HGS NOVEMBER CALENDAR

November 10, 1980 (Dinner Meeting)
Galleria Plaza Hotel
Robey H. Clark
Diamond Shamrock Corporation (AAPG President)
"Buried Structures in the Gulf of Mexico"
Social Period—6:30 PM, Dinner and Meeting—7:00 PM
Reservations (telephone only, 771-8315) must be made or cancelled by Friday noon, November 7, 1980.
HOUSTON GEOLOGICAL SOCIETY
6916 ASHCROFT
HOUSTON, TEXAS 77081
771-8315

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PRESIDENT’S COMMENTS

This month sees the first of a series of articles which will be published in the Bulletin over the course of the year on where the authors think the professional geological scientist will be needed (and possibly to what extent) in the first quarter of the 21st Century. A long time off, you say? Only twenty years. Those of you who are just entering the profession or have entered it in the last five years will, come the 21st Century, have half of your professional life still ahead of you. The keynote article, by Michel T. Halbouty, raises the spectre that a goodly number of those now entering the profession might not reach the 21st Century as professional geologists. Those of us who experienced the late 50’s, 60’s and early 70’s know whereof he speaks. If it happens and whether it happens as it did in the 50’s and 60’s, in mass layoffs or as a gradual culling process as more advanced degree graduates become available, really is inconsequential. To the individual it will happen to, it will be catastrophic.

The Houston Geological Society, through its twice-monthly technical programs, Continuing Education Seminars, and field trips, offers all members, and particularly recent graduates, an opportunity to expand their knowledge by hearing experts on many subjects within their profession. The AAPG seminars and the numerous professional “short course” businesses that have developed in the past seven years, all serve to keep the professional geologist abreast of the latest developments and techniques in our profession. You will be the loser if you don’t avail yourself of these opportunities or if the company you work for doesn’t support your need for them.

Phil Salvador, along with Dr. Deal, has put together an exciting field trip to the Solitario of the Trans Pecos Region of West Texas. The ranch over which some of you will be hiking is privately owned and covers some 300,000 acres. Attempts were made to pass legislation to enable the Federal Government to purchase the ranch for a National Park but they failed, and some interests in the State attempted to get the Parks and Wildlife Commission involved for the establishment of a State Park - which also failed. The last word we heard was that private interests had approached the owner with the idea of buying it for use as a “commercial” camping and hiking area. Phil tells me the starting gun goes off for the 20 spots open when you get this issue.

Chet Baird
President

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Copies of the HGS Photo Directory are still available. The cost is $10 for HGS members and $15 for non-members. To order, call 771-8315 or go by and pick one up at the HGS office 6916 Ashcroft.

David Levin
Publication Sales Committee

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The earthquake threat exists not only in California and Alaska but in many regions throughout the country, particularly the intermountain states, the Pacific Northwest, the central Mississippi Valley, the Southeast, the Northeast, and Hawaii.

SOCIETY CALENDAR FOR DECEMBER

December 10, 1980
HGS Luncheon Meeting
Location to be announced
“Deltaic and Deep-Sea Plio-Pleistocene, Offshore Gulf Coast”
No Dinner Meeting in December

SUBSURFACE SOUTHEAST TEXAS STRATIGRAPHY

Stratigraphic Cross Sections of Southeast Texas, prepared by the Houston Geological Society Cross Section Committee, 1979, 6 sections. $25 postpaid.

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During the process of working local petroleum prospects myopia may set in. Thus, there is a need to occasionally step back and review the regional picture in order to help solve a geological problem. The Houston Geological Society has correlated the subsurface stratigraphy of Southeast Texas based on resistivity and SP curves along with paleontological data (when available) from 127 wells. The stratigraphy is displayed in 4 dip sections (N-S) and 2 strike sections (E-W) spaced about 40 miles apart, which encompasses 24 counties and 45 miles of the adjacent offshore.

Offlap of progressively younger strata (Jurassic through Pleistocene) is easily seen in the 4 dip sections (N-S). The widening of the paleoshelf to the west accompanied by greater thicknesses of carbonate sequences are also portrayed in the dip sections. In the southern portion of the cross-sections, growth faults are present in the Tertiary rocks and/or sediments. The 2 strike sections (E-W) show relatively uniform strata thickness along depositional strike in Southeast Texas.

General resistivity and SP log responses can be viewed in all the cross-sections. Specifically, high resistivity and SP kicks are associated with the Cotton Valley, Eagle Ford-Woodbine, Austin, Wilcox, Frio Formations, and younger Miocene sand packages.

The cross-sections are a good addition to a reference library and will aid the veteran as well as the newly arrived geologist in reviewing Southeast Texas regional geology. Each section can be separately hung up on your wall. The sections are a good size up to 6 feet long and 2 feet wide. The vertical scale of the electric logs is 1/4 inches per 1000 feet, making characteristic formation kicks identifiable in a gross sense. All in all the price is reasonable for the potential usage one can get from this series of cross sections. Order from the Houston Geological Society, 6916 Ashcroft, Houston, Texas, 77081.

