

ANNUAL REPORT ISSUE  
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# G.S.A. ARCHIVES

## NEWS & INFORMATION

Monthly Newsletter of  
The Geological Society of America

VOLUME 5, NUMBER 10

OCTOBER 1983

### COUNCIL APPROVES NOMINEES, HONORARY FELLOWSHIPS, AWARD WINNERS AT MAY 1983 MEETING

At its May 1983 meeting at GSA headquarters, the Council approved the following nominees, medal and award winners, honorary fellowships, Annual Meeting cities and dates, and Penrose Conference.

#### Nominees for Council

- For Councilor (1984-85) and President (1984)  
M. Gordon Wolman; Baltimore, Maryland
- For Councilor and Vice-President (1984)  
Brian J. Skinner; New Haven, Connecticut
- For Councilor and Treasurer (1984)  
Robert L. Fuchs; Denver, Colorado
- For Councilors (1984-1986)  
Charles J. Mankin; Norman, Oklahoma  
James W. H. Monger; Vancouver, British Columbia  
Geoffrey G. Snow; Denver, Colorado  
William A. Thomas; Tuscaloosa, Alabama

- Douglas Saxon Coombs*  
Department of Geology  
University of Otago  
Dunedin, South Island, New Zealand
- Boris Sergeevich Sokolov*  
Department of Geology, Geophysics and Geochemistry  
USSR Academy of Sciences  
Leninsky pr.14,117901 Moscow V-71, USSR

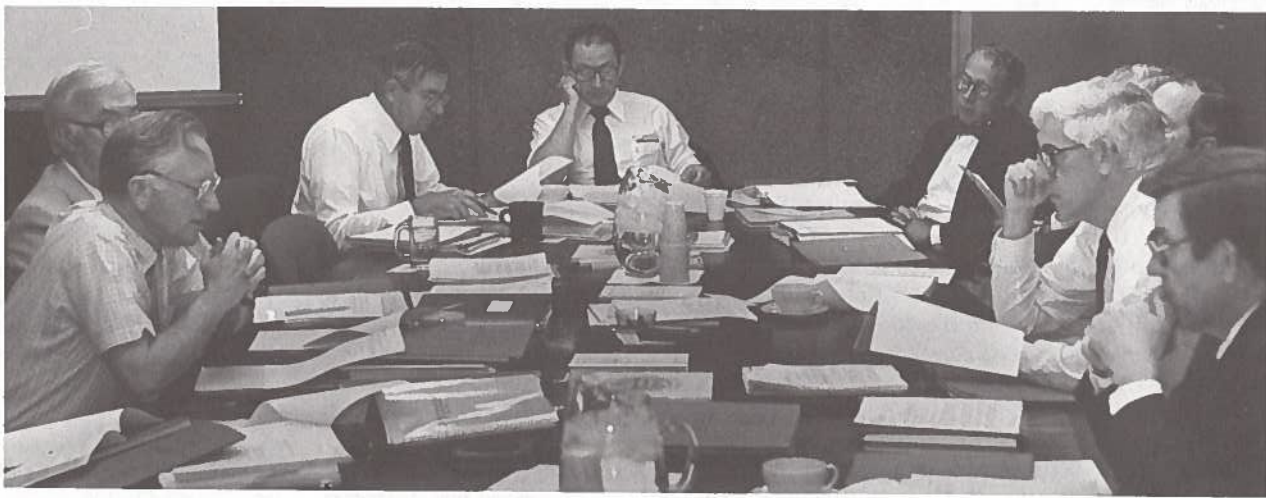
#### Honorary Fellowships

- Harry Blackford Whittington*  
Department of Earth Sciences  
Sedgwick Museum, Downing Street  
Cambridge University  
Cambridge CB2 3EQ, England

#### Medal and Award Winners

- Penrose Medal  
*Gustav A. Cooper*  
3425 Porter Street  
Washington, DC 20016
- Day Medal  
*Harmon Craig*  
University of California, San Diego  
Scripps Institution of Oceanography  
La Jolla, CA 92093

(continued on p. 158)



GSA Council at work, May 1983.

**Council** (continued from p. 157)

**Archaeological Geology Division Award**

*George R. Rapp, Jr.*  
College of Letters and Science  
Science and Math Building, 108  
University of Minnesota  
Duluth, MN 55812

**Gilbert H. Cady Award (Coal Geology Division)**

*Paul Averitt*  
130 South Upham Court  
Lakewood, CO 80226

**E. B. Burwell Award (Engineering Geology Division)**

*Peter W. Lipman*  
and  
*Donal R. Mullineaux*  
U.S. Geological Survey  
Federal Center  
Denver, CO 80225

**George P. Woollard Award (Geophysics Division)**

*George A. Thompson*  
Department of Geophysics  
Stanford University  
Stanford, CA 94305

**History of Geology Division Award**

*Claude C. Albritton, Jr.*  
Department of Geological Sciences  
Southern Methodist University  
Dallas, TX 75275

**O. E. Meinzer Award (Hydrogeology Division)**

*Edwin P. Weeks*  
Water Resources Division  
U.S. Geological Survey  
Federal Center  
Denver, CO 80225

**G. K. Gilbert Award (Planetary Geology Division)**

*Eugene M. Shoemaker*  
U.S. Geological Survey  
2255 North Gemini Drive  
Flagstaff, AZ 86001

**Kirk Bryan Award (Quaternary Geology & Geomorphology Division)**

*Leland H. Gile*  
2600 Desert Drive  
Las Cruces, NM 88001

*John W. Hawley*  
New Mexico Bureau of Mines and Mineral Resources  
Socorro, NM 87801

*Robert B. Grossman*  
Soil Conservation Service  
National Soil Survey Laboratory  
Box 82503  
Lincoln, NE 68501

**National Medal of Science**

(Nominations from GSA not required until further notice.)

**Future GSA Annual Meeting Dates**

|      |                       |              |
|------|-----------------------|--------------|
| 1983 | October 31-November 3 | Indianapolis |
| 1984 | November 5-8          | Reno         |
| 1985 | October 14-17         | Boston       |
| 1986 | November 10-13        | San Antonio  |
| 1987 | October 26-29         | Phoenix      |
| 1988 | October 31-November 3 | Denver       |

**Penrose Conference**

**Structural Styles and Deformational Fabrics of Accretionary Complexes**

Date: April 30-May 4, 1984  
Eureka-Arcata area of northern California

Conveners: *J. Casey Moore*

Department of Earth Sciences  
University of California  
Santa Cruz, CA 95064 (408) 429-2574

*Daniel E. Karig*  
Department of Geological Sciences  
Cornell University  
Ithaca, NY 14850 (607) 256-3679

*Darrel Sidney Cowan*  
Department of Geological Sciences  
University of Washington  
Seattle, WA 98195 (206) 543-4033

## GSA TO SPONSOR GROUP TERM LIFE INSURANCE PLAN FOR MEMBERS

The Executive Committee and Council of the Society have approved a Group Term Life Insurance Plan for GSA members. The plan, underwritten by Connecticut General Life Insurance Company, will be administered by Smith-Sternau Organization, Inc., specialists in the administration of association group insurance programs for more than 34 years. Smith-Sternau has an outstanding reputation. Their staff's expertise will allow members to obtain prompt, complete servicing of their life insurance needs.

The GSA plan will offer member coverage from \$12,000 to a maximum benefit of \$156,000. Dependent spouse and child coverage will also be available. An initial mailing introducing the plan will be made to GSA members in November 1983.

