March, 1977

BULLETIN

HOUSTON GEOLOGICAL SOCIETY

HGS MARCH CALENDAR:

March 7, 1977 (Evening Meeting)
Summit Club, First International Bank Building
Dr. Curtis M. Martin, Shell Development Co., Houston
Edward B. Pinnow, Jr., Shell Oil Co., New Orleans
"Gulf Coast Deep Drilling - Model for Application of Stratigraphic Concepts to Exploration on Passive Margins"
Social hour—5:15 PM, Dinner—6:15 PM, Meeting—7:00 PM
Make or cancel reservations (212) 990-9999 by Friday, March 4, 1977

March 20, 1977 (Ноут Meeting)
Consolidated Ballroom, Houston Oaks Hotel
Clayton S. Valerio, Jr., Amoco Production Co., Houston
"Gas Production from Tight Sandstones of Perno-Pennsylvanian Age, Val Verde Basin, Texas"
Reception—11:30 AM, Luncheon and Meeting—12 Noon
Make or cancel reservations (212)-9320-6666 by Monday, March 28, 1977
HOUSTON GEOLOGICAL SOCIETY
234 Esperson Building
Houston, Texas 77002
223-9309

EXECUTIVE BOARD

Hal H. Bybee, Continental Oil Co.
Royce E. Schneider, The Superior Oil Co.
Dean Grafton, Cities Service Co.
Jeffery V. Morris, Transcontinental Gas Pipeline Corp.
M. M. "Odie" Osborne, Trunkline Gas Co.
Clyde G. Beckwith, Continental Oil Co.
W. L. Titwell, Houston Oil and Minerals
Robert A. Harris, Mitchell Energy Corp.
Elieea C. Shieled, The Anschutz Corp.
Anthony Rezso, Tenneco Oil Co.

President
First Vice-President
Second Vice-President
Secretary
Treasurer
Executive Committeeman (7-1-77)
Executive Committeeman (7-1-77)
Executive Committeeman (7-1-77)
Past President

Executive Committeeman (7-1-78)
Executive Committeeman (7-1-78)

COMMITTEE CHAIRMEN

Dan C. Edwards, Ashland Oil, Inc.
Kenneth W. Toedter, Natomas International Corp.
Albert W. Ersieben, Exxon Co., U.S.A.
Albert C. Rasch, Exxon Co., U.S.A.
Tom W. Peet, Petroluem Pipelines
Donald W. Lane, Consultant
Stewart Chuber, Consultant
M. M. "Ode" Osbome, Trunkline Gas Co.
Clyde G. Beckwith, Continental Oil Co.
W. L. Titwell, Houston Oil and Minerals
Robert A. Harris, Mitchell Energy Corp.
Elieea C. Shieled, The Anschutz Corp.

Finance
Historica
Library
Membership
Personnel Placement
Publication Sales
Public Relations
Reinforcement
Research & Study
Special Publications
Transportations

Adviser, Museum of Natural Science
GCAGS Representative
GCAGS Alternate
AAPG Delegate Chairman
AAPG Group Insurance

SPECIAL REPRESENTATIVES

Edd R. Turner, Jr., Getty Oil Co.
Sabin W. Marshall, Texas Gas Transmission
Anthony Reso, Tenneco Oil Co.
Thomas D. Barber, Mobil Oil Co.
John Bremenhhal, Insurance Consultant

Advertising Prices Per Year

Professional Card $ 5.00
1/4 Page $ 20.00
1/2 Page $ 30.00
Full Page $ 70.00
PRESIDENT'S COLUMN—MARCH, 1977

It has come to my attention through several sources that there is being drafted for consideration of the 1977 Legislature of the State of Texas a bill known as the Earth Scientist Licensing Act. The bill will require licensing of persons in earth science disciplines of geology, geophysics, geochemistry, paleontology, mineralogy, engineering geology, marine geology, mining geology and petroleum geology, provided that person or his work product has professional contact beyond the confines of his own corporation, company or employer.

This bill is being drafted for State Senator Walter Mengden, Jr. of Houston as a companion bill to accompany a bill to amend the Schedule D section of the Securities Act. The licensing bill was deemed necessary to be able to adequately “define a professional geologist.” As of this writing the bill has not been placed in the “hopper” so it is impossible to know its final form. The draft I have seen has some good and some bad. It certainly needs input from a broader cross section of the over 6000 geologists in the State of Texas. It certainly will have a direct impact on the more than 2600 members of the Houston Geological Society.

I suggest to each of you to become informed about this bill and let your feelings be known to your elected state representatives. Senator Walter Mengden, Jr. will have the up-to-date information on the bill and its status in his Austin, Texas, office.

Your Executive Committee has changed the HGS Membership Application Form. In a move to expedite new membership applicants and also to cut down on administrative expenses, it has been decided to require new applicants to include a check for HGS Dues ($10) with their application for membership.

This new form is in this bulletin. Please remove the form from the bulletin and give it to a prospective new member. With this cooperation from the membership your Society can continue the healthy growth we have experienced in recent years.

Copies of the membership application can be obtained from the HGS office, 234 Esperson Building, from any member of your Executive Committee and from the Membership Committee. Please destroy any copies of “old” application forms.

HAL H. BYBEE, President
Houston Geological Society

SOCIETY CALENDAR FOR APRIL

April 11, 1977 Dr. Myron H. Dorfman, Austin
Summit Club “Alternate Energy Resources”

April 27, 1977 Dr. James M. Coleman, Baton Rouge
Rice Rittenhouse Topic to be announced

FIRST CALL FOR PAPERS
27TH ANNUAL MEETING
GULF COAST ASSOCIATION
OF GEOLOGICAL SOCIETIES
AND
GULF COAST SECTION-SEPM
AUSTIN, TEXAS - OCTOBER 26-29, 1977

The Program Committee is now considering papers for presentation at the twenty-seventh Annual Meeting and for publication in the Transactions of that meeting. If you have a paper that you believe will be of interest and importance to geologists of the Gulf Coast area, please contact either of the following:

Victor R. Baker, GCAGS Program Chairman, Dept. of Geological Sciences, University of Texas, Austin, Texas 78712; or, Don G. Bebout, GCS-SEPM Program Chairman, Bureau of Economic Geology, University of Texas, Austin, Texas 78712

CALL FOR AUTHORS GEOLOGIC ATLAS
OF HOUSTON AND VICINITY

Authors are now being solicited for a series of papers to be included in a comprehensive Geologic Atlas of the Greater Houston Area. The text will be geared for the lay reader on about the technical level of recent articles on plate tectonics appearing in Scientific American. Topics to be included are: active geologic processes, surface, subsurface, regional and historical geology. Additional sections covering natural resources and applications of geology to current environmental problems such as water supply, flooding, subsidence, faulting, foundations, and waste disposal are planned. A companion field guide documenting and further illustrating the Atlas is also envisioned. Prior to final publication a series of community oriented seminars will be presented.

