



# GSA news & information

VOLUME 3, NUMBER 8

G.S.A. ARCHIVES

AUGUST 1981

## 1981 ANNUAL MEETING

GSA and ASSOCIATED SOCIETIES — NOVEMBER 2–5

Headquarters Hotel — Stouffer's Cincinnati Towers

Technical Sessions and Exhibits — Cincinnati Convention-Exposition Center

**CINCINNATI** the beautiful Ohio valley city famed for German beer and southern comfort, spiced by the touch of many cultures, will host the four-day 1981 Annual Meeting of the Geological Society of America from 8:00 a.m., November 2 through 5:00 p.m., November 5.

Without having to leave the city, one can experience many places—the fabled hills of San Francisco, the festive spirit of Munich, the river-front flavor of New Orleans, the gourmet restaurants of Paris, or the cosmopolitan mood of New York; they all come together in Cincinnati for your enjoyment.

The Society has not met in Cincinnati since 1961. Here's a fresh opportunity to experience Cincinnati as well as to study the fossiliferous Cincinnati Series, the stratigraphy of coal-rich Kentucky, the mineralization of the St. Francois Mountains, and the wide variety of mid-continent geomorphology. These and other field trips provide a wide panorama of geologic experiences. The program consists of technical sessions, poster sessions, 19 field trips, a four-day science film theater, exhibits, employment service, and a wide variety of guest programs and business and social functions.

Cincinnati is a compact, convenient site. Stouffer's is directly across the street from the Convention Center, which is

the location of technical sessions, exhibits, and employment service. Many of the other hotels are within easy walking distance. A covered, lighted walkway connects the downtown areas, making it easy to get around—day or night. Moderate prices make it convenient to enjoy Cincinnati attractions.

The 1981 logo is the famous Tyler-Davidson Fountain. The Fountain was crafted in Munich and dedicated to Cincinnati in 1871. It is located in the center of Fountain Square—the focal point for all of greater Cincinnati. It represents the tradition and graciousness of the city.

Seven associated societies will hold concurrent meetings with GSA. They are: Cushman Foundation, Geochemical Society, Geoscience Information Society, Mineralogical Society of America, National Association of Geology Teachers, Paleontological Society, and Society of Economic Geologists.

General Chairman: Warren D. Huff, Department of Geology, University of Cincinnati, Cincinnati, OH 45221, (513) 475-3731 or 475-3732.



## 1981 SYMPOSIA

1. *Archaeological Geology in the Eastern Mediterranean*: Archaeological Geology Division; Norman Herz
2. *Origin of Coal*: Coal Geology Division; Norman C. Hester and James C. Cobb
3. *Role of Government Agencies in the Development of Engineering Geology*: Engineering Geology Division; James W. Skehan, S.J., and Richard H. Jahns
4. *Active Mid-plate Tectonics*: Geophysics Division; Robert M. Hamilton and Otto W. Nuttli
5. *The History of American Paleontology: Selected Views*: History of Geology Division; Kennard B. Bork
6. *Regional Hydrogeology—Past, Present, and Future*: Hydrogeology Division; Harry LeGrand and Wayne Pettyjohn
7. *Marine and Continental Correlation of the Cenozoic*: Madeleine Briskin, Rhodes W. Fairbridge, George J. Kukla, William A. Berggren, Claude Deplessy, and Alan Hecht
8. **1981 Centennial Frontier Symposium: *Frontiers of Structural Geology***: Structural Geology Division; Donald U. Wise, George Davis, Peter Giser, Paul Hoffman, and Sharon Moser
9. *Paleozoic Foraminiferal Evolution, Paleoecology and Paleobiogeography*: Cushman Foundation for Foraminiferal Research; Charles A. Ross and Raymond C. Douglass
10. *Shales and Subsurface Hydrology*: Geochemical Society; Donald L. Graf and Yousif Kharakha
11. *The Future of the Journal*: Geoscience Information Society; Mary W. Scott
12. *Real Behavior in Minerals: The Integration of Theory and Technique*: Mineralogical Society of America; C. T. Prewitt and J.D.C. McConnell
13. *Recent Advances in Sedimentary Geology: Implications for Instruction*: National Association of Geology Teachers; Lee J. Suttner
14. *Biotic Interactions in Recent and Fossil Benthic Communities*: Paleontological Society; Michael J. S. Tevesz and Peter L. McCall
15. *Metals in Shales, II*: Society of Economic Geologists; Stephen E. Kesler
16. *Comparative Planetary Geology*: Leon T. Silver and Harold Masursky
17. *Ordovician Stratotype Sections, Biostratigraphy, and Interpretative Lithostratigraphy*: John Pojeta and Earle R. Cressman
18. *Hydrogeology of High Level Nuclear Waste Isolation*: P. A. Witherspoon and F. J. Pearson
19. *The Mississippian-Pennsylvanian Systemic Boundary in the Appalachian Basin*: Charles L. Rice and Donald C. Haney
20. *Late Miocene Paleooceanographic and Biogeographic Reconstructions*: Michael L. Bender and Lloyd H. Burckle
21. *Melanges: Their Nature, Origin, and Significance*: Loren A. Raymond

## SUNDAY "AT LARGE" SYMPOSIA

22. *Ground-water Flow in Karst Systems*: James F. Quinlan
23. *Paleogeography and Climate*: Eric J. Barron
24. *The Carl Tolman Symposium on the Geology and Mineral Resources of the Precambrian St. Francois Terrane, Southeastern Missouri*: Jerry D. Vinegard
25. *Metals in Shales, I*: Society of Economic Geologists; Stephen E. Kesler
26. *Organic Geochemistry of Solid Fossil Fuels*: Organic Geochemistry Division/Geochemical Society; John C. Winters

## ABSTRACTS WITH PROGRAMS

Purchase of *Abstracts with Programs* is available three ways:

1. Advance Mailing. For receipt by mail prior to the meeting, purchase from GSA Publication Sales. See page 143 for order form. Price: \$6.00.

2. Reserved On-Site. For a reserved copy to be guaranteed on-site, purchase on the preregistration form. A ticket will be included in your preregistration packet. Use the ticket to redeem your *Abstracts* volume. (The reserved price is the same as the on-site price but offers the assurance of a guaranteed volume.) Price: \$7.00.

3. Open On-Site. Purchase on-site as available. Price: \$7.00.

## OFFICIAL GSA FUNCTIONS

**GSA Presidential Address**, "GSA—A Legacy and a New Era." Monday, November 2, 4:00–5:00 p.m., at the Convention Center. GSA President, Howard R. Gould, will present his address. All meeting participants are invited.

**GSA Corporate Meeting**, Tuesday, November 3, 8:00–8:30 a.m., at the Convention Center. The time will be unopposed and will include a question-and-answer session.

**GSA Annual Dinner**, Wednesday, November 4, 7:00–10:00 p.m. During the ceremonies of the banquet, the prestigious Day and Penrose medals will be presented. Honored this year will be Day Medalist Donald L. Turcotte and Penrose Medalist John Rodgers.

Immediately following the dinner, Frank Press, president of the National Academy of Sciences and former National Science Advisor to President Carter, will address the audience as our honored guest speaker.

