



GSA news & information

VOLUME 3, NUMBER 3

G.S.A. ARCHIVES

MARCH 1981

Dwight Roberts named president of the Geological Society of America Foundation

When it was clear that the GSA Foundation was going to be a reality, a search committee, chaired by Caswell Silver, was appointed by the Centennial Development Committee to locate leadership for the Foundation. Ideally, the committee hoped to find a leader with fund-raising experience and a knowledge of geology. Thus, it is with particularly great pleasure that we can announce the achievement of our ideal. Dwight Roberts, the new President of the GSA Foundation, began his duties on March 2.

Dwight graduated with a geology major from the University of Colorado in 1957 and has served with the University

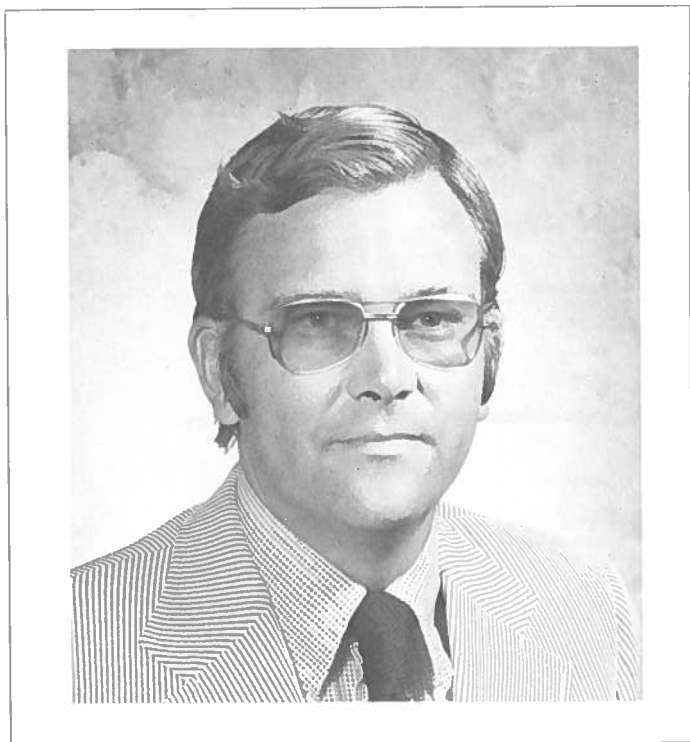
of Colorado Foundation, which he created, and with its predecessor, the CU Development Office, since 1961. Since 1975, Dwight has been President of the University of Colorado Foundation, Inc. During his time with the CU Foundation, the endowment was built to \$15 million and the flow of funds in and out of the Foundation grew to \$10 million annually. Thus, he brings to GSA solid and extensive experience in the operation of a large tax-exempt foundation as well as an appreciation of the profession that the GSA Foundation will serve.

Dwight is a native Missourian, married, has a son, 15, and a daughter, 12, and lives only a few miles from headquarters. When he isn't traveling in search of funds, he is an avid fly fisherman and bird hunter. In addition to his activities with the CU Foundation, Dwight was one of the founding trustees of CASE, the Council for Advancement and Support of Education, and served as Chairman of the Board of this national organization in 1976-1977. He has also been active in Boy Scouts, the Boulder YMCA, the Boulder Rotary Club, the Mile High United Fund and the Boulder Chamber of Commerce. In 1967 he was named to "Outstanding Young Men in America."

The GSA Foundation office will be adjacent to the lobby in the Headquarters building, and Dwight will be responsible for guiding the Foundation toward its initial goal of \$9 million: \$4 million for support of the Decade of North American Geology and other Centennial programs and \$5 million to expand GSA's programs of service to the profession through research grants, publication subsidies, professional conferences, and national geological meetings.

All questions about contributions to the Foundation should be directed to:

Dwight V. Roberts, President
Geological Society of America Foundation
Box 9140
Boulder, CO 80301
(303) 447-2020



