



# GSA news & information

VOLUME 1, NO. 1

JANUARY 1979

## Toronto '78 Joint Annual Meeting of GAC-MAC-GSA and associated societies is second largest ever

Toronto, Ontario, Canada, is not a stranger to GSA meetings. The second meeting of the Society was held in Toronto in 1889, at which time 47 Fellows signed the meeting book. As a historical touch at the GSA annual dinner a reproduction of the list of signatures was included in the dinner program.

The total 1978 registration of 4,826 at Toronto has been exceeded only by the 5,351 at the Denver Annual Meeting in 1976. The on-site registration at the Toronto Annual Meeting included 1,371 professional registrants, 762 students, 128 guests, and 161 one-day registrants. The trend to preregister has continued and accounted for 1,821 professionals, 394 students, and 189 guests. Preregistration is a time-saving device (as well as money-saving) for those arriving at the meeting.

The 1978 Annual Meeting was 4 full days, as was the 1976 Denver meeting, in contrast to 3 days for the 1977 Seattle meeting, and the scheduled 3½ days for the 1979 meeting in San Diego.

From a total of 1,346 abstracts submitted, 1,038 papers were presented. These were grouped into 42 regular sessions and 35 half-day symposium sessions at which 340 papers were presented. Also, there were 155 poster presentations in 6 half-day sessions. The fifth symposium on geochemical cycles was held on Sunday preceding the meeting.

In association with the meeting there were 26 well-attended field trips. The trips included 73 leaders and were attended by 788 participants.

The GSA employment interview service was operated simultaneously with the Annual Meeting in Toronto. An added feature this year was a special briefing session on employment trends and outlook. The session was moderated by Richard A. Paull, University of Wisconsin, Milwaukee, and panel members were John D. Edwards, Shell

Oil Co.; Penelope Hanshaw, U.S. Geological Survey; Thornton L. Neathery, Alabama Geological Survey; Chester E. Nichols, Union Carbide Corp.; and George W. Mannard, Texasgulf, Inc. At the meeting 68 employers conducted 865 interviews in the booths provided; 7 posted job descriptions and used the message center; many others posted job notices and interviewed outside the employment service; 12 employers received printouts before the meeting but did not interview in Toronto; and an additional 12 employers requested printouts to be sent after the meeting. Before the meeting, there was a total of 369 applicants on the file, 258 preregistered applicants attended the meeting, and 74 applicants registered at the meeting.

Exhibits are always an important part of an annual meeting and the exhibit hall at Toronto was a major attraction. There was a total of 121 booth spaces occupied by 37 educational exhibitors and 54 technical exhibitors.

The Toronto '78 committee is congratulated and thanked for their outstanding job of planning and organizing the joint meeting with the Geological Association of Canada and the Mineralogical Association of Canada. The work of a local committee starts several years before the meeting and is the key to a successful meeting. In case you have forgotten who did the work, the committee membership follows: *Duncan R. Derry*, Honorary Chairman; *Paul M. Kavanagh*, General Chairman; *John S. Auston*, Deputy General Chairman; *J. Jeffrey Fawcett*, Technical Program; *Norah J. Allman*, Information and Publicity; *Donald H. Gorman*, Student Assistance; *W. O. MacKasey*, Field Trips; *Steven D. Scott*, Technical Services; *Marilyn Seigel*, Social Program; *Walter M. Tovell*, Science Theater; *Mary-Claire Ward*, On-site Registration and Transportation; and *Denis E. Clarke*, Recording Secretary.

# GSA UPDATE . . .

## February 1, 1979, deadline set for Honors and Awards nominations

The Committee on Honors and Awards solicits help from Fellows and Members in nominating potential recipients of GSA's highest honors—the Penrose Medal, the Day Medal, and Honorary Fellowship.

The deadline for receipt of nominations for 1979 has been established as February 1. Nominees for each award are screened by a separate subcommittee, which then makes its recommendations to the Committee on Honors and Awards, which in turn presents the selected names to the Council for approval. Nominations arriving before the deadline are forwarded to the appropriate subcommittee; those arriving after the deadline are held for the following year.

To ensure thorough consideration, each suggested nomination should be backed up with a brief biographical sketch and a summary of his or her chief contribution to geology. In the case of the Penrose and Day Medals, a selected bibliography must accompany the nomination.

The Society regularly awards two gold medals, the Penrose Medal and the Arthur L. Day Medal, to honor scientists who have achieved very special distinction in their contributions to research in geology. Annually, it also elects certain internationally outstanding geologists as Honorary Fellows.

### Penrose Medal

The terms of the bequest from R.A.F. Penrose, Jr., states the following:

"The Medal of the Society shall be made of gold of an appropriate weight of 3 ounces, and shall be awarded in recognition of eminent research in pure geology. The award shall be made in recognition of outstanding original contributions or achievements which mark a decided advance in the science of geology, and only at such time or times as the Council may decide.

"Nominees for the Medal shall be selected by the Council of the Geological Society of America, and may

or may not be members of the said Society. Nominees for the Medal may be selected from any nation or any race of people."

### Arthur L. Day Medal

The terms of the endowment bequest state the following in regard to the award:

". . . a Gold Medal may be awarded annually, or less frequently, at the discretion of the Council for outstanding distinction in contributing to geologic knowledge through the application of physics and chemistry to the solution of geologic problems."

### Honorary Fellows

The Council rules state the following concerning Honorary Fellows:

"Geologists who have distinguished themselves as geological investigators or in rendering special service to the Society may be elected as Honorary Fellows. Except in exceptional circumstances, the candidates shall be residents outside North America."

### Other Awards

In addition to these three Society awards, four of the GSA Divisions confer honors and awards to authors of published works of distinction that advance their specialized science or related fields. These are the **Kirk Bryan Award**, conferred by the Quaternary Geology and Geomorphology Division, with approval of the Council; the **O. E. Meinzer Award**, conferred by the Hydrogeology Division, with approval of the Council; the **E. B. Burwell, Jr. Award** conferred by the Engineering Geology Division, with approval of the Council; and the **Gilbert H. Cady Award**, conferred by the Coal Geology Division, with the approval of the Council.

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### CHANGE OF ADDRESS,\*

The Geological Society of America, 3300 Penrose Place, Boulder, CO 80301

NAME \_\_\_\_\_

(Please print)

New Address \_\_\_\_\_

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\*North American subscribers should report address changes 6 weeks in advance; all others, 3 months in advance.

## Information on microfiche readers and reader-printers

Many *Bulletin* readers have inquired concerning the variety, availability, and cost of microfiche readers. The information table below provides general guidelines for choosing appropriate readers for particular uses.

A 20-page illustrated consumer guide, "How to select a

microform reader-printer" is available for \$2 from National Micrographics Association Publications, National Microfilm Association, Suite 1101, 8728 Coleville Road, Silver Spring, Maryland 20910.

### GENERAL INFORMATION ON MICROFICHE READERS

Type	Description	Advantages	Cost
<b>HAND-HELD or POCKET READER</b>	A hand-held reader is a hand lens in a plastic holder about the size of a flashlight; it measures about 15 cm x 5 cm x 3 cm.	Hand-held readers may be illuminated by ambient light, batteries, or a 110-volt adaptor. These readers are designed for quick reference and field uses rather than for prolonged periods of reading.	\$ 15 to \$ 90
<b>LAP READERS</b>	Lap readers are very compact and light weight; they measure about 23 cm x 30 cm x 8 cm.	Lap readers are equipped for AC or 12-volt operation. They are not readily portable due to their light construction but fit easily in a briefcase.	\$ 45 to \$ 150
<b>PORTABLE READERS</b>	Portable readers are designed as self-contained cases, similar in size to a briefcase.	Portable readers are versatile and operate equally well with AC, battery, or 12-volt power. They are light weight and compact, easily transported, and very sturdy. The microfiche image can be projected on a wall for group presentations.	\$150 to \$ 260
<b>DESK READERS</b>	Desk readers are stationary units operated on a desk, table, or stand.	Desk readers are compact in order to conserve work space. They provide a greater image-viewing area, better lenses, and a wider choice of operational features.	\$130 to \$ 350
<b>READER-PRINTERS</b>	Reader-printers are designed for viewing and for producing page-size paper copies from individual microfiche frames.	Reader-printers are large and stationary. Paper copies are printed at a rate similar to that of other photocopying units.	\$900 to \$3,500

## Memorials Volume VIII now available

Memorials Volume VIII is now available, containing the following memorials: Harold MacColl Bannerman (1897-1976) by W. H. Bradley; Leslie Madison Clark (1898-1976) by E. W. Shaw; Arthur Earl Fath (1887-1976) by Walter M. Small; Richard Foster Flint (1902-1976) by Stephen C. Porter; Richard Eugene Fuller (1897-1976) by Julian D. Barksdale; Roald Hilding Fryxell (1934-1974) by friends of R. H. Fryxell; Ansel Miller Gooding (1924-1976) by C. W. Martin, R. O. Kapp, and W. J. Wayne.

Marjorie Hooker (1908-1976) by Anna Jespersen; Benjamin Franklin Howell (1890-1976) by Erling Dorf; Gerald Elgin Knowles (1923-1976) by Mason L. Hill; Phillip H. Kuenen (1902-1976) by Francis P. Shepard; Frank Albert Morgan (1898-1976) by Mason L. Hill; William Charles Rasmussen (1917-1973) by Henry C. Barksdale; Eugene C. Reed (1901-1976) by V. H. Dreeszen.

William Low Russell (1897-1976) by Robert J. Stanton, Jr.; John Roy Sandidge (1897-1976) by Samuel P. Ellison, Jr.; Ned Myron Smith (1923-1976) by M. William Pullen and Ted V. Jennings; Eugene J. Szmuc (1927-1976) by

Rodney M. Feldmann; Martin Van Couvering (1888-1976) by Frank B. Conselman; James Marvin Weller (1899-1976) by H. B. Willman; Eugene J. Wilson (1921-1976) by Robert M. Kleinpell; Monta Eldo Wing (1897-1976) by David M. Delo.

Books may be purchased for \$9.00 through the Publication Sales Department, GSA, 3300 Penrose Place, Boulder, CO 80301.

