HOUSTON GEOLOGICAL SOCIETY

HOUSTON GEOLOGICAL SOCIETY

Volume 20
Number 5

BULLETIN

HGS JANUARY CALENDAR

January 9, 1978 (Evening Meeting)
Summit Club, First International Bank Building
Dr. W. E. Galloway, Texas Bureau of Economic Geology, Austin
“Relationships between Depositional Systems, Ground-Water Flow History, and Origin, Migration, and Concentration of Uranium—Catahoula Formation of Texas Coastal Plain”
Social Hour—5:15 PM, Dinner—6:15 PM, Meeting—7:00 PM
Reservations (telephone only, 223-9309) must be made or cancelled by Friday, January 6, 1978.

January 12-13, 1978 (Continuing Education)
Exxon Auditorium
Dr. John W. Lee, Texas A&M, College Station
“Reservoir Engineering for Petroleum Geologists.”

January 25, 1978 (Luncheon Meeting)
Tanglewood Room, Holiday Inn—Medical Center, 6701 South Main
Dr. Clyde H. Moore, Jr., LSU, AAPG Distinguished Lecturer
“Diagenetic Controls Over Porosity Distribution in Ancient Carbonate Rock Sequences”
Luncheon and Meeting—12:00 Noon
Reservations (telephone only, 223-9309) must be made or cancelled by noon Monday, January 23, 1978.
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PRESIDENT'S COMMENTS

One of the objectives of the Houston Geological Society is to aid and encourage academic training in the science of geology. The Society is active in this area through the Academic Liaison Committee, the Awards and Student Loan Committee, the Boy Scout Committee, and the Memorial Scholarship Fund, which was discussed in this column in December.

The Bylaws state that the purpose of the Academic Liaison Committee shall be to work in liaison with teachers, schools, and other groups to promote interest in and appreciation of geology. This committee is under the able direction of Dr. Philip F. McKinlay. He arranges for HGS members to speak on geology and the mineral industries to schools all over the Houston area and to age groups ranging from third graders to college geology clubs. This is a valuable community service. It exposes young people to the fascinating field of geology through contact with a professional geologist. Those who fulfill various speaking engagements are often called upon for mineral, rock, and fossil identification in addition to delivering their prepared lectures. I have asked Dr. McKinlay to report to the membership on the monthly activity of this committee so that you may be aware of its impact in our local school community. Those who participate in this program are to be commended for their service. If speaking to school or community groups on the subject of geology interests you, please contact Dr. McKinlay at 666-8000.

The object of the Awards and Student Loan Committee is to choose recipients for all awards established by the Executive Board, to recommend to the Executive Board candidates for honorary life membership; and to review and recommend to the Executive Board academic loans to be made to worthy graduate students pursuing the study of geology. The activity of this committee is under the capable leadership of Albert C. Raasch, Jr. There are no outstanding student loans at the present time. Possibly many of our newer members are unaware that the Society has monies available in the Academic Fund to provide student loans so by this column I hope to bring this fact to your attention. This committee would be happy to receive and review any loan application. Of the awards established by the Executive Board, the one involved in aiding and encouraging academic training in geology is the Outstanding Student Award for geology students at Rice University, University of Houston, Lamar University, Texas A&M University, and the University of Texas at Austin. This award is given to the geology student at each school who has been the outstanding person, both academically and in teaching and service to the department and to the university. These five students and their faculty sponsors are our guests at the May evening meeting, and a plaque plus a cash award is presented to each honoree. HGS participates in the Science and Engineering Fair of Houston as a Special Awarding Agency in the area of Earth Science. This committee furnishes judges to determine the winners in the junior and senior high-school levels and then honors these winners at the April evening meeting. The winning students and their parents are our guests, and the winners are presented with appropriate prizes. Through this activity, we encourage young people in the study of geology.

The Boy Scout Committee, while not having a formal connection with academic training in geology, does aid in the introduction of young people to geology through the Geology Merit Badge Program. McInnis S. Newby, a former president of HGS and an active adult leader in the Boy Scout program, is chairman of this committee. Some of his predecessors, notably Robert E. Miller, Tom W. Penn, and Cecil R. Rives had put together a fine Geology Merit Badge course which included four evening lectures and two field trips, one to the Caldwell area to collect fossils and one to the Llano region to study rocks and minerals. Mr. Newby's plan is to synthesize this previous work into a syllabus which any professional geologist could use in presenting a Geology Merit Badge Program. In this way, we should be able to expand the scope of the program and involve a greater number of Boy Scouts. Some of the great paleontologists of the United States got their start from collecting fossils as youngsters in the fossiliferous Ordovician strata around Cincinnati, Ohio, and through Mr. Newby's program some young students in the Houston area may decide that geology will be their life's work.

DEAN GRAFTON

SOCIETY CALENDAR FOR FEBRUARY

February 4, 1978

Houston Club

HGS Auxiliary Breakfast-Dance. Call 468-9495 for information.

February 6, 1978

Stouffers—Greenway Plaza

(Joint mtg. w/HAPL)

T. D. Cook, Shell Development Co. "Exploration History of the South Texas Lower Cretaceous Carbonate Platform" (tickets will be sold in advance; no sales at the door)

February 16-17, 1978

Exxon Auditorium

(Continuing Education).

John K. Sales, State University College of New York. "Model Studies of Geologic Structures Applied to Hydrocarbon Exploration"

February 22, 1978

Holiday Inn—Med. Ctr.

W. H. Roberts, Gulf R & D

"The Design and Function of Oil and Gas Traps"

AAPG CANDIDATES ANNOUNCED

Edd R. Turner, AAPG president, has announced the slate of candidates for office in the AAPG. Ballots will be cast by members in the spring of 1978 and the successful candidates will assume their offices on July 1, 1978.

Candidates for president-elect are John D. Haun, professor of geology at Colorado School of Mines, Golden, and John A. Taylor, an independent geologist from Oklahoma City.