Employment distribution of GSA membership

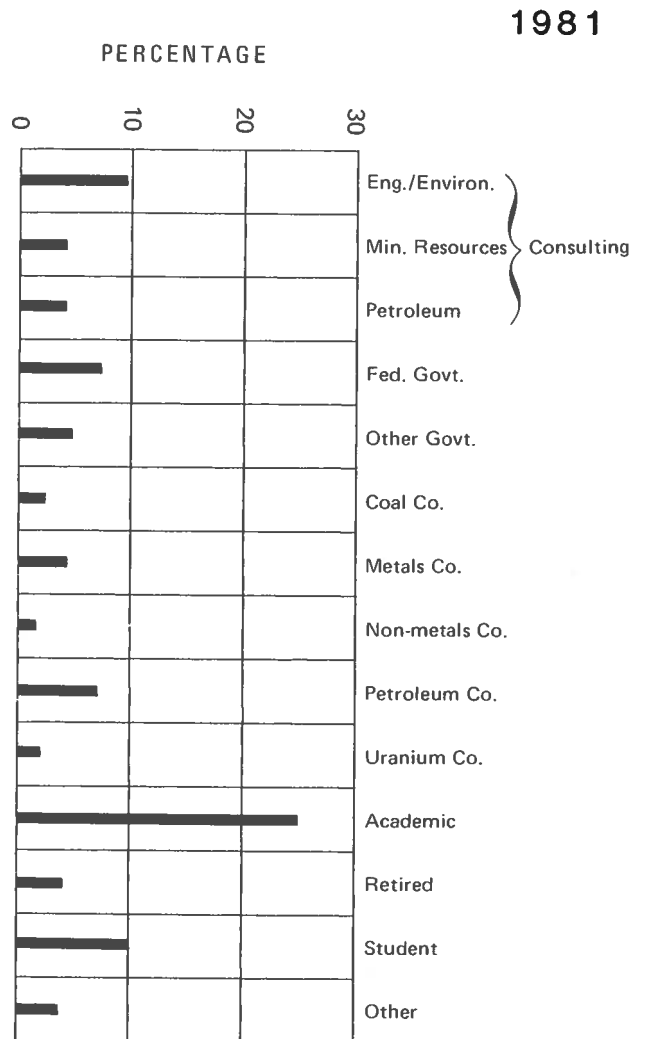
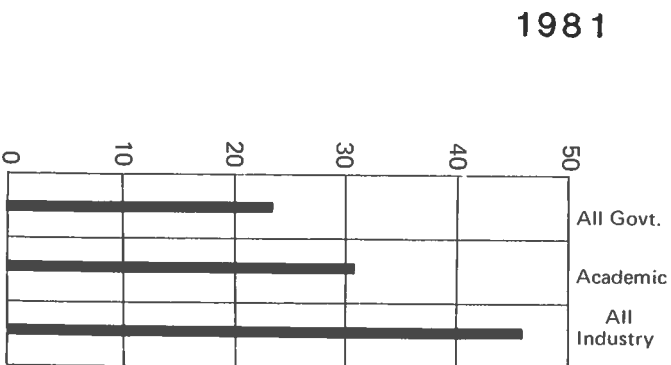
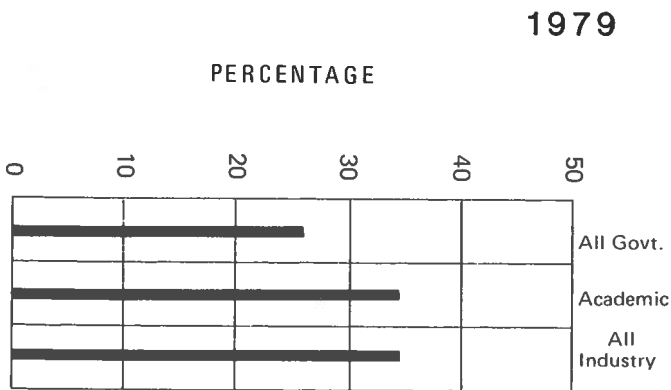
On the recommendation of the Membership Committee, the GSA 1979 dues statement included a questionnaire on the employment status of each member. The committee felt that it would be helpful to them and of interest to all the members to have such information. Although some members failed to answer the questionnaire, the returns were very large, and it was felt that the percentages in each category fairly represented the membership. The results of that survey were published in the March 1979 *GSA News & Information*.

The Membership Committee felt that the results were revealing and helpful. Last year they again considered the question, and particularly in view of the rapidly changing economic situation, they recommended that a similar canvass be made on the 1981 dues statement. They expanded the list of categories from that used in 1979 and the canvass was included on the 1981 statement.

The results that were in by January 1981 have been tabulated and are presented in the accompanying charts. As in the last canvass, not all members who returned their dues statements answered the questionnaire, but the great majority did, and the results are considered representative of the membership.

The charts were calculated by eliminating the categories students, retired, and other; therefore, they represent employed members only. It appears that since 1979 there has been a decrease in the percentage of the membership employed by government and in academic work and a significant increase in the percentage of the membership employed by all phases of industry.

As a supplement to the employment charts, two more charts show age distribution of the membership, including students. Although the shifts in age distribution are not dramatic, there has been a small shift toward older age. The maximum percentage has shifted from the 26-30 age group to the 31-35 group.





CENTENNIAL NEWS

Serendipity

The Geological Society of America, 1888-1930, published by GSA in 1932 and written by one of the founding fathers, H. L. Fairchild, is a gold mine of interesting information about the early history of the Society. It is clear from reading this book that the Centennial Decade is perhaps more appropriate than the proposers realized. Although GSA officially started with a gathering of 13 eminent, and mostly senior, geologists in the Botanical Lecture Room of one of those new (20 years old) upstart fresh-water colleges "warmly disapproved by the ultra orthodox"—Cornell—its organization actually took much of the 19th-century decade of the '80s.