A great deal of interest in the project has already been expressed by the Houston-Galveston Area Council, Museum of Natural Science, local schools, Boy Scouts, the League of Women Voters, and other committees of the Society.

If you would like to research, write, edit or help in any other way, please contact any of the committee members for more information. Your suggestions and comments will be greatly appreciated.

Al Allong 220-3836
Clyde Bechwith 965-2297
Cy Strong—Chmn. 220-3798
Bob Thornton 621-9550
DeWitt van Siclen 749-3871
Tom Zimmerman 626-5700

CY STRONG, Chairman
Research and Study Committee
EVENING MEETING MARCH 7, 1977

DORIS MALKIN CURTIS—Biographical Sketch

Doris Malkin Curtis was born and educated in New York City, where she majored in geology at Brooklyn College and received Master's and Ph.D. degrees in geology from Columbia University. The two segments of her Shell career, begun in 1942, were separated by a period from 1950 to 1959 during which she was a geology professor at the University of Houston and the University of Oklahoma, and a research geologist at the Scripps Institution of Oceanography. Her work in Shell has included assignments in the Gulf and Atlantic coasts and in Shell's International Region. Presently she is Staff Geologist in the Basin Studies group at Shell Development Company, working on the geology and geochemistry of source rocks. Her principal fields of geologic interest are stratigraphy, sedimentation, and petroleum habitat. Dr. Curtis is a member of the Houston Geological Society, International Association of Sedimentologists, AAPG, and Sigma Xi. She is a Fellow of both GSA and AAAS, and she is an Honorary Member of SEPM. In June 1977, Dr. Curtis will take office as President-elect of the Society of Economic Paleontologists and Mineralogists.

EDWARD B. PICOU, JR.—Biographical Sketch

Edward B. Picou, Jr. is a native of Baton Rouge, La. He majored in geology at Louisiana State University where he earned his B.S. degree in 1955. After graduation, he served two years as an officer with the Corps of Engineers, mostly in Korea. He joined Shell Oil Company in 1957 as a micropaleontologist. Assignments with Shell's Exploration Divisions have included duty stations in Baton Rouge, New Orleans, Lafayette, and Houston. His experience includes biostratigraphic work in the Louisiana-Texas Cenozoic, both onshore and offshore. In 1965 he was promoted to Division Paleontologist and he is currently serving in that capacity in the Offshore Division of Shell's Southern E & P Region, headquartered in New Orleans. Mr. Picou's professional affiliations include membership in New Orleans Geological Society, Paleontological Society, Gulf Coast Section of SEPM, AAPG, and SEPM. In 1973-74 he served as President of the Gulf Coast Section of SEPM; and most recently he was Technical Program Chairman for SEPM at the May 1976 annual meeting of AAPG-SEPM in New Orleans.

GULF COAST CENOZOIC—MODEL FOR APPLICATION OF STRATIGRAPHIC CONCEPTS TO EXPLORATION ON PASSIVE MARGINS (Abstract)

by: Doris Malkin Curtis and Edward B. Picou, Jr.

Since the early examination of rotary drill cuttings in the 1920s and the acceptance of electric and geophysical methods as geologic tools in the 1930s, the application of data derived from direct observation (fossils and rocks) to interpretation of data from indirect observation (electric and geophysical surveys) has resulted in the discovery of more than 40 billion bbl of oil and 300 Tcf of gas in the Gulf Coast Cenozoic section. With basic stratigraphic principles and sophisticated exploration technology, still more petroleum remains to be found.

The lithologically monotonous sequence of more than 50,000 ft (15 km) of Cenozoic shales and sandstones was deposited in varied depositional settings from continental to bathyal marine. Studies of modern-sedimentation models and ancient-sediment distribution patterns, and of the Cenozoic microfaunal succession, ecology and paleoecology, have formed the basis for concepts that have evolved during the past 50 years. These include: (1) there is a close interrelation in time and space of environment, sedimentation, fauna, structure, and hydrocarbon distribution; (2) in the generally regressive basin-filling cyclic sequence, gross lithologic units are diachronous; (3) benthonic-foraminiferal zonation provides isochrons and paleoenvironmental indicators; (4) within each cycle, deltaic depocenters can be recognized; (5) elements of deltaic and littoral morphology can be interpreted from depositional sequences; (6) facies distribution is the product of rate of supply of sediments, rate of subsidence of the basin, and energy distribution in the depositional environment; (7) distribution of sandstone reservoirs is predictable from biofacies and lithofacies studies.

Concepts can be applied to such problems as electric-log correlations, correlating across growth faults, determining base of objective section, calibrating seismic events, well-design programs for geopressed drilling, salt-dome exploitation, not only in the search for new reserves in the Gulf basin but also in the exploration of other paralic basins with similar clastic fill on passive continental margins.

DEADLINE

Material to be included in April Bulletin should be received by the HGS editor no later than March 1. Deadlines for future bulletins will always be the first day of the preceding month.
CLAYTON S. VALDER, JR.—Biographical Sketch

Clayton S. Valder, Jr. is a Senior Staff Geologist with Amoco Production Company, Houston, Texas. He was born in Winimac, Indiana and reared in Omaha, Nebraska. During World War II, he was with the 14th Armored Division in the European Theater. He completed his college education after the war and graduated from the University of Oklahoma in 1947. Mr. Valder began his oil industry career in January 1948 when he was employed by Stanolind Oil and Gas Co. (now Amoco Production Company) Department where he rose to the position of Staff Geophysicist, he transferred to the Geological Department and has spent the past twenty-two years in various geological assignments in North Texas, West Texas, and Southeast New Mexico. While in West Texas, he served as President of the Lubbock Geological Society in 1959 and as Treasurer of the Southwest Federation of Geological Societies in 1960. Mr. Valder is a member of the Houston Geological Society and AAPG, which he has served as a District Delegate and Chairman of Regional Cross Section Committee.

