



GSA news & information

VOLUME 3, NUMBER 1

G.S.A. ARCHIVES

JANUARY 1981

GSA publications announcements from the annual meeting

BULLETIN ARTICLE LENGTH

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.

PUBLICATIONS STUDY COMMITTEE

A special publications study committee was appointed by the Council and is in place. This committee initiates implementation of the recommendations of the Headquarters Advisory Committee—namely, “to investi-

gate thoroughly all aspects of GSA publications and make recommendations for future policies and procedures.” Please send your comments and opinions to any or all of the committee members listed below:

Brian J. Skinner, Committee Chairman
Department of Geology
Yale University
New Haven, CT 06520

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Geological Survey of Canada
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Harrisburg, PA 17120

William A. Thomas, Vice-Chairman
Department of Geology & Geography
University of Alabama
Tuscaloosa, AL 35486

Pending receipt and consideration of the committee's report, the office of Science Editor will remain vacant. In the interim, the Science Editor's functions of manuscript review and acceptance will be performed by

qualified members of the Society outside of the headquarters' regular staff. Inquiries and manuscripts should be addressed to THE EDITORS, Geological Society of America Publications, Box 9140, Boulder, CO 80301.

NEWS FROM GSA DIVISIONS

GSA has seven specialty divisions, all of which prepare and publish newsletters paid for from their division dues. Much of the information contained in the newsletters is of interest to division members only, but, with the thought that some of the items are of general interest, here are a few excerpts from several recent issues.

John C. Frye, Executive Director

from the Coal Geologist

PEAT PUBLICATION REPRINTED

At the Miami GSA meeting in 1974, the Coal Geology Division and the Organic Geochemistry Division of the Geochemical Society jointly sponsored a symposium on the geoscience and geobiology of peat. Most of the papers were subsequently published by GSA as Microform Publication 7, under the title "Interdisciplinary Studies of Peat and Coal Origins." The sponsorship by the two divisions was acknowledged in the Preface to the publication, which was edited by P. H. Given and A. D. Cohen.

Although the original 300 copies were completely sold out, a new printing has been made and is available from GSA at a cost of \$4.00 (\$3.20 with membership discount). Peter Given adds a footnote that the reprinted microfiche is accompanied by full bibliographic references to those papers presented at the symposium, not available for inclusion in the microfiche, but subsequently published elsewhere.

from the Hydrogeologist

IRWIN REMSON

FOURTH BIRDSALL DISTINGUISHED LECTURER

Irwin Remson, Professor of Applied Earth Sciences and Geology and Chairman of the Department of Applied Earth Sciences at Stanford University, is the Fourth Birdsall Distinguished Lecturer. His former positions were Professor of Civil Engineering and Mechanics at Drexel Institute of Technology and Geologist and Engineer with the U.S. Geological Survey.

Educated at Columbia University, Dr. Remson's recent research has been concerned with the application of computer simulation and management models to subsurface hydrology. His books include *Numerical Methods in Subsurface Hydrology* by Remson, G. M. Hornberger, and F. J. Molz; and *Geology in Environmental Planning* by A. D. Howard and Remson.

from the Engineering Geologist

U.S. National Group is formed

Untiring efforts by David J. Varnes on behalf of the Engineering Geology Division and the Association of Engineering Geologists, over a four-year period, have come to fruition. The effort has been in support of creation of a United States National Group of the International Association of Engineering Geology. The IAEG is headquartered in Krefeld, West Germany, and has an extensive membership throughout the world. Of the major nations, only the United States has been without a recognized national group for coordinated representation.

The application for admission was presented to the Council of IAEG at the recent International Geological

Congress held in Paris in July. The request was presented by Dr. Linn Hoover, Secretary of the U.S. National Committee on Geology, a body of the National Academy of Sciences. The organizing subcommittee on Engineering Geology will administer the affairs of the USNCEG and this subcommittee will meet in October or November at the annual meeting of GSA or AEG to make decisions relating to officers, procedures, mailing of the IAEG Bulletin and Newsletter, group dues and other appropriate matters. The subcommittee is made up of nine members: Charles L. Drake (ex-officio Chairman of USNCG), John B. Ivey (ex-officio President of AEG), Allen W. Hatheway (ex-officio Chairman of EGD), Richard H. Jahns (1-year term), Frank W. Wilson (1-year term), Don U. Deere (2-year term), Richard J. Proctor (2-year term), George A. Kiersch (3-year term), and David J. Varnes (3-year term). Until the USNCEG activities are established and a correspondence address is activated, IAEG will continue to handle contact with individual members. The new USNCEG should be activated in 1981.

Members of EGD are encouraged to contact David Varnes or Allen Hatheway for membership forms and the required recommendations for membership in IAEG and the USNCEG. Current yearly dues for IAEG are now set at \$12 to include the very fine and valuable *Bulletin*. With establishment of the USNCEG this dues will not increase and may possibly decrease somewhat.

from the History of Geology Division

INTERNATIONAL COMMITTEE ON THE HISTORY OF GEOLOGICAL SCIENCES

Prof. Dr. Martin Guntau, Secretary-General, INHIGEO, issued its *Newsletter 13* (Rostock, 1979), which summarizes the 2nd International Symposium on the History of Arabic Sciences (including the earth sciences) held at Aleppo, Syria, April 5-10; the 2nd German Democratic Republic (GDR)-Union of Soviet Socialist Republics Symposium on the History of German-Soviet Relations in Field Geological Sciences held at Jerevan, Armenian SSR, October 25-29; work in the history of geology in the GDR since the establishment of its Society of Geological Sciences (1954—its Division of the History and Philosophy of Geological Sciences was formed in 1976); and investigations in the history of geology in the Americas during 1979.

John G. Burke, Stephen Jay Gould, Rhoda Rappaport, and Leonard G. Wilson were honored for their outstanding contributions to the history of geology by election as Corresponding Members of INHIGEO at its meeting at the 26th International Geological Congress, Paris, July 10, 1980. This brings to eleven the number of American Corresponding Members elected by INHIGEO, as distinguished from Members of the Committee. The Committee recommends the names of persons proposed as Members of INHIGEO for formal selection and appointment by the IUGS Council.

from the Geophysics Division

Awards Committee

The Awards Committee, consisting of Isidore Zietz (chairman), George Fisher, Jack Oliver, and George Thompson recommended that the division establish a George P. Woollard Award for

"that individual who, in the judgement of the Executive Committee, has contributed in an outstanding manner to the solution of a fundamental problem of geology through the application of the principles and techniques of geophysics."

This recommendation will be acted on by mail ballot.

Section activities

Members discussed the role of the division in the development of timely and informative GSA symposia that tie together geophysics and geology. The dialog indicated the importance of finding individuals or committees that could work with the six sections to identify geophysical input to the sectional programs. The problem of early scheduling of section meetings almost requires a two-year lead time. Several members indicated a willingness to work with the six sections in the scheduling of special programs, instruction sessions, or symposia. The membership present did not adequately represent all sections and there is a need for additional volunteers to help with the programs. The following members volunteered an interest: (1) South-Central: Special need; (2) Northeast: Special need; (3) Cordilleran: Mary Lou Zoback and Burt Slemmons; (4) Southeast: Wulf Gose; (5) North-Central: Cam Craddock; (6) Rocky Mountain: Dean Kleinkopf and Don Mabey.

from the Archaeological Geology Division

The National Academy of Sciences (National Research Council) has established a Committee on Conservation of Historic Stone Buildings and Monuments. The committee's activities are sponsored jointly by the Environmental Protection Agency (EPA), National Science Foundation (NSF), the General Services Administration (GSA), and the Andrew Mellon Foundation. A conference in Washington, D.C., on the title subject is being planned for February 2-4, 1981. Five workshop groups will meet and discuss the following broad topics: (a) Characterization of masonry materials, (b) Mechanisms of deterioration, (c) Diagnosis of deterioration and evaluation of conditions, (d) Treatment for preservation and maintenance, (e) Evaluation of treatments for preservation and maintenance. The backgrounds of invited attendees, both scientists and conservators, will represent many interests, so in order to prepare for the workshops that follow, a plenary session will be held during which the state of the art will be discussed. After the conference, the results of the workshops will be published by the Academy in a report that will also include the submitted papers of the presentors. The chairman of the committee is Dr. Norbert Baer, Conservation Center of the Institute of Fine Arts, New York University. Dr. Stanley M. Barkin, acting as staff support to the committee, can provide additional information on the conference and can be contacted at National Materials Advisory Board, National Research Council, Commission on Sociotechnical Systems, 2101 Constitution Avenue, Washington, DC 20418 (Telephone: 202-389-6527).

CENTENNIAL NEWS

1888 - GSA - 1988

D-NAG HAS A LOGO!

In the September issue of *News and Information*, we announced a contest for a logo to appear on all publications resulting from the Decade of North American Geology. The deadline for receipt of suggestions was November 1. Responses were received from all over the country. To each of you who submitted an entry we want to express again our sincere thanks for taking the time and trouble to share your ideas with us. Each entry represented a thoughtful and creative attempt to provide a distinctive symbol for the Decade. An important factor in the final decision was the need for a logo that would retain its identifiability even when reduced to the spine of a book or the corner of a page. The winning entry, shown in the space below, is based on the design submitted by Gerald Meyer, Senior Staff Hydrologist, Water Resources Division, USGS, Reston, Virginia.