Candidates for vice-president are Thomas D. Barber, general manager for Michel T. Halbouty, Houston, and James O. Lewis, Jr., consulting geologist, also of Houston.

Candidates for treasurer are Robert L. Fuchs, president, Geosystems Corporation, Westport, Connecticut, and George B. Pichel, chief geologist, Union Oil and Gas Division, Los Angeles, California.
Dr. Galloway is a native Texan, being born in Waco and receiving his geological training at Texas A&M and The University of Texas. He was awarded a B.S. with High Honors from A&M, where he was an NSF research participant during his junior year. His M.A. and Ph.D. in Geology were granted by The University of Texas at Austin, where he was an NSF Fellow. During his schooling, he held summer jobs with Mobil and with the Bureau of Economic Geology. In 1970 he joined Continental Oil Company at Ponca City, where he rose from Research Scientist to Director of Geological Research in the Exploration Research Division before joining the Bureau of Economic Geology at Austin as a Research Scientist.

Dr. Galloway's research interests include the stratigraphy and geologic setting of uranium and sedimentary copper deposits; the effects of depositional environment and diagenesis on reservoir parameters; stratigraphic analysis of seismic gravity and computer-compiled subsurface data; and seismic modeling techniques. He is a member of Tau Beta Pi, Sigma Gamma Epsilon, and Phi Eta Sigma honorary societies. He received the A. I. Levorsen Award from the Rocky Mountain Section-AAPG (April 1977) for the paper to be given to HGS.

RELATIONSHIPS BETWEEN DEPOSITIONAL SYSTEM; GROUND-WATER FLOW HISTORY; AND ORIGIN, MIGRATION, AND CONCENTRATION OF URANIUM—CATAHOULA FORMATION OF TEXAS COASTAL PLAIN1

(Abstract)

by William E. Galloway

The Catahoula Formation is a host for major known reserves of uranium ore and is the target of extensive exploration in the Texas coastal plain. Regional genetic facies analysis shows the Catahoula to consist of two principal fluvial systems. The Gueydan fluvial system of South Texas consists of low sinuosity, bed-load to mixed-load channel sands, and gravelly sands interbedded with ash-rich crevasse and floodplain facies. Coarse material was derived from erosion of volcanic debris in Trans-Pecos Texas; ash was derived from explosive eruptive centers in western Mexico. The Chita-Corrigan fluvial system of East Texas contains deposits of several sinuous to meandering, mixed-load channel complexes surrounded by extensive crevasse-splay, floodplain, and lacustrine facies. Sands were derived from nonvolcanic sources, but air-fall ash is abundant.

Analysis of trace uranium content of ash-derived mudstones indicates early mobilization of uranium in depositional environments characterized by subaerial leaching and soil formation. Solubilized uranium entered a well-integrated, semiconfined ground-water flow system in areas of ground-water recharge, and moved coastward down the regional hydrodynamic gradient. Primary controls on the geometry of ground-water flow and total flux through a particular area include (1) the aggregate permeability, degree of interconnection, and orientation of aquifer sands (determined by the depositional system); (2) the distribution of syndepositional fault zones (which affect both facies distribution and later ground-water flow geometry); and (3) the geographic position of recharge and discharge areas. The areal extent, geometry, and uranium content of alteration fronts, in turn, reflect the geometry and flux of the ground-water flow system at the time of mineralization. Postmineralization diagenetic alteration of host sands and the geological relationships suggest that Catahoula mineralization patterns were established soon after deposition in a semiconfined aquifer; subsequent remobilization and migration of uranium have been limited.

HGS MEMORIAL SCHOLARSHIP FUND

The Board of the HGS Memorial Scholarship Fund wishes to acknowledge contributions to the fund from the following individuals and companies:

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PRICE SCHEDULE—HGS MEETINGS

Summit Club
Dinner ..................................................... $7.50

Holiday Inn-Medical Center
Luncheon .............................................. $6.50

RESERVATIONS—223-9309

Please make reservations for Monday evening meetings by the preceding Friday; for Wednesday noon meetings by the preceding Monday noon.

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NOON MEETING—JANUARY 25, 1978

CLYDE H. MOORE, JR.—Biographical Sketch

Dr. Moore was born in Jacksonville, Florida. He received his B.S. in Geology from Louisiana State University and his M.S. and Ph.D. in Geology from The University of Texas at Austin. He began his working career as a Research Geologist with Shell Development in Houston in 1961. In 1968, he left Shell to join the faculty of Louisiana State University, where he is currently Professor of Geology and Director, Department of Geology, Applied Carbonate Research Group.

Dr. Moore's research interests include carbonate cementation in mixed marine-meteorite water systems, sediment budgets and distribution patterns in Holocene reef systems, trace-element geochemistry of carbonate cements, and pore-space evolution in ancient carbonate-rock sequences. Dr. Moore is a member of the American Association of Petroleum Geologists and is on tour as a Distinguished Lecturer for the AAPG.

DIAGENETIC CONTROLS OVER POROSITY DISTRIBUTION IN ANCIENT CARBONATE-ROCK SEQUENCES

(abstract)

by Dr. Clyde H. Moore, Jr.

The distribution of original porosity in carbonate-rock sequences at the time of deposition is a function of textures and fabrics controlled by processes in the depositional environment. Carbonate sequences representing high-energy environments such as beaches, marine bars, and tidal channels can be expected to have high original porosity because of their relatively coarse, well-washed textures. This relation between original depositional environment and pore-space distribution leads to a basic exploration strategy widely utilized both in quartzose and carbonate provinces.

In carbonate-rock sequences, however, the ultimate nature and distribution of porosity commonly are the result of diagenetic processes that act either to occlude primary porosity or to generate secondary porosity during the post depositional history of the sequence. Three ancient carbonate-rock sequences illustrate diagenetic controls over ultimate porosity distribution.