GAS PRODUCTION FROM TIGHT SANDSTONES OF PERMO-PENNYSYLVANIAN AGE, VAL VERDE BASIN, TEXAS (Abstract)

by: Clayton S. Valder, Jr.

During the past five years more than 1900 wells have been drilled in a tight quartz sandstone of Permo-Pennsylvanian age in the Val Verde Basin of Texas. This active play encompasses parts of Sutton, Schleicher, Crockett, Edwards, Val Verde, and Terrell counties. These wells have already proven the existence of major gas reserves which have the potential to develop into the “giant” category, given a favorable economic climate. This is a somewhat unique play in that the exploration wildcat success has averaged about 50%, with development well success averaging around 80%.

RECENT DEATHS

Don G. Benson, 71, died February 7, 1977, formerly a consultant with Colorado Oil Company and Sinclair Oil Company.

Marvin J. Bennett, 63, formerly Sales Manager for Tobin Research Inc. died January 25th, 1977, in St. Louis.
TREASURER'S REPORT

This report is submitted to the membership in order to furnish a statement regarding the financial condition of the Society. The bylaws require this statement at periodic intervals.

The Houston Geological Society budgets money from two funds: Operating, and Academic. The Operating Fund is used to run the Society, i.e., publish the Bulletin, cover meeting expenses and pay for necessary administrative, clerical, printing and mailing costs. Our greatest expense is incurred from publishing the Bulletin. Operating income is derived from two sources, members' dues and Bulletin advertising. The major portion of this income is received during the three months of October, November, and December, while expenses continue throughout the following months. A budget is presented to the President at the beginning of the fiscal year and is reviewed each quarter by the Finance Committee. Based on the December 31 review, sufficient funds are anticipated to be available to meet projected expenses for the remainder of the fiscal year. This is due mainly to the increase in dues and the efforts by the Executive Committee to maintain and increase the membership of our Society.

The Academic Fund is endowment capital and not to be used for operating expenses. It is the source of money for Student Loans, Continuing Education classes, Field Trips and similar academic or educational programs, plus the Society's publication fund.

In the past, a Memorial Fund was also maintained. This year the money was transferred to the Houston Geological Society Memorial Scholarship Fund. The Society is trustee for the fund which is supported by donations from the Society in memory of our departed colleagues and by other donations which are used to award scholarships in Earth Sciences to the worthy, needy students in our community.

M. M. "OZZIE" OSBORNE, Treasurer
Houston Geological Society

STATEMENT OF FINANCIAL CONDITION
INCOME AND EXPENSES FOR SIX MONTHS ENDING DECEMBER 31, 1976

OPERATING FUND

<table>
<thead>
<tr>
<th>CASH IN BANK - July 1, 1976</th>
<th>$1,908.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADD: RECEIPTS</td>
<td></td>
</tr>
<tr>
<td>Membership dues</td>
<td>$23,781.00</td>
</tr>
<tr>
<td>Bulletin advertising</td>
<td>1,977.00</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>15.00</td>
</tr>
<tr>
<td></td>
<td>$25,773.00</td>
</tr>
<tr>
<td>DEDUCT: DISBURSEMENTS</td>
<td></td>
</tr>
<tr>
<td>Bulletin</td>
<td>$7,626.00</td>
</tr>
<tr>
<td>Meetings</td>
<td>2,217.00</td>
</tr>
<tr>
<td>Administrative</td>
<td>2,831.00</td>
</tr>
<tr>
<td>Awards &amp; Gifts</td>
<td>36.00</td>
</tr>
<tr>
<td>Remembrance</td>
<td>144.00</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>412.48</td>
</tr>
<tr>
<td></td>
<td>$13,266.48</td>
</tr>
<tr>
<td>CASH IN BANK - December 31, 1976</td>
<td>$14,414.52</td>
</tr>
</tbody>
</table>

ACADEMIC FUND

<table>
<thead>
<tr>
<th>CASH IN BANK - July 1, 1976</th>
<th>$4,090.52</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADD: RECEIPTS</td>
<td></td>
</tr>
<tr>
<td>Publications sales</td>
<td>$4,494.00</td>
</tr>
<tr>
<td>Continuing Education</td>
<td>11,157.00</td>
</tr>
<tr>
<td></td>
<td>$15,651.00</td>
</tr>
<tr>
<td>DEDUCT: DISBURSEMENTS</td>
<td></td>
</tr>
<tr>
<td>Administrative</td>
<td>$975.00</td>
</tr>
<tr>
<td>Publication refund</td>
<td>111.00</td>
</tr>
<tr>
<td>Continuing Education</td>
<td>1,415.00</td>
</tr>
<tr>
<td>Transfer to savings</td>
<td>9,000.00</td>
</tr>
<tr>
<td>Operating fund adjustment</td>
<td>1,072.00</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>520.00</td>
</tr>
<tr>
<td></td>
<td>$13,093.00</td>
</tr>
<tr>
<td>CASH IN BANK - DECEMBER 31, 1976</td>
<td>$6,648.52</td>
</tr>
<tr>
<td>SAVINGS IN BANK - DECEMBER 31, 1976</td>
<td>$33,576.57</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$40,225.09</td>
</tr>
</tbody>
</table>

Houston Geological Society Bulletin, March 1977
APPLICATION FOR MEMBERSHIP

To the EXECUTIVE COMMITTEE:

I hereby apply for ACTIVE /ASSOCIATE membership in the HOUSTON GEOLOGICAL SOCIETY and pledge myself to abide by its constitution and bylaws.

NAME ____________________________ SPOUSE'S FIRST NAME ________________

COMPANY ____________________________ POSITION ________________

BUSINESS ADDRESS ____________________________ PHONE ________________

HOME ADDRESS ____________________________ (ZIP) ________________ PHONE ________________

SCHOOL ____________________________ MAJOR SUBJECT ________________ DEGREE ________________ DATE ________________

OUTLINE OF EXPERIENCE

MEMBERSHIP in OTHER SCIENTIFIC SOCIETIES: AAPG /Yes /No

OTHERS (specify) ____________________________

REMARKS ____________________________

THIS APPLICATION MUST BE RECOMMENDED BY TWO ACTIVE MEMBERS.

