

GSA NEWS & INFORMATION

Monthly Newsletter of
The Geological Society of America

VOLUME 6, NUMBER 5

MAY 1984

1984 Technical Program Committee Gears Up for Reno Meeting

by Sue Beggs

The Joint Technical Program Committee (JTPC) will meet at GSA headquarters in Boulder, Colorado, on July 13, 1984. JTPC is responsible for final selection of abstracts submitted for presentation at the annual meeting.

How JTPC Works

The Joint Technical Program Committee is chaired by the Technical Program Chairman and Co-Chairman. It consists of representatives appointed by each of GSA's divisions and associated societies. In addition, five at-large representatives are appointed by Council to be responsible for disciplines not covered by these other groups. The at-large categories usually include stratigraphy, sedimentology, remote sensing, marine geology, mathematics, and general geology. Official planning for an annual meeting program begins about two years before the meeting. A process of symposia selection and review of volunteered abstracts culminates in the selection of both oral and poster papers. The full committee meets in Boulder 16 weeks before the annual meeting to make the selections.

Symposia

The GSA Council has set a limit of 22 symposia—one half-day session for each associated society and GSA division and six for at-large sponsorship. The Technical Program Chairman sends information for submission of proposals in September one year before the meeting. The deadline for submission is usually January 1. After approval by the Chairman, Co-Chairman, and General Chairman, the symposia are finalized. Symposia conveners must meet Council requirements of having two reviews by persons not involved in the symposium. They must also meet publication deadlines so that their abstracts will be included in the Abstracts with Programs volume.



David B. (Burt) Slemmons (left), Mackay School of Mines, Reno, is chairman of the Joint Technical Program Committee for GSA's 1984 Annual Meeting. Here he confers with Haydn Murray, Indiana University, the 1983 chairman.

Volunteered Papers

The other part of the committee's work is to choose which of the volunteered abstracts are accepted for presentation at the annual meeting.

Abstract forms are available a year before the meeting. The abstracts deadline for 1984 is June 8.

Each year about 25 representatives are appointed to select abstracts. They meet once, about four weeks after the abstracts deadline, at GSA headquarters. Each representative selects from among the reviewed abstracts in his or her category.

The Technical Program Chairman is provided with a six-year history of abstracts received per year by classification. After the abstracts deadline, the chairman knows whether the current abstracts distribution is unique and can adjust the number of sessions accordingly.

Each year the number of abstracts submitted exceeds the amount of time available for presentation at the four-day annual meeting. Fifty half-day sessions are available for volunteered abstracts. At 15 minutes per paper, 16 papers can be presented in a four-hour, half-day session, allowing presentation of (16 x 50) 800 papers. For the 1983 meeting, the JTPC had to choose those

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RENO

1984 Technical Program (continued from p. 73)

800 abstracts from the 1,106 submitted. Recent Technical Program Chairmen have made it a policy to distribute the abstract rejection burden fairly. The chairman informs the committee how many abstracts must be rejected per classification so that the burden is shared equitably.

Poster sessions are scheduled in addition to the oral sessions. Authors of volunteered papers can request a poster session, or a JTPC representative can recommend that format for a paper, after consultation with the author.

Session schedules and room assignments are made by the Technical Program Chairman, who takes into account the preferences expressed by representatives of the societies and divisions. Room assignments are based on peak attendance in similar sessions during recent past meetings. Session chairmen are selected from those who indicated on the abstract form their willingness to serve, or by nomination from the JTPC representative. Technical Program Chairmen do their best to minimize conflict within the program and to provide a balanced program within the boundaries of the time and space limitations.

At the end of the JTPC meeting, the program has been finalized. All authors of abstracts receive notification within one week. Authors of accepted abstracts receive a card identifying the time and location of their presentation. Later, all speakers are sent an information packet, which includes the dimensions of the rooms and other details related to their presentation.

Program Review Committee

Each Technical Program Chairman has responsibility for only one annual meeting, but continuity from year to year is provided by the overview committee—the Program Review Committee (PRC). The PRC consists of a chairman appointed by Council and four Technical Program Chairmen—one future, one current, and two past. One of the most significant functions of PRC is its annual joint meeting with the JTPC representatives. Representatives from GSA divisions and associated societies

have the opportunity to comment on both the content and the mechanics of the annual meeting program. This has proved to be the most constructive avenue for change—and improvement.

1984 JTPC

Representatives and conferees from GSA divisions and associated societies who will participate in the 1984 JTPC meeting at GSA headquarters on July 13:

Chairman: David B. Slemmons

Co-Chairman: John W. Bell

General Chairman, Local Committee: Lawrence T. Larson

Chairman, 1983 JTPC: Haydn H. Murray

Chairman, 1985 JTPC: James F. Tull

President, GSA, ex officio: M. Gordon Wolman

Executive Director, GSA, ex officio: F. Michael Wahl

GSA Representatives-at-Large:

George E. Plafker (1982-1984); Daniel E. Karig (1982-1984);

A. Gordon Everett (1983-1985); Stephen H. Stow (1983-

1985); Douglas W. Rankin (1984-1986)

GSA Division Representatives

Archaeological Geology: Vance T. Holliday

Coal Geology: Edwin R. Landis

Engineering Geology: Robert L. Schuster

Geophysics: Nikolas I. Christensen

History of Geology: Vance T. Holliday

Hydrogeology: Terry Katzer

Planetary Geology: Donald U. Wise

Quaternary Geology and Geomorphology: Donald F. Eschman

Structural Geology and Tectonics: Campbell Craddock,

Robert Yeats

Associated Society Representatives

Cushman Foundation: Don L. Eicher

Geochemical Society: Donald Langmuir

Geoscience Information Society: Claren Kidd

Mineralogical Society of America: Timothy L. Grove

National Association of Geology Teachers: William E. Bonini

Paleontological Society: David J. Bottjer

Society of Economic Geologists: Joseph V. Tingley

Society of Vertebrate Paleontologists: Not meeting with GSA

Associated Society Conferees

Cushman Foundation: None appointed

Geochemical Society: John Frantz

Geoscience Information Society: None appointed

Mineralogical Society of America: Maryellen Cameron,

Richard N. Abbott

National Association of Geology Teachers: None appointed

Paleontological Society: Jane Gray

Society of Economic Geologists: Arnold Brokaw

Society of Vertebrate Paleontologists: Not meeting with GSA

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GSA News & Information

Vol. 6, no. 5

May 1984

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.

Prepared from contributions from the staff and membership. Executive Director: F. Michael Wahl; Managing Editor: Faith Rogers; Associate Editor: Lee Gladish; Production and Advertising Manager: James R. Clark; Assistant Production Manager: Meredith Larson; Production Assistants: Ann H. Fogel and June E. Thomas.