A localized carbonate-sand sequence in the Lower Cretaceous Edwards of west-central Texas is a well-developed beach sequence which has undergone extensive syngenetic diagenesis. The present pore system is entirely secondary, having been generated by preferential solution after the general occlusion of its primary pore system by early cementation and silification. The final pore-space distribution of the carbonate beach is completely independent of original depositional textures.

Lower Cretaceous shelf-edge rudist-reef sequences long have been exploration targets along the northern and western Gulf margin, and much of the success has been confined to the western or Mexican part of the trend. In general terms, exploration of the Texas and central Gulf has confirmed the trend of the Stuart City rudist shelf-edge sequence, but little commercial porosity development has been found. Studies of similar sequences in exposures in central Texas and Mexico indicate that early syngenetic diagenesis acts to occlude most original porosity in rudist-reef sequences, and that exposure to fresh water prior to mineral stabilization is probably necessary for the generation of significant secondary porosity. Studies of the subsurface Stuart City trend have developed little evidence for significant freshwater influence during its burial history; this may explain its general lack of commercial secondary porosity.

The Jurassic Smackover in southern Arkansas appears to be a classic stratigraphic trap in carbonate rock with original porosity preservation, and the trapping mechanism appears to be porosity pinchout into nonporous lagoonal-mud facies. In reality, however, the Smackover porosity occlusion is by cementation, and porosity distribution is controlled by diagenetic processes rather than environmental parameters. Primary porosity is preserved preferentially in the vadose zone associated with penecontemporaneous salt tectonics.

It is clear from these examples that exploration-exploitation strategies in carbonate provinces must utilize the concept of total rock history, taking into account both depositional and diagenetic regional trends and models in any attempt to predict the distribution of potential reservoir rocks.

AUSTIN CONVENTION BEST-PAPER AWARDS

GCAGS AWARDS

No. 1—David K. Davies, William Almon
"Effects of sandstone composition and diagenesis on reservoir quality, Tertiary-Pleistocene Gulf Coast region."

No. 2—James O. Lewis
"Stratigraphy and entrapment of hydrocarbons in the San Miguel sands of southwest Texas."

No. 3—J. O. Snowden, W. B. Simmons, E. B. Traughber, R. W. Stephens
"Differential subsidence of marshland peat as a geologic hazard in the Greater New Orleans area, Louisiana."

SEPM AWARDS

No. 1—Charles D. Winker, James D. Howard
"Plio-Pleistocene paleography of the Florida Gulf Coast interpreted from relict shorelines."

No. 2—Wayne C. Isphording
"Petrology and stratigraphy of the Alabama Miocene."

No. 3—R. Michael Looney, Victor R. Baker
"Late Quaternary geomorphic evolution of the Colorado River, Inner Texas coastal plain."

ONE BILLION

One billion seconds ago, the first atomic bomb had not been exploded. One billion minutes ago, Christ was still on the earth. One billion hours ago, men were still living in caves. One billion dollars ago, in terms of U.S. government spending, was yesterday. (Courtesy RMAG Newsletter)
GUEST COLUMN

BOOM DEMAND FOR EXPLORATIONISTS

by Morgan J. Davis, Morgan J. Davis Associates

When asked to write a short article for this column, I wondered what would be of primary interest at this time to explorationists, especially geologists. I decided to express my own awareness and concern about the increasing demand for geologists and geophysicists as it exists at the present time. This concern also embraces some of the practices I am often hearing about in connection with the employment of experienced explorationists by the many different exploration organizations now operating throughout the potential oil and gas provinces of the United States.

First, what is going on in the schools? I express appreciation to my good friend Dr. Robert E. Boyer, Chairman of the School of Geological Sciences at The University of Texas, for some of my information.

There is a high demand at the moment for young explorationists, geologists, and geophysicists who are just coming out of the universities as well as a high demand for experienced personnel. To give you some idea of starting salaries for explorationists being offered by company recruiters at The University of Texas, I offer the following table:

1. Geologists with B.S. degrees—$1500 to $1600 per month ($18,000 to $19,200 per year).
2. Geophysicists with equivalent degrees—$1000 to $1500 per year more than the geologists.
3. Graduates with Master’s degrees—around $1800 per month or about $22,000 per year. (Again, geophysicists are being offered more.)

The demand for B.S. and M.S. graduates is presently higher than the demand for PhD’s but, when employed, the PhD’s are receiving in the range of $25,000 per year. To us old-timers, these beginning salaries seem extremely high, and they are probably at least two times higher than they were 10 years ago. Actually, in the past 2 to 4 years, beginning salaries have been going up something like $1200 per year, each year.

Even though the larger universities are now turning out record numbers of graduates, universities with a superior reputation for quality, such as The University of Texas, are not keeping up with the demand. Having witnessed a number of exploration booms during the past 50 years, I must take note of the fact that each boom has followed a "bust," and, if the past can be used as a forecast of the future, this may happen again. Having made this rather pessimistic statement I hasten to add that I do not expect the present boom to be as short-lived as some have been in the past. Our national need for self-sufficiency in fuels is so great, and in my opinion the prospect of large additional domestic hydrocarbon supplies is so promising, that I am willing to predict a rather long period, possibly 10 years, during which competent explorationists will continue to be in high demand.

On the other hand, I believe it is worthwhile to sound a note of caution and to express the hope that our schools throughout the nation will not "mass produce" geologists and geophysicists. In my opinion, the need for these professional people is not inexhaustible and, almost inevitably during a period of mass production of technical and professional people, standards are allowed to deteriorate.

The demand for explorationists has caused many schools which formerly were not set up to give adequate geological and geophysical training to expand their faculties too rapidly, and the result is that many of them have not yet attained the ability to graduate well-trained, highly competent explorationists. This is unfortunate.