S. A. Epstein

PRICE SCHEDULE—HGS MEETINGS

Galleria Plaza Hotel
Dinner .................................................. $16.00
RESERVATIONS (771-8315)
Please make reservations for the Monday evening meeting by noon on the preceding Friday.
Robey Clark was born in Mound, Louisiana, and received a B.S. in geology from Louisiana State University in 1943. He served in the Pacific from 1943 to 1946 with the U.S. Navy Reserve, and then returned to college and obtained an M.S. in geology from the University of Wisconsin in 1949. Mr. Clark went to work for Magnolia Petroleum Company (now Mobil Oil Corporation) in 1946 and was associated with that company until 1971, when he went with Diamond Shamrock Corporation, where he now is Group Vice President, Exploration and Production.

Mr. Clark has published on sedimentation, stratigraphy, and basin analysis. He is a member of numerous professional organizations: AAPG, GSA, SEG, SEPM, API, SPE of AIME, IPAA, Panhandle Geological Society, and Houston Geological Society. He has served on AAPG's Business Committee, Research Committee, and Industry Liaison Committee. He was Secretary of AAPG in 1975-76, and was President-Elect last year. His term as President of AAPG began July 1 and will continue until mid-year 1981.

Dianne Broadaway (Co-author)—Biographical Sketch

Dianne Broadaway is a Senior Geophysicist at Diamond Shamrock Corporation, where she has been employed since 1973. She received a B.S. in geology in 1973 from West Texas State University. Ms. Broadaway is a member of SEG and the Geophysical Society of Houston.

Buried Structures in the Gulf of Mexico (Abstract)

After 35-40 years of active exploration, the Gulf of Mexico continues to be an attractive target for exploration. The many reasons for this include: availability of land, size and quality of data base, increased prices for oil and gas, and changing concepts of prospects. This paper focuses on one aspect, "the buried structure."

Until about the last 10 years the resolving power of the reflection seismograph was inadequate to delineate those buried structures which do not disturb strata above approximately 9,000 feet but which are quite evident at greater depths. Actually, only in the last several years have such structures been recognized as targets worthy of large capital investments. Abbreviated case histories of several of these features provided before-and-after looks at the seismic data and a discussion of the bidding history. It now appears that buried structures will contribute substantial amounts of oil and gas to the nation's reserves.

CONTINUING EDUCATION PROGRAMS FOR THE 1980-1981 SERIES

12/4-5/1980
EARLE McBRIDE: Exploration for Turbidites and Deep Water Sandstones

Earle F. McBride of the University of Texas will present a short course entitled "Exploration for Turbidites and other Deep Water Sandstones" beginning at 1 pm to 5 pm on December 4 and continuing at 8:30 am to noon on Friday in the Exxon Building Auditorium.

Dr. McBride will compare case histories of delta-front turbidites and associated slope deposits: submarine slides and debris-flow deposits from different environmental settings.

Transport and depositional mechanisms of turbidity currents will be reviewed together with resulting sedimentary structures and characteristic bedding types. Diagenetic factors influencing loss of porosity in turbidites will be examined. The short course will also study the relation of facies (proximal-medial-distal) to porosity and permeability as well as considering the geometry of the turbidite beds and facies.

See inside back cover for registration form.

1/15-16/1981
Clark Burchfiel: Geology of the Overthrust Belt and Tectonic Evolution of Western North America

2/19-20/1981
The Origin of the Gulf of Mexico and the early opening of the Central North Atlantic Symposium

2/21-23/1981
Field trip to the Ouachita Mountains in association with the above Symposium

3/19-20/1981
Atlantic Symposium

5/14-15/1981
Field Studies from the Gulf of Mexico

Papers are requested for presentation at this program. If your company has a field study or can prepare one please contact Butch Wilson at 629-8390.

CONTRIBUTORS FOR THE 1980-1981 HGS ENTERTAINMENT FUND

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THE PRESENT NEED TO HIRE MIGHT RESULT IN THE FUTURE NEED TO FIRE(1)

MICHEL T. HALBOUTY(2)

After World War II there was a gradually increasing demand for geologists which reached its peak in the late 40's, plateaued out in the middle 50's, and became a severe problem in the early 60's.

There is no need for me to review what happened beginning late in 1959 and in 1960, when there were mass firings of geologists worldwide. I am sure we are all familiar with that episode. Not surprising, the hue and cry that emanated from these firings are still with us today. It was a cyclic period that began with the need to hire and ended with the need to fire. I am deeply concerned that the nature and factors leading up to that hiring and firing cycle are analogous to what is happening today, that is: the fervent search by companies and independents, small and large, to hire graduates without regard for competence, and promiscuous proselytizing without regard for ethics.

I remember so vividly the great concern and surmise of AAPG officials that the mass firings were without valid reasons, which prompted Ben Parker, then President (1960-61) of AAPG, to appoint a committee to investigate the "why" of these unprecedented dismissals.

The investigation was undertaken earnestly and with deep concern for our profession. After several months of interviews with top executives of all major companies, the report submitted to AAPG was indeed revealing. It was obvious that the companies took the opportunity of the sluggish exploration period to re-evaluate each geologist in their employ. This reevaluation indicated that many who were hired so rapidly, in the late 40's and 50's, when the demand for geologists was great, were really incompetent. It was also revealed that the majority of those discharged had only one degree. It was only natural for the companies to take advantage of the depressed exploration period to fire those they decided were not qualified explorationists. The investigation also disclosed that the companies included a few competent in the firings so as to reduce the stigma and the impression of firing a particular category (incompetents) of geologists.