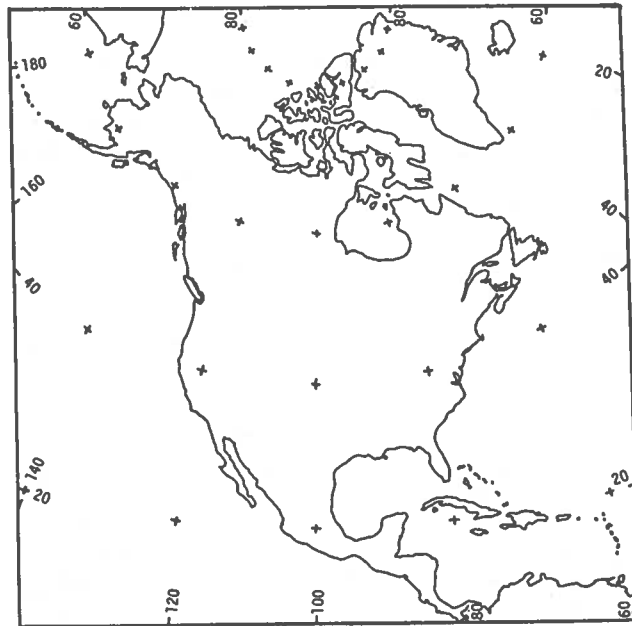
CENTENNIAL NEWS

by Allison R. (Pete) Palmer

Submarine Geologic Mapping Needs Data

The new Geologic Map of North America currently is being compiled and is scheduled for publication in 1986 as part of GSA's Decade of North American Geology program. The map will, for the first time, include submarine geology around North America in the areas shown on the accompanying map, presented in much the same style as the subaerial geology. Depicted will be age/rock unit, major faults, concentration of Fe/Mg nodules and phosphorite, volcanic centers, locations of ultramafic and felsic rocks, hydrothermal deposits, and axes of major submarine canyons and channels. This is the first time such an undertaking has been attempted, and to assure the most complete treatment possible, we invite the geological community to contribute data for the map. The data can be either published or unpublished, but all sources will be cited or acknowledged as appropriate when the map is published. Send contributions to:

Brian Tucholke
 Department of Geology and Geophysics
 Woods Hole Oceanographic Institution
 Woods Hole, MA 02543



University Library Needs Replacement Copies of GSA Books

Eight out-of-print GSA books are among 80 books destroyed by vandals in the University of South Alabama Library. If you have a copy of any of the books listed and you are willing to part with it (or them), contact Catherine F. Potter, Library, University of South Alabama, Mobile, AL 36688; telephone (205) 460-7028. The books the library needs are the following:

Eocene Faunas from the Department of Bolivar, Colombia,

by Bruce Clark and J. W. Durham; GSA Memoir 16, published in 1946

Permian Crinoid Calceolispongia, by Curt Teichert; GSA Memoir 34, published in 1949

Molluscan Faunas of the Flagstaff Formation of Central Utah, by Aurèle LaRocque; GSA Memoir 78, published in 1960

Oligocene Plants from the Upper Ruby River Basin, Southwest Montana, by Herman Becker; GSA Memoir 82, published in 1961

Biostratigraphic Studies in the Comanche (Cretaceous) Series of Northern Mexico and Texas, by Bobby F. Perkins; GSA Memoir 83, published in 1960

Morphologic and Systematic Relationships of Some Middle Ordovician Ostracoda, by John Kraft; GSA Memoir 86, published in 1962

Supai Formation (Permian) of Eastern Arizona, by Stephen S. Winters; GSA Memoir 89, published in 1963

Late Eocene Zoogeography of the Eastern Gulf Coast Region, by Alan H. Cheetham; GSA Memoir 91, published in 1963

Working Groups Forming for IGCP Project on Northern Margin of Tethys

Geoscientists with an active interest in the topic are encouraged to participate in International Geological Correlation Program (IGCP) Project 198, Evolution of the Northern Margin of Tethys. The first meeting for the project will be in Czechoslovakia October 15-21, 1984; it will include plenary sessions and an excursion in the Carpathian Mountains. The project will continue for five years.

Participating countries are Austria, Czechoslovakia, France, Federal Republic of Germany, Romania, Switzerland, the U.S., and the USSR. Possible areas of study include sedimentation, lithofacies, paleogeography, fauna, structural history, igneous activity, and geophysical aspects of the area (Europe, and extending into the Middle East).

For further information, contact the organizer of the U.S. working group, Alan E. M. Nairn, ESRI, University of South Carolina, Columbia, SC 29208; telephone (803) 777-6484.

In Memoriam

Julian D. Barksdale
 Seattle, Washington
 December 21, 1983

Donald E. McGannon
 San Antonio, Texas

Paul W. Hughes
 Lake Oswego, Oregon
 February 10, 1984

John D. Moody
 Dallas, Texas
 November 29, 1983

1984 Annual Meeting Will Offer Wide Variety of Field Trips

Reno lies on the western edge of the Basin and Range province and adjacent to the Sierra Nevada Mountains. Within a day's drive are the Great Valley and Coastal Range provinces of California, the southern tip of the Cascades, and the southern part of the Columbia Plateau Basalts. This year's GSA Annual Meeting field-trip program draws from many of these provinces, and one trip originates in the Rocky Mountain province.

Nevada history is entwined with the mineral industry, and today Nevada is the top American producer of gold, mercury, barite, magnesite, and turquoise, to name a few. The majority of the geologic concepts prevalent today in Nevada have evolved since World War II; from the research point-of-view, the Basin and Range province is still in a late youthful stage. Although no square foot of the state has evaded the geologist's boot, much of the field work performed to date can be considered only as reconnaissance geology. The great variety of geologic features in the Great Basin is the result of the large size of the basin (110,000 mi² in Nevada alone), its range of rocks (Precambrian to Quaternary), its variations in climate (Sonoran Desert to alpine heights), and its complex geologic relationships and history.

The Field Trip Committee has made its selection from about 50 proposals. Selection criteria included widest interest and accessibility for those areas above 4,500 ft altitude.

The 1984 Field Trip Chairman is Joseph Lintz, Jr., Mackay School of Mines, Reno, NV 89557, (702) 784-6050. For further information, contact GSA Field Trip Coordinator Kathy Ohmie, (303) 447-2020.

All premeeting trips terminate in Reno on the afternoon or evening of Sunday, November 4, 1984. Postmeeting trips begin in Reno. Costs and registration information will be given in the August issue of *GSA News & Information*.

PREMEETING TRIPS

STRATIGRAPHY AND PALEONTOLOGY

1. The Mississippian-Pennsylvanian Boundary in the Eastern Great Basin. Gary Webster, Washington State University; Mackenzie Gordon, USGS, Reston; Ralph L. Langenheim, Jr., University of Illinois. Three days, November 2, 3, 4.

Leaves from Salt Lake City, morning of November 2. Outcrops exhibiting the Mississippian-Pennsylvanian boundary in west-

ern Utah, with emphasis on the House and Confusion Ranges in Utah and the Arrow Canyon Range in Nevada. Travel by van, with flight to Reno from Las Vegas, evening of November 4. Limit: 40.

2. Late Cambrian Faunal Crises: The Basis for Biomes. A. R. Palmer, Geological Society of America; M. E. Taylor, USGS, Denver. Four days, November 1, 2, 3, 4.

Leaves from Las Vegas, morning of November 1. Proceeds northward through eastern Nevada and western Utah, then across Nevada, traveling by van. Focus on biotite boundaries and trilobite extinctions in the light of modern extinction theories. Limit: 32.

ECONOMIC GEOLOGY

3. Coal Deposits, Stratigraphy, and the Cretaceous-Tertiary Boundary, Southern Raton Basin, New Mexico and Colorado. Charles L. Pillmore, USGS, Denver. Three days, November 2, 3, 4.

Leaves from Denver by bus, November 2. Coal deposits and coastal and fluvial environments of the Upper Cretaceous and lower Tertiary rocks of the Vermejo and Raton Formations. Special emphasis on examination of the Cretaceous-Tertiary boundary in the Raton Formation. Includes flight from southern Colorado to Reno, November 4. Cosponsored by the Coal Division. Limit: 45.

