1986
ANNUAL MEETING
AND EXPOSITION

November 10–13, 1986
San Antonio Convention Center
San Antonio, Texas

THE GEOLOGICAL SOCIETY OF AMERICA

For further information contact: GSA, P.O. Box 9140, Boulder, CO 80301 (303) 447-2020
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1986 ANNUAL MEETING LOCAL COMMITTEE

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Field Trip Chairman .......... Edmund G. Wermund, Jr. .......... University of Texas at Austin
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Transportation Chairman ....... Berry Sutherland .......... University of Texas at San Antonio

APPRECIATION FROM GSA

The Geological Society of America is grateful to and sincerely thanks all those who have contributed so much to the success of this meeting: the speakers for their contributions to the science; exhibitors for their financial support, products, and information; the local committee for its leadership; the associated societies for their programs and patience; and you geoscientists for your attendance and ongoing support of the Society. To each and every one, a special thanks from GSA's Council and staff.
WELCOME

You are invited to San Antonio, a city of rich Mexican heritage and many gifts of nature. San Antonio is a major center for geologists, a place of history and tradition, a city carefully planned with excellent convention facilities and entertainment within easy walking distance.

The meeting is hosted by faculty from the University of Texas at San Antonio and at Austin; Texas A&M, and St. Mary's universities; the Bureau of Economic Geology; and other local geologists and friends. The field trips, technical program, and other events have been designed to bring you the best in the geosciences. In addition to the regular program of volunteered and invited papers, we expect to have special poster displays of new data from COCORP, the Ocean Deep Sea Drilling Project (ODP), the University of Texas Institute of Geophysics, and recently completed transects from the Decade of North American Geology (DNAG) project. The newest information from the Voyager encounter with Uranus will also be presented, and a number of internationally recognized geoscientists will be discussing their most recent work.

TECHNICAL PROGRAM/SYMPOSIA

The technical program consists of volunteered papers that are presented in oral or poster session and invited papers presented in symposia. The symposia list appears below.

1. Surveying and Prospecting for Archaeological Sites. Archaeological Geology Division; John Gifford, University of Miami.
4. Tectonics and Geophysics of the Western Himalayas. Geophysics Division and Structural Geology and Tectonics Division; Lawrence Malinconico, Southern Illinois University and Robert Lillie Oregon State University.
7. Mars—Ten Years After Viking. Planetary Geology Division; Arden Albee, California Institute of Technology.
8. Quaternary Evolution of the Mississippi Valley. Quaternary Geology and Geomorphology Division; James Knox, University of Wisconsin.
13. Recent Advances in Hydrogeology: Implications for Instruction. National Association of Geology Teachers; Bernard Pipkin, University of Southern California.
16. Timing and Depositional History of Eustatic Sequences: Constraints on Selenic Stratigraphy. Cushman Foundation; Charles Ross, Chevron USA.
19. Terranes in the Circum-Atlantic Paleozoic Orogen. David Dallmeyer, University of Georgia.
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### POSTER SESSION

- **COCORP, DNAG, ODP—Special Posters Displays Daily.**
  - **Poster Session I**
    - Geochemistry, Geoscience Information, Marine Geology, Micropaleontology, Oceanography, Paleontology
  - **Poster Session II**
    - History of Geology, Hydrogeology, Sedimentary Petrology, Sedimentology
  - **Poster Session III**
    - Economic Geology, Geomorphology, Glacial Geology, Quaternary Geology
  - **Poster Session IV**
    - Engineering and Environmental Geology, Planetary Geology, Precambrian Geology, Remote Sensing, Stratigraphy
  - **Poster Session V**
    - Coal Geology, Geology, North American Ocean Trenches, Petroleum Geology
  - **Poster Session VI**
    - Archaeology, Structural Geology, Tectonics
  - **Poster Session VII**
    - Experimental Petrology, Igneous Petrology, Metamorphic Petrology, Mineralogy, Crystallography, Volcanology
  - **Poster Session VIII**
    - General Geology, Geology Education
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**ROOM KEY:**

- **A** = Theater (1600)
- **B** = South Banquet (1600)
- **C** = Mission (770)
- **D** = River (620)
- **E** = Centro (646)
- **F** = Plaza (534)
- **G** = Ficota AB (303)
- **H** = Fiesta D (303)
- **J** = Fiesta E (303)
- **K** = Fiesta C (252)
San Antonio, Texas, via varied transportation means, offers ready access to diverse and unique geologic exposures in Texas and adjacent states. Trans-Pecos calderas and structure, Ouachita Mountains tectonics, Wichita Mountains stratigraphy and intrusives, High Plains morphology, Pennsylvanian cycles, Edwards limestone aquifer systems, Llano granites of the craton, salt domes, lignite resources, and coastal processes on barrier islands offer great diversity.

All trips originate and end in San Antonio, unless otherwise specified. Participants must provide their own transportation to the starting point and from the termination point, for those trips not originating or terminating in San Antonio. Trips are technical in nature and can be physically rigorous.

Trip costs include transportation for the trip itself and guidebook. It also may include costs of other services as noted by the following symbols: M—Meals; A—Airfare; ON—Overnight lodging. FOR SOME PREMEETING TRIPS, GROUP RATE AIRFARES HAVE BEEN ARRANGED TO GET PARTICIPANTS TO SAN ANTONIO AT THE TERMINATION OF THE FIELD TRIP. IF YOU DO NOT WISH TO TAKE ADVANTAGE OF THIS AIR TRAVEL, PLEASE REGISTER USING THE FEE LISTED WITHOUT AIRFARE FOR THAT TRIP.

REGISTRATION. Field trip registrants are required to be registered for the meeting. If you do not plan to attend the meeting, but do plan to participate in a field trip, you may register using the one-day registration fee. This will entitle you to a one-day badge for the day of your choice. Registration fee cannot be refunded or transferred.

PREREGISTRATION DEADLINE: must be RECEIVED at GSA Headquarters no later than October 10, 1986. Preregistration is suggested because participants are selected on a first-come, first-served basis.

Registration form and procedures are provided in this announcement. Registration for field trips after the deadline may be possible if trip logistics and space permit; contact Kathy Ohmke, Field Trip Coordinator, GSA Headquarters. On-site registration MAY BE possible during the meeting at the Field Trip Desk, Convention Center, for postmeeting field trips.

CANCELLATION DEADLINE IS OCTOBER 17. No refunds will be given for cancellations received after this date. If GSA must cancel a field trip because of logistics or registration requirements, a full refund will be issued to trip registrants as soon as possible after the meeting.

GUIDEBOOKS may be purchased at the field trip desk during the meeting. After the meeting, contact E.G. Wermund, Bureau of Economic Geology, University of Texas, Austin, TX 78713 for information on ordering guidebooks.

For further trip information, contact Field Trip Chairman E.G. Wermund, Bureau of Economic Geology, University of Texas, Austin, TX 78713, (512)471-1534; Field Trip Co-Chairman Weldon Hammond, Div. Earth & Physical Sciences, University of Texas, San Antonio, TX 78285, (512)691-4455; Field Trip Coordinator Kathy Ohmke, GSA Headquarters; or the designated field trip leaders.

PREMEETING TRIPS

1. Quaternary Geology and Geomorphology of the Rolling Plains, Texas Panhandle—Thomas C. Gustavson, Robert W. Baumgardner, Jr., Chris Caran, and Edward Collins, Bureau of Economic Geology, University of Texas, Austin, TX 78713 (512)/471-1534); Walter Dalquest, Midwestern State University, Wichita Falls, Texas. Two and one-half days, Nov. 7–9.

Evidence for interpretations of geomorphic processes and Quaternary history in parts of the Rolling Plains of the Texas Panhandle will be described. Particular attention will be paid to the dissolution of evaporites, primarily salt, and collapse of overlying strata as a process that has had a significant effect on landscape development and Quaternary stratigraphy in this area. A preliminary discussion of newly recognised Quaternary deposits covering several hundreds of square miles will be presented. Trip originates at Lubbock, Texas, airport, 5:00 p.m., Nov. 7. The trip will be of interest to Quaternary geologists, geomorphologists, archaeologists, paleontologists, and anyone concerned with regional paleoclimate.

Cost: $235; includes 2 ON, 2 M, A—Lubbock to San Antonio; $155 without airfare. Limit 45.

2. Archaeological Geology of Classic Paleoindian Sites on the Southern High Plains, Texas and New Mexico—Vance T. Holliday, Department of Geography, University of Wisconsin, Madison, WI, 53706 (608/262-6300); Eileen Johnson, The Museum, Texas Tech University, Lubbock; Vance Haynes, University of Arizona, Tucson; Glen Evans, Austin, Tex.; Dennis Stanford, Smithsonian Institution, Washington, D.C. Two and one-half days, Nov. 7–9.

The field trip will focus on the historical significance of the Lubbock Lake Plainview, and Clovis (Blackwater Draw Locality #1) sites, the Paleoindian archaeology and geochronology, and the la Quaternary environmental records as relate to the entire region. One other late Quaternary stratigraphic sequence in lower Blackwater Draw, near Lubbock Lake, may also be viewed. The trip should be of interest to archaeological geologists and Quaternary geologists and also those interested in the history of geology and, perhaps, vertebrate paleontology. Trip originates in Lubbock, Texas.

Cost: $235; includes 2 ON, 2 M, A—Lubbock to San Antonio; $155 without airfare. Limit 45.

3. Igneous Geology of Trans-Pecos Texas—Jonathan G. Price and Christopher D. Henry, Bureau of Economic Geology, University of Texas, Austin, TX 78713 (512)/471-1534); Don F. Parker, Baylor University, Waco, Texas; Daniel S. Barks, University of Texas, Austin. Three and one-half days, Nov. 6–9.

The field trip will examine caldera structures, field relations of pyroclastic rhyolite and rhyolite ash-flow tuffs and lava flows, magma mixing within intrusion and petrogenesis of silica-unsaturated and silica-saturated magmas. The Trans-Pecos region is an igneous province with some of the best exposures of alkaline rocks and calderas in the world. Highlights of the first full day of the field trip will be the Marble Canyon stock, an unusual alkalic intrusion that is zoned from a nepheline-bearing alkali-gabbro rim to a quartz-eyene core, and the Van Horn Mountains caldera, which...
many classic caldera structures are well exposed. Highlights of the second day will be exposures of peralkaline ash-flow tuffs, which exhibit spectacular secondary flow features, inside and outside the Buckhorn caldera and exposures of alkalic rocks on the Paisano volcano in the Davis Mountains area. On the return to San Antonio on the last day, the trip will focus on pyroclastic rocks of the Pine Canyon caldera in Big Bend National Park. Trip originates in El Paso, airport, 5:00 p.m., Nov. 6. Cost: $250; includes 3 ON, 5 M. Limit 45.