NAME (print): ____________________________ SIGNATURE: ____________________________

NAME (print): ____________________________ SIGNATURE: ____________________________

RETURN TO: HOUSTON GEOLOGICAL SOCIETY
234 Esperson Building
Houston, Texas 77002
Phone: 223-9309

Houston Geological Society Bulletin, March 1977
PLEASE

Check the committees on which you would be willing to serve.

ACTIVITIES PREFERENCE

☐ Academic Liaison
☐ Advertising
☐ Awards & Loans
☐ Ballot
☐ Bulletin
☐ Boy Scout
☐ Continuing Education
☐ Directory
☐ Distribution & Publication
☐ Entertainment
☐ Environmental
☐ Exhibits
☐ Field Trip

☐ Finance
☐ GCAGS Transactions
☐ Historical
☐ Library
☐ Membership
☐ Personnel Placement
☐ Programs
☐ Public Relations
☐ Remembrances
☐ Research & Study
☐ Special Publications
☐ Transportation

Check Areas of Professional Interest
Domestic Onshore ☐ ; Domestic Offshore ☐ ; Foreign ☐

GEOLOGICAL WORD SEARCH
February Answers

PRICE SCHEDULE—MARCH MEETINGS

Summit Club
Houston Association of Petroleum Landmen—Host
Dinner
Cocktail
Beer
Soft Drink

Rice Rittenhouse
Geophysical Society of Houston—Host
Luncheon $6.00
Cocktail 1.40

Houston Oaks Hotel
Luncheon 7.00
Cocktail 1.50

RESERVATIONS

Please make reservations for the Monday evening meetings by the preceding Friday and for the Wednesday noon meetings by the preceding Monday. (Phone 223-9309)

INVERTEBRATE FOSSILS
CONTINUING EDUCATION

Approximately 270 Houston Geological Society members attended the January 20, afternoon lecture of Dr. George DeVries Klein concerning "Exploration for Turbidites and Other Deep-Water Sandstones." The group met at the Exxon Auditorium for the three hour program, interrupted only by a short break for coffee, soft drinks, and cookies. Comments from the group indicated that Dr. Klein's turbidite message was timely, but lacking in specific subsurface examples. In this regard, several excellent papers describing turbidite oil fields in California are published in the February, 1977 AAPG Bulletin.

The next (and final 76-77) C. E. program will be held on May 4 and 5 when Dr. Richard C. Selley will present a six-hour program entitled "Subsurface Facies Analysis." This course describes in detail the diagnostic criteria of sedimentary facies determined from subsurface data. The format will be slightly changed in timetable; the first three hours will be given Thursday afternoon as usual and the second on Friday morning, ending at lunch time. Dr. Selley has prepared some notes which will be handed out at the auditorium. Details concerning cost and enrollment will be given in the April HGS Bulletin. Membership response to this year's Continuing Education Programs has been rewarding to the Society. It appears that many members who attend the seminars are reasonably happy with time, the place, and the topics. Next year, provided the AAPG continues to present stimulating programs, the C. E. committee will organize six seminars: one each in October, November, January, February, March, April, and May. The schedule and topics will be published in the June issue of the Bulletin. If there are special programs which you would like to see scheduled, please contact Stewart Chuber, any committee member, or the Society office to make your requests known. Listed below are the Continuing Education committee members:

Tom Bakewell
Ralph Bass
John Biancardi
Hugh Bickford
Bill Burkman
Max Carman
Tom Casey
Paul Cernock
Bruce Dice
Albert Engel
Stewart Folk
William Fowler
Paul Gebhard
Kirby Gowen
William Huckabay
Syed Hussain
Roy Knappe
Howard Kunz

STEWART CHUBER, Chairman
Continuing Education Committee

PROFESSIONAL AND ORGANIZATIONAL NEWS

GAY C. HELM, formerly Gulf Coast Regional Geologist for Ranger Oil, has joined Tricentrol, U. S., Inc. as Chief Geologist. Tricentrol, U. S headquarters are at 1100 Milam Bldg., Suite 1585, Phone: 651-9887.

GEORGE KEPRTA, formerly geologist with Monsanto Company, is now a geologist with P. R. Rutherford, Inc.

JAMES L. SMITH has become Chief Geologist of Daniel Oil Company. He was recently employed by Suburban Propane Gas Corp. as Area Geologist. Prior to this he spent 25 years with Cities Service Oil Company working the Louisiana and Texas Gulf Coast areas.

LEO J. McCULLE, formerly a geological drilling specialist with Exxon Company, announces the opening of his new office as an exploration and drilling consultant at 1212 Main Street, Suite 551, Houston.

COLORADO GEOLOGICAL SURVEY has released Special Publication No. 9, "1975 Summary of Coal Resources in Colorado" by A. L. Hornbaker, R. D. Holt, and D. K. Murray, 1976. The price is $1.00 postpaid. It can be ordered from the Colorado Geological Survey, Room 715, State Centennial Building, 1313 Sherman St., Denver, Colorado 80203.

CYPHER ENERGY CORPORATION is a new exploration company formed to explore the Gulf Coast Area of Louisiana and Texas. Partners in the Company and H.G.S. members are: WILLIAM F. HOWELL, President, formerly with Mesa Petroleum and Vice-President of exploration for Basin Exploration; CLAUDE H. ROBERTS, Vice-President, formerly with Hemingway, Bartell and Associates and Damson Oil Corporation; and C. DAN BUMP, Vice-President, formerly with Kilroy Company of Texas and Hamilton Brothers. Cypher's office is 711 Houston Club Building, Phone: 223-5349.

