BULLETIN
HOUSTON GEOLOGICAL SOCIETY

February, 1986

Volume 28
Number 6

ORIGIN OF MANKIND

FEBRUARY 17, 1986 (Dinner Meeting)
Astro Village Hotel, Kirby at Loop 610
Richard E. Leakey, National Museum of Kenya
"THE ORIGIN OF MANKIND"
Social Period - 7:00 PM, Meeting - 8:00 PM
Reservations by advance purchase only (page 7).

FEBRUARY 19, 1986 (Dinner Meeting)
Westin Galleria Hotel, 5060 Alabama
HGS International Explorationists
H. Hugh Wilson, SOHIO Petroleum
"LATE CRETACEOUS EUGEOSYNCLINAL SEDIMENTATION, GRAVITY TECTONICS, AND OPHIOLITE EMBEDDING IN OMAN MOUNTAINS, SOUTHEAST ARABIA"
Social Period - 5:30 PM, Dinner and Meeting - 6:30 PM.
Tickets must be purchased by Monday, February 17.

FEBRUARY 20, 1986
HGS Continuing Education Seminar (see page 7)
Seismic Stratigraphy by Dr. Norman Neidell

FEBRUARY 22, 1986
Las Vegas Nite (see page 18)
Scotter Hotel, Greenway Plaza

DOUBLE PRESENTATION
FEBRUARY 26, 1986 (Luncheon Meeting)
Meridien Hotel, 400 Dallas
Social Period - 11:30 AM, Luncheon and Meeting - 12:00 Noon.

FEBRUARY 26, 1986 (Dinner Meeting)
Wyndham Hotel, 12400 Greenspoint Drive
HGS International Explorationists
Alan J. Scott, RPVTexas Inc.
"SHELF PLUMES AND WAVE-INFLUENCED DELTAS"
Reservation by name only, telephone 771-8315. Must be made or cancelled by noon, Monday, February 24.

NOTICE: This is a double presentation and telephone reservations are required (771-8315). The deadline for making or cancelling reservations is noon, Monday, February 24.

MONTHLY CALENDAR (see page 19)
EXECUTIVE BOARD

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BULLETIN

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PRESIDENT'S COMMENTS

By the time you are reading this column, you should have received the HGS 1986 Membership Directory. This is the first directory to be composed with the Society's own computer. The directory editor again this year is Bill Anderson of Phillips. Also involved are Membership Chairman Neil Samuels, Publications Chairman Chuck Noll, several people from the Computer Applications Committee, and especially John Hefner. The next time you see one of these be sure to thank them for their efforts.

Our February 17 meeting was to have been a joint meeting with the Houston Association of Petroleum Landmen. We have decided instead to jointly attend the address of the world famous anthropologist, Richard Leakey, that is sponsored by the Houston Geological Auxiliary. Mr. Leakey is director of the National Museums of Kenya and is well known as the world’s leading scientist on the origins of mankind. The meeting will be at the Astro Village Ballroom. Preferential seating will be given to early ticket purchasers. The price is $25 per person and includes wine, cheese and hors d’oeuvres. I urge you to get your tickets early as seating is limited.

I ran across another interesting article in an old Bulletin. In February, 1981, William Fisher wrote “Geologic Activities into the 21st Century: Will the boom bust again?” Bill explained about economic cycles brought on by resource supply shortages. He also explained that upswing is followed by a downturn. The interesting part is that he thought that domestic oil and gas exploration wouldn’t peak until the 1990’s. Little did he know that it would only be 10 short months after the article came out until the bottom dropped out. You have to hand it to Bill though. He at least saw it coming. Many others were thinking that things would continue to go up forever.

Speaking of when the bottom dropped out, be sure to see the notice of the upcoming special seminar for unemployed and underemployed geologists and geophysicists that appears elsewhere in this Bulletin.

In April of 1982, Matt Daura held a HGS meeting at a far western location, the Westchase Hilton, in order to make it easier for our members to attend technical meetings. This was a result of a study that indicated most of our members live to the west or southwest of Houston. At the same time there were inquiries about forming a northern section of the HGS to meet locally (out north) for dinner and a speaker. As a result of these inquiries, Gerry Cooley, Ron Harlan, Dan Smith and I have scheduled “double” meetings in that a luncheon speaker for downtown would also speak at a dinner meeting out north on the same day. At first these were scheduled only twice a year. Ron and Dan have expanded that to four times a year. When I was Program Chairman, I received a note suggesting that I encourage North Belt Management to support HGS activities in the North Belt area. I thought this was amusing since it’s usually difficult to get management to do anything. The HGS did send out letters to all known exploration managers asking that they encourage participation in HGS activities. The bottom line, however, is how much each of us does for our own continuing education and participation in professional activities and not what someone else does for us. I don’t think any of the western or northern meetings have been large successes. Very few of them had more than 100 attendees. A couple only had 50 or 60 people. Not really raving success stories, but it is a start. I have been asked why we don’t have more meetings in the North Belt area. Well, we will when we get better participation in that area. We won’t have successful meetings at North Belt, however, until the members in that area take it upon themselves to talk about the meetings and build up the attendance. If there is anyone out there who is willing to help organize or advertise the North Belt meetings let me know as soon as possible. The fate of the society in the North Belt area rests in the hands of the members in that area. Let’s all do our part to make it successful!

MAC MckINNEY
President

PRICE SCHEDULE—HGS FEBRUARY MEETINGS

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<tr>
<th>Location</th>
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HGS INTERNATIONAL GROUP

Westin Galleria Hotel, February 19
Dinner ........................................ $21.00

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 $21 and a stamped self-addressed envelope to:

Houston Geological Society
616 Ashcroft
Houston, Texas 77081

Ticket distribution and receipts are handled by Mark Spanglet and all inquiries should be directed to him at 877-5920 between 8 AM and 4 PM.

SOCIETY CALENDAR FOR MARCH 1986

Monday, March 10 ......... Joint Dinner Meeting with GSH
Stouffers Inn, Greenway Plaza
Speaker -- George Ansell, Colorado School of Mines
“Energy and Minerals: A Technology and Education Agenda for the Future”

Wednesday, March 19 ............... Dinner Meeting
Westin Galleria Hotel, 5060 Alabama
Speaker - Stephen J. Derksen, Marathon Oil Company
“Rift Basin Development, Especially in Suday and Kenya.”

Wednesday, March 26 ............... Luncheon Meeting
Meriden Hotel, 400 Dallas
Speaker - Billy S. Flowers, Shell Offshore, Inc. (ret.)
“Corsair Trend - Exploring for Deep Geopressed Gas, Middle Miocene, Offshore Texas”
EVENING MEETING—FEBRUARY 17, 1986
RICHARD E. LEKEY—Biographical Sketch

Richard Erskine Leakey is a world-renowned anthropologist and paleontologist. He was born in Nairobi, Kenya, December 19, 1944, to Louis and Mary Leakey, who had already gained worldwide fame for their study of prehistoric life in East Africa. Though Mr. Leakey does not hold an academic degree from a university, he grew up among anatomical, geological and biological discussions dealing with anthropology and accompanying his parents on archaeological expeditions in East Africa.

Mr. Leakey began his own research efforts in 1963 as a co-leader of the Lake Natron Research Expedition. Since that time, he has conducted and led numerous expeditions and research projects throughout the Great Rift Valley of East Africa. His discoveries, research and publications have greatly contributed to the study of human ancestry. This work also resulted in his appointment in 1968 as Administrative Director and then Director/Chief Executive of the National Museums of Kenya. The museums, combined with his development of laboratories in Nairobi, have made Kenya a major center for the study of evolution and human origins.