### GSA News & Information

Vol. 5, no. 10

October 1983

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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; Production Assistants: Ann H. Fogel and June E. Thomas.



# CENTENNIAL NEWS by Allison R. (Pete) Palmer

## DNAG Volume *Quaternary Geology of Canada and Greenland* Now Organized

The outline below is the second one that covers a Canadian volume of the DNAG series on *The Geology of North America*. The Canadian volumes will also form

parts of *The Geology and Economic Minerals of Canada*. This volume is scheduled for completion in 1985 and English-language publication in 1986.

### *Quaternary Geology of Canada and Greenland*

- A. Introduction—*R. J. Fulton*
- B. Regional Quaternary Geology
  - 1. Quaternary geology of the Canadian Cordillera—*J. J. Clague, J. M. Ryder, L. E. Jackson, O. L. Hughes, N. W. Rutter*
  - 2. Quaternary geology of the Plains area of Canada—*A. MacS. Stalker, J-S. Vincent, O. L. Hughes, R. W. Klassen, N. W. Rutter*
  - 3. Quaternary geology of the Canadian Shield—*W. W. Shilts, J-S. Vincent, A. S. Dyke, J. T. Andrews*
  - 4. Quaternary geology of the Canadian High Arctic—*D. A. Hodgson, W. Blake, Jr., J. England*
  - 5. Quaternary geology of the Great Lakes and St. Lawrence Lowlands area of Canada—*P. F. Karrow, S. Occhiotti*
  - 6. Quaternary geology of Atlantic Canada—*D. R. Grant*
- C. Applied Quaternary Geology
  - 1. Quaternary paleoenvironments—*T. W. Anderson, J. V. Matthews, Jr., R. Mathewes, J. McAndrews, R. J. Mott, P. Richard, J. C. Ritchie, C. Schweger*
  - 2. Geomorphological processes—*J. A. Heginbottom, M. W. Smith, O. H. Slaymaker, M. A. Carson, T. J. Day, H. M. French, S. G. Evans, W. W. Shilts, D. C. Ford, D. Wells, P. David, P. A. Egginton, K. Hewitt*
  - 3. Terrain geochemistry—*R.N.W. DiLabio*
  - 4. Quaternary geodynamics—*J. T. Andrews, R. Peltier*
  - 5. Quaternary resources—*L. E. Jackson, Jr., S. Morison, W.A.D. Edwards, D. Acton*
  - 6. Quaternary geology and planning—*L. E. Jackson, Jr., O. White, S. G. Evans, J. Gardner, J. Scott, J. Locat, E. A. Christiansen*
- D. Quaternary of Greenland
  - 1. Introduction—*S. Funder, N. Reeh*
  - 2. Chronology and correlation of pre-Holocene deposits—*S. Funder*
  - 3. Holocene geology of ice-free land—*S. Funder*
  - 4. Quaternary paleoenvironments—*B. Fredskild, S. Funder*
  - 5. Offshore Quaternary geology—*H. C. Larsen, S. Funder*
  - 6. History of inland ice based on ice borings—*N. Reeh*
- E. Summary and Conclusions—*R. J. Fulton, J. A. Heginbottom, S. Funder*

*Surface Materials of Canada* and a *Ground-Ice Map of Canada*, both at scales of 1:5,000,000, will be compiled by R. J. Fulton and J. A. Heginbottom, respectively, to accompany this volume.

### Leadership Identified for DNAG Volume on *Economic Geology: U.S.*

Hal Gluskoter (Coal), Dudley Rice (Oil and Gas), and Dick Taylor (Metallic Minerals) have agreed to be the organizers for the DNAG volume on economic geology of the U.S. They will be meeting in mid-October to plan an

organizational workshop to be held in the first half of 1984. This is the last of the 27 volumes of *The Geology of North America* to have its leadership identified. The entire series is now in various stages of development.

### November 30 Is 1984 Dues Deadline

Last year you sent your dues payment in before the November 30 deadline. As a result, you received your GSA publications without delay. This year the timing is even more critical because all section meeting *Abstracts with Programs* will be mailed to members early in the year. If we do not receive your dues payment before the November 30 deadline, you may not get that much-needed *Abstracts with Programs* in time for the section meeting you plan to attend. Remember, back orders take 6 to 8 weeks to reach you!

### PEOPLE

GSA Fellows **B. Clark Burchfiel, Preston Cloud, and Raymond Siever** and Member **Raymond Jeanloz** wrote four of the eight articles on geology in the September issue of *Scientific American*.

GSA Fellow Gordon P. Eaton has been appointed provost and vice-president of academic affairs at Texas A&M University.



## PRELIMINARY ANNOUNCEMENT AND CALL FOR PAPERS

# ROCKY MOUNTAIN SECTION, GSA, 37th Annual Meeting Durango, Colorado, May 11-12, 1984

The Rocky Mountain Section of the Geological Society of America will meet Friday and Saturday, May 11 and 12, 1984, at Fort Lewis College, Durango, Colorado. The meeting will be sponsored by the Department of Geology at Fort Lewis College and the Four Corners Geological Society.

### CALL FOR PAPERS

Papers are invited for presentation at technical and poster sessions and symposia. Fifteen minutes for presentation and five minutes for discussion will be the format for the technical sessions. Papers of local and regional interest to geologists in the Rocky Mountain area will be considered for the program. Symposia and conveners are listed below. Ideas for additional symposia are welcome, and may be submitted to either the General Chairman or the Program Chairman.

### SYMPOSIA

1. **Geology of the San Juan Basin.** Christine E. Turner-Peterson, U.S. Geological Survey, Box 25046, M.S. 916, Denver, CO 80225.
2. **Precambrian Geology of the Southern Rocky Mountain Region.** Barbara J. Tewksbury, Department of Geology, Hamilton College, Clinton, NY 13323.
3. **Economic Deposits in Volcanic Rocks.** Tommy B. Thompson, Department of Earth Resources, Colorado State University, Fort Collins, CO 80523.

### ABSTRACTS

Abstracts are limited to 250 words and must be submitted camera-ready on official abstract forms. Contributors to symposia should submit their abstracts to the appropriate symposium coordinator. One original and five copies should be submitted on or before December 19, 1983. Obtain abstract forms from

Jack A. Ellingson  
Program Chairman  
Department of Geology  
Fort Lewis College  
Durango, CO 81301  
(303) 247-7244

OR Abstracts Coordinator  
Geological Society of America  
P.O. Box 9140  
Boulder, CO 80301  
(303) 447-2020

Submit abstracts to

Jack A. Ellingson  
Program Chairman  
Department of Geology  
Fort Lewis College  
Durango, CO 81301

**ABSTRACTS ARE DUE DECEMBER 19, 1983**

### STUDENT AWARDS

Student papers are encouraged, and awards will be made to students presenting outstanding papers. Student abstracts should be clearly identified and should be authored exclusively by students.

### PROJECTION EQUIPMENT

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

### FIELD TRIPS

#### Premeeting

1. **Paleotectonic development of the San Juan Mountains, Southwestern Colorado.** Don Baars, Jack Ellingson.
2. **The Ojo Alamo Sandstone and the Cretaceous-Tertiary Boundary Problem, San Juan Basin, New Mexico.** Jim Fassett.
3. **Nonmarine Depositional Environments and Paleosol Development in the Upper Triassic Dolores Formation, Southwestern Colorado.** Bob Blodgett.
4. **Quaternary Deposits and Soils in the Durango Area, Colorado.** Dave Moore, Mary Gillam.
5. **Jurassic Depositional Environments in the Southern and Western San Juan Basin.** A. C. Huffman, R. E. Thayden, S. M. Condon.

