September, 1989

BULLETIN

HOUSTON GEOLOGICAL SOCIETY

Volume 32

Number 1

HGS SEPTEMBER CALENDAR

SEPTEMBER 11, 1989 (HGS Dinner Meeting)

"Emplacement and Evolution of Salt Sills in Northern Gulf of Mexico"
Thomas H. Nelson, Salt Tectonics International, Inc. and Lee H. Fairchild, Exxon Production Research Company
Westin Oaks Hotel, 5011 Westheimer
Social Period 5:30 p.m., Dinner and Meeting 6:30 p.m.
Reservations made by name only, telephone **785-6402.** Must be made or **cancelled** by **noon Friday, September 8.**

SEPTEMBER 20, 1989 (Dinner Meeting)

HGS INTERNATIONAL EXPLORATIONISTS
"Hydrocarbon Traps Along Magdalena Valley, Colombia"
Steve Schamel, University of South Carolina
Westin Oaks Hotel, 5011 Westheimer
Social Period 5:30 p.m., Dinner and Meeting 6:30 p.m.
Reservations by advance ticket purchase only (see page 10).
Purchase tickets by **Tuesday, September 15, 1989.**

SEPTEMBER 21, 1989 HGS Short Course
"Migration and Entrapment of Hydrocarbons"
Marlan Downey
Exxon Auditorium, Exxon Building, 800 Bell, 7:30 a.m.

SEPTEMBER 26, 1989 (Dinner Meeting)
HGS ENVIRONMENTAL
"Waste Remediation at Super Fund Site"
Robert Foye, Chemical Waste Management
Wyatt's Cafeteria - Sharpstown
Social Period 5:30 p.m., Dinner and Meeting 6:30 p.m.

SEPTEMBER 27, 1989 (HGS Luncheon Meeting)
"Ulrich (Yegua) Field, Harris County, Texas"
Ann Ayers Martin, Northwind Exploration and William K. Peebles, Independent Geologist
Houston Club, 811 Rusk
Social Period 11:30 a.m., Lunch and Meeting 12:00 Noon
Reservations made by name only, telephone **785-6402.** Must be **made** or **cancelled** by **noon Friday, September 22.**

SEPTEMBER 30, 1989 HGS Field Trip
"3-D Seismic Acquisition"
Holiday Inn - Crowne Plaza, 9:00 a.m.

HOUSTON GEOLOGICAL SOCIETY
7171 Harwin, Suite 314 Houston, Texas 77036
(713) 785-6402

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The Houston Geological Society *Bulletin* is published monthly September through June by the Houston Geological Society, 7171 Harwin, Suite 314, Houston, Texas 77036. Subscription to the *Bulletin* is included in membership dues ($15.00 annually). Subscription price for non-members within the contiguous U.S. is $15.00 per year and $30.00 per year for those outside the contiguous U.S. Single copy price is $2.50. Subscriptions received after March 1 will be applied to the remainder of the fiscal year (ending with the June issue) and also to the following year.

The Houston Geological Society was founded in 1923 and incorporated in 1975. The Society's objectives are to stimulate interest and promote the advancement of geology in this area, to disseminate and facilitate discussion of geological information, and to enhance professional interrelationships among geologists. The Society includes nearly 4,500 members locally and publishes special scientific publications in addition to a monthly *Bulletin*. The HGS also provides student scholarships and continuing education programs for professional geologists.

HOUSTON GEOLOGICAL SOCIETY

BULLETIN

Vol. 32, No. 1 September, 1989

CONTENTS

OUR COVER PHOTO

Looking northwest at Gore fault (in saddle) approximately four miles northeast of Vail, Colorado. View across Booth Creek shows almost flat lying limestone members of the Middle Pennsylvanian Minturn Formation becoming sharply upturned (drag) as the fault zone is approached. This steeply dipping reverse fault separates Pennsylvanian and older Paleozoic strata of the Eagle Basin on the left from mostly Precambrian granitic rocks of the Gore Range on the right. Photo by Kirby Cockerham, Jr., Consulting Geologist, Englewood, Colorado.

PRICE SCHEDULE— SEPTEMBER MEETINGS

(Non-members: add $2.00 to the meal price)

Westin Oaks Hotel, September 11
Dinner $18.00

INTERNATIONAL EXPLORATIONISTS
Westin Oaks Hotel, September 20
Dinner $20.00

Houston Club, September 27
Lunch $15.00

RESERVATIONS POLICY

Reservations are made by calling the HGS office (785-6402). At the meeting, names are checked against the reservation list. Those with reservations will be sold tickets immediately. **Those without reservations will be asked to wait for available seats, and a $2 surcharge will be added to the price of the ticket. All who do not honor their reservations will be billed for the price of the meal.** If a reservation cannot be kept, please cancel or send someone in your place.

The Houston Geological Society office is located at **7171 Harwin, Suite 314, Houston, Texas 77036.** The telephone number is **(713) 785-6402.**

PRESIDENT'S COMMENTS

Welcome back, everybody!

I hope all of you had a fine summer's respite and are looking forward to your first *Bulletin*. We are anxious to see you again and have many exciting and intellectually stimulating events planned for your year. It's always wise to keep your calendar handy when you read the *Bulletin*.

We are off to a great start because of the legacy of my 66 predecessors and Deet Schumacher in particular. Deet left the Society financially sound and well organized. In addition, the membership is growing (only 4 other years had larger membership) and participation by the members is substantially on the increase. As you can see, the Society is in great shape and can do anything it wants or needs to do. Thanks, Deet.

So, with all this muscle, what's in store? My personal goal is to increase the participation of the membership in all aspects of our professional activities. Many of you have ideas for some great projects and feel the HGS ought to support them. In most cases we can and will...all it takes is some leadership from you. *We are actively seeking to expand activities in all areas.* Keep in mind that new initiatives have made this Society exceptional, so you might ask...isn't it time for you to become involved? Wouldn't you take pride in being responsible for contributing to the profession?

The stated purpose of the HGS is to further the understanding of geology, but in addition, we have the responsibility to offer related programs which further both technical and business progress. To do so requires recognizing major trends within the profession. They are hard to define, but it's clear that many things have changed: the technology, the way we do business and with whom we do business. Within the HGS, most of our members *want the majority of the programs, but not all, to have application to their jobs.*

With this in mind, your representatives (i.e. the Board, committee chairmen, members, and the all-important volunteers) have been busy planning, worrying, and finding ways to meet the needs of this Society. You'll be proud of all they have to offer and the following will give you a glimpse of this year's mental snack.

The **technical program** (both oral and written) is, of course, the centerpiece of any scientific/professional organization. The domestic, international and environmental groups have the simple goal of providing the best talks in the world. **Cy Strong and Pinar Yilmaz** have put in many a night painstakingly finding programs which will make you feel technically disadvantaged if you don't go. The topics will be broad, timely and practical... something for everybody at sometime during the year. Everyone cannot attend all of the meetings all of the time but we do hope that if you can't make it, you are at least chagrined.

To provide even more opportunities for technical growth coupled with an opportunity to develop business contacts, **Pat Gordon** is organizing **poster programs for each of the dinner meetings.** I think you'll particularly like the "salt theme" to start off the year.

My job is to tighten up the meetings...especially the luncheons. To that end, the luncheons will start at 12:00, the talks at 12:30, and we adjourn no later than 1:10. (Come on out and see if I make it.)

All of us are acutely sensitive to prices, but please remember that *any member can come in after the meal and hear the talk at no charge.*

See you at the meetings...and, by the way, bring a friend.

So long....

Dick Bishop

DICK BISHOP

MEETINGS

HGS DINNER MEETING—SEPTEMBER 11, 1989

THOMAS H. NELSON—Biographical Sketch

Thomas H. Nelson is president of Salt Tectonics International, Inc., a consulting firm which specializes in workshops, evaluations and interpretations of salt structures for the petroleum industry.

Tom received his Bachelors Degree in geology in 1953 from Brown University. He initially worked for Shell in the Gulf of Mexico. In 1956 he began a career with various Exxon affiliates which spanned more than 31 years. His assignments included both exploration and research and were mainly related to salt tectonics in many of the free world's major evaporite basins. In the late sixties and early seventies, Tom was instrumental in developing many applications of plate tectonics to exploration for Exxon and was an AAPG distinguished lecturer on this subject in 1972. During the final years of his career, Tom returned to exploration in the Gulf of Mexico where he worked primarily with salt tectonics of the outer shelf and continental slope. Upon retirement from Exxon in 1987, Tom formed his consulting firm and is continuing his work in the field of salt tectonics.

He is a member of AAPG, HGS, SEG, GSA and AGU and served on the editorial board of Tectonophysics from 1979 to 1989.

LEE FAIRCHILD—Biographical Sketch

Lee Fairchild earned his B.A. in Geology from the University of California, Berkeley and his M.S. and Ph.D. from the University of Washington. His thesis research was on the structure and petrology of the Leech River Group on southern Vancouver Island, and his dissertation examined mudflows generated during the May 18, 1980 eruption of Mt. St. Helens. Since joining the Structural Analysis section at Exxon Production Research in 1984, he has focused on salt tectonics.

EMPLACEMENT AND EVOLUTION OF SALT SILLS IN THE NORTHERN GULF OF MEXICO

Laterally extensive, sub-horizontal salt sheets are now widely recognized beneath the continental slope of the northern Gulf of Mexico. Because they overlie significant sections of Tertiary clastics which elsewhere in the region produce oil and gas, these sheets are of great interest to the petroleum industry.

Study of a number of salt bodies in the eastern part of the Louisiana slope has led to the conclusion that they are sills. The sills formed as salt from the tops of near-surface diapirs intruded through the shallow, low density slope sediments at depths of less than 1000 feet below the sea-floor. Evidence supporting this conclusion is shown in figure 1. In this figure, a series of reflection terminations is evident to the left of the edge of the salt sill (lower arrow). The

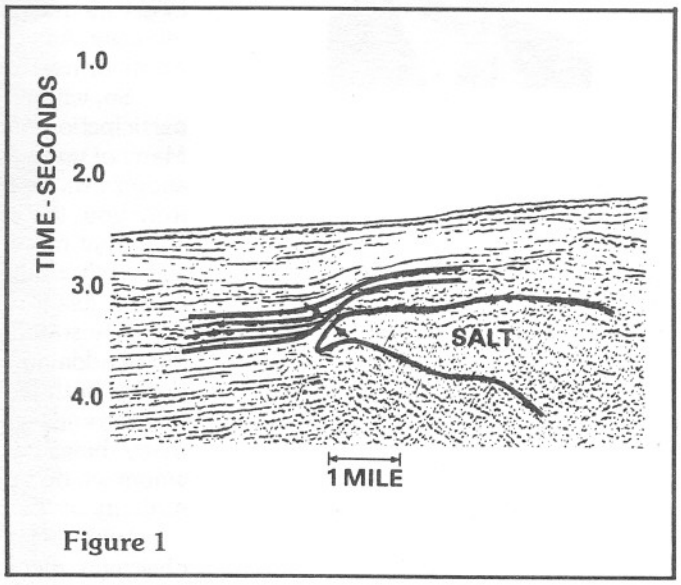

Figure 1

reflection terminations represent depositional onlap onto what was once a bathymetric high. Intrusion of the sill uplifted the overlying sediments and created the bathymetric high. An estimate of the depth below the sea-floor at which intrusion occurred can be obtained by tracing the onlap surface (upper arrow) onto the top of the sill and measuring the thickness of sediments between the onlap surface and the top of the salt. Similar measurements made at 53 different sill edges showed that, in all cases, intrusion occurred at burial depths of less than 1000 feet with a mean emplacement depth of 390 feet below mud-line.

Structural and depositional patterns within the sediments above and around the sills, combined with limited well control, indicate that the sills preferentially intrude into nearly pure muds and spread initially as thin sheets which reach their maximum extent rapidly.

A proposed sequence for sill formation is shown in figure 2. This sequence begins when the density directly over the source salt exceeds the salt density and a diapir begins to form. Assuming the average slope sediment densities, this should occur at about 4900 feet below mud-line. Given an adequate supply of salt, the diapir reaches the surface only when the average density of the sediments above the source salt equals or exceeds the density of the salt. On average this requires about 12,000 feet of sediment overburden.

At this point, observation suggests that a sill will be initiated only if the near-surface sediments around the diapir are nearly pure mud. Sediment strength most likely

plays a significant role in controlling sill initiation. Once started, the sill spreads rapidly to its maximum extent, probably as a thin sheet on the order of a few hundred feet thick.

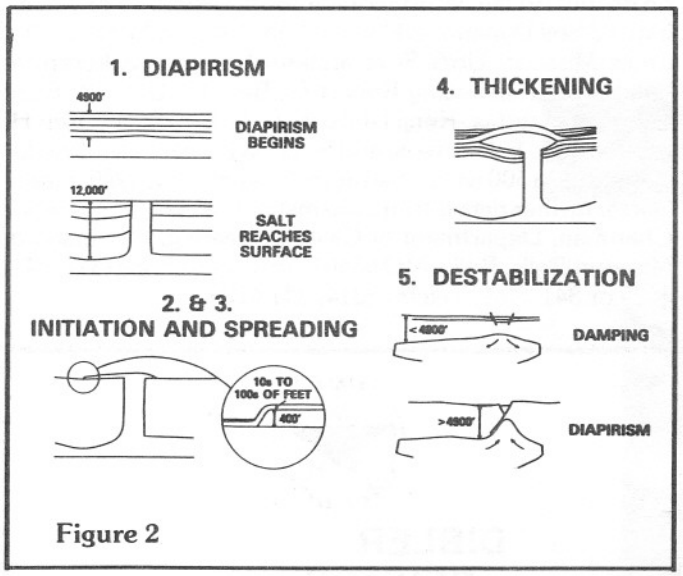

Figure 2

Further salt addition increases the thickness of the sill, but rarely appears to change the extent of the sill. Thickening continues until either the source of deep salt is depleted or a new density inversion is established above the sill.