The trip examines the rather complex folded and thrust-faulted Paleozoic sedimentary rocks in the east-central core and adjoining areas of the Ouachita Mountains, Arkansas, and attempts to demonstrate the apparent deep-water depositional environments and the likely sediment sources of the Lower Ordovician Collar Shale through the Middle Pennsylvanian Atoka Formation; the major thrust faults, including the Alum Fork and other decollements; the respective stages, styles, and intensities of deformation in several of the structural belts (Hooper, Moun Ida, Avilla, Aly, etc.); and the effects of episodes of late Paleozoic thermal activity and, locally, later overprinting by Cretaceous intrusives on these rocks. There will be a rather lengthy discussion of the several published and other proposed tectonic models for the formation of the rocks in the fold belt; the oil and gas potential, including maturation and possible levels of degradation; and the probable exhalative base metal and other mineral occurrences. Trip originates in Little Rock, Arkansas. Cost: $315; includes 3 ON, 3 M, A—Little Rock to San Antonio; $236 without airfare. Limit 45.


This trip will provide a general overview of the effect of geology on urban development in San Antonio. The general stratigraphy, structural geology, hydrogeology, and physiography of the San Antonio region will be presented. The two distinct geotechnical environments in the area—the Tertiary sands and expansive clay formations of southern San Antonio and the Cretaceous limestones and marls of northern San Antonio—will be examined. The geology and geotechnical engineering of several large construction projects will be

San Antonio
6. Stratigraphy and Structure of the Maverick Basin and Devil's River Trend, Lower Cretaceous, Southwest Texas—C. J. Smith, Department of Geology, University of Texas, Arlington, TX 76019 (817/273-2987); Peter R. Rose, Telegraph Exploration, Telegraph, Texas; Bruce C. Miller, Exxon Company USA, Corpus Christi, Texas; R. E. Webster, Dallas; C. H. Humphreys, Ensearch Exploration, Dallas.

Three days, Nov. 7–9.

The purpose of this trip is to describe, interpret, examine, and provoke discussion on (1) the stratigraphic and facies relationships of the Lower Cretaceous Fredericksburg-lower Washita (Albian) strata between the Maverick Basin and the Devil's River trend formations of the southern Edwards Plateau, (2) surface structural patterns and their relationship to Paleozoic (Ouachita) structural and tectonic trends, and (3) the hydrocarbon potential of the Lower Cretaceous sequence in the Maverick Basin. The field trip will focus not only on clarifying the genetic stratigraphic relationships but also on examination of Cretaceous structure, including the relationship between Cretaceous and Paleozoic structures.

Cost: $265; includes 2 ON, 3 M. Limit 45.

7. Petrology of the Cambrian Wichita Mountains Igneous Suite—M. C. Gilbert, Department of Geology, Texas A&M University, College Station, TX 77843 (409/845-2541); B. N. Powell, Phillips Petroleum, Bartlesville, Oklahoma; R. Cooper, Lamar University, Beaumont, Texas. Three days, Nov. 7–9.

This trip will begin with examination of the Meers fault, the largest surface-breaking fault scarp east of the Rocky Mountains. The trip will familiarize participants with the layered mafic intrusion and/or A-type sheet granites and magma mixing associated with the Southern Oklahoma aulacogen. The aulacogen extends approximately 450 km from southeastern Oklahoma into the midcontinent, where it forms a WNW-trending swath across crystalline basement rocks with ages of 1.3–1.4 Ga.

Characteristics and differences of the igneous rocks will be demonstrated, including bimodal chemistry, major gabbroic units (one a layered cumulate complex), and assemblage of granitic sheets of A-type chemistry, a series of rhyolites including both ash-flow tuffs and thick flows, and a set of diabase dikes. Trip originates in Lawton, Oklahoma.

Cost: $326; includes 2 ON, 4 M, A—Lawton to San Antonio; $235 without airfare. Limit 45.
8. Hydrology of the Edwards Aquifer, San Antonio Region, Texas—Weldon W. Hammond, Jr., Geology Program, Earth and Physical Sciences, University of Texas, San Antonio, TX 78285 (512/691-4455); Diane Pavlick, USGS, San Antonio; George Ozuna and Glenn Longley, Southwest Texas State University, San Marcos. One day, Nov. 8.

The Edwards Limestone contains one of the most highly permeable and productive carbonate aquifers in the United States. San Antonio is the largest city in the United States to be supplied entirely by ground water. This field trip will present evidence relating to regional differences in porosity development and the geologic controls on porosity development and as such will concentrate on the hydrogeologic characteristics of the aquifer. The trip will examine local recharge areas, faults, well fields, and springs. Emphasis will be placed on research relating to the fresh water-saline water interface and its relation to hydrostratigraphic controls and hydrodynamic responses within the aquifer.

Cost: $55; includes 1 M. Limit 45.

9. Paleoenvironments and Fossil Communities of the Late Pennsylvania of North-Central Texas—Thomas E. Yancey, Texas A&M University, College Station, TX 77843 (409/845-0643); Steve Schutter, Exxon Production Research Company, Houston. One and one-half days, Nov. 7-8.

This trip will examine paleontologic communities and transgressive-regressive sequences, cyclic stratigraphy, of the late Pennsylvanian Eastern Shelf. Upper Strawn Group, Canyon Group, and lower Cisco Group outcrops. Approximately late Desmoinesian, Missourian, and early Virgilian age, will be visited. A transgressive fauna in carbonate-dominated systems can be compared to a regressive fauna of predominantly delta-related sediments. Comparisons with classic midcontinent faunas are possible. Trip originates at the Dallas-Fort Worth airport, 5:00 p.m., Nov. 7.

Cost: $140; includes 1 ON, 1 M. Limit 45.

10. Geology of Gulf Coast Lignite—Walter Ayers, Texas Bureau of Economic Geology, University of Texas, Austin, TX 78712 (512/471-1534); John Breyer, Texas Christian University, Fort Worth; John Johnston, Louisiana Geological Survey, Baton Rouge; Robert Finkelman, Houston, (713/497-0425). Three and one-half days, Nov. 6-9.

The major focus of this trip is an evaluation of the evidence used in interpreting the depositional environments of the Gulf Coast lignites. Sections will be examined at five active lignite mines in Louisiana and Texas. Four mines are in the Wilcox Group; the fifth is in the Jackson Group. In addition, there will be discussions on coal quality trends, mining methods, geochemistry, petrography, and environmental aspects of lignite mining. Trip originates in Shreveport, Louisiana.

Cost: $265; includes 3 ON, 3 M. Limit 45.

11. Geology and Mineral Resources of Gulf Coast Salt Domes—Steven Seni, Bureau of Economic Geology, University of Texas, Austin, TX 78713 (512/471-1534); Fairs Samuelson, Texasgulf Chemicals Co., Newgulf, Texas; and Peter Price, Marathon Oil Co., Littleton, Colorado. One day, Nov. 9.

A resurgence of interest in salt domes and their cap rocks has been fueled by expanded use of domes for product storage such as the Strategic Petroleum Reserve and by proposed use of salt domes for nuclear and toxic-chemical waste disposal and for compressed air storage. Recent exploration has discovered Zn-Pb-Ag deposits in Gulf Coast cap rocks, and research indicates a genetic link between these cap-rock deposits and several classic ore deposit types in sedimentary terranes. Two salt domes on the Texas Coastal Plain provide a convenient and appropriate starting point for comparing mechanisms and timing of dome and cap-rock evolution and natural resource distribution. Sites to be visited include the cap rock limestone quarry at the Damon Mound and the Praeh salt sulfur operation at Boling dome. General features of calcite and anhydrite cap rocks will be examined in cores from Hockley and Boling domes, including sulfur and Pb-Zn-Ag sulfide mineralization.

Cost: $70; includes 1 M. Limit 45.
12. Sedimentation in and Deformation of the Southern Oklahoma Aulacogen—R. N. Donovan and T. Boone Pickens, Jr., School of Geology, Oklahoma State University, Stillwater, OK 74078 (405/624-6358). Three days, Nov. 7–9.

In the vicinity of the Wichita Mountains, the field trip will address the themes: (1) the basal transgression of the Upper Cambrian across an irregular land surface carved from volcanic rock; (2) the passage from a siliciclastic to a carbonate-dominated sedimentation pattern; (3) shallow carbonate platform sediments including evidence for vanished evaporites; (4) intense structural deformation involving faulting and folding of the lower Paleozoic rocks under the influence of a left-lateral transpressive stress system; (5) the Permian alluvial fan conglomerates derived from an active fault scarp; and (6) the evidence for recent (ca. 10,000 B.P.) movement of the Meers fault. Trip originates at Lawton, Oklahoma.

Cost: $326; includes 2 ON, 4 M, A—Lawton to San Antonio; $235 without airfare. Limit 45.

POSTMEETING TRIPS

13. Precambrian Granite Magmatism and Diapirism, Llano Uplift, Central Texas—Volker W. Gobel, Department of Geology, Stephen F. Austin State University, Nacogdoches, TX 75962 (409/560-3701); Robert M. Hutchinson, Golden, Colorado. Two days, Nov. 14–15.

The trip will familiarize participants with the granite magmatic phase of the Llano orogenic basement rocks in central Texas and examine petrology, internal zoning, granite teutonics, and intrusion patterns as displayed by selected plutons. Characteristics and differences of the three-phase granitic cycles in the Llano Uplift region will be demonstrated: Town Mountain-type rapakivi granites and Six Mile-type and Oatman Creek-type granites.

Cost: $150; includes 1 ON, 1 M. Limit 45.


The field trip will view and discuss the integrated geologic and geomorphic development of the Edwards Aquifer and the evolution of the surface drainage basin. View the Edwards Limestone outcrop in the Balcones fault zone between San Antonio and New Braunfels. The main message will be the geologic history of the Edwards Aquifer from the Cretaceous to the present and its interdependency with the surface drainage network. Outcrops to be visited will show the Balcones escarpment, Edwards Limestone depositional environments, discharge sites and major springs, collapsed caverns at mega-collapse localities in karstic plains, evidence for stream piracy, and recharge through stream bottoms and fractures.

Cost: $60; includes 1 M. Limit 90.

15. South Texas Modern Depositional Systems—John L. Russell and Jon A. Baskin, Department of Geosciences, Texas A&I University, Kingsville, TX 78363 (512/595-3310). Three days, Nov. 14–16.