Lee Gladish joins GSA staff as Books Coordinator

As of December 1, Lee Gladish, an experienced editor and producer of quality publications, joined GSA as a replacement for Dorothy E. Merrifield, who retired as Books Manager at the end of the year. Lee was most recently the Editor of the *Colorado Quarterly*. He will be responsible, in the newly established role of Books Coordinator, for all of GSA's D-NAG publications, as well as all Memoirs, Special Papers, and the Map and Chart series.

Dorothy, a veteran of 10½ years at GSA, edited and guided some 80 GSA books to publication, from authors' manuscripts to the printed volume. Several hundred authors came to know and respect her, and they personally benefited from her masterful coordination (and blue pencil). Her quiet demeanor, dedication, and productivity will be greatly missed by all GSA members and staff.

UPDATE

Articles in *Bulletin*, Part II, January 1981

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

1. Correlation of Mississippian shelf-to-basin strata, eastern California, by George C. Dunne, Rachel M. Gulliver, and Calvin H. Stevens, Doc. no. M10101. (On microfiche: 38 p., 6 figs.)
2. Location of a caldera source for the Soldier Meadow Tuff, northwestern Nevada, indicated by gravity and aeromagnetic data, by R. C. Greene and Donald Plouff, Doc. no. M10102. (On microfiche: 18 p., 5 figs., 1 table)
3. Trace elements in continental-margin magmatism: Part III. Alkali granites and their relationship to cratonization, by John J. W. Rogers and Jeffrey K. Greenberg, Doc. no. M10103. (On microfiche: 37 p., 3 figs., 2 tables)

In January *Geology*

1. Mesozoic hotspot epeirogeny in eastern North America, by S. T. Crough
2. Rise of deep diapirs, by D. L. Anderson
3. Plate tectonics of the Ancestral Rocky Mountains, by C. F. Kluth, P. J. Coney
4. Quaternary flake tectonics of the California Transverse Ranges, by R. S. Yeats
5. Geometry and rate of extension across the Pajarito fault zone, Española basin, Rio Grande rift, northern New Mexico, by M. P. Golombek
6. Modern concepts of Earth dynamics anticipated by Alfred Wegener in 1912, by W. R. Jacoby
7. Shear zone between the Inner Piedmont and Kings Mountain belts in the Carolinas, by J. W. Horton, Jr.
8. Research note: New trilobite locality in the Piedmont of South Carolina, and its regional implications, by H. D. Maher, A. R. Palmer, D. T. Secor, A. W. Snoke
9. High copper content of fluid inclusions in quartz from northern Sonora: Implications for ore-genesis theory, by F. J. Sawkins, D. A. Scherkenbach
10. Descriptive nomenclature and classification of pyroclastic deposits and fragments: Recommendations of the IUGS Subcommittee on the Systematics of Igneous Rocks, by R. Schmid
11. Penrose Conference report: Role of pressure solution and dissolution in geology, by T. Engelder, P. A. Geiser, W. Alvarez

AAAS announces new award

The American Association for the Advancement of Science has established a new award for Scientific Freedom and Responsibility. It will be presented for the first time at the 1982 AAAS Annual Meeting in Washington, D.C., and will consist of a plaque and a cash prize of \$1000. The award was established by action of the AAAS Board of Directors in June 1980.

Under the criteria approved by the AAAS Board, the purpose of the award is to honor scientists and engineers whose actions, often at significant personal cost, have outstandingly exemplified principles of scientific freedom and responsibility. The new prize will recognize scientists and engineers who have

- * acted to protect the public's health, safety, or welfare; or
- * focused public attention on important potential impacts of science and technology on society by their responsible participation in public policy debates; or
- * established important new precedents in carrying out the social responsibilities or in defending the professional freedoms of scientists and engineers.

Members of the AAAS or its affiliated professional societies are invited to nominate candidates for the award by providing the following information: the name and address of their nominee; a brief statement (about 100 words) describing the action(s) of their nominee which they believe merits recognition; general background information about their candidate (no longer than 3 pages); and names and addresses of one or two other persons (one of whom must be a scientist) who support the nomination. Nominations will be reviewed by the Scientific Freedom and Responsibility Award Committee, who may recommend a nominee or nominees to the Chairman of the AAAS Board for final approval.

Nominations should be sent to: Scientific Freedom and Responsibility Award, American Association for the Advancement of Science, 1515 Massachusetts Ave., N.W., Washington, DC 20005. Deadline for receipt of nominations is 30 June 1981.

Three professional societies affiliated with the AAAS also sponsor awards for scientists or engineers in their profession who have taken extraordinary actions in the public interest. These include the Institute of Electrical and Electronics Engineers, the American Physical Society, and the American Psychological Association.

GSA News & Information

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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.

INTRODUCING

No.11 in an increasingly popular series

Precambrian geochronology of North America, an annotated bibliography, 1951-1977. MP-11. Raymond G. Vugrinovich. 1980. 142 pages (773 bibliographic entries) on two 24x 98-frame microfiche \$4.00.

CONTENTS: Introduction. Annotated Bibliography. Index.

This bibliography was conceived as a source to which a worker could turn to find geochronological studies relevant to a particular area. Studies dealing solely with refinements in decay constants, improvements in analytical or mathematical techniques, and laboratory studies of the behavior of isotope systems under conditions approximating metamorphic environments have not been included. Abstracts reporting preliminary results have been included if the full-length paper was published at least one year later.

This bibliography brings together as many of the studies dealing with the Precambrian geochronology of North America as possible and provides a short summary of each study.

Journal articles, symposium and conference papers, abstracts, and those Ph.D. theses found in *Dissertation Abstracts International* covering the period 1951 through 1977 are included.

The summaries give a review of the results of each study. They are not intended to serve as substitutes for the original papers. For this reason changes in decay constants, errors in measurements and ages, analytical techniques, and sections of papers dealing with subjects other than geochronology have been largely ignored. Structural, petrological, paleomagnetic, and stratigraphic data have been included only to clarify geochronological results.

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Boulder, Colorado 80301

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		TOTAL	

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• GSA member discount (see reverse side of membership card) allowed when claimed.

• Orders in excess of \$50 will be accepted on open account only when originating within North America or a U.S. possession. The Society reserves the right to limit credit to organizations and individuals with established lines of credit.

• Denver metro residents— add 3½% sales tax; Boulder residents— add 5½% sales tax; Colorado residents— add 3% sales tax.

NORTHEASTERN SECTION, GSA, April 9-11, 1981

The 16th Annual Meeting of the Northeastern Section of the Geological Society of America will be held at the Bangor Civic Center, Bangor, Maine, on Thursday, Friday, and Saturday, April 9 to 11, 1981. Registration begins Wednesday, April 8, 1600 to 2100 hours. The Northeastern Section of the Paleontological Society and the Eastern Section of the Society of Economic Paleontologists and Mineralogists will meet concurrently. The meeting is sponsored by the Maine Geological Survey, Department of Conservation, and the Department of Geological Sciences, University of Maine at Orono.

TECHNICAL PROGRAM

General Program. Technical sessions will be scheduled on Thursday and Friday mornings and afternoons and on Saturday morning.

Symposia. Ten special symposia are scheduled. Registration badges will be necessary to attend these and other sessions.

(1) *Geochronology of Northern Appalachians: New England and Maritime Canada* (Henri Gaudette and William Poole)

(2) *Economic Geology of the Northern Appalachians* (Bruce Bouley and Richard Potter)

(3) *Geologic Framework of the New England and Maritime Canada Continental Margin* (John Schlee and Donald Sherwin)

(4) *Tectonics of the Northern Appalachians: Maine and Maritime Canada* (David Westerman and Howard Donohoe for Geological Society of Maine and Atlantic Geoscience Society)

(5) *Neotectonics of Maine* (Harold Borns, Patrick Barosh, and Woodrow Thompson)

(6) *Depositional History and Evolution of the Ancient Continental Margin in the Northern Appalachians* (Victor Rahmanian and Richard Hiscott)

(7) *Sediment Transport in Sand-dominated Estuaries* (Barry Timson for Eastern Section, SEPM)

(8) *Late Wisconsinan Deglaciation of Maine, Quebec, and New Brunswick* (Harold Borns, Woodrow Thompson, and Pierre LaSalle)

(9) *The Adaptive Potential of Bivalved Shells: Comparative Assessments of Brachiopods, Molluscs, and Ostracods* (Roger Thomas for Northeastern Section, Paleontological Society)

(10) *Solving Environmental Problems in the Northeastern U.S. and Eastern Canada* (Allen Hatheway and Owen White for GSA Engineering Geology Division)

Poster Sessions. One or more poster sessions will be scheduled for papers where that mode of presentation seems most suitable.

Projection Equipment will be available for 2" x 2" slides in carousels. A single projector and screen will be furnished at each session. A screening room for checking slides will be available.

