THE WINDFALL MYTH, ENERGY CRISIS AND OIL GLUT

The Windfall Myth

Windfall has been defined as "an unexpected or sudden gain," but it also means "something that is blown down by the wind." This latter definition may well describe the petroleum industry if Federal, State and local governments do not cease their imposition of ridiculous restrictions and roadblocks.

What, one might ask, has triggered these impositions? Certainly they are due in part to the fact that elected officials, government employees, and, indeed the public in general have become militantly anti-profit in their attitude. One Senator termed profits "obscene." On the other hand, however, he omitted to define what constitutes a "chaste profit."

In defense of profits the American people must be reminded that making an adequate profit is the American way of doing business. If it were not for profits the United States would still be a poorly developed, agrarian nation, much like Soviet Russia remains today! Existing industry thrives on profits that keep its plants in good order and expanding, and new businesses are formed from profits of established industry. If our industries cease to make profits our industries will cease to exist. If the profit motive is killed by governmental decrees the American way of life will end.

At present the public eye focuses on the petroleum industry more than on any other part of our business complex. In the months that our Washington establishment has spent debating an energy policy a driving impetus to levy more taxes to keep "those oil companies" from making "windfall profits" has prevailed.

For the record, let us examine just what the profit picture looked like last year for the large oil companies. There were eighteen U. S. companies that grossed over $3 billion in 1976. The highest rate of return on gross income of the eighteen was only 7.8 percent; the lowest return, 3.2 percent. If you had bought a share of stock this year in the company paying the best dividend return you would be earning 6.6 percent on your money -- about the return on a one-year savings certificate. The lowest return company would pay you a mere 1.5 percent.

By comparison, Houston Lighting and Power, a utility, has a 12.5 percent return on gross income in 1976 and is currently paying about 5.6 percent to its shareholders. The comparison hardly justifies accusations of obscene profits!

What exactly perpetuates the Windfall Myth? Would there really be a windfall of profits if oil and gas prices were deregulated? If an industry is making an inadequate return, a so-called windfall could mean the difference between life and death.

Law makers, policy makers, or whatever the Washington establishment can be called, should be directed toward a closer scrutiny of the activities of the large petroleum companies before forming opinions or making ill advised statements. Only the four largest of the eighteen companies and two others who are heavily into marketing invested less than their net income in exploration and production of oil and gas. The other twelve companies spent more than net income, and two of the companies spent more than twice their net incomes on exploration and production. In addition to these expenditures, each company also made large investments on refineries, pipelines and other petroleum related projects; furthermore, there were many millions spent on capital ventures such as uranium, coal, oil shale and other diversifications.

Capital funds generated from net income, and depletion, depreciation, and amortization charges provide the investment dollars for petroleum companies large and small, but of the eighteen largest companies only five invested less than their cash flow, and those five, only slightly less at that! The rest of the companies invested over twice their available funds. Increases in long term debt are a common occurrence in the industry.

An industry that employs 1,500,000 of the United State's population, that invests sums in excess of net income to further the flow of petroleum energy, which 1) provides fuel for almost all other domestic industries 2) keeps the entire population warm and lighted, and 3) moves the population from place to place needs much more capital than it can generate now under controlled oil and gas prices.

Additional so-called "windfall profits" from deregulation of crude oil and natural gas -- a substantial part of which would be taxed away -- would be a welcome incentive to drill more wells, produce more oil and gas and deliver more energy.

Energy Crisis and Oil Glut

Questions are being raised about the validity of an "energy crisis" in times of an oil "glut." In spite of the seeming contradiction, glut and shortage can co-exist. Let's examine some facts.

The "glut" is temporary. Oil now beginning to flow from the Alaskan North Slope will not substantially extend the period during which we can expect to rely exclusively on fossil fuels for our energy needs. We are using 17 million barrels of oil each day. That's
6.2 billion barrels a year.