The field trip will examine Holocene depositional systems in Nueces, Kleberg, and Kenedy Counties, Texas. Estuarine, eolian, fluvial, deltaic, lacustrine, and barrier island environments will be investigated. The Nueces Bay–Corpus Christi Bay normal estuarine system will be compared to the Baffin Bay system, which commonly has reverse estuarine circulation. Baffin Bay is unique in the United States because it is commonly hypersaline and contains Holocene carbonate and evaporites. The South Texas Eolian Sand Plain will be examined. Fluvial and bay head delta systems of the Nueces River will be examined as well as lagoonal and barrier island environments on Mustang and North Padre islands.

Cost: $200; includes 2 ON, 3 M. Limit 45.


The trip will concentrate on the truly outstanding and magnificently exposed stratigraphic sequence in the El Paso border region. The Franklin Mountains tilted fault block, Cerro de Cristo Rey, and adjacent bolsons contain exposed Precambrian through Cenozoic stratigraphic sequences. Six Precambrian formations totaling 1,674 m in thickness in the Franklin Mountains will be examined. Cretaceous siliciclastics and carbonate rock sequences at Cerro de Cristo Rey will be examined and related to equivalent units of the Edwards Plateau, Late Cenozoic Fort Hancock and Camp Rice lacustrine-fluvial sequences will be examined. Trip terminates in El Paso.

Cost: $190; includes 2 ON, 2 M, A—San Antonio to El Paso; $125 without airfare. Limit 45.


In Late Cretaceous time, hundreds of volcanoes erupted on the chalky, open shelf of central and south Texas. Original magmatic compositions were mafic and alkaline, nephelinites being most common, with local phonolites and basalts. Eruption produced tuff mounds of palagonite tuff an associated mudflows. Fringing reefs and shoal-water carbonates were constructed and the volcanoes’ flanks and were deposited on a regional scale in the Uvalde area. This trip will visit the classic Austin exposures of palagonite tuff and overlying “beachrock” and shoal complexes. Distal and proximal tuff facies; mudflows; lagoonal, coral-bear muds; and subaerial basanite flows will be visited. Participants will tour the Uvalde an to see fresh exposures of ultramafic and alkaline rocks. The Knippa Quarry exposes a lava-lake complex cut by subaerial vent-facies of nephelinites-bearing spinel-peridotite nodules. The trip will finish by examining the asphalt-saturated, shoal-water carbonates of the Anacacho Mountains.

Cost: $95; includes 2 ON, 2 M. Limit 45.

This trip will emphasize depositional and diagenetic environments as applied to origin of and exploration for Paleozoic shale- and carbonate-hosted ore deposits in northern Arkansas and southeastern Missouri. The first part of the trip will examine the Paleozoic siliciclastic strata of the Ouachita region in outcrops and cores taken during exploration for sedimentary exhalative Zn-Pb-Ag deposits. Stratiform barite deposits with associated sulfides will be studied in open-pit exposures. Examine the Late Cambrian shelf carbonates in surface exposures and the associated ore deposits of southeastern Missouri. The group will visit a Viburnum Trend Pb-Zn mine and a Washington County residual barite deposit. Trip originates in Little Rock, Arkansas, the evening of Nov. 3, and ends in St. Louis the afternoon of Nov. 8.

For reservations, forward a $100 deposit, payable to “Midcontinent Pb-Zn Excursion” by Sept. 1 to Richard Hagni, Department of Geology, University of Missouri, Rolla, MO 65401. (314/341-4657). Balance due by Oct. 1, 1986. Cost: $325; includes 5 ON, 6 M, and guidebook. 40 participants.

Limestone-Replacement Pb-Zn-Ag Deposits of Northern Mexico—Kenneth Clark, Department of Geological Sciences, University of Texas, El Paso, TX 79912; Joaquin Ruiz and Peter Megaw, Department of Geosciences, University of Arizona, Tucson. Four and one-half days. Nov. 13–17.

Trip departs from San Antonio at noon, Nov. 13 and terminates in El Paso the evening of Nov. 17. The group will fly to Monterrey, Nuevo Leon, and drive to Torreon, Coahuila. On Friday the group will travel to Velardeña, Durango, to examine the replacement Pb-Zn-Ag deposits within Cretaceous carbonate strata on the San María structural dome. Succeeding days include travel to Chihuahua to examine similar ores distributed in mantos and breccia pipes at Naica and at Santa Eulalia (east and west camps).

For reservations, forward a $100 deposit payable to “Mexico Excursion, Fall, 1986” by Sept. 1, 1986, to PUBCO, P.O. Box 637, University of Texas, El Paso, TX 79968-0637, (915)/533-1965). Balance due by Oct. 1, 1986. Cost: $375; includes 4 ON, 12 M, guidebook, and airfare to Monterrey from San Antonio. (Price may vary depending on final logistics and fluctuating exchange rates.)

The field trip will show the platform Comanchean section of central Texas in the type area of its many formations. It will emphasize the Trinity Group fluvial to marine transition, from fluvial conglomerates to carbonate bank deposits, the remarkable uniformity of the Fredericksburg and Washita shallow marine, and the Del Rio Clay unique pyritized dwarf fauna.

Cost: $150; includes 2 ON, 2 M. Limit 45.

SEG-SPONSORED FIELD TRIPS

Sediment-Hosted Pb-Zn-Ag-Ba Deposits of the Midcontinent—Richard Hagni, Department of Geology, University of Missouri, Rolla, MO 65401 (314/341-4657); Charles Stone, Arkansas Geological Commission, Little Rock; Tim Master, Consultant, Hot Springs, Arkansas; Heyward Wharton, Missouri Geological Survey, Rolla; Robert Dunn, Paul Gerdemann, and Jay Gregg, St. Joe Minerals Corp., Viburnum, Missouri; and Milton Bradley, Cominco American, Bixby, Missouri. Five days (plus previous evening), Nov. 3–8.
EXHIBITS

Exhibits open at 6:00 p.m. Sunday, November 9, at the Convention Center and remain open throughout the Welcoming Party until 9:00 p.m. Hours Monday and Tuesday will be 9:00 a.m. to 5:00 p.m., and Wednesday, 9:00 a.m. to 2:00 p.m.

Exhibit space MAY still be available at this time. Please contact Kathy Ohmie, Exhibits Coordinator at GSA headquarters.

Exhibitors as we go to press:

Aapg Bookstore
Aapg Visiting Petroleum Geologists Program
Academic Press, Inc.
ADAMAS
Allen & Unwin, Inc.
American Geological Institute
American Geophysical Union
American Institute of Professional Geologists
Association of Engineering Geologists
Bausch & Lomb
Blackwell Scientific Publications
Blake Industries, Inc.
William C. Brown Publishers
Buehler Ltd.
Bujak Davies Group
Bureau of Economic Geology—University of Texas
Burges Publishing Company
Bushwalker/Plateau Design
Cambridge University Press
Camca Instruments, Inc.
Canadian Society of Petroleum Geologists
Carolina Biological Supply Company
Chapman & Hall
Chemex Labs Ltd.
Chemical Abstracts Service
ChemPet Research
Circum-Pacific Council
Circum-Pacific Map Project
Cushman Foundation
Dapple Systems
Daryl Howard, Inc.
Delci, Inc.
Digital Image, Inc.
Earth Enterprises, Inc.
Earth Observation Satellite Company
Economic Geology Publishing Company
Edax International
E G & G Ortec
Elsevier Science Publishing Company, Inc.
EMTEK
Encyclopaedia Britannica USA
Finnigan MAT
W. H. Freeman & Company
GBL Electronics
General Supply Corporation
Geological Association of Canada
Geologic Times
Geoscience Information Society
Geoscience Resources, Inc.
Gisco Geophysical Instrument Company
GSA Bookstore
GSA Combined Publishers Display
GSA Decade Project—DNAG
GSA Sections
GSA 1987 Annual Meeting—Phoenix
GSA 1986 Annual Meeting: University of Texas—San Antonio
University of Texas—Austin
Hilquist, Inc.
International Association for Mathematical Geology
International Union of Geological Sciences
JCPDS
Jena/Distributor Seiler Instrument Company
JEOL, USA, Inc.
KDI Electro-Tec Corporation
Kendall/Hunt Publishing Company
Kevex Corporation
Krueger Enterprises, Inc.
E. Leitz, Inc.
Logitech, Inc.
Louisiana State University—Dept. of Geology
Lubrecht & Cramer Ltd.
Ben Meadows Company
Charles E. Merrill Publishing Company
Mineralogical Society of America
National Association of Geology Teachers
National Science Foundation
Nature's Own
New Mexico Bureau of Mines & Mineral Resources
Nicolet X-Ray Instruments
Nikon, Inc., Instrument Group
Ocean Drilling Project—Texas A & M University
Oklahoma Geological Survey
Olympus Corporation
Oxford University Press
Paleoceanographic Mapping Project
Paleontological Society
Pennsylvania Geological Survey
Pergamon Press, Inc.
Philips Electronic Instruments
Plenum Publishing Corporation
Prentice-Hall
Princeton University Press
Raiders of Lost Continents
Rice University
Rigaku/USA, Inc.
Rocklabs
RockWare, Inc.
Rocky Mountain Association of Geologists
SEPM
San Antonio Independent School District
Saunders College Publishing
Schonstedt Instrument Company
Scintag, Inc.
Siemens
Sigma Gamma Epsilon
Spectrex Corporation
Spex Industries, Inc.
Springer-Verlag New York, Inc.
Thrustbelt Systems Ltd.
Touchstones
Tracor Northern
University of Arkansas—Monticello
U.S. Geological Survey
Van Nostrand Reinhold Company, Inc.
VG Instruments, Inc.
Washington State University—Department of Geology
Wildlife Supply Company
John Wiley & Sons
Williams & Heinze Map Company
X-Ray Assay Labs Ltd.
SPECIAL EVENTS

Surrros & Burritos
Wednesday, November 12, 7:00 to 11:00 p.m.
La Villita

This is a special entertainment event where everyone is invited to celebrate San Antonio. The flavor of both Texas and Mexico is yours luring this special evening of barbecue and acos, country-western and mariachis, cowboys and Spanish dancers. An exclusive western hoe-down and Mexican fiesta will be presented for GSA in La Villita, the famous Mexican village across from the Convention Center in downtown San Antonio.

Your ticket will be a personal visa that will get you across the “border” between Mexico and Texas for all the Mex-Tex food and beverage you can hold. In addition to margaritas, beer, and wine, the Texas side will offer roast beef, chicken drumsticks, and barbecue sausage, and the Mexican side will offer homemade corn tortillas, fajitas, nachos grandes, and pan dulce.

Cloggers, square-dancers, and Mexican bands will provide the background for dancing and singing. Be on hand for President Ernst’s “grand” entrance.