Press has been Professor of Geophysics and Director of the Seismology Laboratory at California Institute of Technology; since 1965 he has been Professor of Geophysics and Chairman of the Department of Earth and Planetary Sciences at Massachusetts Institute of Technology. In addition, he has served the following government agencies and committees: Office of Science and Technology, Arms Control and Disarmament Agency, AID, U.S. delegation to Nuclear Test Ban Conference, President's Advisory Committee and International Geophysics Committee, Lunar and Planetary Mission Board, Scientific Planetary Mission Board, National Center for Earthquake Research, and the National Science Board.

As one of this nation's outstanding scientific leaders, Press has been recognized for excellence by Columbia University, U.S. Department of Interior, and NASA. A member of the National Academy of Sciences since 1958, he is also past president of AGU and the Seismological Society of America. A Fellow and former Councilor of GSA, Press was also a recipient of the 1972 Day Medal.

*The dinner will be in the Grand Ballroom of Stouffer's Hotel. Everyone is welcome to attend both the medal presentations and the after-dinner address.*

## SPECIAL EVENTS

**Welcoming Party**, Sunday, November 1, 6:30–10:00 p.m. The Cincinnati Union Terminal is the site for a unique opening-night reception. GSA will have exclusive access to the terminal which boasts something for everyone. The halls and ramps of the terminal lead to two levels of restaurants and shops. The usual cash bars will have the unusual price of \$1.00–1.50 for all beverages.

The ornately tiled car and bus ramps in the north market have been transformed into the Gourmet Fare—a multitude of

different food operations. You can dine in any language you want. Pick a salad at one shop, an entree at another, and dessert at a third. All food operations have a variety of beverages to choose from in addition to their own specialties. Picnic tables are placed throughout to provide a comfortable and casual environment for dining.

Completed in 1933, the Cincinnati Union Terminal is among the world's finest examples of art deco architecture and, at \$41,000,000, the most expensive railroad station ever built. During its heyday in the 1940s, the terminal could accommodate 216 trains and 17,000 passengers. As passenger-train travel declined, the terminal underwent transition from a station to a place to go for stores and markets, restaurants, and night life.

**Alumni Receptions, Monday, November 2, 6:00-9:00 p.m.** Over 50 universities and colleges will be participating in these popular receptions at the Netherland Hilton.

**Oktoberfest, Tuesday, November 3, 7:00-11:00 p.m.** Our Cincinnati hosts have arranged a special evening of music and dance amid the gaiety and robustness of German food and icy steins of beer in Cincinnati's elegant Music Hall. Four hours of live entertainment featuring German music; a sing-a-long,

dancers, and mini-productions from "Die Fledermaus," "Kismet," and other stage productions. Unlimited free beer and transportation to the Music Hall are included in the ticket price. On the menu—hams, rounds of beef, turkey breasts, small German rye, pickles, hot doughy pretzels, sauerkraut balls, grilled knockworst tidbits, Bavarian meatballs, miniature Coney Islands, cheddar and beer spreads, ham salad in patty shells, whole wedges of baby gouda cheese, apple strudel—and, of course, German chocolate cake. **This event will be well-subscribed so we suggest you preregister. Cost: \$21**

#### CINCINNATI HAPPENINGS

**Music Hall.** The nationally acclaimed Cincinnati Ballet Company and the Cincinnati Symphony Orchestra both have fall series. Box office (513) 721-8222.

**Playhouse in the Park.** The Robert S. Marx Theater and Shelter House Theater have an excellent subscription series October-June. Box office (513) 421-3888.

**Riverfront Stadium.** Cincinnati Bengals vs. Houston Oilers on Sunday, November 1. Box office (513) 621-3550.

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#### GUEST PROGRAM

The Cincinnati Guest Chairmen have produced a program that is original and especially inviting. The activities are informative and created with your interests in mind. Your participation will be an excellent way to experience the ambiance of this new-old river city.

*Please note that registration as a Guest at the Annual Meeting is a prerequisite for participation in the Guest Program and for the use of the Hospitality Center. However, Guest registration does not include admission to the Technical Programs.*

The Hospitality Center will be located in Stouffer's Bamboo Room. Light refreshments and a place to relax will be provided to those registered as Guests. (Please wear your badge). The Center will be open on Sunday at noon and from 9:00 a.m. to 4:00 p.m. each meeting day. Hostesses will be on hand to help you in any way they can. The entire local committee wants you to enjoy your visit and warmly welcomes you to Cincinnati!

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#### GUEST TOURS

**NOTE: ALL TOURS LEAVE FROM AND RETURN TO THE ELM STREET SIDE OF STUFFER'S**

##### Monday, November 2 (full-day tour)

**Queen City Luncheon Tour.** Depart hotel 10:00 a.m. Count 80 landmarks as you wend your way through Cincinnati's vibrant downtown area and Kentucky's riverfront. Glimpse the old European charm of quaint Mt. Adams which boasts Eden Park, the Cincinnati Art Museum, and the Playhouse in the Park. Stroll through spectacular Krohn Conservatory, one of the country's largest floral conservatories. Visit beautiful Taft Museum and enjoy its treasure house of art. A luncheon stop combines with a tour through one of the oldest premium wineries in the United States. Enjoy a "taste of the grape" before dining in the historic surroundings of this winery. Return to the hotel at 3:00 p.m. The cost: \$18.50 (lunch included).

##### Monday, November 2 (half-day tour)

**Ohio River Luncheon Cruise.** Depart hotel 11:00 a.m. Experience the romance of the river as your cruise the *Betty Blake*, a two-decked, glass-enclosed riverboat laced with multicolored awnings and sporting a rousing calliope. It's an ideal setting for a relaxed luncheon and leisurely sightseeing, as you are lured into the changing scenery of fall foliage, rolling hills, and city skylines. Relive old-fashioned fun when riverboats were "king." Return to the hotel at 2:00 p.m. The cost: \$13.00 (lunch included).

##### Monday, November 2 (half-day tour)

**Stoned in Cincinnati.** Depart hotel 1:00 p.m. Put on comfortable shoes and come along on a walking tour through downtown Cincinnati to view the foundations of the Queen City and examine building stones that tell a story of history, art, and architecture. Join guide Dr. R. A. Davis, humorist, paleontologist, and Curator of Collections at the Cincinnati Museum of Natural History, for a leisurely stroll and learn just how international the building stones of Cincinnati are. Coffee will be served in historic St. Louis Church. Return to the hotel at 4:30 p.m. The cost: \$5.00.

##### Tuesday, November 3 (full-day tour)

**Kentucky Horse Park and Shaker Village.** Depart hotel 8:00 a.m. You'll ride through the rolling hills of Kentucky to Shaker Village, where you'll set your own pace on a self-guided walking tour among 27 carefully restored, early 19th-century buildings. After wandering leisurely through 40 rooms of Shaker furnishings, watching artisans demonstrate broommaking, cabinetmaking, spinning, and weaving, you'll settle down to a hearty lunch in the rustic charm of the Inn.

After a short bus ride, you'll delight in the serene beauty of the Kentucky Horse Park. You'll view a film, take a horse-drawn carriage tour of the park, see a magnificent collection of carri-

ages, and visit the International Museum of the Horse with its lively exhibits tracing the history of the horse from its origin to modern day. You'll relax with a glass of wine on your return trip. Return to the hotel at 5:00 p.m. The cost: \$27.00 (lunch included).