During such a boom period, there is also considerable traffic in experienced personnel between companies. I am reliably informed that all sorts of extra inducements are being offered in order to attract experienced explorationists from older and larger organizations to some of the newer and rapidly growing groups which have entered actively into exploration for oil and gas. Some of these inducements involve equities in addition to high salaries, stock options, and bonuses. It seems to me (at the risk of being termed "old-fashioned" and "out of date") this detracts from the concept that geologists and geophysicists are professional people. This type of compensation seems to be based more on a desire to build up staff rapidly than on the desire to reward explorationists for actual individual achievement.

An unfortunate effect of hiring explorationists with 7 to 10 years of experience out of the larger and older organizations is the fact that this removes from these groups some of the most effective members of the exploration team and creates a gap between the younger, less-experienced people and the older employees probably already advanced to positions involving some administrative responsibilities. This results in loss of efficiency.

But, coming back to the possibility of a "bust" in the future, what can the universities and schools do to soften the blow, if and when explorationists are no longer in high demand? I like the expressed objective of Dr. Boyer, who believes the present universities which are turning out well-equipped, highly trained explorationists should keep their standards very, very high; this, in itself, will eliminate a certain number of young aspirants not intellectually equipped to become exploration experts, and will insure that their graduates will still be sought after, even in a highly competitive market. He also believes that students should be encouraged to diversify to some extent, with continuing emphasis on geophysics and an active program for training of professionals in minerals generally, as well as in energy resources. Above all, both he and I would deplore the tendency already exhibited by some of the schools which were not formerly well staffed to turn out explorationists in larger and larger numbers.

INTERIOR REQUESTS COMMENTS ON FINAL COAL-LEASING PROGRAMMATIC EIS

The public is being asked to comment on the final environmental-impact statement on the Proposed Federal Coal Leasing Program. Public comment will be accepted until January 31, 1978, in compliance with an order given by the U.S. District Court for the District of Columbia. The court concluded, in the case of Natural Resources Defense Council vs. Rossy B. Hughes, Civil Action No. 75-1749, that the final coal programmatic EIS filed in 1975 was inadequate because (1) the description of the proposal was insufficient to allow informed comment, (2) the alternatives to a new Federal coal-leasing program were inadequately presented, and (3) the need for new Federal leasing was not properly analyzed.
Interior has requested that the public focus comment on the following questions:
(1) Is there a need for renewed Federal coal leasing?
(2) If there is a need, how should the program be defined?
(3) If new Federal leasing should be undertaken, how would different types of Federal leasing systems affect the environment?

Interested parties are requested to compare the Energy Minerals Activity Recommendation System (EMARS) leasing system, Title 43 CFR Subpart 3525, 42 Federal Register 25471, with the Federal Coal Leasing Amendments Act of 1975, 30 U.S.C. 181 et seq., and indicate what other leasing systems they believe are compatible with the Act.

**DROPPING THE PILOT**

The first pilot-light system, patented in 1912, was developed to put an end to the not-infrequent explosions caused by the casual system of lighting gas stoves, in which even an experienced cook could never be quite sure of how high to turn up the gas or when to strike a flame. By keeping some gas lit at all times, the skill necessary to heat an oven was reduced to a level where even a dull child could safely use the appliance (as long as the tot did not get too curious about what that little blue flame was doing in there).

But each of the little blue flames that peek out at us from the dark recesses of our gas-fired appliances, generating heat summer and winter, burns up about 300 Btu's of a precious fossil fuel every hour of every day of every year. According to recent estimates by the Department of Energy, the eternally burning pilot lights in our clothes dryers, ovens, water heaters, and furnaces account for 3% of the total annual national consumption of natural gas and 13% of residential gas consumption. The grand total: 648 billion cu ft a year.

Not all the gas is wasted. Everything burned while our ovens and clothes dryers and furnaces are actually in operation counts as useful heat, and all the heat generated by the pilot in water heaters transfers into the water and thus must be counted as useful, too. But even allowing for these factors, and for the small contribution that burning pilots make to home heating in cold weather, we are still wasting about one-third of those 648 billion cu ft of gas in generating useless (or, in warm weather, nuisance) heat.

Now there are other ways to keep our gas-burners from blowing up in our faces. The most reasonable alternative proposed to date is the installation of electrical ignition devices on new appliances. These devices act like spark plugs in combustion engines; at the completion of a circuit (by the touch of a button or flick of a switch), they spark to ignite a preregulated quantity of gas.

Although appliances utilizing this new technology are currently on the market, they are somewhat more expensive to manufacture than conventional pilot-light models. The cost is passed on to the consumer with price tags running about $12 higher on clothes dryers, $30-$36 on ovens, and $20-$25 on furnaces. Thus, the new system is not cost-competitive with the old—at least not yet.

However, if all the appliances (except water heaters) that we now use were replaced by ones using electrical ignition systems, U.S. consumers would save about $600 million per year on gas bills. Unfortunately, most consumers look only at price tags in the showroom rather than considering lifetime operating costs, so it seems that government may have to make the choice for us. So far, only California has seen fit to legislate a mandatory end to the sale of appliances (except, once again, water heaters) run by pilot lights.

The DOE will make public its recommendations on the subject soon; if the California law were nationalized, it could save 222 billion cu ft of gas per year, once the replacement process is completed. (This will take a number of years, as replacement will most likely occur slowly, as old appliances wear out.)

How much gas is that, really? Enough to heat a million homes for a year. Why go on burning it up?

Randi Jaffe
Editorial Assistant
*Across the Board*
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**PROFESSIONAL NOTES**

Paul H. Carter, Jr., has joined McCord Exploration as geologist for the Texas Gulf Coast in their Houston office (759-0053).

William D. Poyner has been named Offshore Division Exploration Manager for Anadarko Production Co., Houston (626-7610), with responsibility for the company's exploration effort in the Gulf of Mexico and the Atlantic.