HYDROLOGY

4. Truckee-Carson River Hydrogeology. Patrick A. Glancy, USGS, Carson City; Roger Jacobson, Desert Research Institute, Reno. Two days, November 3, 4.

Hydrogeologic phenomena in an area extending 100 miles east of Reno. Two geothermal sites, recharge areas of the eastern Sierras, Pleistocene Lake Lahontan, and modern Pyramid Lake. Travel by bus. Limit: 40.

TECTONICS/STRUCTURE

5. Tectonic Development of the Northern Sierra Nevada: An Accreted Late Paleozoic Island Arc and Its Basement. Richard A. Schweickert, Mackay School of Mines; Gary Girty, University of Kansas; Richard Hanson, University of Zambia; David Harwood, USGS, Menlo Park. Three days, November 2, 3, 4.

November 5-8

1984 Annual Meeting—Reno, Nevada

PREREGISTRATION, FIELD TRIPS, AND HOUSING FORMS

Available in *August News & Information*

ABSTRACTS DEADLINE: JUNE 8, 1984

PREREGISTRATION DEADLINE: OCTOBER 5, 1984

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abstracts forms

Employment Service Coordinator
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Meetings Department
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Geological Society of America, P.O. Box 9140, Boulder, CO 80301

(303) 447-2020

November 6 is National Election Day. Vote absentee.

Be sure to contact the county election bureau where you are registered to ask about absentee balloting.

1984 Annual Meeting Field Trips

Leaves from Reno, November 2; travel by van. Submarine volcanism, sedimentation, faulting, and basin development in an island arc, west side of the Sierras. Stratigraphic and structural relations of the basement, which represents an early Paleozoic accretionary complex, and its ramifications for the late Paleozoic and Mesozoic tectonics of the Cordillera from Nevada to Canada. Campgrounds at moderate to high altitudes both nights. Limit: 50.

6. Sonoma Orogenic Belt of West-central Nevada. Robert C. Speed, Northwestern University. Two days, plus previous evening, November 2 (p.m.), 3, 4.

Leaves from Reno, late afternoon or early evening, November 2. Travel by van to Hawthorne (2.5 hours). Systemic spatial array of tectonic units related to the Sonoma event, including forearc deposits, accretionary prism, serpentinite melange, suture, foreland basin strata, and North American foreland; Golconda allochthon at two sites. Cosponsored by the Structural Geology and Tectonics Division. Limit: 30.

7. Comparison of Paleozoic Tectonostratigraphic Assemblages between the Mojave Desert and West-central Nevada. Michael D. Carr, USGS, Denver; John Oldow, Rice University; Paul Stone, USGS, Menlo Park. Three days, plus previous evening, November 1 (p.m.), 2, 3, 4.

Assembles at Los Angeles airport (LAX), evening of November 1 for drive in vans to Mojave, California (2.5 hours). Exposures of Paleozoic tectonostratigraphic units will be compared in the El Paso Mountains, Darwin Wash, and Miller Mountain. Data concerning the southern extent of the Antler and Sonoma orogenies and possible existence of exotic terranes in the southwestern Great Basin. Limit: 32.

8. Tertiary Tectonics of West-central Nevada: Yerington to Gabbs Valley. Richard F. Hardyman, USGS, Denver; John Proffett, Proffett Exploration, Anchorage; E. B. Ekren, USGS, Denver. Three days, November 2, 3, 4.

Leaves Reno, morning of November 3. Various styles of late Tertiary faulting west of, and across, the central part of Walker Lane; Jurassic batholith revealed by Cenozoic faulting; listric faulting; mineralization areas, volcanic rocks, and fanglomerates used to establish directions and distances of faults. Limit: 45.

9. Tectonic Evolution of the Ruby Mountains and East Humboldt Range, Nevada. Arthur W. Snoke, University of Wyoming; Keith Howard, USGS, Menlo Park. Three days, plus previous evening, November 1 (p.m.), 2, 3, 4.

Starts from Elko, Nevada; travel by van. Stratigraphic, structural, metamorphic, and plutonic features of these two ranges. Includes migmatitic late Precambrian to middle Paleozoic miogeosynclinal sediments, a deformed Tertiary pluton, and mylonites. Organizational meeting and orientation on the evening of November 1. Limit: 50.

VOLCANISM AND ENGINEERING GEOLOGY

10. Geology of the Nevada Test Site. Holly D. Ander; Frank M. Byers, Los Alamos National Laboratory; Paul P. Orkild, USGS, Denver. Two days, November 3, 4.

Emphasizes Tertiary basin-and-range-style faulting and the Timber Mountain resurgent caldera complex. Laramide deformation of the Paleozoic sediments and, if time permits, a visit to the proposed waste isolation facility. Travel to and from the Nevada Test Site by bus and commercial airline from Las Vegas to Reno on November 4 (included in cost). Restricted to United States citizens; documentation of citizenship may be required. Limit: 90.

11. Mono Craters, Long Valley Caldera: Seismicity, Volcanism, and Engineering. Ed Harp, USGS, Menlo Park; Alan Ryall, Mackay School of Mines; Spencer H. Wood, Boise State University. Three days, November 2, 3, 4.

Travel by bus south to the Mono Craters-Mammoth area to inspect the phenomena of the area, both past and present. Evening discussions on the potential for future eruptions. Earthquake-engineering aspects of the cultural resources. Limit: 90.

12. Engineering Geology of Slide Mountain Rock Slide and Ophir Creek Debris Flow. Robert J. Watters, Mackay School of Mines. One day, November 4.

Examination and study of the May 30, 1983, rock slide and debris flow on Slide Mountain, 20 miles south of Reno. Engineering and rock behavior as it affected the rock slide, reservoir failure, and water passage down Ophir Creek onto the alluvial flats. Rugged terrain, field clothes advised. Limit: 30.

ARCHAEOLOGY AND QUATERNARY GEOLOGY

13. Archaeological Geology of Hidden and Lovelock Caves, With an Overview of Quaternary Geology in the Lahontan Basin. Jonathan O. Davis, Desert Research Institute, Reno; Roger B. Morrison, USGS, Denver. Two days, November 3, 4.

Examination of the deposits and setting of two classical archaeological sites of the western Great Basin, with an appreciation of the sedimentation and history of Lake Lahontan. Cosponsored by the Archaeological Geology Division. Limit: 40.

QUATERNARY GEOLOGY

14. Quaternary Stratigraphy of the Eastern Mojave Desert. John C. Dohrenwend, USGS, Menlo Park; Stephen G. Wells, University of New Mexico; Leslie D. McFadden, University of New Mexico; Roger S.U. Smith, Austin. Four days, November 1, 2, 3, 4.

Newly discovered field relations and newly devised techniques currently in use to develop an integrated alluvial, pluvial, and eolian Quaternary stratigraphy for the eastern Mojave Desert. Flight to Las Vegas late afternoon-early evening, November 8; ends at Las Vegas airport late afternoon, Sunday, November 11.

CONCURRENT HALF-DAY TRIPS

A. Magma Mixing in Some Sierran Plutonic Rocks. Malcolm J. Hibbard, Mackay School of Mines. Departs Tuesday, November 6, 8 a.m., and Wednesday, November 7, 1 p.m.

Display of new criteria for magma mixing in plutonic rocks. Travel by bus across Donner Summit to Kingvale, California. Limit: 45 each trip.

POSTMEETING TRIPS

ECONOMIC GEOLOGY

15. Mineral Deposits of Central Nevada. Odin Christensen, Newmont Exploration, Reno; Daniel Shawe, USGS, Denver; Bradford Mills, Round Mountain; Peter Chapman, Carson City. Four days, November 9, 10, 11, 12.