#### **Tuesday, November 3 (half-day tour)**

**Queen City Tour.** Depart hotel 1:00 p.m. This overview of Cincinnati takes you from the hustle and bustle of famous Fountain Square and Fountain Square South to the Contemporary Art Center, Procter and Gamble's International Headquarters, and the Taft Museum in beautiful Lytle Park. Visit Riverfront Stadium, home of the Cincinnati Reds, and Yeatman's Cove, the park that beautifies the riverfront. See such well-known landmarks as Music Hall, Isaac Wise Temple, Lloyd Library, Union Terminal, Mt. Adams, the Cincinnati Art Museum and Historical Society, Playhouse in the Park, and the University area. A final stop takes you to beautiful Krohn Conservatory and its large collection of flowers under glass. Return to the hotel at 3:30 p.m. The cost: \$9.00.

#### **Tuesday, November 3 (half-day tour)**

**Cavern Tour and Planetarium Show.** Depart hotel 1:00 p.m. Here's your chance to go spelunking in a "wet" cave without the usual required hard hat, knee pads, and boots. You'll see beautiful cave formations, stand under a waterfall, follow an underground stream, and cross a glass bridge as you thread your way through an eerie labyrinth of passageways (all indoors) in the Museum of Natural History's famous replica of a cave. Fash-

ioned with every attention to detail, this three-story cavern is typical of those found in Kentucky's karst topography. Then from "inner space," you'll travel to "outer space" and star gazing with a program in the Museum's planetarium. Return to the hotel at 4:30 p.m. The cost: \$8.00.

#### **Wednesday, November 4 (half-day tour)**

**Cincinnati Soaps.** Depart hotel 12:30 p.m. As home base for the Procter and Gamble Company for over 100 years, Cincinnati could easily be known as the "Clean City," as well as the Queen City. Come tour the spacious Ivorydale Soap Manufacturing Plant and watch suds being bottled and bars being packaged. You'll enjoy a behind-the-scenes guided tour, learn about soap-making history from the early kettle and framing process to the continuous, modern-day process, and take home a complimentary gift package of products as a remembrance of your day. Return to the hotel at 3:00 p.m. The cost: \$5.00.

#### **Wednesday, November 4, (half-day tour)**

**Cincinnati Safari.** Depart hotel 1:00 p.m. Cincinnati Zoo, home of the famed Bengal white tigers, invites you for an afternoon of guided exploration. In addition to the usual elephants, lions, and giraffes, you'll see infant gorillas, juvenile bald eagles, an aquarium, nocturnal creatures, and a new insect house literally crawling with eight-legged life. Garden surroundings and naturalistic enclosures lend a parklike atmosphere. Time will be allowed for small-animal handling and a stop at the Zoo Gift Shop. Return to the hotel at 4:30 p.m. The cost: \$8.00.

## **HOUSING INFORMATION**

To reserve hotel accommodations, fill out the reservation form on the opposite page and mail to the address listed.

The Cincinnati Convention & Visitors Housing Bureau will coordinate ALL hotel reservations. Your choice of hotel accommodations and rates will be honored, if possible, although rooms will be confirmed on a first-come, first-served basis. *Telephone requests will not be honored. All reservations must be submitted on the GSA Housing Form.* Cancellations should be made in writing directly to the Housing Bureau or to the hotel.

We strongly suggest that you guarantee your first night's room reservation by a major credit card. Make arrangements directly with the hotel once you have received your confirmation. **A guarantee is ABSOLUTELY NECESSARY if your expected arrival is past 6:00 p.m. Hotels are under no obligation to hold your room beyond 6:00 p.m.**

We would like registrants to understand a fact of hotel business—a CONFIRMATION is not the same as a GUARANTEE. Confirmation has come to mean the hotel has received your reservation and you can reasonably expect to find a room waiting for you before 6:00 p.m. Even so, registrants have found themselves without a room even at 5:00 p.m. A hotel that has sent you a confirmation and yet tells you "no vacancy" on arrival should make convenient arrangements for your stay at another hotel. If problems occur, we would like to hear about them. There will be a Locator/Housing Counter at the Convention Center on Sunday where we will do our best to iron out any difficulties.

Confirmation of your reservation will come from the hotel to which the Housing Bureau has assigned your request. Changes in arrival/departure times are to be made directly with the hotel.

Please be courteous with the hotels and GSA. Cancel reservations that you are not able to use. "No-shows" hurt hotel business and eventually damage GSA's ability to make hotels meet commitments. To your credit, GSA's reputation is excellent. Help keep it that way.

Check-out time is 1:00 p.m. If you plan later departure, notify the hotel as soon as possible. Hotels are not required to hold a room in your name after the check-out time. An alternative is to check out and have the bellman hold your luggage until actual departure time.

### **DEADLINE FOR RECEIPT OF HOTEL RESERVATIONS IS OCTOBER 9.**

Reservations after this date will be on a space-available basis only.

### **STUDENT HOUSING**

For those interested in triple or quad accommodations, we suggest the Holiday Inn-Downtown at Linn Street, the Cincinnati Club, or the Netherland Hilton. These hotels have rooms available at a reasonable rate for 3 or 4 persons. Daily rates including tax should run between \$17-20 per person. Specify the type of arrangement you need, and the Housing Bureau will make the hotel assignment. However, the Bureau will not assign roommates. If you want to share a triple or quad, you are responsible for locating roommates.

*Hotel/Motel Map & Rates,  
page 135*

PLEASE COMPLETE BY OCTOBER 9 & RETURN TO:

GSA Housing Bureau  
200 West Fifth St.  
Cincinnati, Ohio 45202

GSA OFFICIAL HOUSING FORM  
GSA Annual Meeting, Cincinnati, Ohio, November 2-5, 1981



PLEASE PRINT OR TYPE:

HOTEL/MOTEL PREFERENCE

1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_

TYPE OF ACCOMMODATIONS

(send one reservation form per room)

RATE REQUESTED\*

_____	Single (1 bed, 1 person)	_____
_____	Double (1 bed, 2 persons)	_____
_____	Twin (2 beds, 2 persons)	_____
_____	1 Bedroom Suite	_____
_____	2 Bedroom Suite	_____
_____	Triple (Number of beds _____, 3 persons)	_____
_____	Quad (Number of beds _____, 4 persons)	_____

\*Subject to 10% Room tax.

ARRIVAL DAY/DATE \_\_\_\_\_ TIME \_\_\_\_\_ a.m./p.m.

DEPARTURE DAY/DATE \_\_\_\_\_ TIME \_\_\_\_\_ a.m./p.m.