PREREGISTRATION FORM

**16th Annual Meeting of the Northeastern Section
Geological Society of America
April 9-11, 1981
Bangor, Maine**

PREREGISTRATION DEADLINE – March 9, 1981

Only One Registrant to a Form (except Spouse or Guest)

NAME (last, first, middle) _____

ADDRESS _____

AFFILIATION (for badge) _____

SPOUSE OR GUEST _____

REGISTRATION FEES (includes social and program)

	Before Mar. 9	After Mar. 9	No.	Amt.
Professional	\$25.00	\$30.00	1	\$ _____
Student (ID required)	10.00	15.00	1	\$ _____
Spouse or Guest	7.50	10.00	1	\$ _____
Annual Luncheon and Business Meeting, April 10	8.00	8.00	_____	\$ _____
Northeastern Section, Paleontological Society Luncheon, April 9	6.75	6.75	_____	\$ _____
TOTAL (U.S. funds)				\$ _____

Requests for registration refunds will be honored in full up to **March 23**; after March 23, 25% of the total will be deducted from all refunds.

Make checks payable to **NEGSA 1981 Annual Meeting** and send to

Dr. Frank Howd, Department of Geological Sciences
110 Boardman Hall
University of Maine at Orono
Orono, Maine 04469

PREREGISTRATION DEADLINE March 9, 1981

SPECIAL EVENTS

Decade of North American Geology Workshop. An open meeting of the working group concerned with the contributions of the Northeastern Section to the centennial celebration of GSA will be held Wed., April 8, 1930 hours, at the Holiday Inn on Main St., across from the Bangor Civic Center. The contributions deal with regional geologic syntheses.

Paleontological Society Luncheon. Following the Thursday morning symposium, the Northeastern Section of the Paleontological Society will have a luncheon and business meeting, the location of which will be announced at a later date. Sign up on the preregistration form.

Social. The usual informal social will be held on Thursday, April 9, from 2000 to 2300 hours at the Bangor Civic Center. Free draft beer and soda will be provided; mixed drinks and wine will be available on a cash basis. Registration badges must be worn.

GSA Section Lunch and Business Meeting. These events will be held Friday, April 10, from 1200 to 1330 hours at the Holiday Inn on Main Street across from the Bangor Civic Center. Seating will be limited to 375. Sign up on the preregistration form.

GENERAL INFORMATION

Exhibit Space will be available in the arena adjacent to the Bangor Civic Center. Booths for educational institutions are \$70, for commercial enterprises \$140. Contact Irwin D. Novak, Department of Earth Sciences, University of Southern Maine, Gorham, ME 04038, telephone (207) 780-5350.

Travel Information. The city of Bangor is accessible from north and south by Interstate 95. The Bangor Civic Center is located at the junction of U.S. Routes 1A and 202 and Interstate 395. Shuttle bus service and hotel limousine service will be available from Bangor International Airport. Shuttle bus service will also be available from outlying hotels to the Bangor Civic Center.

Accommodations. Coordination of housing reservations will be handled by the Bangor Chamber of Commerce. Blocks of rooms have been reserved at the motels listed on the Housing Form. Early return of the completed form will help avoid confusion in assigning accommodations. In the interest of coordinating an efficient

shuttle bus service, please indicate arrival and departure times if you are flying, and if you would use a shuttle bus between the hotels and the Bangor Civic Center.

HOUSING FORM

**Northeastern Section, Geological Society of America
April 9-11, 1981, Bangor, Maine**

Listed below are motels in the Bangor area and approximate driving time from each to the Bangor Civic Center. In the space below, please indicate first, second, and third choices for accommodations and forward to the Bangor Chamber of Commerce. All reservations will be on a first-come, first-served basis. Room confirmations and deposit requests will be sent by the motel. **Do not send room deposits to the Bangor Chamber of Commerce.**

MOTELS	RATES	
	Single	Double
Convention Headquarters:		
Holiday Inn, Main Street	\$26.00	\$30.00
2 Minutes from the Civic Center:		
Penobscot Inn	\$25.00	\$30.00
Wedgewood Arms	_____	28.50
8 Minutes from the Civic Center:		
Bangor Hilton Inn	\$26.00	\$35.00
Budget Motor Inn	20.00	24.00
Quality Inn Chateau	21.00	28.00
Holiday Inn—West	26.00	30.00
Koala Inn	25.00	30.00
Ramada Inn	31.00	38.00
10 Minutes from the Civic Center:		
Bangor Motor Inn	\$24.00	\$28.00
Brewer Motor Inn	20.00	24.00
Chart House Motor Hotel	18.00	22.00
Fairmount Terrace Motel	20.00	24.00
Stable Inn	24.00	28.00
Stacey's New Plaza Motel	18.00	23.00
White House Motel	16.00	22.00

Name: _____

Address: _____

City: _____ State _____ Zip _____

Telephone: () _____

Please specify preference for motel: 1st Choice: _____

2nd Choice: _____

3rd Choice: _____

Single () Double ()

In event space is not available in any of the specified facilities, reservations will be made elsewhere; however, we will do our best to accommodate you.

To help coordinate shuttle bus service, please indicate if you plan to

FLY _____ DRIVE _____

ARRIVAL DATE _____ TIME (a.m.) _____ (p.m.) _____

DEPARTURE DATE _____ TIME (a.m.) _____ (p.m.) _____

Would you use a shuttle bus between your hotel and the Bangor Civic Center?

YES _____ NO _____

RETURN THIS FORM TO:

Bangor Chamber of Commerce
55 Washington Street
Bangor, Maine 04401

ROCKY MOUNTAIN SECTION, GSA, April 16-17, 1981

The 34th Annual Meeting of the Rocky Mountain Section of the Geological Society of America will be held at the Rushmore Plaza Civic Center, Rapid City, South Dakota, April 16 and 17, 1981. The meeting is hosted by the Department of Geology and Geological Engineering, South Dakota School of Mines and Technology.

REGISTRATION

Registration is required for all those attending the meeting, field trips, social events, and exhibits. Official registration badges will be required for admission to all these activities. Student registrants must present proper verification or identification to be eligible for a student discount.

Advance registration is urged so that the local committee can plan more efficiently. This can be achieved by mailing the pre-registration form and a check (made payable to the South Dakota School of Mines and Technology) to

Dr. Charles Thielen
Dean of College Relations
South Dakota School of Mines and
Technology
Rapid City, South Dakota 57701

Registration will be held from 1800 to 2200 hours, Wednesday, April 15, and from 0800 to 1500 hours, Thursday, April 16, and Friday, April 17, at the Rushmore Plaza Civic Center, Rapid City, South Dakota. Advance registrants may pick up badges, programs, and lunch, banquet, and field trip tickets at the registration tables.

Requests for advance registration refunds will be honored in full up to April 1, 1981. After April 1, 25 percent of the total will be deducted from all refunds. An exception to this rule will be made for oversubscribed or cancelled field trips which will be refunded in full regardless of the date.

TECHNICAL PROGRAM

Two days of technical sessions will be held in the Rushmore Plaza Civic Center on April 16 and 17. Depending upon the abstracts submitted, there will be sessions on tectonics and structural geology, geomorphology, paleontology, stratigraphy and sedimentology, economic geology, engineering and environmental geology, mineralogy, geochemistry, geophysics, hydrogeology, and general geology.

SYMPOSIA

- (1) *Energy and Ore Deposits of the Northern Great Plains and Black Hills Regions* (Andrew Button and Fred Steece).
- (2) *Studies of the Pierre Shale* (Gale A. Bishop and James E. Fox).

PREREGISTRATION FORM

**34th Annual Meeting of the Rocky Mountain Section
Geological Society of America
April 16-17, 1981 • Rapid City, South Dakota**

PREREGISTRATION DEADLINE – MARCH 17, 1981

Only one registrant to a form (except spouse or guest)

NAME (last, first, middle) _____

ADDRESS _____

AFFILIATION (for badge) _____

SPOUSE OR GUEST _____

REGISTRATION FEES

(includes welcoming party, April 15, and program)

	Before Mar. 17	After Mar. 17	No.	Amount
Professional	\$40.00	\$45.00	1	_____
Student (ID required)	\$15.00	\$20.00	1	_____
Spouse or Guest	\$15.00	\$20.00	_____	_____
Annual Luncheon and Business Meeting, April 17	\$ 4.50	\$ 4.50	_____	_____
GSA Banquet	\$12.00	\$12.00	_____	_____
Premeeting Field Trips				
1: Cretaceous stratigraphy		\$ 40.00	_____	_____
2: Tertiary intrusions		\$115.00	_____	_____
3: Engineering geology		\$ 35.00	_____	_____
4: Paleozoic stratigraphy		\$ 30.00	_____	_____
Postmeeting Field Trips				
5: Precambrian geology		\$ 24.00	_____	_____
6: White River Badlands		\$ 28.00	_____	_____
Special Premeeting Field Trip				
7: Homestake Gold Mine		\$ 30.00	_____	_____
TOTAL (U.S. funds)			_____	_____

Requests for registration refunds will be honored in full up to April 1, 1981; after April 1, 25% of the total will be deducted from all refunds.