Alaskan oil will raise American production from 8.1 million to 8.9 million barrels daily. The positive effect of this increase is to reduce the amount of oil we are forced to import, leading to a more favorable balance of payments situation with the OPEC countries. But consumption is increasing, and the Alaskan fields may not extend the time during which we can rely on fossil fuels by more than two years.

Even taking Alaskan oil into account, U. S. oil production peaked in 1970 at 9.8 million barrels a day. The figure for 1976 was 8.1 million. Canadian production peaked in 1973. Production has declined steadily since then, at a rate of 350,000 barrels less each year. The oil-rich Middle East saw its highest production year in 1974, with 21.8 million barrels drawn, but more recent figures are down 2 million barrels. Africa peaked in 1970.

Production of oil and natural gas in the free world reached its highest level in 1973, but discovery and production in Communist nations is still rising. No matter how much oil is being found, pumped, and used, the supply of fossil fuels is finite, so there is an energy crisis.

For the short run, we have a "glut" of oil -- on the West Coast. If by "glut" we mean that more oil is available than can be used where produced, then we have had for a number of years a "glut" of oil in Texas and Louisiana. Both states produce more than they can use, but that oil and gas is trans-shipped to the rest of the nation. The coming "glut" of oil on the West Coast is government inspired: federal, state and local authorities are standing in the way of shipping the oil where it is needed and can be used.

For months, permission has been sought to reverse flow in an existing pipeline running from New Mexico to Long Beach, California which would enable movement from the West Coast of Alaskan oil into existing cross-country pipeline systems. The Federal Power Commission has been delaying the plan by asking for detailed information in a continuing series of queries. Now the California Air Board is saying it wants no tankers coming into the port at Long Beach. It might be said that the West Coast is not cooperating with the rest of the country.

President Carter has discarded the idea of trading Alaskan oil with Japan, in exchange for Japan's supplies of Persian Gulf oil delivered to East Coast ports.

It is not possible to move large volumes of North Slope oil through the Panama Canal: large tankers are too big for the canal. If tankers are required to go around the Horn, oil arriving at East Coast ports could cost more than the highest priced Mid-East oil. To build a pipeline across the Panama Isthmus could cost somewhere in the neighborhood of $2 million a mile -- roughly a $100 million project, and that cost does not take into consideration building loading docks and deep-water ports. There are no deep-water facilities -- needed by super tankers -- on either end of the Canal.

One envisions tankers full of Alaskan oil, like the Flying Dutchman, plying the Pacific forever.

On the political side, it needs to be made clear to consumers that control of prices holds down production. Oil and natural gas price control, rather than meaningless toings to consumers, means we must rely more and more heavily on greater quantities of imported oil -- from countries over whose pricing policies the U. S. has no control.

Oil producers are trying desperately to find oil resources, develop them and get fuels to the American market. With governmental interference in production and shipping, price controls holding down production and the driving need to decrease our dependence on imported fuels while developing other energy sources for the day oil runs out, the oil man is caught between a rock and a hard place. "Glut" and energy crisis indeed can co-exist.

Edd R. Turner
Past President - AAPG
Guest Editorial

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CONCERNING LEGISLATION

(The following accounting of recent activities in Washington was submitted by the APGS Washington counsel, James U. Hamersley)

As the Second Session of the 95th Congress is now underway, APGS legislative activity has also been underway. Not only has the Congress taken a long February recess, but the Panama Canal Treaty Senate debate has stopped much of the flow of activity, and many bills that affect geologists may be stalled. Included among these are the following:

A) Dam Safety: The House Government Operations Subcommittee on Environment, Energy and Natural Resources has completed a study on dam safety. Of the 50,000 dams that are operational, the report stated that 20,000 were to have significant or high safety hazards. Although the 1972 National Dam Inspection Act directed the Army Corps of Engineers to inventory all dams in the United States, funds were never released, and the inspection program has not been implemented. With the November 1977 dam tragedy in Toccoa, Georgia, the President directed that funds be released for the program to begin.

