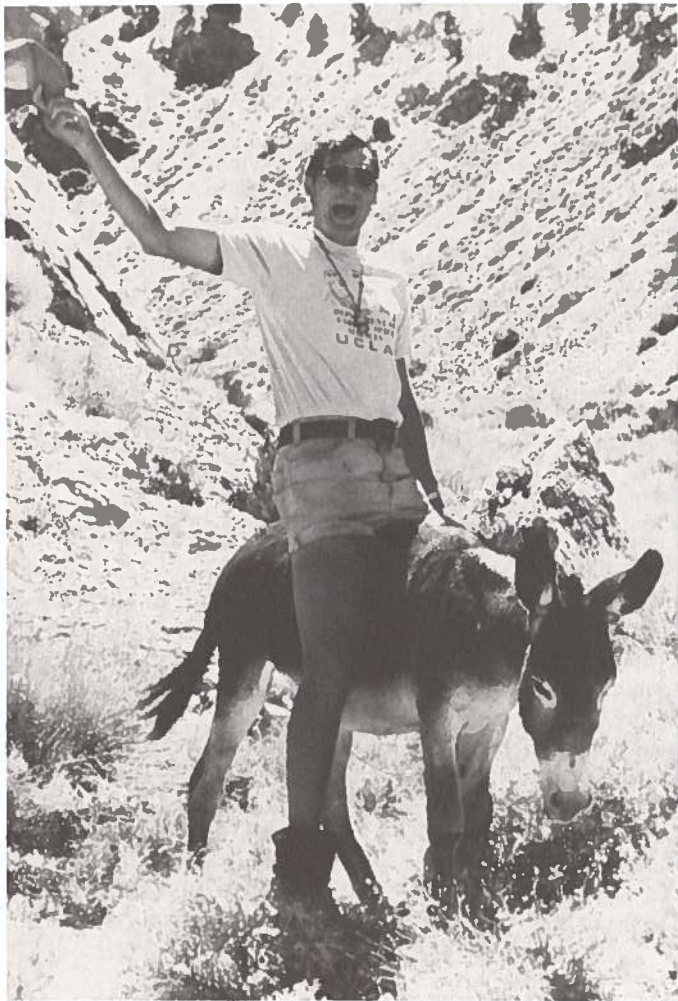


## GSA NEWS & INFORMATION

Monthly Newsletter of  
The Geological Society of America

VOLUME 8, NUMBER 10

OCTOBER 1986



### GSA Annual Meeting November 10-13, 1986 San Antonio, Texas

GSA President Gary Ernst made friends with this orphaned burro by feeding it burro health food: orange peels, apples-in-eighths, and M & M's. Our president will be on a burro once again in San Antonio. If you're on hand for the festival night called Burros and Burritos, you'll see his grand entrance.

Student registrants should take particular note of the Special Student Forum on Wednesday, November 12, 5:30 to 7:00 p.m. A first-time-ever contentious contact forum will take place in honor of student registrants.

Eugene Shoemaker and Steven Stanley will line up their differing views of "The Geological Record of the Causes and Consequences of Massive Extinctions." Annual Meeting General Chairman James O. Jones will handle the introductions, and President Ernst (this time not aboard his burro) will act as MC and referee for the great debate.

President Ernst will also have some remarkable remarks during his state-of-geology address on Monday, November 10, 5:00 to 5:30 p.m. Plan to hear his challenging address, "The Status and Future of the Earth Sciences: How Bad, How Good?"

Preregistration ends on October 10, but on-site registration opens at 10:00 a.m., Sunday, November 9, at the San Antonio Convention Center. The Welcoming Party and opening of the Technical Exposition lead off the official festivities Sunday evening, 6:00 to 9:00 p.m. For more information: GSA Meetings Department, (303) 447-2020.

---

## SEE YOU IN SAN ANTONIO

---

## GSA Centennial Celebration Subcommittee Seeks Exhibit Material

A History of GSA Exhibit is planned as part of the celebration of the 100th anniversary (1988) of the Geological Society of America.

The Centennial Celebration Committee has appointed a Special Projects Subcommittee, which is seeking items to be used for the exhibit: historical material such as photos, sketches, maps, notebooks, or old field equipment. The Subcommittee is interested especially in field-oriented and action photos and materials that relate to the Founders of GSA.

Along with mementos of the Founders of the Society, the Subcommittee members need to borrow display cabinets in which to exhibit rare books and maps. These cabinets would be used during the 1988 Annual Meeting and be returned to the donors shortly thereafter.

If you have any materials, cabinets, or suggestions about potential donors, please contact Norb Cygan, Chevron USA, P.O. Box 599, Denver, CO 80201.

Another project of the Subcommittee, under the chairmanship of William R. (Dick) Keefer, will address the history of the development of geology in North America. He wants to hear from GSA members who may have material or current presentations that relate to significant advances or events in geology. Please contact Dick Keefer at 773 S. Youngfield Court, Lakewood, CO 80228.

GSA's History of Geology Division is participating actively in the planning of these exhibits. Subcommittee chairmen and officers will be at the History of Geology Division luncheon, on

Tuesday, November 11, at the 1986 GSA Annual Meeting in San Antonio. They will also be available in the News Room on Thursday morning, November 13. If you would like to discuss arrangements for the loan of your materials, you are invited to get together with them at the Annual Meeting

## American Institute of Physics Offers Reduced Subscription Rates

The American Institute of Physics (AIP) offers reduced-rate subscriptions for its own journals to *individual* members of Affiliated Societies, of which GSA is one. This offer is limited to one subscription per person to each journal. Following is a list of AIP-owned journals showing the member rates for 1987 which are available to individuals who are members of GSA and, for reference, the nonmember rates.

	Domestic rates		Foreign rates	
	Member	Non-member	Incl. Canada & Mexico	Non-member
Applied Physics Letters	\$ 40.00	\$330.00	\$ 75.00	\$365.00
Journal of Applied Physics	80.00	580.00	140.00	640.00
Journal of Chemical Physics	100.00	935.00	175.00	1010.00
Journal of Mathematical Physics	50.00	610.00	75.00	635.00
Journal of Physical and Chemical Reference Data*	55.00	240.00	65.00	250.00
The Physics of Fluids	45.00	535.00	65.00	555.00
Physics Today	20.00	70.00	35.00	85.00
Review of Scientific Instruments	30.00	345.00	50.00	365.00
Current Physics Index	65.00	355.00	90.00	380.00
General Physics Advance Abstracts	12.00	150.00	22.00	160.00

\*Nonmember subscriptions are handled by the American Chemical Society in Columbus, Ohio.

Send subscription orders with remittances directly to the American Institute of Physics, 335 East 45th St., New York, NY 10017. Include a statement indicating that you are a member of GSA.

## November 26 is 1987 Dues Deadline

Last year, most members remitted their annual dues payment before the November 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 1987. If we do not receive your dues payment before the November 26 deadline, 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 1987 dues and publications selection form mailed to you earlier. Dues for 1987 are \$70 for Members and Fellows and \$32 for Students.

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

## Council Action on Dues and Fees

The Council of the Society, at its meeting in May, authorized an \$8.00 increase in dues for Fellows and Members, effective in 1987. The rate for Student Associates was not increased. This will be the first dues increase in three years, in keeping with current Council policy of establishing rates for three-year periods and only approving amounts that are necessary to keep pace with normal operating cost increases and expanded membership services and benefits.

Over the past three years the total number of pages in monthly publications that members receive (*Bulletin*, *Geology*, and *News & Information*) has increased at an average annual rate of 12%. The number of pages in *Geology* alone has gone from 760 to 1104, a 45% increase. The cost of these additional pages, when combined with normal increases in operating expenses over each of the past three years, has made this action necessary. The new rate represents an annualized increase of only 4.1%, and it is less than the actual expenses incurred. The balance of the total cost of these member publications, plus other member benefits such as reduced registration fees at meetings, will continue to be subsidized from Penrose Endowment Fund revenue. At the present time approximately 25% of these costs are funded from this source.

The Council has also asked that a \$10 *optional fee* for membership maintenance be requested annually from Senior Fellows and Senior Members. This fee will help defray the actual costs of maintaining records and of printing and mailing materials, including *News & Information*. Persons in these categories are exempt from payment of dues. This item appears on the Senior Fellow/Member dues statement for 1987 as an *optional payment selection* for those who wish to help defray these costs.

Vol. 8, no. 10 GSA News & Information October 1986

GSA NEWS & INFORMATION (ISSN 0164-5854) is the monthly newsletter of The Geological Society of America, Inc., P.O. Box 9140, Boulder, Colorado 80301. Second-class postage rates paid at Boulder, Colorado and additional mailing office.

Prepared from contributions from the staff and membership. Executive Director: F. Michael Wahl; Managing Editor: Faith Rogers; Associate Editor: Lee Gladish; Director of Communications: Nancy A. Reed; Production and Advertising Manager: James R. Clark; Marketing/Advertising Assistant: Ann H. Fogel; Assistant Production Manager: Meredith L. Larson; Production Assistants: Mona T. Gonzales and Joan E. Manly.

\*Advertising: Contact James R. Clark or Ann H. Fogel (303) 447-2020.



**PRELIMINARY ANNOUNCEMENT AND CALL FOR PAPERS  
NORTH-CENTRAL SECTION, GSA, 21st Annual Meeting  
St. Paul, Minnesota  
April 30-May 1, 1987**

The **North-Central Section** of the Geological Society of America, hosted by the Department of Geology and Geophysics, University of Minnesota, and by neighboring geology departments, will meet concurrently with the North-Central Section of the Paleontological Society, the Great Lakes Section of the Society of Economic Paleontologists and Mineralogists, and the National Association of Geology Teachers.