The overall conclusions in the report astounded AAPG officials, but they did resolve the doubts which initiated the investigation. The most damaging backlash occurred in universities where the faculties in the geosciences warned their students that the companies could not be trusted, and that it would be to their advantage and welfare not to work in the petroleum industry. Students were told by their professors and counselors that they should pursue their vocation with academia or with government. Even today in some universities this attitude still prevails.

Now, with the upsurge in drilling that is taking place, the demand for the geoscientist has reached unprecedented proportions. The competition to hire students upon graduation is intense. Because of this demand students are not pursuing post-graduate work. Thus, the excellence in our profession is being diminished.

Notwithstanding the competition for the graduate students, proselytizing from company to company, independents to majors, and independents to independents has reached the point of great concern to many in our profession who share with me the belief that our code of ethics is being abused, if not ignored. This prompted me to write a letter last April to the Chairman of the AAPG Industrial Liaison Committee. This letter was broadly discussed at the Committee meeting during the AAPG annual convention in Denver. There was much anxiety expressed by representatives from both the major and independent segments of our industry regarding this serious problem.

The basic contents of the above-mentioned letter dated April 10, 1980, are shown below:

"The open proselytizing of personnel by both major and independent companies has become obscene and if it continues unabated, personnel changes will become so habitual that there will be no trust or loyalty between employer and employee.

"I know it is a difficult matter to control as each individual has the freedom to move in any direction that he, or she, deems advantageous. BUT — when geoscientists abruptly move from one job to another it gives me great concern for the future of our profession and the excellence of its productivity. I am fully aware that this is a most perplexing subject to discuss, but I keep wondering if geoscientists are becoming so callous as to negate the value of trust and loyalty.

"The question may be asked: Has the Code of Ethics in our profession reached the point where there is no regard for loyalty, fidelity to trust, and inviolability of confidence? If the answer to that question is 'yes,' then I feel sorry for those who are to follow us as it would be obvious that man's greed has overwhelmed his sense of propriety. If the answer to that question is 'no,' which I believe is the case, then we must examine the philosophy of life and the order of priorities on which the younger members of our profession base their decisions.

"As I look and listen, I get the impression that over the last ten, or more, years new geologists entering the profession consider the financial reward the primary measure of job satisfaction. Operating from this position, then, job hopping becomes a way of life. This kind of lifestyle sacrifices the sense of loyalty to a company or employer, the satisfaction of team effort, and the long range opportunities for promotion into managerial and executive positions.

"You may ask: What is the solution?

"I'm not sure I know, but I feel the solution lies in possibly three areas:

"(1) During their college years, young geoscientists should be instilled with a deep appreciation of the philosophy of professional conduct embodied in our Code of Ethics. This is a faculty responsibility as much as dispensing knowledge, and from what I observe faculty is completely ignoring this responsibility.

"(2) The employer must instill in his employee a true sense of worth or value; that the employee should be shown he is vital to the operation; and that he is recognized as an integral part of the organization and acknowledge his contributions and achievements.

"(3) The employee, in turn, should show his loyalty and dedication by performing his duties and/or assignments to the best of his ability. The realization of his goals would then be bounded only by the amount of determination he brings to his work to perform and create. This would result in such satisfaction to the employee he would be reluctant to change employers.

"I may be too idealistic and hoping for a utopia that will never exist in this area and, of course, I may be whistling in the dark where no one can hear me, but I still believe it is
something for leaders in our profession to begin thinking about
with the hope that there might be a solution. Therefore, it may
be well that this matter be discussed by the Industrial Liaison
Committee and possibly as a result of our initial discussions
further rapport between selected members of our Committee
and a corresponding group from the Committee on Academic
Liaison may produce worthwhile results."

It was generally agreed at the Industrial Liaison
Committee meeting that my letter was indeed relevant to a
precarious situation existing in our profession, and a
subcommittee was appointed to study this matter further for
appropriate recommendations. What the subcommittee may
conclude and recommend remains to be seen, but, in the
meantime, I am very concerned that the proselytizing for
explorationists that is taking place will cause repercussions
and irreparable damage to our profession far more than the
benefits to certain individuals.

If there is no loyalty from geologists, as they flitter from
one job to another, why should there be any loyalty from the
employer if the demand slackens? This should be of great
concern to all of us as this very attitude could again trigger
mass firings and faculty retaliation at universities in the
future.

We should question ourselves: Have we reached the point
where we have become callous to our professional ethical
responsibilities? Have we forgotten the meaning of loyalty,
fidelity to trust, and inviolability of confidence to those who
employ, train, educate and offer the novice opportunities to
prosper and excel in our profession? Are we heading into
another cycle of hirings and firings which will have far-reaching
effects on individuals as well as our discipline? These
are questions of utmost importance to the future of our
profession and only those of us who belong to it can give the
proper answers or solve the problems.

(1) Submitted on September 2, 1980, to the Houston
Geological Society for publication in its Bulletin.
(2) Consulting Geologist and Petroleum Engineer,
Independent Producer and Operator.