Fee: $28

SPECIAL EVENTS

 Welcoming Party
Sunday, November 9, 6:00 to 9:00 p.m.
Convention Center

Arrive by riverboat or walk over to the Society’s reception to meet your friends and colleagues. This will also be the one opportunity to visit the technical and scientific exhibits unopposed by technical sessions. Registration will be open until 7:30 p.m. for your convenience.

GSA Presidential Address and Awards
Monday, November 10, 5:00 to 6:00 p.m.
Convention Center

Everyone is welcome to attend President Gary Ernst’s address, which will be followed immediately by the GSA awards ceremonies for the Penrose and Day Medals. President Ernst’s address is titled: “Status and Future of the Earth Sciences: How Bad, How Good?” In a provocative address he will focus on both the negative and the positive, emphasizing ways we can improve. His message is primarily for those in research and academic fields who want to dynamically affect the future.

After his address, President Ernst will present GSA’s prestigious awards to 1986 Day Medalist E-an Zen and 1986 Penrose Medalist, Laurence L. Sloss.

All-GSA Awards Reception
Monday, November 10, 6:00 to 7:00 p.m.
Convention Center

A special reception honoring GSA’s Penrose and Day Medalists will follow the awards ceremonies. Everyone is invited to meet the medalists and to celebrate in their honor. This one-hour reception will be held in the same ballroom as the alumni receptions, which begin immediately afterward. Every registrant and guest is welcome to attend the awards and reception.

Fee: $28

Alumni Night
Monday, November 10, 7:00 to 9:30 p.m.
Convention Center

Alumni receptions begin at 7:00 p.m. simultaneously in the Convention Center and surrounding hotels. More than 50 alumni groups participate. If your university plans to hold an alumni reception, please notify the Events Coordinator at GSA by September 15.

Awards Luncheons and Other Ticketed Meal Functions

Associated societies and GSA divisions hold annual catered events. These events are used to honor medalists and to address important issues related to each group. The events are open to anyone wishing to attend. Check the registration form to determine the dates of each event and to register for tickets. On-site, the annual meeting program will list the locations and times for each event.

SPORTS EVENTS

Invitational Tennis
Sunday, November 9, 9:00 a.m. to 1:00 p.m.
McFarland Tennis Center

Pack your racket and tennis shoes for a light-hearted tournament with good players. Meet at 8:30 a.m. at the Convention Center for departure to the McFarland Tennis Center for a round-robin doubles tournament.

Partners will be drawn Sunday morning. No singles will be played. Entry will be limited to the first 40 persons registering. Awards will be given to the top three players. The fee includes transportation, beverage, balls, and court fees. This event is by preregistration only.

If you have questions on Sunday morning, call or visit the GSA Annual Meeting Office either at the Hyatt or the Convention Center anytime after 7:00 a.m.

Fee per person: $15

San Antonio Stampede:
5K/10K Run
Wednesday, November 12, 7:30 a.m., start
Convention Center

Attention walkers, joggers, runners! Take a mid-week break to participate in the third annual 5K/10K races. November usually provides excellent weather for running in Hemisfair Exhibition Park near the Convention Center. The race will be professionally directed and timed. Water will be provided on the course, and refreshments and prizes will be at the finish line.

Finnigan MAT, Inc., has again graciously agreed to sponsor the race shirts for runners. Racers should select a T-shirt size on the registration form. Additional T-shirts may be purchased on-site. T-shirts and race maps may be picked up in the registration area beginning on Sunday, November 9.

Fee including T-shirt: $7
GSA SHORT COURSES

All courses sponsored by GSA will be held in San Antonio immediately before and after the GSA Annual meeting. Receive twice the benefits of attending the GSA meeting by participating in one of GSA's professional instruction programs. The courses are designed for several different professional levels.

ENROLLMENT.

Course participation is open to GSA members and nonmembers. Registration for the Annual Meeting is not required.

PREREGRISTRATION DEADLINE IS OCTOBER 10.

On-site registration is based on availability. The on-site fee will be $15 additional.

CANCELLATION.

Fees will be refunded if we are notified by October 17. Substitutions may be made at any time. No refunds will be made after the course is completed. For more information, contact: Course Registrar, GSA Headquarters.

Computer Graphics for Geological Applications

Saturday, November 8, and Sunday, November 9, 8:00 a.m. to 5:00 p.m., Hewlett Packard

This course is designed for those familiar with personal computers, for those who have used a mainframe, or for those with a need to use specialized graphic techniques to help solve geologic problems. The objective will be to provide the participant with an understanding of techniques for creating computer graphics to illustrate geologic information.

Faculty: Richard G. Craig, Department of Geology, Kent State University; Ph.D., Pennsylvania State University. Since joining the staff at Kent State in 1978, Craig has transformed a virtually noncomputer department into one of considerable strength in computer use. Well known in the field of computer graphics, Craig is listed in Marquis's Who's Who in Frontier Science and Technology. Harlan P. Foote, Battelle Memorial Institute, Pacific Northwest Labs. A specialist in the fields of computer graphics, remote sensing, and pattern recognition, Foote has worked for Battelle-Northwest since 1966. Most recently, Foote was selected by NASA as a Principal Investigator on the Landsat 4 project. Barry L. Roberts, M.S., Department of Geology, Kent State University. Michael P. Singer, URS Dalton, Cleveland; M.S., Department of Geology, Kent State University. Computer equipment provided courtesy of Hewlett-Packard. Travel arrangements for Foote provided by Battelle.

Fee includes course manual, lunch both days, and dinner Saturday evening. Limit: 24. Fee: $270.

Glacial-Marine Sedimentation

Saturday, November 8, 1:00 to 6:00 p.m., continues 7:30 to 10:00 p.m.; Sunday, November 9, 8:00 a.m. to 5:00 p.m., Hilton Hotel

Intended for a broad spectrum of participants ranging from student to professional, this course will present an up-to-date summary of what is known about glacial-marine sedimentation. Emphasis will be on the diverse nature of modern depositional environments and their resulting facies and deposits. Other discussions will analyze the temporal and spatial distribution of glacial-marine sediment in the rock record. The course will also include introductory sections that provide basic information about marine and glacial depositional environments. Hands-on core and seismic profile workshops will enhance the presentation. An informal reception will be held in conjunction with the workshop on Saturday evening.

Faculty: Bruce F. Molnia, Polar Research Board, National Research Council, National Academy of Sciences; Ph.D., University of South Carolina. Chief Scientist on more than a dozen research cruises, Molnia's main areas of investigation include the Gulf of Alaska, the...
Seawater Chronostratigraphy Using Strontium Isotopes
Sunday, November 9, 1:00 to 5:00 p.m., Convention Center

Designed for upper-division undergraduates, graduate students, and professionals in the geosciences, this one-half day course will cover the theoretical basis and analytical methodology behind the application of the Sr isotopic evolution of seawater to the correlation and chronology of sedimentary marine carbonate sequences. Specific applications of the Sr isotopic chronostratigraphic method will be used to demonstrate the effectiveness and limitations of the technique. These include correlation of the Monterey Formation between coastal southern California basins, studies of brine migration, oil-source rock correlations, and paleoenvironmental analysis of uranium ore deposits in the San Juan Basin, New Mexico.

Faculty: Richard W. Hurst, Department of Geology, California State University, Ph.D., University of California, Los Angeles. Recently elected to the New York Academy of Sciences, Hurst has over ten years experience in the fields of isotope and trace element geochemistry, hydrology, and environmental geochemistry and biogeochemistry. Terry E. Davis, Department of Geology, California State University, Ph.D., University of California, Santa Barbara. A consultant in geology and geochemistry since 1957, Davis is the author of more than fifty publications.

Fee includes course manual. Limit: 100. Fee: $50.

An Introduction to the Geologic Use of Microcomputers
Sunday, November 9, 8:00 a.m. to 5:00 p.m., Marriott Hotel

Choosing the right hardware and software for use by today's geologists can be both time-consuming and expensive. Designed to shorten your work, this course will provide an overview of comparable software and microcomputers available for purchase and how to apply this software for both geological and other practical uses. The course will cover geological data management, analysis, display, and communication. It also will cover the use of word processing in the preparation, editing, and revision of reports and manuscripts.

Faculty: Peter G. Satterlin, Professor, Wichita State University; Ph.D., Northwestern University. Satterlin was employed with Gulf Oil of Canada for 10 years and has over 20 years experience in the field of computer applications for the geologist. Daniel F. Merriam, Distinguished Endowment Professor of Natural Science, Wichita State University; Ph.D., University of Kansas, D.Sc., University of Leicester, England. Merriam is well known in the fields of geology and computers and is the author of Computer Applications in Geology and more than 155 articles. Mark A. Sonderegger, B.S., Computer Science, Wichita State University.

Fee includes course manual and lunch. Limit: 60. Fee: $85.

Geologic Applications of Fossil Radiolarians
Sunday, November 9, 8:00 a.m. to 5:00 p.m., Hyatt Regency Hotel

This course is designed for academic and industry paleontologists as well as field-oriented geologists working on both onshore and offshore marine sediments. The primary objective of the course is to demonstrate the geologic utility of fossil radiolarians. Topics will include discussions on the major Paleoecic, Mesozoic, and Cenozoic radiolarian groups and their biostratigraphic, paleoecologic, and paleoclimatic significance, as well as the various approaches to radiolarian collection, acid extraction, and observation.

Faculty: Charles D. Blieme, U.S. Geological Survey, Paleontology and Stratigraphy Branch, Denver; Ph.D., University of Texas at Dallas. Blieme has worked for the U.S. Geological Survey for the past six years and is well known for his work in North American radiolarian biostratigraphy. Richard M. Casey, Marine Studies Program, University of San Diego; Ph.D., University of Southern California. Case has taught for more than 20 years and is a leading authority in the fields of Cenozoic radiolarian biostratigraphy and paleoecology. Patricia Whalen, Geoscience Department, University of Texas at Dallas; Ph.D., University of Texas at Dallas.

Fee includes course manual. Limit: 100. Fee: $75.