The Congress will soon recommend new legislation that high priority be given to the national problem of unsafe dams. There will be a reorganization of agencies involved in the building and operating of dams, as well as requests for financial and technical assistance to the States.

B) Divestiture: At this time, no action has been scheduled on any divestiture bill. S. 1927 (Kennedy, D-Mass.) or H. R. 7816 (Udall, D-Ariz.). These bills would prohibit the top eight major oil companies from future bids on Federal lands containing coal or uranium. Representative Rodino (D-NJ), in a move which would assure that the bill will be stalled until the end of the Session, has asked that it be referred to the House Judiciary Committee after any Interior Committee action. It appears that there is no chance of any divestiture legislation at this time.

C) Outer Continental Shelf: There has been no announcement of the conference committee members to resolve the problems between the Senate and House versions of this bill. There will be efforts to stop the bill from coming out of conference, and stalling the committee formation.

D) Carter Energy Plan: Until the natural gas deregulation issue is solved, no action will take place on this legislation. Again, the Panama Canal issue has held up this item.

E) Mining Law Reform: (H.R. 9292) This bill would be one of the significant pieces of legislation for APGS in 1978. The bill, which is an administration proposal, establishes a lease system for mining hard rock minerals. This would place the Interior Department in a position of having greater regulation over
mining activities of Federal lands. Permits would be required for prospecting, and small and medium-sized mines would be burdened with paper work.

F) Natural Diversity Act: This is a bill to establish a national program for the States to identify areas of natural value and to form a National Register of these valuable lands. It also would authorize funds to help the States implement these programs. A similar bill of a California Democrat Phil Burton, is before the Subcommittee on Parks and Recreation of the House Interior Committee.

Actions that will demand future APGS participation will include comments to the Forest Service on the Forest and Rangeland Renewable Resources Planning Act of 1974, and comments before the Securities and Exchange Commission on disclosure of oil and gas reserves.

On January 23, an APGS group met with the United States Department of Agriculture to discuss the proposed strip mine spoil classification. APGS will monitor future strip mine regulations as they are issued.

In addition, a legislative committee meeting was held February 23, 1978, and a Washington luncheon took place on March 2, 1978.

My name is Kelsey L. Boltz and I appear here today on behalf of the 4000 member Association of Professional Geological Scientists, a nationwide organization of geologists from industry and academia and as Executive Vice President of Nuclear Dynamics, Inc., a medium-sized company engaged in uranium exploration and development in the Western United States and in coal mining in Eastern Kentucky.

During testimony given yesterday and this morning before this Subcommittee, there have been numerous articulate spokesmen analyzing the proposed subject legislation HR 5831 and HR 9292. In order not to be repetitious, but still add our views to the record, I would summarize our position as follows:

HR 9292 works for the benefit of no one, neither the mining industry nor the consumer. The proponents of this bill may visualize vast revenues flowing to the Federal Government organization through royalties on new mineral discoveries; however, the real effect will be that there will be few, if any, new discoveries made if this bill become law. The discretionary powers given to the Department of Interior in HR 9292 will make access to and tenure of public lands so uncertain that investors who are also the United States public representing the capital needed to conduct these operations will be extremely reluctant or refuse entirely to undertake these high risks. Mineral exploration, development and production is, by its nature, a high risk activity. Adding to this risk the further uncertainties of bureaucratic caprice could make the whole enterprise economically prohibitive. Bankers have repeatedly said, "We don't take risks -- we only rent money."

Although I am a geologist by profession, most of my time the past few years has been spent working with banks and other financial institutions raising the capital necessary to conduct the various phases of mineral exploration, development and production. I can assure you that few, if any, of these institutions will be willing to risk their funds if they must rely on the arbitrary discretion of a bureaucrat as to whether they would be able to recover their investment. This legislation would virtually eliminate the mineral industry's access to the type of debt financing known as project financing or, "off balance sheet" financing. This is an arrangement with the lender whereby the borrowing company dedicates the property and cash flow therefrom to the service of the debt and the borrower looks only to the operation for the debt service. Such arrangements do not affect the company's additional borrowing power. Elimination of the conditions to acquire this type financing would shift debt burden directly on the company thereby dramatically reducing industry's capability to acquire the enormous funds necessary to extract the minerals.