In either case, when silling stops, remobilization begins. If the salt source is depleted and no density inversion has been established, irregularities on the top of the sill tend to dampen out or become inverted. If a density inversion has been established, irregularities on the sill become focal points for the growth of new diapirs and the cycle begins again.

HGS LUNCHEON MEETING—SEPTEMBER 27, 1989

ANN AYERS MARTIN—Biographical Sketch

Ann Ayers Martin received a BS degree with Honors in Geological Science from the University of Texas at Austin in 1974. She began her professional career with Houston Oil and Minerals where she worked in both development and exploration assignments, principally in the Frio and Miocene formations of the upper Texas Gulf coast. She left Houston Oil and Minerals in 1981 to become one of the founding members of Northwind Exploration, a contract oil and gas exploration partnership. While at Northwind, she worked extensively in the Yegua trend, leading to the discovery and development of Ulrich Field in Harris County.

Mrs. Martin is a member of the Houston Geological Society, the AAPG, and AWG. She is currently working with the HGS Continuing Education Committee, organizing the upcoming "Downdip Yegua" School.

WILLIAM K. PEEBLES—Biographical Sketch

Bill Peebles is a graduate of Rice University and has seventeen years of experience as a reservoir and development geologist for Sun Oil, Transco, Florida Gas and Houston Natural Gas and is now an independent geologist working the downdip Yegua and Wilcox. He is a member of HGS, AAPG, SPE, SPWLA and is a Certified Petroleum Geologist. Publications include HGS's "Directory of Oil Company Name Changes."

ULRICH (YEGUA) FIELD, HARRIS COUNTY

The Ulrich (Yegua) Field complex in Harris and Chambers Counties, Texas produces gas and condensate from Eocene sediments of the Yegua Formation in a geologic trend commonly known as the "Downdip Yegua" trend.

The field produced from two discrete sand untis, termed "channel" and "sheet" sands, in a deltaic depositional sequence. Distinctive local paleontological markers persist throughout the complex and are related to inner and middle neritic ecological zones.

The integration of several technical disciplines was necessary to first discover, and then develop, the field. Salt modeling of gravity data was particularly useful in interpreting the seismic data.

The Ulrich (Yegua) Field is notable in several aspects. The Yegua 1-D reservoir has produced at a rate in excess of 42 MMCFD from a single well. The Yegua 2A zone is commercially productive from a well with electric log resistivity of 0.8 ohm-meter. Other unique features of this field include trapping faults of unusually low angles and growth faults with highly variable throws.

PRE-TALK POSTER SESSIONS!

We are trying to broaden the special and increase the impact of our technical meetings. To start, we are trying to include poster sessions **before** the regular dinner meetings. These sessions will primarily be from local explorationists (yes, that means **you**) who want to show some geology.

These sessions offer an opportunity not only to exchange ideas but also to find out who else is working your "area". Who knows, buyers and sellers may meet!

Our intent is to have a theme for each meeting, although this may not always be possible. The plan is to kick the idea off with a session on "Gulf Coast Salt Tectonics" at the September 11 evening meeting.

Right now, we need your input both for topic ideas and for volunteers to put up a few posters of their favorite

theories and/or interpretations. How about a Frio nite! Wilcox! Yegua! We do not need reproduction - quality posters for these events; just your ideas on paper to stir up some conversation and maybe controversy!

Please send your ideas to Pat Gordon, 654-5919.

LATE CAMBRIAN-ORDOVICIAN GEOLOGY OF THE SOUTHERN MIDCONTINENT

A Symposium/Workshop
October 18-19, 1989 - Norman, Oklahoma

The Oklahoma Geological Survey is sponsoring a symposium/workshop dealing with all aspects of Late Cambrian-Ordovician geology of the Southern Midcontinent. Topics to be covered include sedimentology, diagenesis, petroleum occurrence and exploration, other mineral resources, and geologic history. The area of interest includes all of Oklahoma, north Texas, Texas Panhandle, northeast New Mexico, southeast Colorado, southern Kansas, southwest Missouri, and western Arkansas. The proceedings will be published by the OGS about eight months after the meeting. Contact: Lloyd Gatewood, Oklahoma City.

AAPG SYMPOSIUM HISTORY OF THE PETROLEUM INDUSTRY

The History of the Petroleum Industry Symposium to be held in the Titusville-Oil City area of western Pennsylvania on September 17-20, 1989 will be a fascinating experience for those interested in the roots of our industry. For those people who are interested in attending the meeting, registration information can be obtained by writing to the following address: AAPG History of Petroleum Symposium, P.O. Box 979, Tulsa, OK 74101-0979.

AMERICAN ASSOCIATION OF STRATIGRAPHIC PALYNOLOGISTS

A Symposium on Geological Applications of Palynology will be held on October 18, with the AASP annual meeting in Tulsa. The meeting will seek to show how geological problems can be solved by use of the—often unique—capabilities of palynology. The papers in the Symposium will showcase application of palynological techniques to solve real geological problems. Two days of technical sessions will follow the symposium. For further information, contact Merrell A. Miller, Amoco Production Company, P.O. Box 3385, Tulsa, OK (phone 918/660-3468).

Second International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics

Papers are invited for the Second International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, March 11-15, 1991, to be held in St. Louis, Missouri, USA. Several state of the art speakers have been invited, including Robert G. Bea, W. D. Liam Finn, George Gazettas, Kenji Ishihara, R. S. Steedman, Ken H. Stokoe II, A. S. Veletsos, and R. W. Whitman. Deadline for submitting a 500 word abstract is November 1, 1989. Please ask for further details from: Shamsher Prakash, Conference Chairman, Department of Civil Engineering, University of Missouri-Rolla, Rolla, MO 65401 USA. Telephone (314) 341-4489 or 341-4461, Telefax (314) 341-4729.

INTERNATIONAL EXPLORATIONISTS

Chairman's Column

This fall we begin the 8th year of the International Explorationists Group. Welcome back! During the summer, we took a close look at last years operations. I'm pleased to report that membership now exceeds four hundred and the group is financially healthy. We hope 1989-90 will be another successful year of well-attended meetings and eloquent international speakers. Also, this summer, a few new ideas bloomed regarding ways to expand the coverage of international exploration topics. We'll be trying out a few of these ideas this year right here in the *Bulletin*.

First of all, please note the NEW LOCATION OF THE DINNER MEETINGS! Beginning this month, and for the remainder of the year, the International Explorationists Group dinner meetings will be held at the Westin Oaks Hotel, 5011 Westheimer (not to be confused with the Westin Galleria Hotel on Alabama where we met last year). This new location, still in the Galleria, was arranged to provide a quality dinner and program at a reasonable price while satisfying the need for more floor space during the social hour. Although we will be changing locations, the ticket price to the dinner metings will still be $20.00. Meetings will continue to be held on the third Wednesday of the month; and, as in previous years, "no-shows" will be billed. For your convenience and ours, please purchase your ticket as soon as possible before the Monday preceeding each meeting. This will ensure you a reservation and promotes better service from the hotel.

Also this year, you'll be seeing more space in the *Bulletin* devoted to International Exploration; two new columns are planned. The first, entitled INTERNATIONAL NOTEBOOK, will be a readers forum, edited by Geologic Consultant, Hugh Hay-Roe. Invited are personal essays on career and/or travel experiences involving international exploration. This column is intended to be non-technical in nature with emphasis on foreign geologic experiences of International Explorationists. Personal stories of foreign travel in the oil industry can be most entertaining and informative, yet, very few of these experiences are ever recorded, much less published. The INTERNATIONAL NOTEBOOK column will offer our travelled explorationists an opportunity to change that. The second column, new for this year, and starting in October, will be an INTERNATIONAL SECTION of the EXPLORATION ACTIVITY REVIEW. The purpose of this column is to report on wildcat wells and significant hydrocarbon discoveries made internationally. It will be compiled jointly by Bill Eisenhardt, Consultant and Geologic Representative for Geomap Company, and Ricardo Sotto, Manager of Geologic and Database Sales for Petroconsultants.

This month George Tappan, in charge of audio-visual and hotel arrangements for our meetings, transfers his duties to John Sauri. We thank George for all the time he has given this group in the past three years, and we welcome John who comes to the International Committee after several years as HGS *Bulletin* Editor. The technical program for the coming year is once again being arranged by Pinar Yilmaz. A good mix of geographic areas of the world in different phases of exploration is planned. Membership and ticket sales will continue to be handled by Kumar Bhattacharjee and Chris Nicholson, respectively. We hope that our efforts will make for a successful 8th year!

DENISE M. STONE

INTERNATIONAL EXPLORATIONISTS DINNER MEETING—SEPTEMBER 20, 1989

STEVEN SCHAMEL—Biographical Sketch

Dr. Steve Schamel is currently Associate Director and Research Professor of geology at the Earth Sciences and Resources Institute (ESRI) at the University of South Carolina in Columbia, South Carolina. He holds a B.A. in geology from Franklin and Marshall College and a M.A. and Ph.D. in geology from Yale University.

Before joining ESRI as a full-time staff member in 1980, Dr. Schamel served as Scientific Director of the ESRI Tunisian Geologic Project. He has held teaching posts at Lafayette College, Florida State University and Yale University. In addition, he has worked for the USGS and has been a Visiting Research Associate at the Lamont-Doherty Geological Observatory. He presently is serving on the Editorial Board of **Geology**. He has consulted for the Nuclear Regulatory Commission, the Florida Department of Environmental Regulation, the Baker Chemical Company and other organizations.

During graduate work at Yale, Dr. Schamel did research on the early structural development of the Northern Apennines under the direction of John Rodgers. He was a Fulbright Scholar at universities in the Federal Republic of Germany and the College de France in Paris. He speaks German, Italian, French and Spanish.

Ongoing research interests include: international hydrocarbon exploration, the interaction of structure and sedimentation in extensional basins, the development of North Africa-Southern Europe-Tethys, tectonics of the Northern Andes, and microcomputer applications in geology.

HYDROCARBON HABITATS OF THE UPPER AND MIDDLE MAGDALENA VALLEYS OF COLOMBIA

The Magdalena River flows northward across the Colombian Andes, traversing a series of en echelon, sediment-filled structural depressions called the Magdalena basins. These basins resist easy classification in that until the late Miocene they have been parts of much more extensive basins: an extensional, backarc basin during the Triassic-Jurassic; a pericratonic trough during the Cretaceous and early Tertiary; the inner margin of a broad, east-facing foreland trough during the mid-Tertiary; and more

recently an array of intermontaine or "successor" basins. The geologic character of the Magdalena basins is tied intimately to that of the bordering Central and Eastern Cordilleras. Since 1918, there has been nearly continuous exploration activity in the Magdalena basins resulting in the discovery of more than 2.6 billion barrels of oil and 2.7 trillion cubic feet of gas, more than half of the total oil and about a third of the total gas reserves of the country. As of the end of 1988, the daily production from the basins averaged 142,484 barrels of oil and 165.9 mcf of gas.

The abundant hydrocarbon resources of the Magdalena basins are based on the presence of a thick, organic-rich limestone and shale succession (La Luna or Villeta) deposited in an extensive pericratonic trough along the northwest margin of the Guyana Shield during the Cretaceous. In the south, nearer the paleogeographic margin of the trough, shallow marine sands (Caballos and Monserrate) bounding the Cretaceous marine megacycle are the prime reservoirs. To the north, nearer the axis of the trough, Cretaceous sand reservoirs are absent and production is almost exclusively from mid-Tertiary molasse deposits. The Magdalena basins contain a wide variety of structural and stratigraphic traps, most developed during or prior to peak of maturation of the Cretaceous source beds. Recent discoveries of giant oil accumulations, such as the San Francisco field, were made in large, hanging-wall anticlines previously considered breached and unproductive. The testing of deeper reservoirs and new structural concepts during the 1980's has resulted in many important discoveries. From the standpoint of hydrocarbon exploration and exploitation, the Magdalena basins are not yet "mature". The potential for additional major discoveries is excellent and it is certain that with improved production techniques current estimates of remaining ultimately recoverable reserves in the producing fields will be revised upward.

INTERNATIONAL EXPLORATIONISTS GROUP COMMITTEE

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Technical Program:
Pinar Yilmaz, Exxon Prod. Res. Co. 966-6033
Ticket Reservations:
Chris Nicholson, Marathon Intl. 629-6600 x-3817
Membership:
Kumar Bhattacharjee,
Sita Oil Exploration House, Inc. 999-6957
Audio-visual/Meeting Arrangements:
John Sauri, Consultant 552-4196

CALL FOR EXOTIC ROCKS

What morsels of international geology are you keeping in your garage or office?? The International Explorationists Group is looking for donations of exotic rocks collected by its globetrotting members to use for speakers awards over the coming year. If you have a rock (or mineral) that would look presentable to mount on a 5x7 walnut base, consider submitting it. Rocks should have a short summary identifying them by country of origin, locality, formation name, and significance to exploration, if any. Please submit samples to Denise M. Stone at any International Explorationists dinner meeting.

INTERNATIONAL EXPLORATIONISTS MEETING INFORMATION

Westin Oaks Hotel, September 20
Dinner (5:30 p.m.) $20.00

Admission to all International meetings is by **advance ticket purchase only.** Tickets may be purchased from representatives in the International departments of most companies or by sending a **check for $20.00 and a stamped, self-addressed envelope to:**

Houston Geological Society
7171 Harwin, Suite 314
Houston, Texas 77036

Ticket distribution and receipts are handled by Chris Nicholson (629-6600, x3817). All inquiries should be directed between 8 a.m. and 4 p.m..