It all began with a summer visit by T. C. Chamber-

lain, of multiple working hypothesis fame, to N. H. Winchell at the University of Minnesota. Winchell suggested to Chamberlain that "the geologists of the western [sic] part of the country ought to be organized into a Mississippi Valley Geological Society." They agreed to bring this up for discussion at the approaching August meeting of Section E of the AAAS, which was the principal annual gathering of geologists at that time. Conversations with other geologists at that meeting expanded Winchell's concept and "it was resolved to organize the geologists of America into a general society." The first informal meeting was convened almost immediately, and a committee of six, with Winchell as chairman, was chosen to draft a constitution for the proposed society. The draft was written up for the committee that evening by S. A. Miller and presented to the organizers for discussion the next day. As a measure of the gravity of the decision to break away from AAAS and have meetings with serious scientific purpose at some other time than the middle of the field season, seven years passed before the concept became a reality.

And where did this all take place?—Cincinnati! And when?—*the summer of 1881!* And where is the 1981 Annual Meeting of GSA?—Cincinnati! The Centennial Decade is serendipitously underway!

D-NAG Public Workshops—March and early April

Public workshops on "Problems and perspectives in regional geological synthesis," related to the planning for the synthesis volumes for the *Geology of the North American Plate and adjacent areas*, will be held at all GSA sectional meetings, at the eastern AGU, AAPG, GAC, and CSPG meetings, and at the meeting of the Lake Superior Institute from March through early June this spring. At each of these workshops, plans for several of the synthesis volumes whose topics will be relevant to the audience at the meetings will be presented for discussion by one or more of the volume planners. Take this opportunity to have some share in the planning process for this unprecedented masterwork on the geology of our continent and attend

the workshop of your choice. The first three workshops and the topics to be discussed are listed below.

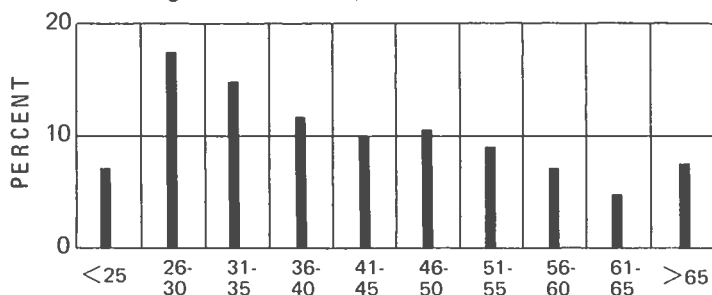
Friday, March 20, 8:00 to 10:30 a.m., Southeastern Section Meeting, Hattiesburg, Mississippi: Appalachians, Atlantic Coastal Plain, Continental Interior Phanerozoic, Gulf Region, Precambrian.

Thursday, March 26, 5:00 to 7:00 p.m., Cordilleran Section Meeting, Hermosillo, Sonora, Mexico: Eastern Pacific, Precambrian, United States and Mexican Cordillera.

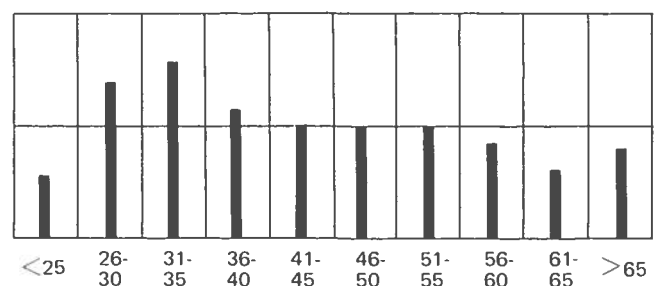
Wednesday, April 8, 7:30 to 9:30 p.m., Northeastern Section Meeting, Bangor, Maine: Appalachians, Continental Interior Phanerozoic, Precambrian.

FELLOWS/MEMBERS/STUDENTS

Age Distribution, DEC. 1978



Age Distribution, JAN. 1981



UPDATE

Articles in *Bulletin*, Part II, March 1981

Articles in *Bulletin*, Part II are listed below. (Summaries only of these articles are in *Bulletin*, Part I.)

1. Tectonic elements of the southern part of the Gulf of California, by Jeffrey W. Niemitz and James L. Bischoff. (On microfiche: 48 p., 16 figs.)
2. Late Miocene-Pliocene (Magnetic Epoch 9—Gilbert Magnetic Epoch) calcium-carbonate stratigraphy of the equatorial Pacific Ocean, by Dean A. Dunn and T. C. Moore, Jr. (On microfiche: 44 p., 6 figs., 7 tables)
3. Heat-flow measurements in 17 perialpine lakes, by Peter Finckh. (On microfiche: 63 p., 6 figs., 5 tables)

In March *Geology*

1. Causes of massive biotic extinctions and explosive evolutionary diversification throughout Phanerozoic time, by Y. Herman
2. Orientation of logs in the Taupo Ignimbrite as an indicator of flow direction and vent position, by P. C. Froggatt, C.J.N. Wilson, G.P.L. Walker
3. Paleomagnetic estimates of temperatures reached in contact metamorphism, by E. McClelland Brown
4. Cenozoic faulting in the vicinity of the Charleston, South Carolina, 1886 earthquake, by J. C. Behrendt, R. M. Hamilton, H. D. Ackermann, V. J. Henry
5. Permian and Triassic rocks near Quinn River Crossing, Humboldt County, Nevada, by K. B. Ketner, B. R. Wardlaw
6. Post-Oligocene tectonic rotation of the Oregon Western Cascade Range and the Klamath Mountains, by J. Magill, A. Cox
7. Weathering before the advent of land plants: Evidence from unaltered detrital K-feldspars in Cambrian-Ordovician arenites, by A. Basu
8. Quaternary stratigraphic usage in North America: A brief survey, by A. R. Nelson, W. W. Locke III