**CALL FOR PAPERS**

Papers are invited for presentation at technical and poster sessions and symposia. Fifteen minutes for presentation and five minutes for discussion will be the format for the technical sessions. A wide variety of papers of interest to geoscientists are solicited.

**SYMPOSIA**

1. **Quaternary Geology of Southeastern Minnesota.** R. Baker, (715) 425-3345; H. Hobbs.
2. **Ordovician Lithostratigraphy and Biostratigraphy.** Sponsored by the Society of Economic Paleontologists and Mineralogists. R. E. Sloan, (612) 624-1333; D. Kolata.
3. **Ordovician Radiations and Faunal Gradients.** Sponsored by the Paleontological Society. R. Anstey, (517) 355-4626.
4. **Precambrian Terrane Boundaries.** P. Hudleston, (612) 624-1333; D. Southwick.
5. **Eastern Side of the Cretaceous Seaway.** G. Shurr, (612) 255-2009; J. Van Alstine, D. Setterholm.

6. **Upper Mississippi Valley Karst: Genesis and Environmental Consequences.** E. C. Alexander, (612) 624-1333.
7. **Geology and Petrology of Layered Intrusions.** P. Weiblen, (612) 624-1333; J. Miller.
8. **The Hydrogeology of Glacial Terranes.** O. Pfannkuch, (612) 624-1333.
9. **New Horizons in Geo-Education.** Sponsored by the National Association of Geology Teachers. J. H. Shea, (414) 553-2236.

**ABSTRACTS**

Abstracts, which are limited to 250 words, must be submitted camera ready on official GSA 1987 abstract forms. One original and five copies must be submitted to R. E. Sloan (address below) on or before **December 12, 1986**. Acceptance or rejection of an abstract will be based on the abstract as submitted by the author. Contributors to symposia should submit one additional copy of their abstract to the symposium coordinator whose name above

*(continued on p. 197)*

**THE GSA SEAL  
NOW A HUSKY,  
SOLID-BRASS  
BELT BUCKLE  
FOR FIELD OR EVERYDAY WEAR**



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.

**A GREAT GIFT IDEA \$9.75**  
member discount will apply

**WEAR ONE  
ORDER YOURS TODAY!**

Check, money order (in U.S. funds), or credit cards below accepted. Credit card users must provide their full name, card name, card number, and expiration date. Colorado residents add sales tax. We pay surface postage on prepaid orders.

MasterCard \* VISA \* American Express \* CHOICE  
Carte Bleue \* Barclay Card \* Access  
EuroCard \* Standard Bank Card



GSA Publication Sales  
P.O. Box 9140  
Boulder, CO 80301 • (303) 447-2020

**THE GEOLOGICAL SOCIETY OF AMERICA**

### North-Central Section (continued)

is followed by a telephone number. Obtain abstract forms from  
R. E. Sloan or Abstracts Coordinator  
Dept. of Geology and Geophysics GSA  
University of Minnesota P.O. Box 9140  
Minneapolis, MN 55455 Boulder, CO 80301  
(612) 624-1333 (303) 447-8850

### PROJECTION EQUIPMENT

All slides must be 2" x 2" and fit a standard 35-mm carousel projector. Two projectors will be available in each meeting room. Please bring your own loaded carousel trays.

### STUDENT AWARDS

Student papers are encouraged, and awards will be made to students presenting the most outstanding papers. Student papers must be clearly identified as such and must be written exclusively by students. Prizes awarded for student papers with more than one author will be divided among the authors.

### FIELD TRIPS

Field Trip Coordinator is D. Southwick, (612) 373-3372.

#### Premeeting

1. **St. Anthony Falls Hydraulic Lab.**
2. **Middle Ordovician Stratigraphy and Paleontology of the Twin Cities.** R. E. Sloan and D. Kolata.
3. **Geomorphology and Pleistocene Glacial History of Central Minnesota.** B. Goldstein (2 days).

#### Postmeeting

4. **Middle and Late Ordovician Lithostratigraphy and Biostratigraphy of the Upper Mississippi Valley.** R. E. Sloan and D. Kolata (2 days).
5. **Cretaceous of Minnesota.** D. Shurr, J. Van Alstine, and D. Setterholm (2 days).

6. **Pleistocene of Southeastern Minnesota.** R. Baker and H. Hobbs (2 days).
7. **Structure and Precambrian Terrane Boundaries of Northern and Central Minnesota.** D. Southwick and P. Hudleston (2 days).
8. **Geology of the Beaver Bay Complex and Related Keweenaw Intrusions.** J. Miller and P. Weiblen (2 days).
9. **Geology of the Rock Elm Cryptoexplosion Structure, Pierce County, Wisconsin.** W. S. Cordua.
10. **Karst Geology of Southeastern Minnesota.** E. C. Alexander (2 days).

### SOCIAL EVENTS

A welcoming party will be held on Wednesday evening, April 29th. The Annual Banquet will be on Thursday evening, April 30th. The Society of Economic Paleontologists and Mineralogists will hold a luncheon on Thursday, April 30th, and the Paleontological Society will hold a luncheon on Friday, May 1st.

### EXHIBITS

Space will be available for educational, research, and industry exhibits. Contact W. F. Rice, (612) 624-1333.

### DETAILED INFORMATION

Information concerning registration, hotel and motel accommodations, transportation, and other activities will appear in a future issue of *GSA News & Information* and as part of *Abstracts with Programs* for 1987. Additional information, requests, or suggestions should be directed to

Peter J. Hudleston  
Dept. of Geology and Geophysics  
University of Minnesota  
Minneapolis, MN 55455  
(612) 624-1333

## ABSTRACTS ARE DUE ON DECEMBER 12, 1986

### Memorial Preprints

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

- Irving A. Breger*, by Harry J. Rose and Patrick G. Hatcher  
*Frederic Mason Chace*, by John G. Stone  
*Alfred H. Chidester*, by John A. Reinemund  
*Clifton Sherwood Corbett*, by Horace Winchell  
*Edgar S. Driver*, by Robert V. Brodine  
*Gordon Wesley "Buck" Gulmon*, by Joseph F. Fritz, Frederick F. Mellen, and Armando T. Ricci, Jr.  
*John Haller*, by James B. Thompson, Jr.  
*Daniel Kirk Hamilton*, by Neil P. Carroll  
*Thomas Andrew Hendricks*, by Paul Averitt and Irving J. Witkind  
*Robert Stevens Moehlman*, by Benjamin T. Simmons  
*John Drummond Moody*, by Arthur A. Meyerhoff and Dennis A. Holmgren  
*Fred Holmsley Moore*, by Milton Hruby  
*Dmitry Vasilievich Naliukin*, by Vasily Dmitrievich Nalivkin  
*Katherine Van Winkle Palmer*, by Kenneth E. Caster  
*Vladimir Stephen Papezik*, by Gordon A. Gross  
*William S. Pike, Jr.*, by Homer F. Simmons  
*Lowell E. Redwine*, by John C. Crowell  
*Richards A. Rowland*, by Haydn H. Murray and Walter D. Keller  
*Harrell L. Strimple*, by Thomas W. Broadhead and Terrence J. Frest

### In Memoriam

Kenneth R. Dodds  
Portland, Oregon  
February 24, 1986

Edmund D. Gill  
Victoria, Australia

William E. Humphrey  
Houston, Texas  
July 22, 1984

Wilbur G. Valentine  
Derby, Vermont  
July 17, 1986

Dirk E. Vogel  
Haverlee, Belgium  
May 18, 1986

Gordon H. Wood, Jr.  
Bethesda, Maryland  
May 22, 1986

### Notice of Council Meeting

The Council of the Society reminds you that meetings of Council are open to all Fellows, Members, and Student Associates as observers, except during executive sessions. Only councilors, officers, and section representatives may speak to agenda items, except by invitation of the chair. Because of space and seating problems, notification of attendance must be received by the Executive Director in advance of the meeting. The next meeting of the Council will be Wednesday morning, November 12, at the annual meeting in San Antonio.

# PRELIMINARY ANNOUNCEMENT AND CALL FOR PAPERS CORDILLERAN SECTION, GSA, 83rd Annual Meeting

Hilo, Hawaii

May 20-22, 1987

The Cordilleran Section of the Geological Society of America will meet at the University of Hawaii at Hilo. This meeting will be held jointly with the Paleontological Society, Pacific Coast Section.

## CALL FOR PAPERS

Technical sessions of the meeting will include the topics listed on the GSA abstract form. Papers on these topics and other subject areas are solicited. Specialized sessions may be arranged by the local program committee after review of all abstracts.

## REGISTRATION

Preregistration will be by mail. On-site registration will take place for the duration of the meeting at the university.

Preregistration fees are as follows:

- GSA Member, professional—\$40
- Non-GSA member, professional—\$55
- GSA Student Associate—\$10
- All other students—\$20

On-site registration fees:

- GSA Member, professional—\$50
- Non-GSA member, professional—\$65
- GSA Student Associate—\$15
- All other students—\$25

Please take advantage of the lower registration rates. **Preregister by April 6, 1987.**

## SYMPOSIA

1. **Adaptation and Maladaptation in the Fossil Record.** Sponsored by the Paleontological Society, Pacific Section. G. Retallack, University of Oregon.
2. **The Fourth Columbia River Basalt Symposium.** James L. Anderson, Pomona College; P. R. Hooper, Washington State University; and S. P. Reidel, Rockwell International.
3. **Cordilleran Magmatism.** J. Lawford Anderson, University of Southern California.
4. **Effective Discovery of Gold Deposits.** M. Koval, Rockwell International; and R. H. Ridler, Gerry, Mitchner, Booth and Wall, Toronto.
5. **Hawaiian Petrology.** M. Garcia, Hawaii Institute of Geophysics; and D. Clague, U.S. Geological Survey, Menlo Park.
6. **Volcanic Islands and Seamounts of the Pacific Ocean Basin.** J. N. Kellogg and G.P.L. Walker, Hawaii Institute of Geophysics.
7. **The Pacific Hot Spots: Seasat, Magnetism, and Volcanism.** R. Bostrom, University of Washington.
8. **Geological Hazards and Monitoring.** R. Tilling, U.S. Geological Survey, Reston; and B. A. Bolt, University of California, Berkeley.
9. **Earth Science Education, Society, and Technology.** R. Hazlett, University of Hawaii at Hilo.