NAMES OF OCCUPANTS

1. \_\_\_\_\_  
2. \_\_\_\_\_  
3. \_\_\_\_\_  
4. \_\_\_\_\_

MAIL CONFIRMATION TO:

Name \_\_\_\_\_

University or Company \_\_\_\_\_

Street \_\_\_\_\_

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

Phone \_\_\_\_\_  
Area \_\_\_\_\_

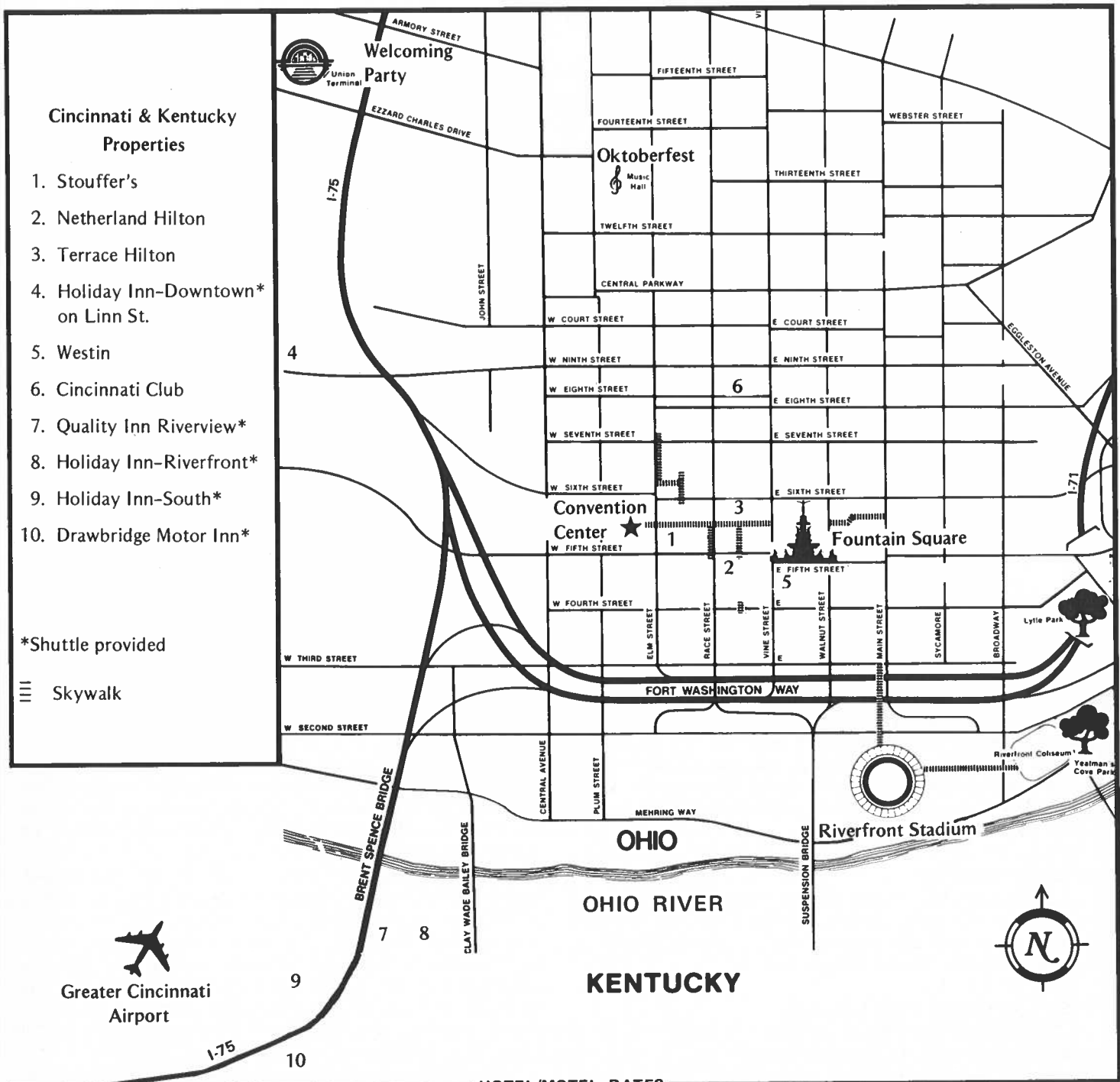
SPECIAL NOTES

1. *Make reservations by October 9.* Reservations after this date are on a space-available basis only.
2. Room assignments will be made in order received. If hotels of your choice are filled, the Housing Bureau will make the best arrangements elsewhere.
3. Be sure to list definite arrival and departure dates and times.
4. Inform GSA Housing Bureau of cancellations in writing. Notify hotel directly for changes in arrival/departure or type of accommodations.
5. To guarantee your reservation past 6 p.m., call the hotel where you are confirmed and charge the first night's stay on a major credit card.

**GSA News & Information**  
Vol. 3, no. 8 August 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.



- Cincinnati & Kentucky Properties**
1. Stouffer's
  2. Netherland Hilton
  3. Terrace Hilton
  4. Holiday Inn-Downtown\* on Linn St.
  5. Westin
  6. Cincinnati Club
  7. Quality Inn Riverview\*
  8. Holiday Inn-Riverfront\*
  9. Holiday Inn-South\*
  10. Drawbridge Motor Inn\*

\*Shuttle provided

≡ Skywalk

Greater Cincinnati Airport

**HOTEL/MOTEL RATES**

A free shuttle will operate daily between the southeast hotels and the Convention Center.

HOTEL	Single	Double/Twin	Triples <sup>1</sup> Quads	Parlor <sup>2</sup>	Number In Room Block
Stouffer's (Headquarters)	\$40	\$50	+ \$ 6	\$41-185	750
Cincinnati Club (Student Housing)	\$30	\$38	+ \$ 7		50
Drawbridge Motor Inn*	\$30-38	\$40-48			100
Holiday Inn-Downtown*	\$36-39	\$42-45	+ \$ 6		150
Holiday Inn-Riverfront*	\$30	\$36			100
Holiday Inn-South*	\$35	\$43			100
Netherland Hilton	\$34-42-55	\$44-52-65	+ \$10	\$55-up	500
Quality Inn*	\$42	\$52			175
Terrace Hilton	\$46	\$58			100
Westin (Western International)	\$60	\$60		\$168-up	200

Note: All rooms subject to 10% room tax

\*GSA shuttle provided to/from Convention Center.

<sup>1</sup> 3-4 persons to a room using twin beds plus rollaways. Charge is per rollaway.

<sup>2</sup> Range for parlors only. Sleeping rooms are an additional charge at single or double rate.



## REGISTRATION INFORMATION

**WHO SHOULD REGISTER?** Registration is required for all attendees, including all field-trip participants and guests.

*Badges are required for admission to all events.* Student IDs are required for those receiving student registration. IDs are required at both the on-site and the preregistration counters.

**PREREGISTRATION DEADLINE: OCTOBER 2, 1981**

### REGISTRATION FEES

	Advance	On-Site	One-day (available on-site only)
Professional	\$65	\$75	\$35
Student	\$32	\$38	\$17
Guest	\$20	\$30	N/A

### REGISTRATION SCHEDULE

#### Cincinnati Convention Center

Friday, Oct. 30	8:00 a.m. to	2:00 p.m.*
Saturday, Oct. 31	8:00 a.m. to	4:00 p.m.*
Sunday, Nov. 1	11:00 a.m. to	7:00 p.m.
Monday, Nov. 2	8:00 a.m. to	5:00 p.m.
Tuesday, Nov. 3	8:00 a.m. to	5:00 p.m.
Wednesday, Nov. 4	8:00 a.m. to	5:00 p.m.
Thursday, Nov. 5	8:00 a.m. to	12:00 p.m.

*\*At Field Trip Desk for Preregistration Only*

There is substantial momentum toward early registration. Over two-thirds of registrants preregister. The conveniences of the preregistration deadline only four weeks before the meeting, plus a generous refund policy, have been attractive.

Preregistration helps avoid long lines and sold-out events. Consider its potential for you this year.