Alfred J. Deschamps has accepted the position of District Geologist-Gulf Coast with Home Petroleum Company (686-7444).

Albert H. Newton has joined Aminoil USA as Division Development Geologist (686-9261).

John W. Sauri has joined the geological staff of General Crude (651-9261).

Dalton L. Null recently joined Hydrocarbon Exploration Company, Inc., as Vice President-Exploration (961-3054).

Dr. Doris M. Curtis was elected to Honorary Membership in the Gulf Coast Section of SEPM at the recent convention in Austin. She has been an Honorary Member of the national Society of Economic Paleontologists and Mineralogists since 1974. Dr. Curtis is President-Elect of SEPM for 1977-1978, the first woman to achieve this office.

Herschel H. Nixon and his wife, Joan Lowery Nixon, are co-authors of a children's book which appeared on the bookshelves in November. *Oil and Gas: From Fossils to Fuels* explores fuel from its beginnings and projects into the future with a positive attitude.

Michael J. Switek, Jr., has joined General Crude Oil Company as an exploitation geologist in the company's Houston office (224-9261).

**RECENT DEATH**

HALBOUTY HONORED

Michel T. Halbouty, Honorary Life Member of the Houston Geological Society, was honored on November 12, 1977, at Texas A&M University. Presiding at the ceremony of the naming of the Michel T. Halbouty Geosciences Building was Dr. Earl Cook, Dean of the College of Geosciences. Paying tribute to Mr. Halbouty were Dr. Jarvis Miller, President of Texas A&M University, Dr. Jack K. Williams, Chancellor of the Texas A&M University System, and Mr. Matthew M. Hammer, representing the geoscience students. Presentation was by Mr. Clyde H. Wells, Chairman, Board of Regents, The Texas A&M University System.

The following is the published tribute to Mr. Halbouty:

"Since his graduation in 1930, Michel Halbouty has distinguished himself and this University by his contributions to his fellowman. With business interests throughout the United States, he is recognized as one of the most active independent oil and gas operators and producers in the nation. Internationally renowned as one of the world's outstanding geologists and petroleum engineers, he is a member of many world-wide professional and technical societies and is the recipient of numerous service and professional awards. In addition to receiving the highest award bestowed by the American Association of Petroleum Geologists, he also has received the highest honors conveyed by the American Institute of Mining, Metallurgical and Petroleum Engineers. He is the only earth scientist to have achieved the distinction of being so singularly honored by these two great scientific and professional societies.

"Throughout the years, Mr. Halbouty has served faithfully his community and his alma mater. Exemplary of his many civic leadership positions is membership of the Board of Trustees of the Texas Heart Institute and the Board of Trustees of Texas Children's Hospital in Houston. A constant friend of education, he is a founding member of the President's Endowed Scholars program, and since 1947 he has been the donor of a permanent annual graduate fellowship in the Department of Geology. Recently, a generous gift from Mr. Halbouty established the Geosciences and Earth Resources Endowment Fund at the University."

PUBLICATIONS—NEW AND OLD


GUIDEBOOKS:

The Stratigraphy and Structure of the Sierra de Juarez, Chihuahua, Mexico (includes 5 geologic columns), 1972, $7.00.

Geology of the Florida Mountains, Luna County, New Mexico, 1974, $4.00.

Exploration from the Mountains to the Basin, Transactions of the Joint Meeting of the Southwest Section of the AAPG and the Permian Basin Section of SEPM, 1975, $10.00.


Orders, with check, should be sent to the El Paso Geological Society, %Howard Jackson, Dept. of Geological Sciences, U. of Texas at El Paso, El Paso, Texas 79968.

MAPS:

Map Series 8, Licensed Coal Mines in Colorado, compiled by David C. Jones, 1977. 2-color map, scale 1:1,000,000, 19 x 32 in. (folded). Current to April 1, 1977. $2.00 postpaid from Colorado Geological Survey, Room 715, 1313 Sherman Street, Denver, Colorado 80203. Prepayment requested.

CONGRESSIONAL ISSUES

The Houston Chronicle reports the following selected issues having been voted on since the last Bulletin.

SENATE

1. National energy policy—Approved 52 to 35 its energy tax package to provide incentives for energy production and conservation.

2. National energy policy—Voted 62 to 24 to free additional domestic oil from price controls by allowing "stripper well" owners to include companion injection wells within the oil-well count when determining stripper status.

3. Social Security—Approved 42 to 25 a Social Security financing reform package to increase payroll taxes for both employers and employees over the next decade, through shifting the greater tax burden to employers.


Tower, Rep. Y Y N N
Bentsen, Dem. Y Y A Y

HOUSE

1. Congressional pay—Defeated 233 to 167 a move to consider legislation requiring that any future congressional pay raises could only apply to members of the next elected congress, and not to incumbent members voting the raise.


Archer, Rep. N Y
Eckhardt, Dem. Y Y
Gammage, Dem. N Y
Jordan, Dem. Y A
SHORT COURSE—EXPLORATION GEOLOGY FOR GEOPHYSICISTS
JANUARY 5-17, 1978

The sixth annual presentation of Exploration Geology for Geophysicists, a short course sponsored by the University of Houston Geology Foundation, will be held at the Houston Marriott Hotel.

Although designed especially for the geophysicist, the course may also serve as a refresher for geologists. All aspects of geology that concern the occurrence of gas and oil are considered.

The course fee is $750 (includes lecture notes, reprints, refreshments, a 2-day field trip to the coastal area, and a banquet meal). The fee does not include living expenses in Houston or the optional field trip to Central Texas (a charge of $100 for this trip includes meals, lodging, and transportation). A seminar on Petroleum Exploration Economics will be presented by Jan L. Arps immediately following the course, on January 18 and 19, for an additional charge of $125.

For application forms and additional information, write to Dr. Carl E. Norman, Department of Geology, University of Houston, Texas 77004 (713/749-3870).