Mr. Leakey has lectured all over the world, written a variety of books, and contributed popular and scientific articles for many magazines and journals. Perhaps his better known publications include the best-seller Origins, People of the Lake (both co-authored with Roger Lewin), Charles Darwin’s Origins of Species which was abridged and introduced by Richard Leakey, and worldwide best-seller The Making of Mankind. Mr. Leakey also narrated a popular and widely televised seven-part documentary for BBC UK entitled “Making of Mankind.”

Mr. Leakey is married to Dr. Meave Leakey, who has accompanied him on many expeditions, contributed to his research efforts, and co-authored a number of research papers. The title of Mr. Leakey’s HGS presentations is:

THE ORIGIN OF MANKIND

DOUBLE PRESENTATION
FEBRUARY 26, 1986
ALAN J. SCOTT—Biographical Sketch

Dr. Alan J. Scott is a noted clastic and carbonate sedimentologist with 25 years of experience in both ancient and modern depositional systems. Through his work he has related modern coastal processes to a variety of ancient clastic analogs in the Gulf Coast and southern and central Rocky Mountain regions.

While serving a 14-year tenure as professor of geology at The University of Texas at Austin, Dr. Scott supervised theses and dissertation research based on a philosophy of practical problem solving and personal development to increase his students’ effectiveness in industry research. As director of the Geology Foundation at The University of Texas, he administered expenditures and solicited funds for a foundation endowed at the level of $7.3 million. He has conducted in-house technical development seminars for many oil companies, as well as seminars and short courses for society-sponsored groups such as the American Association of Petroleum Geologists and the Rocky Mountain Association of Geologists.

As president and senior scientist of RPI/Texas, Inc., Dr. Scott applies his expertise in sedimentology and the effects of regional tectonics to detailed stratigraphic projects defining exploration fairways for the oil industry.

SHELF PLUME AND WAVE-INFLUENCED DELTAS: A SIGNIFICANT MECHANISM FOR FORMING SHELF SANDS AND STRATIGRAPHIC TRAPS

Shelf-bar sandstones of the Western Interior Seaway of North America are encased in marine shales and form excellent stratigraphic traps for hydrocarbons. Several of these sandstones were deposited by coastal/nearshore currents that were diverted by projecting deltaic headlands. These currents transported sand down-drift and onto the adjacent muddy shelf floor. The sands formed plumes that were relatively narrow (5-15 miles wide) belts that extended 10-20 miles down-drift and projected 5-15 miles basinward from associated deltaic shorelines.

Channel avulsion and lobe-switching resulted in abandonment and transgression of deltaic axes. The plumes associated with abandoned delta lobes became inactive and were re-worked. Migrating shelf-bars were formed during this transgressive phase. The degree of reworking and the relative significance of waves and near-shore currents formed a spectrum of plume types.

Sandstones associated with shelf plumes are characterized by their arcuate strike-longate geometry, geographic relation to contemporaneous deltaic headlands and vertical sequence of subfacies. The sandstones have transitional bases and coarsen upward. Log response patterns resemble shoreface sequences. Subfacies successions based on sedimentary structures lack beach subfacies or evidence of subaerial exposure. The shelf-bar sandstones are also completely encased in bioturbated shelf mudstones.

Modern shelf sand plumes have been recognized on the Sinai Shelf down-drift from the Nile River delta. Several examples of Cretaceous plume related shelf-bars have been described along the western margin of the Western Interior Seaway. Shelf plumes are also an important Gulf Coast exploration model for many wave-influenced Cretaceous and Tertiary formations.

ON THE MOVE

Professional and organizational news may be sent to Lerverne B. Cobb, L. B. Cobb and Associates, 27 East Shady Lane, Houston, Texas 77063, or telephoned to (713) 780-0132. Announcements must be sent six weeks in advance of publication in the Bulletin.

Duane L. Archer has been named vice president of Core Services for NL Erco, a division of NL Industries. Mr. Archer held numerous positions with Amoco Research and Core Laboratories prior to joining NL Erco.
H. Hugh Wilson is a senior consulting geologist for the Middle East and East Africa regions, for Sohio Petroleum Company International. He received a B.S. degree, with honors, in natural science (geology major) from Dublin University in 1950 and an M.S. degree in geology from the same university in 1952. Upon graduation, Mr. Wilson joined Royal Dutch Shell and spent the next 17 years in various areas of the world: as field geologist in Colombia, chief geologist and head of exploration in Turkey, exploration manager in Guatemala, exploration manager of the Arabian Gulf and Oman area, general manager of exploration and production in Australia, and in management programs in London. In 1969, he transferred to Shell U.S. where he worked primarily the Gulf Coast area. In 1973, Hugh resigned from Shell to join a consulting firm in New Orleans, and later became a consultant to Louisiana Land and Exploration Company. After six years of looking after worldwide projects for LL&E, he formed his own consulting firm, Vanguard Exploration. In 1983 he joined Superior Oil as a staff explorationist and in August of 1984 went to work for Sohio in international exploration.

Mr. Wilson has published papers on a wide range of technical topics and geographical areas. These papers appeared in such publications as AAPG bulletins, Geology Magazine, Journal of the Institute of Petroleum, GCAGS Transactions, and the Journal of Petroleum Geology. The areas covered by his papers have included the U. K., Guatemala, British Honduras, the Oman Mountains, the Gulf of Mexico, Saudi Arabia, and Mexico. He has dealt with such diverse subjects in his papers as salt tectonics, diagenetic traps for hydrocarbons, orogenic pulses, and timing of hydrocarbon expulsion. In addition, he has been a lecturer for the Advanced Petroleum Geology courses at Tulsa University and for in-house exploration seminars within oil companies. He was key speaker at the GSA Penrose Conference on Geodynamics of Continental Interiors, and has been guest speaker at geological societies in California, Louisiana and Texas. He has served as Associate Editor of AAPG and was a team member of the International Geodynamics Project working on global synthesis of evidence leading to the reconstruction of distribution of continents and oceans through time.

Mr. Wilson is a fellow of the Geological Society of London and the Institute of Petroleum in London. He is a member of the Geological Society of America, the American Association of Petroleum Geologists, the American Association for the Advancement of Science, the Australian Petroleum Exploration Association, the New Orleans Geological Society, and the Houston Geological Society.

The Oman Mountains border the Gulf of Oman from the Arabian Sea to the mouth of the Persian Gulf. The Jebel Akhdar anticline forms the central core of these mountains and exposes a section from the Precambrian nucleus to late Tertiary aged strata on the flanks. Intercalated in this sequence, between well-dated late Cretaceous sediments, is a melange of rocks composed of turbidite limestone, radiolarian chert (Hawasina Group) and massive exotic blocks of Permo-Triassic limestone overlain by a thick sheet of serpentinic igneous rock (Semail igneous series). This association of rocks, known as Steinmann's Trinity has been little disturbed since its emplacement during the Late Cretaceous. The scarcity of Late Cretaceous fossils in the Hawasina, the common occurrence of well-preserved Permian to middle Cretaceous species, and the contorted nature of the strata have led some geologists to postulate that these sediments were deposited outside of their present location during a prolonged pre-Late Cretaceous interval and then tectonically emplaced during the latest Cretaceous. However, it also can be interpreted from field data that the Hawasina is para-autochthonous and was deposited near its present location during Late Cretaceous time.

Regional correlation of autochthonous sections show that northeast Oman was situated far out on the Arabian platform where carbonate sedimentation persisted from Permian to Cenomanian time during prolonged regional tectonic quiescence. Sedimentary and tectonic quiescence ended during Late Cretaceous time when the thick Aruma pelagic shale was deposited across northeastern Oman concomitant with major normal faulting.