Geologic and geochemical setting of multiple active mining districts in Nevada, including Northumberland, Round Mountain, Manhattan, and Mount Hope. Cosponsored by the Geological Society of Nevada. Limit: 40.

TECTONICS AND STRUCTURE

16. Mesozoic-Cenozoic Convergent Margin of Northern California. Raymond Ingersoll, University of California, Los Angeles; Stephan Graham, Stanford University; Richard Schweickert,

(continued on p. 78)

1984 Annual Meeting Field Trips

Schweickert, Mackay School of Mines; Darrel Cowan, University of Washington. Three days, November 9, 10, 11.

Leaves from Reno by bus, morning of November 9. Across the Sierra Nevada into the Sacramento Valley for a comprehensive overview of all components of an ancient convergent margin. Ends November 12, late afternoon, at the San Francisco airport. Limit: 90.

17. The Pre-Cordilleran Active Overthrust Belt, San Juan Province, Argentina. Robert A. Whitney, Mackay School of Mines; Hugo E. Bastias, Alejandro Vaca, University of San Juan, Argentina. Nine days, November 9-18.

Structure, tectonics, stratigraphy, and economic geology of an actively forming back-arc overthrust belt occurring in carbonate shelf and continental slope deposits in west-central Argentina. Leaves from Reno airport November 9; ends in Los Angeles November 18. Argentine visa required; no immunization requirements. Spouses welcome. One day in Buenos Aires. Cosponsored by the Structural Geology and Tectonics Division. Limit: minimum 10; maximum 25.

18. Neotectonics of Western Nevada. David B. Slemmons, Mackay School of Mines; John W. Bell, Nevada Bureau of Mines and Geology; Robert Wallace, USGS, Menlo Park. Two days, November 9, 10.

Examination of late Quaternary faulting in western Nevada,

focusing on faults of 1954, with older faults subsidiary. Leaves from Reno November 9; returns to Reno airport in the late afternoon, November 10. Cosponsored by the Engineering Geology Division. Limit: 37.

19. Tertiary Extension Tectonics in the Sevier Belt of Southern Nevada. Brian Wernicke, Harvard University; Peter L. Guth, USMA, West Point. Three days, plus previous evening, November 8 (p.m.), 9, 10, 11.

Tertiary low-angle and detachment faulting in the Sevier thrust belt across the transition from the craton to the miogeocline; outcrops in the Mormon Mountains, Meadow Valley Mountains, Sheep Range, and Desert Range, Nevada. Flight to Las Vegas late afternoon and early evening, November 8; ends at Las Vegas airport, late afternoon, November 11. Limit: 40.

REMOTE SENSING

20. Alteration and Mineralization Detection by Enhanced Remote Sensing Imagery for Mineral Exploration in Southwest Nevada and Adjacent California. James V. Taranik, Mackay School of Mines; Floyd F. Sabins, Chevron Oil Field Research, La Habra. Three days, November 9, 10, 11.

Leaves from Reno by bus, morning of November 9. Comprehensive variety of aircraft and satellite sensor data at such locales as Pyramid and Walker Lakes, Yerington, Tonopah, Goldfield-Cuprite, Beatty, Death Valley, Pahrump Mining Districts, and the Keystone thrust fault. Ends at Las Vegas airport, late afternoon, November 11. Limit: 90.

HYDROGEOLOGY AND GEOTHERMAL

21. Hydrogeology of the Nevada Test Site. John W. Hess, Desert Research Institute, Las Vegas. Two days, plus previous evening flight. November 8 (p.m.), 9, 10.

A review of the regional flow systems, the groundwater recharge, and the unsaturated flow within the Nevada Test Site. Limited to United States citizens; documentation may be required. Flight to Las Vegas, late afternoon and early evening, November 8; ends at the Las Vegas airport, late afternoon, November 10. Limit: 60.

22. High-temperature Geothermal Resources of Western Nevada. Dennis T. Trexler, University of Nevada, Las Vegas (Reno office). One day, November 9.

Surface manifestation, geologic controls, and reservoir characteristics of active hydrothermal systems at Steamboat, Brady's, and Desert Peak Hot Springs. Leaves Reno by bus at 8 a.m.; returns late afternoon. Limit: 60.

NSF Division of Earth Sciences Announces Program Changes

Significant changes in the structure of the Division of Earth Sciences (EAR) at the National Science Foundation (NSF) include the addition of two new programs and name changes for three existing programs.

The new programs are Instrumentation and Facilities and the Continental Lithosphere. The Instrumentation and Facilities Program is designed to respond to instrumentation needs in university earth-science laboratories, especially when needed equipment is sufficiently costly that shared use is desirable. The Continental Lithosphere Program will deal with requests for multidisciplinary, multi-institutional research projects of sufficiently broad scope and importance that there is broad support from a major sector of the earth-science community.

In existing programs, Seismology and Deep Earth Structure has been changed to Seismology; Environmental Geology is now called Surficial Processes; and Mantle Geochemistry has become Volcanology and Mantle Geochemistry. Except for Volcanology and Mantle Geochemistry, which has been expanded to include all aspects of volcanological research, there is no change of scope for the programs.

The additions and changes were made in response to recommendations in the report "Opportunities for Research in the Earth Sciences" from the NAS/NRC Board on Earth Sciences and the priorities listed in the Earth Science Briefing of the NAS/NRC Committee on Science, Engineering and Public Policy.

Annual target dates for submission of proposals will continue to be announced in the NSF Bulletin. Although compliance with the target dates may reduce the time needed by NSF to reach a funding decision, proposals will be accepted at any time during the year. Instructions for preparation of proposals are included in "Grants for Scientific and Engineering Research" (NSF 83-57). Project descriptions should not exceed 15 single-spaced pages (the equivalent, 30 doubled-spaced pages, is acceptable) or they will be returned to the principal investigator.

REMINDER 1985 GSA ANNUAL MEETING ORLANDO, FLORIDA October 28-31

General Chairman: Anthony F. Randazzo, Dept. of Geology, University of Florida, Gainesville, FL 32611; (904) 392-6127

Technical Program Chairman: James F. Tull, Dept. of Geology, Florida State University, Tallahassee, FL 32306; (904) 644-1448

**Field trip proposals due June 1, 1984
Symposia proposals due January 1, 1985**

For other information, contact Sue Beggs, Meetings Manager, GSA, P.O. Box 9140, Boulder, CO 80301; (303) 447-2020

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Penrose Conference Scheduled on Geochemistry and Nuclear-Waste Repositories

To promote the interdisciplinary exchange of ideas related to the geochemistry of rock-waste-package interactions, a GSA Penrose Conference on "Geochemistry of the Environment near a High-level Nuclear Waste Repository" will be held on the southwest flank of Mount Hood, Oregon, September 9-14, 1984. Conveners are David G. Coles, Floyd N. Hodges, and Michael J. Apted (all of Battelle Pacific Northwest Laboratories, Richland, Washington) and Donald H. Alexander (Nuclear Regulatory Commission, Washington, D.C.). The conference will be cosponsored by the Nuclear Regulatory Commission.