LOW-TEMPERATURE GEOTHERMAL ENERGY

Just about everybody knows that electricity is being generated commercially by geothermal energy at The Geysers north of San Francisco. In that case, steam from high temperature underground geothermal sources turns the turbines that produce the electricity that lights the bulbs . . . in the house that Jack built. The bad news is that the largest portion of U.S. geothermal resources falls into a low temperature category. Fear not, faint hearts. The good news is binary-cycle conversion systems.

The conventional binary-cycle system of producing electricity from geothermal brines involves extracting the heat from the brines and transferring it to a working fluid, such as isobutane. The hot brines pass through tubing in a shell-like heat exchanger and heat the working fluid which expands to a gas which drives a turbine, etc., etc., etc. These systems can economically use lower temperature (+150°C) geothermal resources to generate electricity. This is being done at a test facility of the Department of Energy near El Centro, California, and plans are for a 500 kw pilot plant in 1978.

GCAGS EXECUTIVE COMMITTEE MEETING, AUSTIN

The total registration at the Austin convention was 1,821. The 1978 convention will be held in New Orleans with Mr. Jules Braunstein, Shell Oil, as General Chairman.

As of January 31, 1977, the Treasurer reported a balance of $12,048.00 in cash, $65,000.00 in one-year Certificates of Deposit in Shreveport, and a $1,000.00 loan to the Lafayette Geological Society. This Executive Committee approved:

1. A $4,000.00 non-interest-bearing loan to SEPM for printing a paleoecology volume.
2. A $5,000.00 gift to AAPG for furnishings in the new Lewis Weeks building.
3. A $2,000.00 gift to be used for student research-project grants.

Mr. Scott Lysinger, Felmont Oil in Houston, was appointed to the AAPG Advisory Council, replacing Mr. Don Boyd of Corpus Christi. The Houston Geological Society will host the 1982 GCAGS convention.

AAPG—OKLAHOMA CITY
APRIL 9-12, 1978

Group space has been reserved for AAPG members planning to fly to the 1978 annual meeting. Group fares are not applicable at this time. As there is no meal service on these flights, all seats have been reserved in economy class in order to give you the best possible fare. All flights are via Continental Airlines.

HOUStON TO OKLAHOMA CItY

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April 9 Same flights, same times

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April 13 Same flights, same times

Requests for additional information and reservations should be directed to:
Travel Unlimited, Inc.—AAPG Flights
P. O. Box 25187
Houston, Texas 77005 713/526-3161

SAN FRANCISCO BAY DID NOT EXIST 15,000 YEARS AGO

San Francisco Bay was not a bay at all 15,000 years ago, according to a recent report of the U.S. Geological Survey, Department of the Interior.

A team of USGS researchers has uncovered new evidence that 15,000 years ago the ancestral Sacrament-San Joaquin River flowed through the Golden Gate toward a shoreline near the Farallon Islands, about 30 mi off the present coast. “The Bay of San Francisco,” they said, “did not begin forming until about 10,000-11,000 years ago.”

Brian F. Atwater, USGS geologist, Menlo Park, Calif., and senior author of the report said, “During the last Ice Age, between 15,000-25,000 years ago, so much water was tied up in continental ice sheets and glaciers that sea level was several hundred feet lower than it is today. As a result, the present site of San Francisco Bay stood high and dry above the surface of the Pacific Ocean.

About 13,000 years ago, the ice in Canada, Yosemite, and other glaciated areas began to melt. Sea level rose as the meltwater returned to the oceans. By dating the fossil remains of tidal-marsh plants, the USGS scientists estimated that the rising sea had entered the Golden Gate and begun to spread inland by about 10,000 years ago.
“During the next 2,000 years,” Atwater said, “the shoreline advanced inland across gently sloping areas as rapidly as 2 miles (3.5 kilometers) per century, in response to a rise in sea level of about 6 feet (2 meters) per century. This rate of sea-level rise decreased as the ice sheets disappeared, and has averaged half a foot (15 centimeters) per century during the past 6,000 years.”

“Compared with most rocks and landforms,” Atwater said, “estuaries such as San Francisco Bay are quite young features. Because of their youth, they continue to change rapidly, compared with more stable geologic features. An understanding of the geologic history of estuaries helps us to discriminate between natural changes and the effects of dredging, waste disposal, and other human activities.”

Some clues about local inhabitants before the Bay formed were unearthed a few years ago by USGS geologist Edward Helley and several colleagues, who discovered some unusual fossils in excavations for San Francisco’s dump near Mountain View, a community located 40 mi southeast of San Francisco.

“We found fragments of fossil cedar, redwood, and Douglas Fir that are 23,000 years old and grew about 20 feet (6 meters) below present sea level,” Helley said.

According to USGS geologist David Adam, these trees require a cooler, wetter climate than exists today.

Additional fossils found nearby indicate that Mountain View was a land “where the buffalo and camel roamed. The walls of the garbage pit contained fossils of American bison, camels, mammoths, sloths, and horses,” Helley said. “Horses later became extinct in the New World, and were unknown to native Californians when the Spanish arrived in the sixteenth century.”


SUBSURFACE SAFETY DEVICES

The USGS reports that subsurface safety devices (SSSD’s) have increased in reliability over the past 5 years. There are 3 major categories of SSSD’s: (1) surface-controlled subsurface safety valves, (2) subsurface-controlled subsurface safety valves (SSCSSSV’s -Ed.), and (3) tubing plugs. The USGS comes up with a monthly failure percentage (MFP) of SSSD’s using the average number of failures per month during each 6-month period divided by the number of particular valves in service during that period. For category (1) for the period Nov. ’76 through Apr. ’77 the USGS reports a monthly failure percentage of 0.8%, category (2) 0.4%, and category (3) 0.1%. What is interesting is that the MFP for these same categories for the period July ‘72 through Oct. ‘73 was (1) 1.6%, (2) 1.1%, and (3) 0.5%.