## FIELD TRIPS (tentative)

1. **Kilauea Volcano.** C. Neal, Hawaiian Volcano Observatory.
2. **Mauna Loa Summit, Northeast Rift Zone Backpacking Excursion.** J. P. Lockwood, U.S. Geological Survey, Hawaiian Volcano Observatory.
3. **Innovative Energy Systems (including Geothermal,**

**OTEC, and Wind Energy Development), Island of Hawaii.** B. Chen, University of Hawaii at Hilo.

4. **Geology of the Island of Hawaii.** University of Hawaii at Hilo Staff.
5. **Mauna Kea Volcano, and Astronomical Complex.** University of Hawaii Staff.
6. **Geology of Maui.** J. Sinton, Hawaii Institute of Geophysics.
7. **Honolulu Volcanic Series, Island of Oahu.** M. Garcia and G.P.L. Walker, Hawaii Institute of Geophysics.

For further information on symposia and field trips, contact the convener.

## POSTER SESSIONS

Considerable space is available for poster sessions, and we strongly encourage both student and professional participation. Poster sessions are to be so identified on the abstract form.

## ABSTRACTS

GSA abstracts for oral presentations and poster sessions must be limited to 250 words and **MUST** be submitted camera-ready on official abstract forms available from

Abstracts Coordinator  
Geological Society of America  
P.O. Box 9140  
Boulder, CO 80301  
(303) 447-8850

or  
GSA Campus  
Representatives,  
all college and  
university campuses

## ABSTRACTS ARE DUE DECEMBER 29, 1986

Acceptance or rejection of an abstract will be based on the abstract as submitted by the author. Send one original and *five* copies to

GSA Abstracts  
Richard Hazlett  
Dept. of Geology/Division of Natural Sciences  
University of Hawaii at Hilo  
Hilo, HI 96720-4091

All papers in ordinary sessions will be 15 minutes long, plus 5 minutes for discussion. Each poster session presentation will be on display for one-half day.

All abstracts will be reviewed for informative content, correct structure, reliability of data, appropriate geographic coverage, and originality. Only one paper will be accepted from an author; if papers are co-authored, no more than one paper may be presented by an author. These restrictions apply to technical sessions other than invited symposia. If papers are accepted, they are expected to be presented by the designated author, **NOT** a last-minute appointee. Authors will be notified of acceptance well in advance of the meeting.

## PROJECTION EQUIPMENT

Projectors for standard 2" x 2" slides will be provided in each meeting room. In addition, a *more limited* number of overhead

(continued on p. 199)

### **Cordilleran Section** (continued)

projection units will be available for informal and postpresentation discussions. Note: Speakers are expected to bring their own preloaded slide carousels.

### **BUSINESS MEETING**

The Cordilleran Section will hold its business meeting luncheon at the University of Hawaii at Hilo, at a time and place to be announced.

### **EXHIBITS**

Exhibits of educational and commercial organizations will be on display at the university. Exhibit space must be reserved by April 6, 1987. Contact Joseph Halbig, (808) 961-9383, for further information.

### **SUPPORT FOR STUDENTS**

Funds are available to assist GSA Student Associates planning to travel to Hawaii to present a paper at this meeting. For information, contact

Bruce Blackerby  
GSA Student Support  
Dept. of Geology  
California State University  
Fresno, CA 93740

### **SOCIAL ACTIVITIES**

A reception for all participants will be held on the evening of Tuesday, May 19, 1987, at the Naniloa Surf Hotel, Banyan Drive, in Hilo. In addition, an International Night luau will be held on Thursday evening, May 21, at the same location. The Naniloa Surf will also offer a guest activities program. For participants

housed on campus, some sports facilities may be available for recreation (e.g., volleyball, basketball). Campus meal plans will be available to all participants for the duration of the meeting.

### **HOUSING**

Two hotels have been contracted to accommodate participants: the Naniloa Surf and the Hilo Hukilau, within an easy walk of one another and about a ten-minute drive from campus. (A bus shuttle service will be provided.) Accommodations are also available in University of Hawaii at Hilo campus suites and student dormitories. Campus housing will be let on a student-priority basis but will be open to all participants.

### **ERUPTIVE ACTIVITY**

Should a volcanic eruption occur during the meeting, an evening shuttle-bus service will be provided to participants interested in viewing the volcano, depending on conditions of visibility.

### **CHARTER FLIGHTS**

Charter flight service is being arranged for this meeting. Information will be provided with housing forms in a future issue of *GSA News & Information*.

### **FURTHER INFORMATION**

The above symposia and field trips are tentative; further suggestions are always appreciated. Inquiries, additional information, requests, or suggestions should be directed to

Joseph Halbig or Richard Hazlett, General Chairmen  
Dept. of Geology/Division of Natural Sciences  
University of Hawaii at Hilo  
Hilo, HI 96720-4091  
(808) 961-9383

## **PRELIMINARY ANNOUNCEMENT AND CALL FOR PAPERS ROCKY MOUNTAIN SECTION, GSA, 40th Annual Meeting Boulder, Colorado May 2-4, 1987**

The **Rocky Mountain Section** of the Geological Society of America will meet Saturday, Sunday, and Monday, May 2 through May 4, 1987, at the University of Colorado, Boulder, Colorado. The meeting is sponsored by the Department of Geological Sciences, University of Colorado.

### **CALL FOR PAPERS**

The technical program will consist of oral sessions, poster sessions, and symposia. Format for the oral sessions will be 15 minutes for presentation and 5 minutes for discussion. Each poster presentation will be on display for one-half day. Symposia will be conducted by invited speakers; titles and conveners are listed below.

### **SYMPOSIA**

1. **Dawn of the Age of Mammals in the Northern Rocky Mountain Region.** Thomas M. Brown, U.S. Geological Survey, Branch of Paleontology and Stratigraphy, M.S. 919, Box 25046, Federal Center, Denver, CO 80225, (303) 236-5665, and Kenneth D. Rose.
2. **Cenozoic Volcanism in and around Colorado.** Edwin E. Larson, Dept. of Geological Sciences, University of Colorado, Boulder, CO 80309-0250, (303) 492-6172, and John W. Drexler.

3. **Nonmarine Depositional Systems and Paleobiotas: Advances in Paleoenvironmental Synthesis.** Emmett Evanoff, Dept. of Geological Sciences, University of Colorado, Boulder, CO 80309-0250, (303) 492-8069, and Steven C. Good.
4. **Engineering Geological and Hydrological Problems in Mountainous Terrain.** A. Keith Turner, Dept. of Geology, Colorado School of Mines, Golden, CO 80401, (303) 273-3802, and Kenneth E. Kolm.
5. **Cretaceous Event Stratigraphy; Western Interior Basin.** Erle G. Kauffman, Dept. of Geological Sciences, University of Colorado, Boulder, CO 80309-0250, (303) 492-6629, Bradley B. Sageman, and James I. Kirkland.
6. **Rocky Mountain Tectonics.** Thomas L. Davis, Dept. of Geophysics, Colorado School of Mines, Golden, CO 80401, (303) 273-3938, and Thomas L.T. Grose.
7. **Volcanism and Fossil Biotas: Implications for Preservation, Evolution and Extinction.** Martin G. Lockley, Dept.

(continued on p. 200)

**Rocky Mountain Section** (continued from p. 199)

of Geology, University of Colorado at Denver, 1100 14th St., Denver, CO 80202, (303) 556-2688, Robert H. Chesson, and Alan Rice.

**ABSTRACTS**

Those who plan to submit abstracts are urged to read Ivo Lucchitta's article "A Program Chairman's Lament," in the June 1986 issue of *GSA News & Information*. It will make understandable the conditions that must be met to have an abstract accepted for the 1987 program. The conditions are these: (1) Abstracts must appear on official 1987 GSA Abstract Forms. Abstracts using pre-1987 forms, or photocopied forms, or forms with altered numbers will be rejected. (2) Abstract forms must be filled out properly and completely, following the instructions that accompany the forms. The host organization will not retype abstracts. (3) Abstracts should be informative and readable, and deal with topics that are interesting and relevant to geoscientists in the Rocky Mountain region. (4) An individual may be author or co-author of more than one abstract, but he/she may present only one volunteered paper. (This restriction does not apply to symposia for which participants have been invited.) (5) **The abstract deadline is December 5, 1986.** Abstracts that are postmarked later than December 5 will be rejected.

Abstract forms and instructions may be obtained from  
Abstracts Coordinator or GSA Campus  
Geological Society of America Representatives,  
P.O. Box 9140 all college and  
Boulder, CO 80301 university campuses  
(303) 447-8850

Submit one camera-ready original and 5 copies of your abstract, *unfolded*, to one of two places: (1) If you are a symposium participant, send the abstract to the appropriate convener (listed above). (2) If you are volunteering an abstract for an oral or a poster session, send it to either of the Program Co-Chairmen  
William C. Bradley or Edwin E. Larson  
Dept. of Geological Sciences Dept. of Geological Sciences  
University of Colorado University of Colorado  
Boulder, CO 80309-0250 Boulder, CO 80309-0250  
(303) 492-6188 (303) 492-6172

**PROJECTION EQUIPMENT**

Equipment will be provided for 2" x 2" slides and single projectors only. *Please bring your own loaded carousel trays.*

**FIELD TRIPS**

One- and two-day field trips in Colorado will precede and follow the technical program. Field Trip Chairman is William W. Atkinson  
Dept. of Geological Sciences  
University of Colorado  
Boulder, CO 80309-0250  
(303) 492-6103

**SPECIAL EVENTS**

A Welcoming Party will be held Friday evening, May 1. The annual banquet will be Saturday evening, May 2.