### GSA News & Information

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Prepared from contributions from the staff and membership by John C. Frye, Executive Director; Jo Fogelberg, Publications Manager; and June Thomas, Judy Hall, and Renée Gitchell, Production Assistants.

# Who's who of GSA: Officers and councilors for 1979

The direction and destiny of the Geological Society of America are in the hands of the officers and councilors that you, the membership, elect each year. All too often only a few of these individuals are known to any one member. For that reason it has been suggested that a few basic facts about each of them serving during 1979 be listed in the Society's *News and Information*. The following is our attempt to condense a great deal of information about each into a few words.

## PRESIDENT

**LEON T. SILVER**, b. Monticello, NY, 4-9-25; m. 47; c. 2; m. 74. **PETROLOGY, GEOCHEMISTRY.** BS, Univ. Colorado, 45; MS, New Mexico Univ., 48; PhD (petrol., geochem.), California Inst. Technol., 55. Jr. geol., 47-65, geol., USGS, 65-76; asst. prof. to assoc. prof. geol., 55-65, **PROF. GEOL., CALIFORNIA INST. TECHNOL.**, 65-. Guggenheim fel., 64-65. Mem. Subcomm. Geochron., Intl. Union Geol. Sci., 70-; consult., NASA, 71-. Mem. Board of Mineral & Energy Res., NRC, 75-; Except. Sci. Achievement Medal, NASA, 71. Mem. Natl. Acad. Sci.; fel. Geol. Soc. Amer.; fel. Mineral. Soc. Amer.; Geochem. Soc.; Amer. Geophys. Union. Igneous and metamorphic petrology; geochemistry of uranium, thorium and lead; geochronology; regional geology of southwestern United States; tectonic history of North America; mineralogy and petrology of meteorites and lunar materials. Address: Division of Geological and Planetary Sciences, California Institute of Technology, Pasadena, CA 91125. Phone: (213) 795-6811, Ext. 2101.

## VICE-PRESIDENT

**LAURENCE L. SLOSS**, b. Mountain View, CA, 8-26-13; m. 37; c. 2. **GEOLOGY.** BA, Stanford Univ., 34; PhD (geol.), Univ. Chicago, 37. From instr. to assoc. prof. geol., Montana School Mines, 37-46; geol., State Bur. Mines & Geol., Montana, 37-46; from lectr. to assoc. prof., 47-54, **PROF. GEOL., NORTHWESTERN UNIV.**, 54-. Amer. Assn. Adv. Sci.; Amer. Geophys. Union; fel. Geol. Soc. Amer.; Paleont. Soc.; Soc. Econ. Paleont. & Mineral. Sedimentary petrology; stratigraphic analysis; regional sedimentary tectonics. Address: Department of Geological Sciences, Northwestern University, Evanston, IL 60201. Phone: (312) 492-7539.

## PAST-PRESIDENT

**PETER T. FLAWN**, b. Miami, FL, 2-17-26; m. 46; c. 2. **GEOLOGY.** BA, Oberlin Coll., 47; MS, Yale, 48; PhD (geol.), 51. Jr. geol., USGS, 48-49; res. sci. & geol., Bur. Econ. Geol., 49-60, dir. bur. & prof. geol., 60-70, dir. div. natural res. & envir., 70-72, v. pres. acad. affairs, 70-72, prof. geol. sci. & prof. public affairs, 70-73, exec. v. pres., Univ. Texas, Austin, 72-73; pres., Univ. Texas, San Antonio, 73-77; **PROF. GEOL. SCI. & PROF. PUBLIC AFFAIRS, UNIV. TEXAS, AUSTIN**, 77-

USAAF, 44-45. fel. Geol. Soc. Amer.; Amer. Assn. Petrol. Geol.; Amer. Inst. Mining, Metall. & Petrol. Eng.; Natl. Acad. Eng.; Hon. Mem. Assn. Amer. State Geol.; Assn. Prof. Geol. Sci.; Soc. Econ. Geol.; Sociedad Geologica Mexicana. Economic and environmental geology; geology of Texas and Mexico. Address: Department of Geological Sciences, The University of Texas, Austin, TX 78712. Phone: (512) 471-4962.

## TREASURER

**WILLIAM B. HEROY, JR.**, b. Washington, DC, 8-13-15; m. 37; c. 4. **GEOLOGY, GEOPHYSICS.** AB, Dartmouth Coll., 37; PhD (geol.), Princeton, 41; adv. mgt. prog., Harvard Univ., 61. Asst. geol., Princeton, 39-41; asst. geol. field party, 41-42, geol., Texaco Co., 42-45; Geotech. Corp., 45-46, supvr., 46-50, v. pres & dir., 50-59, exec. v. pres., 59-61, pres., 61-65; exec. v. pres., 65-68, pres., Geotech. Div., 65-67, group mgr., 67-68, asst. to pres., Teledyne, Inc., 68-70; v. pres.-treas., 70-76, **PROF. GEOL. SCI., SOUTHERN METHODIST UNIV.**, 70-. fel. Geol. Soc. Amer.; Soc. Explor. Geophys.; Soc. Econ. Geol.; Seismol. Soc. Amer.; Amer. Assn. Petrol. Geol.; Amer. Geophys. Union. Geology of the Shell Canyon area; economic geological petroleum; geophysical prospecting; surface and structural geology; stratigraphy, sedimentation and seismology. Address: 111 Heroy Building, Southern Methodist University, Dallas, TX 75275. Phone: (214) 692-2425.

## COUNCILOR 1977-1979

**PAUL A. BAILLY**, b. Paris, France, 12-3-26; m. 58; c. 2. **GEOLOGY.** MS, Univ. Nancy, France, 48; Grad. Studies, Intl. Inst. Educ. Fellowship, Yale, 48-49; PhD (geol.), Stanford Univ., 51; Amer. Mgmt. Assn., Mgmt. Seminars, 62-65. Field geol. instr., Stanford Univ., 50-51; Second Lieut., French Paratroops, 51-52; field geol. (Morocco), Kennecott Copper Corp., 52; field geol., 53-56, expl. dist. mgr., 57-60, pres., Bear Creek Mining Co., 60-67; **PRES., OCCIDENTAL MINERALS CORP.**, 68-. Mem. Soc. Econ. Geol.; Geol. Soc. Amer.; Amer. Inst. Mining, Metall. & Petrol. Eng.; Canadian Inst. Mining & Metall.; Mem. Editorial Board Econ. Geol., 65-68; Mem. Adv. Comm. Program Eng. Develop., Univ. Minnesota, 69-72; Mem. Panel ad hoc Comm. Materials Policy, NMAB, NRC, 72; Mem. Comrate, Comm. Mineral Res. & Envir., NAS, 72-75; Chmn. Comrate's Task Force Minerals Policy, 73-74; Mem. Adv. Board Office Earth Sci., NRC, 77-80. Author of numerous articles on geology, exploration, mine development, and public land laws. Address: Occidental Minerals Corp., Irongate Building 4, 777 South Wadsworth Blvd., Lakewood, CO 80226. Phone: (303) 988-2200.

## COUNCILOR 1977-1979

**RANDOLPH W. BROMERY**, b. Cumberland, MD, 1-18-26; m. 47; c. 5. **GEOLOGY, GEOPHYSICS.** BS, Howard Univ., 56; MS, American Univ., 62; PhD, Johns Hopkins Univ., 68. Explor. geophy., USGS, 48-67; geophy. consult., US Dept. State, 67-68; assoc. prof. geophy., 67-69,



Leon T. Silver



Laurence L. Sloss



Peter T. Flawn



William B. Heroy, Jr.

prof. geophy., chmn. dept. geol. & geog., 69-70, v. chancellor, 70-72, chancellor, Univ. Massachusetts, Amherst, 72-. EXEC. V. PRES., UNIV. MASSACHUSETTS, 77-. Commendation, Rep. Liberia Geol. Surv., 66; Cum Laude, Howard Univ.; Hon. Doc. Educ. degree, Western New England Coll., 72; Hon. Doc. Sci. degree, Frostburg State Coll., 72; Hon. Doc. Laws degree, Univ. Hokkaido, Japan, 76. Mem. Spec. Pres. Adv. Panel Minority Part. Sci., NAS; Mem. Natl. Comm. Mineral Res. & Environ., NAS, 72; Chmn. Adv. Comm. Sec. Interior, Washington, DC; Mem. Commission Human Res., NAS; Mem. Sea Grant Review Comm., US Dept. Commerce; Incorporator, Woods Hole Oceanography Inst.; Dir. Singer, Exxon, NW Mutual Life Ins. Co., New England Tel.; Chmn. Sea Grant Review Panel; Mem. Adv. Comm., NASA. Address: Office of the Chancellor, Whitmore Administration Building, University of Massachusetts, Amherst, MA 01003. Phone: (413) 545-2211.

#### COUNCILOR 1977-1979

DON U. DEERE, b. Corning, IA, 3-17-22; m. 44; c. 2. ENGINEERING GEOLOGY. BS, Iowa State Univ., 43; MS, Univ. Colorado, 49; PhD, Univ. Illinois, 55. Asst. prof., 46-48, assoc. prof. & head CE dept., Univ. Puerto Rico, 49-51; assoc. prof., 55-58, prof., Univ. Illinois, 59-72; vis. prof., Univ. Florida, 74-75; CONSULT., 72-. Mem. Tau Beta Pi; Phi Kappa Phi; Amer. Soc. Civil Eng.; Amer. Inst. Mining, Metall. & Petrol. Eng.; Amer. Soc. Testing & Mtl.; Intl. Soc. Rock Mech.; Amer. Geophys. Union; Amer. Assn. Adv. Sci.; Geol. Soc. Amer.; Assn. Engr. Geol.; Assn. Prof. Geol. Sci.; Geol. Soc. London; Natl. Acad. Eng.; Natl. Acad. Sci. Mem. Rock Mech. Comm., NAS; Board Dir., Intl. Soc. Rock Mech.; Chmn. Comm. Rock Mech., ASTM; Comm. Rapid Excavation, Rock Mech., NAS; Comm. Soil Mech & Found., ASCE; Chmn. Comm. Stand. Lab. & Field Tests, Intl. Soc. Rock Mech.; Chmn. Subcomm. Nomenclature & Classif. Rock, ASTM; Comm. Underground Works of US for Large Dams; Chmn. US Natl. Comm. Tunneling Tech., NAS/NAE. Address: 6834 S.W. 35th Way, Gainesville, FL 32601. Phone: (904) 378-3061.