SUMMARY OF PERSONAL HISTORY OF
MICHEL T. HALBOUTY

Michel T. Halbouty is recognized as one of the world’s outstanding geolo-
gists and petroleum engineers and is internationally
renowned and respected for his scientific ability in
petroleum exploration. He is considered an outstanding
authority on the geological and engineering problems of North America
and is rated as one of the top experts on the geology
of Gulf Coast salt domes. Mr. Halbouty is recognized
as one of the most active independents in the nation,
producing and operating in many oil and gas fields in the
United States.

He is a graduate of Texas A&M University, having received
his Bachelor of Science Degree in 1930 and his Master of
Science Degree from that institution in 1931 in Geology and
Petroleum Engineering. In May, 1956, he received the
Professional Degree in Geological Engineering from Texas
A&M University. In June, 1966, the Degree of Doctor of
Engineering, Honoris Causa, was conferred upon him by the
Montana College of Mineral Science and Technology.

Mr. Halbouty has written and published over 200 papers
mainly on petroleum geology and petroleum engineering, has
authored or coauthored four books of professional and
historical interest in addition to taking a most active part
in community and civic leadership.

Awards and Honors:
1965 Texas Mid-Continent Oil & Gas Association
   Distinguished Service Award
1965-66 President, American Association of Petroleum Geologists
1968 Texas Society of Professional Engineers
   Engineer of The Year
1968 Texas A&M
   Distinguished Alumni Award
1969 American Association of Petroleum Geologists
   Honorary Membership
1970 Houston Geological Society
   Honorary Life Membership
1971 Society of Petroleum Engineers of AIME
   Distinguished Service Medal
1972 Society of Petroleum Engineers of AIME
   DeGolyer Distinguished Service Medal
1973 American Institute of Mining, Metallurgical & Petroleum
   Engineers
   Honorary Membership
1975 AIME
   Anthony F. Lucas Gold Medal
   American Association of Petroleum Geologists
   Human Needs Award
1977 American Association of Petroleum Geologists
   Sidney Powers Memorial Medal Award
   (AAPG’s Highest Honor)
1977 National Aeronautics and Space Administration
   William T. Pecora Award
1978 Texas A&M University
   Geosciences Building named The Michel T. Halbouty
   Geosciences Building
1978 American Schools and Colleges Association
   Horatio Alger Award
1979 Oil Industry Council - City of Hope
   Spirit of Life Award
1979 National Academy of Engineering
   Elected to Membership

PASSAGES

Harris Hayes Allen died July 6, 1980 in Houston at age 66. Mr. Allen was retired.
Edward J. Barragy, 76, died September 2, 1980.
Martin G. Miller, 67, died March 6, 1980 in Boston,
Massachusetts. Mr. Miller was Co-Chairman of the Executive Committee of Miller & Lents Ltd.
Roy (Dusty) Marvin Rhodes, 54, died June 30, 1980 in
Houston. Mr. Rhodes was a Sales Engineer for Dresser Atlas.
Russell M. Seward Jr., 60, died July 21, 1980 in
Houston. Mr. Seward was a geologist with Texaco.
Henryk B. Stenzel, 81, died September 5, 1980. Mr.
Stenzel was a former Professor of Geology at the University of
Texas, Texas A&M, Rice, University of Houston and Louisiana
State University.
Gilbert A. Talley, 70, died May 27, 1980 in Houston. Mr.
Talley was retired from Monsanto.
CRISIS IN THE SCIENCE CLASSROOM
Efthalia and John Walsh

Young people going back to school and college this fall are members of the post-Sputnik generation, beneficiaries of the highly touted “revolution” in American education two decades ago that transformed the teaching of science, math and foreign languages. But the new curriculum proved to be no cure-all and now there are warnings of another crisis in the classroom.

The symptoms? Science and math test scores are sagging. Top echelon computer science jobs are going begging. A high-tech military cannot find and keep officers and noncoms to man and maintain sophisticated equipment. American setbacks in international markets raise anxieties that the U.S. work force is losing its technical edge.

Such concerns recently reached the top of the policy pyramid in Washington. President Carter’s science advisor Frank Press took over an emergency assessment of science and math education, saying “we would be stupid as a country to permit the continued erosion of science and math training in our primary and secondary schools.” As with the 1957 Sputnik, the sense of urgency is sharpened by what is seen as a direct challenge from the Soviet Union. This challenge is expressed not only in growing military strength but in a bid to outpace the United States and other Western nations through an educational “mobilization” program designed to prepare all Soviet youth to participate fully in an advanced technological society.

Central to this Soviet effort is a reform of compulsory education launched 15 years ago and aimed at a major expansion of enrollment and improvement in instruction. Heavy stress is placed on science and mathematics. The capstone of the reform is a new math program that is topped off by two years of calculus in the final two years of the ten-year, general polytechnic school course. The result: An estimated five million Soviet graduates from secondary schools this year will have studied two years of calculus. This compares to about 105,000 U.S. students who will have taken only one year of calculus in high school. Press and many American educators feel that calculus is crucial because it serves as the passport to the study of advanced sciences and higher mathematics.