CONFERENCE REGISTRATION

GCSSEPM Foundation 10th Annual Research Conference
December 10-13, 1989

Name (Last) (First) Nickname for Badge

Company or University Department Company Address or University

City State Zip code Spouse's Name (if registering)

Please check items for which you are registering:

☐ Research Conference $195 ($250 after October 31, 1989)

☐ Spouse Registration $30 Total amount enclosed $ _____

Mail this form and payment to: GCSSEPM Foundation
1416 Creekford Drive
Arlington, Texas 76012

Checks must be drawn on U.S. banks in U.S. funds only. International money order payable in U.S. funds acceptable. Make checks or money orders payable to GCSSEPM Foundation.

Students wishing to qualify for one of the limited number of $50.00 student places should contact Samuel P. Miano at (504) 586-6758 for special student registration forms.

CUT ON THIS LINE TO SEPARATE FORMS

HOTEL RESERVATIONS

GCSSEPM Foundation 10th Annual Research Conference

MAIL THIS FORM DIRECTLY TO THE ADAM'S MARK HOTEL

Adam's Mark Hotel
2900 Briarpark Drive
Houston, Texas 77042
(713) 978-7400 or (800) 231-5858
ATTENTION: RESERVATIONS

Arrival Date:_____ Approximate Time: _____ Departure Date:_____ Number of Rooms:_____

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Business Phone:(____) _____ Additional Occupants Names:_____

Credit Card: _____ Card Number: _____ Exp. Date:_____

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Special conference rates: $ 64, single or double

For Arrival after 6:00 PM, please guarantee with a major credit card or send one night's deposit with this form.
Check in time is 2:00 PM. Check out time is 12:00 Noon.

THE HOTEL MUST RECEIVE YOUR ROOM RESERVATION NO LATER THAN NOVEMBER 26, 1989 IN ORDER TO GUARANTEE THE CONFERENCE RATES.

ENVIRONMENTAL/ENGINEERING GEOLOGISTS

Notes From The Chair

As with all things, time brings change, and this year is no different. Cheryl Lentini, our Chairperson for the 1988-89 fiscal year, was forced to resign halfway through her two year term due to medical reasons. Cheryl's short tenure, however, "revolutionized" the Environmental Committee. We obtained our independence as a full committee, independent of and on an equal status with the other committees of the Houston Geological Society. Also, under Cheryl's leadership, the Committee has continued to expand its scope from strictly environmental geology to include engineering geology. Our membership during this past year has also expanded. Monthly business meetings have been well attended and the number of members actively working on a wide variety of projects has increased.

To Cheryl, I tip my hat with much respect and admiration. She accomplished much in a short period of time.

During the last business meeting, officers for the 1989-90 fiscal year were elected. These individuals are listed below.

Chair ..... Robert Rieser, Groundwater Technology
Vice-Chair ..... Helen Sadik-MadDonald, ERM-SW
Secretary &
Membership .....Karen Synowiec, Chevron
Treasurer.....Laura Gammill, Dow Chemical
Editor (Environmental
Update column) ..... Glenn Lowenstein, Teacher
Activities ..... Ken Richardson, Consulting Geologist
Publications.....Eric Lipman, Geologist

As the new Chair, I seek continued growth in the active membership and the monthly business meeting attendance, as well as an increase in attendance to the events sponsored by the Committee. I am also interested in helping geologists make the transition from the petroleum industry into the environmental industry. (I made that transition a year ago.) The question is how best to go about it. There will be no more verbage in the Environmental Update column concerning "how to's". It is time for a different approach. This will be one of the topics introduced for discussion at our business meetings during the course of the year.

I am also interested in taking the Committee out of professional isolation. We have made brief efforts at this in the past. Regular communication, however, needs to be maintained with other organizations. Some of these could include the Engineering Council of Houston (ECH), American Institute of Professional Geologists (AIPG), the Sierra Club, Texas Hazardous Waste Management Society, and the American Society of Civil Engineers, to name a few. Which organizations would best fit our goals and objectives is in question. We cannot possibly keep track of all of them. If you have a strong feeling about any particular group or are already a member of another group, come to our business meetings, get on our mailing list, and make yourself heard.

Another topic for discussion during this fiscal year is how the Committee can have an impact on the teaching of environmental sciences in the high schools and junior high schools. This topic is rarely (let alone adequately) discussed in the earth science curriculum at the pre-college level (See Glenn Lowenstein's article in the June, 1989 HGS *Bulletin* concerning the only two schools in the HISD that offer environmental science courses). We need to make our children aware of the Earth we live on and the importance of caring for her. Where else can we go after we pollute her air beyond breathability, contaminate her water beyond reuse, cut down her rain forests beyond replacement. There **is nowhere else** to go. (There's no place like home.)

As usual, our monthly business meetings will be the second Wednesday of the month and held at Charlie's Hamburger Joint on Ella Boulevard south of the 610 Loop. This month, on the 13th, our guest speaker is Santiago Reynolds of SANCO and Associates, Inc. He will discuss fracturing and fracture identification as it relates to the environmental industry. September's dinner meeting will be held on the 26th. The speaker, Bob Foye of Chemical Waste Management, Inc. will speak on "Waste Remediation at Superfund Sites". See the *Bulletin* for time and place. I might also note that the Committee is in the process of preparing a field trip for November which emphasizes coastal environmental problems from Matagorda Bay to Galveston Island.

The topics mentioned above are only a few of those which will be discussed and acted upon throughout the year. It should be a very interesting year. To be a successful year, however, it is necessary for interested people, like yourself—an assumption based upon the fact that you are still reading this column—to become involved, to make the commitment of time, talent, and energy. Take the plunge and join us on the 13th of this month at Charlie's.

ROBERT B. RIESER

HGS ENVIRONMENTAL/ENGINEERING COMMITTEE DINNER MEETING—SEPTEMBER 26, 1989

ROBERT FOYE, JR.—Biographical Sketch

Dr. Foye is a registered engineer with over twenty-seven years of experience in overseas and domestic engineering, construction, and project management. He has worked on a variety of projects involving waste management, Remedial Site Investigations (RIs), and Feasibility Studies (FSs) for site cleanup, selection and layout; geotechnical and chemical testing in field and laboratory; and in analysis and final detailed design, construction, and construction management services. He has also been an assistant professor of Civil Engineering for over six years, teaching a variety of courses including soil mechanics and foundation engineering, structural analysis, steel design, engineering fundamentals, graphics, computers, and surveying.

Robert holds a B.S. degree in engineering (1960), from the United States Military Academy, West Point, N.Y. In 1966, he was awarded the degree of M. Engr. in civil

engineering from Texas A&M University. Continuing at Texas A&M, he obtained his doctorate in civil engineering in 1972.

He was employed by the US Army Corps of Engineers (USCOE) for twenty-one years and by Woodward-Clyde Consultants (WCC) for over six years prior to joining the Environmental Remedial Action Division (ENRAC) of Chemical Waste Management (CWM).

SITE REMEDIATION - PAST, PRESENT, FUTURE
(No abstract)

UNDERSTANDING FEDERAL ENVIRONMENTAL LAWS

Lawyer James Blackburn, a specialist in environmental law, will outline federal environmental laws and regulations for those seeking training in environmental law. Mr. Blackburn will pay special attention to recent amendments to the hazardous waste and superfund programs, proposed amendments to the Federal Clean Air Act and their implications for future compliance. Other topics include the Federal Clean Water Act, the National Environmental Policy Act, The Endangered Species Act, hazardous waste and hazardous materials requirements, federal wetlands law, and water law.

When: 9:00 a.m. - 5:00 p.m.
Wednesday - Friday, October 25-27, 1989

Fee: $545 ($495 for each additional registrant from the same company).

FOR MORE INFORMATION call the Rice University Office of Continuing Studies, (713) 520-6022.

HAZARDOUS WASTE CONFERENCE

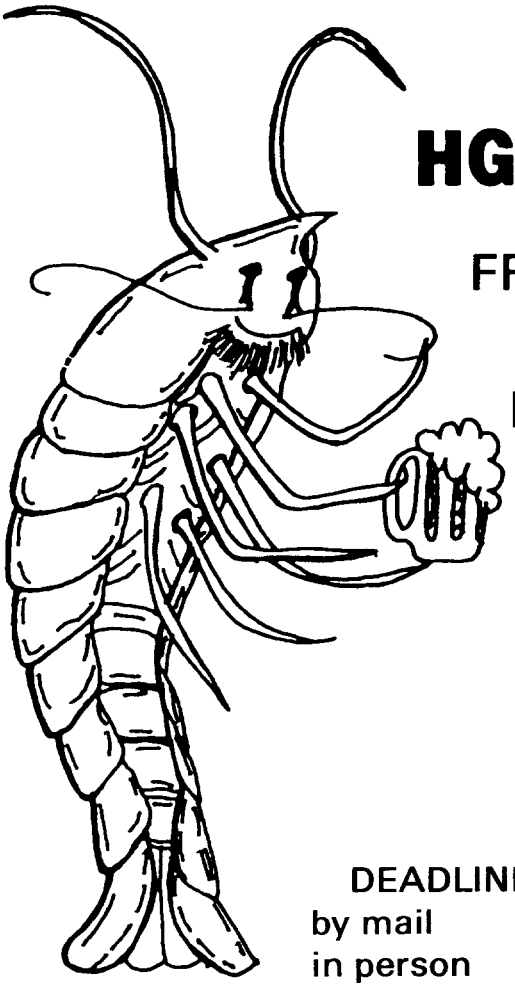
Pittsburgh, Pennsylvania—The United States Environmental Protection Agency (EPA), NUS Corporation, the American Academy of Environmental Engineers, the United Nations Environment Programme, and the World Federation of Engineering Organizations are sponsoring **The Third International Conference on New Frontiers for Hazardous Waste Management.** The conference will be held September 10-13, 1989, in Pittsburgh, Pennsylvania. This biennial event will focus on developments in current and future technologies for solving hazardous waste problems. Seventy-seven international speakers will discuss these waste treatment technologies. In addition, more than 90 exhibitors are expected to provide information on environmental and hazardous waste engineering as well as consulting services. Registration for this three-day event is $325 before August 25. After this date, the three-day fee is $395 (or $225 per day). Onsite registration is available during the conference.

For information, contact Lynne Casper, NUS Corporation, Park West Two, Pittsburgh, PA 15275, or call (412) 788-1080.

CONFERENCE ON SINKHOLES AND KARST

October 1-4, 1989, the Florida Sinkhole Research Institute will be hosting the 3rd Multidisciplinary Conference on Sinkholes and the Engineering and Environmental Impacts of Karst in St. Petersburg, Florida. For information, contact Barry F. Beck, Director, Florida Sinkhole Research Institute; Suite 492, 12424 Research Parkway, Orlando, FL 32826; (407) 658-6834.

MAKE UP A PARTY



HGS SHRIMP PEEL

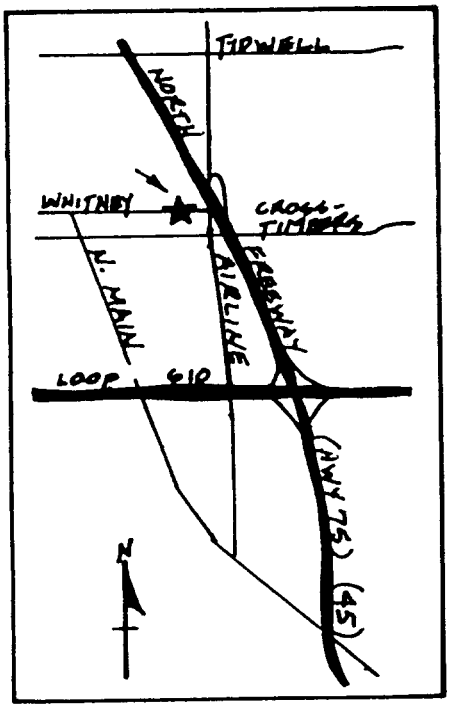
FRIDAY, OCTOBER 13, 1989

Knights of Columbus Hall
607 East Whitney

5:30 p.m. until

TICKETS
$12.00 (Advance - per person)
$20.00 (At door - per person)

DEADLINE FOR ADVANCE TICKET PURCHASE
by mail — Friday, October 6
in person — Wednesday, October 11



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Clyde Harrison
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Suite 780
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Make checks payable to HGS ENTERTAINMENT FUND.
Enclose a self addressed, stamped envelope for orders by mail.

REFRESHMENTS

Music - Dancing

AIPG
American Institute of Professional Geologists
ANNOUNCES
Annual Texas Section Convention — Houston, Texas

Sept. 14 Reception - 6:00-8:00 p.m. Westin Galleria, 5060 W. Alabama
Sept. 15 Sessions - 8:45-4:00 p.m. Weston Oaks, 5011 Westheimer

KEYNOTE SPEAKER: Susan Landon, President-Elect, National AIPG

TITLE: Professionalism: Issues In A Changing Profession

SESSIONS: "Environmental Clean Up — The Driving Mechanism"
William E. Colbert, Texas Water Commission, Director of Public Relations

"Environmentally Speaking Have Things Changed"
Ken Kramer, Sierra Club, Lone Star Chapter Director

"Trends in Oil and Gas Recovery in the 1990's"
Jerry Lucia, Bureau of Economic Geology

Panel discussion — registration of geologists in Texas

PRE-REGISTRATION: Must be received by noon, Sept. 12.
$35.00 AIPG members and non-membes
$15.00 AIPG members' spouse
(Fee includes reception on the 14th, lunch, and sessions on the 15th)

REGISTRATION: After noon, Sept. 12.
$35.00 AIPG members, spouse, and non-members
(Fee DOES NOT INCLUDE LUNCH on the 15th)

TO REGISTER: Send form (below) to: Annette Brewster, ERM-Southwest, 16000 Memorial Dr., Ste. 200, Houston, Texas 77079-4006
or call Dave Rensink: (713) 739-3330
or register at the door on the morning of the 15th.