The distribution, grading, and constitution of the carbonatelastic material in the Hawasina, and the alignment of exotic limestone blocks indicate that the sediment source area was a northwest-southeast-trending uplift of Permian to Cretaceous carbonate rocks. Scarcity of terrigenous clastic material and terminal submarine volcanism suggest that the source area was a submerged seamount. Erosion from this high is believed to have been by means of turbidity currents activated by repetitive block-fault movement over a rising mantle diapir.

Hawasina sediments compare with present deep-water sediments in the Puerto Rico Trench were faunally barren siliceous oozes of abyssal facies are interbedded with calcareous turbidites rich in reworked older and contemporaneous shallow-water fauna. The absence of contemporaneous (Late Cretaceous) shelf fauna in the Hawasina is attributed to the seamount source area being deeper than neritic, whereas the absence of contemporaneous pelagic calcareous fauna was the result of dissolution below the carbonate compensation depth. One of the most controversial problems in Oman is the dating of melange sediments which are heavily contaminated with reworked fossils.

The deep trough which received Hawasina sediments appears to have been bounded by a steep block-faulted northeastern limb whereas the southwestern limb became shallower gradually through the Aruma belt to the Arabian carbonate platform. At the close of Hawasina time, volcanism and catastrophic tension relief faulting dislodged the remnants of Permo-Triassic limestone from the roof of a mantle diapir.
and these descended into the trough as huge gravity slides (e.g., Jebel Kawr, 250 sq mi), leaving the seamount as a denuded basement uplift. Regional tension relief was accomplished finally by crustal separation and flood eruption of Semail ultrabasic pillow lavas onto the abyssal landscape.

Exploration for simple structures in the autochthonous Cretaceous limestones which subcrop the Hawasina is hampered by seismic energy attenuation and velocity problems. It is probable that simple block faulted structures such as the Fahud and Natih fields may underlie the contorted Hawasina cherts.

This presentation by H. Hugh Wilson was originally scheduled to have been presented to the Society on September 18, 1985.

NEW HGS SEMINAR
HEAR YE! HEAR YE! HEAR YE!

As a part of its continuing educational effort, the Houston Geological Society announces an original seminar to be called: WHAT TO DO WHEN THE BOTTOM DROPS OUT. It is scheduled for March 7, 1986 in the Exxon Auditorium, from 9:00 AM until about 2:30 PM. The fee for HGS members is $10. For non-members a fee of $25 will be charged to cover bare-bones expenses and a portion of this fee ($15) can be used to pay for a one-year membership in the Houston Geological Society.

Topics will include advice on what to do when the bottom drops out, organizing the job search, the outlook for employment in the industry in general, and employment in specific fields outside the industry — e.g., government, academia, the public school system, etc. Also included will be speakers from a placement firm, a research organization which specializes in testing an individual’s innate skills, and a presentation by a recruiter for a major company.

If you are unemployed or underemployed the society wants to help in this difficult time. The aim of the seminar is to provide new ideas and new concepts (from a panel of experts) which are intended to help your job search.

If you want the benefit of counsel from experts covering all facets of the job market, come to the seminar. For additional information, or to register for the seminar, call the HGS office at 771-8215.

CALVERT—HGS SCHOLARSHIP FUND

The Houston Geological Society gratefully acknowledges recent contributions to the Calvert-HGS Scholarship Fund from the following individuals:

Mr. W. Dean Grafton
Mr. Paul K. Goodrich
Mr. W. N. McKinney, Jr.
Mr. J. W. Roach
Mr. James E. Werner
Mr. Jack Colle
Mr. W. F. Cooke, Jr.

WOMEN GEOSCIENTISTS—AWG SEMINAR
FEBRUARY 8, 1986

The Association of Women Geoscientists will sponsor a personal development seminar at the L'Hotel Sofitel, 425 North Belt East, Houston on February 8, 1986. All interested persons are invited to attend.

TOPICS:

Session A
Time Management - Bonnie Foxworth
Selling Yourself and Your Ideas - Eunice Reass
Managing Your Own Career - Marsha Keliher
Negotiating Agreement Without Giving In - Maureen O'Shea Peltier

Session B
Alternative Careers for The Geoscience Professional - Panel
Risk Taking: Getting Out of Your Rut - Helen Snyder
An Introduction To Computer Usage - Molly Mayfield
Computer Application in Geology - Molly Mayfield
Computer Application in Geophysics - Oklahoma Seismic Corp.

Session A and B
The Fashion Cycles - Their Impact on Professional Business Dress - Carla Kay

TIME: 8:00 AM to 5:00 PM
LUNCH: 11:45 AM
Career and Life Planning - Knowing where you are going so you won’t end up somewhere else.
Robert E. Pennington, III

COST: $65 for AWG and FHPW Members
$75 for Non-members
$15 Lunch only
Pre-registration Deadline: February 3

ASSOCIATION FOR WOMEN GEOSCIENTISTS
Personal Development Seminar

ENCOURAGE EXCHANGE ENHANCE

Please make a reservation for the following persons:

Name: __________________________ Address: __________________________ Phone: __________________________
All Day Lunch Only Amt. Encl. ____________

Name: __________________________ Address: __________________________ Phone: __________________________
All Day Lunch Only Amt. Encl. ____________

Name: __________________________ Address: __________________________ Phone: __________________________
All Day Lunch Only Amt. Encl. ____________

Return to Carolyn Perkins, 5415 Ariel, Houston, Texas 77096. (713) 780-4419. Make check payable to AWG - Houston.
1985-1986 HGS FIELD TRIP COMMITTEE

Name          Company                Phone
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Bill Baehr    Consultant            271-9131
Wynn Gajkowski Mark Producing Inc. 953-5242
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Quentin Moore Corpus Christi Oil and Gas 658-0601
Diane Neff    Quadra Oil and Gas 270-1648
Kari Rekoske  Elf Aquitaine Petroleum 739-2312
Dave Roberts  Wintershall 877-1406

UPCOMING FIELD TRIPS

5. Damon Mound ........ March 15, 1986

**Details of the trips will be published in the Bulletin.

HGS BIG BEND FIELD TRIP

"The Last 50,000,000 Years in the Big Bend Region, Trans-Pecos, Texas"
by Dr. J. B. Stevens, Lamar University, Beaumont, Texas

Date: April 23-27, 1986
Registration Fee: $350.00
(includes all transportation, lodging, breakfast, lunches, and guidebooks).

Please complete the registration form and mail it, a check for $350.00 payable to the Houston Geological Society, and self-addressed stamped envelope by April 15, 1986 to:
Gary Moore
Columbia Gas Development Corporation
P.O. Box 1350
Houston, Texas 77251-1350.

REGISTRATION FORM

"The Last 50,000,000 Years in the Big Bend Region, Trans-Pecos, Texas"

NAME: ____________________________

COMPANY: _________________________

PHONE NUMBER: ___________________
ENTERTAINMENT CALENDAR, 1985-1986

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<td>Bar-B-Q</td>
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<td>Skeet Shoot</td>
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H.G.S. Golf Tournament

The annual HGS Golf Tournament will be held on Monday, March 17, 1986 at Kingwood Country Club with its three 18 hole courses will again be the site of our tournament.

The tournament will be a four-man team, best ball tournament with both individual and team prizes. A shot-gun start at 11:45 AM using all three courses will be followed by a putting contest and an informal Bar-B-Que 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 each flight will play 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 ninety-six (96) four-man teams entered (384 total golfers).