American math and science teaching reforms of the 1950s and 1960s were designed to produce more scientists and engineers and to prepare young people heading for careers in science. Ironically, the programs may have worked too well. Available data indicates that students on the fast tract, taking advanced courses, are as well or better prepared in science and math as American students have ever been. The trouble comes in the underrepresentation of women and minority students in this select group and with low level of competency in science and math among the overwhelming majority of students.

This time around it will not be enough to develop new course materials, retrain teachers, and provide extra funds for lab equipment and supplies, although that too is necessary. Clearly, there are serious problems with student motivation. A decline in teacher status and pay, poor discipline in the classroom, and financial constraints in most school districts are the most widely publicized of all the difficulties that directly and indirectly affect science and math education. These difficulties, rooted in more fundamental changes in family life and in society at large, are hard to understand and harder to change.

Nevertheless, sentiment is strong that whatever the obstacles, corrective measures must be taken. The surge in Soviet education and comparable efforts in other socialist countries and in friendly rivals such as Japan and Western Europe is seen as putting the U.S. future on the line.

Comparing educational systems in different countries is notoriously tricky. Evidence is accumulating, however, that the Soviets and countries in Eastern Europe are making an extraordinary effort to raise the level of scientific understanding among the masses, which in this case really does mean everybody. Marxist-Leninist theory provides an ideological basis for a scientific world view that puts a high value on scientific knowledge, theoretical and applied. But the Soviets are not so naive as to assume that identifying ideology with science will be sufficient to motivate students. Education is the chief mobility mechanism in Soviet society. Success in school, above all in science and math, opens the way to careers with high prestige and pay. This is well understood, and it is a powerful incentive to parents and children.

Until recently, Americans who called attention to the thrust of Soviet education received the Cassandra treatment. All that is changing. For example, receiving new found attention are the views of University of Chicago mathematics professor Izaak Wirzup, a knowledgeable student of Soviet and Eastern European math education. He writes that the Soviets have not only made a prodigious effort to enroll all school-age children, but “For the 98 percent of the school age population that now completes secondary school or its equivalent, the Soviets have introduced science and mathematics curricula whose content and scope place them far ahead of every other nation, including the United States.”

Making a direct comparison, Wirzup notes that, “In only two years, the Soviet compulsory program for all students covers equivalent of at least 13 years of American schooling in arithmetic, algebra, and calculus and does so much more thoroughly and effectively. The American one-year geometry offers but a small fraction of the Soviet ten-year geometry curriculum.” The Soviets have also made a much greater research effort to find better ways to teach children math and science.

Have the Soviets created an educational Utopia? Visiting Americans doubt it. A gap in the quality of education in urban and rural schools remains. Students in non-Russian regions of the USSR are said to be denied opportunities for training and jobs open to Russians students. Wirzup himself notes difficulties with the new math curriculum. Its introduction in 1975, at the time compulsory schooling was lengthened to ten years, increased stresses on the system. Some Soviet educators have told visitors that the Soviets were repeating the mistakes of the American reformers of the 1960s. Students were overworked and teachers overburdened. And the innovative math curriculum encountered resistance from traditionalists. As a result, authorities in 1977 ordered a review of all school curricula, particularly the math program.

There is also considerable skepticism in the United States that 15- and 16-year-olds across the board will attain a very high proficiency in calculus. At the same time, there is respect for the Russian assumption that students of normal intelligence will profit from serious exposure to physics, chemistry, and math. The Soviets have put massive resources behind their assumption that a decisive advantage is to be
gained by raising the level of scientific literacy and numeracy of their population.

The United States has no centralized educational system comparable to the Soviets, Europeans, or Japanese. Education, constitutionally is the responsibility of the states and is carried out in some 16,200 local school districts. Quality, therefore, varies enormously. State requirements exert little pressure toward excellence in science and math. Two-thirds of the states require only one year of high school science for graduation; the other third requires two years. The last science course taken by half of the high school graduates is biology in the tenth grade. Only seven percent of all students take advanced math or calculus.

There is no mandated national curriculum in this country and little likelihood for one. The elective system that prevails in the U.S. high schools encourages adolescents to follow the path of least resistance. “Kids are capable of learning a great deal more than we require of them,” says Lee S. Shulman, director of the Institute for Research on Teaching at Michigan State University. “The price we pay for giving students freedom to elect courses of study is that many of them either select themselves out or are counseled out of the more difficult courses. This is especially true for minorities and women.”

Admiral Hyman Rickover, long a critic of American education, seconds this view that students are pampered. In a recent letter to the director of the National Science Foundation, Rickover writes, “By promoting the notion that learning is easy and entertaining, we are letting our children grow up believing they need not struggle to excel—a notion that is damaging to both the child and to society.”

Standardized test scores in science and math have shown a pattern of decline for a decade or more. An inquest of the declines in both biological and physical science scores for effects. This is especially true for minorities and women.”

The National Assessment of Educational Progress exams in science, given three times since 1969, indicate significant declines in both biological and physical science scores for 9- and 13-year-olds. Drops occurred in all reporting regions and all groups; but as predicted, patterns of advantage emerged. Groups performing above the national norms were whites, males, students with at least one parent with post-high school education, students from the northeast and central regions, and students from affluent groups in big cities and big city suburbs.