Focus on Application

The purpose of the conference is to assemble a group of speakers who have expertise in the experimental and theoretical technologies related to nuclear waste disposal but who may have never applied their expertise to the problem of nuclear waste isolation. Other attendees would be expected to have research interest or experience in the technology of nuclear waste disposal. An absolute criterion for this conference is that it is *technical* and not programmatic. Participants will be chosen with strong consideration of this proviso. Geoscience disciplines that are applicable to studying the area of the repository-waste package include field studies of low-grade metamorphic rocks, laboratory investigations of hydrothermal reactions between rocks and fluids, reactions and transport mechanisms for hydrothermal ore deposits, clay stability, metallic corrosion in a geologic environment, water migration in a thermal field, solution chemistry effects (i.e., pH, Eh, complexants) on mineral phase stability—particularly radionuclide-bearing phases, experimental determination of sorption and solubilities of radionuclides under geologic conditions, and the formation of colloids as a potential nuclide transport mechanism.

The conference will emphasize hydrothermal conditions because the thermal load caused by the waste emplacement will initially raise temperatures up to 300 °C during its first few hundred years after disposal and because of the need to accelerate otherwise sluggish reactions in the laboratory. The repository zone immediately surrounding and including the waste will be emphasized due to the need to understand what constitutes the source for radionuclide release. Can the complex series of reac-

tions and consequent formation of alteration and corrosion products be simulated in laboratory tests? How can such test data be meaningfully extrapolated over time scales approaching hundreds of thousands of years? What confidence can be placed on such results, and can these extrapolations be made with reasonable assurance? Are there dominant processes that will control the release and migration of radionuclides? What are the state-of-the-art test methods that can be used to obtain the most relevant and defensible data on expected rock-waste-package interactions? These are some of the questions currently facing those concerned with waste disposal.

Field Trip

A one-day field trip to the North Santiam Mining District of the Western Cascades of Oregon, led by Michael L. Cummings and J. Michael Pollock of Portland State University, will give participants an opportunity to examine the character of and controls on hydrothermal alteration.

Registration

The registration fee is expected to be \$400 to \$500, including food, lodging, and the field trip. Applications should be sent to David G. Coles, Battelle Pacific Northwest Laboratories, P.O. Box 999, Richland, WA 99352 by June 1, 1984.

Those wishing to attend the conference should include a brief description of their reason for attending. Conference size will be limited to less than 70 participants.

Upcoming 1984 Penrose Conferences

Melanges of the Appalachian Orogen

June 23-30, 1984

Stephenville, Newfoundland

Registration fee: \$550 (GSA member); \$560 (nonmember)

Conveners: Harold Williams, Dept. of Earth Sciences, Memorial University of Newfoundland, St. Johns, Newfoundland A1B 3X5, Canada; (709) 737-8142 (dept.); Nicholas Rast, Dept. of Geology, University of Kentucky, Lexington, KY 40506; (606) 257-6222 (dept.); Brenna E. Lorenz, Dept. of Earth Sciences, University of Arkansas, Little Rock, AR 72204; (501) 569-3300 (dept.).

Geochemistry of the Environment near a High-level Nuclear Waste Repository

September 9-14, 1984

Mount Hood, Oregon

Registration fee: \$400-\$500

Conveners: David G. Coles, Battelle Pacific Northwest Laboratories, P.O. Box 999, Richland, WA 99352; Floyd N. Hodges and Michael J. Apted, Battelle Pacific Northwest Laboratories; Donald H. Alexander, Nuclear Regulatory Commission, Washington, D.C.

Transport Processes in Fractured Rock

September 23-28, 1984

Park City, Utah

Registration fee: \$410 (GSA member); \$420 (nonmember)

Conveners: Leslie J. Smith, Dept. of Geological Sciences, University of British Columbia, Vancouver, British Columbia V6T 2B4, Canada; (604) 228-2449; Frank W. Schwartz, Dept. of Geology, University of Alberta, Edmonton, Alberta T6G 2E3, Canada; (403) 432-3265.

PEOPLE

GSA Fellow **Robert H. Dott, Jr.**, University of Wisconsin, and Member **John P. Lockridge**, Mountain Petroleum, Denver, will receive American Association of Petroleum Geologists Distinguished Service Awards at the AAPG national convention in May.

Member **Jeanne E. Harris**, National Gas Corp. of California, Denver, has received from the Denver chapter of the Association for Women Geoscientists the Outstanding Woman of the Year award for 1983.

Fellow **Tjeerd Van Andel**, Stanford University, has been awarded the Van Waterschoot Van Der Gracht medal by the Royal Netherlands Geological Society.

Member **Suzanne H.L. Webel**, Conquest Exploration Co., Denver, received the 1983 Award for Continuing Leadership from the Denver chapter of the Association for Women Geoscientists.

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.

*Mail this application to the convener(s) of the conference(s) you wish to attend.
Names and addresses are given with each conference listing on p. 80.*

Memorials Volume XIV Now Available

GSA Memorials Volume XIV, containing the following memorials, is now available.

Henry Raymond Aldrich, by Robert W. Webb
Howard T. Anderson, by Steven C. Anderson
Nathan Wood Bass, by S. W. Lohman
Paul Sherman Bauer, by Richard S. Williams, Jr., and Magnús Magnússon
A. Lyndon Bell, by Alfred G. Fischer
Harlan Richard Bergquist, by Glen F. Brown
Leonard Gascoigne Berry, by Robert B. Ferguson
Clarence Eckhardt Brehm, by Wilton H. Webb
Arthur Francis Buddington, by R. B. Hargraves
Charles Eric Bruce Conybeare, by Michael John Rickard and David Ingle Smith
Max D. Crittenden, Jr., by V. R. Todd, J. E. Pike, and D. M. Miller
Randall Lee Gresens, by Eric S. Cheney
Robert Mann Grogan, by Francis J. Pettijohn
John Kyle Gustafson, by Donald H. McLaughlin
Sidney Henry Haughton, by Kingsley Dunham
Arne Junger, by Arthur G. Sylvester
Louis Kehrer-Erni, translated by G. Suter-Kehrer
Charles Rudolph Kolb, by Grover E. Murray and David E. Pope
Russell Stafford Knappen, by Sherman Alexander Wengerd and Florence Mather Wengerd
Harry Stephen Ladd, by Frank C. Whitmore, Jr., and Joshua I. Tracey, Jr.
Kenneth Knight Landes, by John A. Dorr, Jr.
Willard Frank Libby, by Leona Marshall Libby
John Becker Lucke, by Robert L. Nichols
Denis Eugene Marchand, by Jennifer W. Harden
John Douglas Marr, by Joseph L. Adler
Elliott Bates McKee, Jr., by Julian D. Barksdale
Phillip Leonidas Merritt, by Thomas E. Gillingham

Howard Augustus Meyerhoff, by Curt Teichert
Wallace Everette Pratt, by Amos Salvador
J. Fred Smith, Jr., by Irving J. Witkind
Alfred Kitchener Snelgrove, by Daniel A. Bradley
Johann Steiner, by Henry A. K. Charlesworth and J. Sebastian Bell
G. Gordon Suffel, by R. W. Hutchinson
Frank McKim Swartz, by William Spackman
Claude Nathan Valerius, by C. Lane Sartor
Emanuel George Zies, by Felix Chayes

The volume may be purchased for \$12.00 through Publication Sales, GSA, P.O. Box 9140, Boulder, CO 80501.

GSA Members Named to Board of Directors of Association for Women Geoscientists Foundation

GSA Members Lois K. Ongley, Gwenn M. Jensen, and Constance A. Sancetta and Fellow Maria Luisa B. Crawford have been selected by the Association for Women Geoscientists (AWG) Foundation to serve on its seven-member Board of Directors.