### REFUNDS

GSA will refund advance registration fees for all cancellations received in writing by **OCTOBER 15, 1981**. **NO REFUNDS WILL BE MADE ON CANCELLATION NOTICES RECEIVED AFTER THIS DATE.** Refunds will be mailed from GSA after the meeting. All refunds will be subject to a \$10 processing fee.

### EXHIBITS

GSA's Educational Exposition will open Monday, November 2, at 8:00 a.m. and continue until Wednesday, November 4, at 5:00 p.m. at the Convention Center. The exhibits are professionally oriented and are scientific and technical in nature. The number and quality of exhibits increases each year so that 1981 should include 120 exhibitors and close to 150 booths. All meeting registrants are encouraged to meet the exhibitors and to become informed about the most recent developments in the geosciences. For your convenience, eating facilities and a lounge will be available in this area.

### SCIENCE THEATER

The Science Theater will provide registrants with an opportunity to view, during technical-session hours, an absorbing program of geologically oriented films. It will operate at the Convention Center Sunday through Thursday.

### SHORT COURSES AND FORUMS

**Mineralogical Society of America. A Short Course on Amphiboles and Other Hydrous Pyriboles** will be held on October 29 (evening) to November 1 (noon) at a convention center near Erlanger, Kentucky. It will include an intensive review of the crystal chemistry, spectroscopy, phase equilibria, igneous and metamorphic petrology, and subsolidus behavior of amphiboles, as well as discussions of the mineralogy and geology of amphibole asbestos and wide-chain pyriboles. The outstanding lecturers who have been selected for this course will also participate in the preparation of Volume 8 of the *MSA Reviews in Mineralogy* series. For further information, write to Amphibole Short Course, Mineralogical Society of America, 2000 Florida Avenue, N.W., Washington, DC 20009.

**American Geological Institute. Geo-Writing: Quickly. Clearly. Concisely.** Two one-day workshops will be held on Saturday, October 31, from 8:00 a.m. to 5:00 p.m., and Sunday, November 1, from 8:00 a.m. to 5:00 p.m. It will include how to break writer's block, how to write for different situa-

tions and publications, how to write easily and clearly. Instructed by AGI's Wendall Cochran. Fee: \$65. For information, contact William Matthews III, Director of Education, AGI, Box 10031, Lamar University Station, Beaumont, TX 77710.

**Paleontological Society. Short Course on Lophophorates: Bryozoans and Brachiopoda.** The short course will be held on Sunday, November 1, at the Cincinnati Museum of Natural History. It will be an all-day meeting, starting at 8:30 a.m. and continuing until shortly after 5:00 p.m. For information, contact J. Thomas Dutro, Jr., U.S. Department of the Interior, Room E-316, Museum of Natural History, Washington, DC 20560, (202) 343-3222.

**GSA Employment Service Forum: Future Employment Opportunities in the Geological Sciences.** Anyone interested in an overview of employment opportunities, salary scales, and current trends in academia, government, industry, and consulting is cordially invited to attend this forum. Six highly qualified panel members will speak briefly on the outlook in their special areas and then answer questions from the audience. The session will be held Monday, November 2, from 1:00 to 3:00 p.m. in Room 10 at the Convention Center.

**GSA Committee on Geology and Public Policy.** The committee will offer an open forum on "The Role of Geologists in Public Policy," that will be open to all on Tuesday, November 3, 5:00 to 7:00 p.m.

### EMPLOYMENT INTERVIEWS

Organizations seeking qualified earth scientists to fill staff needs and persons seeking employment in the earth-sciences fields are invited to participate in the GSA Employment Interview Service. The Employment Interview Service will be conducted in the Convention Center.

All interested organizations are urged to submit their requests for computer listings of applicants, along with notices of the vacancies suitable for posting. The minimum fee for a printout of two specialty listings is \$50. Interview booths may be rented in half-day increments during the meeting (Monday



**GSA PREREGISTRATION FORM • 1981 ANNUAL MEETING • CINCINNATI, OHIO • NOVEMBER 2-5**

**IMPORTANT**

- |   |  |
|---|--|
| <p>1. Full payment <b>must</b> accompany registration.</p> <p>2. Register one professional or student per form.</p> <p>3. Your check will be your receipt. Copy this form for your records.</p> | <p>4. Preregistration deadline: <b>Must be postmarked no later than OCTOBER 2.</b></p> <p>5. Refund policy: Written request must be <i>received at GSA</i> headquarters no later than <b>October 15.</b> No refunds after <b>October 15.</b> Refunds subject to \$10 processing fee.</p> |
|---|--|

(Please type or print)

<b>Registrant Name</b> _____ (first) _____ (last) _____ (nickname for badge) _____																															
<b>Institution/Employer</b> _____																															
<b>Mailing address</b> _____						<b>Phone, business</b> ( ) _____ <b>home</b> ( ) _____																									
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Please circle all affiliations: <table border="0" style="width: 100%; text-align: center;"> <tr> <td><b>GSA</b></td> <td><b>GIS</b></td> <td><b>GS</b></td> <td><b>MSA</b></td> <td><b>NAGT</b></td> <td><b>PS</b></td> <td><b>SEG</b></td> <td><b>AAPG</b></td> <td><b>AGU</b></td> <td><b>SEPM</b></td> </tr> <tr> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> <td>9</td> <td>10</td> </tr> </table>												<b>GSA</b>	<b>GIS</b>	<b>GS</b>	<b>MSA</b>	<b>NAGT</b>	<b>PS</b>	<b>SEG</b>	<b>AAPG</b>	<b>AGU</b>	<b>SEPM</b>	1	2	3	4	5	6	7	8	9	10
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**PREREGISTRATION FEES:**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	
	Fee Per Person	No.	Amount																								
Professional . . . . .	\$65	1	\$ _____	Queen City Luncheon Tour . . . . .	Nov. 2	(4)	\$18.50	_____	_____																		
Student (ID required for badge pick-up) . . . . .	\$32	1	\$ _____	Ohio River Luncheon Cruise . . . . .	Nov. 2	(5)	\$13.00	_____	_____																		
Guest (fee does not include admission to technical sessions) . . . . .	\$20	—	\$ _____	Stoned in Cincinnati . . . . .	Nov. 2	(6)	\$ 5.00	_____	_____																		

<b>For Guest</b>	Guest Name _____
<b>Badge Only</b>	City _____ State _____

**GUEST ACTIVITIES (Guest registration is required)**

Cincinnati Soaps . . . . .	Nov. 4	(10)	\$ 5.00	_____	_____
Cincinnati Safari . . . . .	Nov. 4	(11)	\$ 8.00	_____	_____
<b>SPECIAL EVENTS (Registration is required)</b>					
History of Geology Division Luncheon . . . . .	Nov. 2	(12)	\$12.00	_____	_____
Geoscience Information Society Luncheon . . . . .	Nov. 2	(13)	\$12.00	_____	_____
Engineering Geology Division Luncheon . . . . .	Nov. 3	(14)	\$12.00	_____	_____
Hydrogeology Division Luncheon . . . . .	Nov. 3	(15)	\$12.00	_____	_____
Mineralogical Society of America Luncheon . . . . .	Nov. 3	(16)	\$12.00	_____	_____
National Association of Geology Teachers Luncheon . . . . .	Nov. 3	(17)	\$12.00	_____	_____
Paleontological Society Luncheon . . . . .	Nov. 3	(18)	\$12.00	_____	_____
Oktoberfest . . . . .	Nov. 3	(19)	\$21.00	_____	_____
Association of Women Geoscientists Breakfast . . . . .	Nov. 4	(20)	\$ 8.00	_____	_____
Coal Geology Division Luncheon . . . . .	Nov. 4	(21)	\$12.00	_____	_____
Geophysics Division Luncheon . . . . .	Nov. 4	(22)	\$12.00	_____	_____
Quaternary Geology & Geomorphology Division Luncheon . . . . .	Nov. 4	(23)	\$12.00	_____	_____
Society of Economic Geologists Luncheon . . . . .	Nov. 4	(24)	\$12.00	_____	_____
GSA Annual Dinner . . . . .	Nov. 4	(25)	\$18.00	_____	_____
<b>ABSTRACTS VOLUME (Reserved on-site)</b> . . . . .		(26)	\$ 7.00	_____	_____
<b>TOTAL</b>					_____