**EXHIBITS**

Space will be available for educational, research, and industry exhibits. Contact Peter W. Birkeland, Dept. of Geological Sciences, University of Colorado, Boulder, CO 80309-0250; (303) 492-6985.

**DETAILED INFORMATION**

Information concerning registration, accommodations, and other activities will appear in *GSA News & Information* and as part of *Abstracts with Programs* for 1987.

Inquiries, additional information, requests, or suggestions should be directed to  
Mary J. Kraus  
General Chairman GSA  
Dept. of Geological Sciences  
University of Colorado  
Boulder, CO 80309-0250  
(303) 492-7251

**ABSTRACTS ARE DUE DECEMBER 5, 1986**

*GSA Co-sponsors Groundwater Contamination Workshop*

GSA is one of the co-sponsors of "Perspectives on the Contamination of Groundwater from Agriculture," a workshop sponsored by the Soil Science Society of America. The workshop will be held in New Orleans, Louisiana, December 5 and 6, 1986. Cost for preregistration (before October 24) is \$75. On-site registration will be \$85. For information, contact Keith R. Schlesinger, Soil Science Society of America, 677 South Segoe Rd., Madison, WI 53711; (608) 274-1212.

**1987 ABSTRACT FORM REQUEST**

To: GSA Abstracts Coordinator  
P.O. Box 9140  
Boulder, CO 80101

Please send \_\_\_\_\_ copies of the 1987 GSA abstract form. I understand that the same form may be used for all 1987 GSA meetings—the six Sections Meetings and the Annual Meeting.

Name \_\_\_\_\_

Organization \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

\_\_\_\_\_ Please check here if you have NOT been receiving mailings about GSA's publication sales but would like to be added to our mailing list.



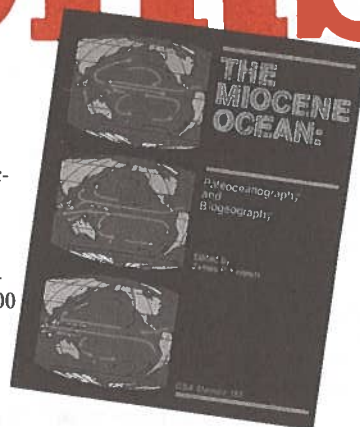
# GSA MEMOIRS

**The Miocene Ocean: Paleogeography and Biogeography**  
 edited by James P. Kennett, 1985

**NEW**

The book covers paleogeography and paleodepth of the Miocene ocean; stratigraphy; stable isotopic history of the Pacific and Indian Oceans; benthic foraminiferal distributions in relation to bottom and intermediate water structure and history; surface-water biogeography of planktonic foraminifers and radiolaria in relation to paleoceanographic history; and paleoceanographic studies of the Atlantic Ocean.

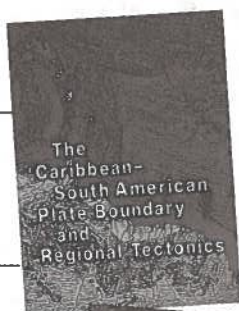
Memoir 163, 343 p., + 17" x 22" insert in rear pocket + 3 98-frame microfiche cards in rear pocket, ISBN 0-8137-1163-0, CIP, hardbound . . . . . \$42.00



**The Caribbean-South American Plate Boundary and Regional Tectonics**  
 edited by William E. Bonini, Robert B. Hargraves, and Reginald Shagam, 1984

The diversity of the subject matter covered by the 28 papers in this volume is a reflection of the complexity of the debates which continue on the evolution of the Caribbean plate and its borderlands. Some authors postulate a distant Pacific source for Caribbean crust. Others consider the geometry, timing, and effects of collision, and the subsequent phases of obduction over the craton. Still others view the process of evolution from the vantage point of the craton.

Memoir 162, 432 p., + 4 pocket plates, ISBN 0-8137-1162-2, CIP, hardbound . . . . . \$47.50



*"One of the most valuable publications in regional tectonics to appear in a long time. . . ."* AAPG Bulletin

*"... an important addition to the geologic literature pertaining to Proterozoic rocks of the Great Lakes Region."* Journal of Geological Education

**Early Proterozoic Geology of the Great Lakes Region**  
 edited by L. G. Medaris, Jr., 1983

The first two papers in this volume provide an overview of the Penokean orogeny. The next five papers present more restricted topical or areal views of the period. The final two papers discuss two post-Penokean, early Proterozoic events in the region—the 1780-Ma felsic magmatism in south central Wisconsin and the deposition and significance of red quartzites in Wisconsin and Minnesota.

Memoir 160, 148 p., ISBN 0-8137-1160-6, CIP, hardbound . . . \$28.00

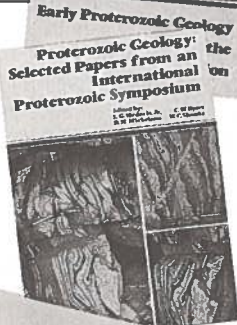


*"If you have begun to think (or teach) that we have figured out the changes in tectonic style through earth history, please read this book. Better yet, assign it to your upper level students. . . ."* Journal of Geological Education

**Proterozoic Geology: Selected Papers from an International Proterozoic Symposium**  
 edited by L. G. Medaris, Jr., C. W. Byers, D. M. Michelson, and W. C. Shanks, 1983

Twenty-three papers cover Proterozoic tectonics, magmatism and metamorphism, mineral deposits, life and the oceans, and glaciation.

Memoir 161, 324 p., ISBN 0-8137-1161-4, CIP, hardbound . . . . . \$49.00

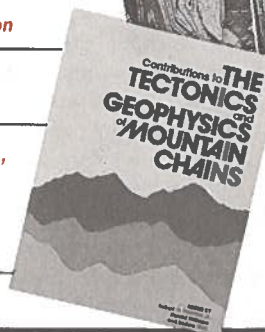


*"... a wealth of information, both in detailed text and accompanying diagrams and maps."* Geophysics

**Contributions to the Tectonics and Geophysics of Mountain Chains**  
 edited by Robert D. Hatcher, Jr., Harold Williams, and Isidore Zietz, 1983

Subjects covered include regional geology and tectonics of the Appalachian orogen; comparisons with the Caledonides, Mauritanides, Alps, and the North American Cordillera; and the application of the mechanical principles to the solution of structural problems; and the utilization of the technique of reflection seismology, as well as data from aeromagnetic and gravity studies, to interpret large-scale problems in the tectonics of mountain chains.

Memoir 158, 228 p., + 12 pocket plates, ISBN 0-8137-1158-4, CIP, hardbound . . . . . \$42.50



Check, money order (in U.S. funds), or credit cards below accepted. Credit card users must provide their full name, card number, and expiration date. Colorado residents add sales tax. We pay surface postage on prepaid orders. MasterCard, VISA, American Express, CHOICE, Diners Club, Carte Bleue, Barclay Card, Access, EuroCard, Standard Bank Card



Order today from:  
 GSA Publication Sales  
 PO Box 9140  
 Boulder, CO 80301  
 (303) 447-2020  
 toll free-outside Colorado 1-800-GSA-1988

**THE GEOLOGICAL SOCIETY OF AMERICA**

## Three More Penrose Conferences Set for 1987

### Late Quaternary Sea Level

A GSA Penrose Conference, "Late Quaternary Sea Level: The Marine and Terrestrial Record," will be held April 6–12, 1987, at the Bermuda Biological Station for Research, Ferry Reach, 1–15 Bermuda. Conveners are James L. Carew, Department of Geology, College of Charleston, Charleston, SC 29424; John E. Mylroie, Department of Geology and Geography, Mississippi State University, Box 2194, Mississippi State, MS 39762; Mark Boardman, Department of Geology, Miami University, Oxford, OH 45056; and John F. Wehmiller, Department of Geology, University of Delaware, Newark, DE 19716.

Among geologists, significant eustatic change in sea level is a universally accepted hallmark of the Quaternary, and a variety of methodologies have been used to glean information about past Quaternary sea-level positions. Some of those involve direct assessment of the geologic record of the facies tied to sea level, or glacial ice sheet position. Others are indirect interpretation of sea level from aspects of geologic deposits, such as foraminifera ratios and oxygen isotopes. Despite the increasing amount and sophistication of data relevant to this subject, controversy concerning the number, duration, timing, and magnitude of sea-level fluctuations during the past 200,000 yr has grown. Of particular interest are questions involving the number and duration of the Sangamon high stands, and the number, timing, and magnitude of post-Sangamon high stands. The results of workers in different fields are often in apparent conflict concerning those questions.

The purpose of this conference is to bring together researchers who are active in the subdisciplines that are yielding data relevant to this debate. Some of these areas are: amino acid stratigraphy, coral reef investigations, oxygen isotope research, speleology, glacial stratigraphy and sedimentology, and shallow and deep marine sedimentology and paleontology. The conveners believe that discussion and comparison of data among such a wide range of researchers, who are all gathering data about late Quaternary sea level, will lead to greater understanding among specialists who seldom communicate with one another. This should lead to refinement of our knowledge of the fluctuations of late Quaternary sea level, understanding the constraints that the data of various investigators place on the interpretation of others, and suggestions for methods or avenues of attack that might yield data to resolve apparent conflicts.

The conference is being held in Bermuda because it provides an excellent opportunity to examine a variety of features that yield data on late Quaternary sea level. Coral reefs and reef facies that are clearly tied to sea-level position, and subterranean solution conduits and their contained deposits that are also tied to sea level via the position of the freshwater lens, are abundant and well researched. Additionally, the geology of Bermuda is being studied extensively, and those doing the work will be there to share their knowledge. A half-day field trip to visit coral reef sites and a half-day trip for investigation of the information contained in caves of Bermuda are planned. A full-day trip to see the geology of Bermuda, bearing on the topic of the conference, will be led by researchers who have recently conducted their studies.