Timing of orogenic activity in the Appalachian-Caledonian system

A GSA Penrose Conference, "Timing of Orogenic Activity in the Appalachian-Caledonian System," will be held May 10–15, 1981, at Ann Jordan Lodge (University of Alabama), Alexander City, Alabama. Approximate cost is \$325–350. Please send application to conveners by March 15, 1981: William A. Thomas and James F. Tull, Department of Geology and Geography, University of Alabama, P.O. Box 1945, University, AL 35486.

BE A CARD-CARRYING MEMBER OF GSA



To earn the member discount on an order placed at a GSA meeting, you will need to show your membership card to the order-taker.
If you are going to a section meeting, put your GSA membership card in your wallet right now.

Call for science films

The 1981 AAPG National Convention will be held from May 31 to June 3 in San Francisco. As in years past, Tobin Research will sponsor the Convention Theater.

The committee would appreciate hearing from anyone with knowledge of new high-quality earth-science films, either domestic or foreign, which might be available for showing at that time.

Please contact the chairman at the following address:
Richard L. Jones
Convention Theater Chairman
Rt. 1, Box 404-65
Amity, OR 97101
(503) 835-7182.

Association of Engineering Geologists will hold 1981 annual meeting in Portland, Oregon

The 1981 Annual Meeting Association of Engineering Geologists will be held in Portland, Oregon, September 27 through October 4, 1981, at the downtown Hilton Hotel.

Chairman: Mavis D. Kent, L. R. Squier Associates, Inc., P.O. Box 1317, Lake Oswego, OR 97034; phone (503) 635-4419.

GSA News & Information

Vol. 3, no. 2

February 1981

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Prepared from contributions from the staff and membership by John C. Frye, Executive Director; James R. Clark, Production Manager; and June Thomas and Ann H. Fogel, Production Assistants.

UPDATE

RULE CHANGE FOR ARTICLE LENGTH IN BULLETIN, PART I

By action of the GSA Council at the Atlanta Annual Meeting, the rules governing length of articles that can be accepted for Part I of the *Bulletin* were changed.

Beginning immediately, manuscripts up to about 60 pages in length will be accepted for publication in Part I, that is, in the traditional paper (hard-copy) format of the *Bulletin*. Part II on microfiche will continue to be available for longer manuscripts and for supplemental data for articles in Part I.

Earns Fund

Donation from Dr. Harold T. Stearns to the Harold T. Stearns Fellowship will provide an additional \$10,000. The fund is designated for the support of research projects of the geology of the North Pacific region. In 1980 the fund supported two grants, and now it will be supporting more in coming years.

Abstract Journal in Earthquake Engineering Research Center

The Abstract Journal in Earthquake Engineering, a quarterly journal of world literature published by the International Center for Earthquake Engineering and Earthquake Hazard Mitigation, has announced that starting in November 1980, the Earthquake Engineering Research Center (ERC) has announced.

The journal covers a wide range of reports, papers, and technical journals, consulting reports, and research, educational, and governmental institutions are presented in the new volume. Coverage includes two conferences on earthquake engineering: the Second U.S. National and the Third Canadian.

Subscription orders and inquiries may be sent to *Abstract Journal in Earthquake Engineering*, 47th Street and Hoffman Boulevard, Richmond, California 94804.

Symposium announcement and call for papers

A symposium, "Geologic Factors and the Evolution of Plants," will be held at the Third North American Paleontological Conference, August 5-7, 1982, in Montreal, Quebec, Canada. The symposium is sponsored by the Paleobotanical Section, Botanical Society of America.

Theme: Contributors to the symposium will be asked to address the effects of geologic factors upon the evolutionary history of plants or the reciprocal influence of plants upon geologic processes. Both botanical and geological perspectives are desired, and an interdisciplinary approach is essential.

Organization: Interested parties are invited to submit a title and abstract (on a form available from the secretary) of the material they intend to cover to the steering committee on or before August 1, 1981. The steering committee will choose from among the submissions so as to render the final presentations of uniform content and quality. Acceptance/rejection notification will be made before the NAPC III contributed-paper deadline of September 15, 1981. Participants in the symposium will be invited to submit a manuscript at the time of the symposium for inclusion in a symposium volume. Please direct questions and prospective titles to Bruce H. Tiffney, Secretary, Symposium Steering Committee, Department of Biology, Yale University, 260 Whitney Avenue, P.O. Box 6666, New Haven, CT 06511, U.S.A.

Circle, Washington, DC 20036. Those finding positions of interest will be sent application materials by the program officer of first country interest.

Lists of 1980-81 grantees (American scholars, visiting scholars) are also available from the Council. Meanwhile, nominations for 1981-82 awards are being made to Fulbright agencies abroad; most scholars receiving awards will be notified by February or March, 1981.