#### Postmeeting

6. **Geology of the Animas River Valley from Durango to Silverton as Viewed from the Durango & Silverton Narrow Gauge Railroad.**

#### During the meeting

7. **Geology of the Durango Area.**

### SPECIAL EVENTS

A Welcoming Party will be held Thursday evening, May 10. The annual banquet will be held Friday evening, May 11.

### EXHIBITS

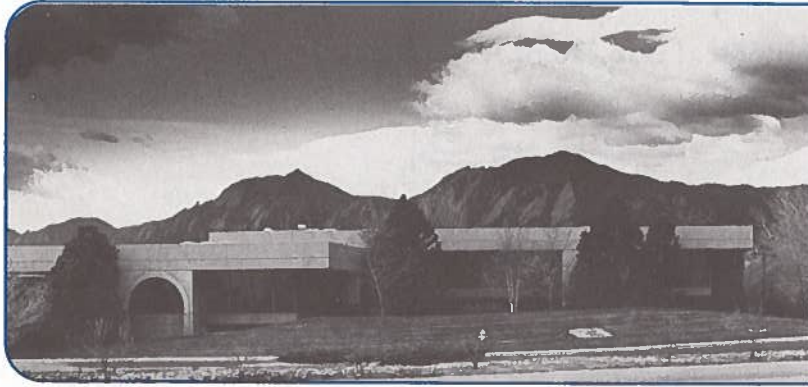
Space will be available for education, research, and industry exhibits.

### DETAILED INFORMATION

Information concerning registration, accommodations and other activities will appear in *GSA News & Information* and as part of *Abstracts with Programs* for 1984.

Inquiries, additional information, requests, or suggestions should be directed to

John A. Campbell  
General Chairman  
Department of Geology  
Fort Lewis College  
Durango, CO 81301  
(303) 247-7748.

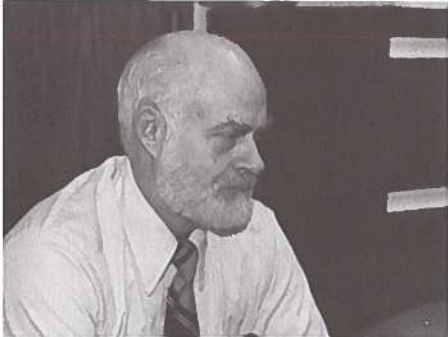


# NEWS & INFORMATION

Monthly Newsletter of  
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VOLUME 5, NUMBER 10

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## GSA Annual Report 1982

# Officers of The Geological Society of America 1982

Digby J. McLaren ..... *President*  
 Paul A. Bailly ..... *Vice-President*  
 William B. Heroy, Jr ..... *Treasurer*  
 Howard R. Gould ..... *Past President*

## Councilors

|                     |                        |                   |                      |
|---------------------|------------------------|-------------------|----------------------|
| <b>1980-1982</b>    | <b>1981-1983</b>       | <b>1982-1984</b>  |                      |
| Robert E. Boyer     | Hubert Gabrielse       | Haydn H. Murray   | Thornton L. Neathery |
| Dallas L. Peck      | John C. Harms          | Arthur A. Socolow | Rosemary J. Vidale   |
| Frank E. Kottlowski | Bruce B. Hansaw        |                   |                      |
| Peter R. Vail       | Robert D. Hatcher, Jr. |                   |                      |

John C. Frye, *Executive Director*  
 F. Michael Wahl, *Executive Director* (effective July 1, 1982)  
 Shafroth and Toll, *Colorado Legal Counsel*  
 Hardee, Barovick, Konecky & Braun, *New York Legal Consultant*

## Officers and Past Chairmen of Sections, 1982

### CORDILLERAN SECTION

Gregory A. Davis ..... *Chairman*  
 M. Clark Blake, Jr. .... *Vice-Chairman*  
 Martin L. Stout ..... *Secretary*  
 William H. Mathews ..... *Past Chairman*

### ROCKY MOUNTAIN SECTION

William P. Nash ..... *Chairman*  
 Allan A. Ekdale ..... *Vice-Chairman*  
 Stanley S. Beus ..... *Secretary*  
 John Montagne ..... *Past Chairman*  
 Robert A. Chadwick ..... *Past Vice-Chairman*

### NORTH-CENTRAL SECTION

Campbell Craddock ..... *Chairman*  
 Sturges W. Bailey ..... *Vice-Chairman*  
 Kenneth G. Brill, Jr. .... *Secretary*  
 Herbert J. Howe ..... *Past Chairman*  
 Terry R. West ..... *Past Vice-Chairman*

### SOUTH-CENTRAL SECTION

Kenneth S. Johnson ..... *Chairman*  
 Melvin C. Schroeder ..... *Vice-Chairman*  
 Page C. Twiss ..... *Secretary-Treasurer*  
 Donald E. McGannon, Jr. .... *Past Chairman*

### NORTHEASTERN SECTION

Richard S. Naylor ..... *Chairman*  
 Maria Luisa Crawford ..... *Vice-Chairman*  
 Arthur A. Socolow ..... *Secretary*  
 Robert W. Metsger ..... *Past Chairman*

### SOUTHEASTERN SECTION

John M. Dennison ..... *Chairman*  
 James F. Tull ..... *Vice-Chairman*  
 Stephen H. Stow ..... *Secretary-Treasurer*  
 S. Duncan Heron, Jr. .... *Past Chairman*  
 Jack H. Medlin ..... *Past Vice-Chairman*

## Officers and Past Chairmen of Divisions, 1982

### ARCHAEOLOGICAL GEOLOGY DIVISION

Norman Herz ..... *Chairman*  
 Claude C. Albritton, Jr. .... *First Vice-Chairman*  
 Harold W. Borns, Jr. .... *Second Vice-Chairman*  
 Diana Chapman Kamilli ..... *Secretary-Treasurer*  
 Jack D. Donahue ..... *Past Chairman*

### COAL GEOLOGY DIVISION

Russell A. Brant ..... *Chairman*  
 John C. Crelling ..... *First Vice-Chairman*  
 Donald D. Carr ..... *Second Vice-Chairman*  
 Gary B. Glass ..... *Secretary*  
 Heinz H. Damberger ..... *Past Chairman*

### ENGINEERING GEOLOGY DIVISION

Harry F. Ferguson ..... *Chairman*  
 Erhard M. Winkler ..... *Chairman-Elect*  
 Frank W. Wilson ..... *Secretary*  
 John S. Scott ..... *Past Chairman*

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David B. Slemmons ..... *Chairman*  
 William J. Hinze ..... *First Vice-Chairman*  
 Peter Dehlinger ..... *Second Vice-Chairman*  
 William E. Bonini ..... *Secretary-Treasurer*  
 Joel S. Watkins ..... *Past Chairman*

### HISTORY OF GEOLOGY DIVISION

Ellen T. Drake ..... *Chairman*  
 Ursula B. Marvin ..... *First Vice-Chairman*  
 Hubert C. Skinner ..... *Second Vice-Chairman*  
 Clifford M. Nelson, Jr. .... *Secretary-Treasurer*  
 Kennard B. Bork ..... *Past Chairman*

### HYDROGEOLOGY DIVISION

Leonard A. Wood ..... *Chairman*  
 David A. Stephenson ..... *First Vice-Chairman*  
 George H. Davis ..... *Second Vice-Chairman*  
 Claire B. Davidson ..... *Secretary-Treasurer*  
 John E. Stone ..... *Past Chairman*