<p align="center"><b>FOR OFFICE USE ONLY</b></p> <p>Balance Due \$ _____ A/R      Refund \$ _____ A/P</p> <p>Deposit Date _____      Check No. _____</p>	<p align="center"><b>U.S. CURRENCY ONLY</b></p> <p align="center">Make Check Payable to  <b>1981 GSA ANNUAL MEETING</b></p> <p align="center">Mail to <b>GSA, 1981 Annual Meeting</b>  <b>P.O. Box 9140</b>  <b>Boulder, CO 80301</b></p>
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through Wednesday) at a nominal fee. GSA staff will handle all interview scheduling with employment service applicants. Request forms may be obtained from the March and July issues of *GSA News & Information* or by contacting the Membership Department.

Job-seeking participants who have attended past annual meetings have found the Employment Interview Service very helpful in their search for positions. The applicant fee is \$15 for a one-year registration, including the interview service at the annual meeting. Employment Service forms may be obtained from the March and July issues of *GSA News & Information* or by contacting Clara Hodgson, Membership Coordinator, Geological Society of America, P.O. Box 9140, Boulder, CO 80301, (303) 447-2020.

*Note to Applicants:* Completed application forms, a one-page resume, and your \$15 payment must be received at GSA headquarters *no later than September 10, 1981*, in order for your record to be included on the computer printouts of the applicant listing during October and November. Get the maximum exposure by getting your forms in early, and don't forget to indicate whether you are attending the meeting for interviewing purposes!

## TRANSPORTATION

Airfares are being offered at attractive but constantly changing rates. Major airlines have opened several new routes to Cincinnati. Check directly with the airlines to obtain the best rates. Ask for Excursion, Peanuts, and Special Fares. The time and day of the week you choose to travel will have a substantial bearing on the price of your ticket. (Remember—if you

plan to arrive at your hotel after 6:00 p.m., guarantee your room with a major credit card.)

Taxi fare from the airport to downtown Cincinnati is \$13.50 plus tip. However, most taxis offer a \$13.50 flat rate for one to five passengers. Round up four other persons to share the cab and the price would be \$2.70 each. (Prices as of June 1, 1981.)

Bus services are available from Airport Shuttle-Cincinnati at a one-way rate of \$5.50. Schedules are in ½-hour intervals. Buses marked **Downtown Hotels** make stops at the Westin, Terrace Hilton, Netherland Hilton, Stouffer's, and Cincinnati Club Hotels. Buses marked **Suburban Hotels** make stops at the Drawbridge Motor Inn and the Holiday Inn-Downtown on Linn Street. **Courtesy pick-up service** is available at no charge from the Holiday Inn-South, the Holiday Inn-Riverfront, and the Quality Inn. Call from the airport for pick-up.

**GSA shuttle buses** are provided at no additional cost for daily transportation between the Kentucky hotels, the Holiday Inn-Downtown, and the Convention Center. The shuttle will also service all hotels for the official evening functions. The service begins on noon, Sunday, and operates until 6:00 p.m., Thursday. The shuttle service is for your convenience and you are encouraged to use it whenever possible.

## INFORMATION/MESSAGES/HOUSING LOCATOR

Beginning on Sunday, there will be phone numbers operating for each of these helpful services: information, messages, and housing locator. From November 1 to 5, these numbers can be obtained by calling Stouffer's at (513) 352-2100 or the Convention Center at (513) 352-3797.

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## FIELD TRIPS

**NOTE: ALL FIELD TRIP REGISTRANTS MUST ALSO REGISTER FOR THE ANNUAL MEETING.**

### Registration—Final day: OCTOBER 2

Preregistration for a field trip is very important. Use the official field trip registration form included in this announcement. *Full payment must accompany preregistration.* Unpaid purchase orders are not accepted as valid registration. Field trip preregistration forms must be received at GSA headquarters, Boulder, no later than **OCTOBER 2, 1981**. On-site registration for trips originating in Cincinnati MAY be possible for those trips not fully subscribed. For trips originating outside Cincinnati prior to the meeting, late registration may be possible by contacting the Field Trip Coordinator or the Field Trip Chairman.

Trips are technical in nature and can be physically rigorous. Participants will be selected on a first-come, first-served basis. You may want to indicate a second choice in the space provided on the field trip preregistration form.

### Cancellation—Final day: OCTOBER 15

Cancellation or change of field trip reservations must be made in writing and must be received by the Field Trip Coordinator, GSA headquarters, Boulder, no later than **OCTOBER 15, 1981** to be eligible for refund. All refunds will be subject to a \$10 processing fee. *Preregistrants please note:* there will be no refunds for premeeting trips after this date; refunds may be possible for postmeeting trips **ONLY** if the reserved place is filled by on-site registration. There will be absolutely no refunds for those who register on-site.

In addition, there will be no discount or refund for special travel arrangements made by individuals in conjunction with any field trip. Substitution of personal vehicles is not permitted in cases where transportation is provided.

### 1981 FIELD TRIPS

All trips will begin and end in Cincinnati unless otherwise indicated in the field trip descriptions. Cincinnati trips will depart from the front of the Convention Center. For those trips not originating or terminating in Cincinnati, participants should be prepared to make their own arrangements for transportation either to the point of origin, or from the termination point, and be responsible for any lodging or meals necessary.

**Services:** The cost of all field trips includes transportation, lunches, and except for several trips which leave and return to Cincinnati, overnight lodging during the trip. Where it was possible to arrange for good meals on a group basis, and at a reasonable price, breakfasts and dinners are also included. Details of what is included in the cost of each trip, as well as the itinerary, are given in the information sheets that will be sent to all registrants. The information may also be obtained from the Field Trip Coordinator, GSA Headquarters, Boulder, CO 80301, (303) 447-2020, or from the Field Trip Chairman, Lois J. Campbell, Department of Geology, University of Kentucky, Lexington, KY 40506, (606) 257-3642.

**Weather and Clothing:** Late October-early November weather in the Ohio Valley varies from mild and sunny to cold

and wet. Participants are urged to bring suitable field clothes for moderately inclement weather. Where individual trips may encounter more severe conditions, appropriate comments will be included in the information sheet that will be sent to each registrant for a trip. For most of the trips medium-weather multi-purpose jackets should provide suitable protection, and rain gear is also desirable.