REGISTRATION FORM
AIPG ANNUAL TEXAS SECTION CONVENTION

Name: _____

Address: _____

_____

_____

Check appropriate box:

☐ **AIPG MEMBER**	**$35**	_____
☐ **Spouse of AIPG member**	**$15 pre-reg.**	_____
	$35	_____
☐ **Non-member**	**$35**	_____

Make check payable to AIPG, Texas Section **TOTAL:** _____

RAILROAD COMMISSION IS FOCUS OF STATE'S ENERGY, TRANSPORTATION PICTURE

By Kent Hance

Editor's Note: *At our request, Kent Hance, Chairman of the Texas Railroad Commission, has written an article for HGS in which he outlines the role and responsibilities of the TRC.*

From modest beginnings as a pioneer in rail regulation almost a century ago, the Railroad Commission of Texas has grown to become a multi-faceted state regulatory agency which oversees the vital areas of energy, transportation, environmental protection, and public safety.

Today, regulating the production of oil and gas in Texas is the Commission's largest responsibility, involving more than half of the agency's workforce of over 900 people. The Commission oversees the entire lifespan of an oil or gas well, from the permit to drill to the final decision to plug and abandon the well when production is finished. We approve the drilling location, total depth and target producing zones, the amount of oil and/or gas that can be produced daily if the well is successfully completed, and the amount and depth of pipe and cement that must be used to protect fresh water and other oil or gas producing zones. When an operator decides to plug a well, we make sure the procedure is correct to prevent future pollution problems.

Protecting the state's fresh water from oilfield pollution has been a top priority at the Commission from the beginning. We have regulated underground injection of fluids in oilfield operations since the 1930s and are proud to note that our Underground Injection Control program was one of the first in the nation to be approved by the Environmental Protection Agency under the Safe Drinking Water Act. Using a $100 fee paid by operators when they submit an application to drill a well, we maintain a special fund used for combatting oilfield pollution and plugging abandoned wells. In Fiscal Year 1988 we plugged 627 wells at a cost of approximately $3 million.

> *"Protecting the state's fresh water from oilfield pollution has been a top priority at the Commission from the beginning."*

Making sure Texas citizens and industries can depend on safe, economical, ground-based transportation systems is another important responsibility of the Railroad Commission. Under the provisions of state law, the Commission considers applications for new truck and bus authority in the state. We also make sure truck and bus companies operating in Texas file proof of adequate insurance coverage, register their vehicles with the Commission, and charge Commission-approved rates for their services. We have not forgotten our rail regulation heritage of almost a century ago. Our safety inspectors check operating procedures and equipment used by railroads operating in the state, and make sure Texas' 13,000 miles of mainline track are properly maintained.

Ensuring a continuous, safe supply of natural gas to Texas consumers at a just and reasonable price is another important function of the Railroad Commission. We approve gas rates in unincorporated areas of the state, while cities generally set rates for customers within their city limits. To determine a reasonable rate, the Commission examines a utility's expenses and revenue to make sure the company can adequately serve its customers. By law, a utility must have rates that give it the opportunity to buy gas, pay its employees, earn a reasonable return on invested capital, and maintain its system as safely as possible.

> *"The Commission oversees the entire lifespan of an oil or gas well, from the permit to drill to the final decision to plug and abandon the well when production is finished."*

Pipelines carrying natural gas, crude oil, and refined products spread from border to border throughout Texas. With over 135,000 miles of pipelines, Texas ranks first among all states in this category. Commission inspectors located throughout the state continuously check this extensive network to make sure pipeline companies are safely operating and maintaining them.

Liquefied petroleum gas, more commonly known as propane and butane, as well as compressed natural gas, are also important sources of fuel for Texans. To make sure that dealers and their employees handle these products safely, the Commission holds seminars and administers licensing tests throughout the year. We also train firemen and other disaster response personnel to deal with LP-gas in emergency situations.

One of the state's most abundant energy resources is lignite. Many lignite deposits lie close to the surface, easily reached with modern mining technology. For almost 15 years, the Railroad Commission has ensured these resources are properly developed and the environment protected. We also regulate surface mining for uranium, iron ore, and iron ore gravel. Before issuing a mining permit, the Commission studies the proposed mining site to make sure mining will not harm the quality or quantity of water in the area, or affect wildlife. We also require a company to post a bond to cover land reclamation costs and then make sure the land is properly reclaimed when mining ends. In 1980, Texas became the first state in the nation to have a federally-approved coal regulatory program.

Because of the complex, technical nature of many of the industries we regulate, the Railroad Commission conducts an extensive educational seminar program throughout the state each year. People who work in the regulated industries are able to choose from topics ranging from understanding Texas truck laws, to protecting fresh water during oil and gas operations, to safely converting vehicles to run on LP-gas or compressed natural gas. Seminar schedules and brochures are available on request.

The successes the Commission has enjoyed illustrate the benefit of strong rules, fairly applied. The economy of

Texas has enjoyed a steady regulatory climate which has stabilized the production of oil and gas; protected shippers, carriers and consumers in transportation, natural gas, and LP-gas industries; and nurtured the development of mineral resources while protecting the environment. As the Railroad Commission approaches its 100th birthday, we look back with pride at many years of service to Texas and the nation. At the same time, we look forward to the next 100 years, expecting them to be as challenging and as satisfying as the last.

HOUSTON GEOLOGICAL AUXILIARY

Welcome to the 39th year of the Houston Geological Auxiliary. We want **YOU**, old and new members, to join us for another year of social activities planned by our Board and committees.

Plan to join us September 27th at the River Oaks Country Club. Chairpersons Laurie McDonough and Suzanne Womack have planned an exciting day for us with Jan Carson of Channel 2. Mark your calendar now for December 5th. We will meet at the Hyatt Regency West to hear Linda Weiland talk on the history of our very own city on March 25th. We will have our couples event with a BBQ and Azalea Classic Horse Show at the Great Southwestern Equestrian Center. Our installation luncheon and style show featuring Petticoats, Parasols and Paraphernalia of the Goodwill Industries of Houston will be held at the Junior League on May 9th.

We invite the wives of HGS members as well as women HGS members to join us for this year. New members of HGA are also invited to join GEO-WIVES, a newcomers group which meets monthly. Please contact Myrtis Trowbridge, President HGA, at 468-3161 if you need any additional information.

JEANNE COOLEY

Photo taken at the HGA May Luncheon and Installation of Officers.

HOUSTON GEOLOGICAL AUXILIARY

The Houston Geological Auxiliary was organized to encourage social relations among the members of the Houston Geological Society and to assist the society in any manner they might request. Any female Geologist who is a member in good standing of the HGS is eligible for membership in the auxiliary. Four social activities are being planned, beginning in the fall, and you are cordially invited to join us for the coming year.

APPLICATION FOR MEMBERSHIP — HOUSTON GEOLOGICAL AUXILIARY

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(LAST NAME) (HUSBAND'S NAME) (YOUR NAME)

ADDRESS _____ ZIP CODE _____

HOME TELEPHONE _____ HUSBAND'S COMPANY _____

CIRCLE ONE: Current Member New Member Reinstated Member

Dues are $10.00 per year, payable upon application for membership.
Make checks payable to: HOUSTON GEOLOGICAL AUXILIARY and mail with completed application form to:
Houston Geological Auxiliary
c/o Mrs. Charles E. Edwards
1502 S. Gessner
Houston, Texas 77063

DIGITAL DIGEST

TO PROGRAM OR NOT TO PROGRAM

by MARK W. HODSON

Various types of commercial applications software have been discussed in past Digital Digest columns. Only one column has discussed developing computer software instead of buying it (Sam Flarity's column on using a drafting package for intelligent mapping involved customizing a commercial drafting package to the special needs of the explorationist, rather than starting from scratch).

The emphasis on commercially available applications in this paper probably reflects my personal views and experiences in a matter that troubles many people involved in geotechnical computer applications—do we buy our software "off the shelf", or do we write it outselves?

First, let's consider programming instead of buying.

One common explanation for the do-it-yourself mentality is that software developed in-house will do exactly what one wants it to do. By writing software in-house, one may get a product that more nearly does things (e.g. organizes your data, calculates your answers) the way they need to be done now. If a company's way of calculating, say, directional surveys, is thought to be technically superior, or if the way one organizes well data files helps get to answers more quickly, in-house software may be the answer.

"By writing software in-house, one may get a product that more nearly does things the way they need to be done now."

Even home-grown software rarely does exactly what everyone wants it to do. To paraphrase Abraham Lincoln, "You can please some of the users all of the time, and all of the users some of the time, but you can't please all of the users all of the time."

A second reason might be the cost of commercial software licenses. The initial cost for commercial software licenses can be large. If there are several computers to put commercial programs on and the vendor doesn't give a big per-copy price break for multiple copies, or if the software has more capabilities than you currently need, it all generally gets paid at once. Then there's maintenance; that's the annual fee paid to the vendor to keep the software running. Maintenance is needed to fix bugs that are discovered after prolonged use or to adapt software to new, improved computers, plotters, operating systems, and other geoscience computing facilities. Annual maintenance charges can range anywhere from a small flat fee to twenty percent of the purchase price.

A third reason for writing your own software is flexibility. By developing a better numerical technique, one doesn't have to wait for a vendor to decide to put it in. Additionally, costs associated with implementing a custom modification are reduced. Similarly, time delays from vendors who consider your particular software bug insignificant to warrant immediate attention, or who only provide bug fixes with periodic updates, are eliminated.

"Developing in-house software can eat up significant amounts of time, even if the geologists are not doing the programming themselves."

Developing in-house software can eat up significant amounts of time, even if the geologists are not doing the programming themselves. Geological input is crucial if the software is to do things in a useful and appropriate manner, and it can take much communication to make sure the right ideas and information get to software developers. Future productivity improvements may, in the long run, justify the time geologists spend in software development projects, but management may decide they cannot afford the short-term loss in time spent performing traditional geologic tasks. If geologists actually get involved in programming, things can get even hairier. Few geologists understand efficient programming and software development, just as few programmers understand both the theory and practice of geology. Advice columns frequently print letters from upset secretaries who complain that their business is foundering because the boss spends too much time "playing with that damned computer". In most instances, computer enthusiasts are failing because they lack the specific programming knowledge that would enable them to efficiently express their business (or geologic) expertise in a computer program.

Developing in-house software requires one to see that it gets maintained. This means someone is needed who knows and understands the program, and can fix or change it as the need arises. If it is a complex program, documentation and user training may need to be provided. One may need to retain computer-oriented people, or risk being unable to use your own software.

Now let's examine some of the potential benefits and hazards of commercial geotechnical software.

To start, let me make clear that commercial software is not sought outright; a license that allows use of the software on one or more computers is purchased. It generally costs

continued

more to license software for more computers. Licenses for big computers also tend to cost more than for small computers.

Perhaps the most often-cited reason for licensing commercial software is cost. Commercial software is almost always less expensive than home-grown, if just programming and development costs are considered.

Licensing commercial geotechnical software can sometimes save having to build or license other expensive packages. For instance, any mapping package must have some data management capability. Some commercial mapping packages contain databases that are driven by commercial database management systems (DBMS). The mapping package may not contain all of the DBMS, or it may not allow the user the full flexibility of the DBMS. However, the developer generally gets a large price break from the DBMS vendor. The whole mapping package might cost less than just the DBMS would if licensed by itself. Since one would have to buy a complete, retail-priced license for the DBMS by itself, there is a cost advantage in buying the more comprehensive software package.

"Commercial software is almost always less expensive than home-grown, if just programming and development costs are considered."

Costs for personnel with the expertise to fix, modify, and provide training on commercial software are also shared among the several buyers.

Even if commercial software doesn't do exactly what is needed, there may still be a satisfactory solution to ones' computing needs. Commercial software rarely does exactly what is needed in the fashion one would like to see it done. Each potential purchaser does things a little bit differently. Even if a program offers several options for each capability, it usually can only do about 80 to 95 percent of what you want it to do. Programs will also probably have additional capabilities that aren't needed, capabilities which one might therefore resent paying for. Competing products might also offer 80 to 95 percent of what you want, but part of the missing five to twenty percent might differ from the missing parts of other packages. So, to get most out of what one wants commercially, money may be wasted on multiple packages that are at least sixty percent redundant, require separate training to run, and may not even share the same datasets.

Fortunately, appearance differs from practical reality. Quite often, overlapping packages have different aims. For example, a program that uses well data to generate synthetic seismic data for use with seismic sections will have many features in common with one that develops stratigraphic cross sections of well data. In most companies, however, the two tasks are usually done by different people, for different reasons, and at different times. And buying two packages is often still cheaper than writing one. Furthermore, if ones' favorite algorithm or pet feature is not available, most vendors will add it into their product if you give them the money to do so and/or agree that they can sell it to others. Features requested by several purchasers generally get added eventually. Generally speaking, commercial software can get close enough to an ideal solution to get the job done and cost less than proprietary software.

A potential disadvantage that commercial software sometimes shares with in-house software is lack of technical input. Software can suffer from lack of contact with geologists during development, whether that development is done in-house or at a software company. Software developers who are either experts in the technical field their package addresses or get extensive input from clients before and during program development minimize such problems. One thing to look for when evaluating commercial software is whether a software package can do things the way geologists wants them done. The user interface capabilities must also make sense to the geologist.

Another potential problem common to commercial and in-house software is support. One may find themselves in an uncomfortable situation if the software vendor goes belly up. Just as if the developer or supporter of an in-house package were to quit or die, one may have to scramble and spend more money to find and obtain either replacement software or support to keep the software running and the users trained.

Even if one avoids development costs by using commercial software, the cost of developing interfaces with other software may be high. While many vendors tout their ability to read data in a variety of formats, it sometimes seems almost none have ever heard of a particular format or data type. This problem is not unique to commercial software; someone may have to develop similar interfaces for in-house software. So, whether one develops data transfer in-house or has a vendor do it, money is being spent that would have to be spent anyway.