#### COUNCILOR 1977-1979

M. GORDON WOLMAN, b. Baltimore, MD, 8-16-24; m. 51; c. 4. GEOLOGY. BA, Johns Hopkins Univ., 49; fel., Harvard, 50; MA, 51; PhD (geol.), 53. GEOL., USGS, 51-; PROF. GEOG. & CHMN. DEPT. GEOG. & ENVIRON. ENG., JOHNS HOPKINS UNIV., 58-. USNR, 43-46. Geol. Soc. Amer.; Amer. Geophys. Union; Assn. Amer. Geog. (award, 72). River morphology; water resources. Address: Department of Geography & Environmental Engineering, Johns Hopkins University, Baltimore, MD 21218. Phone: (301) 338-7090.

#### COUNCILOR 1978-1980

WILLIAM C. BRADLEY, b. Madison, WI, 2-22-25; m. 58; c. 3. GEOLOGY. BS, Univ. Wisconsin, 50; MS, Stanford, 53, PhD (geol.), 56. Instr. to assoc. prof., 55-68, chmn. dept., 68-72, PROF. GEOL., UNIV. COLORADO, 68-; res. sci., Univ. Texas, 65-66; Pres., Colorado Sci. Soc., 69; vis. lect., Univ. Adelaide, 73-74. Amer. Assn. Adv. Sci.; Geol. Soc. Amer. Geomorphology. Address: Department of Geological Sciences, University of Colorado, Boulder, CO 80309. Phone: (303) 492-6188.

#### COUNCILOR 1978-1980

WILLIAM R. DICKINSON, b. Nashville, TN, 10-26-31; m. 53, 70; c. 2. GEOLOGY. BS, Stanford, 52, MS, 56, PhD (geol.), 58. Asst. prof. to assoc. prof., 58-68, PROF. GEOL., STANFORD UNIV., 68-. Guggenheim fel., 65. Amer. Assn. Adv. Sci.; Geol. Soc. Amer.; Amer. Assn. Petrol. Geol.; Soc. Econ. Paleont. & Mineral.; Amer. Geophys. Union; Natl. Assn. Geol. Teachers. Petrology; structural geology; sedimentology; plate tectonics. Address: Department of Geology, Stanford University, Stanford, CA 94305. Phone: (415) 497-2537.

#### COUNCILOR 1978-1980

ROBERT N. GINSBURG, b. Wichita Falls, TX, 4-26-25; m. 56. SEDIMENTOLOGY. AB, Univ. Illinois, 48; MA, Univ. Chicago, 50, PhD (geol.), 53. Asst. marine geol., Marine Lab., Univ. Miami, 50-54; res. geol., 54-60, res. assoc. geol., Shell Develop. Co., 60-65; prof. geol. & oceanog., Johns Hopkins Univ., 65-70; PROF. SEDIMENTOL., COMP. SEDIMENTOL. LAB., UNIV. MIAMI, 70-. fel. Geol. Soc. Amer.; Soc. Econ. Paleont. & Mineral.; Amer. Assn. Petrol. Geol. Recent sediments; coral reefs; ancient and modern algal structures; carbonate geochemistry; marine geology. Address: University of Miami, Fisher Island Station, Miami Beach, FL 33139. Phone: (305) 672-1840.

#### COUNCILOR 1978-1980

JAMES B. THOMPSON, JR., b. Calais, ME, 11-20-21; m. 57. PETROLOGY, GEOCHEMISTRY. AB, Dartmouth Coll., 42; PhD, Massachusetts Inst. Technol., 50, Instr. geol., Dartmouth Coll., 42; asst., 46-47, instr., Massachusetts Inst. Technol., 47-49; instr. petrol., 49-50, asst. prof. petrog., 50-55, assoc. prof. mineral., 55-60, PROF. MINERAL., HARVARD UNIV., 60-. Ford Found. fel., 52-53; Guggenheim fel., 63; A. L. Day Medal, Geol. Soc. Amer., 64. Natl. Acad. Sci.; Amer. Assn. Adv. Sci.; fel. Geol. Soc. Amer.; fel. Mineral. Soc. Amer.; fel. Amer. Acad. Arts & Sci. Metamorphic petrology; geology of New England. Address: Department of Geological Sciences, Harvard University, Cambridge, MA 02138. Phone: (617) 495-2083.

#### COUNCILOR 1979-1981

HELEN TAPPAN LOEBLICH, b. Norman, OK, 10-12-17; m. 39; c. 4. MICROPALAEONTOLOGY. PALEOECOLOGY. BS, Univ. Oklahoma, 37, MS, 39; PhD (geol.), Univ. Chicago, 42. Asst. geol., Univ. Oklahoma, 37-39; instr., Tulane Univ., 42-43; geol., USGS, 43-45, 47-59; Guggenheim fel., 54; hon. res. assoc. paleont., Smithsonian Inst., 54-57; lectr. geol., 58-65, assoc. res. geol., 61-63, sr. lectr. geol., 65-66, v. chmn. dept., 73-75, PROF. GEOL., UNIV. CALIFORNIA, LOS ANGELES, 66-. Soc. Econ. Paleont. & Mineral.; Amer. Micros. Soc.; fel. Geol. Soc. Amer.; Paleont. Soc.; Soc. Protozool.; Phycological Soc. Amer. Micropaleontology; living and fossil foraminiferans, tintinnids, thecamoebians and organic-walled, siliceous and calcareous phytoplankton; morphology, taxonomy, ecology, primary productivity and food chains, evolution and extinctions. Address: Department of Earth & Space Sciences, University of California, Los Angeles, CA 90024. Phone: (213) 825-1563.

#### COUNCILOR 1979-1981

JOHN D. MOODY, b. Denver, CO, 12-4-18; m. 45; c. 3. GEOLOGY. Geol. Engr., Colorado School Mines, 40, Petrol. Prod. Engr., M. Geol. Engr., 47. From surv. to explor. coordinator, Gulf Oil Corp., 38-60; mgr. explor., Plymouth Oil Co., 60-62; mgr. explor., Socony Mobil Oil Co., 62-63; exec. v. pres. for explor. & prod., 63-67, sr. v. pres., Mobil Oil Corp., 67-74; CONSULT., 74-; PRES., MOODY-ROBERTSON CONSULT., 75; PRES., INTL. OIL & GAS CORP., 77-; PRES., MINEX, INC., 77-. Alberta Soc. Petrol. Geol.; Amer. Assn. Adv. Sci.; Amer. Assn. Petrol. Geol.; Amer. Geophys. Union; fel. Geol. Assn. Canada; fel. Geol. Soc. Amer.; fel. Geol. Soc. London; Assn. Prof. Geol. Sci. Consultant on petroleum, geology, energy and minerals. Supervised and conducted exploratory and development projects worldwide. Address: 950 Third Avenue, 18th Floor, New York, NY 10022. Phone: (212) 935-0774.

#### COUNCILOR 1979-1981

RAYMOND A. PRICE, b. Winnipeg, Manitoba, 3-25-33; m. 56; c. 3. STRUCTURAL GEOLOGY, TECTONICS. BS, Univ. Manitoba, 55; MA, Princeton Univ., 57, PhD (geol.), 58. Geol., Geol. Surv. Canada, 58-68; assoc. prof. geol., 68-70, PROF. GEOL., QUEENS UNIV., ONTARIO, 70-, HEAD DEPT. GEOL. SCI., 72-; Chmn. Canada Subcomm. Geodynamics; Mem. Canada Avd. Comm. Rock Mech.; assoc. ed. Canada Journal Earth Sci. & Geol. Soc. Amer.; Mem. Canada Natl. Comm. Intl. Geol. Correlations Prog., 74; Intl. Union Geodesy & Geophys., 74-78. fel. Geol. Soc. Amer.; fel. Geol. Assn. Canada; Amer. Assn. Petrol. Geol.; fel. Royal Soc. Canada; Amer. Geophys. Union. Regional geology of southern Canadian Rockies; tectonic evolution of North American Cordillera; nature and significance of variations in tectonic style; mechanics of large-scale thrust faulting; mesoscopic fabric analysis; flexural-slip folding. Address: Department of Geological Sciences, Queens University, Kingston, Ontario K7L 3N6. Phone: (613) 547-2799.

#### COUNCILOR 1979-1981

JACK A. SIMON, b. Champaign, IL, 6-17-19. GEOLOGY. BA, Univ. Illinois, 41, MS, 46. From asst. geol. to assoc. geol., 46-53, geol. & head coal div., 53-67, prin. geol., 67-73, asst. chief, 73-74, CHIEF, ILLINOIS STATE GEOL. SURV., 74-; PROF. METALL. & MINING, UNIV. ILLINOIS, 74-. Amer. Assn. Adv. Sci.; Geol. Soc. Amer.; Amer. Assn. Petrol. Geol.; Amer. Inst. Mining, Metall. & Petrol. Eng.; Assn. Prof. Geol. Sci.; Soc. Econ. Geol.; Soc. Econ. Paleont. & Mineral. Coal resources, coal mining geology; Pennsylvanian stratigraphy. Address: Chief, Illinois State Geological Survey, Natural Resources Building, Urbana, IL 61801. Phone: (217) 344-1481.



# CORDILLERAN SECTION, GSA, APRIL 9-11, 1979 . . .

The Cordilleran Section of the Geological Society of America, honoring the centennial of the U.S. Geological Survey, will hold its 75th annual meeting with the 66th annual meeting of the Paleontological Society, Pacific Coast Section, at the Student Union on the campus of San Jose State University, San Jose, California, on April 9-11, 1979.

## REGISTRATION

Registration will be by preregistration as well as at the welcoming party at the San Jose Hyatt House Hotel, Sunday evening, April 8, from 1930 to 2300 hours, and at the San Jose State University Student Union during the meeting. Preregistration costs are \$15 for professionals, \$2 for GSA Student Associates, and \$5 for other students. On-site registration is \$25 for professionals and \$5 for all students.