Entry fee will be $40.00 for HGS members and $50.00 for non-members. The deadline for entries will be March 10, 1986. The entry fee will pay green fees, golf carts, driving range use with practice balls, and the BBQ award dinner. So get your group together, come out and enjoy the competition, food, and the fun.

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

Gary L. Wirey
Wirey Resources, Inc.
8102 Wycomb Dr.
Houston, Texas 77070
Phone: 469-1874

All entries received will be acknowledged by return phone call.

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Houston Geological Society Bulletin, February 1986
SEISMIC STRATIGRAPHY
An Integrated Approach to Seismic Exploration for Stratigraphic Traps
Dr. Norman Neidell
Zenith Exploration

SHORT COURSE:
Thursday, February 20th, 1986 (7:30-11:00 AM and 12:30-4:00 PM) to be held in the Exxon Building Auditorium, 800 Bell Street at Travis

SCOPE OF COURSE:
A procedure for defining stratigraphic traps using the seismic method is described. The course starts with principles of basin analysis and then details an approach which has been successful in locating stratigraphic traps. For application on land, a geologic model is impressed on a wavelet processed section where precise velocities have been developed on a shot-point by shot-point basis. Facies analysis is applied on this section as well as a color seismic acoustic impedance display. Seismic patterns and geometries are analyzed and depositional models are formulated. Moveout velocities are also analyzed. Case studies illustrating the procedure and a modified procedure for marine data and resulting discoveries in sand/shale and carbonate environments are reviewed and summarized to show the power of the approach.

INSTRUCTOR:
Dr. Norman Neidell received a B.A. Degree from New York Univ., a Post-Graduate Diploma in Applied Geophysics from Imperial College and a Ph.D in Geodesy and Geophysics from Cambridge University. He acquired basic experience with Gulf Oil and Seiscom-Delta, and undertook independent ventures in 1971. In 1973, he joined the founding of Geoquest International Inc., an exploration consulting company and seismic contractor. In 1976, he co-founded Zenith Exploration Co. Inc., now an oil and gas consulting company. He currently serves as President and Chief Executive Officer. Dr. Neidell is an Associate Professor in the Geology Department of the University of Houston and lectures in Continuing Education Programs as well as for programs at the University of Tulsa, the Society of Exploration Geophysicists (SEG), AAPG, and the Society of Petroleum Engineers (SPE). He is a past President and Honorary Member of the Geophysical Society of Houston, a past Editor of Geophysics and a member of several SEG committees.

SEISMIC STRATIGRAPHY
REGISTRATION FORM
Fee: $75 (on-site registration $95)
Students, unemployed and emeritus $40 (on-site $50)

NAME: ____________________________ TELEPHONE: _______________
COMPANY AFFILIATION: ___________________________________________
ADDRESS: _______________________________________________________

Enclose check payable to: HOUSTON GEOLOGICAL SOCIETY and return this form to:
Houston Geological Society
6916 Ashcroft
Houston, Texas 77081

Substitutions can be made at any time. Please complete a separate registration for each participant.
CONTINENTAL SCIENTIFIC DRILLING PROGRAM

A proposal for deep scientific drilling and associated exploration and research, Texas Gulf Coast

by Lynton S. Land and William Galloway
University of Texas at Austin

The Texas and Louisiana Gulf Coastal provinces are characterized by an array of scientific dilemmas ranging from the origin of the Gulf itself and the nature of the subcrust to the causes and effects of long-lasting and continuing circulation of thermobaric waters throughout the thick sedimentary section.

The Gulf Coast is correctly classified as a "passive margin", as attested by the scarcity of seismic activity. Plate tectonics theory requires that the Gulf originated by rifting related to continental drift. From the little information concerning deep structure lithology that is available, this theory is appropriate, but by no means conclusively demonstrated. The nature of the underlying crust and its superadjacent sediments and their contained waters; the precise timing of the rifting; the fluid dynamics, geochemistry, diagenesis and early depositional history of the sedimentary sequence; the thermal history and the unusually high thermal gradient; and the fluid pressure regime in the deep sedimentary section are all too poorly known to permit quantitative analysis of processes which are of enormous scientific and practical importance.

In our opinion, the San Marcos arch is the best location for investigating these important phenomena and problems. The arch, extending southeastward from exposed Grenville basement rocks of the Llano uplift, is situated in an area of both lateral and vertical convergence of the sedimentary cover of the Gulf Coast Basin. Seaward of the Llano uplift, highly deformed and slightly metamorphosed rocks of the Ouachita-Marathon orogen have been intersected at depth beneath Cretaceous sediments. The inferred edge of continental crust underlies an extensive Lower Cretaceous reef trend a few miles to the southeast of the known Ouachita rocks. Rapid thickening of Tertiary and possibly of Cretaceous sediments southeast of the reef, together with geophysical indications of a relatively shallow Moho suggest that a transitional continental crust underlies sediments basinward of the reef trend. This transitional crust could be rifted Grenville basement, buried rocks of the Ouachita trend, an island arc related to the Ouachita trend, or exotic continental basement related to a proto-south American continent.

On the basis of our present understanding of deep structure, it appears possible to locate a drill hole southeast of the reef trend which will penetrate a thick sequence of abyssal sediments, sample sediments in an underlying rift, and enter the "transitional crust" beneath the sediments.

Of equal importance to structural problems are questions related to diagenesis, lithification, and hydrodynamics of Tertiary and underlying Mesozoic sedimentary fill of this basin. Recent application of new techniques, including stable isotope, stable isotope, trace element and fluid composition analysis have shown that both the diagenetic and the hydrologic systems are dynamic, and that fluid and mass transport within the basin are much more extensive and complex than previously assumed. Mass flux from the Mesozoic or older basin and convective recycling of deep waters are increasingly appealing as explanations for observed pervasive diagenetic features and for deposits of ore minerals and hydrocarbons found in shallow sediments.

The Cenozoic section contains three ground water regimes: an active meteoric regime, extending to depths exceeding one kilometer; a regime at intermediate depths, characterized by normal to moderately elevated hydrostatic gradients; and a deep system in the lower portion of the basin fill, including the Mesozoic section, containing highly over-pressured, thermobaric waters, apparently derived in part from mineral dehydration reactions and thermal alteration of organic matter. Evidence exists that these deep thermal waters are still escaping to the surface along structurally controlled channels, and that the diagenetic changes and deposition of ore minerals continue today. Isotopic evidence indicates that at least some of the oil being produced from Cenozoic rocks is derived from deeply buried anoxic Cretaceous sediments. The penetration and study of these deep rocks is obviously of great scientific and practical importance.

The causes of the abnormally high thermal gradient present in much of the Gulf Coast is a matter of controversy. Undoubtedly circulating thermobaric waters play an important part. However, the nature of the "transition basement" and the structure at the basement-sediment interface may also be important, particularly as the rifting process might involve emplacement of large volumes of igneous material. Data derived from preliminary seismic and heat flow studies and from deep drilling will facilitate the modeling of the deposition rates of sediments and hence of subsidence rates related to cooling and loading of the transition crust. Furthermore, if the observed thermal gradients are essentially linear, then the planned deep drillhole should reach into the zone of green-schist metamorphism, thus providing an opportunity to collect rocks and associated fluids in a place where metamorphism and the formation of new crust is actually taking place.

The approximate locations of the proposed deep seismic reflection profile to be shot as a first stage of exploration are indicated on the enclosed figures. To achieve the best results the borehole should penetrate a relatively thin succession (100-3000 ft) of synrift, graben fill sediments at depths of less than 35,000-40,000ft. For this reason a detailed seismic grid will be shot in the proposed drill site area to more clearly define the geometry and depth of basement. The detailed work may be done simultaneously with or after a deep sounding "COCORP type" profile has been run which will define the major framework of the Gulf Coast along the San Marcos Arch.