WORD SEARCH ANSWERS

ANHYDRITE  APATITE  AURITE  BARITE  BERYL  BIOTITE  CALCITE  CHLORITE  DIOPSIDE  DOLOMITE  EPIDOTE  FLUORITE  GALENA  GARNET  GOETHITE  GYPSUM  HALITE  HEMATITE  HORNBLende  ILMENITE  LIMONITE  MAGNESITE  MAGNETITE  MUSCOVITE  OPAL  ORTHOCLEAS  PLAGIOCLASE  PYRITE  QUARTZ  SELENITE  Sphalerite  SULFUR  TALC  TOURMALINE  TREMOLITE
SCHOOLS AND SHORT COURSES

URANIUM GEOLOGY AND EXPLORATION, a 3-day short course offered March 30-April 1 at Colorado School of Mines. The instructor will be Dr. Richard H. DeVoto of the CSM department of geology. Registration fee is $300.00. Address further inquiries to the Office of Continuing Education, Colorado School of Mines, Golden, Colorado 80401. (Registration deadline March 15, 1977)

FIRST SHORT COURSE IN MICROPALAEONTOLOGY, a 10-day course offered June 27-July 7 at the University of Nebraska. The course is designed to update industrial and academic personnel, and to provide training for graduate students. A team of 10 specialists will serve as instructors. Course tuition is $600.00. Address further inquiries to Dr. Paul R. Krutak, Dept. of Geology, 418 Morrill Hall, University of Nebraska, Lincoln, Nebraska 68508.

PROBABILITY METHODS IN OIL EXPLORATION, a week-long course offered September 11-16, at Snowmass, Colorado. This course is an outgrowth of the AAPG Conference on Probability Methods in Oil Exploration held at Stanford University. Instructors will be Profs. J. C. Davis and J. H. Doveton of the Univ. of Kansas, and Prof. J. W. Harbaugh of Stanford. The course will be concerned with numerical methods and computer-aided techniques that have been developed within the last few years. Details and registration forms may be obtained by writing Probability Short Course, Stanford University Post Office Box 8888, Stanford, California 94305.

CARBONATE WORKSHOP FOR EXPLORATIONISTS AND ENGINEERS, a 4-day session sponsored by the University of Texas at Austin. Modern depositional environments, petrographic classifications, facies characteristics and relationships, diagenesis of carbonates and evaporites will be discussed. Half the course will consist of lectures and lab sessions, the other half a field trip to examine central Texas Cretaceous carbonates. Instructors will be Drs. D. G. Bebout and R. G. Loucks of the Bureau of Economic Geology, and Drs. A. J. Scott, R. L. Folk, and L. S. Land of the Dept. of Geological Sciences. Registration for the course and trip is $175.00. This does not include food or lodging. Interested persons should contact Continuing Education Program - Carbonates, Dept. of Geological Sciences, University of Texas at Austin, Texas 78712. Registration deadline is March 11. Limit - 30 participants.

H. G. S. MEMORIAL SCHOLARSHIP FUND

The Scholarship Board acknowledges with sincere appreciation the following contribution to the Memorial Scholarship Fund:

Mrs. Sam D. Rogers, Houston, Texas CONTRIBUTOR
Mrs. Rogers has made this contribution in the memory of her late husband, a former member of the Houston Geological Society.

ANNUAL MEETING SOUTHWEST SECTION AAPG

The Abilene Geological Society is now at work preparing for the SW Section Convention meeting in Abilene on March 6-8, 1977.

Continuing Educational Courses will be offered on Sunday preceding the convention: Dr. John Shelton of Oklahoma State University—"Exploration for Sandstone Reservoirs," and John F. Harris, Consultant of Tulsa—"Practical Subsurface and Stratigraphic Methods of Exploration for Carbonate Reservoirs". A program of some 16 papers will be presented, covering various aspects of the geology of central, western, and panhandle Texas, and adjacent parts of New Mexico, Oklahoma, and Mexico. The program also includes several papers on alternate energy and geologic concepts.

Registration fee is $35, short course fee is $25. To preregister, mail check payable to SW Section AAPG, to:

Box 974, Abilene, Texas 79604

GEOLOGICAL WORD SEARCH

The names of 35 common and well-known minerals are concealed within this puzzle. They are written horizontally, vertically, diagonally, backwards and forwards. A list of the 35 minerals can be found somewhere else in this bulletin.
<table>
<thead>
<tr>
<th>Society</th>
<th>Meeting Name</th>
<th>1977</th>
<th>1978</th>
<th>1979</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AIME</strong></td>
<td>Amer. Inst. of Mining, Metal.,</td>
<td>Mar. 6-10</td>
<td>Feb. 29-Mar. 4</td>
<td>Feb. 25-Mar. 1</td>
</tr>
<tr>
<td></td>
<td>and Petroleum Engineers</td>
<td>Atlanta, Ga.</td>
<td>Denver, Colo.</td>
<td>New York</td>
</tr>
<tr>
<td><strong>AGU</strong></td>
<td>Amer. Geophysical Union</td>
<td>May 30-June 3</td>
<td>Apr. 17-21</td>
<td>Apr. 16-20</td>
</tr>
<tr>
<td></td>
<td>Spring Annual Meeting</td>
<td>Washington</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AGU</strong></td>
<td>Amer. Geophysical Union</td>
<td>Dec. 5-9</td>
<td>Dec. 4-8</td>
<td>Dec. 3-7</td>
</tr>
<tr>
<td></td>
<td>Fall Annual Meeting</td>
<td>San Francisco</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>IPAA</strong></td>
<td>Independent Petroleum</td>
<td>Oct. 23-25</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Association of America</td>
<td>Dallas, Tx.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>OTC</strong></td>
<td>Offshore Technology</td>
<td>May 2-5</td>
<td>May 8-11</td>
<td>Apr. 30-May 3</td>
</tr>
<tr>
<td></td>
<td>Conference</td>
<td>Houston, Tx.</td>
<td>Houston, Tx.</td>
<td></td>
</tr>
<tr>
<td><strong>SESG</strong></td>
<td>Society of Exploration</td>
<td>Sept. 13-22</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Geophysicists</td>
<td>Calgary, Canada</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SIPE</strong></td>
<td>Society of Independent</td>
<td>Oct. 29-Nov. 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prof. Earth Scientists</td>
<td>San Francisco</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SPE</strong></td>
<td>Society of Petroleum</td>
<td>Oct. 9-12</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Engineers of AIME</td>
<td>Denver, Colo.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>World Petroleum Congress</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>**Circum Pacific Energy and</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mineral Resources Conf.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AAPG</strong></td>
<td>AAPG-SEPM national</td>
<td>June 13-16</td>
<td>April 9-12</td>
<td>April 1-4</td>
</tr>
<tr>
<td><strong>SEPM</strong></td>
<td>Annual Meeting</td>
<td>Washington</td>
<td>Oklahoma City</td>
<td>Houston, Tx.</td>
</tr>
<tr>
<td><strong>AAPG</strong></td>
<td>Eastern Section</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Joint with AAPG national</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AAPG</strong></td>
<td>Gulf Coast Section</td>
<td>Oct. 26-29</td>
<td>Oct. 11-13</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(with GCAGS)</td>
<td>Austin, Tx.</td>
<td>New Orleans, La.</td>
<td></td>
</tr>
<tr>
<td><strong>AAPG</strong></td>
<td>Mid-Continent Section (biennial)</td>
<td>Sept. 11-13</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Amarillo, Tx.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AAPG</strong></td>
<td>Pacific Section</td>
<td>Apr. 20-22</td>
<td>Apr. 26-29</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bakersfield, Cal.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AAPG</strong></td>
<td>Rocky Mountain Section</td>
<td>Apr. 4-6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Denver, Colo.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AAPG</strong></td>
<td>Southwest Section</td>
<td>Mar. 6-8</td>
<td>Feb. 26-28</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Abilene, Tx.</td>
<td>Midland, Tx.</td>
<td></td>
</tr>
<tr>
<td><strong>GSA</strong></td>
<td>Geological Society of America</td>
<td>Nov. 7-9</td>
<td>Oct. 23-25</td>
<td>Nov. 5-7</td>
</tr>
<tr>
<td></td>
<td>National Annual Meeting</td>
<td>Seattle, Wash.</td>
<td>Toronto, Canada</td>
<td>San Diego, Cal.</td>
</tr>
<tr>
<td><strong>GSA</strong></td>
<td>Rocky Mountain Section</td>
<td>May 12-13</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Missoula, Mont.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GSA</strong></td>
<td>North Central Section</td>
<td>Apr. 28-30</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Carbondale, Ill.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GSA</strong></td>
<td>Cordilleran Section</td>
<td>Apr. 5-7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sacramento, Cal.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GSA</strong></td>
<td>Southeastern Section</td>
<td>Mar. 23-26</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Winston-Salem, N.C.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GSA</strong></td>
<td>South Central Section</td>
<td>Mar. 17-19</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>El Paso, Tx.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>Position</td>
<td>Address</td>
<td>Phone</td>
<td></td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-----------------------------------------------</td>
<td>--------------------------------</td>
<td>-------------</td>
<td></td>
</tr>
<tr>
<td>WAYNE Z. BURKHEAD</td>
<td>Consulting Geologist</td>
<td>713 Rocky River</td>
<td>713/621-3077</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Houston, Texas 77027</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R. P. AKKERMAN</td>
<td>Geologist EXPLORATION Engineer Review of Subsurface Data</td>
<td>3425 Bradford Place 668-4327</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Houston, Texas 77025</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HARRIS H. ALLEN</td>
<td>Oil and Gas Consultant</td>
<td>933 San Jacinto Bldg. 228-9329</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Houston, Texas 77002</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JOHN L. BIBLE</td>
<td>BIBLE GEOPHYSICAL CO., INC. Gravity-Magnetic Surveys Interpretations</td>
<td>236 Esperson Bldg. 222-6266</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Houston, Texas 77002</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LESLIE BOWLING</td>
<td>Oil and Gas Consultant</td>
<td>1228 First National Bank of Commerce Bldg. 522-0432</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>New Orleans, Louisiana</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JOHN D. BREMSTELLER</td>
<td>AAPG-SEG Group Insurance Plan HGS - Group Cancer Insurance Plan</td>
<td>P.O. Box 36632 Houston, Texas 77036</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STEWART CHUBER</td>
<td>Consulting Geologist</td>
<td>711 Polk St., Suite 802</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Houston, Texas 77002</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GEORGE H. CLARK</td>
<td>Petroleum Geologist</td>
<td>201 Gordon Dr.</td>
<td>544-8257</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Crockett, Texas 75835</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. D. CANTRELL, JR.</td>
<td>Petroleum Geology, Evaluation and Exploration Geologist and Engineer</td>
<td>508 C &amp; I Building, Houston, Texas 77002</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(713) 225-3754</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T. WAYNE CAMPBELL</td>
<td>PALEO-DATA, INC. CONSULTING PALEONTOLOGIST AND GEOLOGIST</td>
<td>6619 FLEUR De LIS DRIVE NEW ORLEANS, LOUISIANA 70214</td>
<td>(504) 488-3711</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HARRIS H. ALLEN</td>
<td>Oil and Gas Consultant</td>
<td>933 San Jacinto Bldg. 228-9329</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Houston, Texas 77002</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
GENEOS PETE COKINOS
Petroleum and Geological Engineering Consultant
947 Hazel Street Beaumont, Texas 832-0368 835-4501 892-8733

JOHN S. DUDAR, Ph.D.
Consultant Oil, Gas, Coal, Uranium Carbonate & Sandstone Stratigraphy
8102 Mobud Houston, Texas 77036 (713) 771-0793 or 464-9451

JACK COLLE
JACK COLLE & ASSOC.
Consulting Geologists & Paleontologists
708 C&I Building — Houston, Texas 77002 (713) 227-6266
Jack Colle (622-9555) J. G. Ward (497-7298)

EVARD P. ELLISON
Geologist
1214 Americana Building 225-6285 Houston, Texas 77002

W. F. COOKE, JR.
PRESIDENT
ACCO Oil & Gas Co.
One Briar Dale Ct. (713) 622-7070
Houston, Texas 77027

ERNEST A. ELWOOD, JR.
Prudential Drilling Company
1880 Post Oak Tower 621-7330 Houston, Texas 77027

JACK W. CRAIG
Consulting Geologist
1520 C & I Building Houston, Texas 77002 713/652-4960

PAUL FARREN.
Geophysical Consultant
Geodata Building 667-3317
5603 S. Rice Ave. (77081)

WALT M. CURTIS
GEOPHYSICAL CONSULTANT
8822 Westview Dr. Houston, Texas, 77055 (713) 464-0801

STEWART H. FOLK
Certified Professional Geologist Coal, Petroleum, & Geothermal Resources
700 Post Oak Bank Building Office 713/622-9700
Houston, Texas 77056 Home 713/781-2336
JOSEPH N. GRAGNON
Consulting Geophysicist
1410 Americana Building
Houston, Texas 77002
713/652-3837