Make checks payable to the South Dakota School of Mines and Technology and send to

Dr. Charles Thielen, Dean of College Relations
South Dakota School of Mines and Technology
Rapid City, South Dakota 57701

PREREGISTRATION DEADLINE March 17, 1981

- (3) *Groundwater Studies of the Northern Plains Region* (Lee Case).
- (4) *1988 Centennial of the Geological Society of America—Workshop on problems of regional geological synthesis* (A. R. Palmer).

Registration badges are necessary to attend these and other sessions.

SPECIAL EVENTS

Welcoming Party. There will be a no-host cocktail party from 1800 to 2200 hours, Wednesday, April 15. The party will be held at the Rushmore Plaza Civic Center near the registration area. Registration badges will be required.

GSA Banquet. The GSA Banquet will be held in the Heritage Room at the Travelodge on Thursday, April 16. Cocktails will be available on a cash basis at 1830 hours and the banquet will follow at 1930 hours. Wine is included with the meal. The guest speaker will be Dr. Laurence Lattman of the University of Utah. He will speak on the topic of "Geology in Biblical Times." Tickets must be purchased at the time of registration. The cost of the event is \$12.00.

Luncheon and Annual Section Business Meeting. The luncheon and business meeting will be held in the Washington Room at the Alex Johnson Hotel on Friday, April 17, at 1200 hours. Tickets must be purchased at the time of registration. The luncheon cost is \$4.50.

Management Board Meeting. The Management Board will have a breakfast meeting at 0700 hours in the Jefferson Room at the Alex Johnson Hotel to discuss the 1982 section meeting.

Museum of Geology. The Museum of Geology, located on the South Dakota School of Mines and Technology campus, will be open to the public from 0800 to 1700 hours on both Thursday, April 16, and Friday, April 17. Numerous minerals and vertebrate fossils of local origin are included among the many displays shown here. Admission to the public is free.

Mount Rushmore National Memorial Easter Sunrise Service. There will be a special Easter Sunday Sunrise Service held at Mount Rushmore National Memorial at 0700 hours. The service is all-denominational and open to the general public. Be prepared for a cool April morning in the Black Hills.

GENERAL TRAVEL INFORMATION

Rapid City, South Dakota, is located at the edge of the Black Hills, a Laramide uplift, exposing rocks ranging in age from Precambrian to Mesozoic; classic Cenozoic deposits of the Badlands National Park can be viewed about 60 miles to the east. This region is easily accessible by air via Western, Frontier, and Republic airlines with non-stop or one-stop connections through Salt Lake City, Denver, Casper, Minneapolis, Bismark, and Minot, or by automobile via I-90 (east-west) or U.S. 85 and 18/I-25 (north-south). Rental car agencies are located at the airport, and a shuttle-bus service is available from the airport to Rapid City and back. The fare is approximately \$5.00 one way, and the travel time is about 10 minutes. The Airport Limousine Service, which meets every incoming and outgoing plane, is also available as a local shuttle-bus between hotels and the Rushmore Plaza Civic Center. The designated shuttle-bus

stops are given with the partial listing of motels.

Most of the downtown motels are within ½ mile of the Rushmore Plaza Civic Center for those individuals who prefer the pedestrian route. This walk is through the site of the 1972 Rapid City Flood which devastated a large part of the town. This area is now a beautiful park illustrating land usage compatible with geologic processes.

SPOUSE ACTIVITIES

Mount Rushmore National Memorial, Badlands and Wind Cave National Parks, Devil's Tower and Jewel Cave National Monuments, Custer (Needles Highway) and Bear Butte State Parks, and Spearfish Canyon are open and easily accessible during April. In Lead/Deadwood, surface tours of the gold mine are conducted by the Homestake Company, and a visit to Wild Bill Hickock's and Calamity Jane's graves is a must for history buffs. The

ACCOMMODATIONS

Excellent motel and hotel accommodations are available in Rapid City. Reservations are the responsibility of the individual. A partial listing of the Rapid City motels and hotels is provided below. These motels/hotels are along the shuttle-bus route.

RAPID CITY MOTELS AND HOTELS

MOTEL/HOTEL	ADDRESS	TELEPHONE (605)
Alex Johnson Hotel	523 6th Street	342-1210
Foothills Motel	1625 N. LaCrosse	348-5640
Gill's Sun Inn	1901 West Main	343-6040
Holiday Inn	LaCrosse and I-90	343-1230
Howard Johnson	LaCrosse and I-90	343-8550
Travelodge—Roman's Ron De Vu	124 Main Street	343-5435
Motel Six	I-90 and LaCrosse	343-1220
Prime Rate	620 Howard Street	343-5434
Ramada Inn	2208 Mt. Rushmore Road	342-1300
Super 8 Motel	LaCrosse and I-90	348-8070
Town House	210 St. Joe	348-4450
Tip Top Motor Hotel	405 St. Joe	343-3901
Town 'N Country	Highway 16 South	343-5383

Numerous campgrounds are available in Rapid City and throughout the nearby Black Hills National Forest. A list of some of the local campgrounds is provided below. Most National Forest Campgrounds (not listed below) cost about \$2 to \$3 per night.

CAMPGROUND	TELEPHONE (605)
Berry Patch RV Campground	341-5588
Big Sky Motel	348-3200
Happy Holiday Campground	342-7365
Holiday Inn TRAV-L-PARK of Rapid City	342-3611
KOA Campgrounds of America	348-2111
Lake Park Campground	341-5320
Lazy J Trailer Park & Campground	342-2751
Timber-of-the-Ages	787-4560
Wooded Acres Campgrounds	342-9625

ROCKY MOUNTAIN SECTION, GSA

South Dakota School of Mines and Technology Museum of Geology, located on campus, will be open for public viewing.

Shopping facilities are available for those interested in this activity. The Rushmore Mall, located along I-90, houses many stores, and the downtown area has many fine specialty shops and places to eat.

GUIDEBOOKS

The American Geological Institute will publish the Rocky Mountain Section, Geological Society of America Meeting Guidebook. This will include complete road logs and detailed geological descriptions of all the field trips plus 15 to 17 invited papers pertaining to the geology of the Greater Black Hills and Northern Great Plains Regions (including the Williston Basin and Eastern Powder River

Basin). These guidebooks will be available for sale at the meetings in the exhibits section.

EXHIBITS

There will be an exhibit hall in the Rushmore Plaza Civic Center. Registrants are welcome to visit the exhibits to view the latest in geologic literature, equipment, and technology. Guidebooks will also be on sale in the exhibit room.

FIELD TRIP INFORMATION

All field trip registrants **MUST ALSO REGISTER IN ADVANCE** for the meeting. The deadline for Advance Registration is **March 17, 1981**. All trips will depart from and return to the Rushmore Plaza Civic Center parking lot unless otherwise specified. Trips may be cancelled owing to a low number of registrants or for reasons beyond our control.

Premeeting

1. Stratigraphy and depositional environments of Lower and Upper Cretaceous strata, southern Black Hills, South Dakota (April 14—leave 0800 hours; April 15—return 1800). Leaders: R. Bretz, G. Bishop, K. Dandavati, and J. Fox.

The first day of this two-day field trip will include stops dealing with stratigraphy and depositional environments of the Lower Cretaceous Inyan Kara Group at Calico, Fuson, and Fall River Canyons. The second day will begin with a visit to a mammoth-bearing sinkhole deposit in Hot Springs, South Dakota. The remainder of the field trip will include several stops to observe stratigraphy and depositional environments of Upper Cretaceous strata along the Cheyenne River and its tributaries east of Hot Springs, SD. Strata include: Belle Fourche Shale, Greenhorn Formation, Carlile Formation, Niobrara Formation, and Pierre Shale. **Limit: 40; Cost: \$40 plus overnight lodging in Hot Springs, SD (one night).** Includes transportation, lunch, and guidebook.

2. Tertiary intrusions of the Northern Black Hills, South Dakota, and Wyoming (April 13—leave 1600 hours; April 15—return 1600 hours). Leaders: Alvis L. Lisenbee and Frank Karner.

Eocene alkalic plutons, including dikes, sills, stocks, and laccoliths, and related volcanic rocks will be examined. Stops include Devil's Tower, Sundance Mountain, the Bear Lodge complex in Wyoming, and the Cutting Stock area and Tomahawk volcanic complex in South Dakota. The trip emphasizes the petrographic character of the rhyolite-quartz latite-trachyte-phonolite association and the modes of emplacement. Lamphrophyres, pyroxenites, and carbonatites occur in some centers. Warm clothing is recommended. **Limit: 30; Cost: \$115.** Includes two nights lodging, two lunches, and two dinners, transportation, and field trip guidebook.

3. Engineering geology and groundwater conditions in the Black Hills (April 14—leave 0800 hours; April 14—return 1800 hours). Leaders: P. Rahn, F. Steece, and V. Bump.

The purpose of this field trip is to acquaint geologists with engineering geology and groundwater conditions in the Black Hills. Landslides in Cretaceous rocks, rock-cut slopes in slate, ground water in Precambrian crystalline rocks and Paleozoic carbonates, and other features of general engineering interest will be examined. The flood plain management program in Rapid City, a consequence of the 1972 flood, will be inspected. The morning trip will tour the Rockerville, Hill City, and Keystone

areas. The afternoon trip will tour the Spearfish, Deadwood, and Nemo areas. **Limit: 40; Cost: \$35.** Includes lunch, transportation, and guidebook.