Additional research leading to selection of the most propitious drill site would include use of the abundant shallow to intermediate depth (500 m) drill data to refine our knowledge of fluid and diagenetic regimes of the upper part of the basin fill, analysis of the thermal regime and heat flow along the crustal transition zone, and expanded geochemical and isotopic studies to better define the extend and importance of vertical flux of fluids and elements through the sedimentary fill.
PRE-WOODBINE EXPLORATION POTENTIAL
February 18, 1986

The Louisiana State University BASIN RESEARCH INSTITUTE and the DEPARTMENT OF GEOLOGY are pleased to invite you to participate in a one day seminar presenting some of their current research results related to the hydrocarbon potential of the Central Gulf Rim (north Louisiana, southern Arkansas, and east Texas). The conference should be of vital interest to all geologists engaged in oil and gas exploration and production activities in this important geologic sub-province. We plan to discuss the structural development of the region, the Pre-Woodbine stratigraphy and depositional environments, diagenetic patterns affecting reservoirs, and the origins of hydrocarbons and brines. All of this will be done in the context of past hydrocarbon production history with the hope of stimulating the formulation of new strategies for oil and gas exploration.

The registration fee of $35.00 must be received by February 15, 1986. All participants must register in advance. The fee will cover conference expenses and includes a luncheon in the LSU Union Royal Ballroom. All technical presentations will be in the LSU Union Colonnade. For more information contact the conference coordinator, Karen Humphrey, Geology Department, Baton Rouge, LA. 70803, (504) 388-3415.

RICE UNIVERSITY GEOLOGY SEMINAR SERIES

The Department of Geology of Rice University invites you to attend their Wednesday afternoon geology seminars during the 1984-85 academic year. Seminars are held in Room 106 of the Geology Building and they begin promptly at 4:00 PM. For further information call 713-527-4880.

GULF COAST SECTION/SEPM 1985-1986 EXECUTIVE COUNCIL

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HGS SEEKS NOMINATIONS

The Nominating Committee will soon be meeting to select a slate of 1986-87 HGS officer candidates to be presented to the membership in March. If you have someone you wish to be considered for nomination contact any of the following, Matt Daura 439-4002, Peggy Rice 293-2923 or Jerry Cooley 665-8432 and be assured that your nominee will receive due consideration.

UNIVERSITY OF HOUSTON GEOLOGY SEMINAR SERIES

The Department of Geosciences at the University of Houston, University Park, invites you to attend their Friday afternoon seminars during the 1985-86 academic year. Seminars will be held in room 315 Science and Research I and will begin at 3:00 P.M. for further information call 713-749-1803.

PASSAGES

Claude M. Watts, Geologist with Tenneco Oil Exploration and Production, formerly with Houston Oil and Minerals and Texaco, died December 12, 1985, at the age of 62.

Stuart K. Clark, retired from Conoco where he had been Manager of Foreign Department, Honorary Life Member of HGS, died December 27, 1985, at the age of 92.
REVIEW OF EXPLORATION ACTIVITY

National Rig Count: Dec. 2—1986; Year Ago—2686
Houston Region: Dec. 2—310

OFFSHORE GULF COAST

Union Oil of California will drill a 10,836' Miocene wildcat on Matagorda Island Block 672 off Calhoun County, Texas. The #1 OCS-G-4702 is 10 miles south of Matagorda Island Block 619 Field, a Pleistocene gas reservoir.

Off Brazoria County, Odeco will drill a 10,750' Miocene test on Galveston Block 304-L. The #1 OCS-G-4566 is 7 miles northeast of Miocene gas production at Galveston Block 310-L Field.

Chevron, USA will test the Pleistocene to 10,000' at the #1 OCS-G-5635 on South Timbalier, South Addition Block 267 off Lafourche Parish, Louisiana. The wildcat is 10 miles northeast of South Timbalier Block 301 Field, a Pleistocene oil reservoir.

Two wildcats are scheduled for the Viosca Knoll Area in the northern Gulf of Mexico. On Block 945, Texaco will drill the #1 OCS-G-5788 to 16,711' 4-1/2 miles southeast of South Pass Block 62 Field. About 35 miles east, Shell Offshore has staked a 14,000' test on Block 956. The #1 OCS-G-6896 will be drilled in 31 75' of water. There is no nearby production.

Phillips Petroleum has tested gas and condensate at a 16,000' wildcat on Matagorda Island Block 639, offshore Texas. The #1 OCS-G-4542 flowed at a combined rate of 15MMCFGPD and 266 BCPD from two undesignated zones below 10,000'.

PELTO OIL has staked the #1 State Tract 33, a 13,500' Frio test 5-1/3 miles southeast of Frio and Vicksburg production at Port Arthur Field in Jefferson County. Primary targets are Hackberry and Nodosaria sands which are inconsistently developed in the area. At the Camerina "A" horizon the wildcat spots on south dip, immediately downthrown to a large down-to-the-coast fault.

Farther north, in Jasper County, South East Texas Oil will drill a 12,500' Wilcox wildcat 2 miles south of Wilcox and Yegua production at Buna Field. The #1 Crockett should encounter sand development similar to that a Buna West Field. At the Wilcox horizon the wildcat spots on the outer edge of a saddle between two downthrown anticlinal features.

Three new field discoveries were reported: In Live Oak County, CPC Exploration opened East Mikeska Field at the #1 Hailey Estate, flowing 614 MCFGPD from the Wilcox at 11,405-429'. In Jackson County, Ladd Petroleum completed its #1 Bain in the Yegua at 8892-9018', flowing 2512 MCFGPD and 38 BCPD. In Orange County, Celeron Oil & Gas completed a Hackberry discovery at the #1 Powell Lumber Company, flowing 408 BOPD and 384 MCFGPD from 8651-55'.

South Louisiana

Cotton Petroleum has completed a new deep Yegua discovery 4 miles southeast of Vicksburg and Cockfield production at North Strarks Field in Calcasieu Parish. The #1 Sonat Minerals flowed 155 BOPD and 250 MCFGPD from 11,353-73'. About 4 miles southeast, Exxon has staked location for another deep Yegua wildcat. The #1 La Bokay Corporation, projected to 12,500', will attempt to extend the downdip Yegua producing limits even further. At the Hayes horizon, regional structure consists of subtle noses developed on southerly dip, but could be substantially different below the Hackberry interval.

In Allen Parish, Pinelands Petroleum will drill a 13,100' Wilcox wildcat 8 miles northwest of Sparta and Wilcox production at Reddell Field. The #1 Pinelands Petroleum Company Fee is 1-1/2 miles northeast of a 13,875' Westland dry hole which encountered ample Wilcox sand development, primarily water-bearing. Structure at the Top Wilcox horizon appears to be slightly irregular south dip, based on very sparse control.

Also in Allen Parish, Amoco Production has staked location for its #1 Unkel, a 16,800' Wilcox test 3 miles north of Cockfield production in North Edna Field. Nearest Wilcox production is 4-1/2 miles north at Lyles Field. Regional structure at the Cockfield horizon is dominated by broad south plunging noses with no faulting apparent.

Camex, Incorporated will drill a 14,500' wildcat 1-1/2 miles northeast of multiple pay Miocene production at Bayou Sale Field in St. Mary Parish. The #1 Burgessier Company will test Middle Miocene Robulus "43" and Operculinoides sands, present but wet in a McCormick dry hole 1-1/2 miles northwest. At the Rob "43" horizon the wildcat spots on south dip near the axis of a salt-withdrawal trough.