NEW MEMBERS

OCTOBER 28, 1977

USGS NAMES NEW CHIEF GEOLOGIST, CENTRAL REGION DIRECTOR

Dr. Dallas L. Peck has been named Chief Geologist to head the Geologic Division of the USGS, Department of the Interior. He succeeds Dr. R. P. Sheldon, who will return to his research in economic geology. Peck will direct the operations of one of the major divisions of the USGS, employing the largest single group of geologic science professionals in the United States. He is a recognized authority on geothermal energy and volcanology. Dr. Peck is a graduate of the California Institute of Technology and Harvard who joined the Survey in 1951.

Robert F. Evans has been named an assistant director of the USGS, Department of the Interior, to coordinate activities in the Survey’s 15-state Central Region, which includes Texas. He will be headquartered at the Denver Federal Center. Evans will provide policy guidance and liaison with other federal, state, and local agencies in the 15 states in addition to coordinating the Survey’s activities. Evans is a graduate of Texas Western College in El Paso (U.T.-El Paso) and spent 4 years in private industry before joining the USGS in 1956.
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Geophysicist's Aid
Kilroy Co. of Texas
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Houston, Tx. 77001
225-2542

1977-78
HOUSTON GEOLOGICAL SOCIETY—EXECUTIVE BOARD

Seated, l-r: W. L. Tidwell, Secretary; Jeffery V. Morris, First Vice-President; Dean Grafton, President; William A. Fowler, Jr., Second Vice-President; Eleanor M. Hoover, Treasurer. Standing, l-r: Executive Committee-men M. M. Osborne, Howard W. Kiatta, Elgean C. Shield, and Robert A. Harris; Past-President Hal H. Bybee.
CONTINUING EDUCATION

Dr. W. John Lee will present his course entitled "Reservoir Engineering for Geologists" at the third, two-session lecture on January 12 and 13 in the Exxon Auditorium. Doors will open at 12:30 and the lecture will begin one hour later and finish at 5 p.m. The friday morning session will begin at 8:30 a.m. and conclude by noon. A preregistration slip was attached to the December Bulletin; costs are $20 preregistration, $25 at the door, and $10 for students. Your preregistration slips and checks should be mailed to the Houston Geological Society, Attn: Vicki King, 806 Main St., Suite B-1, Houston, Tx 77002.

Dr. Lee received his Bachelor's, Master's, and Ph.D. degrees in Chemical Engineering from Georgia Institute of Technology. He worked for Exxon Production Research Co. in Houston from 1962-68, and 1971-77, and was an associate professor at Mississippi State University. Since early 1977 he has been teaching petroleum engineering at Texas A&M University.

The fourth Continuing Education Program will be held on February 16 and 17 when Dr. John K. Sales will discuss "Model Studies of Geologic Structures Applied to Hydrocarbon Exploration." He will cover the mechanics of normal faulting, the origin and evolution of Atlantic-type continental margins, the geometry of rifting and prospecting in the fault environment. Additional topics will be the mechanics of geosynclinal thrusting, the evolution of Pacific-type continental margins, prospecting in the foreland fold and thrust belt environment, and the mechanics of Wyoming province basement deformation. A preregistration slip is enclosed. As before, the costs are $20, $25, and $10 for early, at-the-door, and student registration.

STEWART CHUBER

RED TAPE, ENVIRONMENTAL HASSLES
SLOW U. S. ENERGY SEARCH

Bureaucratic inefficiency and petty environmental roadblocks are frustrating this country's search for essential energy sources, according to Edd R. Turner, President of the AAPG. Speaking before energy scientists meeting in Jackson, Wyoming, Turner said that, "For all their meddling, governmental and environmental objectors rarely offer an alternative solution to energy generation problems. It doesn't seem to have occurred to them that we petroleum explorationists are responsible people." Instead, Turner said, these groups contrive ways to stop the development of needed energy mineral sources through numerous laws, regulations, and unfounded environmental concerns. "In particular, the Kaiparowits Basin project which was to supply electric power to the heavily populated West Coast was killed because our government did nothing to resolve the issues that were raised—including the contention that lights would have to be mounted on the power-line towers to warn night-flying birds."

He also denounced the "bureaucratic thinking" evident in a bill currently before Congress withdrawing 116 million acres in Alaska from any resource development and setting aside 23 million acres of the National Petroleum Reserve for management by the Fish and Wildlife Service. "It's also unbelievable that there is no comprehensive inventory of federal lands withdrawn or removed from operation under mineral development laws. Making such an inventory isn't even required of federal agencies," he added.

"The government does not know the total number of acres formally withdrawn or otherwise restricted from the mineral development laws; the uses to which these withdrawn or restricted lands are being put, and the geographical locations of these withdrawn or restricted lands."

Turner said that restoration of these lands to general use "... is tied up in a processing morass with a considerable backlog of applications, many over 5 years old."

No mineral assessment exists of withdrawn lands, or of acreage under the threat of withdrawal. This nonpolicy robs us of actual mineral wealth, and prevents our defining the energy supply-sustaining potential of minerals we don't fully understand yet. "For example, bear in mind that before World War II, the only commercial use of uranium was as a pigment for ceramic glazes," Turner said.

"Clearly our federal-lands laws and land-management programs are crying for change and efficient administration."

AAPG ANNUAL CONVENTION AND EXHIBITION

APRIL 9-12, 1978, OKLAHOMA CITY, OK.

Registration, Housing and Exhibit Space forms are available from AAPG Headquarters, P. O. Box 979, Tulsa, Oklahoma 74101.