### PLANETARY GEOLOGY DIVISION

Leon T. Silver ..... *Chairman*  
 Harold Masursky ..... *First Vice-Chairman*  
 Robin Brett ..... *Second Vice-Chairman*  
 Joseph M. Boyce ..... *Secretary-Treasurer*

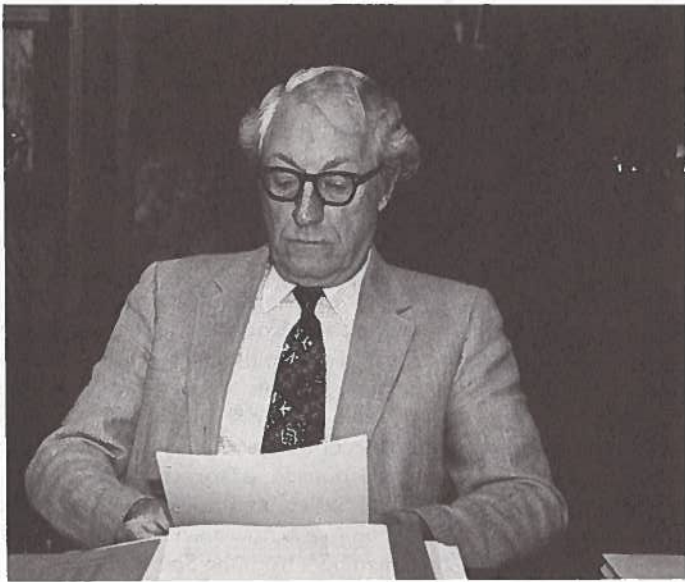
### QUATERNARY GEOLOGY AND GEOMORPHOLOGY DIVISION

Troy L. Péwé ..... *Chairman*  
 John T. Andrews ..... *First Vice-Chairman*  
 Donald J. Easterbrook ..... *Second Vice-Chairman*  
 Richard F. Madole ..... *Secretary*  
 Marie Morisawa ..... *Past Chairman*

## STRUCTURAL GEOLOGY AND TECTONICS DIVISION

|   |  |
|---|--|
| Sharon Mosher ..... <i>Chairman</i>                 | Richard H. Groshong, Jr. .... <i>Secretary-Treasurer</i> |
| David E. Dunn ..... <i>First Vice-Chairman</i>      | Donald U. Wise ..... <i>Past Chairman</i>                |
| Campbell Craddock ..... <i>Second Vice-Chairman</i> |  |





## Report of the President

### Decade of North American Geology and GSA Foundation

The Centennial Program, the Decade of North American Geology, continues to gather momentum. During the year the first DNAG publication, *Perspectives in Regional Geological Synthesis*, was issued, and Pete Palmer continued Planning Workshops for synthesis volumes on The Geology of North America. Planning for the Centennial Field Guides is also well advanced. The Geological Society of America Foundation, with Dwight V. Roberts as President, has almost reached its initial goal of \$4 to \$4.5 million, and has taken over full responsibility for all donations and special funds required by the Society. Membership donations are increasing, but could be further increased.

By Digby J. McLaren

To the Council and Membership of the Geological Society of America, Inc.:

In *GSA News & Information* for September 1982 I gave you a mid-term message, bringing you up to date to the Council meeting in May in Boulder. This report will bring you up to the Council meeting in New Orleans, during October 1982. In May I suggested that the biggest change in the Society was undoubtedly the retirement of John C. Frye, who had been Executive Director for eight years. It was a matter of deepest regret to all of us to learn of John's unexpected death on November 12, 1982, after completing his first field season in retirement. I, personally, lost a friend of 30 years, and the Society lost a devoted and committed supporter. In January of this year, *News & Information* published a report from our new Executive Director, F. Michael Wahl, on his first six months; he had delivered this report to Council in New Orleans. It is a measure of the ability and devotion of both John Frye and Mike Wahl that the Society continues to develop efficiently and to grow in stature with unbroken continuity.

### Publications

The next most important change in the Society began during Howard R. Gould's tenure as President, when Council instituted a new publication policy. The best comment I can make on that is to point to the new format of the *Bulletin* and of *Geology* and to the changes in editorial policy initiated by our new team of editors. I recommend to you, particularly, the Comments by Editors Bob Hatcher and Bill Thomas in the January *Bulletin*. During the year, both the *Bulletin* and *Geology* increased in size, and the backlog for the *Bulletin* has almost disappeared.

### Membership, Computerization

Headquarters reports that during the year, growth of membership took a significant upturn. The Council in New Orleans received the results of a member survey carried out by ENTERCOM, a public relations firm, and authorized the Executive Director to make recommendations, in consultation with ENTERCOM, to the Executive Committee, concerning a major membership drive. Council further authorized the Executive Director to proceed with computerization of Headquarters.

### Heroy Honored

At its October meeting, Council named the day "Bill Heroy Day" to mark Bill's retirement as Treasurer and in honor of his many services to the Society over the years.

### Annual Meeting

The annual meeting in New Orleans proved to be the highlight of the year, and I should like particularly to thank the staff members involved. When meetings go without a hitch, no one notices, and this is the best comment one can make to those responsible. Jules Braunstein, with characteristic efficiency and enthusiasm, chaired the Local Committee and ensured that everyone had a good time. We were all saddened to learn of the untimely death of Jules on March 25, 1983.

### Continued Growth

Many volunteers within Committees, Divisions, Sections, Associated Societies, and Council, together with headquarters staff, are responsible for the remarkable upsurge in interest by the membership and for the growth of the Society. It has, indeed, been an exciting experience as well as an honor to serve as President, and now with Paul Bailly at the helm I predict that the trend will continue to be upward.





## Report of the Executive Director

By F. Michael Wahl

The year 1982 was one of transition and change for GSA. My appointment as Executive Director, a post assumed in June, and six months under a new management philosophy were major changes and are reflected throughout this annual report. In many ways 1982 was a good year for the Society. Most significant was the implementation of changes in our membership publication policies whereby, beginning in January, all members received the *Bulletin*, *Geology*, and *News & Information* as part of their membership. It was also the first year in which the appointment of external editors for our four major areas of publications became fully operational. On the financial side, it was a year that saw high interest rates with good returns on GSA's endowment investments, followed by an upsurge in the capital appreciation of our securities near the end of the year as market prices rose.

### Headquarters Staff

The headquarters employees of the Society are to be commended for outstanding performance during this year of transition and change. Uncertainties and anxieties were evident at times but were always superseded by outstanding performance. The number of full-time-equivalent employees was reduced slightly compared with 1981.

### Computer System

Perhaps the most significant activity that occurred near the end of the year was the installation of our new computer system. This marked the end of many months of study and planning and enabled the Society to move forward in 1983 with the complete computerization of all departmental activities.

### Publications

The year 1982 was one of important changes for publications of the Society. Following recommendations of the ad hoc Publications Study Committee, the Council adopted the policy whereby all members of the Society would receive all periodicals, thus resulting in substantial increases in the monthly press runs for the *Bulletin*, *Geology*, and *News & Information*. Equally significant was a reorganization of the Publications Committee to include the newly appointed outside editors for the *Bulletin*, *Geology*, the Map and Chart Series, and books. In addition to these five members, the Committee is now chaired by a councilor and includes three at-large members from the Society.