Some people contend that by developing in-house software, one can facilitate integration through sharing a single set of home-grown databases, and can customize all interfaces to suit end-users. This is an extremely expensive solution. It can't be justified unless a company has very few applications and databases, or there are many users who will benefit from all the effort. Commercial geologic workstations offer another way of getting integrated applications and usable interfaces. Such integrated packages are still subject to the 80-to-95-percent what-you-want limitations described earlier, however. Personally, I feel workstations make a lot of sense, but they must fit well with the way a company does things in order to be economic.

Applying these ideas to ones' situation may not immediately help in the decision to either buy commercial software or do in-house programming. Some applications may look like good candidates for developing in-house, while in other situations, it would be better to buy software. That's alright—there's nothing wrong with mixing commercial and home-grown software, as long as one understands it and can arrange support for both. If neither side's arguments struck home, I would recommend a good dose of additional information. Computer-literate friends, consultants, books and magazine articles, and even computer hardware and software vendors are all good sources of information. If all this fails to help, I know of a psychic reader just off the Southwest Freeway...

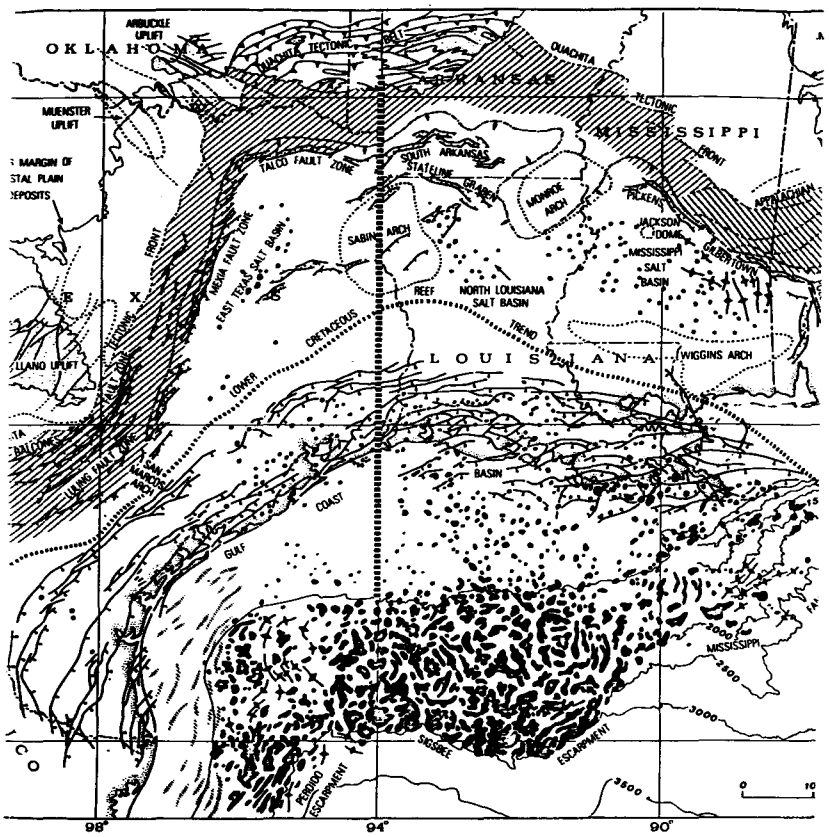
P.S. The Computer Applications Committee plans to demonstrate a cross-section balancing software package on the HGS's Compaq computer during the social period preceding the September dinner meeting. Come see geologic computing in action!

AAPG RESEARCH COMMITTEE-SEPM RESEARCH COMMITTEE

GULF COAST TYPE WELL PROJECT

In late 1989 the AAPG will be publishing a regional stratigraphic cross section and accompanying seismic line which extends from the south flank of the Quachita Tectonic Belt in southern Arkansas (lat. 34. 15'N.) to south of the 28th parallel in the High Island Area, South Addition Block of offshore Gulf of Mexico (see figure). The cross section shows chronostratigraphic correlations, lithostratigraphy, and generalized structural relations common to the central Gulf Coast and Mid-Continent region. The section will be published in three sheets with an image area of 30" X 54" per sheet (each sheet representing approximately 425 statute miles of geographic coverage).

In conjunction with this, the AAPG and SEPM Research Committees have undertaken biostratigraphic, lithostratigraphic and organic geochemical analyses of cuttings from key wells tied to the cross section. This will enhance understanding of regional formational and biostratigraphic correlations and provide a reference standard for nomenclature and descriptive style. To date, analyses are being completed on two wells along the cross section, one in Jasper County, Texas and another in Block 163-L, High Island Area. A number of major oil companies and private consultants are providing analytical services. It is intended that the Jasper County well information will be published in sheet form in 1990.



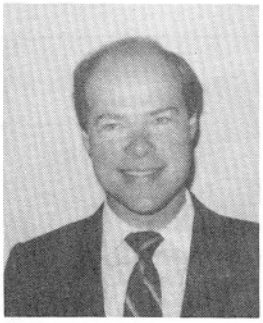
Location of AAPG Gulf Coast Regional Cross Section

The project needs an updip and a downdip well to complete the stratigraphic coverage of the regional cross section. The updip well needs to be located on or very near the cross section in southwest Arkansas (Miller, Howard, Hempstead, or Little River County), northwest Louisiana (Caddo or De Soto Parrish), or Shelby/Panola County, Texas. The downdip well needs to be located on or very near the cross section in High Island Blocks A-574, A-519, A-467, A-444, A-154, A-414, A-285, or A-384. The wells should have sufficient cuttings available at 10-60 ft. intervals to complete various analyses, and a suite of routine logs. A reference set of cuttings will be retained and archived by AAPG.

Any company interested in contributing to this project can contact Roger M. Slatt, Gulf Coast Type Well Project Coordinator, ARCO Research and Technical Services, 2300 West Plano Parkway, Plano, Texas 75075.

OPINION — A SHRINKING MEMBERSHIP

By Frank Huber



I believe that it is incumbent upon the HGS to address the issue of membership. HGS membership has declined for the last two years due to the lack of geologists gainfully employed in the oil industry. This decline has been slow, but steady. The very real possibility of a calamitous decline exists, when many ex-geologists without jobs decide to give up that last association with their past. The HGS faces a very real problem. Action needs to be taken along several fronts. Firstly, the HGS needs to have a higher concentration or percentage of petroleum geologists in Houston as members of HGS. Numerous companies do not support HGS by encouraging their employees to join. These company people need to recognize the benefits of membership in HGS. The HGS also needs to emphasize the benefits of membership, not the least of which is access to ideas and people outside the narrow confines of a particular company. This is particularly true in a turbulent era where a company may need to lay off employees or reorganize staffs. Unemployed geologists also need a membership form.

Second, the HGS needs to aggressively pursue other fields where practicing geologists are increasing their presence, such as the environmental/waste management fields, teaching professions, engineering geology/surface geology, hydrogeology and possibly planetary science. To gain geologists in these fields, the HGS will need to become a useful vehicle for these scientists. Some progress has been made in these areas already, but the HGS needs to carry through in these areas and expand inroads into other areas. Let's take each in turn.

The environmental/waste management field is a growing field that has taken a large number of oil field "retreads". While the initial entry into that field is sometimes difficult, most technical people who gain experience and "pay their dues" find that in their third year, and in other situations where a candidate has groundwater education or experience, he or she can often parlay this ability in the waste management field. Management experience helps not only in this field but also in switching into other less related fields. The HGS has both a duty and an opportunity to educate its members to the advantages of cross-training and sincerely taking an interest in the fate of the environmental industry and the people in it. Salaries in the environmental field for comparable experience range from 85% to 100% of the pay scale in the oil industry after 10 years of experience. Compensation in the environmental industry may surpass the oil industry in the near future. The Environmental Committee has been one of the most innovative committees in the society and I believe that the largest segment of new membership may be coming from this area, as well as having a large number of members retaining their membership because of their association in that area.

The teaching field has a number of geoscientists that have made the effort to switch into that arena from the petroleum side. A number of geologists who are still searching for gainful employment do temporary teaching work part time. A number of science teachers also have some interest in the geology field. The HGS helps these people through the Academic Liason Committee and occasionally through environmental field trips. We may be able to do more. We can encourage individuals or maybe schools to join the society (such as one membership for everyone at a school so that they can receive a *Bulletin* and keep up with activities that may be of interest to them or to their students). There are also a number of university professors who could become more involved and who may be able, due to their wider range of view, offer some insights into where the HGS should head in the future to ensure its survival.

Planetary science is a totally ignored area by the Houston Geological Society although NASA is located right here in Houston. One thing that we could do is offer to become co-sponsors of the Lunar and Planetary Science Conference. The AAPG is already a co-sponsor of that conference. Perhaps we can attempt to see what we might

Continued on page 37

GULF OF MEXICO SALT TECTONICS, ASSOCIATED PROCESSES AND EXPLORATION POTENTIAL

GULF COAST SECTION SOCIETY OF ECONOMIC PALEONTOLOGISTS AND MINERALOGISTS FOUNDATION

Tenth Annual Research Conference
Adam's Mark Hotel
Houston, Texas, December 10-13, 1989

TECHNICAL PROGRAM

Cochairmen: **Allen Lowrie**, Consultant and **Dorene West**, GECO Geophysical Company, Inc.

Program Committee: **Jon Blickwede**, Amoco Production Company; **Marc B. Edwards**, Consultant; **Robert Evans**, Mobil Res. and Dev. Corp.; **Lee Fairchild**, Exxon Production Research; **James F. Fox**, Phillips Petroleum Company; **Thomas H. Nelson**, Salt Tectonics International; **Frank Sauer**, Standard Oil Production Co.; **Jerry Watson**, Consultant; **William Feathergail Wilson**, Placid Oil Company; **Howard Yorston**, Interpretation Consultants

Technical Sessions: 2 1/2 days, 29 presentations, poster sessions, and displays

Preliminary List of
SPEAKERS AND TOPICS

Robert O. Brooks Horizontal Components of Gulf of Mexico Salt Tectonics

Richard T. Buffler Distribution of Crust, Distribution of Salt and the Early Evolution of the Gulf of Mexico Basin

S. Cao, I. Lerche and J.J. O'Brien Moving Salt Sheets and the Deformation and Faulting of Sedimentary Formations

M.B. Dusseault and Doug Hambley The Development and Use of a New Isothermal Steady-State Constitutive Law for Salt and Potash Mines

Thomas Fails So, How Thick is a Critical Overburden Thickness?

Joseph C. Fiduk, Richard T. Buffler and E. William Behrens Distribution and Movement of Salt on the Texas-Louisiana Continental Slope, Garden Banks and Eastern East Breaks Areas, Gulf of Mexico

Wulf A. Gose, J. Richard Kyle and M. Randy Farr Direct Dating of Salt Diapir Growth by Means of Paleomagnetism

Nancy S. Hardin Salt Distribution and Emplacement Processes, Northwest Gulf Lower Slope: A Suture Between Two Provinces

Frank Huber Ewing Bank Thrust: Structural and Sedimentological Aspects

M.P.A. Jackson and Carlos Cramez Seismic Recognition of Salt Welding in Salt Tectonics Regimes

M.P.A. Jackson and C.J. Talbot Salt Canopies

Donald H. Kupfer (1) Diapirism Sequences as Indicated by Internal Salt Structures and (2) Five-Island, LA, Anomalous Zones and Spines - Revisited

J.R. Kyle, W.N. Agee and M.R. Ulrich Evolution of Basinal Formation Waters

John Lopez Structural Styles of Growth Faults in the U.S. Gulf Coast Basin

Allen Lowrie and John Armentrout Sediment and Salt Tectonics: Do Sea Level Fluctuations Affect Salt Movement?

Thomas H. Nelson Diapir Style Differences Related to Stage of Evolution and the Nature of the Encasing Sediments

Harry H. Posey, James D. Prikryl and J. Richard Kyle Fluid Variation in Calcite Cap Rocks of Gulf Coast Salt Domes

J.C. Pratsch Salt in Oil and Gas Exploration Offshore Gulf Coast Region

Ronald W. Race Salt Tectonics and Associated Hydrocarbon Occurrences in the Northeast Gulf of Mexico

Steven J. Seni and M.P.A. Jackson Counter-Regional Growth Faults and Salt Sheet Emplacement

D.T. Thompson, I Lerche and J.J. O'Brien Salt Basins of Western Europe and Gabon, West Africa: Dynamical Aspects and Hydrocarbon Production

B.C. Vendeville Scaled Experiments on the Interaction Between Salt Flow and Overburden Faulting During Syndepositonal Extension

Robert D. Walters Interactive Analysis of Salt-Sediment Relationships on a 3D Seismic Survey

Paul Weimer and Richard T. Buffler (1) Variations of Salt Deformation in the Mississippi Fan Area, Deep Gulf of Mexico and (2) Structural Geology of the Mississippi Fan Foldbelt, Deep Gulf of Mexico

Douglas E. Williams [illegible]

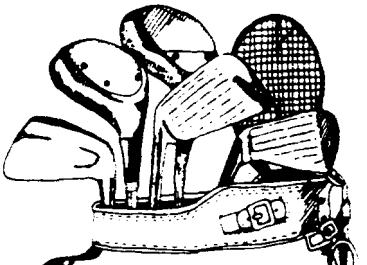
HGS GOLF TOURNAMENT
October 2, 1989

PLACE: Kingwood Country Club

FORMAT: Four Man Scramble

FEATURING:

* Closest to the pin contests
* Longest drive contests
* Putting contests
* Trophies, Awards, & Prizes
* Refreshment stands
* Bar-B-Q dinner
* Betting holes



Schedule of Events

9:30 AM to 11:30 AM
Registration and free use of driving range

11:30 AM
Receive golf cart keys

11:45 AM
Shotgun start

4:45 PM
Putting Contest and Cash Bar Open

5:30 PM
Buffet Dinner with Award Presentation

This year's tournament will be a four-man scramble. A shot-gun start at 11:45 a.m. using all three courses will be followed by an informal buffet dinner with presentation of awards. A player may select his/her own foursome or be placed in a foursome by the tournament committee. The field will be split into three flights according to handicap and thus be placed on one of the three courses. After field is full and flights assigned, any substitute must have a higher handicap than the lowest handicap in the assigned flight.