Basic Principles of Rock Mechanics
Friday, November 14, and Saturday, November 15, 8:30 a.m. to 4:00 p.m., Texas A&M University, College Station

This course assumes attendees have no prior knowledge of rock mechanics; it is intended for
geologists who need to either teach or apply this material. The course will cover the basic principles of rock mechanics and their applications, with special emphasis on applications in structural geology and tectonics. During the laboratory time, small groups will see
— an actual experiment, including sample preparation, jacketing, and gauging;
— deformed samples, including thin section; and
— a variety of experimental apparatus.
Organizers: John H. Spang, Head, Department of Geology, Texas A&M University; Ph.D., Brown University. Winthrop D. Means, State University of New York at Albany; Ph.D., University of California at Berkeley.
Primary faculty: John Handin, Ph.D., UCLA. Handin co-authored the classic papers on the effects of confining pressure, temperature, and pore pressure on the deformation of sedimentary rocks. He has served on numerous national and international panels on rock mechanics, waste isolation, and earthquakes. John Logan, Ph.D., University of Oklahoma. Logan is working on characterizing the constitutive relations and physical processes of frictional sliding and fault zones through experimental studies and field verification. Neville Carter, Ph.D., UCLA. Carter studies flow properties and dislocation-activated processes under mantle conditions and halite under repository conditions. Additional faculty: Melvin Friedman, Ph.D., Rice University. Andreas Kronenberg, Ph.D., Brown University. Handin, Logan, Carter, Friedman, and Kronenberg are Research Associates at the Center for Tectonophysics and teach in the Department of Geology and/or Geophysics, Texas A&M University, College Station, Texas. The course instructors represent a combined total of more than 100 years experience in the field of industry, university, and government rock mechanics labs.
Fee includes course manual, transportation from San Antonio to College Station on Thursday evening, and an informal dinner on Friday evening. Return transportation to San Antonio will be arranged at an additional fee. Information on lodging in College Station will be sent to registrants. Limit 60. Fee: $135.

OTHER COURSES AND WORKSHOPS

Exploration Geochemistry: Design and Interpretation of Soil Surveys
The course is designed to update practicing exploration geochemists on design, implementation, and interpretation of soil geochemical surveys, including choice of appropriate analytical and statistical methods. Case studies will be used to illustrate both the problems that can arise and the benefits of a systematic approach to anomaly definition and rating based on a sound understanding of geochemical processes in surficial media. Instructors will be W. K. Fletcher, S. Hoffman, M. B. Mehrtens, A. J. Sinclair, and I. Thomson.
Fee: $375, includes double-occupancy lodging, lunches on meeting days, and Volume 3 of Reviews in Economic Geology. Enrollment is limited to 60 people on a first-come, first-served basis. Deadline for registration is September 26. For information/registration: Lois Elms, Western Experience, 2369 Carriage Circle, Oceanside, CA 92056; (619) 722-0027.

Stable Isotopes in High-Temperature Geological Processes
Friday, November 7 through Sunday, November 9. El Tropicano Hotel. Registration will be held at an informal welcoming reception at the hotel on Thursday evening, November 6. Sponsored by the Mineralogical Society of America.
A comprehensive overview of the behavior of stable isotopes in the high-temperature environment will be given by 12 well-known specialists. Treatment will include theoretical and experimental aspects of isotopic fractionation (J. R. O’Neill), the kinetics of isotopic exchange (D. R. Cole and H. Ohmoto), isotopic variation in natural waters (S.M.F. Sheppard), isotopic exchange in open and closed fluid/rock systems (R. T. Gregory), the early history of the solar system (R. N. Clayton), isotopic variation in the mantle (T. K. Kyser), isotopic behavior in magmatic fluids (B. E. Taylor), oxygen and hydrogen isotopic studies of igneous rocks (H. P. Taylor and S.M.F. Sheppard), meteoric/ hydrothermal systems (R. E. Criss), submarine hydrothermal systems (K. Muehlenbachs), isotopic behavior during metamorphism (J. W. Valley), and stable isotopes and ore genesis (H. Ohmoto).

Fossil Land Plants
Sunday, November 9, 8:00 a.m. to 5:00 p.m. Hyatt Regency Hotel. Sponsored by the Paleontological Society.
The course will give an overview of the taphonomic constraints involved with the development of terrestrial-plant-bearing lithologies, the paleogeographic distribution of plant communities through time and their bearing on paleoclimatology, the diversity and paleoecology of megafossil communities in the context of their depositional environment, and their evolution. Participants include William Fritz, Georgia State University; Robert Spicer Goldsmith’s College, London; Robert Gastaldo Auburn University; Andrew Knoll, Harvard University; Patricia Gesell, University of North Carolina, Chapel Hill; Steven Scheckler, Virginia Polytechnic Institute; William DiMichele, US National Museum; Gene Mapes, Ohio University; Sergio Archangelsky, Museum of Natural Sciences, Buenos Aires; Sidney Ash Weber State; Leo Hickey, Peabody Museum; and Jack Wolfe, USGS.
There is no fee. Course notes will be available at a nominal fee. For information: Robert A. Gastaldo, Department of Geology, Petrie Hall 210, Auburn University, Auburn, AL 36849-3501; (205) 826-4282.

GeoRef Workshop: Learn to Search the Geological Literature by Computer
Wednesday, November 12, 8:00 a.m. to 12:30 noon. Hilton Hotel. Sponsored by GIS and A
Learn how to begin searching the American Geological Institute’s GeoRef online database over a million geological references from 178: the present. The 1986 speakers are: Barbara Pearson, Exxon Production Research Company Houston; Marilyn Stark, Colorado School of Mines, Golden; and Sharon Tahirkheli, American Geological Institute, Alexandria, Virginia. Beginning and prospective searchers will learn about the GeoRef database and wh. covers, Boolean logic, online search comment and how to devise effective search strategies.
GeoRef Trainers Workshop

Thursday, November 13, 8:00 a.m. to 12:00 noon. Hilton Hotel. Sponsored by AGI and GIS.

The purpose of this workshop is to share experience with present and potential workshop trainers on GeoRef. The attendees must be people who are experienced GeoRef database searchers. The scope of the workshop will include discussion of the experience of expert trainers from the GeoRef Information System. Topics to be discussed: Who should be a trainer? What tools are needed for training? What are aims of training? What should be included in a training session? How long should the session be? The workshop will be conducted by G. N. Rassam and Sharon Tahirkheli of AGI.

There is no preregistration or fee. For information: Kay Yost, AGI, 4220 King Street, Alexandria, VA 22302; (800) 336-4764 outside Virginia, or (703) 379-2480; or Marilyn Stark, Colorado School of Mines, Golden, CO 80401; (303) 273-3687.
FORUMS/PANELS
GSA Employment Service Forum: Future Employment Opportunities in the Geological Sciences
Monday, November 10, 1:00 to 3:00 p.m., Convention Center

Are you interested in salary scales, tips for successful interviews, and an overview of employment opportunities? What are the current trends in academia, government, industry, and consulting and the impact of federal legislation on job demand? Attend the GSA Employment Service Forum to hear from seven experts. Each panel member will speak briefly on the outlook in his or her special area and answer questions from the audience. The 1986 speakers are: Chairman Dick Paull, University of Wisconsin; J. D. Edwards, Pecten International Company; Penny Hanshaw, USGS; J. D. Mancuso, Chevron Resources Company; Charlie Mankin, Oklahoma Geological Survey; Dave Stephenson, Dames & Moore; and Steve Stow, Oak Ridge National Laboratory. For further information: Clara Hodgeson, Membership Coordinator, GSA Headquarters.

Tide- Versus Storm-Dominated Shelves: Their Modern and Ancient Oceanographic Settings and Deposits
Tuesday, November 11, 7:30 to 10:00 p.m., Hyatt Regency Hotel. Sponsored by the Sedimentary Geology Division

Rudy Slingerland and William Duke, organizers of the symposium being presented on Monday, November 10, will be the leaders of the panel discussion. This program is intended to emphasize basin-wide sedimentologic relationships; thus, styles of shelf sedimentation will be addressed from a broad-scale, multidisciplinary viewpoint. The panel discussion will open with some outlandish comments by George deV. Klein which may be difficult for some to swallow. In anticipation of this potential problem, soft drinks and beer will be available to be administered as needed!

Special Student Forum
Wednesday, November 12, 5:30 to 7:00 p.m., Convention Center

The Geological Record of the Causes and Consequences of Massive Extinctions
Eugene M. Shoemaker, USGS, Flagstaff; Steven Stanley, Johns Hopkins University

For students only! The first contentious contact forum is a unique program provided to honor GSA's student registrants. Discussion by two distinguished geologists of their differing interpretations of the geological, geochemical, paleontological, and other sources of evidence for the causes of massive extinctions.

Did the collision of Earth with an object from space result in the extinction of the dinosaurs? What was the source of the thin layer with an unusually high iridium content which occurs at the contact of the Cretaceous and Tertiary? Do massive extinctions occur on a periodic basis?

These questions and others will be debated in an informal setting where student participation will be welcome. Only those with student badges may attend.

SCIENCE THEATER

New film series will highlight the 1986 Science Theater. Featured will be the remarkable seven-part Planet Earth series; the 1986 release of six films entitled "Understanding Reefs" filmed off south Florida by Julia Hubbard, King's College, London; and two series on energy from the BBC/British Open University Forum and the Altschul Group. Also shown will be recent films from the Encyclopaedia Britannica Corporation including "Geologic Time," produced at the Grand Canyon, "Flood Forecasting," made on location in flood-plain regions, and AAPG's "Arid Carbonate Coastlines," shot on location in the Persian Gulf. A host of other new films related to climate, Great Lakes research, landslides, plate tectonics, and the environment will keep you abreast of the latest developments.

FUTURE ANNUAL MEETING DATES

<table>
<thead>
<tr>
<th>Year</th>
<th>City</th>
<th>Dates</th>
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<tr>
<td>1987</td>
<td>Phoenix</td>
<td>October 26–29</td>
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<tr>
<td>1988</td>
<td>Denver</td>
<td>October 31–November 3</td>
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<td>1989</td>
<td>St. Louis</td>
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<td>1990</td>
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<tr>
<td>1993</td>
<td>Boston</td>
<td>October 25–28</td>
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GUEST PROGRAM

The San Antonio Guest Committee presents a program that highlights the attractions of the city. The activities offer a look into San Antonio’s rich history and scenic beauty.

Please note that registration as a guest at the annual Meeting is a prerequisite for participation in the Guest Program and for use of the spatiility Room. However, guest registration is not included admission to the technical program.

The Hospitality Room is in the Medina Room of the Hyatt. Hours are from noon to 5:00 p.m. on Sunday and from 8:00 a.m. to 4:30 p.m., Monday through Thursday. Light refreshments and a place to relax will be provided to those interested as guests. Please wear your badge. A registered guest who visits the Hospitality Room will receive a gift. Hostesses will be in the spatiility Room to help you in any way they can. The Guest Committee welcomes you to San Antonio and hopes that you enjoy your visit.

ONTECHNICAL PROGRAM

Unique Business of Antique Jewelry
Wednesday, November 12, 10:00 to 11:00 a.m. at the Regency.

Since 1894, the Hammond family has been involved in the jewelry business. Hall Hammond will share his knowledge of the secrets of estate jewelry—how to spot and how to buy! Guests will have a chance to see the glitter and to get a basic understanding of this fascinating business.