4. Paleozoic and Mesozoic stratigraphy of the Northern Black Hills (April 15—leave 0800 hours; April 15—return 1630 hours). Leaders: Fred Steece and J. P. Gries.

The trip will cover the Paleozoic and Mesozoic rocks of the Northern Black Hills from the Precambrian contact to the top of the basal sandstones of the Cretaceous Inyan Kara Group. Stops will permit detailed examination of outcrops of all but the Spearfish Redbeds and the Jurassic sequence. Discussions on the outcrop will include observations on structural history, Tertiary intrusions and attendant mineralization, and physiography, in addition to comments on the lithology and reservoir characteristics of the sedimentary strata themselves. **Limit: none; Cost: \$30.** Includes transportation, box lunch, and guidebook.

Postmeeting

5. Geology of uraniferous conglomerates in the Nemo area, Black Hills (April 18—leave 0730 hours; April 18—return 1730 hours). Leader: Jack A. Redden.

Recent mapping of uraniferous Precambrian conglomerates and associated rocks indicates a complex depositional and structural history for these low metamorphic grade, largely coarse clastic sedimentary rocks. The trip will visit the older fluvial uraniferous and auriferous conglomerates and associated rocks, a 1,000-m-thick gravity differentiated sill, and the "Estes" unconformity and overlying thick Estes fanglomerate which developed along contemporaneous faults. Field stops will emphasize the coarser grained metasedimentary rocks and evidence for fluvial and marine fanglomeratic environments of different parts of the section. **Limit: 25; Cost, \$24.** Includes lunch, van transportation, and guidebook. Private vehicle prohibited unless 4WD.

6. White River Badlands of South Dakota (April 18—leave 0800 hours; April 18—return 1800 hours). Leaders: Philip R. Bjork and J. Reid Macdonald.

Oligocene and lower Miocene continental sediments and their vertebrate faunas will be examined. Particular attention will be given to the Chadron, Brule, Sharps, Monroe Creek, Harrison, and Rosebud Formations within the triangle formed by Scenic, Wounded Knee, and Hermosa, SD. **Limit: 30; Cost: \$28.** Includes lunch, refreshment, transportation, and field trip guidebook.

Special Field Trip/Premeeting

7. Homestake Gold Mine Underground Tour (April 14—leave 1630 hours; April 14—return 2300 hours). Leaders: Homestake personnel and Fred Rich.

Tour will include on-the-spot discussions of the geological aspects, production, and mining techniques of America's largest gold mine. **Limit: 30; Cost: \$30.** Includes transportation and guidebook.

SOUTH-CENTRAL SECTION, GSA, April 13-14, 1981

PREREGISTRATION DEADLINE, April 1, 1981

THE SOUTH-CENTRAL SECTION of the Geological Society of America will hold its 15th Annual meeting in the Convention Center in San Antonio, Texas, on April 13-14, 1981. The meeting will consist of two days of symposia and voluntary papers, three field trips, a welcoming party, annual banquet, and luncheon for the Texas Chapter of the National Association of Geology Teachers. The meeting is sponsored by Trinity University, San Antonio, TX.

(continued next page)

SOUTH-CENTRAL SECTION PREREGISTRATION FORM

15th Annual Meeting of the South-Central Section, GSA

April 13-14, 1981, San Antonio, Texas

Deadline for advance registration: April 1, 1981

Name _____
last
first
middle

Institution or Firm _____

Address _____

City _____ State _____ Zip _____

Phone () _____ () _____
business
home

Spouse or Guest _____
last
first
middle

Address _____

City _____ State _____ Zip _____

Registration	Until April 1	After April 1	
Regular fee	\$25.00	\$35.00	
Student fee	\$10.00	\$15.00	

Annual banquet Monday evening, April 13 (\$11.00) includes boat ride and refreshments on the San Antonio River.

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

FIELD TRIP RESERVATION

Field Trip No. 1: Geology of the Uvalde, Texas, region: tar sands, astroblems and intrusive bodies of southwest Texas: \$40.00 (student, \$20.00) \$ _____

Field Trip No. 2: Environmental geology and hydrology of the greater San Antonio area: \$40.00 (student, \$20.00) _____

Field Trip No. 3: Geology of the South Texas uranium belt: \$40.00 (student, \$20.00) _____

TOTAL _____

NOTES REGARDING FIELD TRIPS: Reservations will be accepted **only if accompanied by full payment.** Field trips may be cancelled if registration is insufficient or for reasons beyond GSA's control. Full refund will be made in those circumstances. Personal cancellations must be received **in writing before April 1, 1981.** Refunds are subject to a processing fee.

TO RETAIN INFORMATION ON REVERSE SIDE, COPY THIS FORM TO MAIL IN.

SOUTH-CENTRAL SECTION, GSA

ADVANCE REGISTRATION

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

Donald McGannon, South-Central Section, GSA
Department of Geology, Trinity University
715 Stadium Drive
San Antonio, TX 78284

Registration fee: Advance, \$25.00, after April 1, 1981, \$35.00;
Student's advance, \$10.00, after April 1, 1981, \$15.00

TECHNICAL SESSIONS

Six symposia have been organized as part of the technical sessions. Titles and convenors are as follows:

- (a) Geophysical Stratigraphy, *Robert Sheriff, Seiscom Delta, Houston, Texas*
- (b) Astrogeology, *William Phinney, Johnson Space Center, Houston, Texas*
- (c) Uranium Ore Genesis, *Andrew Weinzapfel, Conoco, San Antonio, Texas*
- (d) Geopressured Zones in the Gulf Coast Region, *William Morton, Bureau of Economic Geology, University of Texas, Austin, Texas*

- (e) Environmental Geology of the Balcones Fault Zone, *O. T. Hayward, Baylor University, Waco, Texas*
- (f) Petrogenesis and Tectonics of the Greater Trans-Pecos Area, *Don Davidson, University of Texas, El Paso, Texas*

Sessions of voluntary papers will run concurrently with the symposia. Titles of sessions will be selected after all abstracts have been received.

NAGT MEETING

The Texas chapter of the National Association of Geology Teachers will hold its annual meeting for the first time with the South-Central Section, GSA. An NAGT program is planned to run concurrently with the GSA technical sessions. Abstracts for NAGT papers should be sent to Donald E. McGannon, Program co-chairman, Department of Geology, Trinity University, San Antonio, TX 78284.

ANNUAL BANQUET

The annual banquet will be held in the VIP room of the San Antonio Convention Center at 1930 hours on Monday night, April 13. The banquet will be preceded by a boat ride and refreshments along the beautiful San Antonio River beginning at 1800 hours. Guest speaker will be Dr. William Fisher, Director of the Bureau of Economic Geology, University of Texas, Austin. Cost of the evening will be \$11. Tickets can be pur-

HOUSING INFORMATION

The headquarters hotel is the **Hilton Palacio del Rio**. The room reservation form may be used for the Hilton only. Reservations for the other hotels listed below should be made **DIRECTLY** with the hotel.

Hotel	Phone (512)	Single	Double (2 persons/2 beds)
Hotels within walking distance of the Convention Center.			
Menger 204 Alamo Plaza	223-4361	\$ 29	\$ 39
Crockett 301 E. Crockett	225-4491	\$ 28	\$ 32
Marriott 889 E. Market	224-4555	\$ 52-66	\$ 64-78
Other hotels in the downtown area			
Downtown Travelodge 100 Villita	226-2271	\$ 27	\$ 37
Downtown Holiday Inn Durango at Santa Rosa	225-3211	\$ 30	\$ 40
Hotels near the International Airport on Loop 410, easily accessible to the Convention Center via I-37.			
La Quinta Airport East 333 NE Loop 410	828-0781	\$ 28	\$ 32
Ramada Inn 333 NW Loop 410	344-4581	\$ 36	\$ 42
Albert Pick Motor Inn 96 NE Loop 410	344-8331	\$ 30	\$ 37

All accommodations in San Antonio subject to 7% tax

Those wishing to camp will find a KOA 10 miles east of the Convention Center at 602 Gambler Rd.

SOUTH-CENTRAL SECTION, GSA

chased at the registration desk until noon, Monday, April 13. Preregistration for the banquet is recommended, however.

WELCOMING PARTY

There will be an alfresco welcoming party along the Lagoon at the Convention Center from 1800 to 2000 hours, Sunday, April 12. A cash bar and snacks will be available.

NAGT LUNCHEON

A luncheon for NAGT members will be held on Tuesday at 1200 hours in the VIP room of the Convention Center. A NAGT business meeting will be held at that time.

BUSINESS MEETING

The Management Board of the South-Central Section of the Geological Society of America will meet in the Hilton Palacio del Rio at 1630 hours, Sunday, April 12.

The annual business meeting of the section will convene in the Hilton Palacio del Rio at 1630 hours, Monday, April 13.

PROJECTION EQUIPMENT

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

BEST STUDENT PAPER AWARD

The South-Central Section, GSA, will again offer 3 awards for the best papers authored exclusively and presented by a student. The awards are in the amounts of \$100, \$50, and \$25. We encourage participation in this professional competition.