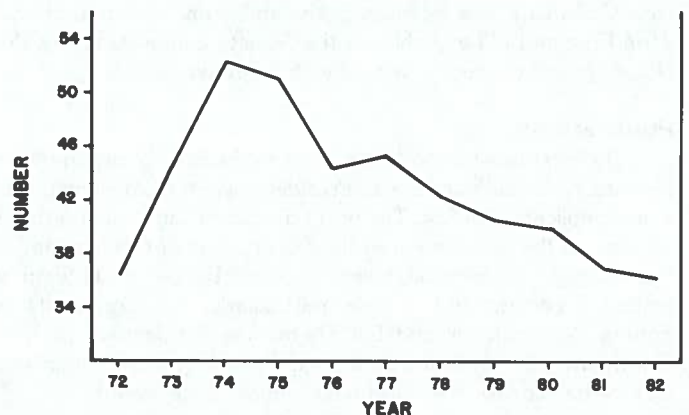
### Bulletin and Geology Pages Increased

Issues of both the *Bulletin* and *Geology* introduced new format and layout modifications throughout the year as the editors implemented significant changes in journal content and editorial philosophy. The Council, responding to the needs of the publications program, provided both temporary and permanent increases in the number of science pages allotted to each journal. This resulted in a reduction of manuscript backlogs and a decrease in time from acceptance to publication.

### New Maps and Books

More rigorous reviews of Map and Chart Series submissions resulted in the publication of six new maps in the series during the year. The Society's book program also continued strong, with the publication of two Memoirs, five Special Papers, and one volume in *Reviews in Engineering Geology*.

FULL-TIME EQUIVALENT EMPLOYEES





### Focus on Journals

The primary goal of the Society throughout the year was to restore the *Bulletin* to its former position as one of the top geologic journals in the world, and to make *Geology* the world's best rapid-publication journal in the geological sciences. We believe that considerable strides were made toward these goals in 1982.

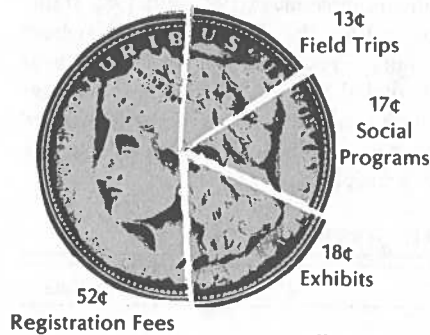
### Meetings

The 1982 Annual Meeting of the Society was held in New Orleans, Louisiana, October 18-21. Innovations for the meeting included contracting with a public-relations consultant to coordinate media contacts and the New Orleans Public Information Service; the designation of an official annual meeting travel agency; adoption of a new badge-printing system which provided preregistrants with a highly readable, inexpensive badge; an expanded exhibits display; and an improved GSA booth and bookstore. Registration of 4,793 for the meeting included 2,881 professionals, 1,447 students, and 465 guests. The technical program included the presentation of 1,279 papers in 83 one-half day symposia and technical sessions. There were also six half-day poster sessions.

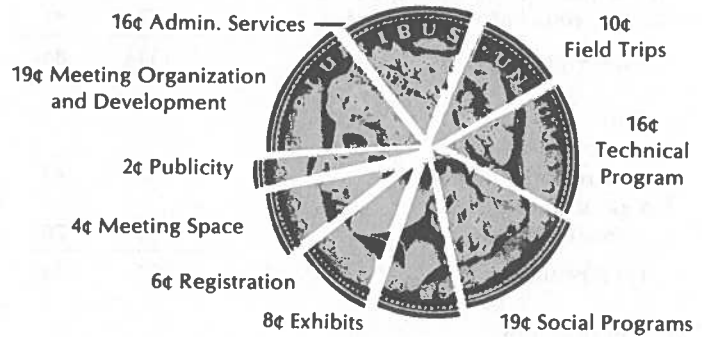
A total of 5,591 registrants attended GSA section meetings during 1982, at which 1,364 papers were presented in 122 half-day sessions (see table).

### 1982 Annual Meeting

#### Source of each revenue dollar



#### Allocation of each expense dollar



### 1982 GSA SECTION MEETING STATISTICS

| Section                   | Location                 | Reported registration | Professionals | Students | Guests | Papers presented | No. of half-day sessions |
|---------------------------|--------------------------|-----------------------|---------------|----------|--------|------------------|--------------------------|
| Cordilleran               | Anaheim, California      | 1,952                 | 1,029         | 719      | 80     | 429              | 24                       |
| Rocky Mountain            | Bozeman, Montana         | 734                   | 487           | 201      | 46     | 201              | 21                       |
| North-Central             | West Lafayette, Indiana  | 420                   | 242           | 166      | 12     | 173              | 15                       |
| South-Central             | Norman, Oklahoma         | 523                   | 407           | 116      | 68     | 131              | 17                       |
| Northeastern-Southeastern | Washington, D.C. (joint) | 1,962                 | 1,083         | 811      | 68     | 430              | 45                       |

### Research Grants

GSA's Committee on Research Grants awarded a total of \$90,110 for support of research during 1982. This sum included \$80,000 from the Penrose Endowment, as well as industrial donations (\$6,500), donations from members and past recipients (\$425), earnings from the Harold T. Stearns Fund (\$1,000) and the Arthur L. Day Fund (\$550), and contributions through the GSA Foundation (\$1,635). Also available was \$1,200 for presentation of the Gladys W. Cole Memorial Award.

Support was provided for 145 of the 391 proposals received and evaluated. This included 80 doctoral and 65 masters proposals. The average grant was \$623, and the award rate was 37% of proposals received.

Recipients of specialized Society awards in 1982 were as follows:

Robert H. Fahnestock  
Memorial Research Award

Thomas F. Bullard  
University of New Mexico

Harold T. Stearns  
Fellowship Award

George E. Gehrels  
California Institute  
of Technology

Gladys W. Cole Memorial  
Research Award

William J. Breed  
Museum of Northern Arizona



## Employment Service Program

Employment Service activity decreased in 1982 in comparison to 1981. The accompanying table gives 1981 and 1982 statistics for year-round activity and for the Annual Meeting, where employers interview applicants. Program revenue for the year was \$27,405 and expenses totaled \$29,597, producing a net loss for the program of \$2,192. This loss is attributed to the depressed economy, resulting in a smaller number of participants in the program than was originally anticipated.

### EMPLOYMENT SERVICE STATISTICS

|   | 1981       | 1982       |
|---|------------|------------|
| <b>Employers</b>                                    |            |            |
| No. of year-round employers                         | 57         | 43         |
| No. of Annual Meeting employers                     | 77         | 41         |
| <b>Total employers</b>                              | <b>134</b> | <b>84</b>  |
| <b>Positions</b>                                    |            |            |
| No. of positions from year-round employers          | 57         | 43         |
| No. of positions from Annual Meeting employers      | 165        | 70         |
| <b>Total positions</b>                              | <b>222</b> | <b>113</b> |
| <b>Types of positions</b>                           |            |            |
| Academic — year-round                               | 19         | 33         |
| — Annual Meeting                                    | 95         | 54         |
| Industry — year-round                               | 32         | 8          |
| — Annual Meeting                                    | 58         | 10         |
| Government & other                                  |            |            |
| — year-round  | 6          | 2          |
| — Annual Meeting                                    | 12         | 6          |
| <b>Total number of applicants at Annual Meeting</b> | <b>309</b> | <b>263</b> |
| <b>Total number of applicants</b>                   | <b>474</b> | <b>527</b> |

## Membership

Membership of the Society increased approximately 5% during 1982. This compares with an approximate 1% increase during 1981. Most of this growth was in the number of student associate members, with a modest increase in the number of regular members. The number of Fellows of the Society decreased during 1982, reflecting the continuation of a trend that has existed each year since 1975. Further comparisons of gains and losses in membership, by category, are presented in the accompanying tables.