Ongley, independent, Houston, has been named president of the board; Jensen, Cities Service Oil & Gas Corp., Denver, is vice-president; Sancetta, Lamont-Doherty Geological Observatory, Palisades, New York, is secretary; and Crawford, Bryn Mawr College, Bryn Mawr, Pennsylvania, is an advisor.

The AWG Foundation, established in 1983, plans to provide grants to women studying geoscience, to support a geology field program in cooperation with the Girl Scouts of America, and to develop career guidance programs for female students in junior and senior high school.

Other members of the Board of Directors are Susan J. Mara, treasurer, and Judith B. Moody and A. F. Spilhaus, Jr., advisors.

GSA COMMITTEES SEEK CANDIDATES FOR APPOINTMENTS

The GSA Committee on Committees requests help from all members. As one of his duties, Vice-President Brian J. Skinner has appointed a group to look for talent to serve GSA as members of our committees and as our representatives to other organizations.

The Committee on Committees will meet in late July or early August and will present at least two nominations for each open position to Council at its November 7 meeting in Reno. During that meeting, individual councilors may add other names to the lists for consideration. The entire Council will then select appointees for all positions, thus completing the process of bringing new expertise into Society affairs.

The Committee on Committees for 1984 consists of the following people: *Bruce B. Hanshaw*, chairman, U.S. Geological Survey, 104 National Center, Reston, VA 22092, phone (703) 860-7488; *J. James Eidel*, Coastal Mining Company, 333 So. Carson Meadow Drive, No. 44, Carson City, NV 89701, phone (702) 883-9651; *G. Ross Heath*, School of Oceanography, Oregon State University, Corvallis, OR 97331, phone (503) 754-4763; *Elaine Padovani*, Earth Sciences Division, National Science Foundation, 1800 G Street NW, Washington, DC 20550, phone (202) 357-

7911; *Raymond A. Price*, Geological Survey of Canada, 601 Booth Street, Ottawa, Ontario K1A 0E8, Canada, phone (613) 995-4208.

This group is broadly based, both geographically and in disciplines, but its members cannot possibly know all the GSA members who are potential candidates for serving the Society. You can help them by volunteering yourself or by suggesting names of others you think should be considered for any of the openings.

In making recommendations, please give serious consideration to the special qualifications of the individual for a particular committee. To assist you in nominating GSA members for these various positions, the following brief summaries of what each committee does and what qualifications are desirable are provided. Please be sure that your candidates are Members or Fellows of the Society and that they meet fully the requested qualifications.

All nominations sent through headquarters will be forwarded to the committee members. **Deadline: June 15, 1984.** Listed below are the committees on which vacancies will occur. Appointments will be made by Council at its meeting in Reno.

COMMITTEES AND QUALIFICATIONS

Geology & Public Policy

Translates knowledge of the earth sciences into forms most useful for public discussion and decision making.

Committee members should have an awareness of public policy and decisions involving the science of geology. They should also be able to develop, disseminate, and translate information from the geologic sciences into useful forms for the general public and for the Society membership; they should be familiar with appropriate techniques for the dissemination of information.

Penrose Medal

Selects candidates for the Penrose Medal.

Committee members should be familiar with outstanding achievements in the geological community that are worthy of consideration for the honor. Emphasis is placed on "eminent research in pure geology which marks a major advance in the science of geology."

Day Medal

Selects candidates for the Arthur L. Day medal.

Committee members should have knowledge of those who have made "distinct contributions to geologic knowledge through the application of physics and chemistry to the solution of geologic problems."

Honorary Fellows

Selects candidates for Honorary Fellows, usually non-North Americans.

Committee members should have knowledge of geologists throughout the world who have distinguished themselves through their contributions to the science.

Membership

Screens Member and Fellow applications; evaluates membership benefits and makes recommendations to the Council about them.

Committee members must be GSA Fellows and must be

able to attend one meeting a year. Previous experience in recruitment programs and in the evaluation of professional qualifications is desired.

Nominations

Recommends to the Council nominees for the positions of GSA officers and councilors.

Committee members should be familiar with a broad range of well-known and highly respected geological scientists.

Research Grants

Evaluates research grant applications and selects grant recipients.

Committee members should have experience in directing research projects and in evaluating research grant applications.

Treatise on Invertebrate Paleontology

Advises the *Treatise* editor in all phases of *Treatise* policy including planning of new volumes as well as revisions; also gives advice on special editorial matters such as acceptance or rejection of contributed manuscripts.

Committee members should be familiar with and have a broad understanding of paleontology.

Joint Technical Program Committee, GSA Representatives-at-Large

Supervises the review of abstracts for papers to be presented at the annual meeting. Representatives-at-large should be specialists in either sedimentology, stratigraphy, or marine geology. These subdisciplines are not represented by any of the associated societies or GSA divisions.

GSA Representative to the North American Commission on Stratigraphic Nomenclature

Must be familiar with and have expertise in stratigraphic nomenclature.

NOMINATIONS FOR GSA COMMITTEES FOR 1985

Geology & Public Policy
(3 vacancies)

Penrose Medal
(2 vacancies)

Day Medal
(3 vacancies)

Honorary Fellows
(2 vacancies)

Membership
(2 vacancies;
must be a GSA Fellow)

Nominations
(4 vacancies)

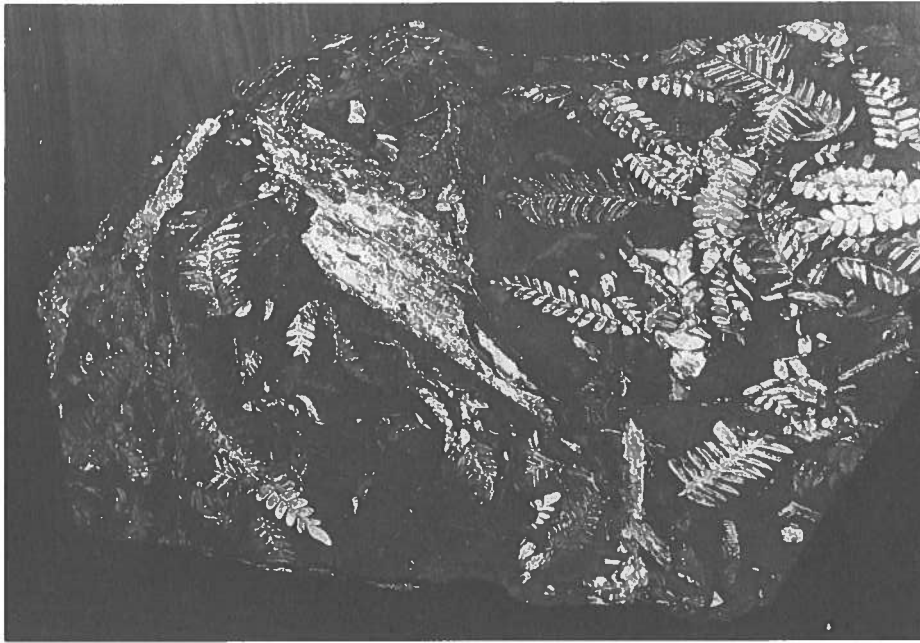
Research Grants
(2 vacancies)

*Treatise on Invertebrate
Paleontology* (1 vacancy;
must be a paleontologist)

Joint Technical Program
Representatives-at-Large
(2 vacancies; sedimentology,
stratigraphy,
marine geology)

GSA Representative for 1985
North American Commission
on Stratigraphic Nomenclature
(1 vacancy)

Reminder: Please include statements of nominees' qualifications for assignments.