FIELD TRIPS

Preregistration is required for the field trips. A guidebook will be provided to participants of each field trip. Additional guidebooks will be on sale during the meeting.

1. **Geology of the Uvalde, Texas region: tar sands, astroblems and intrusive bodies of southwest Texas.** Saturday, April 11. Leader: Walter W. Coppinger.

One day premeeting trip will depart and return from the loading area of the San Antonio Convention Center across the street from the headquarters hotel. The cost of the trip will be \$40 (\$20 students) which includes transportation, lunch, and guidebook. (Maximum 40).

2. **Environmental geology and hydrology of the greater San Antonio area.** Sunday, April 12. Leader: Feather Wilson.

One day premeeting trip will depart and return from the loading area of the San Antonio Convention Center across the street from the headquarters hotel. The cost of the trip will be \$40 (\$20 students) which includes transportation, lunch, and guidebook. (Maximum 40).

3. **Geology of the South Texas Uranium belt.** Wednesday, April 15. Leader: Andy Weinzapfel, Conoco.

One day postmeeting trip will depart and return from the loading area of the San Antonio Convention Center across the street from the headquarters hotel. The cost of the trip will be \$40 (\$20 students) which includes transportation, lunch, and guidebook (Maximum: 40).

ROOM RESERVATION FORM, SOUTH-CENTRAL SECTION, GSA

For use **ONLY** with Hilton Palacio del Rio (Deadline: March 22, 1981)

Name _____
last first middle

Institution or Firm _____

Address _____

City _____ State _____ Zip _____

Check one: Single, \$55-\$77
 Twins, \$73-\$95

Check one: do not hold past 6 p.m.
 hold until arrival. If I do not arrive and use the room, bill me at the address below.

All accommodations in San Antonio subject to 7% tax.

Name _____
 Address _____
 City _____

(Will share room with _____)

Arrival _____ Departure _____
day date time day date time

MAIL TO: Hilton Palacio del Rio, 200 South Alamo Street, San Antonio, TX 78206, Phone (512) 222-2481

NORTH-CENTRAL SECTION, GSA, April 30–May 1, 1981

The Department of Earth Sciences of Iowa State University will host the 15th Annual Meeting of the North-Central Section of the Geological Society of America along with the 8th Annual Meeting of the North-Central Section of the Paleontological Society, and the 14th Annual Meeting of the Pander Society on April 30 and May 1 (Thursday and Friday), 1981. For further information, write or call Local Committee Chairman Donald L. Biggs, Department of Earth Sciences, Iowa State University, Ames, Iowa 50011, telephone (515) 294-5373, or Program Committee Chairman Carl F. Vondra, Department of Earth Sciences, Iowa State University, Ames, Iowa 50011, telephone (515) 294-5867.

Registration is required for all those attending the meeting, field trips, and social events. Official badges will be required for admission to all convention activities. Student registrant must present proper identification or verification to be eligible for student discount.

REGISTRATION

Preregistration: You are requested to register in advance so that the local committee can plan more efficiently. Your registration form and payment must be postmarked no later than Friday, March 27, 1981, to qualify for the reduced pre-registration fees. Please complete the accompanying registration form and return it with a check or money order (made payable to Iowa State University) to the North-Central Section of GSA, Office of Continuing Education, Room 102, Scheman Continuing Education Building, Iowa State University, Ames, Iowa 50011.

On-Site Registration: Registration will be held from 5:00 until 10:00 p.m. Wednesday evening, April 29, and from 7:30 a.m. Thursday and Friday (April 30 and May 1). Name badges, banquet, luncheon, and field trip tickets will be available at the registration desk, 1st floor lobby, Scheman Continuing Education Building. Preregistrants should pick up their packets of registration materials and tickets at the registration desk.

Requests for advance registration refunds will be honored until April 15, 1981, for all but field trip fees. Field trip fees will be refunded only if the space can be resold.

TECHNICAL PROGRAM

Technical sessions, symposia, and workshops will be held in the Scheman Continuing Education Building at the Iowa State Center. Depending upon the abstracts submitted, there will be sessions on economic geology, environmental geology, general geology, geochemistry, geomorphology, geophysics, mineralogy, petrology, paleoecology, paleontology, quaternary geology, sedimentation, stratigraphy, structural geology, and tectonics. In addition, there will be symposia on:

1. **Process and Response in Wisconsin and Holocene Environments of the Midwest** (George R. Hallberg and James C. Knox, conveners)
2. **Geologic Aspects of Mining and Reclamation** (Lyle V. A. Sendlein, convener)
3. **Modeling of High Temperature Petrologic Processes** (Bert E. Nordlie and V. Rama Murthy, conveners)
4. **Cretaceous of the Mid-Continent Region** (Robert L. Brenner and Donald E. Hattin, conveners)

5. **Mississippian Classification and Fossil Zonation** (Charles Collinson and H. Richard Lane, conveners)
6. **Geology of the Forest City Basin** (John Lemish, convener)
7. **Paleoecology of Midwestern Paleozoic Fossils** (Wayne I. Anderson, convener)
8. **Conodonts** (Gilbert Klapper, convener)

Also, an open forum workshop will be held on the problems of geological synthesis for "The Decade of North American Geology." (See Centennial News on p. 151 of the October 1980 issue of *GSA News & Information* for more details regarding the workshop.)

SPECIAL EVENTS

Welcoming Party. A welcoming party will be held for all registrants on the first and second floor lobbies of Scheman Continuing Education Building from 7:00 until 10:00 p.m. on Wednesday evening, April 29. Beer will be on-the-house. Cash bars will also be available for those desiring cocktails.

Annual Banquet. The annual banquet of the North-Central Section of GSA will be at 7:00 p.m. Thursday, April 30, in Room 230 of the Scheman Continuing Education Building. The cost is \$15.00. Entertainment during the banquet will be provided. A short business meeting of the North-Central Section of GSA will take place after the banquet. This will be followed by a lecture entitled "Plate Tectonics and Magma Generation" presented by Peter J. Wyllie of the University of Chicago. It is free and open to all registrants and will be in Benton Auditorium at 8:30 p.m.

Paleontological Society-Pander Society Joint Luncheon. The Paleontological Society and the Pander Society will have a joint luncheon at 12:00 noon Friday, May 1, in Room 299, Scheman. The luncheon will be followed by the Paleontological Society business meeting. Cost: \$5.50.

MEALS

Special meals are planned by the sponsoring organizations as indicated above. Although noon meals are readily available at the Iowa State Memorial Union and at Ames restaurants (list furnished with registration packet), a sandwich buffet consisting of soup, salad, sandwich, dessert, and beverage will be available Thursday and Friday noon in Room 240, Scheman, for your convenience. Tickets for these meals (including the noon sandwich buffet) must be ordered in advance on the accompanying registration form.

STUDENT AWARDS

The Geological Society of America will award \$50 to the best paper delivered by and authored exclusively by a student. The Paleontological Society will award a certificate for the best paleontological paper by a student.

TRAVEL TO AMES

Ames may be reached by auto on Interstate 35 from Des Moines and Minneapolis and via Interstates 80 and 35 from either Omaha or Chicago. Des Moines is served by Braniff, Frontier, Ozark, United, and Republic West Airlines. Inter-city bus (limousine) and car-rental service are available to Ames from the Des Moines airport.

PREREGISTRATION DEADLINE, March 27, 1981

PARKING AND LOCAL TRANSPORTATION

Parking at the Iowa State Center in the large lot just north of the Scheman Continuing Education Building is free. A shuttle-bus service to the Memorial Union and the motels listed below will be furnished free of charge for all registrants.

Parking on the main campus is restricted to permit holders only, with the exception of parking lots designated for visitors or parking at the Memorial Union Parking Ramp.

SPOUSE AND GUEST ACTIVITIES

A tour of the Des Moines Botanical Gardens and the Living History Farm west of Des Moines will be conducted from 9:00 a.m. until 4:00 p.m. on Thursday, April 30.

The Botanical Garden is housed in a large, modern, glass dome called a crystogon. Visitors are able to view the more than 1,000 tropical and subtropical plants by way of an intricate
(Continued on page 17)

HOUSING INFORMATION

To reserve hotel/motel accommodations, fill out the housing reservation form completely and mail to the address indicated before March 15. The Office of Continuing Education will coordinate all hotel/motel reservations. Your choice of hotel accommodations and rate will be honored on a first-come, first-served basis. Telephone requests cannot be honored. All reservations must be submitted on the Housing Reservation Form. Confirmation of your reservation will come directly from the hotel/motel to which your reservation has been sent. Housing in Ames is limited; therefore, it is imperative that you mail your request early.

Hotel/Motel Rates*

Hotel or Motel	Single	Double/Twin	Triple/Quad
Gateway Center Motor Hotel	\$ 35	\$ 41	\$ 51
Starlight Village Motel	27	36	46
Silver Saddle Motel	20	23-25	28-31
Travelodge	24	28-30	36
Iowa State Memorial Union	18-25	25-35	

* Rates are subject to slight increase due to inflation.