All are urged to take advantage of the lower preregistration rates. **Preregister before March 21, 1979 (or March 9, if field trips are included).**

**Two free drink tickets** for the Sunday night welcoming party will be provided to all **professional preregistrants**, and one free entrance ticket for the young people's party on Tuesday night will be provided to **student preregistrants**.

Refunds on cancelled preregistrations and luncheons will be made only until March 30, 1979, less a \$5 processing fee. Refunds will be made for field trip fees only until March 21, unless the trip is cancelled. After March 30, 1979, no refunds of any type will be made, except for cancelled trips.

## \*WELCOMING PARTY

On Sunday evening, April 8, a no-host cocktail party will be held at the Hyatt House Hotel (Mediterranean Room) from 1930 to 2300 hours. Professional preregistrants will receive two free drink tickets for this party.

## \*YOUNG PEOPLE'S PARTY

For Tuesday night, 2000 to 2400 hours, April 10, the San Jose State University

\*Both parties are open to all GSA registrants.

Geology Club has organized a party featuring a live band and dancing at the San Jose Convention Center (Exhibition Hall II). Student preregistrants will receive one free entrance ticket. Price of admission for other registrants is \$3.00.

## QUESTIONS OR PROBLEMS

If you have questions or problems contact Calvin Stevens, Local Cochairman, Geology Department, San Jose State University, San Jose, CA 95192; telephone: (408) 277-2385.

## SYMPOSIA (in honor of the U.S. Geological Survey centennial)

(1) *The G. K. Gilbert Symposium: Quaternary History of the San Francisco Bay Region* (Ray Pestrong, organizer)

\* (2) *The W. H. Dall Symposium: The Quick and the Dead—Studies of Living and Fossil Organisms* (Judy Smith, organizer)

(3) *The W. C. Mendenhall Symposium: Glacial Geology of the Arctic* (Mort D. Turner, organizer)

(4) *The W. T. Lee Symposium: Geologic and Hydrologic Effects of Southwestern Storms, 1976-1978* (William M. Brown III, organizer)

(5) *The Clarence King Symposium: Stratigraphy and Structure of Wall Rocks of the Sierra Nevada Batholith* (Warren Nokleberg and Elwood Brooks, organizers)

(6) *The John Wesley Powell Symposium: Human Impact on Arid Lands* (John Nakata and Howard Wilshire, organizers)

(7) *The J. P. Pardee Symposium: Worldwide Quaternary Faulting* (Lloyd Clutt, organizer)

(8) *The C. C. Birdseye Symposium: The Southern California Uplift Revisited* (Thomas E. Gay, organizer)

\* (9) *The Ralph Arnold Symposium: Famous Fossil Fields Revisited* (Stephen Rowland, organizer)

(10) *The C. A. Anderson Symposium: Cenozoic Volcanic Rocks of the Northwest* (Edwin H. McKee, organizer)

\*Symposia organized by the Paleontological Society.

## GENERAL TRAVEL INFORMATION

San Jose, located at the south end of San Francisco Bay, can be reached easily by many non-stop flights from points all over North America (San Jose airport is located just north of downtown San Jose). Hotel shuttle bus service is available between the airport and the recommended hotels in San Jose. During the meetings, shuttle bus service between the hotels near the airport and San Jose State University will be provided. The University is most easily reached by car by taking the 7th Street exit north from Highway 280 to the San Jose State University parking garage.

## PROJECTION EQUIPMENT

Carousel projection equipment will be provided for standard 2" x 2" (35 mm) slides only (dual projectors by prior request only), unless prior arrangements are made. Please bring your own loaded carousel trays.

## PALEONTOLOGY SOCIETY MEETING

The Paleontology Society will meet at the LeBaron Hotel for an informal cocktail hour on Monday, April 9, at 1800 hours, followed by dinner at a local restaurant. Further information will be posted in the GSA convention registration areas.

## GSA ANNUAL LUNCHEON

All registrants are invited to the GSA luncheon to be held on the San Jose State University campus at the Student Dining Commons. The meal will be served Tuesday, April 10, at 1215 hours, for a price of \$4.50. Tickets must be purchased by 1200 hours, Monday, April 9.

## GSA SPECIAL LUNCHEON

The Director of the U.S. Geological Survey, H. William Menard, will be the featured speaker. All registrants are invited to this special luncheon to be held on the San Jose State University campus at the Student Dining Commons. The meal will be served Wednesday, April 11, at 1215 hours, for a price of \$5.50. Tickets must be purchased by 1200 hours, Monday, April 9.

# PREREGISTRATION DEADLINE, MARCH 21, 1979

## FIELD TRIPS

(Note: All field trip registrants MUST ALSO preregister for the meeting.)

Field trip registration is on a first-come, first-served basis. If a trip is oversubscribed, the full trip registration fee will be refunded to late registrants. Field trip preregistration **must be received in San Jose by March 9, 1979**, accompanied by payment in full. Trips may be cancelled owing to low numbers of registrants or for reasons beyond our control. Full refunds will be made under such circumstances. No other trip refunds will be made, unless the request is received on or before March 21. All trips will start at the south side of the San Jose State University campus at 5th and San Salvador Streets.

## PREMEETING

**1. Geology of the Tres Pinos-Panoche Valley-New Idria Area of the Central Diablo Range, California** (April 7-8). Leaders: Tor H. Nilsen and Thomas W. Dibblee, Jr. Stratigraphy, sedimentology, paleogeography, and structural evolution of a characteristically complex part of the northern Coast Ranges underlain by Franciscan basement rocks. Examination of upper Mesozoic to Miocene units, including the Franciscan subduction complex, turbidites of the Great Valley sequence, lower Tertiary deep-sea fan deposits, and lower and middle Tertiary shallow-marine strata. Includes lunches, guidebook, transportation (bus). (Lodging not provided.) Leave 0800, return 1700 hours (trip will return to San Jose for evening of April 7). Limit 40. \$31.

**2. Recent Deformation along the Hayward, Calaveras, and Other Fault Zones, Eastern San Francisco Bay Region** (April 8). Leaders: Rick Haltenhoff, Robert Wright, George Reid, and Henry Minch. Examination of stratigraphic, structural, and geomorphic evidence of recent faulting along branches of the Hayward, Calaveras, and other fault zones in east San Jose and the Livermore-Amador and Ygnacio Valleys. Open-trench exposure (conditions permitting) on a recently active fault and observation of fault-related deformation of cultural features. Discussion will center on the problems of unravelling the complex structures of the Santa Clara Valley, Livermore Valley, and

Mount Diablo areas. Includes lunch, guidebook, transportation (bus). Leave 0800, return 1800 hours. Limit 35. \$20.

**3. Environmental and Engineering Geology of the Santa Clara Valley** (April 8). Leader: John W. Williams. Examination of south San Francisco Bay areas where geologic processes (ground subsidence, landslides, and recent faulting) have influenced man's land use and construction plans. Includes lunch, guidebook, transportation (bus). Leave 0800, return 1700 hours. Limit 47. \$14.

**4. San Andreas Fault Zone and Related Structures from Vicinity of Monterey Bay to Northern Carrizo Plain** (April 7-8). Leaders: R. O. Burford, P. W. Harsh, and N. T. Hall. Examination of structural, physiographic, and cultural evidence for late Tertiary, Holocene, and continuing movement at selected sites along the San Andreas fault zone via San Juan Bautista, Hollister, Bitterwater oil field, Paso Robles, Cholame, and Simmler. Return to San Jose via McKittrick, Lost Hills, Pacheco Pass, and Gilroy. Includes lunches, guidebook, transportation (bus). (Lodging not provided.) Leave 0830, return 1830 hours. Limit 45. \$31.

**5. Active Fault Features along the Calaveras Fault East of Gilroy** (April 8). Leaders: Charles F. Armstrong, David L. Wagner, and Edward J. Bortugno. Examination of geomorphic features associated with faulting along the active Calaveras fault zone. Many examples of structures offset by creep along the fault will be visited. Includes lunch, guidebook, and transportation (bus). Leave 0900, return 1700 hours. Limit 45. \$14.

**6. Tertiary Paleontology and Stratigraphy of the Central Santa Cruz Mountains, California Coast Ranges** (April 8). Leaders: Joseph C. Clark, Earl E. Brabb, and Warren O. Addicott. Examination of biostratigraphy, paleoecology, and facies changes in a thick Tertiary section southwest of the San Andreas fault. Collection of mega- and microfossils of Paleocene to late Pliocene age. Includes lunch, guidebook, transportation (bus). Leave 0800, return 1700 hours. Limit 35. \$16.

## POSTMEETING

**7. Geology of the La Honda Basin, Santa Cruz Mountains, California** (April 12-13). Leaders: Tor H. Nilsen and Earl

E. Brabb. Stratigraphy, sedimentology, paleogeography, and tectonic evolution of a major sedimentary basin within the Salinian block of northern California. Late Mesozoic to Pliocene turbidites, deep-marine shales, shallow-marine sandstones, and volcanics will be examined. Contrasting stratigraphic sequences juxtaposed along major strike-slip faults will be emphasized. Includes lunches, guidebook, transportation (bus). (Lodging not provided.) Leave 0800, return 1700 hours (trip will return to San Jose for evening of April 12). Limit 40. \$30.

**8. Coastal Tectonics and Coastal Geologic Hazards in Santa Cruz and San Mateo Counties, California** (April 12). Leaders: Gerald E. Weber, Kenneth R. LaJoie, and Gary B. Griggs. Examination of the tectonics of the San Gregorio fault zone, including deformed marine terrace sequences, geomorphic features, and sea cliff and trench exposures of the active fault traces. Coastal geologic hazards and problems associated with coastal sediment transport, sea cliff retreat, and landslides. One stop to pet elephant seals at the Ano Nuevo State Reserve. Includes lunch, guidebook, and transportation (bus). Leave 0700, return 1730 hours. Limit 45. \$24.