NOTE: Due to the limited number of available golf carts, entries will be limited to the first 108 four-man teams entered (432 total golfers).

Entry fee will be $45.00 for HGS members (verified by computer listing) and $60.00 for non-members. The deadline for entries is September 26, 1989. Entry fee includes green fees, golf carts, driving range use with practice balls, and the buffet award dinner. So get your group together, come out and enjoy the competition, food, and fun.

Companies interested in sponsoring please contact Laurel Vance at 775-2309.

For persons interested in helping, or for any other questions, please contact tournament chairman Dave Wolford, with Data Log at 937-4118.

To enter, fill out the following entry blank and mail with your entry fee (payable to HGS Entertainment Fund) to:

Chris Bechtel
OMNI Petroleum Services, Inc.
2501 Central Parkway
Suite C-13
Houston, Texas 77092

All entries will be acknowledged by return phone call.

SEPT. *CALENDAR of EVENTS* 1989

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
					1	2
3	4	5	6 Oil & Gas SIG	7	8	9
10	11 **HGS DINNER MEETING** **Thomas Nelson** **Westin Oaks**	12	13 UH Geol. Alumni Assoc. Luncheon SPWLA Westside Luncheon	14 SPE Luncheon SPWLA Greenspoint Luncheon	15	16
17	18 GSH Luncheon	19	20 **HGS INT'L EXPL. DINNER MEETING** **Westin Galleria** SPWLA Cased Hole Luncheon	21 **HGS SHORT COURSE** **Marian Downey** **Exxon Bldg.** SIPES Luncheon Petroleum Club	22	23
24	25	26 **HGS ENVIRONMENTAL DINNER MEETING** **Wyatt's Cafeteria** SPWLA Pet. Club Luncheon	27 **HGS LUNCHEON** **Ann Martin** **Houston Club**	28	29	30 **HGS FIELD TRIP** **3-D Seismic Acquisition**

GEO-EVENTS

MEETINGS

IN HOUSTON

GSH Icebreaker, Marriott Brookhollow, 4:30 - 7:30 p.m., Sept. 6.

Oil & Gas SIG, M.D. Anderson Hall, University of St. Thomas, 7 p.m., Sept. 6.

HGS Dinner Meeting, Thomas H. Nelson, "Emplacement and Evolution of Salt Sills in Northern Gulf of Mexico", Westin Oaks, 5:30 p.m., Sept. 11.

SPWLA Westside Luncheon, Holiday Inn Houston West (I-10 at Hwy. 6), 11:10 a.m., Sept. 13.

UH Geological Alumni Association Luncheon, Petroleum Club, 11:45 a.m., Sept. 13.

HGS Environmental Committee Meeting, Santiago Reynolds, "Fracture Delineation as Related to the Environmental Industry", Charlie's Hamburger Joint, 2222 Ella Blvd., 6 p.m., Sept. 13.

SPE Luncheon, Whitehall Hotel, 11:30 a.m., Sept. 14.

SPWLA Greenspoint Luncheon, Baroid Industries Cafeteria, 12 Noon, Sept. 14.

GSH Noon Luncheon, Marriott Brookhollow, 12:00 Noon, Sept. 18.

SPWLA Cased Hole Luncheon, Marriott Galleria, 11:30 a.m., Sept. 20.

HGS International Dinner Meeting, Dr. Steve Schamel, "Hydrocarbon Traps along Magdalena Valley, Colombia", Westin Oaks, 5:30 p.m., Sept. 20.

SIPES Luncheon, Roger D. Shew, "Depositional, Diagenetic, Production, and Seismic Characteristics of Mid-Dip Tuscaloosa Point Bar Complex, Little Creek Field, Mississippi", Petroleum Club, 11:30 a.m., Sept. 21.

SPWLA Luncheon, Petroleum Club, 11:15 a.m., Sept. 26.

HGS Environmental Dinner Meeting, Robert Foye, "Waste Remediation at Super Fund Sites", Wyatt's Cafeteria - Sharpstown, 5:30 p.m., Sept. 26.

HGS Luncheon, Ann Martin, "Ulrich (Yegua) Field, Harris County, Texas", Houston Club, 11:30 a.m., Sept. 27.

AROUND THE COUNTRY

AAPG Mid Continent Section Meeting, Oklahoma City, Sept. 24-26.

SCHOOLS AND FIELD TRIPS

AAPG Short Course, "Modeling in Computer Exploration and Production", Doubletree-Post Oak, Robert Y. Elphick, "Computer Assisted Petrophysical Modeling", Sept. 12. Hossein Kazemi, "Understanding Reservoir Modeling in Reservoir Management", Sept. 13. Jay Leonard, "Principles of Computer-Oriented Basin Modeling", Sept. 14. Jay Leonard, "New Computer Technologies for Managers and Supervisors", Sept. 15.

HGS Short Course, Marlan W. Downey, "Migration and Entrapment of Hydrocarbons", Exxon Auditorium, Exxon Building, 800 Bell, 7:30 a.m., Sept. 21.

HGS Field Trip, 3-D Seismic Acquisition, Holiday Inn Crowne Plaza, 9:00 a.m., Sept. 30.

COMMITTEE NEWS

TED J. GRIFFIN, JR. RECEIVES 1988-89 HGS BEST PAPER AWARD

The Houston Geological Society is pleased to present their 1988-89 Best Paper Award to Ted J. Griffin, Jr., Vice President of Core Laboratories North American Operations. Ted's presentation, entitled "Comparative Sidewall/Conventional Core Data", provided a valuable perspective on utilizing and intergrating sidewall core data with conventional core analysis. Ted presented his findings at both the luncheon and dinner meetings on January 25, 1989. The Society wishes to thank Ted for his outstanding talk by awarding him with a plaque of recognition at the September dinner meeting.

Ted is a 1974 graduate of the University of Southwestern Louisiana. He began his career with Core Laboratories in 1975 as Technical Administrative Assistant in Core Analysis Development. He moved to Calgary in 1980 as Assistant General Manager of Core Laboratories-Canada, and in 1984 was appointed Vice President and General Manager-Canada. Ted was transferred to London in 1985 as Vice President of Europe/Africa/Middle East operations. In 1987 he returned to Houston to his current position.

The recipient of the HGS Best Paper Award is selected by the society members through their participation as judges at each luncheon and dinner meeting. The Awards Committee extends its appreciation to all who have served as judges throughout this past year.

BARBARA BENTLEY
Chairman, Awards Committee

HGS OUTSTANDING STUDENT AWARDS

Each year the Houston Geological Society acknowledges six outstanding students from local Texas universities. The 1988 award recipients were selected by their respective geoscience departments and honored at the April HGS dinner meeting with a plaque and a check for $150.00. Pictured below are: (L-R) **Anne Meltzer** from Rice University, **Donald Craig** from Stephen F. Austin University, **Roseanne Lindholm** from the University of Houston, **Ron McGowen** from Lamar University, and **Stan Franklin** from Texas A&M University. **Jacob Kons** from the University of Texas at Austin is not pictured.

ENTERTAINMENT COMMITTEE'S BASS TOURNAMENT WRAP-UP

Our Geological Bass Anglers certainly exhibited their bass catching prowess and skill the last weekend of April. Despite tough fishing conditions, 18 anglers caught over seventy pounds of black bass, the largest of which weighed 2 pounds 12 ounces. A lot of fish were caught! While admiring the lake front resort located deep in the piney woods of east Texas, one might conclude the name Frontier Park appropriate. Several cases of beer were consumed, delicious barbecue eaten and fishing tackle was given away following the weigh-in. Many of our fishermen who are not as fond of cleaning fish, exercised a catch and release program in order to help keep our Texas lakes well stocked. Personally I enjoyed Joe Alcamo's beer-battered bass, deep fried to a golden delicacy.

Winning first place in the total weight division were Dan and Jerry Hayes with fish weighing 17 pounds 3 ounces, second place went to Bob Dean and Brian Arabie with 14 pounds 4 ounces, and third place to Joe Alcamo and Bill Rieniets with 11 pounds 7 ounces. In the largest bass category, Earl Taylor took first with his 2 pounds 12 ounces fish, Joe Samuels second with 2 pounds 10 ounces, and Mike Volle third with 2 pounds 3 ounces. It obviously was a close race. Congratulations!!

Special thanks to our sponsors for their contributions: Atlas Wireline Services, Core Laboratories, GECO Geophysical, Halliburton Well Services, Schlumberger, and Strago Petroleum Corporation.

Until Next Year!

BILL VEST

Winners (L-R) Earl Taylor, Joe Samuels, Mike Volle, Bill Rieniets, Joe Alcamo, Bob Dean, Dan Hayes, Brian Arabie, Jerry Hayes

HGS UNDERGRADUATE SCHOLARSHIP FUND THANKS HGS HOUSE OF DELEGATES

Members of the HGS House of Delegates to the AAPG took up a collection at their April meeting and made a generous contribution to the HGS Undergraduate Scholarship Fund. This contribution was given in memory of Mr. B. C. Phillips and is greatly appreciated.

ENTERTAINMENT COMMITTEE THANK-YOU

On behalf of the entire HGS membership, the HGS Entertainment Committee would like to thank the companies listed below for their sponsorship of the Spring Barbecue and Dance. Their generous help enabled us to revive our spring social event which had been lost for the last 5 years. From this beginning we hope to grow and continue in the years ahead.

Core Services Inc.
North Central Oil Corporation
Data Inc.
Seismic Exchange Inc.
Hamman Oil & Refining Company
Petroleum Information Corporation
Richardson Seismic Services
Geomap Company
Omni Petroleum Services, Inc.
Coastal Oil & Gas Corporation
IP Petroleum Company, Inc.
Schlumberger Well Services
General Atlantic Energy Corp.
Core Laboratories
Sperry Sun MWD
Exlog

MEMBERSHIP COMMITTEE SPONSORS MEMBERSHIP DRIVE

Welcome one and all to a new season. The Membership Committee has already begun the 1989 Membership Drive and we could use your help. The total membership has dropped precipitously since the crash of '86. Other societies were no less affected. However, we are now only 10% below our previous high, and the trend is hopefully toward further increases. The goal of the HGS is to surpass the previous high, and reach a membership total of 5,100 by the year end.

There are many geologists moving to Houston this year who should become members, and many geologists who already live here have neglected to become members. Additionally, according to our Bylaws, engineers and geophysicists qualify if they are involved in the direct application of geology; these scientists would be an asset to the society. Synergism is the melding of the various disciplines, and is becoming more necessary in our professional activities. These disciplines can contribute an additional perspective to the interpretation of geological data, and the general HGS membership will benefit from their participation within our Society. **To achieve this goal, the HGS needs the help of our membership. Prizes will be offered to those members who find and sponsor the highest number of new members.**

The prizes will range from HGS memorabilia to dinners for two. The steps towards entering are easy:

1) be a HGS member;
2) find a prospective member or members;
3) print and sign your name as the first sponsor (upper of the two sponsor spaces);
4) help find a second HGS member to sponsor the lucky prospective member; and
5) be sure the prospective member correctly mails the application to the HGS.

Membership Committee members are not eligible for this contest, but the rest of you are. At press time, my committee is still building, but all positions should be filled by the time you read this. Some members who are now available to you with forms and HGS information are listed below. Margaret, our HGS secretary, will also provide forms and information.

Independents: S. Kumar Bhattacharjee (SITA)
Amoco: Mike Deming
Jeff Walters (Samadan)
BP Exploration: Jim Webb
ARCO: Ben Winkleman

Good luck to us all.

BRUCE A. FALKENSTEIN

PERSONNEL PLACEMENT COMMITTEE

Second quarter activity for the HGS Personnel Placement Service was down from the first quarter, but still more active than the previous year. We sent 217 resumes to fill 18 positions, for a total of 50 positions for the first six months of 1989.

Currently, our resume files are being updated. Only resumes more recent than 1/88 will be retained. We request that individuals who believe that their resume predates 1988 please send us an updated version.

A concise resume that is professional in appearance cannot be overly stressed. For those that have trouble with the "concise" part, it is important to remember that an employer will most likely be interested in your more recent job experience. Being concise also controls the format used to describe previous jobs. A format consisting of paragraphs may contain more information than a one line "bulletized" phrase or sentence. Although paragraphs have more information a potential employer with a stack of 20 or 30 resumes and very little spare time is unlikely to spend time reading long paragraphs. Commonly, the person who spends a little extra effort on their resume is able to stand-out significantly from the rest.

The Personnel Placement Committee uses a two stage system to match qualified persons with job requests. Half the system is the resume, the other half is the Personnel Placement Form. All geoscientists using the Placement Service must have both forms and resumes on file or they can not be placed with employers. When a job request is received by us, qualified people are located through computer search. The information on computer is obtained from the Personnel Placement Forms. We encourage people to check as many categories on the Personnel Placement Forms as they may qualify for. Those categories should also be included in a person's resume. For those talented individuals with diverse backgrounds, please do not hesitate to send us more than one resume.

The Committee is presently in the early stages of a new project; to increase the exposure of the Placement Service outside the HGS. We will attempt to keep the membership informed concerning our progress.