HOUSING RESERVATION FORM

15th Annual Meeting of the North-Central Section of the Geological Society of America

Name _____
 University or Company _____
 Street Address _____
 City _____ State _____ Zip _____
 Phone _____
 Credit Card and Account Number (to guarantee arrival after 6:00 p.m.) _____

Mode of Travel to Ames _____
 Arrival Date/Day _____ Time _____ a.m./p.m.
 Departure Date/Day _____ Time _____ a.m./p.m.

Hotel/Motel Preference _____
 1. _____ 2. _____ 3. _____

Type of Accommodations	Desired Rate
_____ Single (1 bed, 1 person)	_____
_____ Double (1 bed, 2 persons)	_____
_____ Twin (2 beds, 2 persons)	_____
_____ Triple (number of beds _____, 3 persons)	_____
_____ Quads (number of beds _____, 4 persons)	_____

Names of other occupants
 1. _____
 2. _____
 3. _____

Mail before March 15 to

North-Central GSA Housing Committee
 Office of Continuing Education
 Room 102, Scheman Continuing Education Building
 Iowa State University
 Ames, Iowa 50011

NORTH-CENTRAL SECTION, GSA

PREREGISTRATION FORM

15th Annual Meeting of the North-Central Section of the Geological Society of America
meeting concurrently with
the North-Central Section of the Paleontological Society and the Pander Society

(for office use only)

ck/mo. no. _____ \$ _____	
Personal Check <input type="checkbox"/>	Other Check <input type="checkbox"/>
Issued by _____	

Name (last, first, middle) _____

Registered as: Professional Student Spouse/Guest

Spouse/Guest name for badge _____

Affiliation (abbreviation for badge) _____

Professional Address _____

City, State, Zip _____

Phone (business) (____) _____ (home) (____) _____

GSA Member Yes No Speaker Yes No Pander Society Member Yes No

GSA Student Associate Yes No PS Member Yes No

Enclosed is a check or money order (U.S. funds) payable to Iowa State University
in the amount of \$ _____ for:

- _____ Preregistration (postmarked March 27 or earlier) at \$30 per person
- _____ Registration (after March 27) at \$35 per person
- _____ Student preregistration* (postmarked March 27 or earlier) at \$15 per person
- _____ Student registration* (after March 27) at \$17 per person
- _____ Guest/Spouse registration at \$5 per person
- _____ GSA banquet (Scheman), April 30, at \$15 per person
- _____ Joint Paleontological Society/Pander Society luncheon, May 1, at \$5.50 per person
- _____ Sandwich buffet (Scheman), April 30, at \$5.50 per person
- _____ Sandwich buffet (Scheman), May 1, at \$5.50 per person
- _____ Guest/Spouse trip to Des Moines Botanical Gardens and Living History Farm and lunch, April 30, at \$20 per person

ALL FIELD TRIP REGISTRANTS MUST ALSO PREREGISTER FOR THE GENERAL MEETING

- _____ Field Trip 1, Depositional Environments of Glacial Sediments and Landforms on the Des Moines Lobe, Iowa, at \$46 per person
- _____ Field Trip 2, Cretaceous Stratigraphy and Sedimentation in Northwest Iowa, Northeast Nebraska, and Southeast South Dakota, at \$130 per person
- _____ Field Trip 3, Cherokee Sandstones and Related Facies in Central Iowa: An Examination of Their Tectonic Setting and Depositional Environments, at \$46 per person

*Valid ID will be required at on-site registration

MAIL BY FRIDAY, MARCH 27, 1981, TO:
North-Central Section of the Geological Society of America
Office of Continuing Education
Room 102, Scheman Continuing Education Building
Iowa State University
Ames, Iowa 50011

To register more than one person (other than spouse or guest), please duplicate or request additional forms.

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network of paths which thread through the planted areas and around goldfish ponds and a waterfall. Visitors will have an opportunity to go back in time at the Living History Farm when they visit an 1870 town and three farm sites. These demonstrate living and farming from the pioneer days to the present, with a glimpse into the future. The cost per person is \$20.00 and includes transportation, entrance fees, and a luncheon in Des Moines.

The Iowa State University campus is carefully and attractively landscaped and includes many features of interest. These include the University Library which contains several large wall murals created under the direction of Grant Wood, the Memorial Union, the Farm House, the Campanile, the C. Y. Stephens Auditorium, the Fisher Theater, and the Brunnier Gallery.

The following cultural events will be available on campus:

1. Cinderella (price \$3.50), April 30, May 1, 2, Fisher Theater (University Theater)
2. Spring Musical (price \$4.00), April 30, May 1, 2, Maintenance Shop, Memorial Union (Union Board)
3. Iowa State University Singers Concert (free), May 1, C. Y. Stephens Auditorium

FIELD TRIPS

All field trip participants must preregister for the meeting. The preregistration deadline is Friday, March 27, 1981. All trips except No. 2 will depart from and will return to the parking lot immediately north of the Scheman Continuing Education Building.

1. **Depositional Environments of Glacial Sediments and Landforms on the Des Moines Lobe, Iowa.** Saturday, May 2. Limit: 39. Leaders: Timothy J. Kemmis and George R. Hallberg. Cost: \$46 per person, includes transportation, guidebook, box lunch, and refreshments. The trip will depart at 8:00 a.m. from the north entrance of Scheman Continuing Education Building.

The trip will examine Pleistocene deposits and landforms along the east-central portion of the Late-Wisconsinan Des Moines Lobe. The objectives are to examine the complexity of glacial sedimentation and landform development in the area, to see how data from recent glacial studies can provide a better understanding and differentiation of Quaternary glacial deposits, and to recognize the implications of the complexity of applied geologic studies.

2. **Cretaceous Stratigraphy and Sedimentation in Northwest Iowa, Northeast Nebraska, and Southeast South Dakota.** Saturday, May 2, and Sunday morning, May 3. Limit: 39. Leaders: R. L. Brenner, R. F. Bretz, R. J. Bunker, D. L. Iles, G. A. Ludvigson, R. M. McKay, D. L. Whitley, and B. J. Witzke. Cost: \$130 per person, includes transportation, guidebook, refreshments, box lunch on Saturday, and lodging for Friday and Saturday nights, May 1 and 2. The trip will depart at 8:00 a.m. from the Rodeway Inn in Sioux City, Iowa. The trip will examine Cretaceous and Precambrian rocks along the eastern margin of the Cretaceous Western Interior Seaway. Emphasis will be placed on the stratigraphy, depositional environments, and the influence of paleotopography, particularly along the Sioux Quartzite Ridge.

3. **Cherokee Sandstones and Related Facies in Central Iowa: An Examination of Their Tectonic Setting and Depositional Environments.** Saturday, May 2. Limit: 39. Leaders: John Lemish, Daniel R. Burggraf, Jr., and Howard White. Cost: \$46 per person, includes transportation, guidebook, box lunch, and refreshments. The trip will depart at 8:00 a.m. from the north entrance of Scheman Continuing Education Building. The trip will examine exposures of Cherokee sandstones and related facies in Webster County. Depositional environments represented by these facies include distributary channel, flood basin and swamp, delta front, prodelta, and shallow marine.

A NEW GSA PUBLICATION

Stratigraphy and Glacial-Marine Sediments of the Amerasian Basin, Central Arctic Ocean

Special Paper 181—Edited by David L. Clark, Rick R. Whitman, Kirk A. Morgan, and Scudder D. Mackey. 1980. vi + 58 pages, 67 figures, 8 plates (black and white foldouts), 10 tables. LC: 80-65270. ISBN: 0-8137-2181-4 \$13.00.

This volume is a comprehensive summary of stratigraphic and sedimentologic investigations in the central Arctic Ocean supported by the Office of Naval Research during the past 12 years. Some 13 glacial-marine lithostratigraphic units ranging in age from late Miocene to Holocene are over a major part of the Amerasian Basin. A classification of glacial-marine sediment designating four textural classes is proposed and applied to selected non-Arctic glacial samples. Sections of the volume include a series of clay mineralogy maps for the Arctic, description of surface and in-core sedimentation processes, and a final chapter on paleoclimatology of the central Arctic.

Sedimentation rates based on magnetic stratigraphy suggests that glacial-marine sedimentation has been in progress

in the central Arctic Ocean since at least the Miocene. Stratigraphic units are interpreted to represent intervals of alternating increased and decreased glacial ice-rafting. Correlation with oxygen-isotope stratigraphy defined glaciations is demonstrated for the Pleistocene.

The volume is unique in synthesizing the sedimentologic history for the major part of an ocean basin. Tables, appendices, and maps provide the documentation.

CONTENTS: Acknowledgments. Abstract. Introduction. Previous attempts at an Arctic Ocean stratigraphy. Stratigraphy. Distribution and regional trends of stratigraphic units. Unconformities. Chronostratigraphy. Surface-sediment characteristics. Arctic surface-sediment texture. Ferromanganese micronodules. Mechanism of sediment deposition in the central Arctic Ocean. Glacial-marine sedimentation processes. Comparison of Arctic sediment with other glacial and non-glacial sediment. Sediment maps. Geographic distribution of surface-sediment types in the Arctic Ocean. Late Cenozoic lithostratigraphic units and glacial-marine sediment types. Late Cenozoic paleoclimatology. Conclusions. Appendices. References Cited.

JANUARY 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.

Part I

- S10101—Correlation of Mississippian shelf-to-basin strata, eastern California: Summary.