**9. Paleocene Meganos Submarine Canyon and Fan** (April 12). Leader: Peter J. Fischer. A study of a well-exposed submarine canyon and fan complex north of Mount Diablo whose evolution was controlled by concomitant faulting. This sequence was cut by later Eocene faults and truncated by mid-Eocene angular unconformities. Includes lunch, guidebook, transportation (bus). Wear walking shoes or boots. Leave 0800, return 1700 hours. Limit 47. \$14.

**10. Modern and Ancient Coastal Sedimentary Facies, Coastal California** (April 12-13). Leaders: H. Edward Clifton and William R. Dupre. An examination of modern coastal processes and facies between Pacifica and Santa Cruz. Interpretation of equivalent depositional facies exposed in Pleistocene marine deposits along Monterey Bay. Emphasis on criteria for identifying specific subenvironments and depositional processes. Includes lunch (first day only), guidebook, and transportation (bus). (Lodging extra.) Leave 0800, return 1600 hours. Limit 37. \$24.

*(Cordilleran Section, continued)*

**11. Geology of Kings Canyon Area** (April 12-13). Leaders: Warren J. Nokleberg, James Moore, and Gary Girty. Section across the central Sierra Nevada batholith with emphasis on chronological and compositional trends. View of Kings River ophiolite and Boyden Cave roof pendant (miogeosynclinal sedimentation and multiple deformation). Highly potassic (leucite-bearing) late Tertiary basalt. River and glacial erosion on a prodigious scale. Includes lunch (first day only), guidebook, lodging (triple occupancy), and transportation (bus). A sweater and raingear are recommended. Leave 0600, return 2200 hours. Limit 40. \$41.

**12. Natural and Management-Related Erosion in Franciscan Terrain, Northwestern California** (April 12-14). Leaders: R. J. Janda, K. M. Nolan, Carl J. Hauge, M. Huffman, H. Kelsey, and W. Weaver. Natural and management-related erosion in parts of the Franciscan terrain showing contrasts in hillslope and stream channel morphology; vegetation influences on geomorphic processes; potential erosion and sedimentation problems in areas within and upstream from Redwood National Park. Includes lunch (first day only), guidebook, transportation (bus). (Lodging not provided.) Leave 0800, return 1900 hours. Limit 42. \$53.

**GUIDEBOOKS**

A guidebook for one trip will be provided to participants of each field trip. Additional copies will be on sale during the meeting. After the meeting, guidebooks may be purchased, if still available, until July 30, 1979, by writing to: Guidebooks, Department of Geology, San Jose State University, San Jose, CA 95192.

**GSA EXHIBIT BOOTH**

Lee Swift and Irene Woodall will be in the GSA booth with microfiche readers and copies of the new *Bulletin*. Of course, they will also take orders for GSA publications and answer questions.

**HOTEL INFORMATION**

**(ALL REQUESTS MUST BE RECEIVED PRIOR TO MARCH 8, 1979)**

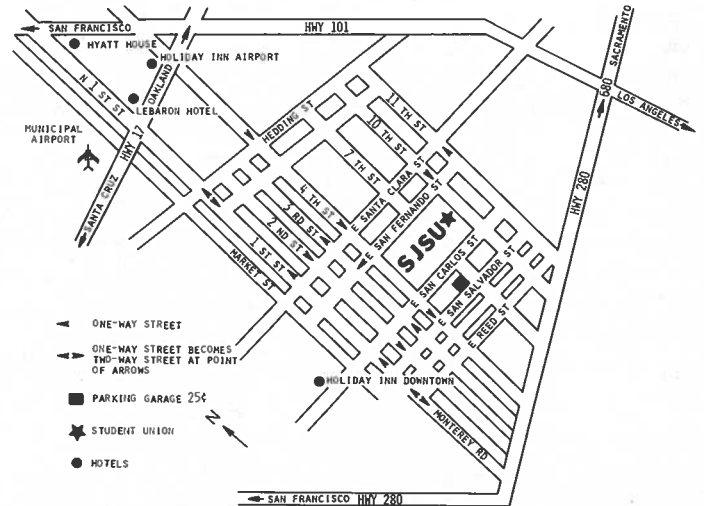
Please fill out the form below and send with one night's deposit to: **San Jose Convention Bureau—GSA, P. O. Box 6178, San Jose, CA 95150.** Please make your deposit check payable to: **San Jose Convention Bureau.**

After March 8, 1979, send late reservations, changes, or cancellations directly to the hotel of your choice.

**HOTELS AND RATES**

- \*San Jose Hyatt House  
1740 N. 1st Street  
(408) 298-0300  
(3.6 mi to Student Union)
- \*LeBaron Hotel  
1350 N. 1st Street  
(408) 288-9200  
(2.7 mi to Student Union)
- \*Holiday Inn Airport  
1355 N. 4th Street  
(408) 287-5340  
(2.6 mi to Student Union)
- Holiday Inn Downtown  
282 Almaden Boulevard  
(408) 998-0400  
(0.9 mi to Student Union)

- Single: \$33
- Double: \$40
- Single: \$32
- Double: \$37
- Single: \$28
- Double: \$32
- Single: \$27
- Double: \$31



All hotels provide airport limousine service

\*Shuttle bus service between these hotels and convention activities on campus will be provided. Cheaper multiple-occupancy can be arranged at all hotels.

**HOUSING APPLICATION—GSA**

Name \_\_\_\_\_ Address \_\_\_\_\_  
 City, State, Zip \_\_\_\_\_ Phone No. ( ) \_\_\_\_\_  
 Hotel Preference: (1) \_\_\_\_\_ (2) \_\_\_\_\_ (3) \_\_\_\_\_  
 Desired Accommodations: Single \_\_\_\_\_ Double \_\_\_\_\_  
 List Names of Occupants \_\_\_\_\_  
 Arrival Date \_\_\_\_\_ Time of Arrival \_\_\_\_\_ Mode of Travel \_\_\_\_\_ Departure Date \_\_\_\_\_

**(CONVENTION BUREAU WILL SEND CONFIRMATION DIRECTLY TO PERSON REQUESTING INFORMATION)**

**SPECIAL STUDENT HOUSING (first-come, first-served)**

Space may be reserved in fraternity and sorority houses (\$3/night). You must provide your own sleeping bags and be prepared for the floor. Place reservations through: Geology Club, Dept. Geol., SJSU, San Jose, CA 95192

April 7     April 8     April 9     April 10     April 11     Total \$ \_\_\_\_\_



**PREREGISTRATION FORM**

**75th Annual Meeting, Cordilleran Section, Geological Society of America  
66th Annual Meeting, Pacific Coast Section, Paleontological Society  
April 9-11, 1979, San Jose, California**

Name (last, first, initial) \_\_\_\_\_

Registered as  STUDENT  PROFESSIONAL

If accompanied by guest, guest's name for badge \_\_\_\_\_

Address (street) \_\_\_\_\_

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

Phone (business) (     ) \_\_\_\_\_ (home) (     ) \_\_\_\_\_

Affiliation (abbreviate for badge) \_\_\_\_\_

GSA Member: Yes  No

Speaker: Yes  No

**REGISTRATION FEES:**

Preregistration (before March 21 includes drink tickets) . . . . .	\$15.00	\$ _____
Registration (after March 21) . . . . .	\$25.00	\$ _____
GSA Student Associates (before March 21 includes party ticket) . . . . .	\$ 2.00	\$ _____
GSA Student Associates (after March 21) . . . . .	\$ 5.00	\$ _____
Other students (before March 21 includes party ticket) . . . . .	\$ 5.00	\$ _____
Other students (after March 21) . . . . .	\$ 5.00	\$ _____
Ticket to young people's party . . . . .	\$ 3.00	\$ _____
GSA annual luncheon (Tuesday, April 10) . . . . .	\$ 4.50	\$ _____
GSA special luncheon (Wednesday, April 11), H. W. Menard, speaker . . . . .	\$ 5.50	\$ _____

**FIELD TRIPS**

1. Geology of the Tres Pinos-New Idria Area . . . . .	\$31.00	\$ _____
2. Deformation along Hayward and Calaveras Faults . . . . .	\$20.00	\$ _____
3. Environmental/Engineering Geology, Santa Clara County . . . . .	\$14.00	\$ _____
4. San Andreas Fault Zone and Related Structures . . . . .	\$31.00	\$ _____
5. Active Fault Features along Calaveras Fault . . . . .	\$14.00	\$ _____
6. Tertiary Paleontology/Stratigraphy of Santa Cruz Mountains . . . . .	\$16.00	\$ _____
7. The La Honda Basin, Santa Cruz Mountains . . . . .	\$30.00	\$ _____
8. Coastal Tectonics/Hazards, Central California . . . . .	\$24.00	\$ _____
9. Paleocene Meganos Submarine Canyon and Fan . . . . .	\$14.00	\$ _____
10. Modern and Ancient Coastal Sedimentary Facies . . . . .	\$24.00	\$ _____
11. Geology of Kings Canyon Area . . . . .	\$41.00	\$ _____
12. Erosion in Franciscan Terrain, Northwest California . . . . .	\$53.00	\$ _____

**All field trip registrants MUST ALSO  
preregister for the meeting.**

**TOTAL** \$ \_\_\_\_\_  
All fees must be provided in U.S. funds.

Make all checks payable to Cordilleran Section GSA and mail **BEFORE** March 21, 1979 (or March 9, if field trips are included), with this preregistration form to:

**David W. Andersen  
Department of Geology  
San Jose State University  
San Jose, California 95192**

Refunds for registration will be made until March 30, less a \$5.00 processing fee. No refunds will be made after March 30.

# SOUTH-CENTRAL SECTION, GSA, APRIL 9-10, 1979 . . .

THE SOUTH-CENTRAL SECTION of the Geological Society of America will hold its 13th annual meeting at the Ozark Folk Center in Mountain View, Arkansas, on April 9-10, 1979. The meeting will include two days of technical sessions, three field trips, and the annual banquet. It is sponsored by the Arkansas Geological Commission, Little Rock, Arkansas.

For further information, please contact Norman F. Williams at (501) 371-1488.

## ADVANCE REGISTRATION

So that the Local Committee can make plans efficiently, you are urged to *register in advance*. Mail the enclosed preregistration form and a check (made payable to South-Central Section, GSA) to:

Norman F. Williams  
South-Central Section, GSA  
Arkansas Geological Commission  
3815 West Roosevelt Road  
Little Rock, Arkansas 72204

Registration fee: Advance \$18.00; after March 28, \$24.00; Students \$5.00.