TOURS

All tours depart from and return to the Hyatt. Tours will depart as scheduled. All tours are escorted and narrated by professional guides. Reservations for these tours will be accepted on a first-come, first-served basis. Please make note of registration and cancellation deadlines.

What To Buy and Where To Find It!
Monday, November 10, 9:00 to 10:00 a.m.

A delightful orientation to San Antonio and the marvelous hodgepodge called El Mercado. Historical facts and figures along with examples of good and unusual buys, found in the market, will be displayed and explained. The Historic Tour starts after the orientation.

Fee: $7

Historic San Antonio
Monday, November 10, 10:00 a.m. to 3:00 p.m.

Beginning with a drive through one of the most elegant neighborhoods of the 1890s, the King William district, the first stop is the beautifully restored Steve’s Homestead. Next we will visit the historic Mission San Jose. Built in 1720 and known as the “Queen of the Missions,” it houses the famous Rosa’s Window. The next stop is the Spanish Governor’s Palace, which was completed in 1749. Lunch will be served at Mi Tierra, located in the heart of the Mexican Market. A fashion show will be presented by the Tequila Tree Specialty Shop. The tour will conclude with a shopping trip to El Mercado (the Mexican Market). Forty shops for fantastic shopping!

Fee: $29

San Antonio Culture
Tuesday, November 11, 1:00 to 5:00 p.m.

While en route to the McNay Art Museum, the tour passes the San Antonio Museum of Art complex and the Terrell Hills area, noted for its beautiful homes. At the McNay Art Museum, there is a fine collection of French Impressionist art. Next, the tour visits the city’s newest treasure, the San Antonio Botanical Center, featuring the varied terraces of Texas, along with a biblical garden, a garden for the blind, and a rose garden. Wine and soft drinks will be served before the tour proceeds to the Institute of Texas Cultures, where contributions from 26 different ethnic groups are displayed.

Fee: $17

Natural Bridge Caverns
Wednesday, November 12, 9:00 a.m. to 3:00 p.m.

Only a short drive north, the Natural Bridge Caverns offer incredible surprises and awesome natural phenomena every inch of the way. Wear comfortable shoes (rubber soles recommended) and bring your camera! Back in San Antonio, lunch will be served in the gardenlike atmosphere of Los Patios, along the banks of Salado Creek. Quaint boutiques allow the visitor time to relax and shop.

Fee: $32

EMPLOYMENT INTERVIEWS

Do you need qualified earth scientists to fill staff positions in research or teaching? Are you looking for employment in the earth-sciences fields? Organizations seeking qualified earth scientists to fill staff needs are invited to apply to the GSA Employment Interview Service. The service will be conducted in the Convention Center.

All interested organizations are urged to submit information about their positions for computer listings of applicants. The minimum fee for a printout of two specialty listings is $125. A specialty code narrows the list of your search. For example, a geologist with background in geochemistry will be listed under the “geochemistry” specialty code.

Interview booths at the meeting may be rented for a nominal fee in half-day increments from Monday through Wednesday, November 10–12, 1986. GSA staff will handle all interview scheduling with Employment Service applicants. Request forms are in the March and July issues of GSA News & Information, sent to all GSA members, or may be obtained by contacting Clara Hodgson, Membership Coordinator, GSA headquarters.

Job seekers have found the Employment Interview Service critical to their successful search for positions. The one-year registration fee is $25 for GSA Members and Student Associates in good standing and $50 for nonmembers. This applicant fee includes the interview service at the annual meeting. Employment Service forms are in the March and July issues of GSA News & Information or may be obtained by contacting the Membership Department, GSA headquarters.

Note to Applicants: If we receive your materials by August 25, 1986, your record will be included in the information that employers receive prior to the meeting. Submit your forms early to receive maximum exposure! Don’t forget to indicate on your application form that you would like to interview in November.
TRANSPORTATION

AIR TRANSPORTATION

GSA has designated the Cain Travel Group of Boulder, Colorado, as the official airline reservation agent for the San Antonio meeting. United and Delta airlines are the official co-airlines.

Cain has been GSA’s official agency for five years and is a proven resource for those who want to work with a travel agent in determining the best possible airfares. The agency service is free, and it can save you both time and money.

Reduced rates will be up to 40% off coach depending on the dates of travel. United and Delta have also offered an additional 5% off any available fare, but restrictions will apply. These rates will be available only to GSA travelers.

All participants booking through Cain Travel will automatically become eligible for inclusion in a drawing for two roundtrip tickets to anywhere in the continental United States prior to August 31, 1987, subject to certain restrictions. In addition, clients will be eligible for a second drawing for $500 in travel credits.

Reservation Procedures:
1. Book early. Understand and write down the restrictions, if any.
2. Call Cain Travel at (800) 346-4747 (toll free) or (303) 443-2246, Monday–Friday, 7:30 a.m. to 5:30 p.m. MST.
3. Identify yourself as a GSA traveler.
4. The agent will quote you the discounted fare for your itinerary and confirm your reservation.
5. Payment options: Check payable to Cain Travel Group; major credit card; invoice to your firm.
6. All payment must reach Cain no later than seven days prior to departure. No reservations can be accepted by Cain after this deadline, which allows adequate mailing time.
7. Tickets will be sent to you via certified mail upon receipt of payment or credit card authorization.
8. In the event of a decrease in your airfare after the ticket has been issued, call Cain Travel and they will re-ticket you at the lower fare.

   The Cain Travel Group will provide a customer service desk at the Convention Center.
ROUND TRANSPORTATION

GSA will not provide a shuttle service in San Antonio. Most GSA hotels are within walking distance from the Convention Center, and the city offers convenient and reliable service from the airport and for getting around downtown. Below is information to help plan your trip.

Airport Transportation. Routes from the airport to hotels are serviced by 40-passenger buses, VIA Limousine Service. They will stop at GSA hotel properties upon request. Hours are 3:00 a.m. to 11:55 p.m. 7 days a week, departing from the airport every 30 minutes. Cost is currently $5.

VIA Limousine Service will also take you back to the airport. However, hotel pick-ups are not automatic. You must make your reservation by calling VIA at 227-5251. Service runs every 30 minutes. Cost is currently $5.

Cab fare is approximately $12 each way per carload. Service is available 24 hours.

Downtown Transportation. VIA Streetcar services the downtown area and major sightseeing attractions. Service is available from 7:00 a.m. to 9:00 p.m. on Saturday and 7:00 a.m. to either 8:00 p.m. or 9:00 p.m. Sunday through Friday, depending on the route. Stops are made every 10 to 20 minutes. Route maps will be available in your registration packet. Cost is 10 cents per ride.

Car Rental. For those desiring the convenience of a rental car, special low rates are offered by National, which is the official GSA car rental agency. Sample daily/weekly rates: Economy $29/$144; compact $32/$159; mid-size $34/$169; full-size (two-door) $36/$179; (four-door) $37/$184. Mileage is unlimited, but vehicles must be returned to the same rental location to avoid drop charges. Advance reservations are recommended. Call National at (800) 328-7949. In San Antonio call: (512) 824-8141.

HOUSING

GSA has blocked rooms at twelve hotels that are offering special convention rates to GSA meeting attendees. GSA endorses these hotels for quality, cleanliness, and service.

TO MAKE YOUR HOTEL RESERVATION

Complete IN FULL the attached Official Housing Request Form and return it immediately. The Housing Bureau will accept reservations submitted on this form ONLY. Your request must be postmarked NO LATER THAN OCTOBER 10. AFTER OCTOBER 10, reservations must be made directly with the hotel. Because many hotels will be filled by this time, you can expect to make several phone calls.

NOTE: You MUST include the hotel code on the Housing Request Form. Codes are identified in parentheses on the hotel description page.

ASSIGNMENT

Hotel rooms will be assigned on a first-come, first-served basis as they are received by the Housing Bureau. Acknowledgment will be sent to you from the Housing Bureau once your form has been processed. Confirmation will be sent from the hotel to which you have been assigned. You should receive both within three weeks of your mailing date. Please check to be sure all information is correct.

ROOM DEPOSITS

Your room will be held until 6:00 p.m. on your date of arrival unless you send one night's room deposit. Due to the possibility of unforeseen delays in your arrival time, we strongly recommend that you send in a deposit regardless of your current schedule.

To make a deposit on your room, either (1) send a check or credit card number with your housing form payable to GSA Housing Bureau (and it will be forwarded to the appropriate hotel) OR (2) wait until you have received your hotel confirmation and mail a check directly to the hotel or call the hotel with your credit card number.

CHARGES AND CANCELLATIONS

If you must CHANGE your hotel reservation, simply write or call the hotel directly and indicate the change desired.

If you must CANCEL your reservation BEFORE OCTOBER 10, write to the Housing Bureau immediately so that other reservations can be accommodated. AFTER OCTOBER 10, please cancel directly with the hotel. Your notice of cancellation must be received within 48 hours of your scheduled arrival or your deposit will not be refunded.

NOTE: All rooms will be taxed 10%. Remember...DON'T BE A NO-SHOW!
HYATT REGENCY — HEADQUARTERS (H Y R)  
123 Losoya Street, San Antonio, TX 78205  
512-222-1234  (526 rooms)  
Single: $83  Double: $93  
Suite range: $200-$520  
Located on Riverwalk; 3 restaurants; lounge with concert pianist;  
lobby with jazz; lounge with DJ; rooftop swimming pool, spa,  
health facilities overlooking the Alamo; gift shop with newstand; concierge;  
in-room movies; inside paid parking  
Check-in: 3:00 p.m.  Check-out: 12:00 noon  CC: AX, V, MC, CB, D

CROCKETT (C R O)  
320 Bonham, San Antonio, TX 78205  
512-225-6500  (100 rooms)  
Single/Double/Double-Double: $69  
Suite range: $150-$350  
3 restaurants; swimming pool; rooftop spa;  
avcross street from Alamo; minutes from Convention Center  
Check-in: 3:00 p.m.  Check-out: 12:00 noon  CC: AX, V, MC, CB, D

EL TROPICANO (E L T)  
110 Lexington, San Antonio, TX 78205  
512-223-9461  (100 rooms)  
Single/Double: $49  Double/Double/Triple: $59  
Suite range: $125-$404  
2 restaurants; Olympic-size pool; lounge with entertainment  
Check-in: 6:00 p.m.  Check-out: 12:00 noon  CC: AX, V, MC, CB, D

EMILY MORGAN (E M M)  
705 East Houston Street, San Antonio, TX 78205  
512-225-8846  (125 rooms)  
Complimentary full breakfast in bed and evening wine social;  
mott rooms with Jacuzzis, refrigerators, remote-control TV;  
exercise room & sauna, whirlpool; outdoor pool; 1 restaurant  
Check-in: 2:00 p.m.  Check-out: 12:00 noon  CC: AX, V, MC, D