STEVEN BRACHMAN
Chairman Personnel Placement Committee

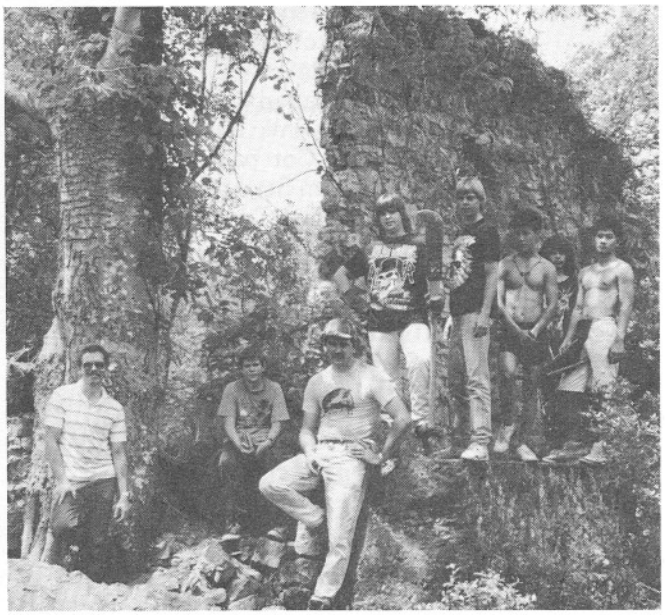
HGS EXPLORER SCOUTS TAKE PRIDE IN AMERICA

On April 28, 1989, HGS Explorer Post 2004 provided volunteer work at an industrial archaeological site on Lake Somerville. As a part of "Take Pride in America", a community service project sponsored by the Army Corps of Engineers, scouts were able to clear the site of small trees and shrubs so that the excavation could begin. In return, scouts were given service badges for their efforts and complimentary campsites on Lake Somerville.

The site is an old Fuller's earth mill located on Yegua Creek. Operational around the turn of the century, the Fuller's earth was used for its refinement qualities in the oil industry and the felt hat industry.

Post 2004 is always in need of students between the ages of 14 and 19 who have an interest in the geosciences and enjoy camping in the outdoors. Post 2004 meets at the Amoco Paleo Lab on West Little York in northwest Houston. Anyone interested in getting involved as an Explorer Post Advisor should contact Dan Helton at 963-3537 or Kenneth Mohn at 951-0853.

DAN HELTON



Scouts at archaeological site, an old Fuller's earth mill.

HGS FIELD TRIP

CARBONIFEROUS GEOLOGY OF THE NORTHERN MARGIN OF THE LLANO UPLIFT, SOUTHERN FORT WORTH BASIN AND CONCHO PLATFORM

DATE & LOCATION: November 10-12, 1989 (Friday thru Sunday) Killeen to Brownwood (and back), Central Texas

LEADERS: Robert C. Grayson, Jr., Department of Geology, Baylor University, Waco, Texas 76798; and Glen K. Merrill, Department of Natural Sciences, University of Houston-Downtown, Houston, Texas

SCOPE OF COURSE: This two day field excursion provides an opportunity to examine facies and facies relationships of Carboniferous stratigraphic units exposed along the northern margin of the Llano uplift and in the adjacent Colorado River drainage basin. Particular emphasis will be given to: (1) the interpretation of depositional environments using vertical sequences and lateral relationships; (2) the significance of the various depositional systems to the tectonic evolution of the Fort Worth basin and its associated tectonic elements; and, (3) the relative timing of geologic events including the penecontemporaneous effects of developing horsts and grabens comprising the Llano Fault System. Topics discussed are directly applicable to anyone working or stydying the Fort Worth Basin, Bend Arch, or Eastern Shelf of the Midland Basin, as well as providing an excellent overview of North Central and West Central Texas geology.

The route on DAY 1 begins in Killeen and ends in Brownwood via Lampasas, San Saba, and Richland Springs. Seven stops, primarily located along the northern margin of the Llano Uplift, are planned for the first day. These are: STOP 1 (J. R. Walker Ranch Section) - conformable Mississippian/Pennsylvanian boundary and slightly higher but also conformable Barnett/Marble Falls formational boundary, discussion of shallow water clastic and carbonate depositional environments and sedimentary interpretation of M/P boundary "iridium anomaly"; STOP 2 (Bend Dump Section) - interfingering, gradational boundary between upper Marble Falls and lower Smithwick Formations, shallow water depositional environments, and significance to basin history; STOP 3 (San Saba Road Section) - disconformable Ellenburger/Chappel boundary, "iridium anomaly" in lower Barnett Formation, conformable Mississippian/Pennsylvanian boundary and conformable Barnett/Marble Falls formational boundary with coincident "iridium anomaly", diachronous development and progradation of the lower Marble Falls carbonate platform; STOP 4 (Antelope Creek Section) - lower Strawn submarine fan lobe showing good vertical sequence and bedding relationships, with fair Bouma sequences, sole marks, and water escape deformation structures; STOP 5 (Blue Bluff)- lower Strawn submarine slump structures, relationship to the Llano fault system and timing of the development of horsts and grabens; STOP 6 (Richland Springs Creek Section) - upper Strawn shallow marine and perideltaic facies documenting onlap of positive features such as the Concho platform and local horst blocks; STOP 7 (Bill Mosley Ranch Section, optional) - Smithwick/Strawn limestone conglomerates shed off a local horst block.

DAY 2 begins in Brownwood and ends in Killeen via Regency and Goldthwaite. Seven field localities, all of which are located north of the Colorado River in the vicinity of Brownwood and eastward toward Goldthwaite, are scheduled to be visited. These include: STOP 8 (Brim Ranch) - Early Missourian Strawn fluvial-deltaic facies capped by transgressive marine limestone of basal Canyon Group; STOP 9 (Railroad Section) - "Brazos River" fluvial channel sandstone and chert-conglomerate, interesting channel geometrics demonstrating lenticular nature of these deposits; STOP 10 (Ricker Station Limestone Section) - lowest of two mappable marine carbonates within the upper Strawn Group, fusulinid limestone developed on deltaic mouthbar or delta plain facies; STOP 11 (Capps Limestone) - highest mappable limestone unit of the upper Strawn Group, and position of the Desmoinesian/Missourian boundary; STOP 12 (Regency River; STOP 13 (Pecan Bayou 1, optional) -distal portion of a lower Strawn submarine fan lobe, Bouma sequences, sole marks, water escape structures, and interesting trace fossils; STOP 14 (Pecan Bayou 2) - lower Strawn proximal fan lobe showing progradational sequence, Bouma sequences, channelized facies, and abandoned, shale-filled channel.

LOGISTICS: The field trip convenes at the Killeen Holiday Inn, Friday, where an overview lecture is scheduled for 8 PM. Check-in will be available all afternoon and evening. The trip will tour via bus starting Saturday morning, and will return to the Killeen Holiday Inn Sunday afternoon.

COST: $145.00, includes guidebook, overview lecture Friday evening, lodging at Killeen and Brownwood, bus transportation from Killeen, breakfasts and lunches, and refreshments in the field.

REGISTRATION FORM - CARBONIFEROUS GEOLOGY

NAME: _____

ADDRESS: _____

PHONE (home & work): _____

Enclose check payable to HOUSTON GEOLOGICAL SOCIETY,
return with this form to: Houston Geological Society, 7171 Harwin, Suite 314, Houston, Texas 77036

HGS SHORT COURSE

MIGRATION AND ENTRAPMENT OF HYDROCARBONS

DATE & LOCATION: 7:30 a.m. to 11:30 a.m., Thursday, September 21, 1989; Exxon Auditorium, Exxon Building, 800 Bell, Houston, Texas.

SCOPE OF COURSE: The course will cover:

1. Seals for hydrocarbon accumulation
2. Faulting and hydrocarbon accumulations, sealing and non-sealing faults.
3. Practical interpretation of oil and gas shows.

Each lecture will include simple illustrative exercises, based on actual examples, where these concepts have been applied to exploration in the USA and worldwide.

INSTRUCTOR: Marlan W. Downey is former president of Pecten International. During his 10-year tenure, production from new discoveries increased from 15,000 BOPD to 90,000 barrels of oil per day. He has been invited to speak before the World Bank, the Soc. of Expl. Geophysicists and the Offshore Technology Conference. He is also a distinguished lecturer for AAPG.

COST:

	Pre-Registration by Sept. 15, 1989	At Door
Members	$35.00	$45.00
Non-members	$40.00	$45.00
Students	$20.00	$25.00

HGS FIELD TRIP

3-D SEISMIC DATA ACQUISITION

DATE & LOCATION: Saturday, September 30, 1989; Meet at 9 a.m. in west parking lot, Holiday Inn Crowne Plaza, Highway 6 and Katy Freeway (I-10). Group will then proceed to Brookshire, Texas test site.

SCOPE OF COURSE: A live demonstration of the Halliburton Geophysical Products MDS-18 seismic acquisition and recording system will be conducted at Halliburton Geophysical's test site near Brookshire, Texas. Participants will see how cables and geophones are placed in the field, observe the loading and shooting of the seismic charges and view the oscilloscope line monitor, line testing, system configuration/parameter selection, and camera results in the simulated operator's truck. The system is capable of implementing 1016 data channels with 3-D multi-line, fiber optic or wire telemetry.

HOST: Dave Shafer, Halliburton Geophysical, 6909 Southwest Freeway, Houston, Texas 77074.

COST: None, but you must furnish your own lunch and transportation. Cold drinks will be provided. Please register by September 22.

REGISTRATION FORM

NAME: _____

ADDRESS: _____

_____

PHONE (home) _____

(work) _____

I am registering for (please check):

FIELD TRIP:
☐ 3-D Seismic Data Acquisition

SHORT COURSE:
☐ Migration/Entrapment of Hydrocarbons

Enclose check payable to HOUSTON GEOLOGICAL SOCIETY.
Return with this form to: Houston Geological Society, 7171 Harwin, Suite 314, Houston, Texas 77036

HGS GUEST NIGHT AND AWARDS BANQUET
JUNE 12, 1989

Bill Tidwell (r) presents Lynn Ashby (l), of the Houston Post, a plaque of appreciation for his comical presentation as Guest Night Speaker.

Warren Calvert says a few words of thanks after receiving recognition for his Distinguished Service to the Houston Geological Society.

Matthew Daura (l) was recognized by the Society with Honorary Life Membership through the presentation of a plaque by HGS President Deet Schumacher (r).

Myrtis Trowbridge (l) and Pat Hefner (c), representing the Houston Geological Auxiliary, accept one of this years' Presidents Awards from Deet Schumacher (r). Claudia Ludwig, Ken Aitken and Don Neville were also recipients of Presidents Awards.

PRESIDENTS APPRECIATION DINNER
JUNE 16, 1989 — RICE UNIVERSITY FACULTY CLUB

Deet Schumacher proudly accepts a large ammonoid presented by the Society in appreciation for Deet's leadership and service during his term as 1988-89 HGS president.

Deet Schumacher presents certificates of appreciation to John Sauri, past editor of the HGS bulletin, and members of his committee for their contributions toward a high quality publication.

Members of the 1988-89 HGS Board are honored with plaques in appreciation for their service to the Society during this past year.

Members of the Computer Applications Committee receive a round of applause for their successful efforts in assisting the Society this past year.

HGS SHORT COURSE

THE DOWNDIP YEGUA TREND

DATE & LOCATION: Friday, October 20, 1989; 7:30 a.m. to 4:30 p.m. Exxon Auditorium, Exxon Building, 800 Bell, Houston, Texas.

SCOPE OF COURSE: This course is designed as a "state of the trend" look at the down dip Yegua Formation, from south Texas to Calcasieu parish, Louisiana. The school is a symposium in style, with a variety of speakers drawn from the leaders in the trend. Discussion will include the geology of the trend, special core and E-log evaluation and geophysical interpretation techniques. A panel of experts will answer questions from the audience.

INSTRUCTORS: Will include: Tom Ewing (Venus Oil), Hollis Marshal (Samedan), Bob Parker (Ladd), Ann Martin (Northwind Exploration), Jim Allen (Allen Geophysical), Randy Miller (Reservoirs Inc.), and Rick Hart (Ladd).

COST:

	Pre-Registration by Oct. 13, 1989	At Door
Members	$35.00	$45.00
Non-members	$40.00	$45.00
Students	$20.00	$25.00

REGISTRATION FORM

NAME: _____

ADDRESS: _____

_____

PHONE (home)_____ **(work)**_____

I am registering for (please check):

☐ The Downdip Yegua Trend

Enclose check payable to HOUSTON GEOLOGICAL SOCIETY.
Return with this form to: Houston Geological Society, 7171 Harwin, Suite 314, Houston, Texas 77036

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38TH ANNUAL GCAGS CONVENTION AWARDS

The first place award for Best Paper at last year's GCAGS convention (held in New Orleans, 19-21 October 1988) was granted to Michael P. Prescott, President of Big M Exploration, Inc. and a member of HGS. Second place for Best Poster was awarded to John A. Adamick, Geologist with TGS Offshore Geophysical Co. and also a member of HGS.

PASSAGES

B. Cochran Phillips, Consultant and retired Regional Exploration Manager for Phillips Petroleum Co., died April 2, 1989 at the age of 64.

Kenneth L. Gow, Independent Geologist, died May 9, 1989 at the age of 86.

YOUR BULLETIN NEEDS YOU

Technical Articles

The Houston Geological Society is seeking brief-but fresh articles for the Bulletin on a wide range of Petroleum-related topics. Technical articles of 1000-3000 words in length with one or two figures are particularly appropriate for our audience. Many MS thesis and dissertations are amenable to such condensation and we encourage graduate students and faculty to submit appropriate material. Publication in the *Bulletin* provides exposure to nearly 5,000 geologists and would not preclude publication elsewhere. Copy deadline is 6 weeks before publication. Call Bill Roberts (465-3899) for additional information.

Reviews

In addition to technical articles, we welcome reviews or summary reports of meetings and conferences of interest to our members. These include AAPG, GSA, SEPM, GCAGS, SEG, research seminars, and others. Reviews of significant new books or articles also constitute suitable material for the Bulletin. Contact Kes Barcas (552-3833).