To maximize interactions of disciplines and individuals, the conference will include oral presentations to the entire group and ample time devoted to discussion. Smaller discussion groups or working groups will be organized as appropriate. The setting of the Bermuda Biological Station and the variety of activities planned should be conducive to a productive and enjoyable week.

Prospective participants should send a letter of application

stating (1) their experience in the topic, and (2) the manner in which they expect to contribute (e.g., presenting a paper) to James L. Carew, Department of Geology, College of Charleston, Charleston, SC 29424.

Applications are due not later than **January 15, 1987**. The registration fee, including meals, lodging, and field trips, is expected to be approximately \$550. Limited support will be available for a few graduate students whose work is pertinent to the subject of the conference. Limited support is also being sought to defray travel costs for foreign and distant U.S. participants.

### Glacial Facies Models

A GSA Penrose Conference, "Glacial Facies Models," will be held May 3–8, 1987, in Ontario, Canada. The conference is cosponsored by the Geological Survey of Canada and the Geological Association of Canada. Conveners are Nicholas Eyles, Department of Geology, Scarborough Campus, University of Toronto, Scarborough, Ontario M1C 1A4, Canada; Carolyn H. Eyles, Department of Geology, McMaster University, Hamilton, Ontario L8S 4M1, Canada; and Andrew D. Miall, Department of Geology, St. George Campus, University of Toronto, Toronto, Ontario M5S 1A1, Canada.

"Glacial Facies Models" will be convened in order to explore and discuss summary models describing the lithofacies sequences deposited in glacial and glacially influenced sedimentary environments and to establish criteria and procedures to aid in their recognition in the rock record both in outcrop and in the subsurface. Traditional glacial studies, largely emphasizing two-dimensional stratigraphic investigations, are being superseded by increasingly sophisticated assessments of glacial lithofacies sequences and their three-dimensional distribution, on a variety of scales, across glaciated basins. There is increasing recognition that because of selective preservation, glacial rocks are dominated by facies deposited in large lakes and in continental margin settings. The establishment of models portraying sedimentation patterns is a particular challenge to sedimentologists because most "glacial" sedimentary sequences include the deposits of a wide range of environments (e.g., rivers, lakes, seas) where a glacial influence is superimposed on an ambient depositional system. Identifying the nature of this signature is central to glacial facies modeling.

The conference will not be over-structured, typically taking the form of two formal sessions per day involving concise and innovative keynote presentations followed by formal discussions. Participants are encouraged to present poster displays of ongoing research; these will be on display throughout the conference. The main issues to be addressed relate to the physical nature of glacial and glacially influenced environments and the resultant sedimentary facies. The conference thus provides a unique opportunity for "process"-oriented workers to converse with those dealing with "products."

To maximize interaction and individual experience, the conference will include local field excursions to classic late Pleistocene glacial sequences exposed along the north shore of Lake Ontario near Toronto. These will afford opportunity for valuable "on the outcrop" discussions and to explore the process whereby abstract facies models are developed from real field situations.

The conference will be limited to 50–60 participants who are actively contributing to the development of facies studies in

(continued on p. 203)

**Penrose Conferences** (continued)

glaciated basins. Interested persons should write N. Eyles at the above address, stating reasons for wishing to attend the conference. Include a brief description of ongoing research and recent publications relevant to the conference topic.

We hope to have available limited support for a few qualified graduate students. The registration fee, including food, lodging, and local travel, will be about \$500. Applications must reach Toronto by **December 15, 1986**.

**Paleoenvironment Interpretation of Paleosols**

A GSA Penrose Conference, "Paleoenvironmental Interpretation of Paleosols," will be held September 11-17, 1987, at the Kah-nee-ta Resort on the Warm Springs Indian Reservation, central Oregon. Conveners are Greg Retallack, Department of Geology, and Patricia McDowell, Department of Geography, University of Oregon, Eugene, OR 97403-1272.

Although fossil soils (paleosols) were recognized as early as 1795 along major unconformities in southeastern Scotland by James Hutton, they have remained little studied because of the subsequently divergent aims and methods of soil and geological sciences. Soil science arose with and has maintained agricultural and political aims, with little attention to soils buried in the rock record. Historical geological sciences have been concerned with the origin of rocks and of fossils and reconstructing a history of Earth. An emphasis on sedimentation and on marine rocks has meant that little attention has been paid to buried soils as evidence of past landscapes. For a variety of reasons this schism between disciplines is now being bridged, and considerable interest in paleosols is arising in both camps. The study of Quaternary soils provides an important body of data on how soils form, and this information is critical for interpreting buried soils. On the other hand, the record of paleosols in the rock record provides a long-term natural experiment with varying factors of soil formation which is important to ideas of both pedogenesis and Earth history.

In this conference, we aim to bring together leading exponents of both geological and pedological approaches to the study of paleosols. Scientists interested in paleosols have very divergent aims, experience, and backgrounds. The time is ripe for us to get together and compare notes.

Formal presentations will be limited to about half the available time and will be organized around the five main soil-forming factors of Hans Jenny: climate, organisms, topographic relief, parent material, and time. For each factor a team of three speakers with expertise in Quaternary and modern soils will be balanced by a team of speakers familiar with pre-Quaternary paleosols. It is hoped that in the ensuing discussions participants will gain a feeling for the limitations and potential of paleosols for interpreting these aspects of paleoenvironments. Participants also will have a choice of small informal discussion groups on more practical matters: recognizing, mapping and naming, taxonomy, and study techniques for paleosols and modeling soil formation. A summary of these discussions will be presented to the group as a whole for further comment. Individual posters also are encouraged.

Location of the conference in the unspoiled high desert of the Warm Springs Indian Reservation, east of the Cascade crest, is convenient for field trips. The first trip, originating in Eugene, Oregon, early on September 12, will be devoted to modern soils and geomorphology of the Willamette Valley, followed by an evening drive through the northern Cascades to the conference center. The second trip, during the conference, will explore mid-Tertiary paleosols in the scenic John Day country of north-central Oregon. A late-afternoon drive back to Eugene will include stops to view the High Cascades.

Prospective participants should send a curriculum vitae and a letter outlining their special area of interest to G. J. Retallack, Department of Geology, University of Oregon, Eugene, OR 97403. The registration fee, including food, lodging, and field trips, is expected to be approximately \$500. Limited support is anticipated for graduate students and for travel expenses of invited speakers from overseas.

---

## Application for participation in a Penrose Conference

Title of Penrose Conference \_\_\_\_\_

Your name and title \_\_\_\_\_

Organization \_\_\_\_\_

Mailing address \_\_\_\_\_

Street or P.O. Box

City and State

Zip Code

Telephone number \_\_\_\_\_

Area Code

Number

Field of interest \_\_\_\_\_

Please state briefly what your interest and experience have been with regard to the conference topic.

# MEETINGS

(Asterisk indicates new or changed information)

1986

**American Association of Petroleum Geologists Eastern Section**, October 2-4, 1986, Ann Arbor, Michigan. Information: Paul A. Catacosinos, Dept. of Geology, Delta College, University Center, MI 48710; (517) 686-9252.

**Association of Engineering Geologists 29th Annual Meeting**, October 5-9, 1986, San Francisco, California. Information: Alan D. Tryhorn, 1986 AEG Annual Meeting, GeoResource Consultants, Inc., 851 Harrison St., San Francisco, CA 94107; (415) 777-3177.

**Symposium on Water Problems of National Concern**, October 16-17, 1986, Washington, D.C. Information: Helen Klose, American Institute of Hydrology, P.O. Box 14251, St. Paul, MN 55114; (612) 379-1030.

**New Mexico Geological Society Fall Field Conference**, October 16-18, 1986, Truth or Consequences, New Mexico. Information: Russ Clemons, New Mexico State University, Las Cruces, NM 88003; (505) 646-2708.

**Kansas Geological Society 38th Annual Field Conference**, October 17-18, 1986. Information: D. F. Merriam, Dept. of Geology, Wichita State University, Wichita, KS 67208; (316) 689-3140.

**Cretaceous-Tertiary Boundary Mass Extinctions Conference**, October 18, 1986, Laporte, Indiana. Information: Sherman P. Kanagy II, Purdue University North Central, I-80 and 421 S, Westville, IN 46391; (219) 785-2541, ext. 254.

**American Association of Stratigraphic Palynologists Annual Meeting** (with Congrès Internationale du Microflore Paléozoïque), October 29-31, 1986, New York, New York. Information: Dan Habib, Graduate School of City University of New York, 33 West 42nd St., New York, New York 10036; (212) 790-4218.

**Society of Economic Paleontologists and Mineralogists Mid-Continent Section Annual Field Conference**, October 30-November 1, 1986, Ponca City, Oklahoma. Information: William A. Morgan, Conoco, Inc., 1000 S. Pine, Ponca City, OK 74603; (405) 767-2853.

**17th Annual Underwater Mining Institute**, November 2-5, 1986, Biloxi, Mississippi. Information: Underwater Mining Institute, University of Wisconsin Sea Grant Institute, 1800 University Ave., Madison, WI 53705.

**International Conference on Coastal Engineering**, November 9-14, 1986, Taipei, Taiwan. Information: Billy L. Edge, Cubit Engineering Limited, 207 East Bay St., Suite 311, Charleston, SC 29401.

**Geological Society of America Annual Meeting**, November 10-13, 1986, San Antonio, Texas. Information: Meetings Dept., GSA, P.O. Box 9140, Boulder, CO 80301; (303) 447-2020.