Father east, in Lafourche Parish, Pennzoil Production has scheduled a 12,700' wildcat, the #17 M.R. Fee 852, to evaluate Cristellaria 'l' sands productive in Bayou Portuguese
Field 2-1/2 miles southwest. Cris 'I' sands are generally developed in the area. At the Cris 'I' horizon the wildcat spots on a broad south-plunging nose cut by a large down-to-the-south fault, based on limited control.

Exxon will drill a 13,300' lower Tuscaloosa test, the #1 Crown Zellerbach, 3 miles northeast of recently established lower Tuscaloosa production at Northwest Liverpool Field in St. Helena Parish. Structure at the lower Tuscaloosa horizon appears to be regional south dip with minor nosing.

**Mesozoic Trend**

**East Texas**

Fair Oil has staked location for the #1 Bruner, a 10,000' Travis Peak wildcat 4 miles southwest of Sub-Clarksville production at Janna-Pat Field in Smith County. About 3/4-miles southeast, the Sun #1 Hammon drilled to 10,600' but reported no cores, test, or shows prior to abandonment. At the Paluxy horizon the wildcat spots on northeast dip, updip to Janna-Pat Field production.

Farther northeast, in Wood County, Sierra Production has completed a new Rodessa oil discovery about 1/2 mile north of Sub-Clarksville production at McCrory Field. The #1 Johnson flowed 199 BOPD from 7984-96'. Trapping mechanism appears to be fault-controlled.

Bosart Oil has completed the #1 Royall National Bank as a Rodessa gas discovery in Anderson County 1-3/4 miles east of Paluxy production at Michael Birch Field (Freestone County). Flow rate was 3 MMCFGPD from 8991-97'. At the Base Massive Anhydrite horizon the new producer spots on the southeast flank of the Prairie Lake South/Michael Birch Field structure.

**South Arkansas**

Lake Ronel Oil will drill a 10,200' Smackover wildcat about 2 miles southwest of Rodessa production at South Rocky Mound Field in Miller County. The #1 Nolte 36-10 is 2-1/2 miles northwest of a 10,500' Schurman dry hole which logged some Smackover porosity development but recovered no shows in a limestone core. Structure at the Smackover horizon is southwest dip off the South Rocky Mound Field structure.

Farther east, in Union County, ANR Production has scheduled a 9500' Smackover test 2 miles north of Cotton Valley production at Cornie Creek Field. The #1-15 Mook-Mellor is one mile north of a dry 9325' Cornie Creek outpost attempt which penetrated about 50' of Smackover with no test results reported. At the Smackover horizon the wildcat spots on irregular south dip and is updip to Cornie Creek Field production.

**Mississippi-Alabama**

Kaneb Oil & Gas has staked location for a 17,000' Jurassic test 3 miles west of West Heidelberg Field (Selma Chalk to Cotton Valley production) in Jasper County, Mississippi. The #1 Soterra is about 2-1/2 miles northeast of an 18,200' Pan Am dry hole which penetrated approximately 5000' of Jurassic section before reaching TD in the Haynesville-Buckner interval. At the Smackover horizon the wildcat spots on the northwest flank of a graben-faulted salt antcline.

In Amite County, Hughes Eastern Petroleum has opened North Hustler Field at the #1 Burris 23-7, a lower Tuscaloosa discovery 2-7/8 miles west of Tuscaloosa production at West Smithdale Field. Flow rate was 575 BOPD and 2032 MCFCGPD from the lower Tuscaloosa Dykes sand at 11,096-100'. Structure at the lower Tuscaloosa horizon is gentle, irregular southwest regional dip.

Mobil Oil Exploration & Production will drill a 16,000' Smackover wildcat, the #1 Atic 21-4, 1-3/4 miles north of Smackover and Norphlet production at Big Escambia Creek Field in Escambia County, Alabama. At the Smackover horizon the new test spots in very close proximity to the north bounding fault of the regional graben system that forms the north and east boundaries of the Big Escambia Creek-Jay Field complex.

**Bill Eisenhardt**

Geomap Company

**Call for Papers**

**Remote Sensing for Exploration Geology**

The Fifth Thematic Conference, emphasizing *Mineral and Energy Exploration: Technology for a Competitive World*, will be held September 29-October 2, 1986 in Reno, Nevada. Topics covered will include:

- Advanced sensors and sensor systems
- Airborne remote sensing applications
- Applications for hydrocarbons mineral and exploration
- Geobotanical and environmental studies
- Global data availability/current and future
- Multiple data sources and applications
- Photogeology and image interpretation

All persons interested in contributing a paper or poster session for consideration should submit a comprehensive summary of their proposed presentation, no later than March 15, 1986. For details, contact:

Dr. Jerald J. Cook  
Remote Sensing Center  
Environmental Research Institute of Michigan  
P.O. Box 8618  
Ann Arbor, Michigan 48107-8618 USA  
Telephone: (313) 994-1200

**Houston Geological Auxiliary Membership Application**

The HGA Membership Application Form usually found in each HGS Bulletin is absent this month due to space limitations. All is not lost however since copies of the form can be found in the January Bulletin.

**Special Airfare to Atlanta**

Aapg Annual Meeting

David Eggleston, Transportation Chairman, has arranged for a very special fare for HGS members attending the AAPG meeting in Atlanta June 15-18, 1986. See the January Bulletin for details.
OIL PRICE versus PROFITS
by David A. Fontaine
Consulting Geologists and Independent Producer

Reprinted with permission from The Oil Gauge - a Houston-based newsletter that promotes investment in the oil and gas industry. P.O. Box 42808, Dept. 131, Houston, Texas 77242.

Falling oil prices do not necessarily mean a decline in oil profits on new discoveries. The reason: as the price of oil declines, so do the costs associated with exploring for it. As long as costs decline at a rate equal to or greater than the decline in oil price — basic profitability is maintained.

Let us examine this cost/price/profit relationship as of July 1985, and do so from the perspective of an investment in an oil and gas limited partnership.

Participation Costs
Directly or indirectly, investors incur three types of participation costs when investing in oil and gas.

1. Front-end load.
   a) sales commissions.
   b) management fees.
   c) offering costs.
2. Production/revenue sharing.
   a) general partner’s percentage.
   b) oil company’s percentage.
   c) limited partner’s percentage.
3. Drilling and completion costs.

Front-end Load

Commissions. Sales commissions are the fees you pay to brokers for selling oil and gas programs to you. Brokers get paid whether or not your investment succeeds or fails. In theory they are, on your behalf, supposed to perform what is known as “due diligence,” a careful, systematic evaluation of your potential investment, with the goal of determining the legality of the program, the quality of management, its track record, economic potential, and a myriad of other facts. I’ve met numerous brokers that have developed a good working knowledge of oil and gas investments. You should quiz your broker to determine if he or she falls into this category. Unfortunately, many brokers know very little about the subject - their main concern being sales. Nevertheless, brokers perform a valuable market function - bringing together buyers and sellers. Learn to evaluate potential investments on your own, this way you won’t be at the mercy of your broker. Broker’s sales commissions can be as high as 10% of your investment - a significant expense to you.

Management Fees. A partnership sponsor or general partner usually charges investors a fee to manage the partnership, often on a onetime only basis. Fees range from a few percent to ten percent. These fees are necessary to compensate the managing general partner for his or her time and skills applied in running the partnership. Partnerships are time consuming entities involving a myriad of operational details performed on behalf of the investor. Reasonable fees are certainly justified.

Offering Costs. Legal and accounting fees, printing costs, and marketing expenses associated with the partnership’s formation comprise the bulk of offering costs. These costs range widely among partnership, and may represent a significant expense to the investor. Offering costs typically range from a few percent to as much as 20% of your initial investment.