What do educators cite as the causes of the downward trend?

“The curriculum reforms of the 60s were purist and elitist,” says Bill Aldridge, Executive Director of the National Science Teachers Association. They were intended to educate the scientific and mathematical creme de la creme, but they were far too difficult for the majority of students. “The new curriculum was too heavy on theory and abstraction,” he says, “and applications were systematically purged.” The result, claims Aldridge, was that science became less interesting to most students, and their ability to succeed was lowered. Perhaps only five or six in a class master the material.

Other critics say that the concepts and curriculum are at fault, but rather teacher training and pay. According to Jerome S. Marco, principal of Walt Whitman High School in Bethesda, Maryland, whose student body annually produces a bumper crop of National Merit Scholarship finalists, “you can have the greatest equipment and the greatest curriculum, but if you don’t have people who can translate concepts into skills, well then, forget it.”

Also, schools are not getting and keeping the excellent teachers in science and math that are needed. “You have to have one hell of a commitment to be willing to teach today,” he said. “The quality math- and science-oriented people are being drained from the field. They can get double their salaries just sitting at a desk as low level computer technicians.”

Science and math teaching has always had a high turnover, but an unprecedented exodus from the field now is occurring. The National Science Teachers Association lost 1,000 of its 10,000 high school members this year. Critics say that the situation is even worse than it appears because teachers who stay are the likeliest ones to have lower qualifications.

In elementary schools, the “Back to Basics” movements is said to have damaged science and math teaching. Science has not been considered a “basic,” and relatively little time is spent on it. Elementary science has always been an uphill fight because most elementary school teachers have little science training and many are intimidated by it. And the back-to-basics approach to mathematics has been extremely narrow, centered on computational skills, not on problem solving.

Almost everybody agrees that science and math education needs federal help. However, science educators see a lack of real commitment by government and the science establishment. As evidence of benign neglect, they cite disappearing federal support for pre-college science and math education programs. In 1964, National Science Foundation funding for pre-college science education reached 60 million dollars. Funding currently runs only 20 million dollars out of a total billion-dollar NSF budget, and that is in inflation-shrunk 1980 dollars. In this period, the programs for teacher retraining and refreshing are remembered as particularly important in providing teachers with intellectual, financial, and moral support.

Amid science educators now, there is a feeling that by backing out of the curriculum reform effort after the first round of curricula revisions the government left the schools high and dry. “The question is of a scientific elite,” concludes Wirzup.

“The United States has a superior elite in science and mathematics. But ours is a small elite, while the Soviets are training a new elite, a large elite, and the general population will be much more sophisticated in science and math than we are.”

Editors Note: Efthalia Walsh is a Washington-based free lance writer; John Walsh is a staff writer for Science.

The preceding article appeared in Volume 1, No. 6 of Science 80, page 17-22. It appears here with the permission of the editors of Science 80. Science 80 is published by the American Association for the Advancement of Science, 1515 Massachusetts Avenue, N.W., Washington, D.C., 20005.
The HGS Memorial Scholarship Fund has awarded a $1,000 scholarship to Mr. James O. Lance, Jr., who is currently in graduate school at the University of Texas at El Paso. Mr. Lance was born on January 20, 1949 in Roswell, New Mexico where he graduated from Goddard High School in 1967. Following his graduation, Mr. Lance attended New Mexico State University for a short period before deciding to enlist in the United States Navy where he served for six years.

Mr. Lance had an excellent undergraduate record (GPA 3.74) at UTEP, and has improved his scholastic record (GPA 3.91) in graduate school at that University. Recommendations from instructors at UTEP included the comment that “I cannot think of a student I have ever been associated with which I could recommend any higher than Mr. Lance.”

James states that “I am requesting a scholarship because I consider myself to have the potential to give a good return on the investment, and because a scholarship will ease the financial burden of returning to graduate school.” Our award was especially welcome since the birth of his second child occurred last July. His goal is to obtain an advanced degree in geophysics. The fact that he has worked for Amoco as a geophysicist, and at the University as a math and science tutor, as well as in the seismic observatory and geophysics laboratory, indicates that James has worked hard to achieve his goal.

As of September 15, 1980 the financial status of the Fund was as follows:

- Corporate Bonds: $23,000
- Savings Account: 6,043
- Savings Certificates: 7,973
- Investment Account: 6,203

Total $43,219

Thanks to the generosity of those listed below, many of which are repeat contributors, the Fund has grown from the originating contribution of $8,000 by Mr. Warren L. Calvert to the amount shown above in less than six years. We have just awarded our third $1,000 scholarship, and our annual income from investments is such that we will be able to increase that amount substantially next year. We hope that others will join those listed below in our efforts to attract, select, and support other outstanding students like Mr. Lance.

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PROFESSIONAL AND ORGANIZATIONAL NEWS

Professional and Organizational News may be sent to Mrs. Virginia Lee Bick, 2534 Yorktown, Suite 156, Houston, 77006 for publication in the HGS Bulletin. All news to be published in the January issue should be sent to Virginia by November 18, telephone no. 840-9562 or 961-0406. Due to lack of space, new promotions will be listed for members of HGS only.