SPECIMEN OF THE MONTH

The fossil plants shown here—*Pecopteris*, a true fern; *Aneimites*, a seed fern; and *Sphenophyllum*, a flax-like plant—grew during the Pennsylvanian Period (300 m.y. ago) and were buried in a sediment which, with intense pressure and chemical changes, became a black shale. These specimens were found above a layer of coal in an abandoned strip mine in Pennsylvania and are now on display at GSA headquarters. Come see this and many other specimens when you are in Boulder, Colorado.

Competition Opens for 1985-1986 Fulbright Scholar Awards

Fulbright Scholar Awards for 1985-1986 are available in all academic fields and a wide range of professions. This year's offerings include about 275 awards for post-doctoral research. The remainder of the approximately 750 total are for college and university lecturing or for consultative or teaching positions with governmental bodies or other professional institutions. More than 100 countries, in all geographic areas of the world, offer awards under the Fulbright program.

Information and applications can be obtained at graduate institutions from the office of the Graduate Dean, of International Programs, or of Research and Sponsored programs. On undergraduate campuses they are available from the office of the Chief Academic Officer. Prospective applicants may also write directly to the Council for International Exchange of Scholars, 11 Dupont Circle, Washington, DC 20036. **Application deadlines** for 1985-1986 are **June 15, 1984**—Australasia, India, and Latin America and the Caribbean; and **September 15, 1984**—Africa, Asia (except India), Europe, and the Middle East.

GSA SPECIAL PAPER 193 Late Eocene & Oligocene Paleosols from Badlands National Park, South Dakota

BY GREG J. RETALLACK

The Late Eocene and Oligocene White River and lower Arikaree Groups in the Pinnacles area of the Badlands are largely superimposed fossil soils (87 of them in 143 m of stratigraphic section). In this volume the author describes the features of the paleosols and provides description and classification of 10 paleosol series. He also reconstructs paleosols and their environments. Fascinating artwork.

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THE GEOLOGICAL SOCIETY OF AMERICA

MEETINGS

1984

Toxins Threatening to Health and Water, May 3, 1984, Brooklyn, New York. Information: E. Lynn Savage, Dept. of Geology, Brooklyn College, CUNY, Brooklyn, NY 11210; (212) 780-5620 or 780-5416.

International Conference on Case Histories in Geotechnical Engineering, May 6-11, 1984, St. Louis, Missouri. Information: Shamsher Prakash, University of Missouri—Rolla, Rolla, MO 65401; (314) 341-4461.

International Energy Conference, May 14-19, 1984, Regina, Saskatchewan. Information: Chairman, Energex '84, University of Regina, Regina, Saskatchewan S4S 0A2, Canada.

International Groundwater Symposium on Groundwater Resources Utilization and Contaminant Hydrogeology, May 21-23, 1984, Montreal, Canada. Information: A. Kohut, Ministry of the Environment, Victoria, British Columbia V8V 1X5, Canada.

Aquifer Restoration and Ground-Water Monitoring, 4th annual conference, May 23-25, 1984, Columbus, Ohio. Information: NWWA, 500 West Wilson Bridge Rd., Worthington, OH 43085; (614) 846-9355.

Current and Future National Water Problems and Issues As Related to Hydrology, May 31-June 1, 1984, Washington, D.C. Information: AIH Workshop Coordinator, P.O. Box 14251, St. Paul, MN 55114; (612) 379-1030.

25th U.S. Symposium on Rock Mechanics, June 25-27, 1984, Evanston, Illinois. Information: Charles H. Dowding, Dept. of Civil Engineering, Northwestern University, Evanston, IL 60201; (312) 492-7270.

International Symposium on Deep Structure of the Continental Crust: Results from Reflection Seismology, June 26-28, 1984, Ithaca, New York. Information: Muawia Barazangi, Dept. of Geological Sciences, Cornell University, Ithaca, NY 14853; (607) 256-6411; Telex 937478.

Canning Basin Symposium, June 27-29, 1984, Perth, Western Australia. Information: Phil Connard, Shell Development (Australia) Pty. Ltd., G.P.O., Box W2050, Perth, W. A. 6001, Australia.

Western Research Institute and U.S. Department of Energy Tar Sand Symposium, June 27-29, 1984, Vail, Colorado. Information: L. C. Marchant, Western Research Institute, P.O. Box 3395, University Station, Laramie, WY 82071.

Geotechnical Engineering Practice, lecture series, July 9-10, 1984, Medford, Massachusetts. Information: Tufts University Conference Bureau, Medford, MA 02155; (617) 381-3568.

Fossil Fuels of Europe Conference, July 15-18, 1984, Geneva, Switzerland. Information: AAPG, P.O. Box 979, Tulsa, OK 74101; (918) 584-2555.

8th World Conference on Earthquake Engineering, July 21-28, 1984, San Francisco, California. Information: EERI-8WCEE, 2620 Telegraph Ave., Berkeley, CA 94704.

Current Issues in Systematics, international meeting, July 1984, London, England. Information: C. J. Humphries, Dept. of Botany, British Museum, Cromwell Rd., London SW7 5BD, England; 01-589 6323, ext. 405.

27th International Geological Congress, August 4-14, 1984, Moscow, USSR. Information: Secretary General, 27th Inter-

national Geological Congress, Institute of the Lithosphere, USSR Academy of Sciences, 22, Staromonetny, Moscow, 109180, USSR; 231-48-36; Telex LITOS 411484.

International Cartographic Association 12th Conference and 7th General Assembly, August 6-10, 1984, Perth, Australia. Information: ICA Conference Director, P.O. Box 6208, Hay St., East Perth, Western Australia 6001; Telex AA95791 Minewa.

American Quaternary Association Eighth Biennial Meeting, August 13-15, 1984, Boulder, Colorado. Information: AMQUA, Office of Conference Services, Campus Box 153, University of Colorado, Boulder, CO 80310; (303) 492-5151.

NATO Advanced Study Institute Field Excursion in the British Caledonides, August 19-September 2, 1984. Information: A. L. Harris, Jane Herdman Laboratories of Geology, University of Liverpool, Brownlow St., P.O. Box 147, Liverpool L69 3BX, England.

Sixth International Palynological Conference, August 26-September 1, 1984, Calgary, Alberta, Canada. Information: Lois Kokoski, Conference Office, Faculty of Continuing Education, University of Calgary, Education Tower Room 102, Calgary, Alberta T2N 1N4, Canada; (403) 284-5051.

Symposium on Evolution of the Caledonide-Appalachian Orogen, September 3-8, 1984, Glasgow, Scotland. Information: Matt Bates, A. T. Mays, 12 Nineyard St., Scottcoats, Scotland KA21 5HP, U.K.

Oceans 84: Industry, Government, and Education—Designs for the Future, Conference and Exposition, September 10-12, 1984, Washington, D.C. Information: Oceans 84, Marine Technology Society, 1730 M St. N.W., Suite 412, Washington, DC 20036; (202) 659-3251.

International Gas Research Conference, September 10-13, 1984, Washington, D.C. Information: L. Hirsch, 8600 West Bryn Mawr Ave., Chicago, IL 60631; (312) 399-8300; Telex 253812.

Recent Advances in Petroleum Exploration and Development, September 24-28, 1984, Beijing, China. Information: BHP Petroleum, G.P.O. Box 1911R, Melbourne, 3001, Australia.

Tectonic Geomorphology, 15th Annual Binghamton Geomorphology Symposium, September 28-29, 1984, Binghamton, New York. Information: Marie Morisawa, Dept. of Geological Sciences, SUNY, Binghamton, NY 13901; (607) 798-2615.