Saving Cash

From the previous discussion of front-end load, we can see that a significant percentage, as much as 30%, of your initial investment is taken off the top to cover costs, fees, and expenses. This is money that will not find its way into the ground (i.e., be used to find oil and gas). Because finding commercial accumulations of oil and gas is the key to profits, it stands to reason that the more of your investment dollar going into the ground and finding oil and gas, the greater will be your return.

While it is difficult to eliminate all front-end load, it is possible to improve our situation by shopping around for partnerships where the general partner assumes a greater share of the front-end expenses. Your search should be easier in 1985 than it was during the boom years of 1980-81. At present, supply and demand are potentially on the side of the investor. There are more prospects to be drilled than dollars to drill them. In order to attract your investment dollars, sponsors and general partners are, in many cases, willing to give you more for your money by assuming more of the costs themselves.

Table 1 compares the front-end load typical of 1980-81 and the present day.

<table>
<thead>
<tr>
<th>FRONT-END LOAD</th>
<th>1980-81</th>
<th>1985</th>
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<tbody>
<tr>
<td>10% Sales Commissions</td>
<td>5% Management Fees</td>
<td>5% Offering Costs</td>
</tr>
<tr>
<td>5%</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>15%</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>30%</td>
<td>10%*</td>
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</table>

67% decrease in ’85
Use 50% “working average”

*10% is probably an absolute minimum, 15% to 20% is more realistic.

The potential savings to investors over the highs of 1980-81 are quite dramatic. Be aware, however, that these savings are not characteristic of every partnership on the street. You must search for them.

Commission - fee partnerships, known as “no load” partnerships, can save you a lot of money if you can find one that appeals to you.

Management fees have, in general, remained the same. Probably because this is a “hard cost,” i.e., someone must spend the time and have the skills to operate the partnership — and they must be compensated.

Offering costs have definitely improved. Only a portion of offering costs are “elastic,” i.e., they increase or decrease with the size of the partnership or the amount of money raised.
Many costs are “fixed,” that is, they remain essentially the same whether the amount of money the partnership raises is small or large. For example, if it costs $1,000,000 dollars to raise $1,000,000 — certainly not ten times more.

The high offering costs typical of the 1980-81 period often amounted to an additional “profit center” for the sponsor or general partner. Presently offering costs have been brought more into line with the actual costs incurred.

**Production Sharing**

Production sharing is the division of oil and gas income between all the participants in a well (e.g., limited partners, general partners, oil companies, others). Most partnership programs do not originate the prospects they drill. Instead, prospects are purchased from oil companies.

**Oil Company.** Oil companies usually charge a cash fee large enough to assure them a good profit over and above their costs in putting the prospect together. Additionally, the oil company usually receives a percentage of any oil or gas revenue from a successful well — often without putting any of their own cash into the drilling of the well. In other words, oil companies often get a cost-free carried interest.

Production sharing arrangements have changed considerably over the last several years. Table 2 illustrates.

### Table 2

**PRODUCTION SHARING**

<table>
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<tr>
<th>Year</th>
<th>1980-81</th>
<th>1985</th>
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<tbody>
<tr>
<td>30%</td>
<td>General Partner</td>
<td>15%</td>
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<tr>
<td>25%</td>
<td>Oil Company</td>
<td>10%</td>
</tr>
<tr>
<td>55%</td>
<td>Investor</td>
<td>25%</td>
</tr>
<tr>
<td>45%</td>
<td></td>
<td>75%</td>
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67% increase in investor revenue 1980 to 1985. Use 50% as a “working average” increase in investor revenue.

In 1980-81, the investor typically paid 100% of the costs, but received only 45% of the revenue. In contrast, for paying 100% of the costs in 1985, the investor will receive as much as 75% of the revenue — a whopping 67% increase from the boom times of 1980-81. Again, the reason for the better deal today is supply and demand. General partners and oil companies want your investment dollars, and many are willing to give you better terms in order to have you participate with them.

**Drilling Costs**

The final area of potential cost savings to the investor is drilling costs. Drilling costs are down about 60% over their all-time highs of 1980-81. A 60% decrease in the investor’s cost to drill is a very significant savings. You must be careful here however, some general partners do not pass on to the investors any savings that result from better drilling costs — choosing instead to negotiate a lower drilling price, but charging the partnership the full price and putting the difference in their pocket.

**Cost Summary**

Front end load, production sharing, and drilling costs, have all decreased from the hectic days of 1980-81. Table 3 summarizes and averages these reductions.

### Table 3

**“WORKING AVERAGE” SAVINGS**

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<th>(1)</th>
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<td>U.S. Gulf Sweet Reference Price</td>
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<tr>
<td>Year</td>
<td>$/Bbl</td>
<td>$/Bbl</td>
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<tr>
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<td>2000</td>
<td>243.09</td>
<td>94.25</td>
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</table>

Today we can participate in oil and gas ventures at a considerable savings. But a word of caution. Just because a partnership may be available without sales commissions, or with better production sharing terms, does not mean it is a good partnership in which to invest. I rather pay commissions and tolerate a higher production sharing arrangement if the general partner has a proven record of finding oil and gas and of making a good profit for investors. Of course, if you can participate at better terms and still go with a quality partnership — all the better.

### $68 a Barrel Oil

How smart are you? What will the price of oil be two years from now? Are you sure? How much of your own money are you willing to bet on your estimate?

Most of us are, to say the least, uncertain. If we cannot rely on our own estimates, perhaps we can find comfort among the world’s over supply of “economic experts.” Table 4 is an actual example of the predictive talents of a group of oil company economic experts known as “long range planners.” With great confidence, they predicted in 1980 that oil would be selling for $68.03 in 1985. Today’s price is about $26 per barrel.

### Table 4

**ACTUAL OIL PRICE PROJECTIONS OF ONE OF THE WORLD’S LARGEST OIL COMPANIES AS OF FEBRUARY 1980**

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<tr>
<td>99</td>
<td>224.05</td>
</tr>
<tr>
<td>2000</td>
<td>243.09</td>
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**Realized Price (after WPT)**

From LRP Instructions of 2/6/80

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<th>Year</th>
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</thead>
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<thead>
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<tr>
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<td>99</td>
<td>224.05</td>
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<tr>
<td>2000</td>
<td>243.09</td>
</tr>
</tbody>
</table>
Obviously we cannot rely on guesses about future prices to guide our investment decisions — too uncertain. Time is better spent evaluating the current price declines relative to the decline of the participation costs discussed earlier, and then determine our profit margin today relative to some standard — the 1980-81 period for example. That was a period when everyone perceived oil as profitable.

Because the current oil price trend is down, we would also like to know how low the price could drop before investment in oil and gas would be less profitable than our 1980-81 base case. Table 5 illustrates some of the relationships so far.

### TABLE 5

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<thead>
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<th>Revenues</th>
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<tr>
<td>Oil Price - 1980</td>
<td>$36</td>
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<tr>
<td>Oil Price - 1985</td>
<td>$26</td>
<td></td>
</tr>
<tr>
<td>Decrease</td>
<td>$10</td>
<td>Percent Decrease -25%</td>
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</table>

<table>
<thead>
<tr>
<th>Percent of Cost Decline (Savings)</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Front-end Load</td>
<td>+50%</td>
<td></td>
</tr>
<tr>
<td>Production Sharing</td>
<td>+50%</td>
<td></td>
</tr>
<tr>
<td>Drilling Costs</td>
<td>+60%</td>
<td></td>
</tr>
<tr>
<td>Average Percent Savings</td>
<td>+53%</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Profit Margin</th>
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</thead>
<tbody>
<tr>
<td>Average Percent of Cost Decline</td>
<td>+53%</td>
<td></td>
</tr>
<tr>
<td>Oil Price Percent Decrease</td>
<td>-25%</td>
<td></td>
</tr>
<tr>
<td>Difference or Profit Margin</td>
<td>+28%</td>
<td></td>
</tr>
</tbody>
</table>

Profit margins are up 28 percent. True, the price of oil has declined, but the costs to participate in oil have decreased at a faster rate, resulting in an increase in the cost-price spread. Oil investment today is potentially more profitable than in 1980-81.