\***Society of Economic Paleontologists and Mineralogists Gulf Coast Section 7th Annual Research Conference**, Shelf Sedimentation, Shelf Sequences, and Related Hydrocarbon Accumulation, December 7-10, Corpus Christi, Texas. Information: Susan Conger Morris, 1422 Hornbrook Dr., Houston, TX 77099; (713) 495-6071.

\***American Geophysical Union Fall Meeting**, December 8-12, San Francisco, California. Information: American Geophysical Union, 2000 Florida Ave., N.W., Washington, DC 20009.

**National Symposium on Surface Mining, Hydrology, Sedimentology, and Reclamation**, December 8-12, 1986, Lexington, Kentucky. Information: Donald H. Graves, T.P. Cooper Building, University of Kentucky, Lexington, KY 40546-0073; (606) 257-2906.

**International Society for Reef Studies Annual Meeting**, December 12-14, 1986, Marburg, West Germany. Information: Heinrich L. Zankl, Dept. of Geology, Inst. für Geologie und Palaontologie, Lahnberg, D-3550, Marburg, West Germany.

**GSA 1986**

**Annual Meeting**, November 10-13, 1986, San Antonio, Texas

**Penrose Conferences**

**Synsedimentary Tectonics**, September 7-12, 1986, Durango, Colorado. Information: William A. Thomas, Dept. of Geology, University of Alabama, University, AL 35486; (205) 348-1880.

**Laramide Beneath the Prairies**, October 13-17, 1986, Rapid City, South Dakota. Information: Alvis L. Lisenbee, Dept. of Geological Engineering, South Dakota School of Mines, Rapid City, SD 57701; (605) 394-2463 or 2461.

**Archaeological Geology: Environmental Siting and Material Usage**, December 6-11, 1986, Saint Simons Island, Georgia. Information: Charles J. Vitaliano, Dept. Geology, Indiana University, 1005 East Tenth Street, Bloomington, IN 47405; (812) 335-1407.

1987

\***American Current Research on Fluid Inclusion**, January 5-7, 1987, Socorro, New Mexico. Information: David I. Norman, Dept. of Geoscience, New Mexico Institute of Mining and Technology, Socorro, NM 87801; (505) 835-5404.

**Palaeoenvironment of East Asia—2nd International Conference**, January 9-14, 1987, Hong Kong. Information: E.K.Y. Chen, Centre of Asian Studies, University of Hong Kong, Hong Kong.

**Hawaii Symposium on How Volcanoes Work**, January 19-23, 1987, Hilo, Hawaii. Information: Robert Decker, U.S. Geological Survey, MS 910, 345 Middlefield Rd., Menlo Park, CA 94025.

**International Symposium on Granites and Associated Mineralizations**, January 21-31, 1987, Salvador, Brazil. Information: Augusto J. Pedreira, ISGAM, SME-CPM, Rua Ceara, 3-Pituba, 40.000, Salvador, Bahia, Brazil.

**Canadian Reef Research Symposium**, January 27-30, 1987, Banff, Alberta, Canada. Information: Canadian Reef Research Symposium, University of Calgary, Conference Office, 2500 University Dr. N.W., Calgary, Alberta T2N 1N4, Canada.

**Sinkholes and the Environmental Impacts of Karst—2nd Multidisciplinary Conference**, February 9-11, 1987, Orlando, Florida. Information: Barry F. Beck, College of Engineering, University of Central Florida, Orlando, FL 32816.

\***Energy-sources Technology Conference**, February 15-19, 1987, Dallas, Texas. Information: American Society of Mechanical Engineers, Meetings Dept., 345 E. 47th St., New York, NY 10017; (212) 705-7057.

(continued on p. 205)

**Meetings** (continued)

**\*Prospectors and Developers Association of Canada 55th Annual Convention**, March 8–11, 1987, Toronto, Ontario. Information: Susan Sikala, Prospectors and Developers Association, Suite 420, 74 Victoria St., Toronto, Ontario M5C 2A5, Canada: (416) 362-1969.

**18th Annual Lunar and Planetary Science Conference**, March 16–20, 1987, Houston, Texas. Information: Pamela Jones, 3303 NASA Rd. 1, Houston, TX 77058; (713) 486-2150.

**7th Biannual Petroleum Conference of Turkey**, April 6–10, 1987, Ankara, Turkey. Information: Necdet Pamir Türkiye Petrolleri A.O. Üretim Grubu Müdafaa Cad. No: 22 Bakanlıklar, Ankara, Turkey; telephone 17 91 60/453-553.

**Phanerozoic Ironstones and Related Deposits**, April 7–8, 1987, Sheffield, England. Information: Gordon Taylor, Dept. of Science, Luton CHE, Park Square, Luton LU1 3JU, England.

**\*Mathematical Geologists of the United States 1987 Conference**, Emerging Concepts, April 13–15, 1987, Redwood City, California. Information: Harry M. Parker, Fluor Engineering, Inc., 10 Twin Dolphin Dr., Redwood City, CA 94065.

**Analysis of Naturally Fractured Reservoirs**, May 4–8, 1987, Snowbird, Utah. Information: Jane Rider, AAPG Education Dept., P.O. Box 979, Tulsa, OK 74101-0979; (918) 584-2555.

**Coastal Sediments '87**, May 12–14, 1987, New Orleans, Louisiana. Information: Nicholas C. Kraus, USAE Waterways Experiment Station, Coastal Engineering Research Center, P.O. Box 631, Attn. WESCR-P, Vicksburg, MS 39180-0631.

**Coastal Lowlands Symposium: Geology and Geotechnology**, May 25–27, 1987, The Hague, Netherlands. Information: Coastal Lowlands Symposium, c/o CONGREX, Keizersgracht 610, 1017 EP Amsterdam, The Netherlands; Telex NL-14527.

**Geological Association of Canada—Mineralogical Association of Canada Annual Meeting**, May 25–27, 1987, Saskatoon, Saskatchewan. Information: W. O. Kupsch, Dept. of Geological Sciences, University of Saskatchewan, Saskatoon, Saskatchewan S7N 0W0, Canada; (306) 966-5696.

**\*28th U.S. Symposium on Rock Mechanics**, June 29–July 1, 1987, Tucson, Arizona. Information: 28th U.S. Symposium on Rock Mechanics, Special Professional Education, Box 9, Harvill Bldg., University of Arizona, Tucson, AZ 85721; (602) 621-5104 or 3054. (Abstracts due October 20, 1986).

**Second Symposium on the South Atlantic Evolution**, July 23–25, 1987, Rio de Janeiro, Brazil. Information: Dimas Dias-Brito, PETROBRAS/CENPES, Ilha do Fundão, Quadra 7, Rio de Janeiro - 21.910 - Brazil; and P. Y. Berthou, Laboratoire de Géologie des Bassins Sédimentaires, Tour 14-15 4eme ETAGE 4, Place Jussieu, 75252 Paris, Cedex 05, France.

**4th International Congress of the Regional Committee on Pacific Neogene Stratigraphy** (affiliated with IUGS) and joint meeting of **IGCP Project 246**, July 29–31, 1987, Berkeley, California. Information: Charlotte Brunner, Chairperson of Organizing Committee, Dept. of Paleontology, University of California, Berkeley, CA 94720.

**International Symposium on Erosion and Sedimentation in the Pacific Rim**, August 3–7, 1987, Corvallis, Oregon. Information: 1987 Corvallis Symposium, Conference Coordinator, College of Forestry, Oregon State University, Corvallis, OR 97331; (503) 754-2004.

**XVI Pacific Science Congress**, August 20–30, 1987, Seoul, Korea. Information: Choon Ho Park, XVI Pacific Science Congress, K.P.O. Box 10110, Korea; telephone (2) 733-4478; Telex ILSKOR 23881. (Abstracts due December 31, 1986.)

**International Congress on Geology, Structure, Mineralization, and Economics of the Pacific Rim**, August 26–29, 1987, Queensland, Australia. Information: C/-Aus. IMM Congress Secretariat, P.O. Box 731, Toowong 4066, Queensland, Australia.

**Sixth International Congress on Rock Mechanics**, August 31–September 3, 1987, Montreal, Quebec, Canada. Information: J. Franklin, Dept. of Earth Sciences, University of Waterloo, Waterloo, Ontario N2L 3G1, Canada.

**XI International Congress of Carboniferous Stratigraphy and Geology**, September 7–11, 1987, Beijing, China. Information: Yang Jingzhi, Nanjing Institute of Geology and Paleontology, Academia Sinica, Nanjing, China.

**\*International Workshop on Computerized Basin Analysis**, September 7–12, 1987, Szeged, Hungary. Information: Laszlo Somos, Geological Survey of Hungary, Pf. 106, H-1442, Budapest, Hungary; telephone (36-1) 634 431; Telex 225 220 mafi h.

**Society of Economic Paleontologists and Mineralogists Fourth Annual Midyear Meeting**, September 11–14, 1987, Austin, Texas. Information: SEPM, P.O. Box 4756, Tulsa, OK 74159; (918) 743-9765.

**18th Annual Geomorphology Symposium on Catastrophic Flooding**, September 26–28, 1987, Oxford, Ohio. Information: Larry Mayer, Dept. of Geology, Miami University, Oxford, OH 45056; (513) 529-3218.

**International Conference on Geophysical and Geochemical Exploration for Minerals and Groundwater**, September 27–October 1, 1987, Toronto, Ontario. Information: Exploration '87, c/o 222 Snidercroft Rd., Concord, Ontario L4K 1B5, Canada; (416) 669-2280; Telex 06-964570.