## TECHNICAL SESSIONS

There will be two days of technical sessions in the Ozark Folk Center conference rooms. A special session will be held in honor of the centennial celebration of the U.S. Geological Survey. The subject of another session is the geology and geophysics of the Mississippi embayment.

## ANNUAL BANQUET

The annual banquet will be held at the Ozark Folk Center on Monday night, April 9. The cost of the event will be \$6.50. Tickets must be purchased by 1000 hours, April 9. An after-dinner speaker and entertainment will be announced.

## BUSINESS MEETING

The Management Board of the South-Central Section of the Geological Society of America will meet in the Conference Center at 2000 hours, Sunday, April 8.

The annual business meeting of the Section will convene in the Auditorium of the Conference Center at 1630 hours, Monday, April 9.

## FIELD TRIPS

Preregistration is required for field trips no. 1 and no. 2. Registration for field trip no. 3 (Blanchard Springs Cavern) will be at the registration desk. Extra copies of guidebooks will be on sale at the registration desk.

**1. Ordovician-Mississippian Rocks of North-Central Arkansas.** One-day pre-meeting field trip, Sunday, April 8, will leave from and return to meeting headquarters at the Ozark Folk Center. Departure time: 0800 hours. The cost of the trip will be \$25.00, which includes transportation, lunch, and guidebook.

**2. Geologic Float Trip on the Upper Buffalo River.** One-day postmeeting float field trip, Wednesday, April 11, will leave from and return to the meeting headquarters at the Ozark Folk Center. Canoes and life jackets will be provided. The float trip will put in near Ponca and take out at Kyle Landing. The cost of the trip will be \$20.00, which includes transportation to and from Folk Center, canoes, lunch, and geologic map. Trip may be cancelled if unsuitable water conditions exist, and money will be refunded. One or two flat-bottom boats will be available.

**3. Tour of Blanchard Springs Cavern.** Tours of the cavern will be available on Monday and Tuesday, April 9-10, in the morning and afternoon. Participants can sign up at the registration desk. Transportation to and from the caverns will be provided.

## HOUSING

Housing in Mountain View is limited, and hotel/motel reservations will be the responsibility of the individual participant. *Please contact the hotel/motel of your choice directly.* If you plan to stay at the Ozark Folk Center Lodge, use the enclosed room reservation form and send it as soon as possible (making check payable to South-Central Section, GSA). Other motels in Mountain View are listed separately. Several excellent campgrounds also are listed and are within 30 minutes of the Folk Center.

## TRAVEL TO MOUNTAIN VIEW

The attached map shows various routes into Mountain View. The nearest airport for commercial air travel is Little Rock, Arkansas. Shuttle bus service will be provided from Little Rock Airport to the Folk Center at Mountain View. Please mark on your registration form if you plan to travel by air and will need bus service. Car rentals are also available at the Little Rock Airport. Batesville, Arkansas, and Mountain View have small airports that can accommodate private aircraft.

## HOTELS/MOTELS IN MOUNTAIN VIEW AREA

**Blanchard Springs Motel** (Highway 14 West, Fifty-Six, Arkansas) (501) 757-2231. 38 units, color TV, phones, air conditioning, adjoining restaurant, swimming pool.

**Dew Drop Inn** (1 block west of northwest corner of Court Square) (501) 269-4200. 12 remodeled rooms with antique furnishings. Family dining for breakfast. Activities.

**Dogwood Motel** (Highway 14 East) (501) 269-3847. 30 units, color TV, phones, carpet, pool.

**Jack's Boat Dock & Fishing Resort** (Highway 5 North, on White River, Allison, Arkansas) (501) 585-2211. 33 cottages with kitchenettes. Full fishing and guide services, supplies.

**Jewell Motel** (East Main Street) (501) 269-3287. 29 units, color TV, phones, carpet, heat, and air conditioning, refrigerators in rooms.

**Junction Motel** (Junction Highways 5-9-14 on Main) (501) 269-3205. 6 rooms.

**Mountain View Motel** (East Main Street) (501) 269-3209. 18 units, carpet, color TV, air conditioning, phones.

**Old Courthouse Hotel** (Northeast corner of Court Square) (501) 269-3292 or 269-4248. 9 double bedrooms and one apartment with kitchen. Ask about new Ozark Outdoor Center activities.

**Ozark Folk Center Lodge** (On Folk Center grounds) (501) 269-3871. 60 double rooms, color TV, phones, patios, pool, and gameroom. Operated by Arkansas State Parks.

## CAMPGROUNDS IN MOUNTAIN VIEW AREA

**Blue Sky Mobile Home Travel Park** (2 miles north on Highway 5-9-14) (501) 269-8132. 15 sites, gift shop and camp store adjoining.

**Shady Grove Trailer Park** (1½ miles south of Folk Center on Highway 5-9-14) (501) 269-3260. 18 sites. All hookups. Camp store/gifts.

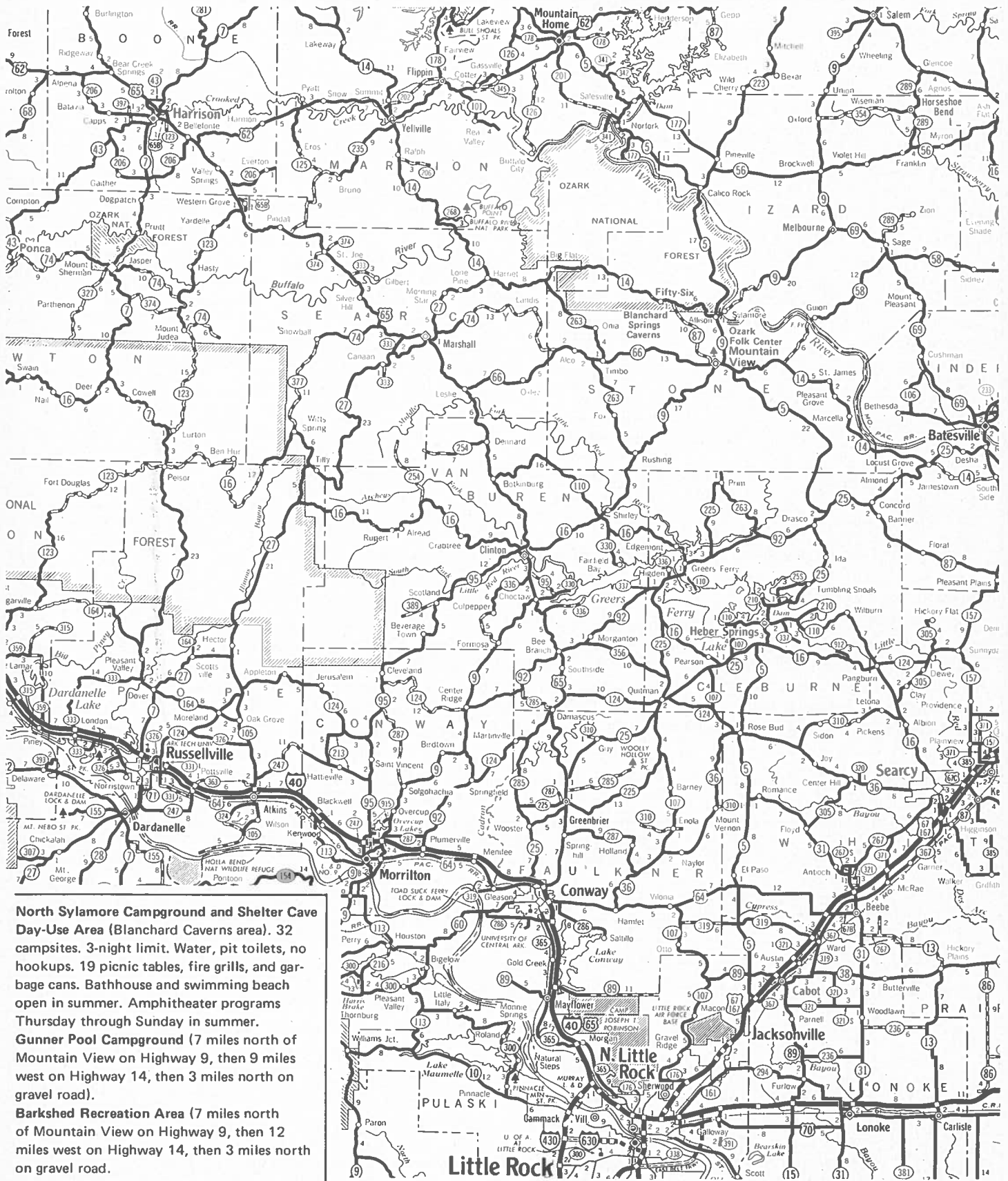
**Mountain View Holiday Inn Trav-L-Park** (Highway 14 West at Swinging Bridge over Sylamore Creek) (501) 585-2231. 113 camper sites with all hookups. 21 tent sites. Canteen, gas, swimming pool, swimming and fishing beach on creek. Activities.

**Sleepy Hollow Camping Area and General Store** (Turn left off Highway 14 just east of Blanchard Springs entrance onto Highway 87, go 2½ miles) (501) 757-2558. All hookups, bathhouse, laundry, store. ½ mile from Sylamore Creek beach.

**Ozark National Forest Area Camping.** Some sites marked, primitive camping allowed anywhere in area. Fire and garbage alert stressed. Developed sites on first-come, first-served basis. For information or to order Ozark National Forest Map, write: District Ranger, Ozark National Forest, Sylamore District, P.O. Box 1, Mountain View, Arkansas 72560. (501) 269-3228.

# PREREGISTRATION DEADLINE, MARCH 28, 1979

(PREREGISTRATION AND HOUSING FORMS ON THE BACK OF MAP)



**North Sylamore Campground and Shelter Cave Day-Use Area (Blanchard Caverns area).** 32 campsites. 3-night limit. Water, pit toilets, no hookups. 19 picnic tables, fire grills, and garbage cans. Bathhouse and swimming beach open in summer. Amphitheater programs Thursday through Sunday in summer.