The Council is still accepting applications for 1981-82, mostly for lecturing. Awards are still open for application in geology: Argentina,* volcanic ash soils; Ecuador,* seismic analysis and anti-seismic construction; Liberia, several specialties; Turkey, geological engineering; Uganda, petrology and/or optical mineralogy.

*Spanish required.

Fulbrights to lecture in Soviet languages

Academic institutions in the USSR wish to sponsor American lecturers, in any field, who can teach in languages of the constituent republics. Nominations for 1981-82 have already been made, but scholars who wish to teach in the Soviet Union in 1982-83, and who are proficient in one of the following languages, are invited to express that interest at an early date: Armenian, Azerbaijani, Estonian, Georgian, Latvian, Lithuanian, Russian, or any of the Central Asian languages. For further information, please contact W. A. James, Council for International Exchange of Scholars, Eleven Dupont Circle, N.W., Washington, DC 20036 (202) 833-4990.

Necrology

Notice has been received of the following deaths: William R. Bolton, Thoreau, New Mexico; James Gilluly, Wheatridge, Colorado; W. F. Libby, Los Angeles, California; Helmut G. F. Winkler, West Germany.

GSA EMPLOYMENT SERVICE—GENERAL INFORMATION

Throughout the year, the Membership Department maintains a computer file of geoscientists seeking employment. The information on this file includes the applicant's name, address, phone number, areas of specialty, type of employment desired, degrees held, years of professional experience, and current employment status.

Employers may request printouts of applicant listings within any one, or combination of several, specialty codes by completing the Employers Request form on the following page. The cost of a printout of one to two specialty codes is \$50; each additional specialty listing is \$15. A printout of the entire applicant listing in all specialties may be purchased for \$150.

In addition to offering applicant listings throughout the year, GSA also conducts the Employment Interview Service each fall in conjunction with the Society-wide annual meeting. Interview space is rented to participating employers in half-day increments and our staff schedules all interviews with attending job applicants for every recruiter renting booth space. Additional services available

for employer participants include a message service, complete listing of applicants, copies of resumes at no additional charge, and posting of all vacancies.

Geoscientists seeking positions may register with the Employment Service by completing the attached application form and submitting it along with a one-page typed resume and \$15 payment to the address given below. Applicant registration is good for one year.

For additional information and submission of forms contact

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

APPLICANT AND EMPLOYER FORMS ARE
BACK-TO-BACK ON THE FOLLOWING PAGES

GEODYNAMICS SERIES

Final Reports of the International Geodynamics Project

Co-published by

American Geophysical Union and Geological Society of America

Dynamics of Plate Interiors, Geodynamics Series Volume 1.

A. W. Bally, P. L. Bender, T. R. McGetchin, R. I. Walcott, editors. 1980. viii + 162 pages, 94 figures, 6 tables **\$15.00**

This is the first volume reporting the findings of the International Geodynamics Project, 1970-1979. It is designed, as all volumes in the series will be, to give specialists an opportunity to evaluate progress in their fields of research; to give students an efficient method of retrieving information to proceed effectively; to give scientists in other disciplines an overview of the scientific progress of the International Geodynamics Project. The 15 papers in *Dynamics of Plate Interiors* are divided into four parts: Formation and Subsidence of Sedimental Basins, Plateau Uplifts, Glacial Isostasy, and Present Crustal Movements and Instrumental Observations. The authors are an internationally recognized group of geophysicists, geodists, geologists, and geomorphologists.

How to order: GSA members, who are not members of AGU, may buy any volume in the series at 20% discount only through GSA Publication Sales. The ordering procedures that members must follow are set forth on the back of the 1981 GSA membership card and on order forms in the *Winter 1980/81 Price List* and page 5 of the January 1981 issue of *GSA News & Information*. GSA will not offer the Geodynamics Series on standing order. The American Geophysical Union, 2000 Florida Avenue NW, Washington, DC 20009, welcomes standing orders. Write for details.



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(last name first)

Mailing address _____

City _____ State _____ Zip code _____ If not U.S. citizen
list visa _____

Date available _____ Telephone () _____
area code number (for contact during business hours)

EXPERIENCE

Must use specialty codes listed below

Choose as many as three that best describe your
expertise in order of importance.
MUST have at least one listed

* 1. _____ 2. _____ 3. _____

TYPE OF POSITION DESIRED

- | | | |
|-------------------------------------|---|--|
| Interested in | Specific interest | Will accept employment in |
| <input type="checkbox"/> Academic | <input type="checkbox"/> Administrative | <input type="checkbox"/> U.S. only |
| <input type="checkbox"/> Government | <input type="checkbox"/> Exploration/Production | <input type="checkbox"/> U.S. with foreign assignments |
| <input type="checkbox"/> Industry | <input type="checkbox"/> Field | <input type="checkbox"/> Either |
| <input type="checkbox"/> Other | <input type="checkbox"/> Research | |
| | <input type="checkbox"/> Teaching | |

*Present specialty (choose one from codes below) _____ Years of experience in this specialty _____

Present employer _____ May he be contacted? Yes No

If you do not wish to be listed for employment with a specific organization, check here and list organization on an attached sheet.