## FIELD TRIPS

### Premeeting

**1. Upper Ordovician (Richmondian) Stratigraphy and Paleocology of Southeastern Indiana and Southwestern Ohio.** *John K. Pope, Roy H. Reinhart, and Wayne D. Martin, Miami Univ., Oxford, OH; and Helen B. Hay, Earlham College, Richmond, IN.*

Stratigraphy and paleocology of the Upper Ordovician Richmondian rocks of Ohio and Indiana. There will be an opportunity to see most of the section, to collect fossils, and to see sedimentary structures and ichnofossils. The lithostratigraphy of the Richmondian will be described in detail. (Limit 80; 1 day) Sun., Nov. 1. Cost: \$75

**2. Stratigraphy of Devonian and Lower Mississippian Agglutinate Foraminifera of Northwestern Kentucky and Southern Indiana.** *James E. Conkin, Univ. of Louisville, Louisville, KY; and Barbara M. Conkin, Jefferson Community College, Louisville, KY.*

Study and collection of agglutinate foraminiferal samples from measured sections of Devonian and Early Mississippian limestones and shales, consideration of their stratigraphic significance and their relationships to unconformities (paracontinuities and paraconformities), pyroclastics, bone beds, and their general paleontologic-stratigraphic context. (Limit 40; 2 days. Trip originates in Louisville, KY) Sat., Oct. 31, to Sun., Nov. 1. Cost: \$215

**3. Chattanooga Shale—Potential Source of Oil, Gas and Heavy Metals.** *Roy C. Kerpferle, USGS, Cincinnati, OH; and John B. Roen, USGS, Reston, VA.*

The thin basinal black-shale sequence will be viewed in classic and recent exposures from the type area in the southern Valley and Ridge to the flanks of the Cincinnati Arch. Characteristics that help indicate the depositional environment and serve as a guide to the potential of the shale as an unconventional source of energy will be emphasized in outcrops, supplemented by representative cores. (Limit 80; 3 days. Trip originates in Chattanooga, TN) Fri., Oct. 30, to Sun., Nov. 1. Cost: \$300

**4. Mississippian-Pennsylvanian Boundary in the Central Part of the Appalachian Basin.** *Kenneth J. Englund and Thomas W. Henry, USGS, Reston, VA; and Frank R. Ettensohn, Univ. of Kentucky, Lexington, KY. (Mississippian-Pennsylvanian Boundary Group, SEPM).*

The Mississippian-Pennsylvanian boundary and associated strata will be examined in the area of the proposed Pennsylvanian System stratotype in southwestern Virginia and southern West Virginia. Emphasis will be on the lithostratigraphy, biostratigraphy and depositional environments of the Upper Mississippian and Lower Pennsylvanian strata, including lateral variations in the stratigraphic sequence extending across the systemic boundary (Englund and Henry). In northeastern Kentucky a comparison of the barrier-shoreline and more traditional tabular-erosion interpretations of the Mississippian-Pennsylvanian boundary will be made. The section from the Lower Mississippian through the Lower Pennsylvanian will be examined along I-64 for its bearing on the two interpretations. The barrier-shoreline model emphasize possible large-scale regional facies relationships, whereas the more traditional interpretation emphasizes the possible influence of syndimentary tectonism on the stratigraphy and depositional environments evident in the strata (Ettensohn). (Limit 64; 4 days. Trip originates in Bluefield, WV) Thurs., Oct. 29, to Sun., Nov. 1. Cost: \$385

**5. Geohydrology of the Ohio River Alluvial Aquifer.** *Donald S. Mull and Robert J. Faust, USGS, Water Res. Div., Louisville, KY. (Hydrogeology Div.)*

Hydrologic characteristics of the Ohio River alluvial aquifer will be discussed in light of induced infiltration studies underway for the Louis-

ville Water Company. Also included is a discussion of potential problems caused by rising groundwater levels in the downtown Louisville area. If time permits, the excursion will examine the hydrogeologic relations of landslides in the Cincinnati area and visit Big Bone Lick State Park, a well-known vertebrate fossil locality. (Limit 40; 1 day. Trip originates in Louisville, KY) Sun., Nov. 1. Cost: \$75

**6. The Serpent Mound Cryptoexplosion Structure, Southwestern Ohio.** *Stephen P. Reidel, Rockwell Hanford Operations, Research Dept., Richland, WA; and Frank L. Koucky, College of Wooster, Wooster, OH.*

Examination of the structure and stratigraphy of the Serpent Mound disturbance and nearby area. Emphasis will be on faulting and style of folding in the central uplift and outer ring-graben. (Limit 40; 1 day; same as postmeeting trip 16) Sun., Nov. 1. Cost: \$80

**7. Coastal Geomorphology and Geology of the Ohio Shore of Lake Erie.** *C. H. Carter, D. E. Guy, Jr., and J. A. Fuller, Ohio Geological Survey, Lake Erie Section, Sandusky, OH.*

Natural and man-made features in the beach and shore zones from Fairport Harbor, east of Cleveland, to Toledo will be looked at as a basis for interpretation of the evolution of the lakeshore. The stops will include middle Paleozoic rocks and Pleistocene glacial deposits. (Limit 40; 2 days. Trip originates at Cleveland airport in Brook Park, OH) Sat., Oct. 31, to Sun., Nov. 1. Cost: \$180

**8. Hydrogeology of the Mammoth Cave Region, Kentucky.** *James F. Quinlan, National Park Service, Mammoth Cave, KY; and Ralph Ewers, Eastern Kentucky Univ., Richmond, KY, and Cumberland Karst Research Laboratory, Stab, KY (Friends of the Karst)*

Mammoth Cave, with more than 350 km of mapped passage, is the largest cave in the world. But it is just a small fragment of a once-greater cave system! The hydrology of the Mammoth Cave region has been intensively investigated. More than 23 groundwater basins, the three larger of which are 240, 320, and 500 km<sup>2</sup>, have been delineated and studied by dye-tracing, mapping of the potentiometric surface, and other techniques. Emphasis will be on methods of study and instrumentation, new concepts of groundwater movement, and the application of results to solving environmental problems of waste disposal and protection of water supplies. (Limit 80; 3½ days) Thurs., Oct. 29, to Sun., Nov. 1. Cost: \$230

**9. Quaternary Deposits of Southwestern Ohio.** *R. P. Goldthwait, Ohio State Univ., Columbus, OH, D. P. Stewart, Miami Univ., Oxford, OH; D. A. Franzi, Syracuse Univ., Syracuse, NY; and Michael J. Quinn, Shell Oil Co., New Orleans, LA. (Quaternary Geology and Geomorphology Div.)*

The first part of the trip takes a look at the middle-late Wisconsin terminal drift, mostly tills, of the Miami lobe in southwestern Ohio where the four tills delineated by Gooding in Indiana are recognized (Stewart and Franzi). From there the excursion turns to Illinoian and Wisconsin maximal-age drifts of the Scioto lobe. Three generations of carbon-dated till sheets, moraines, and related outwash terraces are followed (Goldthwait and Quinn). (Limit 40; 3 days) Fri., Oct. 30, to Sun., Nov. 1. Cost: \$220

**10. Stratigraphical and Structural Geology of the Hot Springs Traverse, Tennessee—North Carolina.** *Nicholas Rast and James C. Bolton, Univ. of Kentucky, Lexington, KY.*

The excursion is designated to demonstrate the structure of the Blue Ridge Thrust Sheet at the contact with the Saltville Sheet in the Del Rio region and the complex relationships in the Hot Springs area, where it seems now there is a possibility of exposed basement being present. (Limit 40; 2½ days. Trip originates at Knoxville, TN airport; headquarters at Newport, TN) Fri., Oct. 30, to Sun., Nov. 1. Cost: \$195

Postmeeting Field Trips,  
page 143







**Postmeeting**

**11. Paleoenvironmental Interpretation of the Middle Ordovician High Bridge Group in Central Kentucky.** Gary L. Kuhnenn, *Eastern Kentucky Univ., Richmond, KY*; and George J. Grabowski Jr., *Rice Univ., Houston, TX*.