**Gunner Pool Campground** (7 miles north of Mountain View on Highway 9, then 9 miles west on Highway 14, then 3 miles north on gravel road).

**Barkshed Recreation Area** (7 miles north of Mountain View on Highway 9, then 12 miles west on Highway 14, then 3 miles north on gravel road).

14-day limit on both Gunner Pool and Barkshed. Facilities: pit toilets, water.

**SOUTH-CENTRAL SECTION PREREGISTRATION FORM**  
**13th ANNUAL MEETING OF THE SOUTH-CENTRAL SECTION, GSA**  
**April 9-10, 1979, Mountain View, Arkansas**

(Deadline for advance registration: March 28, 1979)

Name \_\_\_\_\_  
Last First Middle

Institution or Firm \_\_\_\_\_

Address \_\_\_\_\_

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

Phone (\_\_\_\_\_) \_\_\_\_\_ (\_\_\_\_\_) \_\_\_\_\_  
business home

Travel \_\_\_\_\_ Auto \_\_\_\_\_ Air to Little Rock \_\_\_\_\_ Will need shuttle service

Spouse or Guest \_\_\_\_\_  
Last First Middle

Address \_\_\_\_\_

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

Registration:	Until March 28	After March 28	
Regular fee	\$18.00	\$24.00	\$ _____
Student fee	5.00	5.00	\$ _____
Annual smoker and dinner, Monday evening, April 9 (\$6.50)			\$ _____

**FIELD TRIP RESERVATION**

- Field Trip No. 1:** Ordovician-Mississippian Rocks of North-Central Arkansas.  
 Sunday, April 8. Registration includes transportation, lunch, and guidebook : \$25.00 (Student, \$15.00) \$ \_\_\_\_\_
- Field Trip No. 2:** Geologic Float Trip of the Upper Buffalo River. Wednesday, April 11.  
 Registration includes canoes, lifejacket, lunch, geologic map, and transportation: \$20.00 (Student, \$12.00) \$ \_\_\_\_\_
- Field Trip No. 3:** Tour of Blanchard Springs Cavern. Registration and admission will be at the meeting (registration desk). Check here if you are interested \_\_\_\_\_
- TOTAL \$ \_\_\_\_\_

**ROOM RESERVATION FORM**  
**For use only with Ozark Folk Center Lodge**  
 South-Central Section, GSA

Name \_\_\_\_\_  
Last First Middle

Institution or Firm \_\_\_\_\_

Address \_\_\_\_\_

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

Check accommodations and nights:		S	S	M	T	W	
		April	7	8	9	10	11
Single	\$18.50	___	___	___	___	___	Additional persons: \$1.50 each
Double	\$20.00	___	___	___	___	___	(maximum 4 adults per room)

(Will share room with \_\_\_\_\_)

Arrival \_\_\_\_\_  
Day Date Time

Mail to: The Ozark Folk Center Lodge, Mountain View, Arkansas 72560, or call (501) 269-3871

# GSA PUBLICATIONS

## Summaries in *Bulletin, Part I, January 1979*

Summaries of articles on microfiche in *Bulletin, Part II* are listed below. They are not on the separate subscription. Document numbers are included only to facilitate ordering articles on fiche or paper copies of articles from University Microfilms, Inc, 300 N. Zeeb Rd., Ann Arbor, MI 48106.

1. Geology in China, by Charles L. Drake. Doc. no. M90101 (On microfiche: 34 p., 15 figs., 1 table.)
2. Petrology of Oligocene and early Miocene calc-alkalic volcanism in the Marysvale area, Utah, by L. E. Wender and W. P. Nash. Doc. no. M90102 (On microfiche: 43 p., 12 figs., 6 tables.)
3. Barrier island development along the Alaskan-Yukon coastal plains, by A. D. Short. Doc. no. M90103 (On microfiche: 27 p., 12 figs., 3 tables.)
4. Comparison of spatially filtered geologic maps, by T. R. Eschner, J. E. Robinson, and D. F. Merriam. Doc. no. M90104 (On microfiche: 31 p., 7 figs., 4 tables.)
5. Cenozoic faulting and sedimentation in northern San Luis Valley, Colorado, by David Huntley. Doc. no. M90105 (On microfiche: 19 p., 5 figs.)
6. The taconides of western New Jersey: New evidence from the Jutland klippe, by Constantine Perissoratis, P.W.G. Brock, H. K. Bruckner, Avery Ala Drake, Jr., and W.B.N. Berry. Doc. no. M90106 (On microfiche: 24 p., 5 figs., 2 tables.)
7. Structure and metamorphism of the Otish Mountain area of the Grenvillian Foreland Zone, Quebec, by E. H. Chown. Doc. no. M90107 (On microfiche: 19 p., 11 figs.)

## In January *Geology*

1. Heart disease and geologic setting in Ohio, by Roger J. Bain
2. Estimation of fault-scarp ages from a scarp-height-

slope-angle relationship, by R. C. Bucknam and R. E. Anderson

3. Geologic implications of the relationship between mammalian faunal similarity and geographic distance, by K. W. Flessa, S. G. Barnett, D. B. Cornue, M. A. Lomaga, N. Lombardi, J. M. Miyazaki, and A. S. Murer
4. Effects of off-road vehicles in Ballinger Canyon, California, by R. Stull and S. Shipley
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6. Ophiolitic detritus in the Upper Ordovician flysch of Notre Dame Bay and its bearing on the tectonic evolution of western Newfoundland, by K. D. Nelson and J. F. Casey
7. Distribution of rock types in the Mid-Cayman Rise, Caribbean Sea, as evidence of conjugate normal faulting in slowly spreading ridges, by G. W. White and J. B. Stroup
8. Radiolarians and conodonts from pebbles in the Franciscan assemblage and the Great Valley sequence of the California Coast Ranges, by V. M. Seiders, E. A. Pessagno, Jr., and A. G. Harris
9. Late Paleozoic collision of North and South America, by C. A. Ross
10. Acoustic horizons in the Argentine Basin: New evidence from deep-sea drilling, by H. B. Zimmerman, P. R. Supko, and F. W. McCoy
11. Penrose Conference Report: Submarine slope, fan, and trench sedimentation—New concepts and problem solving, by D. J. Stanley and J. P. Bertrand
12. Flooding and sediment transport in a small alpine drainage basin in Colorado, by A. I. Mears
13. Subduction of continental lithosphere: Some constraints and uncertainties, by P. Molnar and D. Gray

## JANUARY BULLETIN SEPARATES

*Titles and abstracts of conventional articles in the January 1979 GSA Bulletin, Part I are provided on the following pages to aid members who have purchased the separates option to select*

- 90109—Mechanics of unlubricated sliding.

*Richard E. Chapman, University of Queensland, Brisbane, Queensland 4067, Australia. (10 p., 4 figs., 1 tbl.)*

The classic work of Hubbert and Rubey on the role of fluid pressure in the mechanics of overthrust faulting concentrated

*Bulletin, Part I separates of their choice. See instructions for ordering on page 15.*

almost exclusively on the special case of a subaerial block of water-saturated sediments. More general expressions are required because almost all the known sediments with pore-fluid pressures approaching the overburden pressure are below sea level and also because marine seismic investigations are revealing submarine slides on the continental margins.



Hubbert and Rubey's terms  $(1 - \lambda)$  in their expressions for subaerial sliding and  $(1 - \lambda_a)$  in those for submarine sliding can be replaced with greater generality by  $\delta = (1 - \lambda)/(1 - \lambda_e)$ , where  $\lambda$  is the ratio of pore-fluid pressure to total normal stress, and  $\lambda_e$  is the ratio of ambient fluid pressure (air or water) to total normal stress, both at the sliding surface. The critical slope  $\theta$  down which subaerial and submarine sliding can take place is given by  $\tan \theta = (\tau_0/\sigma_e) + \delta \tan \phi$ , where  $\tau_0$  is the initial shear strength of the material at the sliding surface,  $\sigma_e$  is the normal component of the loading or "active" stress, and  $\tan \phi$  is the coefficient of sliding friction for the materials of the sliding surface.

For identical water-saturated blocks, the critical angle of submarine sliding is always steeper than the subaerial. A water-saturated subaerial block sliding at low velocity down a constant slope that is equal to its critical subaerial slope cannot slide far into the sea because the resistance to sliding increases relatively. If a block exceeds some critical length (for which approximate expressions are developed) when its sliding is impeded by changes in the sliding parameters, thrusts or overthrusts may develop.

Because almost all known sediments with pore pressures high enough for low-angle sliding are below sea level, the relatively favorable mechanics of subaerial sliding are unlikely to be common. Some form of lubrication seems required for extensive sliding. This will commonly be provided by abnormally pressured shales of low equivalent viscosity.

For evaluating the mechanism of submarine slides revealed by marine seismic surveys, the following expression may be useful when the initial shear strength of the material can be regarded as negligibly small compared to  $\sigma_e$ :  $\delta = \tan \theta/\tan \phi$ . From the value of  $\delta$  an estimate of the pore-fluid pressures at the sliding surface at the time of sliding can be obtained.

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• 90110—Kaweah serpentinite mélangé, southwest Sierra Nevada foothills, California.

*Jason Saleeby, Division of Geological and Planetary Sciences, California Institute of Technology, Pasadena, California 91125. (12 p., 7 figs., 1 tbl.)*

Prebatholithic rocks of the southwest Sierra Nevada foothills contain a 125-km-long northwest-trending disrupted and metamorphosed ophiolite belt. Much of the belt consists of a serpentinite-matrix mélangé in which the ophiolitic material is dispersed. The mélangé matrix consists of schistose serpentinite derived from tectonic peridotite and sedimentary serpentinite. The tectonic blocks consist mainly of peridotite, gabbro, basalt, chert, ophicalcite, and silica-carbonate rock and are as long as several kilometres. Within the tectonic blocks relict primary features such as bedding, pillows, dikes, and cumulate layering remain. The mélangé represents disrupted and internally mixed oceanic lithosphere of latest Paleozoic to possibly earliest Mesozoic age.