Give number of years experience for any of the following that are applicable:

Administrative _____ Exploration/Production _____ Field _____ Research _____ Teaching _____ Total geological working experience _____
Foreign languages _____ Spoken (fluency) _____ Written _____

ACADEMIC TRAINING

College or University	Degree (rec'd or expected)	Year	Major	Minor

Postgraduate work beyond highest degree in (field) _____ Number of years _____

SPECIALTY CODES

Select those that best describe your ability. Use codes in bold face only when other breakdowns are inadequate.

- | | | | | |
|--|---------------------------|------------------------------|-------------------------------|--------------------------------|
| 100. Economic Geology | 222. inorganic | 350. Mathematical Geology | 453. micropaleontology | 621. photogeology |
| 101. coal geology | 223. stable isotopes | 351. computer science | 454. paleobotany | 622. photogrammetry |
| 102. geothermal, etc. | 224. unstable isotopes | 352. statistical geology | 455. paleoecology | 630. Science Editing |
| 103. metallic deposits | 250. Geomorphology | 400. Mineralogy | 500. Petroleum Geology | 650. Sedimentology |
| 104. nonmetallic deposits | 251. Pleistocene geology | 401. crystallography | 501. exploration | 700. Seismology |
| 105. mining geology | 300. Geophysics | 402. clay mineralogy | 502. subsurface stratigraphy | 720. Stratigraphy |
| 120. Engineering Geology | 301. exploration | 410. Museum (curator) | 520. Petrology | 721. Cenozoic |
| 121. rock mechanics | 302. paleomagnetism | 420. Oceanography | 521. igneous | 722. Mesozoic |
| 150. Environmental Geology | 303. theoretical | 421. marine geology | 522. metamorphic | 723. Paleozoic |
| 151. public education and
communication | 320. Hydrogeology | 422. coastal geology | 523. sedimentary | 724. Precambrian |
| 200. General Geology | 321. hydrochemistry | 450. Paleontology | 550. Planetology | 750. Structural Geology |
| 220. Geochemistry | 322. ground water | 451. invertebrate | 600. Regional Geology | 751. tectonics |
| 221. organic | 323. surface water | 452. vertebrate | 620. Remote Sensing | 752. tectonophysics |
| | 330. Library | | 800. Volcanology | |

* **Résumé must be attached.** Only one page typewritten on one side will be accepted for reproduction to employers. Include concise detail of work experience and college majors and minors on degrees.

* **Fee—\$15.00. Payment must accompany form.** Make check payable to the Geological Society of America.

I agree to release GSA or their representatives from responsibility for errors that may occur in processing or distributing this data. I understand that GSA makes no guarantee of contact by an employer in this service. I agree to notify GSA Employment Service immediately of (1) change of address, (2) acceptance of a position.

I will attend the 19____ GSA Annual Meeting in _____

* Signature (required) _____

This application will be active for 1 year.

***THESE ITEMS ARE ABSOLUTELY NECESSARY TO PROCESS THIS APPLICATION**



**THE
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OF AMERICA**

P.O. Box 9140, Boulder, Colorado 80301

EMPLOYER'S REQUEST FOR EARTH SCIENCE APPLICANTS

(Please type or print legibly with **Black Ink**)

R _____ -1

Name _____ Date _____

Organization _____

Mailing address _____

R _____ -2

City _____ State _____ Zip code _____ Telephone number _____ (_____)
Area code Number

SPECIALTY CODES (see list below)

List the specialty code numbers that you wish to order, or check here if you want entire file of applicants in **ALL** specialties.

1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____

SPECIALTY CODES					
100. Economic Geology	222. inorganic	350. Mathematical Geology	453. micropaleontology	621. photogeology	
101. coal geology	223. stable isotopes	351. computer science	454. paleobotany	622. photogrammetry	
102. geothermal, etc.	224. unstable isotopes	352. statistical geology	455. paleoecology	630. Science Editing	
103. metallic deposits	250. Geomorphology	400. Mineralogy	500. Petroleum Geology	650. Sedimentology	
104. nonmetallic deposits	251. Pleistocene geology	401. crystallography	501. exploration	700. Seismology	
105. mining geology	300. Geophysics	402. clay mineralogy	502. subsurface stratigraphy	720. Stratigraphy	
120. Engineering Geology	301. exploration	410. Museum (curator)	520. Petrology	721. Cenozoic	
121. rock mechanics	302. paleomagnetism	420. Oceanography	521. igneous	722. Mesozoic	
150. Environmental Geology	303. theoretical	421. marine geology	522. metamorphic	723. Paleozoic	
151. public education and communication	320. Hydrogeology	422. coastal geology	523. sedimentary	724. Precambrian	
200. General Geology	321. hydrochemistry	450. Paleontology	550. Planetology	750. Structural Geology	
220. Geochemistry	322. ground water	451. invertebrate	600. Regional Geology	751. tectonics	
221. organic	323. surface water	452. vertebrate	620. Remote Sensing	752. tectonophysics	
	330. Library			800. Volcanology	

Applicants seeking employment in:

- Academic
- Government
- Industry
- Other _____

Minimum degree required

- None
- B.A. or B.S.
- M.A. or M.S.
- Ph.D.