HILTON PALACIO DEL RIO (H P R)  
200 South Alamo, San Antonio, TX 78205  
512-222-1400  (350 rooms)  
Single: $85  Double: $94  
Suite range: $275-$540  
Located on Riverwalk; lounges with entertainment: sing-a-long pub, piano bar;  
2 restaurants; swimming pool, hot tub; inside parking;  
concierge; bathroom phones  
Check-in: 3:00 p.m.  Check-out: 11:00 a.m.  CC: AX, V, MC, D

HOLIDAY INN—DOWNTOWN (H I D)  
318 West Durango, San Antonio, TX 78204  
512-225-3211  (200 rooms)  
Single: $43  Double: $53  
Suite: $119  
Pool and patio; free in-room movies; one restaurant; one lounge  
Check-in: 2:00 p.m.  Check-out: 12:00 noon  CC: AX, V, MC, CB, D

LaQUINTA—CONVENTION CENTER (L Q C)  
1001 East Commerce Street, San Antonio, TX 78201  
512-222-9181  (100 rooms)  
Single: $35  Double: $42  Double/Double: $42  
(No suites available)  
Free parking free local calls, free HBO and Showtime; 1 restaurant;  
1 cocktail lounge; outdoor pool  
Check-in: 1:00 p.m.  Check-out: 1:00 p.m.  CC: AX, V, MC

LaQUINTA—MARKET SQUARE (L Q M)  
900 Doloroso Street, San Antonio, TX 78207  
512-271-0001  (100 rooms)  
Single: $35  Double: $40  Double/Double: $45  
(No suites available)  
24-hour restaurant nearby; near El Mercado Market Place; free Showtime;  
free coffee in lobby  
Check-in: 1:00 p.m.  Check-out: 1:00 p.m.  CC: AX, V, MC

MARRIOTT (S A M)  
711 East Riverwalk, San Antonio, TX 78205  
512-224-4555  (300 rooms)  
Single: $89  Double: $104  
Suite range: $260-$435  
1 restaurant; 2 cocktail lounges; in-house first-aid; airline ticket counter;  
information desk; newstand; sundry shop; bottle shop; children’s rec center;  
indoors & outdoor swimming pool, concierge, 50% rooms with balconies  
Check-in: 4:00 p.m.  Check-out: 12:00 noon  CC: AX, V, MC, CB, D

MENGER (M E N)  
204 Alamo Plaza, San Antonio, TX 78205  
512-223-4361  (200 rooms)  
Single: $44  Double: $54  
Suite range: $85-$144  
Free in-room movies; 2 restaurants; 2 cocktail lounges;  
choose antique-furnished or Texas-size rooms; outdoor swimming pool  
Check-in: 6:00 p.m.  Check-out: 1:00 p.m.  CC: AX, V, MC, CB, D

ST. ANTHONY INTERCONTINENTAL (S A I)  
300 East Travis, San Antonio, TX 78298  
512-227-4392  (100 rooms)  
Single/Double: $75  
Suite range: $175-$450  
Traditional accommodations with antiques; 3 restaurants;  
2 cocktail lounges with entertainment; health facilities;  
morning newspaper; in-house movies; paid parking  
Check-in: 3:00 p.m.  Check-out: 12:00 noon  CC: AX, V, MC, CB, D

TRAVELodge ON THE RIVER (T R R)  
100 Villita Street, San Antonio, TX 78205  
512-226-2271  (100 rooms)  
(Suggested for Student Housing)  
Single: $40  Double: $45  Double/Double: $51  
Suite: $135  
Free in-house movies; free coffee and pot in room; free local calls  
Check-in: 2:00 p.m.  Check-out: 12:00 noon  CC: AX, V, MC
OFFICIAL HOUSING REQUEST FORM
PLEASE READ CAREFULLY AND COPY FOR YOUR RECORDS

FOR HOUSING BUREAU USE ONLY

- PLEASE PRINT OR TYPE ALL ITEMS TO ASSURE ACCURACY.
- COMPLETE EACH PART BELOW IN DETAIL FOR CORRECT AND RAPID COMPUTER PROCESSING.
- SHOULD MORE THAN TWO (2) ROOMS BE NEEDED, SUPPLEMENTAL ROOM LIST MUST BE ATTACHED USING SAME FORMAT AS IN PART III.
- ALL ACKNOWLEDGEMENTS WILL BE SENT TO INDIVIDUAL INDICATED IN PART I. ACTUAL CONFIRMATION WILL FOLLOW FROM HOTEL.

PART I
INSTRUCTIONS: Complete requested data using abbreviations as necessary.
(NAME OF PERSON REQUESTING ROOMS)

(LAST NAME) (FIRST)
(NAME OF COMPANY OR FIRM)
(STREET ADDRESS OR P.O. BOX NUMBER)
(CITY) (STATE) (ZIP — USA)
(COUNTRY) (AREA CODE) (PHONE NUMBER)

PART II
INSTRUCTIONS: Select SIX Hotel/Motels of your choice. No request will be processed without SIX choices.

FIRST CHOICE [ ] [ ] [ ]
(FIRST) (HOTEL CODE)
(SECOND CHOICE) [ ] [ ] [ ]
(FIRST) (HOTEL CODE)
(THIRD CHOICE) [ ] [ ] [ ]
(FIRST) (HOTEL CODE)
(FOURTH CHOICE) [ ] [ ] [ ]
(FIRST) (HOTEL CODE)
(FIFTH CHOICE) [ ] [ ] [ ]
(FIRST) (HOTEL CODE)
(SIXTH CHOICE) [ ] [ ] [ ]
(FIRST) (HOTEL CODE)

PART III
INSTRUCTIONS: 1. PRINT OR TYPE NAMES OF ALL PERSONS OCCUPYING EACH ROOM.
2. SELECT TYPE ROOM DESIRED WITH ARRIVAL AND DEPARTURE DATES.
3. SUPPLEMENTAL LIST FOR ADDITIONAL ROOM MUST USE SAME FORMAT.
4. PRINT OR TYPE LAST NAME FIRST.

GUEST NAME/S (PRINT LAST NAME FIRST)

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<th>CHECK ONE</th>
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<th>DEP. DATE</th>
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<td>NOTE: Reservation will be held only until 6 p.m.</td>
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<td>3</td>
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<td>Double</td>
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<td>unless special arrangements are made directly with hotel. The hotel may request a deposit.</td>
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DEPOSIT
Remit in U.S. funds. Make checks payable to GSA Housing Bureau or charge:

☐ Amer Exp  ☐ MasterCard  ☐ Choice  ☐ VISA  ☐ Diners Club/Carte Blanche
Card Number ____________________________ Expires ______ / ______

NOTE: PLEASE RECHECK ALL ITEMS FOR CORRECT INFORMATION

GSA NEWS & INFORMATION, August 19__
CONVENIENCE INFORMATION

IMPORTANT MESSAGES
GSA information and message desks will be
ed at both the Convention Center and the
Regency, Friday, November 7, through
day, November 13. The desks will be
ded to answer your questions about the GSA
ings as well as the San Antonio area.
Please leave the exact name and phone
ber of your hotel with both your home and
phone numbers to use are:

\-tion Center:
GSA Information (512) 224-2541

\-tion Center:
GSA Message Desk (512) 224-0578

FOREIGN VISITORS
Assistance with housing and other
information is available to foreign visitors by
contacting: Alan P. Morris, Div. Earth and
Physical Sciences, University of Texas at San
Antonio, San Antonio, TX 78285. Phone (512)
691-4455.

CHILD CARE SERVICE
GSA does not make arrangements for
babysitting services. Please contact the
Housekeeping Department or the Front Desk
Manager in your hotel for information.

Parents who are willing to take part in
cooperative child care should send name,
address, and phone number to the Events
Coordinator, GSA headquarters, NO LATER
THAN OCTOBER 24, 1986. Optional: You
may send the name of the hotel and phone of
where you will stay in San Antonio, and the
names and ages of your children. A list of
information will be sent by October 30 to those
who have expressed interest in the program.
Parents can then contact others on the list to set
up an exchange of services.

STRy WITH PROGRAMS

Previously purchased, Abstracts with
vams for the 1986 Annual Meeting is
ble four ways:

\-ance Mailing: If you complete the order
below and mail it to be RECEIVED at
by September 1, 1986, copies sent to U. S.
g addresses should arrive on or before
ber 18, 1986, providing excessive delays in
tal system are not encountered. Price for
members is $15; for GSA members $12.

1. Reserved On-Site in San Antonio: If you
would like a copy reserved for pickup at the
Annual Meeting or for extra copies, purchase
from ABSTRACTS WITH PROGRAMS line
on the Preregistration Form. Pick up your copy
in the Registration Area, Convention Center.
Price: $18. (If you have already ordered a copy
on your 1986 GSA dues form, this will give you
a duplicate copy. Please check your records prior
to ordering.)

2. Open On-Site: Purchase on-site, Registration
Area, Convention Center, from a limited

3. GSA Membership Dues Form: You may
have already ordered a copy when you paid your
dues. If so, placing an order under option 1 or 2
will give you a duplicate copy.

USE THIS FORM FOR OPTION 1
ADVANCE MAILING ONLY.

Abstracts with Programs 1986 Annual Meeting
IL SEPARATELY TO: GSA Publication Sales, P.O. Box 9140, Boulder, CO 80301.

- advance copies of Abstracts with Programs 1986 at $15 per copy. ($12 for GSA member; write your membership number here ____________

Enclosed is check/money order in U.S. funds for $______ (make checks payable to GSA Publication Sales)

Charge to: □ American Express □ Diners/Carte Blanche □ Choice □ MasterCard □ VISA (check one)

Account # ___________________________________________ Exp. Date __________

Telephone (work) __________________________ (home) __________________________

Signature __________________________________________

\-ress __________________________________________
\-ress __________________________________________
\-ate __________________________________________ Zip/Country __________

FE: Order should be RECEIVED by September 1, 1986, to guarantee arrival (domestic mail only) by October 18, 1986.
lorado residents add sales tax.
REGISTRATION

PREREgISTRATION DEADLINE: MUST BE RECEIVED NO LATER THAN OCTOBER 10.

1. There is a 15% savings in registration fees if you register before October 10! Advance registration is suggested for many of the special activities because of participation limits. Use the preregistration form provided in this announcement.

2. Registration is required for all attendees, including field trip participants and guests. Badges will be required for all activities 10:00 a.m. Sunday through 5:00 p.m. Thursday. There will be a fee charged for all lost badges.

3. Registration discounts are given to GSA and Associated Society members. Associated Societies that qualify for this discount are indicated on the registration form. Please indicate your affiliation(s) and member number, and register using the member rates.