DONALD W. LANE
Consulting Geologist
Gulf Coast, Rockies Mountains
Midcontinent, Eastern Interior
12214 Mossycup Drive
Houston, Texas 77024
(713) 461-1637

STEVEN R. GUSTISON
Consulting Petroleum Geologist
Res. (713) 469-4456
Office (713) 658-0601
7510 Fernbrook
Houston, Texas 77070

O. G. LUNDSTROM
GEOLOGIST

MICHEL T. HALBOUTY
Consulting Geologist
and Petroleum Engineer
Independent Producer and Operator
The HALBOUTY CENTER
5100 WESTHEIMER
HOUSTON, TEXAS 77056
(713) 622-1130

VIRGINIA LEE BICK
Member of American Association Petroleum Geologists
5865 San Felipe
Houston, Texas 77057
(713) 789-8878

WILLIAM E. HUMPHREY
Petroleum Exploration Consultant
Suite 700
2200 South Post Oak Road
Houston, Texas 77056

GEORGE N. MAY
GEORGE N. MAY and ASSOCIATES
Consulting Geologists and Paleontologists
P. O. Box 51858 Oil Center Station
Lafayette, Louisiana 70505
234-3379

W. B. McCARTER
C. E. McCARTER
Independents
2522 Hazard
Houston, Texas 77019
523-5733
529-1881
R. B. MITCHELL
Geologist
652-2192
2301 First City National Bank Bldg.
Houston, Texas 77002

I. K. NICHOLS
Gulf Coast Exploration Geologist
C.P.G. No. 932
41 Still Forest Dr.
Houston, Texas 77024

RAYMOND D. REYNOLDS
Geologist
701 Main Street - Suite 436
Houston, Texas 77002

JOSEPH G. PUTMAN III
Consulting Geophysicist & Geologist
1514 Pine Gap
Houston, Texas 77090

RICHARD L. PORTER
Petroleum Geologist & Exploration Consultant
2101 Fountain View No. 29
Ph. 713-781-5357
Houston, Texas 77057

RAYMOND D. REYNOLDS
Geologist
701 Main Street - Suite 436
Houston, Texas 77002

RICHARD L. PORTER
Petroleum Geologist & Exploration Consultant
2101 Fountain View No. 29
Ph. 713-781-5357
Houston, Texas 77057

LEO PUGH
Gulf Coast Geo Data Corp.
Seismic — Gravity Data
816 AMERICANA BLDG.
Houston, Texas 77002

JOSEPH G. PUTMAN III
Consulting Geophysicist & Geologist
1514 Pine Gap
Houston, Texas 77090

RICHARD L. PORTER
Petroleum Geologist & Exploration Consultant
2101 Fountain View No. 29
Ph. 713-781-5357
Houston, Texas 77057

LEO PUGH
Gulf Coast Geo Data Corp.
Seismic — Gravity Data
816 AMERICANA BLDG.
Houston, Texas 77002

FRED L. SMITH, JR.
Consulting Geologist
Paleontologist
Office: 659-5757
Res. 468-7300
1014 C & I Building
Houston, Texas 77002
GENE VAN DYKE
PREsIDENT
VAN DYKE COMPANY
SOUTHWEST TOWER
HOUSTON, TEXAS 77002
(713) 228-8174 TELEX 762200

Merlin J. Verret
President
Delta Energy Resources, Inc.
3002 Country Club Road
Lake Charles, Louisiana 70601 (318) 477-1477

WILLIAM C. WAGNER
Consulting Geophysicist

WILLIAM E. WALLACE Ph. D.
Certified Petroleum Geologist
Exploration Consultant
Domestic - Foreign

J. C. WALTER, JR.
Geologist and Petroleum Engineer
242 Main Bldg.
Houston, Texas 77002
Home Phone: 785-2030
Magcobar DATA units with ONBOARD III onboard computer systems are winning the praise and respect of field engineers and geologists alike. In the words of one engineer with a major oil company, "We've never gotten real numbers like this so fast." And others who have seen the ONBOARD III agree that its versatility, speed, and accuracy sound that of any other wellsite computer system. Here's why.

ONBOARD III can monitor 64 variables during drilling operations. The system also includes 20 customer-oriented programs to analyze and display more than 200 results. For example, ONBOARD III calculates rate of penetration and pipe velocity with .01 second resolution. The Annular Pressure program computes mud column acceleration while the pipe is moving and then calculates resulting effective hydrostatic head.

ONBOARD III can average monitored variables over a time period exceeding 30 minutes—in fact, up to three hours—without overflow which results in erroneous outputs.

ONBOARD III uses any rig power, but is completely isolated from rig power source fluctuations for continuous, reliable information. It can operate for at least ten minutes stand-by power in an emergency. And can recover from an extended power failure in ten seconds. ONBOARD III is the most advanced well-site data management system available—indeed, the only one providing a complete suite of drilling and geological information and analysis.

Put all the advantages of a DATA unit with ONBOARD III on your wells. Call or write your Magcobar DATA Unit representative. Magcobar Division, Dresser Industries, Inc., P. O. Box 6504, Houston, Texas 77005. 713/784-6011.
CRYSTAL OIL COMPANY
Oil and Gas Exploration
730 North Post Oak Road
Houston, Texas 77024
Phone 713/688-3745

RICHARD G. GUERRERO
Expl. Mgr.—Gulf Coast

CAYUGA EXPLORATION INC.
Oil & Gas Exploration
Texas - Louisiana - Canada

Corporate Headquarters
600 Ray P. Oden Building
P.O. Box 1101
Shreveport, Louisiana 71120
Telephone: (318) 222-7791

BURNETT PERSONNEL CONSULTANTS

“The Professionals”

We Specialize in Finding People
Who Find Oil & Gas

Our Business is quite similar to your profession. Whether you are a Geologist, Geophysicist, Petroleum Engineer, Landman, in a Staff Position, or Management, you are part of a team Finding and Developing Oil and Gas Reserves.

At Burnett Personnel Consultants, we are professionals also. Our Profession is finding people who find oil and gas. We are from the oil industry and have technical expertise and knowledge of your profession. We pride ourselves on working with our applicants on a professional basis, and our applicants are presented on a confidential basis to our client companies. We are not a resume mail-out service.