## Survey

A most important project completed during the year was the communications audit conducted by ENTERCOM, Inc. Both members and nonmembers were surveyed regarding GSA. The results of this survey will be used by Council in future years to plan services, programs, and other activities of the Society.

## Fellowship Nominating Procedures

New Fellowship nominating procedures and forms authorized by Council during the year proved to be vastly superior to those of the past. Also, improvements in the quality of materials printed for mailing to the membership received a positive response.

### ELEVEN-YEAR SUMMARY OF MEMBERSHIP STATISTICS

| Year | Fellows | Members | Students | Honorary Fellows | Totals |
|------|---------|---------|----------|------------------|--------|
| 1972 | 3,293   | 5,289   | 873      | 49               | 9,504  |
| 1973 | 3,332   | 5,452   | 1,871    | 46               | 10,701 |
| 1974 | 3,327   | 5,975   | 2,917    | 44               | 12,263 |
| 1975 | 3,347   | 6,438   | 2,224    | 45               | 12,054 |
| 1976 | 3,334   | 6,771   | 2,377    | 45               | 12,527 |
| 1977 | 3,282   | 6,972   | 2,095    | 42               | 12,391 |
| 1978 | 3,251   | 7,208   | 1,903    | 42               | 12,404 |
| 1979 | 3,237   | 7,306   | 1,874    | 42               | 12,459 |
| 1980 | 3,229   | 7,500   | 1,834    | 40               | 12,603 |
| 1981 | 3,214   | 7,633   | 1,828    | 43               | 12,718 |
| 1982 | 3,199   | 7,901   | 2,243    | 43               | 13,386 |

### SUMMARY OF GAINS AND LOSSES IN MEMBERSHIP

|                     | 1979         | 1980       | 1981         | 1982         |
|---------------------|--------------|------------|--------------|--------------|
| <b>GAINS</b>        |              |            |              |              |
| Honorary Fellows    | 3            | 1          | 3            | 3            |
| Fellows             | 60           | 75         | 54           | 80           |
| Members             | 591          | 643        | 645          | 804          |
| Student Associates  | 365          | 268        | 343          | 753          |
| <b>Total Gains</b>  | <b>1,019</b> | <b>987</b> | <b>1,045</b> | <b>1,640</b> |
| <b>LOSSES</b>       |              |            |              |              |
| Honorary Fellows    | 3            | 3          | 0            | 3            |
| Fellows             | 74           | 83         | 69           | 95           |
| Members             | 493          | 449        | 512          | 533          |
| Student Associates  | 394          | 308        | 349          | 341          |
| <b>Total Losses</b> | <b>964</b>   | <b>843</b> | <b>930</b>   | <b>972</b>   |
| <b>Net gain</b>     | <b>55</b>    | <b>144</b> | <b>115</b>   | <b>668</b>   |





## Society Investments

Investments of the Society during 1982 were the responsibility of three separate advisors. The fixed income investments (50%) were handled by Irving Trust Company; substantially all of the endowment funds utilized by the Society for supplementing membership publications and services came from this category. All except about 1% of the remaining 50% of endowment funds were invested in equities. The responsibility for the equity investments was divided among three groups; Reich & Tang (37%), W. G. Campbell (11%), and a special fund committee (1%). Each of these groups had full discretion concerning the buying and selling of specific investments. During 1982 these advisors retained both interest and dividend income, plus capital gains, for reinvestment in order to help the endowment keep pace with inflationary erosion.

During the calendar year 1982, the total market value of all funds increased from \$9,031,000 to \$10,532,000 (16.9%). The investment gain of \$1,524,000 included \$266,628 from the GSA Foundation as reimbursement for Decade of North American Geology program costs.

## Medal and Award Winners for 1982

Penrose Medal: *Aaron C. Waters*

Day Medal: *Eugene M. Shoemaker*

Kirk Bryan Award: *Kenneth L. Pierce*

Meinzer Award: None given in 1982

Burwell Award: *Douglas R. Piteau* and *F. Lionel Peckover*

Cady Award: None given in 1982

History of Geology Award: *George W. White*

## Honorary Fellowships for 1982

*Wallace S. Pitcher*

Jane Herdman Laboratories of Geology  
University of Liverpool, England

*Eugen Seibold*

Geology Institute  
University of Kiel, Germany

*Bernard P. Tissot*

Institut Français du Pétrole, Rueil, France

## Penrose Conferences

The Society sponsored seven Penrose Conferences during 1982:

### The Antarctic Plate: A Global Perspective

Conveners: April 11-16  
Ian W. D. Dalziel Luray, Virginia  
David H. Elliott

### Hydrodynamics and Geochemistry of Ore Generation in Sedimentary Environments

Conveners: May 23-28  
William C. Kelly Gravois Mills, Missouri  
John M. Sharp  
Donald E. White

### Tectonic History of the Ouachita Orogen

Conveners: May 23-28  
William A. Thomas Arkadelphia, Arkansas  
George W. Viele

### Origin of Fluids and Metals in Porphyry and Epithermal Mineral Deposits

Conveners: August 8-13  
P. James LeAnderson Dillon, Colorado  
Arthur A. Bookstrom  
Steve Ludington

### Models of Diagenesis in Clastic Reservoirs

Conveners: August 15-20  
James R. Wood, Jr. Kailua Kona, Hawaii  
James R. Boles  
Ian E. Hutcheon

### Laramide Deformation of the Rocky Mountain Foreland

Conveners: August 22-28  
David R. Lageson Red Lodge, Montana  
Gary D. Couples

### The Sonoma Orogeny and Permian to Triassic Tectonism in Western North America

Conveners: September 7-13  
John H. Stewart Winnemucca, Nevada  
Hubert Gabrielse  
Walter S. Snyder

## Decade of North American Geology

As of December 31, 1982, the Decade of North American Geology (DNAG) had been in operation for 2½ years. During 1982, the first DNAG book, *Perspectives in Regional Geological Synthesis*, was published; organizational workshops were held for seven synthesis volumes in the 27-volume set (18 by GSA) of *The Geology of North America*; all but one of the six volumes of the Centennial Field Guides that are being prepared by GSA's sections were in their developmental stages; and compilation of the

southeastern quadrant of the Geologic Map of North America had begun. Nearly 500 geologists are involved in the DNAG project.

Contributions and pledges to the GSA Foundation to support project development and publication of the products of the Decade of North American Geology reached nearly \$3 million of the projected 10-year budget of \$4 to \$4.5 million. Program expenditures for 1982 totaled \$186,017.



# Report of the Treasurer

By William B. Heroy, Jr.

To the Council and Membership of the Geological Society of America:

This report is for calendar year 1982. My term as Treasurer ended with the Annual Meeting in October 1982, but it is customary for the outgoing Treasurer to report for the calendar year, which is also our fiscal year.

One of the most significant developments in 1982 was the search for a successor for John Frye as Executive Director. This process involved extra travel and meeting expenses as well as moving and travel costs for the successful candidate. The timing was good, and our new Executive Director F. Michael Wahl was on board before John Frye's scheduled retirement. This is a good time to pay tribute to Frye's good financial management. Every full year he was responsible for the Society's operation, we were in the black.

The figures in this report are taken from the unqualified report of our independent auditors, Arthur Anderson & Co. The annual financial statement includes the six GSA sections, all of which have been well managed and operated in the black. None of the sections require subsidy or support from the parent Society to run their operations or annual meetings.