Several extensive sections of the Middle Ordovician High Bridge Group near Camp Nelson and Boonesborough in central Kentucky will be examined. The petrology, sedimentary structures, and paleontology will be presented as evidence for paleoenvironmental interpretations. (Limit 40; 1 day) Fri., Nov. 6. Cost: \$90

**12. Stratigraphy, Sedimentology and Paleocology of the Cincinnati Series (Upper Ordovician) in the Vicinity of Cincinnati, Ohio.** D. L. Meyer, W. A. Pryor, and R. C. Tobin, *Univ., of Cincinnati*; R. G. Osgood, *College of Wooster, Wooster, OH*; and W. B. Harrison, *Western Michigan Univ., Kalamazoo, MI*.

Exposures of highly fossiliferous Upper Ordovician (Edenian and Maysvillian) limestones and shales will be examined in the vicinity of the type area at Cincinnati, Ohio, and in adjacent northern Kentucky. The results of recent research by the leaders on Cincinnati lithostratigraphy, sedimentology, and paleocology will be presented. Emphasis will be on facies recognition and interpretation, paleocology, taphonomy, and trace fossils. (Limit 40; 2 days) Fri., Nov. 6, to Sat., Nov. 7. Cost: \$135

**13. Early Mississippian Deltaic Sedimentation in Central and North-eastern Ohio.** R. A. Heimlich and A. H. Coogan, *Kent State Univ., Kent, OH*; R. J. Malcuit and K. B. Bork, *Denison Univ., Granville, OH*; and T. L. Lewis, *Cleveland State Univ., Cleveland, OH*.

Examination of facies changes and interpretation of paleo-sub-environments in early Mississippian deltaic and shallow-marine clastic sedimentary rocks. Demonstration of continuous sedimentation across the Devonian-Mississippian systemic boundary (Limit 40; 3 days. Trip terminates at Cleveland airport, Brooks Park, OH) Fri., Nov. 6, to Sun., Nov. 8. Cost: \$220

**14. Coals and Coal-Bearing Strata of Southeastern Kentucky.** James C. Cobb and Donald R. Chesnut, *Kentucky Geological Survey, Lexington, KY*; Norman C. Hester, *Consolidated Resources of America, Henderson, KY*; and James C. Hower, *Inst. for Mining and Minerals Research, Univ., of Kentucky, Lexington, KY. (Coal Geology Division)*.

The trip, which will traverse the largest low-sulfur bituminous coal mining region of the United States will focus on coal quality, coal resources, and depositional environments. New roadcuts in Pennsylvanian

strata that are among the highest and most scenic in the country will illustrate the geologic setting and occurrence of more than ten major producing coals of the district. Part of the trip will be devoted to discussions and field examples of problems and methods of coal resource determinations. (Limit 80; 3 days) Fri., Nov. 6, to Sun., Nov. 8. Cost: \$205

**15. Precambrian Geology and Mineralization, the St. Francois Mountains, Southeastern Missouri.** Eva B. Kisvarsanyi and Arthur W. Hebrank, *Missouri Geological Survey, Rolla, MO*; and Richard F. Ryan, *Pilot Knob Pellet Co., Ironton, MO*.

The St. Francois Mountains offer the only extensive outcrop of Precambrian rocks in the Midcontinent region. The first day will be spent in the eastern area, where the focus will be on granite outcrops, granite-rhyolite contacts (Knoblick Mountain), a mafic dike-swarm, rapakivi granites, and mineralization at Silver Mine. The second day, in the western St. Francois Mountains, will focus on volcanic stratigraphy and structures. The third day will feature a tour of a surface iron mine. (Limit 75; 3 days. A group flight from Cincinnati to St. Louis is arranged for the evening of Thurs., Nov. 5; trip participants will then travel by bus to headquarters at Flat River, MO. Trip terminates at St. Louis airport) Fri., Nov. 6, to Sun., Nov. 8. Cost: \$300

**16. The Serpent Mound Cryptoexplosion Structure, Southwestern Ohio.** Stephen P. Reidel, *Rockwell International, Geoscience Group, Richland, WA*; and Frank L. Koucky, *College of Wooster, Wooster, OH*.

Examination of the structure and stratigraphy of the Serpent Mound disturbance and nearby area. Emphasis will be on faulting and style of folding in the central uplift and outer ring-graben. (Limit 40; 1 day; same as premeeting trip 6) Fri., Nov. 6. Cost: \$80

**17. Geoaerchology of the Flint-Mammoth Cave System and the Green River Valley, Western Kentucky.** Julie Stein, *Univ. of Washington*; Patty Jo Watson, *Washington Univ., St. Louis, MO*; and William B. White, *Pennsylvania State Univ., University Park, PA. (Archaeological Geology Division)*.

Use of parts of the world's longest cave, the Flint-Mammoth Cave System in Mammoth Cave National Park, by late Archaic-early Woodland culture (4000-2000 yr B.P.) will be examined, as well as the geoaerchology of late Archaic shell middens in the Big Bend of the Green River, Butler County, Kentucky. (Limit 40; 2 days) Fri., Nov. 6, to Sat., Nov. 7. Cost: \$155

*(continued on next page)*

In order to receive *Abstracts with Programs* prior to the meeting, it is necessary for the order to be received at GSA by **SEPTEMBER 15**. You may expect to receive your copy close to October 23.

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**18. Engineering Geology of Cincinnati.** *Robert W. Fleming, USGS, Denver, CO; Arvid M. Johnson, Univ. of Cincinnati, Cincinnati, OH; and James E. Hough, Consulting Geologist, Cincinnati, OH (Engineering Geology Division).*

An examination of the relations between different materials of various origins and engineering problems. Principal focus is on landsliding, but stops will also include consideration of problems of erosion-sedimentation and foundations. The behavior of the materials will be related to their properties and to construction practices. Landslide sites have been instrumented and data collected during 1979-1980. (Limit 40; 1 day) Fri., Nov. 6. Cost: \$75

**19. Structure and Stratigraphy of the Pine Mountain Thrust Sheet.** *T. Dennis Coskren, Univ. of Kentucky, Lexington, KY.*

A classic area of thin-skinned deformation will be seen. The local stratigraphy includes Cambrian through Pennsylvanian sediments and illustrates the mutual influence of stratigraphy and structure on one another. Tear faults, underthrusting, fensters, passive folding, and minor structural features are all well displayed. There will be ample opportunity for discussion, not to mention controversy. (Limit 35; 2 days) Fri., Nov. 6, to Sat., Nov. 7. Cost: \$170

PREREGISTRATION DEADLINE

OCTOBER 2, 1981



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