**GSA 1987**

*Section Meetings*

Northeastern Section, March 4–7, 1987, Pittsburgh, Pennsylvania  
Southeastern Section, March 26–27, 1987, Norfolk, Virginia  
South-Central Section, March 30–31, 1987, Waco, Texas  
North-Central Section, April 30–May 1, 1987, St. Paul, Minnesota  
Rocky Mountain Section, May 2–4, 1987, Boulder, Colorado  
Cordilleran Section, May 20–22, 1987, Hilo, Hawaii

*Penrose Conferences*

**Geochemistry of Waters in Deep Sedimentary Basins**, March 16–20, 1987, Oxnard, California. Information: Yousif K. Kharaka, U.S. Geological Survey, Water Resources Division, M.S. 427, 345 Middlefield Rd., Menlo Park, CA 94025; (415) 323-8111, ext. 2523.

**Late Quaternary Sea Level: The Marine and Terrestrial Record**, April 6–12, 1987, Ferry Reach, Bermuda. Information: James L. Carew, Dept. of Geology, College of Charleston, Charleston, SC 29424; (803) 792-5589.

**The Construction of Geological Cross Sections: Techniques, Assumptions, and Methods**, May 3–8, 1987, Rosendale, New York. Information: Peter A. Geiser, Dept. of Geology and Geophysics, University of Connecticut, Storrs, CT 06268; (203) 486-4432 or 4433.

(continued on p. 207)

# CLASSIFIED ADVERTISING

Ads (or cancellations) for the December issue must reach the GSA office by October 15. Contact Advertising Department (303) 447-2020.

Per line per issue	1x	3x	6x	12x
Situations Wanted:	\$1.25	\$1.10	\$.95	\$.85
Positions Open:	\$3.00	\$2.64	\$2.28	\$2.04
Consultants:	\$3.00	\$2.64	\$2.28	\$2.04
Services & Supplies:	\$3.20	\$2.81	\$2.43	\$2.17
Code number	\$2.75 extra.			

Agencies and organizations may submit purchase order or payment with copy. Individuals must send prepayment with copy. To determine cost, count 44 characters per line, including all punctuation and blank spaces.

To answer coded ads, use this address: Code # . . . . . GSA News, P.O. Box 9140, Boulder, CO 80301.

All coded mail will be forwarded within 24 hours of arrival at GSA News office.

## Situations Wanted

**GEOLOGIST**, BS, male, some graduate experience. Strong background in theoretical petrology-metamorphic and metasomatic; hydrothermal geochemistry, tectonics, structural analysis. Currently employed in management/supervisory capacity. I seek employment/experience in metallic minerals industry. Excellent verbal/written communication skills, driven worker. Willing to relocate. Excellent resume + refs upon request. Reply code #1036.

**ECONOMIC GEOLOGIST**. Mineralogist/petrologist/structural geologist seeks management or senior technical position. 20 years worldwide mining/exploration/research/teaching. Most recently 3 years evaluation of Texas, Louisiana lignites to optimize mining/end use. Mineralogical evaluation of flotation problems. Also antimony, coal, copper, diamonds, gold, nickel, oil, platinum, tin. Ph.D., US citizen, member GSA, SME. Reply code #1039.

## Positions Open

### POMONA COLLEGE Department of Geology

Applications are invited for a tenure-track assistant professorship to begin in September 1987. One person is to be hired for either of two possible positions: (1) igneous/metamorphic petrologist with strong field background; or (2) structure/field geologist. Candidates should have the ability and desire to teach undergraduate level geology courses and conduct research in their specialty. A Ph.D. is required. Send letter of interest, resume, transcripts and three letters of recommendation to: Dr. Donald H. Zenger, Chairman, Department of Geology, Pomona College, Claremont, CA 91711. The deadline for receipt of completed applications is November 1, 1986. If you have questions, please call (714) 621-8000 X2952. Pomona College is an equal opportunity/affirmative action employer.

### BUREAU OF ECONOMIC GEOLOGY

The Bureau of Economic Geology, The University of Texas at Austin, is recruiting two Ph.D. research scientists with specializations in Structural Geology.

One position requires experience with mechanics of brittle failure, analytical modeling of fracture systems and interpretations of natural fractures and faults. Preference will be given applicants with experience analyzing fractures in core and analyzing progressive and finite strain.

The second position requires experience in

numerical, regional tectonic and basin modeling and use of geophysical logs, porosity and heat flow data to derive compaction and subsidence histories. Preference will be given applicants with experience interpreting reflection seismic results, analyzing stress history of basins and work with wrench and extensional tectonics.

A proven publication record is preferred for all applicants.

Interested applicants should send a resume to: E.G. Wermund, Bureau of Economic Geology, The University of Texas at Austin, University Station, Box X, Austin, TX 78713. The advertiser is an equal opportunity/affirmative action employer.

### HYDROGEOLOGIST-STANFORD UNIVERSITY

The Department of Applied Earth Sciences, Stanford University, invites applications for a junior, tenure-track faculty position in hydrogeology beginning no later than September, 1987. We seek a creative scientist who has the ability to develop varied research directions and to guide and teach graduate and undergraduate students. The scope of our search is broad and includes the physical or chemical hydrology of groundwater systems, ancient or modern. Specialization might include chemical hydrogeology, solute transport in permeable media, simulation of regional-scale groundwater hydraulics or groundwater systems, or paleohydrology of sedimentary basins, as examples. We will be glad to send potential applicants information about ongoing programs at Stanford in applied hydrogeology (groundwater and pollution management), civil engineering (fate and transport of contaminants in groundwater), geothermal and petroleum reservoir simulation, and sedimentary basin evolution, and about our interactions with the groundwater hydrology program at the nearby U.S. Geological Survey. Please submit by November 1, 1986: a resume, a brief statement of teaching and research interests, and names of four references to: Prof. Marco T. Einaudi, Dept. of Applied Earth Sciences, Stanford University, Stanford, CA 94305. Stanford University is an Equal Opportunity Employer and encourages applications by qualified women and minorities.

### DEPARTMENT OF GEOLOGY AND GEOPHYSICS

#### UNIVERSITY OF CALIFORNIA, BERKELEY

Subject to final budgetary approval, the Department is authorized to make two faculty tenure track appointments, with effective date July 1, 1987, at the junior or senior level. Interested and qualified candidates who are engaged in innovative research in one of the following fields are encouraged to apply: radiogenic isotope geochemistry; basin evolution (including sedimentology, organic geochemistry and hydrogeology); igneous petrology; metamorphic petrology.

Applications, including the names of at least three references, should be sent to the Chairman of the Department by November 1, 1986.

The University of California is an Equal Opportunity Affirmative Action Employer.

### THE UNIVERSITY OF AUCKLAND NEW ZEALAND POST-DOCTORAL FELLOWSHIP

The University of Auckland, New Zealand invites applications for a Post-Doctoral Fellowship for one year in the Department of Geology (Associate-Professor K.B. Spurlin) on the topic Radiolarian Micropaleontology Applied to Stratigraphy and Tectonics in the North Island, New Zealand.

Applicants must have experience in extracting Radiolaria from both siliceous and carbonate rocks, have contacts with researchers on Radiolaria overseas and provide guidance for staff working on Radiolaria-bearing rocks.

The Fellowship is available for one year and is valued at \$NZ30,500. Conditions of Appointments and Application Forms are available from the

Assistant Registrar (Academic Appointments), University of Auckland, Private Bag, Auckland, New Zealand. Applications should be forwarded as soon as possible.

**SR ENGINEERING GEOLOGIST**—15 yrs exp & Calif certification required. Excellent opportunities. Send resume: Personnel, Kleinfelder & Associates, 1901 Olympic Blvd, Suite 300, Walnut Creek, CA 94596.

### LEHIGH UNIVERSITY 40Ar/39Ar, K-Ar and Fission Track Geochronologist

The Department of Geological Sciences seeks applicants for a tenure-track position in Geochronology. The position will be at the assistant-professor level and will begin in August 1987. A Ph.D. at the time of appointment is required.

The successful candidate will be expected to establish and maintain a state of the art 40Ar/39Ar Geochronology Laboratory and develop an active research program with special emphasis on the Cenozoic. Interaction with other faculty members in our newly evolving salients in Modern and Quaternary Studies and Petrogenetic and Tectonic studies will be expected. A broad geologic background as well as experience in 40Ar/39Ar, K-Ar is required. Experience in Fission Track dating is desirable but not required.

Teaching duties will include: isotope geochronology, historical geology, participation in the plate tectonics course and graduate courses in the candidate's field of specialization.

Applications, including a curriculum vitae, transcripts, a statement of current research interests and goals and the names of three referees should be sent to Professor Edward B. Evenson, Chairman, Geochronology Search Committee, Department of Geological Sciences, Williams Hall #31, Lehigh University, Bethlehem, PA 18015-3188. Applications received after November 15, 1986 may not receive full consideration. Lehigh is an affirmative action/equal opportunity employer. Interested parties may call Ed Evenson (215-758-3659) with questions or for further details.

### THE U.S. GEOLOGICAL SURVEY (USGS) BRANCH OF COAL GEOLOGY

announces two senior research geologist vacancies:

—an **Inorganic geochemist**, with wide experience in coal geochemistry and coal geology, specializing in geochemical interpretation of the origins of mineral matter in coal and the effects of the inorganic constituents on coal mining and utilization, and

—a **sedimentologist**, specializing in sedimentary facies analysis with focus on basin analysis as well as micro-environments of deposition and interpretation of sedimentary structures, all with regard to coal.

Positions will be located either in Denver or Reston, Virginia. Candidates for both positions should have the Ph.D. degree or equivalent experience, and be senior level, field-oriented, highly motivated scientists with extensive, significant publication records in their respective fields and demonstrated expertise in directing and focusing coal science. It is anticipated that the positions will be at the GS-13 to GS-14 level (\$37,599-\$57,759 per annum), dependent upon qualifications. For further information, contact John O. Maberry, Chair, Search Committee, Branch of Coal Geology, 956 USGS National Center, Reston, VA 22092, telephone 703-648-6448. Applications must be made by Standard Form 171 'Application for Federal Employment,' available from the above address or from any Federal Personnel Office. Applications must be received by November 30, 1986. USGS is an equal-employment employer; the positions are limited to United States citizens.