Minimum professional experience

- None
- 1-5 yrs
- 6-plus

Experience desired (yrs)

	None	1-5	6-plus
Administrative	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exploration/Production	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Field	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Teaching	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

I am interested in interviewing applicants through the GSA Employment Service at the 19____ Annual Meeting in _____.

See attached sheet for current fee schedule.

- 1. I agree to use this service for valid recruiting purposes.
- 2. I agree that no placement charges will be assessed to any applicant participating in the GSA Employment Matching Service.

Total fee enclosed \$ _____
or invoice requested \$ _____

Signature (required)

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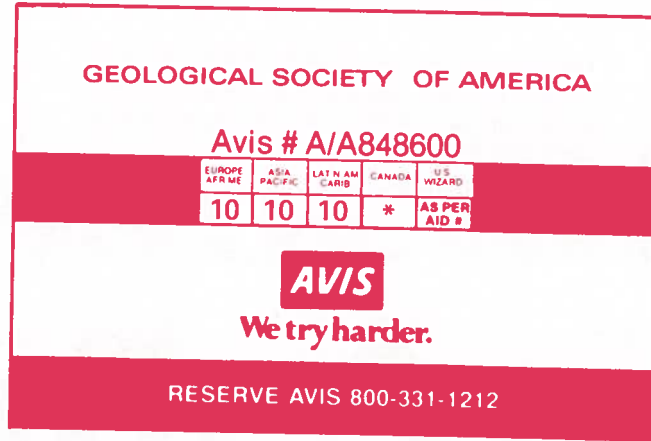
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The discounts are as follows:

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Normal "Time and Mileage" Rates 25%*

CANADA 10%

EUROPE, ASIA 10%

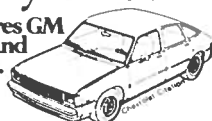
*Except Florida and Hawaii at 10%. AVIS Super Saver Rates are non-discountable, but you should still use your discount card . . . the WIZARD computer will compare rates!

Just clip out the attached card and present it and your current GSA Membership card at the rental counter each time you rent. The special code number alerts Avis to the proper discount.



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MARCH BULLETIN BRIEFS

By Council action, the *Bulletin* Separates program is being discontinued. Effective with the January 1981 issue of *Bulletin*, GSA will no longer publish Separates. Members who hold coupons for *Bulletin* Separates PUBLISHED DURING 1980 may redeem those coupons any time during 1981; however, no new orders for the Separates program will be accepted.

GSA will continue to publish *Bulletin* Briefs in *GSA News & Information* each month for the convenience of the membership.

Article Summaries

- Tectonic elements of the southern part of the Gulf of California: Summary.

Jeffrey W. Niemitz, Department of Geology, Dickinson College, Carlisle, Pennsylvania 17013; James L. Bischoff, U.S. Geological Survey, Menlo Park, California 94025. (4 p., 2 figs.)

- Late Miocene–Pliocene (Magnetic Epoch 9—Gilbert Magnetic Epoch) calcium-carbonate stratigraphy of the equatorial Pacific Ocean: Summary.

Dean A. Dunn, T. C. Moore, Jr., Graduate School of Oceanography, University of Rhode Island, Kingston, Rhode Island 02881. (4 p., 2 figs., 1 table)

- Heat-flow measurements in 17 perialpine lakes: Summary.
Peter Finckh, Geological Institute, ETH, Zurich, Switzerland (present address: Institute for Geophysics, ETH, 8093 Zurich, Switzerland). (4 p., 1 fig., 1 table)

Articles Complete in the March Issue of Part I

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- San Andreas fault: History of concepts.

Mason L. Hill, 14067 E. Summit Drive, Whittier, California 90602. (20 p., 1 fig.)

The long and active San Andreas fault was revealed by the San Francisco earthquake of 1906. Strike-slip movement on a major crustal fracture was first established by that event. The elastic rebound theory was developed in an analysis of this earthquake. It was proposed in 1926 that cumulative horizontal movement on the San Andreas amounted to several miles, but such a great displacement was generally agreed to be unreasonable. In 1953, new evidence of cross-fault stratigraphic correlations of Pleistocene to Cretaceous rocks was presented which seemed to require tens to hundreds of miles of strike-slip displacement. Controversy and additional studies ensued, resulting in general acceptance of such movements by 1968. Since the 1965 proposal that the San Andreas is a transform fault, within a plate-tectonics mechanism, reservations about great horizontal movements of the Earth's crust have been essentially eliminated. The single most important factor in delaying acceptance of miles of strike-slip on the San Andreas has been the long-continued confusion between fault separation and fault slip. Lawson, Noble, Taliaferro, Hill and Dibblee, Wilson, and a few others played the more leading roles in interpretations of the fault. Post-earthquake studies by Gilbert again confirmed his reputation as a great geologist. The San Francisco earthquake was the chief contributor to knowledge about the San Andreas, but now there are more questions than ever regard-

ing the nature, geologic history, and significance of this important crustal structure. The present consensus about the role of the fault in local and global tectonics surely will be modified by revolutionary new conceptual models.