- Staged in the Beautiful Myriad Convention Center
- Sessions include the New Energy Minerals Division
- Free Coffee and Coke Bars
- Large Entertainment Package for All
- Field Trips
- Poster Sessions

TRY THIS BRAND OF WESTERN HOSPITALITY
TEXACO HAS TIGER BY THE TAIL

Interior Secretary Cecil D. Andrus ordered Texaco Inc. to tell him by December 1, 1977, how it can "significantly increase production" from its Tiger Shoal gas field, one of the largest in the Gulf of Mexico. Andrus based his actions on two geologic, engineering, and economic studies of the field—one by the USGS and one by the National Research Council of the National Academy of Sciences (the latter prepared by a committee headed by the Director of the Oklahoma Geological Survey, Charles J. Mankin).

The plan ordered by Andrus should include time frames for completing each stage of proposed drilling and producing operations; the number and location of new wells to be completed in developed and undeveloped reservoirs, and the number and location of recompletions in existing wells; and detailed information on capacities of existing production and pipeline facilities, estimates of additional facilities required to implement the proposed plan, and the projected production time profile. Andrus also mentioned that, "In addition to the development wells, it seems desirable to consider drilling at least one exploratory well to a minimum depth of 16,000 feet to test deeper sands."

Gas from Tiger Shoal goes to Illinois, Indiana, Kentucky, Ohio, Tennessee, Massachusetts, Michigan, New Jersey, New York, Pennsylvania, West Virginia, and Wisconsin, in addition to Texaco's Port Arthur refinery. The latter use is being phased out. Average daily production from the Tiger Shoal Field in 1976 was 445 MMcf. Economically recoverable gas in Tiger Shoal is estimated at 1.375 Tcf by NAS, 1.760 Tcf by the USGS, and 2.305 Tcf by Texaco.

The NAS report included a critique by Texaco of some of the NAS findings.

1979 AAPG-SEPM CONVENTION NEWS, ORGANIZATION AND COMMITTEE APPOINTMENTS

Organization for the 1979 AAPG-SEPM Convention is virtually complete. The chart shown below displays the relationship of all committees vertically from the national officers to the local coordinating committee, program committees, and service committees. Fees collected from registration and exhibits (shown on far left side of the chart) provide the income to support the Technical Program. The right side shows committees whose activities are either fully self-supporting (e.g., field trips) or are mostly financed by separate admission fees and subsidized from income and/or outside sources (e.g., entertainment).

A listing of Committee Chairmen appointed as of December 1, 1977, is also presented below. A large number of volunteers are needed on many of the committees. Members of the Houston Geological Society who would like to serve on a committee of their interest and expertise are invited to call any of the respective Chairmen.

ANTHONY RESO
General Chairman
FREE MOVIE SERIES

Continuing Education Committee will sponsor a series of movies of interest to professional geologists over the noon hour on the next-to-the-last Wednesday during the months of January, February, March and April in the First City National Bank Auditorium. The auditorium is in the basement (take the escalator) of the First City East Building on the corner of Fannin and Dallas streets. The series will include films on carbonate deposition and the outer continental shelf. The first showing on Wednesday, January 18 will be two volcano films, each twenty minutes long. *Heartbeat of a Volcano* records the two-week build-up and the spectacular eruption of Kilauea in Hawaii, and includes seismic records. *Fire Under the Sea: The Origin of Pillow Lava* documents man’s first observations of lava flowing under water. The films will be shown continuously between 11:45 A.M. and 1:30 P.M. Each film will be shown twice, so come when it is convenient during this time.

E. P. RALL
The Houston Geological Society was founded in 1923 and incorporated in 1975. Its objectives are to stimulate interest and promote advancement in geology for this area, to disseminate and facilitate discussion of geological information, to enhance professional interrelationships among geologists in the area, and to aid and encourage academic training in the science of geology.

The Bulletin is published monthly except July and August. Subscription price for nonmembers is $10 per year. Single copy price is $1.50. Claims for nonreceipt in the contiguous U.S. should be made within 2 months of the date of issue; claims from elsewhere within 4 months.

Communication about manuscripts and editorial matters should be directed to the Editor. Inquiries concerning advertising rates should be directed to the Advertising Chairman. Applications for membership in the Houston Geological Society may be obtained from the Society office, 806 Main Street, Suite B-1, Houston, Texas 77002.

COVER

Early Tertiary trachyte plug is intruded in Cretaceous (Comanchean) Glen Rose Limestone at Hill 4105 near west boundary of Hood Spring quadrangle. An angular unconformity is present. The northward-encroaching Glen Rose seas deposited a thin sheet of basal clastic material over the peneplaned Pennsylvanian Tesnus Formation prior to the accumulation of the thick series of clearwater Glen Rose limestones. The plugs are porphyritic, predominantly soda trachytes composed of orthoclase and anorthoclase with varying amounts of hornblende, riebeckite, aegirite, and aegirite-augite. Contact-metamorphic effects produced by the plugs are minor, and the usual effect on the limestone is discoloration due to baking. (From "Geology of Hood Spring Quadrangle, Brewster County, Texas" by Roy G. Graves, Jr., Bureau of Economic Geology Report of Investigations No. 21, August 1954.)

The scene is toward the southeast from the Marathon-Big Bend National Park road about 25 mi south of Marathon, Texas.
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Consulting Geologist  
and  
Petroleum Engineer  
Independent Producer and Operator  

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<td>(713) 622-1130</td>
<td>5100 WESTHEIMER</td>
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<td>TWX (910) 881-4599</td>
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DONALD W. LANE  
Consulting Geologist  

<table>
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<tr>
<th>12214 Mossycup Drive</th>
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<tr>
<td>Houston, Texas 77024</td>
<td>Houston, Texas 77024</td>
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<tr>
<td>(713) 461-1637</td>
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CLYDE E. HARRISON  
O’Donohoe & Harrison  
Exploration Company  

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<td>HOUSTON, TEXAS 77025</td>
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<tr>
<td>HOUSTON, TEXAS 77002</td>
<td>664-4397</td>
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