Outcrop mapping of the mélangé reveals clustering of blocks into several lithologic associations. The associations are defined as mélangé units, which appear to represent the vestiges of once-intact ocean-floor sections. Three types of mélangé units have been recognized: (1) peridotite-gabbro units; (2) gabbro-basalt units; and (3) peridotite-chert-basalt units. The first two units represent crust and upper mantle whose

deformation and metamorphic history began at the site of ocean-floor genesis. The third unit represents abnormal crust composed of ultramafic protrusions and interbedded sedimentary serpentinite, ophicalcite, chert, and pillow lava. Protrusive activity also started at the site of ocean-floor genesis and continued for an extended time after sea-floor-spreading transport of the ophiolite belt away from the genesis site. Genesis was at an oceanic spreading center that was cut by a transverse fracture zone. Ocean-floor mélangé developed along the fracture zone by the combined effect of protrusive activity and wrench faulting. Emplacement of the fracture-zone complex (ophiolite belt) resulted from large-scale wrench faulting that truncated the ancient continental margin and juxtaposed the complex against the modified margin.

During transport to the continental margin, a chert-argillite olistostrome complex was shed across the ophiolite belt. The olistostromes carried limestone blocks with fauna exotic to North America. Once in the vicinity of the continental margin, the ophiolite belt served as basement for continent-derived submarine-fan deposits and island-arc volcanic rocks, both of Late Triassic to Middle Jurassic age. Deformation of these strata along with their ophiolitic basement continued along the older fracture zone trends. The strata now exist as highly deformed depositional remnants above serpentinite mélangé.

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• 90111—Anatomy of a mining-induced fault zone.

*N. C. Gay, Bernard Price Institute of Geophysical Research, University of the Witwatersrand, Johannesburg, South Africa (present address, Chamber of Mines Research Laboratory, P.O. Box 61809, Marshalltown, 2107 Johannesburg, South Africa; W. D. Ortlepp, Rand Mines Limited, Box 62370, Marshalltown, 2107 Johannesburg, South Africa). (12 p., 12 figs.)*

A mining-induced fault zone that formed in the East Rand Proprietary Mine, Boksburg, South Africa, during the stoping of a large, highly stressed pillar is associated with two large seismic events that occurred within 17 days of each other; each event caused appreciable rock-burst damage in the neighboring stopes.

The zone consists essentially of two high-angle normal faults intersecting at about 30°, across which shear displacements of as much as 10 cm were measured. In detail, the fault zone comprises two approximately planar shear zones, each of which strikes subparallel to the stope working faces at the time of the seismic events, and which encompass areas of at least 500 and 600 m<sup>2</sup>, respectively. The shear zones are themselves made up of smaller, en echelon shear planes, which are connected by subsidiary conjugate shears and extension fractures. These shear planes become diffuse and are replaced by extension and bedding-plane fractures at the boundaries of the fault zone.

Microscopically, the shear planes are seen to contain a layer of finely comminuted gouge material within which fluxion structure may be developed. The wall rock adjacent to the gouge is a microbreccia formed by shattered quartz grains and larger areas of rock, cut by conjugate shear and extension fractures across which some comminution has also occurred. The microscopic observations suggest the following sequence of events resulting in the formation of the fault zone: (1) development of extension cracks in the region of planes of maximum

shearing stress, (2) coalescence of extension cracks to form conjugate shear planes, and (3) rapid movement along the more favorably oriented of these shear planes to form the major gouge zone and feather fractures. Dynamic analyses of the attitudes of the microfractures and macrofractures define the stress field operating at the time of the seismic event.

There is a striking similarity between the fault zones and natural faults, both in macroscopic and microscopic form and in the development of cataclastic rock types.

• 90112—Evolution of Florida Bay from island stratigraphy.

*Paul Enos, Department of Geological Sciences, State University of New York at Binghamton, Binghamton, New York 13501; Ronald D. Perkins, Department of Geology, Duke University, Durham, North Carolina 27708. (25 p., 19 figs., 1 tbl.)*

The sedimentary record of most Florida Bay islands is an asymmetric cycle consisting of a transgressive sequence followed by a regressive sequence, both formed during a continuous Holocene rise in sea level. The principal sedimentary environments of Florida Bay and the south Florida mainland are represented in the cycle by an upward succession of (1) freshwater pond, (2) coastal mangrove swamp, (3) shallow bay ("lake"), (4) mud bank, and (5) island. Some parts of the cycle may be missing, but the sequence is always the same. Supratidal carbonate sedimentation on islands may develop from coastal mangrove swamps or by mangrove colonization of mud banks. Islands have developed from mud banks at many different times during the rise of sea level into Florida Bay, indicating that mud banks must have existed throughout most of the history of the bay. Present trends of island formation and growth suggest that Florida Bay will evolve into a coastal carbonate plain with inland mangrove swamps and freshwater ponds, very similar to the present southwest Florida mainland.

• 90113—Aegean and surrounding regions: Complex multiplate and continuum tectonics in a convergent zone.

*J. F. Dewey, A. M. Celâl Şengör, Department of Geological Sciences, State University of New York at Albany, Albany, New York 12222. (9 p., 3 figs.)*

The tectonics of the Aegean region involves complex slip patterns across the boundaries of several microplates that segment the end of the Anatolian plate, which is moving in a westward direction from the Bitlis zone, an intracontinental suture zone,

to consume oceanic lithosphere in the eastern Mediterranean. The segmentation of the western end of the Anatolian plate into scholles with adjacent zones of grabens, strike-slip, and thrust semicontinuum tectonics results from "locking" across the two North Anatolian transform strands where they change orientation at the western end of the Sea of Marmara. This fast lateral motion of buoyant continental slivers is a transient phase of the early stages of continental collision resulting from the irregularity of colliding margins. It is, however, a tectonic phase that leaves a fundamental signature on the convergent zone by imprinting a complex widespread series of structures that mask, and make difficult the interpretation of, earlier structures.

• 90114—Lacustrine sedimentation during the culminating phase of Eocene Lake Gosiute, Wyoming (Green River Formation).

*Ronald C. Surdam, Department of Geology, University of Wyoming, Laramie, Wyoming 82071; K. O. Stanley, Department of Geology and Mineralogy, Ohio State University, Columbus, Ohio 43210. (18 p., 22 figs., 1 tbl.)*

During deposition of the Laney Member of the Green River Formation, Eocene Lake Gosiute evolved from a saline, alkaline lake to a freshwater lake. This evolution reflects the change from a closed-basin hydrologic regime to an open-basin hydrologic regime; sedimentation in the Lake Gosiute system was strongly influenced by the relationship between evaporation and inflow of waters into the basin and, during deposition of the upper Laney lacustrine beds, to the outflow of lake water into the Piceance Creek basin. Stratification sequences, sedimentary structures, and mineralogy of lithofacies in the Laney Member provide insights into the evolution of the lake and into the competing factors that determined the type of sediment accumulated in the lake and fringing environments. Carbonate sedimentation was strongly influenced by lacustrine transgressions and regressions across a very low topographic gradient. Terrigenous rocks mark progradation of beach and deltaic shorelines during times of greater precipitation when more terrigenous detritus was transported to the lake.

Hydrochemistry of Lake Gosiute during the deposition of the Laney Member was controlled largely by surface and spring water. Calcite was precipitated in the lake as a result of mixing of calcium-rich inflow and saline-alkaline lake waters. Dolomite formed as a result of periodic flooding and drying of the fringing carbonate mud flat, where carbonate muds were saturated

## ORDERING SEPARATES FOR 1979

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with saline-alkaline lake waters and underwent evaporative pumping. Some surface waters reaching the lake contained high concentrations of salts dissolved from efflorescent crusts generated by capillary draw of connate waters in alluvial and mud-flat sediments.

- 90115—Geology and paleontology of the Permian beds near Las Delicias, Coahuila, Mexico.

*Bruce R. Wardlaw, U.S. Geological Survey, Denver, Colorado 80225; William M. Furnish, Department of Geology, University of Iowa, Iowa City, Iowa 52242; Merlynd K. Nestell, Department of Geological and Geophysical Sciences, Princeton University, Princeton, New Jersey 08540. (6 p., 3 figs., 2 tbls.)*

About 3,000 m of Permian strata near Las Delicias, southwestern Coahuila, Mexico, are divided into five informal units: Las Sardinias, El Tordillo, Palo Quemado, La Difunta, and La Colorada beds. The lithology and the ammonoid, brachiopod, and fusulinid biostratigraphy are described briefly. The age of the beds ranges from the Aktastinian through the Amarassian Stages (of Furnish). The major structural features are a large-scale synclinal fold and northeast-trending faulting. Major episodes in the geologic history are outlined.

- 90116—Regional stagnation of ice in northeastern Connecticut: An alternative model of deglaciation for part of New England: Discussion and reply. (4 p.)

Discussion: *S. M. Clebnik, Eastern Connecticut State College, Willimantic, Connecticut 06226; J. W. Mulholland, Exxon Production Research Company, P.O. Box 2189, Houston, Texas 77001.*

Reply: *Robert F. Black, Department of Geology and Geophysics, University of Connecticut, Storrs, Connecticut 06268.*

- 90117—Coarsening-upward cycles in the alluvium of Hornelen Basin (Devonian), Norway: Sedimentary response to tectonic events: Discussion and reply. (4 p.)

Discussion: *H. F. Garner, Department of Geology, Rutgers University, Newark, New Jersey 07102.*

Reply: *R. J. Steel, S. Maehle, H. Nilsen, S.-L. Roe, Å. Spinnangr, Geological Institute, University of Bergen, 5000 Bergen, Norway.*

- 90118—Structural evolution of the Vardar root zone, northern Greece: Discussion and reply. (4 p.)

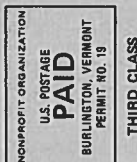
Discussion: *C. M. Barton, Department of Geology, Sedgwick Museum, Downing Street, Cambridge CB2 3EQ, England (present address: Institute of Geological Sciences, Overseas Division, 154 Clerkenwell Road, London EC1R 5DU, England.*

Reply: *Jay Zimmerman, Department of Geology, Southern Illinois University at Carbondale, Carbondale, Illinois 62901; John V. Ross, Department of Geological Sciences, University of British Columbia, Vancouver V6T 1W5, British Columbia.*

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