As of December 31, 1982, total assets of the Society were \$11,979,244, up from \$11,281,093 the prior year. The total liabilities were \$1,048,144 for a net worth of \$10,931,100, an increase of \$700,128 over 1981.

Total operating expenses for 1982 were \$2,637,097, and total operating revenue was \$2,144,041, which included \$398,574 in contributions. The greater part of the contributions came from the GSA Foundation in support of the greatly increasing effort in the Centennial Program.

The operating deficiency was \$493,056, which was made up from income from investments. Total income from investments was \$858,799, an increase of \$13,574 from the previous year. A substantial part of the income from investments was derived from

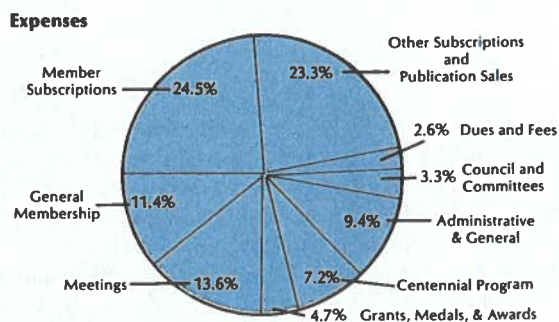
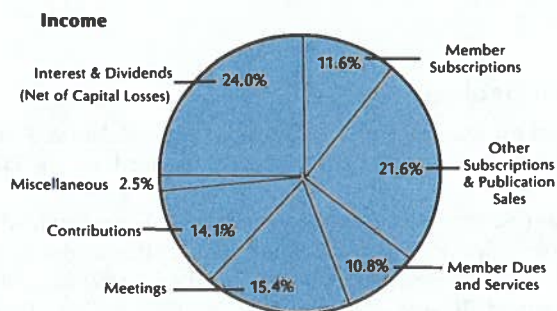
short-term investments that took advantage of the prevailing high interest rates. With interest rates coming down substantially, it can be expected that investment income for 1983 will be significantly reduced.

The accompanying diagrams show the distribution of the Society's combined revenues and expenses for the calendar year 1982.

## GEOLOGICAL SOCIETY OF AMERICA SOURCE AND APPLICATION OF FUNDS, 1982

| INCOME, \$2,820,812                               |                    |               |
|---|--------------------|---------------|
| Interest and Dividends<br>(Net of Capital losses) | \$ 676,771         | 24.0%         |
| Member Subscriptions                              | 327,126            | 11.6%         |
| Other Subscriptions<br>and Publication Sales      | 608,522            | 21.6%         |
| Member Dues and Services                          | 303,517            | 10.8%         |
| Meetings  | 435,729            | 15.4%         |
| Contributions                                     | 398,574            | 14.1%         |
| Miscellaneous                                     | 70,573             | 2.5%          |
|   | <u>\$2,820,812</u> | <u>100.0%</u> |

| EXPENSES, \$2,637,812                        |                    |               |
|--|--------------------|---------------|
| Member Subscriptions                         | 646,622            | 24.5%         |
| Other Subscriptions<br>and Publication Sales | 613,836            | 23.3%         |
| Dues and Fees                                | 68,300             | 2.6%          |
| Council and Committees                       | 87,400             | 3.3%          |
| Administrative and General                   | 247,633            | 9.4%          |
| Centennial Program                           | 190,507            | 7.2%          |
| Grants, Medals, and Awards                   | 123,479            | 4.7%          |
| Meetings                                     | 359,634            | 13.6%         |
| General Membership                           | 299,686            | 11.4%         |
|  | <u>\$2,637,097</u> | <u>100.0%</u> |







THE GEOLOGICAL SOCIETY OF AMERICA

# Annual research awards program

# 1984

The Geological Society of America will continue its annual research awards program in 1984. Eligibility is not restricted to GSA members. New application forms for 1984 and detailed requirements will be available this fall in the geology departments of most colleges and universities in the United States or upon request from the Executive Director, the Geological Society of America, P.O. Box 9140, Boulder, Colorado 80301. PLEASE USE ONLY THE 1984 APPLICATION AND APPRAISAL FORMS.

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

The Geological Society of America awarded \$96,000 in grants in 1983. The awards went to 147 students doing research for advanced degrees. The average amount awarded was \$663. The largest award was \$1,200, but there is no predetermined maximum amount.

Confidential evaluations from two faculty members are required from master's and doctoral candidates and must accompany applications submitted. PLEASE USE THE "APPRAISAL OF APPLICANT" FORMS, WHICH ACCOMPANY THE 1984 APPLICATION FORMS.

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

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

**ALL APPLICATIONS MUST BE SUBMITTED ON THE 1984 FORMS  
AND POSTMARKED BY FEBRUARY 15, 1984.**

**25 years ago . . .**

"The uncertainty of interpretation emphasizes the need for more detailed seismic measurements in the Sierra Nevada region and particularly for measurements on the eastern limit of the seismically indicated root. Such measurements should contribute to an understanding of the geologic history of the Sierra, which presents many challenging problems. After intense folding and the formation of batholiths in the Mesozoic era, the region seems to have lain relatively dormant until the latter part of the Cenozoic era, when it was uplifted to its present impressive height. If the crust was thickened and a root formed during the Mesozoic folding, why did the great uplift occur many millions of years later? Perhaps the uplift depended not on buoyant elevations by an old root but on expansion and phase changes in the material below the mountains. Of many possible phase changes three may be mentioned: crystalline rock to glass, peridotite to serpentine, and eclogite to basalt. Perhaps seismic tests can be devised to decide these questions. . . .

"On a large scale the Bouguer anomaly from San Francisco eastward generally shows an inverse relationship to elevation but is a minimum along the east side of the Carson Range rather than at the main summit of the Sierra. The gravity profile may reflect a thickening of the crust eastward beneath the higher part of the continent, combined with a smaller effect from greater-than-average amounts of granitic rock in the crust of the Sierran region. The answer will depend on more precise and more detailed seismic measurements."

From "Structural Significance of Gravity Surveys in the Virginia City-Mount Rose Area, Nevada and California"  
by George A. Thompson and Clarence H. Sandberg  
*Bulletin of the Geological Society of America*  
v. 69, p. 1269-1282, October 1958

**50 years ago . . .**

"At many places contact action is more intense near an igneous rock than at a distance, and zones of alteration have been distinguished. The matter is complicated in most districts by the facts that zones are most notable in altered sediments and that the sediments are bedded with original beds that differed in composition. If the field occurrence is conclusive as to the zones and as to their concentric distribution around the igneous core, such zones are of great interest. On the other hand, where the igneous core is not known and the zones are not known to be related to a contact, any grouping on the basis of mineral assemblages into facies of metamorphism, suggesting increasing intensity of effects, is to be applied only with the greatest caution. The Minnesota examples serve to illustrate the dangers of such assumptions.

"Granite magma may turn hornblende to biotite, whereas gabbro magma may turn biotite to hornblende. Is one action less intense than the other? The granite magma is, no doubt, more intense than the gabbro magma in its power to add water, but the gabbro magma is the more intense in its ability to heat its walls.

"Again, in the Minnesota contact zones the mineral assemblages are much less closely related to distance from the intrusive than to the nature of the beds. A single hand specimen may show

garnet in one zone, tourmaline in a second, and biotite in a third as the prominent mafic mineral. A single thin section may show three beds; one, biotitic; another, chloritic; and a third, sericitic. On such a basis there is grave question as to the zones found in some districts. They are more likely zones of sediments than zones of differing intensity of metamorphism, especially if chlorite is found closer to the supposed igneous magma than garnet. There should not be too much optimism as to satisfactory facies classification of contact rocks: the factors of metamorphism are too numerous."