**HEAD, DEPARTMENT OF GEOLOGY AND  
GEOPHYSICS  
UNIVERSITY OF WYOMING**

The University of Wyoming, Department of Geology and Geophysics seeks applicants for the tenure track position of Department Head, starting fall semester 1987. Duties emphasize directing the department during an exciting period of development. Appointment will be at the full professor level and salary is open, commensurate with experience and qualifications. The applicant may be from any subdiscipline of the geosciences and should have developed an internationally recognized research program, preferably using quantitative approaches. A record of successful interaction with both industry and funding agencies is expected. The Department of Geology and Geophysics has 24 faculty, extensive modern instrumentation, and is research oriented. Integration of field and laboratory studies is emphasized.

Applicants should provide a resume, names of three references and a letter of application including a statement of current research interests and courses which the applicant feels qualified to teach. Applications must be postmarked no later than October 31, 1986 and sent to: Dr. James E. McClurg, Acting Department Head, Department of Geology and Geophysics, PO Box 3006, University of Wyoming, Laramie, WY 82071. The University of Wyoming is an equal opportunity/affirmative action employer.

**STRUCTURAL GEOLOGIST**

The Department of Geology and Geography, Denison University, invites applications for a tenurable position at the Assistant Professor level, pending administrative action. Ph.D. is required. Structural geology, tectonics, metamorphic petrology, and economic geology are among subdisciplines having relevance to our program. Send application and resume to Kennard B. Bork, Dept. of Geol. & Geog., Denison Univ., Granville, OH 43023. EO/AE.

**PETROLOGIST/SUNY-BINGHAMTON**

The Department of Geological Sciences and Environmental Studies invites applications for a tenure track position in the areas of igneous or metamorphic petrology starting September, 1987. Petrologists with field-oriented research are particularly encouraged to apply. The department is well equipped and staffed for routine analyses of

rocks (microprobe, SEM, XRD, XRF, thin section lab). Teaching at both the undergraduate and graduate level is also required. Rank and salary are open and negotiable depending on the experience of the applicant. A Ph.D. is required; post-doctoral experience is preferred. Please submit by December 15, 1986, a curriculum vita, list of publications, a brief statement of research interests, and the names and addresses of three personal references to: Dr. David Jenkins, Petrology Search Committee, Geology, SUNY-Binghamton, Binghamton, New York 13901. S.U.N.Y. is an equal opportunity affirmative action employer.

**Consultants**

**MEETING COORDINATORS:** Western Experience offers coordination of Earth Science meetings of all types including field trips. If you need assistance call us at our new location. Phone (619) 722-0027. Address 2369 Carriage Circle, Ocean-side, CA 92056.

**Services & Supplies**

**FIELD EQUIPMENT!** For the lowest prices and our unbeatable guarantee of 100% satisfaction, check our listings of field hammers-Brunton compasses—magnifiers—pouches—plus over 2,000 other products for the geoscientist. Call today for a catalog: 1-800-742-2677. It's absolutely free! Geoscience Resources, 2990 Anthony Road, Burlington, NC 27215.

**EARTHQUAKE BOOKS,** Free catalog. Specialty Book Service EH, P.O. Box 210250, San Francisco, CA 94121.

**SCIENCE BOOKS,** Free Catalog. Specialty Book Service SH, P.O. Box 210250, San Francisco, CA 94121.

**FOR SALE.** GSA Bulletins 1946-74, 50 Memoirs, 4 Special Papers, 8 reprints. Also large collection AAPG, USGS, State & Geological Society Pubs., Texts. For information write Geologist, 761 Steele St., Denver, CO 80206.

**FREE Catalog** of old and OP earth science books sent on request. James G. Leishman Bookseller, Box A, Menlo Park, CA 94026.

**MULTIVARIATE STATS FOR THE IBM-PC COMPUTER.** MVSP is an easy-to-use, menu-driven program which performs PCA, RA, cluster analysis, and diversity indices. MVSP is available for just the cost of distribution. Send \$5.00 to cover costs of disk, mailer, and postage. Warren L. Kovach, Department of Biology, Indiana University, Bloomington, IN 47405.

**1986 - 1987  
GEOLOGY WORKSHOPS**

**COSTA RICA - Dec 26/86-Jan 5/87**

*During the best time of the year*

All inclusive from Miami:

\$1,439.00 per person

**E. AFRICA - May 31-June 14/87**

*Visiting Nairobi University*

All inclusive from New York:

\$2,437.00 per person

For reservations call:



**HOLBROOK  
TRAVEL, INC.**

*We Offer You The World*

3540 NW 13th St, Gainesville, FL 32609

(800) 451-7111 (Nationwide)

(800) 345-7111 (Florida)

**Cave Minerals of the World**

By Carol A. Hill and Paolo Forti  
with a historical introduction by  
Trevor R. Shaw.

Grotesquely twisted helicitites, cave pearls polished to a high luster, satin-petalled cave flowers, and the moonmilk (gnome's milk) of ancient medicine—all of these and many other speleothems are portrayed in this new and exciting book. Almost 200 different minerals are described, and nearly 180 color and black and white photographs, graphs, and drawings illustrate the splendor of cave minerals from all over the world.

Approximately 260 pages, including 16 in full color, glossary, bibliography, and index. \$24.95 (pb); \$29.95 (hb). Include \$1.50 P&H.

Order From: National Speleological Society  
Bookstore  
Dept. B-2  
Cave Avenue  
Huntsville, AL 35810

**Meetings** (continued from p. 205)

**Glacial Facies Models,** May 3-8, 1987, Manitoulin Island, Ontario. Information: Nicholas Eyles, Department of Geology, Scarborough Campus, University of Toronto, Scarborough, Ontario M1C 1A4, Canada; (416) 284-3336.

**Paleoenvironmental Interpretation of Paleosols,** September 11-17, 1987, Warm Springs Indian Reservation, central Oregon. Information: Gregory R. Retallack, Dept. of Geology, University of Oregon, Eugene, OR 97403-1271; (503) 686-4573.

**\*Cordilleran Metamorphic Core Complexes, Revisited: Implications for Crustal Extension and Shortening in the North American Cordillera,** September 13-18, 1987, Elko, Nevada. Information: Arthur W. Snoke, Dept. of Geology and Geophysics, University of Wyoming, P.O. Box 3006, Laramie, WY 82071; (307) 766-5457.

**\*Exposed Cross Sections of the Continental Crust,** September 28-October 2, 1987, southeastern Ontario. Information: David M. Fountain, Dept. of Geology and Geophysics, University of Wyoming, Laramie, WY 82071; (307) 766-6299.

**Annual Meeting, October 26-29,** Phoenix, Arizona

**PEOPLE**

The American Institute of Professional Geologists honored five GSA members at its 1986 annual meeting in September. GSA Fellow **Robert J. Weimer**, retired professor of geology, Colorado School of Mines, Golden, received the AIPG Ben H. Parker Memorial Medal for outstanding service to the profession. Fellow **Edward E. Rue**, Rue & Daniel Associates, Mount Vernon, Illinois, received the Martin Van Couvering Memorial Award for outstanding contributions to AIPG. Fellow **Ross L. Shipman**, consultant, Round Rock, Texas, and Fellow **Edward C. Dapples**, retired professor of geology at Northwestern University, now of Sun City, Arizona, were awarded AIPG Honorary Membership. Fellow **Frank E. Kottowski**, director of the New Mexico Bureau of Mines and Mineral Resources, Socorro, received the AIPG Public Service Award for 1986.

Fellow **John B. Patton** retired June 30, 1986, as State Geologist and Director of the Indiana Geological Survey, after 27 years of service.

Fellow **Arthur A. Socolow** retired in August as State Geologist of Pennsylvania, after 29 years in that post.

**GSA REVIEWS IN  
ENGINEERING GEOLOGY VI  
MAN-INDUCED LAND  
SUBSIDENCE**

Edited by Thomas L. Holzer

**E**very earth scientist should be keenly interested in the timely and important subject of this GSA volume. Land subsidence has been caused by man in at least 37 states of the U.S.A. It affects an aggregate area of more than

**MAN-INDUCED  
LAND  
SUBSIDENCE**



EDITED BY THOMAS L. HOLZER

40,000 km<sup>2</sup> and may cost the nation as much as \$100 million annually.

This review includes nine papers in three categories: (1) Fluid withdrawal from porous media; (2) Drainage of organic soil; and (3) Collapse into man-made and natural cavities.

Hardbound in 8½" x 11" format, 231 pages, in illustrated dust cover. ISBN 0-8137-4106-8. \$28.00

Check, money order (in U.S. funds), or credit cards below accepted. Credit card users must provide their full name, card name, card number, and expiration date. Colorado residents add sales tax. We pay surface postage on prepaid orders.

MasterCard \* VISA \* American Express \* CHOICE  
Carte Bleue \* Barclay Card \* Access  
EuroCard \* Standard Bank Card



Order today from:  
GSA Publication Sales  
P.O. Box 9140  
Boulder, CO 80301 • (303) 447-2020

**THE GEOLOGICAL SOCIETY OF AMERICA**

**INSIDE \_ \_ \_**

North-Central Section 1987 Meeting .....	p. 196
Cordilleran Section 1987 Meeting .....	p. 198
Rocky Mountain Section 1987 Meeting .....	p. 199
More 1987 Penrose Conferences .....	p. 202



**THE  
GEOLOGICAL SOCIETY  
OF AMERICA**  
3300 Penrose Place • P.O. Box 9140  
Boulder, CO 80301

**SECOND CLASS  
Postage Paid  
at Boulder, Colorado  
and at additional mailing office**