4. Full payment MUST accompany registration. Unpaid purchase orders are not accepted as valid registration. Credit cards are accepted as indicated on preregistration form. If using a credit card, please recheck the card number given—errors will delay your registration.

5. Register one professional or student per form. Copy the form for your records. One day registrants MUST indicate the day they plan to attend on the registration form.

6. Guest registration is required for guests attending guest activities, special events, and luncheons. The registration fee does not include admission to the technical sessions. Guest registrants MUST be accompanied by either a professional or student registrant.

7. CURRENT student ID is required to obtain student rates at both the on-site and preregistration counters.

REGISTRATION FEES

<table>
<thead>
<tr>
<th></th>
<th>Advance*</th>
<th>On-Site</th>
<th>One-Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional—Member</td>
<td>85.00</td>
<td>100.00</td>
<td>50.00</td>
</tr>
<tr>
<td>Professional—Nonmember</td>
<td>125.00</td>
<td>140.00</td>
<td>70.00</td>
</tr>
<tr>
<td>Student—Member</td>
<td>42.00</td>
<td>50.00</td>
<td>25.00</td>
</tr>
<tr>
<td>Student—Nonmember</td>
<td>62.00</td>
<td>70.00</td>
<td>35.00</td>
</tr>
<tr>
<td>Guest</td>
<td>30.00</td>
<td>45.00</td>
<td>N/A</td>
</tr>
</tbody>
</table>

*Registration fees received before October 10, 1986.

ON-SITE REGISTRATION SCHEDULE

Convention Center, Arcade Area

<table>
<thead>
<tr>
<th>Date</th>
<th>On-Site Hours</th>
<th>Advance Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunday, November 9</td>
<td>10:00 a.m. to 7:30 p.m.</td>
<td></td>
</tr>
<tr>
<td>Monday, November 10</td>
<td>7:30 a.m. to 5:00 p.m.</td>
<td></td>
</tr>
<tr>
<td>Tuesday, November 11</td>
<td>7:30 a.m. to 5:00 p.m.</td>
<td></td>
</tr>
<tr>
<td>Wednesday, November 12</td>
<td>7:30 a.m. to 2:00 p.m.</td>
<td></td>
</tr>
<tr>
<td>Thursday, November 13</td>
<td>7:30 a.m. to 2:00 p.m.</td>
<td></td>
</tr>
</tbody>
</table>

CANCELLATIONS AND REFUNDS

GSA will refund advance registration fees for cancellations received in writing by OCTOBER 17. NO REFUNDS WILL BE MADE ON CANCELLATION NOTICES RECEIVED AFTER THIS DATE. Refunds will be mailed from GSA after the meeting; a $10 processing fee will be charged. Refunds for fees paid by credit card will be credited according to the card number on the preregistration form. NO refunds for on-site registration and ticket sales.

NEW MEMBERSHIP DISCOUNTS

A $40 member discount on registration applies to any professional member of GSA or an Associated Society. The Associated Societies that qualify are listed on the registration form. Professional registrants who paid the nonmember registration fee and apply for GSA membership by March 31, 1987, will be entitled to a $40 reduction in the 1987 membership fee. Students will receive a $15 discount from the 1987 Student Associate membership fee. Only one discount will apply per person. In order to receive the reduction, a copy of the meeting registration form MUST be attached to the membership application. Membership applications are available from GSA headquarters. During the meeting, you can purchase applications at the GSA Bookstore (Exhibitor Hall, Booth #328), GSA Employment Services, or Membership Desk, Registration area, Convention Center.

ASSOCIATED SOCIETIES MEETING WITH GSA

Cushman Foundation
Geochemical Society
Geoscience Information Society
Mineralogical Society of America
National Association of Geology Teachers
Paleontological Society
Society of Economic Geologists

GSA NEWS & INFORMATION, August
### PREREGISTRATION FORM

**1986 GSA ANNUAL MEETING • NOV. 10–13 • SAN ANTONIO**

**PREREGISTRATION** must be RECEIVED by October 10. FULL payment and form MUST accompany all preregistration requests. Unpaid purchase orders NOT accepted as valid registration. One form per registrant. Participants in all events, short courses excluded, must pay a preregistration fee. CANCELLATION deadline: October 17. No refunds on cancellations received after this date. Confirmation card will be your receipt.

**Type or print ** **Copy for your records**

<table>
<thead>
<tr>
<th>Name (Last)</th>
<th>(First)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Institution/Employer</td>
<td>Nickname for badge</td>
</tr>
<tr>
<td>Mailing Address</td>
<td></td>
</tr>
<tr>
<td>City</td>
<td>State</td>
</tr>
<tr>
<td>Country</td>
<td>Business phone</td>
</tr>
<tr>
<td>Guest/Spouse Name (Last)</td>
<td>(First)</td>
</tr>
<tr>
<td>City</td>
<td>State/Country</td>
</tr>
</tbody>
</table>

**Member Affiliations:**

1. (1) GSA  (2) CF  (3) GS  (4) GIS  (5) MSA  (6) NAGT  (7) PS  (8) SEG  Member #

(registration required for participation in all events)

<table>
<thead>
<tr>
<th>Professional Member (member affiliation checked above)</th>
<th>Price</th>
<th>Qty</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. (1) GSA</td>
<td>$125</td>
<td>1</td>
<td>$125</td>
</tr>
<tr>
<td>2. Professional Nonmember</td>
<td>$125</td>
<td>1</td>
<td>$125</td>
</tr>
<tr>
<td>3. Professional One-Day (circle day S M T W T)</td>
<td>$70</td>
<td>1</td>
<td>$70</td>
</tr>
<tr>
<td>4. Professional Nonmember One-Day (circle day S M T W T)</td>
<td>$70</td>
<td>1</td>
<td>$70</td>
</tr>
<tr>
<td>5. Student Member (member affiliation checked above)</td>
<td>$70</td>
<td>1</td>
<td>$70</td>
</tr>
<tr>
<td>6. Student One-Day (circle day S M T W T)</td>
<td>$25</td>
<td>1</td>
<td>$25</td>
</tr>
<tr>
<td>7. Student Nonmember</td>
<td>$25</td>
<td>1</td>
<td>$25</td>
</tr>
<tr>
<td>8. Student Nonmember One-Day (circle day S M T W T)</td>
<td>$35</td>
<td>1</td>
<td>$35</td>
</tr>
<tr>
<td>9. Guest (fill in name above for badge)</td>
<td>$30</td>
<td>1</td>
<td>$30</td>
</tr>
</tbody>
</table>

**PREREGISTRATION FEES**

What to Buy & Where

Historic San Antonio & Lhuceon

San Antonio Culture

Natural Bridge Caverns & Lhuceon

Burros & Burritos

Invitational Tennis

10K Run (circle T-shirt size: S M L)

5K Run (circle T-shirt size: S M L)

### TICKETED MEAL FUNCTION

**Price**

| Engineering Geology | Nov 11 (10) | $15 |
| Geoscience Information Society | Nov 11 (19) | $15 |
| History of Geology Division | Nov 11 (20) | $15 |
| Hydrogeology Division | Nov 11 (21) | $15 |
| Mineralogical Society | Nov 11 (22) | $15 |
| National Association of Geology Teachers | Nov 11 (23) | $15 |
| Paleontological Society | Nov 11 (24) | $15 |
| Sedimentary Geology Breakfast | Nov 11 (25) | $15 |
| Women Geoscientists Breakfast | Nov 11 (26) | $15 |
| Coal Geology Division | Nov 12 (27) | $15 |
| Geochemical Society | Nov 12 (28) | $15 |
| Quaternary Geology & Geomorphological Society | Nov 12 (29) | $15 |
| Society of Economic Geologists | Nov 12 (30) | $15 |

**Premeeting**

1. Geomorphology of Texas Panhandle | Nov 7–9 (31) $235 |
2. Geology of the #1 without airfare | Nov 7–9 (32) $155 |
3. Archaeological Geology, S High Plains | Nov 7–9 (33) $235 |
4. Archaeological Geology #2 without airfare | Nov 7–9 (34) $155 |
5. Igneous Geology, Trans-Pecos Texas | Nov 6–9 (35) $250 |
6. Ouachita Mountain Geology | Nov 6–9 (36) $315 |
7. Ouachita Mountain #4 without airfare | Nov 6–9 (37) $236 |
8. Engineering Geology of San Antonio | Nov 9–10 (38) $45 |
10. Cambrian Wichita Mountains Igneous | Nov 7–9 (40) $325 |
11. Centennial Wichita Geology | Nov 7–9 (41) $235 |
12. Edwards Aquifer Hydrology, San Antonio | Nov 8–9 (42) $55 |
13. Late Pennsylvanian Paleoenvironments | Nov 8–9 (43) $140 |
14. Gulf Coast Lignites | Nov 8–9 (44) $265 |
15. Geology & Mineral Resources—Salt Domes | Nov 8–9 (45) $70 |
16. Southern Oklahoma Sedimentation | Nov 7–9 (46) $325 |
17. Southern Oklahoma #12 without airfare | Nov 7–9 (47) $235 |
18. Postmeeting | Nov 7–9 (48) $150 |
19. Edisto Beach Geological Society | Nov 14–15 (49) $150 |
20. South Texas Motel Depositional System | Nov 14–16 (50) $100 |
22. Stratigraphy #16 without airfare | Nov 13–15 (52) $125 |
23. Texas Crataceous Volcanic Centers | Nov 13–15 (53) $95 |
24. West Texas Cretaceous Volcanic Centers | Nov 13–15 (54) $150 |

**FIELD TRIPS**

**COMPUTER GRAPHICS**

Computer Graphics | Nov 8–9 (55) $270 |

**Glacial-Marine Sedimentation**

Glacial-Marine Sedimentation | Nov 8–9 (56) $100 |

**Contaminant Hydrogeology**

Contaminant Hydrogeology | Nov 8–9 (57) $100 |

**Seawater-Chronostratigraphy**

Seawater-Chronostratigraphy | Nov 8–9 (58) $50 |

**Geologic Use of Microcomputers**

Geologic Use of Microcomputers | Nov 9–10 (59) $50 |

**Fossil Radiolaria**

Fossil Radiolaria | Nov 9–10 (60) $50 |

**ABSTRACTS WITH PROGRAMS—Reserved (on-site pickup)**

(62) $18

**TOTAL COLUMN B**

**TOTAL COLUMN A**

**FOR OFFICE USE ONLY**

Deposit Date

Balance Due $ A/R

Refund $ A/P

Refund Check #

Refund Date

MAIL TO: 1986 GSA ANNUAL MEETING, P.O. BOX 9140, BOULDER, CO 80301.