Graph 1 shows declining oil prices versus return on investment. In 1980, a better program was considered to have a 2:1 return on investment using $36 per barrel oil, and the high costs of participation typical of that year. Given the same 2:1 return on investment today, but factoring in today’s lower participation costs, the price of oil could drop to an astonishing $19.50 per barrel and still yield a 2:1 return.

If costs are kept very low, an oil price as low as $17 per barrel is possible for a 2:1 return. The $19.50 per barrel figure is within a range of probable values from about $22 to $17 per barrel — the exact amount depending on costs and the amount of oil and gas recovered.

### Strategy

Shop around. Get with a program that is fanatically cost conscious, a program that understands the new realities of the new realities of the oil business. The program general partner must be an economic realist - willing to negotiate for deals and terms that spell profit for you, the investor. Today’s oil profits can not be made at yesterday’s deal terms and prices.

---

**David A. Fontaine** is a consulting geologist and independent producer who maintains an office in Houston, Texas. He received his B.A. and M.S. in Geology from Rutgers University, and studied sedimentation and geology at Princeton University. He holds certification in Investment Analysis and Portfolio Management from the New York Institute of Finance. His experience includes surface mapping and stratigraphic studies along the U.S. Atlantic margin, subsurface prospect generation onshore and offshore Gulf Coast, production geology in the Permian Basin of West Texas and the Ventura and Santa Maria Basins of California.

Dave has been active in professional organizations throughout his career. Some of his more significant responsibilities include Secretary of HGS, Assistant Editor - HGS Bulletin, Chairman, Awards and Student Intern Committee, HGS; Chairman, Technical Services Committee - East Coast Offshore Symposium, AAPG 1973; and membership on a study group on arctic resources to the National Petroleum Council. His professional memberships include the AAPG, the International Assn. of Energy Economists, the Houston Producers Forum, and the Crude Club.

---

Houston Geological Society Bulletin, February 1986

14
GCS-SEPM SPRING FIELD TRIP
“The Platform Comanchean Section, Central Texas”
April 19 and 20, 1986

LEADERS:
Rena Bonem, Robert Grayson, O. T. Hayward
all of Baylor University

The platform Comanchean Section of Central Texas consists of fluvial to epeiric marine rocks well exposed over much of their original depositional extent. The Comanchean Section of Central Texas provides the most satisfactory laboratory for the study of Comanchean stratigraphy on the North American continent.

The purpose of this field trip is to show the platform Comanchean Section in typical development in the type areas of many of its formations, to discuss the environments of deposition, and to introduce questions yet unanswered.

PROGRAM:
Saturday, April 19:
Trinity Group, fluvial-to-marine transition, from fluvial conglomerates to carbonate bank deposits including outstanding lateral and vertical facies variations.

Sunday, April 20
Fredericksburg and Washita Groups, displaying remarkable areal uniformity in contrast to the underlying Trinity Group. Also, the Del Rio Clay at a locality world-recognized for its unique pyritized dwarf fauna.

LOGISTICS:
Saturday, April 19:
Assemble at Raintree Inn (headquarters motel, 817/965-5001), 701 S. Loop, Stephenville, Texas at 8:00 a.m. Return to Raintree Inn at approximately 5:00 p.m.

Sunday, April 20:
Assemble at Raintree Inn at 8:00 a.m. Trip concludes at Waco at about 2:00 p.m. Transport will be provided from Waco to Stephenville arriving in Stephenville at about 4:30 p.m.

REGISTRATION:
Fee: $100.00 to cover field transport, motel 2 field lunches and drinks, plus a guidebook.

GSC/SEPM FIELD TRIP

Name: ________________________________
Address: ________________________________

Phone: ________________________________

Will you require transport from the Dallas/Fort Worth region? (Yes/No) ________________________________

Fill out this form and please enclose a check for $100.00 per person made payable to the Gulf Coast Section, SEPM, and send to:

Susan J. Morris
c/o Morris Geological Enterprises
11422 Hombrook Dr.
Houston, Texas 77099
(713) 495-6071

REGISTRATION DEADLINE IS APRIL 1, 1986
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

LAST NAME           FIRST           INITIAL

DATE

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: ____________________________

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COMPANY

POSITION OR TITLE

COMPANY MAILING ADDRESS

CITY

STATE

ZIP CODE

COMPANY PHONE

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CITY

STATE

ZIP CODE

HOME PHONE

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AFFILIATIONS

AGU □ SPE □ OTHER □

LOCAL AFFILIATIONS

GSH ACTIVE □ GSH HON □ SEPM GC SEC □

SPOUSE’S NAME

PREFERRED MAILING ADDRESS

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Annual dues, $15.00 must accompany application.

HGS operates on a fiscal year: July 1 - June 30.

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6916 Ashcroft
Houston, Texas 77081
771-8315

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Received ______________________ Approved for □ ACTIVE □ ASSOCIATE membership

Membership Chairman __________________________ Date: __________________

Action of Executive Board:

Approved __________________________ (Secretary) Date: ______________
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### COVER


### FEBRUARY CALENDAR of EVENTS 1986

<table>
<thead>
<tr>
<th>SUNDAY</th>
<th>MONDAY</th>
<th>TUESDAY</th>
<th>WEDNESDAY</th>
<th>THURSDAY</th>
<th>FRIDAY</th>
<th>SATURDAY</th>
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<td>FEBRUARY IS</td>
<td>National Cherry Month</td>
<td>National Shape-up with Pickles Month</td>
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<td>Bean-Throwing Festival</td>
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<td></td>
<td>Festival Japan</td>
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<td>Weatherman's Day</td>
<td>Cordova Iceworm Festival Cordova, AK</td>
<td>McKelvey Forum - USGS Energy Research Denver, CO 6-6</td>
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<td>INTL VOLCANOLOGY CONGRESS Wellington, New Zealand, 1-9</td>
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<td>3</td>
<td>Sun Day Iceland</td>
<td>CRUDE CLUB Petroleum Club</td>
<td>Uh ALUMNI Petroleum Club</td>
<td>Nat'l Kreut and Frankfurter Week 13-22</td>
<td>Ferris Wheel Day</td>
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<td>9</td>
<td>Fashing Sunday</td>
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<td>17</td>
<td>18</td>
<td>19</td>
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<td>16</td>
<td>World Championship Crab Races Crescent City, CA</td>
<td>HAPL-HGS-HG DINNER MEETING</td>
<td>R. E. Leakey Astro Village Ballroom</td>
<td>LSU SEMINAR Pre Woodbine Petrol Potential Baton Rouge, LA</td>
<td>HGS INTL DINNER MEETING H. H. Wilson Westin Galleria Hotel</td>
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<td>23</td>
<td>Festival of Whales Dana Pt. CA</td>
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<td>HGS LUNCHEON MEETING A. J. Scott Meridian Hotel</td>
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<th>Position</th>
<th>Address/Company</th>
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<th>Fax Number</th>
<th>Email</th>
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<td>ZENITH EXPLORATION COMPANY, INC.</td>
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