Clay Minerals Society Annual Meeting, September 30-October 3, 1984, Baton Rouge, Louisiana. Information: Ray E. Ferrell, Dept. of Geology, Louisiana State University, Baton Rouge, LA 70803; (504) 388-5306.

International Symposium on Recent Investigations in the Zone of Aeration, October 1-5, 1984, Munich, West Germany. Information: P. Udluft, Inst. für Wasserchemie der TU München, Marchioninstr. 17, 8000 München 70, West Germany; telephone 089/7095 7086-98-80.

Big Programs on Small Machines—Research Methods on Mini- and Microcomputers, 13th Annual Geochautauqua, October 4-5, 1984, Morgantown, West Virginia. Information: M. E. Hohn, West Virginia Geological Survey, Morgantown, WV 26507; (304) 594-2331.

(continued on p. 86)

MEETINGS

Association of Engineering Geologists 27th Annual Meeting, October 7-13, Boston, Massachusetts. Information: Richard Sherman, Meeting Chairman, Metcalf & Eddy, 50 Staniford St., Boston, MA 02114; (617) 367-4236.

American Institute of Professional Geologists Annual Meeting, October 17-19, 1984, Orlando, Florida. Information: Bobby J. Timmons, Timmons Associates, P.O. Box 50606, Jacksonville Beach, FL 32250; (904) 246-4533. (Incorrectly printed as American Institute of Petroleum Geologists in February *News & Information* meetings listings.)

North Atlantic Palaeoceanography Conference, November 6-7, 1984, London, England. Information: N. Shackleton, Dept. of Quaternary Research, Godwin Laboratory, Free School Lane, Cambridge CB2 3RS, England.

International Conference on Ground-Water Technology, November 12-17, 1984, Johannesburg, South Africa. Information: David M. Nielsen, National Water Well Association, 500 West Wilson Bridge Rd., Worthington, OH 43085; (614) 846-9355.

Symposium on Geophysics in Kansas—A 25-year Update, November 13-14, 1984. Information: Don Steeples, Kansas Geological Survey, Lawrence, KS 66044; (913) 864-4991.

Ophiolites through Time, November 13-15, 1984, Nancy, France. Information: Jacqueline Desmons, Université de Nancy I, Faculté des Sciences, Laboratoire de Petrologie, B.P. n° 239, F-54506 Vandoeuvre-les-Nancy Cedex, France. (Abstracts deadline is September 1, 1984.)

1985

International Association of Hydrogeologists 17th International Congress, Hydrogeology of Rocks of Low Permeability, January 7-12, 1985, Tucson, Arizona. Information: Eugene S. Simpson, Hydrology & Water Resources, University of Arizona, Tucson, AZ 85721.

Salts and Brines '85, February 24-28, 1985, New York. Information: William C. Larson, Twin Cities Research Center, Bureau of Mines, 5629 Minnehaha Ave. S., Minneapolis, MN 55417; (612) 725-3464.

American Institute of Mining, Metallurgical and Petroleum Engineers Annual Meeting, February 24-28, 1984, New York. Information: Joan M. Andelman, AIME, 345 E. 47th St., New York, NY 10017; (212) 705-7677.

Geology of the Oceans, Geologische Vereinigung 75th annual meeting, February 27-March 2, 1985. Information: Michael Sarnthein, Geologisch-Palaeontologisches Institut, Universitaet, Ols-hausenstrasse, D-2300 Kiel, Federal Republic of Germany.

Paul F. Kerr Memorial Symposium, February 28, 1985, New York. Information: Otto C. Kopp, Dept. of Geological Sciences, University of Tennessee, Knoxville, TN 37996-1410.

Geological Association of Canada—Mineralogical Association of Canada Annual Meeting, May 15-18, 1985, Fredericton, New Brunswick, Canada. Information: H. W. van de Poll, Dept. of Geology, University of New Brunswick, P.O. Box 4400, Fredericton, N.B., Canada E3B 5A3; telephone (506) 453-4803; Telex 014-46-202.

26th U.S. Symposium on Rock Mechanics, June 26-28, 1985, Rapid City, South Dakota. Information: Eileen Ashworth, Dept.

of Mining Engineering, South Dakota School of Mines and Technology, Rapid City, SD 57701-3995; (605) 394-2344.

International Symposium on Karst Water Resources, July 7-19, 1985, Ankara and Antalya, Turkey. Information: A. Ivan Johnson, Woodward-Clyde Consultants, 7600 East Orchard Rd., Harlequin Plaza North, Englewood, CO 80111.

Sixth Gondwana Symposium, August 19-23, 1985, Columbus, Ohio. Information: Sixth Gondwana Symposium, Institute of Polar Studies, Ohio State University, Columbus, OH 43210; (614) 422-5431.

American Institute of Professional Geologists Annual Meeting, September 17-21, 1985, St. Paul, Minnesota. Information: Robert E. Pendergast, Geotechnical Engineering Corp., 1925 Oakcrest Ave., Roseville, MN 55113; (612) 636-7744.

GSA 1984 Meetings

Centennial Steering Committee, May 1, Boulder, Colorado

Executive Committee, May 2, Boulder, Colorado

Section Treasurers, May 2, Boulder, Colorado

Audit Committee, May 2, Boulder, Colorado

Council, May 3-4, Boulder, Colorado

Rocky Mountain Section, May 11-12, Durango, Colorado

Cordilleran Section, May 30-June 1, Anchorage, Alaska

Program Review Committee and Associated Society

Representatives, July 12, Boulder, Colorado

Joint Technical Program Committee, July 13, Boulder, Colorado

Annual Meeting, November 5-8, Reno, Nevada

Advanced Research Fellowships in India Available

The Indo-U.S. Subcommittee on Education and Culture is offering twelve long-term (six to ten months) and nine short-term (two to three months) awards, without restriction as to field, for 1985-1986 research in India. Applicants must be U.S. citizens at the postdoctoral or equivalent professional level. The fellowship program seeks to open new channels of communication between academic and professional groups in the United States and India and to encourage a wider range of research activity between the two countries than now exists. Therefore, scholars and professionals with limited or no experience in India are especially encouraged to apply.

Fellowship terms include \$1,500 per month, in dollars and rupees; an allowance for books and study/travel in India; and international travel for the grantee. In addition, long-term fellows receive international travel for dependents, a dependent allowance, and a supplementary research allowance. This program is sponsored by the Indo-U.S. Subcommittee on Education and Culture and is funded by the U.S. Information Agency, the National Science Foundation, the Smithsonian Institution, and the Government of India.

The application deadline is June 15, 1984. Application forms and further information are available from the Council for International Exchange of Scholars, Attention: Indo-American Fellowships Program, Eleven Dupont Circle, Suite 300, Washington, DC 20036; telephone (202) 833-4985.

MEMOIR 158

CONTRIBUTIONS TO THE Tectonics and Geophysics of Mountain Chains

Edited by R.D. Hatcher, H. Williams, and I. Zietz

The subjects covered by the 15 papers in this multi-disciplinary volume include regional geology and tectonics of the Appalachian orogen; comparisons with the Caledonides, Mauritanides, Alps, and the North American Cordillera; the application of

mechanical principles to the solution of structural problems; and the utilization of reflection seismology and data from aeromagnetic and gravity studies to interpret large-scale problems in the tectonics of mountain chains.

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GSA SPECIAL PAPER 194

THE GRENVILLE EVENT

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