David J. Ewing has been elected President and Chief Operating Officer of Energy Sources, Inc. He joined the firm in 1977 as Vice-President. He has been in the oil business for over twenty-eight years.

Bruce A. Arnett has recently joined Mid-American Petroleum’s Houston staff as an Exploration Geologist.

Fred Hankinson has joined Vantage Petroleum as Vice-President of Exploration. Their offices will be at Summit Tower, 11 Greenway Plaza, in Houston.

John Clay has been elected Vice-President of Transco Exploration Company for their offshore Gulf exploration. He joined the company in 1976 as a geologist and has held several manager positions relating to Gulf of Mexico exploration.

Quatre Exploration, office at 1317 C & I Building, 1006 Main, Houston, has been formed for exploration for oil and gas principally in the state of Texas. Jack Love, Jim Young, Gail Oliphant and Bill Harlan are officers. Quatre has been retained to explore for Anglo Company Ltd., a New York based contract drilling and oilfield service company, active in Canada, Alaska, and the Rocky Mountains.

Judge Robert B. Baum, a long-time member of HGS, is now serving as Judge of the 314th Family District Court (Harris County). He was appointed to this position last year by Governor Bill Clements, and is now up for election in November as the Republican nominee.

Warren Murey has been promoted to Vice-President of Galaxy Oil Company, Wichita Falls, Texas.

AIPG-TEXAS SECTION ANNUAL MEETING. The 1980 Annual Meeting of the Texas Section - American Institute of Professional Geologists will be held in Houston at the Houston Oaks Hotel (Consort I Room, Mezzanine Level) on Friday, November 7 from 2 to 5 PM and Saturday, November 8 from 9 to 11:30 AM. All HGS members are cordially invited to attend, whether AIPG members or not. On Friday afternoon, Stuart P. Hughes (Executive Director of AIPG) will speak on the subject “AIPG in the 1980’s:”; James A. Wheeler will present an historical review concerning registration and regulation of geologists in Texas; and Dr. William L. Fisher will discuss the operations of the Bureau of Economic Geology. On Saturday morning, W. H. Roberts III will present a paper entitled “Oil Deposits and Ore Deposits, An Interesting Analogy”; Martin M. Sheets will document how oil improves the environment; Dr. Frederick Horz will discuss lunar geological studies; and Dr. Charles Wood will talk about the geology of Planet Earth as viewed from space.

Sam R. Evans is the current President of the Texas Section - AIPG and Dean Grafton is the General Chairman of the 1980 Annual Meeting.

Louis A. Oswald Jr. has become an independent geophysical consultant. He was formerly Gulf Coast District Geophysicist with American Natural Gas Production Company and prior to that was with Trans Ocean Oil Inc. and Petty Ray Geophysical.

SOVIETS MAY HAVE USED NUCLEAR EXPLOSION TO INCREASE OIL PRODUCTION

An underground nuclear explosion of October 4, 1979, east of the Ural Mountains in the Soviet Union probably was triggered to stimulate oil production from a mostly unexplored giant oil field, according to two scientists of the U.S. Geological Survey, Department of the Interior.

In a report being placed on open file, Jack Rachlin and James W. Clarke, geologists at the USGS National Center, Reston, Va., say that Survey seismologists pinpointed the location of the explosion in the oil-rich Middle Ob region of West Siberia in the vicinity of the Salym oil field. The field, discovered in 1965, is described as a potential giant field in which “tight” bituminous shales are the principal oil-bearing reservoir.

Noticing that past Soviet experiments with nuclear explosions in the immediate vicinity of petroleum deposits included oil stimulation and underground storage, Rachlin and Clarke discounted the possibility that the explosion was to produce a storage cavity. They reason that because of the relatively undeveloped stage of the Salym field and the absence of thick salt deposits used for storage. It is far more likely that the explosion was triggered to stimulate production by extensive fracturing of the tight bituminous shales in the field.

Estimates of reserves of the Salym oil field are as high as 10 billion barrels. The report notes, however, that thus far, only about 10 million barrels have been produced from the field. A major characteristic of the reservoir is its low permeability. So tight are the rocks and fractures in the formation that the oil flow yield is significantly inhibited. An explosion such as was set off last year, could, in effect, produce a rubble chimney and fracture “envelope” tens of meters in radius. This, in turn, could raise production rates, make larger or additional areas of the formation productive, and decrease exploitation costs.

The underground explosion of October 4, 1979, had a magnitude of 5.4 on the Richter Scale and was located at 60.850°N, 71.525°E. The accuracy of location, based on 115 seismic stations, is considered good, the Survey report says, adding that, “The aseismicity of the region gives high confidence to concluding that this event was, in fact, an underground explosion.” For comparison, nuclear explosions conducted by the United States in the Gasbuggy (December 10, 1967, Colorado) and Rulison (September 10, 1969, Colorado) gas stimulation experiments had magnitudes of 4.7 and 4.9, respectively.

Copies of the report, “Salym — Potential Giant Oil Field in West Siberia: Possible Reservoir Stimulation Experiment Using a Nuclear Explosion,” and published as USGS Open-File
NEW GEOLOGIC MAP OF COLORADO

A new color geologic map of Colorado has been published by the U.S. Geological Survey, Department of the Interior, to replace an earlier version published almost a half century ago.