Our automated file retrieval system insures your consideration for positions compatible with your background and desires. If You Prefer, we will discuss an opportunity with you prior to our presentation to the employer. Whether you are actively searching for a new opportunity or only desire to keep on top of the job market, Call or Mail us a Resume Today. It pays to be represented by the Professionals who are on top of the job market.

ALL POSITIONS FEE PAID

Burt Dunn, Art Deyholos - Gary Lawman
1100 Milam Bldg.- Ste. 3086
Houston, Texas 77002
(713) 658-8544

Suite 1945
713/629-8450
Houston, Texas 77056
BROWN AND McKENZIE, INC.
Oil & Gas Exploration
Five Greenway Plaza East
Suite 1704
Houston, Texas 77046
(713) 626-3300

C. F. Brown, Jr.          Michael McKenzie
Billy Neal, Petroleum Engineer

WESTERN GEOPHYSICAL

Box 2469
Houston, Texas 77001
(713) 781-3261

GEOLOGICAL INFORMATION CENTER

LOGS • WELL HISTORIES
MAPS • PRODUCTION REPORTS
MEMBERSHIPS AVAILABLE

326 ENTEX BUILDING
HOUSTON, TEXAS 77002
(713) 229-9573

Petroleum Information Corporation
A Subsidiary of A.C. Nielsen Company

Oil and Gas Reports • Production Reports
IN HOUSTON ONCE CORPORATE SQUARE
P.O. BOX 1702 • 77001
526-1381

3615 Gulf Freeway
Core Analysis and Mud Logging
223-4193

GEOPHYSICAL SERVICE INC.
A SUBSIDIARY OF
TEXAS INSTRUMENTS INCORPORATED

Telephone: (713) 494-9061

Components Building (#1)       Mailing address:
12201 Southwest Freeway        P.O. Box 2903
Stafford, Texas 77477          Houston, Texas 77001
MITCHELL ENERGY & DEVELOPMENT CORP.
300 ONE SHELL PLAZA  HOUSTON, TEXAS 77002  713-224-5322
An Equal Opportunity Employer M/F
Listed on the American Stock Exchange
Ticker Symbol: MND

J. R. Butler and Company
OIL AND GAS CONSULTANTS
Suite 130, 4605 Post Oak Place, Houston, Texas 77027
Telephone 713/627-7180  Telex: 910 881 4408
Affiliated with GeoQuest International Ltd.

Seiscom Delta inc.
P. O. Box 36928
Houston, Texas 77036
713/785-4060

Principal Offices:
Houston, London, Singapore, Calgary

ATWATER, CARTER, MILLER & HEFFNER
Consulting Geologists and Engineers
424 Whitney Bank Building
New Orleans, Louisiana  70130
(504) 581-6527

R. BREWER & CO., INC.
Houston
Consultants

MORGAN J. DAVIS ASSOCIATES
Petroleum Consultants and Geologists
1300 Main—Suite 620
Houston, Texas  77002
MORGAN J. DAVIS  EDWARD D. PRESSLER
713—651-0209  713—658-1832

RALPH E. DAVIS ASSOCIATES, INC.
Consultants
Petroleum and Natural Gas
500 Jefferson Building—Suite 2031
Houston, Texas 77002  713—659-8835
H. J. GRUY & ASSOCIATES, INC.
Petroleum Consultants
420 Southwest Tower
Houston, Texas 77002
(713) 652-5753

SIDNEY SCHAFER AND COMPANY
2200 Welch Avenue
Houston, Texas 77019
Sidney Schafer
Jack C. Weyand
529-8789

KEPLINGER and Associates, inc.—
INTERNATIONAL ENERGY CONSULTANTS
Oil, Gas, Coal, Uranium, Minerals, Geothermal
Engineering, Geological, Geophysical
3430 Entex Building
Houston, Texas 77002
(713) 651-3127
1400 4th Nat’l Bank Bldg.
Tulsa, Oklahoma 74119
(918) 587-5591

WOODHAM CONSULTING CO.
Geophysical-Geological Consultants
Bill Woodham
1200 C & I Building
654-4138

GeoQuest International, Ltd.
EXPLORATION CONSULTANTS
Suite 130, 4605 Post Oak Place, Houston, Texas 77027
Telephone 713/627-7180  Telex 910 881 4408
Affiliated with J.R. Butler and Company

BIG "6" DRILLING COMPANY
1228 Bank of the Southwest
Houston, Texas 77002
W. H. Smith, President
652-5896
C. B. Benge, Jr., V.P.—General Manager

HOUSTON OIL & MINERALS CORPORATION
242 The Main Building, 1212 Main Street
Houston, Texas 77002
713/651-3800

PRUDENTIAL DRILLING COMPANY
1880 Post Oak Tower Building
5051 Westheimer
Houston, Texas 77056
Off. Phone 621-7330
E. A. ELWOOD, JR.
Res. Phone 782-3275
CAVALLA ENERGY EXPLORATION CO.

JAMES A. MCCARTHY
PRESIDENT

HERMAN L. SMITH
VICE PRESIDENT

PETER R. FRORER
VICE PRESIDENT

1404 FIRST CITY EAST BLDG.
HOUSTON, TEXAS 77002
713/652-0907
GO WITH EXPERIENCE

SPECIALISTS IN HYDROCARBON GEOCHEMISTRY

- Hydrocarbon Source Rock Evaluation
- Crude Oil - Source Rock Correlation
- Crude Oil Characterization
- Geochemical Surface and Subsurface Prospecting
- Biostratigraphic Services
- Depositional Facies Analysis
- Contract Laboratory Services

GeoChem USA
1143-C Brillmore Rd.
Houston, Texas 77043
Phone 713/467-7011

GeoChem U.K.
17 Chester Street
Chester, England CH1 2DS
Phone 0244-316160

GeoChem Canada
17 Chester Street
Chester, England CH1 2DS
Phone 0244-316160
Our business is Results.

W.O. Bishop
J.L.P. Campbell
Bob Carr
Bob Cook
Bill Latson
Jack P. Myers
R.M. "Dusty" Rhodes
Roy "Bud" Smith
Ted Turner

Division of Dresser Industries, Inc.
601 Jefferson, Houston, Texas 77005
713/784-6011