From "Contact Metamorphism of the Slates of Minnesota  
by Granite and by Gabbro Magmas"  
by Frank F. Grout  
*Bulletin of the Geological Society of America*  
v. 44, p. 989-1040, October 1933

**75 years ago . . .**

"It has been shown that the oldest rocks are included in a complex series of metamorphic sediments and intrusives. Among these sediments fine-grained clastic material dominates, suggesting deposition at some distance from land. To what geologic age the sea in which these sediments were deposited belongs is not known.

"Reasons have been advanced in the foregoing pages for believing that these metamorphic rocks belong to the pre-Ordovician. In view of the great thickness of Cambrian strata (40,000 feet) reported by Dawson in the adjacent province of British Columbia, it seems fair to assume that these sediments may, in part at least, be of Cambrian age. In still greater doubt is the age of the metamorphism which converted these sediments into schists and crystalline limestones. There were undoubtedly several periods of crustal movements during early or pre-Paleozoic times; the latest producing any considerable amount of metamorphism probably took place in late Silurian or early Devonian time. The evidence of this lies in the probable Silurian age of the intrusive gneissoid granites which were involved in this folding and also in the fact that there appears to be a sharp line of demarcation between the Middle Devonian and pre-Middle Devonian rocks. The semicrystalline character of the oldest metamorphic rocks may be due, as suggested above, to their having suffered alteration previous to the deposition of the known Paleozoics, but also may be largely due to their having been more deeply buried or lying closer to the axis of maximum disturbance.

"If any conclusions are warranted, on the fragmentary evidence at hand, as to the extension of the Ordovician sea, it will be that it covered northern British Columbia, much of the Yukon and Kuskokwim basins, and the Seward peninsula. Indeed, everywhere that Ordovician sediments have been found the usual absence of detrital material would indicate a much wider extent of the sea. As the Ordovician fauna of Alaska is European and Asiatic rather than North American, a barrier is to be expected between this sea and the other Ordovician seas of North America."

From "Paleozoic and Associated Rocks of the  
Upper Yukon, Alaska"  
by Alfred H. Brooks and E. M. Kindle  
*Bulletin of the Geological Society of America*  
v. 19, p. 255-314, October 1908



## Southeastern Section Awards Research Grants

By Stephen H. Stow

The Southeastern Section of GSA has awarded seven research grants to students in the section. The level of funding ranged from \$275 to \$500, and averaged \$375. The seven recipients were selected from 24 grant applications (three undergraduate, 20 masters, one doctorate); six of the recipients are M.S. students, and one is an undergraduate student.

This is the second year that the Southeastern Section has operated a grant program, which is similar to the research grants program administered by GSA in Boulder. To be eligible, a student must be a Student Associate of GSA and must be in a school in the Southeastern Section. Applications are reviewed by a committee. The last committee consisted of Robert Deininger (chairman), Loren Raymond, William Size, and Wallace Lowry. The money to support the grants program comes from interest on investments, surpluses from Southeastern Section meetings, and private contributions from GSA members.

The recipients in 1983 and the titles of their research projects are

- Robert C. Asreen, Jr., University of Tennessee: A Biostratigraphic and Petrologic Study of the Middle Ordovician Ottosee and Chapman Ridge Formations within the Knoxville-Athens Belt, East Tennessee.
- Daven H. Mashburn, University of Georgia: Geology and Economic Potential of the Northern Half of the Verdery 7.5' Quadrangle, South Carolina.
- Victoria L. Purcell, West Georgia College: The Origin of Spessartine Garnets in Rhyolite near Ely, Nevada.
- David S. Shafer, University of Tennessee: Late Quaternary Geologic, Paleocologic and Paleoclimatic History of the Southern Appalachian Mountains.
- E. Kent Sprague, University of Georgia: Comparison of Amino Acid Racemization and Deposition for Several Coequivalent Facies Types in Late and Early Holocene Salt Marsh Sediments.
- Gary R. Wilkins, University of Tennessee: Quaternary Paleogeology of Central Kentucky: Implications for Vegetation Succession and Deciduous Refugia.
- Cindy Ann Yielding, University of North Carolina: The Stratigraphy and Sedimentary Tectonics of the Upper Mississippian Greenbrier Formation in Eastern West Virginia.

## MEETINGS

### 1983

**ISEM Symposium, Enhanced Oil Recovery—For the Independent Producer**, Nov. 9 and 10, 1983, Dallas, Texas. Information: Institute for the Study of Earth and Man, Southern Methodist University, Dallas, Texas 75275; (214) 692-2425.

**AGU Fall Meeting**, Dec. 5-10, 1983, San Francisco, California. Information: American Geophysical Union, 2000 Florida Ave., N.W., Washington, DC 20009.

**Ontario Geological Survey Research Seminar and Open House**, Dec. 6 and 7, 1983, Toronto, Ontario. Information: Wendy Paquette, Ontario Geological Survey, 1124-77 Grenville Street, Toronto, Ontario M5S 1B3, Canada; (416) 965-1546.

**Ophiolites: Oceanic Tectonics and Metamorphism**, Dec. 15-17, 1983, Florence, Italy. Information: Giovanni B. Piccardo, Istituto di Mineralogia, Petrografia e Geochimica, Università, Via La Pira 4, 50121 Firenze, Italy.

### 1984

**Hydrological Problems of Arid and Semi-arid Regions**, Feb. 1-3, 1984, Baghdad, Iraq. Information: Nadhir Al-Ansari, Ministry of Irrigation, Baghdad, Iraq; Telex 2290.

**Cordilleran Geology and Mineral Exploration—Status and Future Trends**, Feb. 20-21, 1984, Vancouver, B.C. Information: J. E. Armstrong, Box 398, Postal Station A, Vancouver, B.C. V6C 2N2, Canada.

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

**A Critical Assessment of Forecasting in Western Water Resource Management**, June 11-13, 1984, Seattle, Washington. Information: Gary R. Minton, Resource Planning Associates, 113 Lynn Street, Seattle, WA 98109; (206) 282-1681.

**Workshop on Fission Track Dating**, July 31-Aug. 3, 1984, Troy, New York. Information: Donald S. Miller, Dept. of Geology, Rensselaer Polytechnic Institute, Troy, NY 12181; (518) 270-6474.

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

**American Institute of Petroleum Geologists Annual Meeting**, Oct. 17-19, 1984, Orlando, Florida. Information: Bobby J. Timmons, Timmons Associates, P.O. Box 50606, Jacksonville Beach, FL 32250; (904) 246-4533.



### Call for Symposia Proposals 1984 GSA Annual Meeting Reno, Nevada November 5-8

Include title, conveners, purpose, content, speakers  
Submit questions and/or proposals to

David B. Slemmons  
Technical Program Chairman  
Dept. of Geology  
Mackay School of Mines  
University of Nevada  
Reno, Nevada 89557  
(702) 784-6050

DEADLINE: JANUARY 1, 1984

**Memoir 158**

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

**Contributions to the  
Tectonics and Geophysics  
of Mountain Chains**



The subjects covered by the 15 papers in this multidisciplinary 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.

Memoir 158, iv + 224 pages, 8½ x 11", hard bound,  
CIP, ISBN 0-8137-1158-4 ..... \$42.50

Visit the Geological Society of America booth at the Annual Meeting to purchase your copy.

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