George C. Dunne, Department of Geological Sciences, California State University, Northridge, California 91330; Rachel M. Gulliver, 10901 Keywest Avenue, Northridge, California 91326; Calvin H. Stevens, Department of Geology, San Jose State University, San Jose, California 95192. (4 p., 1 fig.)

- S10102—Location of a caldera source for the Soldier Meadow Tuff, northwestern Nevada, indicated by gravity and aeromagnetic data: Summary.

R. C. Greene, U.S. Geological Survey, American Embassy, APO New York 09697; Donald Plouff, U.S. Geological Survey, Menlo Park, California 94025. (3 p., 1 fig.)

- S10103—Trace elements in continental-margin magmatism: Part III. Alkali granites and their relationship to cratonization: Summary.

John J. W. Rogers, Department of Geology, University of North Carolina at Chapel Hill, Mitchell Hall 029A, Chapel Hill, North Carolina 27514; Jeffrey K. Greenberg, Wisconsin Geological Survey, 1815 University Avenue, Madison, Wisconsin 53706. (4 p., 3 figs., 1 tbl.)

Part II

- 10104—Transverse tectonic boundaries near Kodiak Island, Alaska.

Michael A. Fisher, Terry R. Bruns, Roland Von Huene, U.S. Geological Survey, 345 Middlefield Road, Menlo Park, California 94025. (9 p., 5 figs.)

Transverse tectonic boundaries exist at the northeast and southwest ends of the Kodiak islands, so that the Aleutian arc-trench system is longitudinally segmented in this area. Evidence for the transverse boundaries includes alignments of such geologic features as offset volcanic lineations, terminations of structural trends, and boundaries of discrete zones of earthquake aftershock sequences. The boundaries appear to be broad zones of disruption that began to form during the late Miocene or Pliocene. Although oceanic fracture zones and seamount chains intersect the continental margin near the boundaries, subduction of these features probably did not cause the tectonic boundaries. The fracture zones and seamount chains have swept northeastward along the margin, at least since the late Pliocene, because of the direction of convergence of the Pacific and North American plates.

- 10105—Location of the Border Ranges fault southwest of Kodiak Island, Alaska.

Michael A. Fisher, U.S. Geological Survey, Menlo Park, California 94025. (12 p., 6 figs.)

A positive magnetic anomaly extends discontinuously from the south side of the Copper River basin, along the southeast side of Cook Inlet and Shelikof Strait, and southward from Kodiak Island to near Sutwik Island. Regionally, this anomaly parallels the Border Ranges fault and is within

10 km of it along the Kodiak Islands. The most probable source for the anomaly near Kodiak Island is mainly Early Jurassic plutonic rocks and locally ultramafic rocks that are associated with a melange. The Border Ranges fault lies between these two rock types, and given the regional parallelism of the fault and the magnetic anomaly, the fault can be traced offshore southwest of Kodiak Island to near Sutwik Island using marine magnetic data. Lithologic evidence suggests that the fault continues southwest of Sutwik Island toward the southwest end of the Alaska Peninsula.

- 10106—Microearthquakes near the Albuquerque Volcanoes, New Mexico.

Lawrence H. Jaksha, Jerry Locke, U.S. Geological Survey, Albuquerque Seismological Laboratory, Albuquerque, New Mexico 87115; Herbert J. Gebhart, University of Kansas, Lawrence, Kansas 66045. (6 p., 6 figs., 2 tbls.)

A series of about 300 small earthquakes with magnitudes up to 2.5 (M_L) were observed near the Albuquerque Volcanoes, New Mexico, between September 28, 1978, and April 30, 1979.

A first approximation to a crustal model for the active area was derived using a delay time analysis of arrival times from local explosions. The thickness of the sedimentary section near the volcanoes was estimated to be about 5 km. The P-wave velocity in the sedimentary section above the refractor is estimated to be 3.5 km/s. Earthquakes located by a small network of field seismographs were used to calculate station corrections for the 13-element U.S. Geological Survey (USGS) seismic array monitoring the Albuquerque Basin. Hypocenters for 93 well-recorded earthquakes were determined using this array with the station corrections.

The earthquake sequence was generated within a small source region about 2.5 km west of the fissures from which the Albuquerque Volcanoes erupted. The events have an average focal depth of 9.5 km and are interpreted, from a composite focal mechanism, to have occurred along a north-south-striking, high-angle, down-to-the-west normal fault. The active fault, when projected to the surface, is in good agreement with the position and strike of both the volcanoes' fissure and the County Dump fault, directly to the south of the volcanoes.

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- 10107—Correlation between deformation lamellae, microfractures, macrofractures, and in situ stress measurements, White River Uplift, Colorado.

William F. Dula, Jr., Department of Geology, University of Colorado, Boulder, Colorado 80309 (present address: Center for Tectonophysics, Texas A&M University, College Station, Texas 77843). (10 p., 10 figs.)

Dynamic analyses of quartz deformation lamellae and microfractures in lower Paleozoic quartzites from the White River Uplift record a northwest direction of compression which can be related to joint and fault orientations and in situ stress determinations. Crystallographic orientations of deformation lamellae resemble those formed in the subbasal I, relatively nonselective domain.

Microfractures in quartz grains form orthogonal sets of generally north-northeast- and west-northwest-trending fractures which are approximately normal to bedding. The strongest set of microfractures in most samples lies in the σ_1 - σ_2 plane deduced from deformation lamellae analyses, suggesting that the microfractures are extensional features. Maxima of microfractures correspond to maxima of joints measured at adjacent locations. The strikes of prominent west-northwest sets of microfractures and joints are subparallel to the dominant northwest strike of faults on the uplift.

In situ stress measurements conducted in the Piceance Basin and Rangely, Colorado areas indicate principal stress orientations similar to those determined from quartz deformation lamellae, microfractures, and joints which are pre-uplift to early uplift, late Laramide fabric elements.

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- 10108—Reinterpretation of Cambrian-Silurian-Devonian unconformities, southeast coastal Maine.

Bruce A. Bouley, Robert Kerrich, Timothy E. LaTour, Geology Department, University of Western Ontario, London, Canada (present address, Bouley: Callahan Mining Corp., 6245 N. 24th Street, Phoenix, Arizona 85016). (5 p., 4 figs.)

Differentiated volcanic rocks and comagmatic plutons in southeast coastal Maine have been mapped as Silurian to Devonian in age. They are flanked by volcanoclastic and pelitic rocks considered Upper Cambrian to Lower Ordovician based on isotopic and paleontologic dating, and because of fragmental rocks, interpreted as representing erosional unconformities between the lavas and pelites. How-

ever, metal deposits contained within both lithologies have trends in form and element assemblages consistent with progression from proximal, through distal, to basinal volcanic environment. Therefore, we have re-evaluated the stratigraphy and the criteria on which relative ages were assigned previously.

Remapping of critical exposures and measurements of structural data were undertaken at type localities to check for differing deformational histories in major rock units, the main basis for previous age distinctions. The structural elements in the major formations display a consistent orientation, and the geometry of minor structures in rocks with mechanically equivalent properties is comparable. It is concluded from orientation data, and from consideration on volcanic processes, that there is no basis for assigning different tectonic histories, and therefore different ages, to formations above and below inferred unconformities, which are herein viewed as volcanic breccias. The Castine and Ellsworth Formations are, at least in part, simply proximal and distal manifestations of the same volcanic episode.

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- 10109—The Georgia Embayment continental shelf: Stratigraphy of a submergence.

Orrin H. Pilkey, U.S. Geological Survey, and Department of Geology, Duke University, Durham, North Carolina 27708; Blake W. Blackwelder, U.S. Geological Survey, Reston, Virginia 22092; Harley J. Knebel, U.S. Geological Survey, Woods Hole, Massachusetts 02543; Mark W. Ayers, U.S. Geological Survey, and Department of Geology, Duke University, Durham, North Carolina 27708. (12 p., 8 figs., 2 tbls.)

Forty vibracores taken across the continental shelf and in proposed drilling lease areas of the southeast Georgia Embayment are used to document the unconsolidated shelf-sediment cover. The Holocene-Pleistocene sediment veneer is thin, generally less than 4 m thick. Lagoon sediments deposited during the last regression (shelf emergence) or the Holocene transgression (shelf submergence) occur in patches on the inner and central shelf. Because essentially only late Pleistocene and Holocene mollusk shells are present in the shelf-sediment cover, it is believed that most of the carbonate fraction was removed by subaerial leaching during low sea-level stands aided by mechanical abrasion and biological degradation during the regressive-transgressive cycle. During each transgression or submergence, the surficial sand sheet is recharged with a new biogenic carbonate fraction along with the addition of small amounts of clastic sediments derived from "overrun" estuaries and erosion of underlying Tertiary sediments.

The stratigraphy based on the vibracores supports the concept of cross-shelf migration of the shore face-barrier island systems in response to rising sea level. Sedimentologic and paleontologic analyses also indicate that extensive in-place mixing of shelf sediments may have occurred, an important factor to consider in evaluation of the fate of particulate pollutants. The establishment of the time frame of such mixing should be given high priority in future studies.

SEPARATES PROGRAM DISCONTINUED FOR 1981

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