Photos

The Bulletin Committee is always on the lookout for good photographs to use on the front cover of the Bulletin. The subject matter should relate to Geology or the Petroleum Industry. Specific topics can be historical or modern, geological or geophysical, domestic or international. All questions or contributions should be directed to the *Bulletin* Editor.

Letters To The Editor

The Editor welcomes letters that comment on articles in this issue or that discuss other matters of importance to Earth Scientists and Petroleum professionals. The *Bulletin* publishes these letters under the heading HGS Pipeline. Letters should be less than 500 words, concise and typed double-spaced for easy editing.

Other Bulletin Features

On the Move — Accepts announcements of professional and organizational changes.

Trader's Column — Makes free advertising space available to HGS members who have items available for one time transactions.

Source Rocks, Generation, and Migration of Hydrocarbons and Other Fluids in the Southern Midcontinent: A Symposium/Workshop

February 6-7, 1990 - Norman, Oklahoma

The Oklahoma Geological Survey announces sponsorship of its third symposium/workshop in as many years. Topics to be covered include: characterization, depositional environments, and diagenesis of known or potential source rocks; thermal and pressure influences on source rocks; generation, migration, and correlation of hydrocarbons; and the characteristics and flow dynamics of water and other fluids; applied to some part of the Southern Midcontinent.

The proceedings (including extended abstracts for the posters) will be published by the OGS about eight months after the meetings. Direct inquiries to Kenneth S. Johnson, Oklahoma Geological Survey, 100 E. Boyd, Room N-131, Norman, OK 73019 (phone: 405/325-3031).

TRADERS COLUMN

Membership to Geological Data Library, Inc. is being offered for sale by Ladd Petroleum Corporation. Interested parties should contact Rick Hart at 713/622-6911.

The Allied Geophysical Laboratories at the University of Houston are seeking books or journals from retiring geologists. Please call 749-7336 if interested.

EXPLORATION ACTIVITY REVIEW

National Rig Count: July 17—820; Year Ago—903

The Exploration Review Column will be expanding over the next several months to cover international exploration events. (ed)

Texas Gulf Coast

Eagle Oil & Gas has commenced operations at the #1 Guerra, an 11,500' **Wilcox** test about 4000' southeast of abandoned Queen City production at the one-well McDermott Field in **Starr** County. The wildcat is less than a mile southwest of the 18,018' Forest #1 Guerra dry hole which was abandoned following unsuccessful sidewall coring and wireline testing. At the Carrizo Wilcox horizon the new test spots near the crest of a southeast plunging nose bounded by a pair of down-to-the-east growth faults.

In **Duval** County, Cox Oil & Gas has moved in a rig at the #1 Mobil Fee, a 17,000' wildcat near the western edge of shallow Jackson production in the old Hoffman Field. Primary objective is the **Wilcox,** productive 4-1/2 miles northeast in the Rosita Field area. The new test spots near the crest of a down-to-the-southeast-faulted anticline at the Carrizo Wilcox horizon.

San Patricio Corporation will drill a 5600' **lower Wilcox** test 5 miles north of Wilcox oil and gas production at Mula Pasture North Field in **LaSalle** County. The #1 Naylor & Jones Unit is 1-3/4 miles southwest of a 5685' dry hole (Appell #2 Naylor & Jones Ranch Co., et al) which logged reservoir quality lower Wilcox sands from 4100' to 5600'. Top Wilcox structure here is gentle southeast regional dip with local nosing.

A 7000' **Navarro** test has been staked by Kelpetro, Inc. in the northernmost corner of **Karnes** County, 1-1/4 miles northwest of Austin Chalk oil production at the one-well Palo-Grande Field. The #1 Butler is 9-1/2 miles southeast of nearest Navarro production at Klotzman Field, and 6-1/2 miles northeast of a lower Wilcox pay (Bartosh sand) at the one-well Gillette SW Field. At the base Austin Chalk horizon the wildcat spots on southeast dip, immediately upthrown to a down-to-the-southeast fault.

Phillips Petroleum will drill a 16,500' **Wilcox** test 1-1/2 miles southwest of Yegua Oil production at Moss Hill North Field in **Liberty** County. The #1 Hanna's Bend is 4-1/2 miles north of the 12,003' Humble #1 Wimer, one of the very few Wilcox tests in the area, which encountered slight gas shows in several Wilcox sands. At the top Yegua horizon the wildcat spots on steep west dip and appears to be on the extreme southwest flank of the faulted Moss Hill North anticline.

Farther east, in extreme southern **Newton** County, Prairie Producing will evaluate the **Yegua** at their #1 Brown, a 14,500' wildcat 2-2/3 miles east of Yegua and Frio production at Lemonville Field. At the *Nodosaria blanpiedi* horizon the new test spots on the steep south flank of a small faulted structural anomaly.

The following new field discoveries were among those reported in the Texas Gulf Coast province during the past three months:

Fort Bend Co.: Samine Corp. #1 Otto, **Cook Mountain** 9232-9304, F/854 BOPD & 6,400 MCFGPD (opened Indian Field)

Harris Co.: Columbus Energy #1 CEC Gas Unit, **Jackson** 9049-54', F/90 BOPD & 115 MCFGPD

Hidalgo Co.: Shell Western E&P #1 Johnson, et al, **Vicksburg** 14,272-506', F/2,070 MCFGPD (opened southeast McCook Field)

Live Oak Co.: Kilroy of Texas #1 Bateman, **Wilcox** 5779-84', F/1,074 MCFGPD(CAOF) & 3-1/2 BCPD (opened Clayton North Field)

San Jacinto Co.: CXY Energy #1 McMurrey, **Yegua** 4100-04', F/12,378 MCFGPD(AOF)

Webb Co.: Pogo Producing #1 Garcia/Buck, **Wilcox** 8338-76' & 8494-8501', F/1,210 MCFGPD(AOF) & 13 BCPD (opened Missy Field)

Wharton Co.: Maxus Exploration #1 Schumaker, **Yegua** 7627-7745', F/3,996 MCFGPD & 117 BCPD (opened Ammann West Field)

Zapata Co.: Enron Oil & Gas #1 Vela-Cuellar, **Wilcox** 7612-34', F/2726 MCFGPD & 5 BCPD (Opened La Rica Field)

State Waters: Weeks Exploration #1 ST 60S, **Lower Miocene** 8263-90' & 8436-51, F/28.6 MMCFGPD(CAOF) & 53BCPD

South Louisiana

A 17,000′ ***Nodosaria blanpiedi*** test has been staked by Triad Energy of Texas midway between Branch, Rayne and North Crowley Fields in **Acadia** Parish. The #1 Habetz lies within an area of prolific Miocene, Anahuac and Frio production. At the *Nonion struma* horizon the wildcat spots on fairly steep west dip in close proximity to a local down-to-the-south fault.

In adjoining **Lafayette** Parish, ARCO Oil & Gas will drill a 17,000′ wildcat 1-3/4 miles north of *Marg tex* production at Cade Field. The #1 Anderson should be deep enough to evaluate *Bol mex* sands (middle Frio), productive 2 miles northeast at Broussard Field. At the *Marg tex* horizon the new test spots on irregular south dip, fault-separated from Cade Field.

Arkla Exploration has staked their #1 Harvey Estate, a 15,500′ **lower Tuscaloosa** test in northeastern **East Baton Rouge** Parish, 5-3/4 miles west of lower Tuscaloosa production at Baywood Field. Lower Tuscaloosa structure here is irregular southwest regional dip with possible local faulting.

Two new oil discoveries have been completed in southwestern Louisiana. In **Beauregard** Parish, the Burk Royalty #1 Hughes flowed 170 BOPH and 310 MCFGPD from the **Wilcox** at 11,533-553′ about 6 miles northeast of North Singer Field. In adjoining **Calcasieu** Parish, 1-1/2 miles south of Anahuac and Frio production at Choupique Field, the XCL-Louisiana #3 MGGT-GL was completed from **Hackberry** perfs at 12,034-56′, flowing 792 BOPD and 2,447 MCFGPD.

MESOZOIC TREND

East Texas

Operations have commenced at the Roosth & Genecov #1-R Roosth I Trustee, et al, a 10,500′ **Glen Rose** wildcat 2 miles southwest of Paluxy production at Whitehouse Field in **Smith** County. About 1-3/4 miles northwest, the Basin #1 Allen was D&A at 11,573′ in the Rodessa with no cores or tests reported. The wildcat appears to be located on the north flank of the Whitehouse salt dome at the top Pettet horizon.

Farther north, in **Wood** County, Phillips Petroleum has staked a 15,000′ **Smackover** test 1-1/2 miles northwest of Rodessa production at West Manziel Field. The #1-A Moseley is 4-1/2 miles northeast of the Shell #1 Blalock dry hole which cored the Smackover at 12,735-795′ and recovered hard, tight lime with no shows. At the Smackover horizon the wildcat appears to be situated within a salt withdrawal syncline off the northwest flank of a faulted salt ridge.

North Louisiana

Kelly Oil will drill a 9500′ **Hosston** wildcat between Sailes Field (mainly Hosston production) and Lucky Field (Tuscaloosa through Cotton Valley) in **Bienville** Parish. The #1 Placid Fee 22 is about 4000′ north of the Kelly #1 Placid, a 9818′ Hosston dry hole drilled last year, which swabbed some noncommercial gas through Pettit perfs at 7587-96′ before abandonment. At the base Massive Anhydrite the new test spots in a structural low between Sailes and Lucky Fields.

In **Union** Parish, South Oak Production has staked the #1 Baughman Estate, a 10,300′ **Smackover** test about 1-1/2 miles southeast of the one-well North Farmerville Field, productive from the lower Smackover at 10,685-886′. At the Smackover horizon the wildcat spots on the southwest flank of a large south plunging nose and appears to be on trend with the Smackover "A" pinchout responsible for production at Corney Bayou Field to the west.

Alabama-Florida

ARCO Oil & Gas will drill a 19,000′ **Norphlet** test 5-2/3 miles northwest of the town of Chickasaw, **Mobile** County, Alabama. The #1 Brown Foundation is about 3 miles southeast of ARCO's #1 ARCO-Chickasaw River Unit, last year's Smackover discovery which flowed 195 BOPD and 481 MCFGPD from 18,553-580′. At the top Smackover horizon the wildcat spots on a subtle south trending ridge, possibly reflecting a more positive basement feature.

Farther east, in **Escambia** County, Florida, ARCO Oil & Gas is about to spud the #1 Grimes, a 19,000′ **Norphlet** wildcat 6-2/3 miles southwest of Smackover oil production at Bluff Spring Field. The new test is 1-1/4 miles northeast of a 17,331′ dry hole (Shell #1 Schneider) which cored both the Smackover and Norphlet with no details released. At the top Smackover horizon the wildcat spots on the southeast flank of a prominent south plunging structural nose.

The following new field discoveries were reported in the Mesozoic Trend during the past three months:

Navarro Co., Texas: Reynolds Drilling #1 Sloan "D", **Smackover** 9284-9346′, F/530 BOPD & 459 MCFGPD

Wayne Co., Miss.: Texstar North America #1 Mauldin, **Smackover** 15,640-680′, F767 BOPD

Covington Co., Ala.: Cox Oil & Gas #1 Paramount-Jeffers 17-9, **Haynesville** 13,011-056′ (OA), F/478 BOPD & 25.6 MMCFGPD

BILL EISENHARDT
Consultant, Geol. Representative—Geomap Co.

OPINION COLUMN

Continued from page 22

have to offer the scientists involved in Planetary Geology or what they might have to offer us.

We can, of course, give up and believe that since we are in a contracting mode (for Petroleum Geology), we are therefore condemned to shrinking membership. However, I feel that I only wish with this letter to suggest that the HGS has a lot of potential. Work has been taken in this direction by various individuals. I do understand that the HGS is attempting to obtain a wider participation in its activities. I also understand that the *Bulletin* could expand to give members more value, though costs are a consideration. There are other areas in the geosciences which may contribute to growth in our society. I hope all geologists in the Houston area will join the HGS and that the HGS officers will continue to reach out to other less publicized groups of geologists, to help overcome the problem of a shrinking membership.

HOUSTON GEOLOGICAL SOCIETY
MEMBERSHIP APPLICATION

In order to be eligible for active membership, an applicant shall: (1) have a degree in geology or an allied science from a recognized college or university and shall be directly engaged in the application of geology, or shall (2) have been engaged in geological work during at least the preceding five years.

In order to be eligible for associate membership, an applicant shall: (1) be actively engaged in geological or earth science work, or (2) be a student and have completed two years of college and be enrolled in geology or a related science in a recognized college or university granting degrees in earth sciences, or (3) be an administrative officer of a company directly involved with the application of the science of geology.

PLEASE PRINT DATE _____

_____
LAST NAME FIRST INITIAL

To the EXECUTIVE BOARD:

I hereby apply for ☒ ACTIVE ☐ ASSOCIATE membership in the HOUSTON GEOLOGICAL SOCIETY and pledge myself to abide by its Constitution and Bylaws.

Signature: _____

This application must be endorsed by two active members.

Name (print): _____ Signature: _____

Name (print): _____ Signature: _____

APPLICANT: PLEASE TYPE OR PRINT

_____
LAST NAME FIRST INITIAL NICKNAME

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COMMITTEE PREFERENCES (SEE BULLETIN, PAGE 1): _____

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OUTLINE OF EXPERIENCE: _____

Annual dues, $15.00 must accompany application. HGS operates on a fiscal year: July 1 - June 30.

Upon completing this application, please return entire form along with your Dues to:

Houston Geological Society
6916 Ashcroft
Houston, Texas 77081
(713) 771-8315.

SPACE BELOW TO BE USED FOR PROCESSING ONLY

Action of Membership Committee:

Received _____ Approved for ☒ ACTIVE ☐ ASSOCIATE membership

Membership Chairman: _____ Date: _____

Action of Executive Board:

Approved _____ (Secretary) Date: _____

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