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- Foreshore topography, tides, and beach cusps, Delaware.
Roger N. Dubois, Department of Geography, University of Maryland Baltimore County, Catonsville, Maryland 21228. (7 p., 8 figs., 1 table)

The development and maintenance of beach cusps were studied along a shore segment of the Delaware coast from June 5 through June 28, 1979. On three occasions, a berm and a series of beach cusps developed together on the foreshore as part of rebuilding processes following an erosional event. After the beach was rebuilt and cusps were established, the spacing between horns and the elevation of horns remain fixed. Although the processes which govern the spacing between cusps are still in question, the elevation of cusps was controlled by the elevation of swash runup. When wave dimensions were fairly constant, the elevation of the runup, and thus of the cusps, was determined by the water level of the spring high tide. As processes fluctuated back and forth from depositional to erosional events, the horns, as compared to the bays, responded to a greater extent. For example, when sediments were being deposited on the cusps, the rate of deposition on the horn crest was greater than in the bays. When waves eroded the seaward

portion of a berm with cusps, however, most of the sediments lost from the cusps came from the horns; the results frequently left beach scarps at former positions of horns and no scarps at bays. After an erosional event had left beach scarps at former positions of horns, the remnant topography of beach cusps controlled the action of the swash so as to reconstruct horns at their former positions. As the beach was being rebuilt, the swash was diverted sideways by the beach scarps, and the energy of the swash was sufficiently decreased to cause deposition in front of the scarps. In turn, horns were rebuilt, and a new set of cusps was constructed at approximately the same position as of the old set of cusps.

- Dating of Archean basement in northeastern Wyoming and southern Montana.

Zell E. Peterman, *U.S. Geological Survey, MS963, Denver Federal Center, Box 25046, Denver, Colorado 80225.* (8 p., 5 figs., 5 tables)

Rb-Sr whole-rock and U-Pb zircon ages of granite and gneiss cores from three deep drill holes extend known occurrences of Archean rocks in the subsurface of northeastern Wyoming and southern Montana. Rb-Sr and K-Ar mineral ages are discordant and reflect early or middle Proterozoic disturbance. Highly altered rocks occur in a thin zone immediately below the sub-Cambrian unconformity. Samples from a few metres deeper in the basement are much fresher but show the effects of this alteration in filled fractures and thin adjacent alteration haloes. Whole-rock Rb-Sr systems have retained a fair degree of integrity in spite of increased susceptibility to modification because of the disturbed mineral systems. Interaction of the rocks with water a few metres below the sub-Cambrian unconformity probably occurred for only a relatively short time. Fractures filled rapidly with secondary minerals such as chlorite, anhydrite, and carbonate to maintain a relatively impermeable crystalline basement in which the silicates and their contained isotopic systems were preserved.

Ages of cores from two wells extend the Archean basement to the NACP anomaly—a possible suture related to early Proterozoic tectonism. These and published ages limit a possible ensimatic mobile belt to a zone ~300 km wide beneath the Williston basin. However, the possibility remains that Archean crust was continuous between the Wyoming age province and the Superior Province.

- Bacterial oxidation of manganese and iron in a modern cold spring.

G. E. Mustoe, *Geology Department, Western Washington University, Bellingham, Washington 98225.* (7 p., 7 figs., 2 tables)

A marshy cold spring occurs in late Pleistocene glacial outwash exposed on the floor of the Squalicum Creek valley near Bellingham, Washington. A 5-m by 25-m zone of black soil with an average depth of 30 cm surrounds the spring. This soil contains about 43% MnO₂ and 20% to 30% iron oxide calculated as Fe₂O₃; the oxidized material appears amorphous when analyzed by X-ray diffraction. Field observations and laboratory studies indicate Mn and Fe are accumulated due to bacterial oxidation of trace amounts of these metals supplied by ground water. Two strains of pseudomonad bacteria isolated from the black soil rapidly oxidize Fe and Mn when grown on a culture medium containing soil organic matter as a nutrient. Both bacteria can be cultured on tryptone-glycerol agar but are unable to oxidize Mn or Fe added to this synthetic medium. Although the composition of the culture medium is important in controlling whether oxidation occurs, the reaction is not merely due to the catalytic effect of hydroxy acids contained within the nutrient mixture. Optical microscopy and X-ray fluorescence analysis using a scanning electron microscope equipped with an energy-dispersive detector reveal that Fe and Mn oxides, precipitated by the microbes occur as extracellular deposits, and these metals are not accumulated within the bacterial cells.

Although microbiologists have shown that several genera of bacteria are able to oxidize Mn in laboratory cultures, these studies are of uncertain value when used to explain the role microbes play in sedimentary Mn-oxide deposits, because most studies have involved microbes isolated from ordinary soil rather than from Mn-rich environments. This locality demonstrates the ability of soil bacteria to accumulate high concentrations of Fe and Mn under natural conditions.

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GSA and ASSOCIATED SOCIETIES
NOVEMBER 2—5

CINCINNATI

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ABSTRACTS DEADLINE — JUNE 5

PREREGISTRATION DEADLINE — OCTOBER 2, 1981

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