"The map reflects the very extensive geologic mapping that has been done in the state since the earlier version was released in 1935," said Ogden Tweto, USGS geologist, Denver, Colo., and the compiler of the map.

"The map also reflects the results of technological advances, such as aerial photography and isotopic dating of rocks," said Tweto, a leading expert on the geology of Colorado who began his geologic studies of the state when he joined the USGS in 1938.

Tweto said the map, prepared in cooperation with the Colorado Geological Survey, depicts the distribution of 186 different rock units, shown in 105 different colors or patterns. He explained that the map delineates the different rocks on the Earth's surface, except in parts of eastern Colorado where it shows the types of rocks lying beneath a surface cover of wind-blown sand.

The most ancient rocks, about 1.8 billion years old, are gneisses, schists, and other metamorphic rocks in the mountains in the central part of Colorado. Tweto added. A narrow belt that extends across the mountains from Boulder to Durango contains igneous rocks of much younger age, with which most of the state's metallic mineral deposits are associated.

Provinces in eastern and western Colorado contain sedimentary rocks much younger than the rocks of the mountains. These rocks contain coal, oil, gas, oil shale, and most of Colorado's uranium deposits.

The wall-size map was published at a scale of 1:500,000 (one inch represents 8 miles). The geologic data are overprinted on a base map that shows highways, streams and topographic contours in color, and cities, counties and other features in black.

"The new map reflects an enormous increase in the understanding of the geology of Colorado since the earlier geologic map was published in 1935," Tweto said. The USGS geologist added that he used geologic maps, reports and other data prepared by the U.S. and the Colorado geological surveys, by other federal and state agencies, by universities, and by private industry in compiling the new map.

He said the map should be a valuable aid to government and private industry in exploration for minerals, oil and gas, coal and underground water, and also should be helpful in land-use planning, especially in avoiding the building of facilities on areas threatened with geologic hazards such as landslides and swelling clays.

The map also shows the distribution of the Ogallala aquifer — the source of fresh ground water for much of eastern Colorado. It also shows gravels and sands of ancient stream valleys, now covered by wind-blown sand, that supply ground water to the area east and northeast of Denver.

Copies of the map may be purchased from the Branch of Distribution, U.S. Geological Survey, Box 25286, Federal Center, Denver, Colo. 80225, for $3.50 each. Orders must include check or money order payable to the U.S. Geological Survey. Copies are available for purchase over the counter at the USGS Public Inquiries Office, 169 Federal Building, 1961 Stout St., Denver, Colo. Copies also are available from the Colorado Geological Survey, 1313 Sherman St., Denver, Colo. 80203.

EXPANDED AREA TO BE CONSIDERED FOR OIL AND GAS LEASING OFF SOUTHWEST FLORIDA

The Department of the Interior announced that an expanded area offshore the southwest coast of Florida will be included in the forthcoming Call for Nominations and Comments for two 1983 Gulf of Mexico sales.

Secretary of the Interior Cecil D. Andrus has advised Florida Governor Robert Graham that when the Call for Nominations and Comments is issued by the Department in January 1981 for OCS sales 72 and 74, it will include 10 million acres covering about 1,700 blocks in the map areas known as Pulley Ridge (NG 17-7) and Howell Hook (NG 16-9). This new area is immediately south of 26° north latitude.

Andrus has decided to take this action in order to get an appraisal of the oil and gas potential of the area and to seek comments on the particular geological, environmental, biological, archaeological, and socio-economic conditions which might bear upon potential leasing and development of blocks within it. The area has not been included in Gulf of Mexico calls in recent years, but has become increasingly attractive geologically as a result of continuing exploration for and discovery of oil and gas in the gulf region.

Announcing his decision now, instead of waiting until the scheduled call date of January 1981, will allow potential nominators and commentors additional time to gather information in this previously unassessed area.

While this area will be opened to nomination and comment, no decision has been made that any tracts will be selected for study.

With the additional area, the Call for Nominations for sales 72 and 74 will extend across the Gulf of Mexico and involve 144 million acres.

**

The detection and interpretation of short- or intermediate-term precursors to earthquakes remains a challenging task. By contrast, certain long-term predictions, based on the theory of "seismic gaps," seem to be rather successful. The basic premise of the theory is that the margins of tectonic plates move at constant rates when averaged over long periods of time and that most of this movement occurs during discrete events, i.e., earthquakes. Thus, if a certain region along a plate boundary has not had seismic activity of the size and within the time period of neighboring region, a seismic gap is said to exist. This gap is said to be the most likely place for the next earthquake along that region of the plate boundary. A case in point is the Yakataga Seismic Gap in Alaska, which in 1979 was identified as the probable site of a future earthquake. The likelihood of an earthquake was found to be high sometime in the next few decades.
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**HOUSTON GEOLOGICAL SOCIETY**

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 $15 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, 6916 Ashcroft, Houston, Texas 77081.

**COVER PHOTO**

Tattered remains of a once thriving quicksilver retort at the Mariscal Cinnabar Mine on the northern end of the Mariscal Mountain in Big Bend National Park. Photo courtesy of Glenn Hatcher.
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