In HR 9292 the company is continually subjected to the uncertainties of arbitrary bureaucratic decisions administered by those who are often ignorant of how operations must be conducted. Bureaucratic directives concerning sequences of operation activities issued by the unknowledgeable often have an enormous adverse impact on costs. My company is experiencing these problems now in its coal mining operations in Eastern Kentucky where the stip regulations, however well intended, are often administered by people who have no experience in operations. They rarely seem to be cognizant of the enormous effect that these arbitrary and often capricious decisions have on costs. Remember, all the United States consumers will pay these costs one way or another. The threat of runaway operational costs further contributes to the reluctance of institutions to do the financing without which mineral producing operations cannot take place. All this will serve only to drastically increase the costs of production and consequently the costs of the products to the consumer with no tangible cost benefits.

It has been made clear by members of this Subcommittee that a new mining law is inevitable whether or not it is in the best interests of the nation -- it is only a matter of time. If this is so, then we would support HR 5831 with modifications as a workable compromise.

We recognize and support the concept of multiple use of public lands. We strongly endorse the necessity to protect the environment. Furthermore, in areas where the surface over public minerals is privately owned, that owner's rights must be protected.

The time required for patenting as described in Title III of HR 5831 should be extended to a period of at least ten years. The almost infinite number of variables involved in mineral deposits and their exploitation requires a maximum of flexibility. As an example, low grade uranium deposits discovered by my company eight years ago were at that time considered to be uneconomical. During the past eight years, industry has developed in situ leaching techniques which now render these deposits economically feasible. The time elapsed from discovery to production will be approximately ten years. Had we not had secure tenure of these minerals during that time, it is likely that these deposits would not be developed.

With respect to production royalties accruing to the Federal Government, such royalties only serve to increase costs of mining with the attendant ramifications already well described; such as, higher product costs, loss of competitiveness on the world market, and adverse effect on the balance of trade. If the consumer is going to get stuck with the royalty then, of course, the less the better.
Federal Land Withdrawals: A Policy Statement

In a recent departure from custom, the Executive Committee of the American Association of Petroleum Geologists adopted a policy statement, which, in addition to confirming its support of the American free enterprise system, voiced the following recommendation:

"The Executive Committee is of the opinion that much of the country's most highly prospective areas for oil, gas and other mineral production exists on federal lands. It is the Committee's recommendation that governmental processes should be expedited whereby all federally controlled areas, offshore and onshore, be made available to judicious energy mineral resource exploration and development."

The current conflict between sound geological practice and present unsound government restrictions prompts the comments that follow.

Most of the federal lands suitable for mineral, forestry, and agricultural development are in the western states and Alaska. Present production in these areas and the extensive continental shelf lands off our coasts indicates a potential for future major mineral development. The assurance of reasonable access to the surface of federal lands is essential to exploration for energy minerals. Of the 877,000,000 acres designated as federal domain, 546,000,000 acres or 62 percent of the total, are either closed to, or are so burdened by restrictions as to preclude, exploration and development of energy minerals.

This growing problem of restrictive federal land management is not one solely for the petroleum and coal industries. Other industries adversely impacted by land restrictions include mining, forestry, farming, grazing, real estate, and recreation.

Under active consideration at present in Congress is H.R. 39, Alaska National Interest Lands Conservation Act, which if passed would withdraw over 140,000,000 acres from mineral, forestry and agricultural activity. Many of the areas covered by this bill are so remote that they stand for the most part in frozen, pristine isolation. But is isolation and withdrawal what we want? The 140,000,000 acres listed in H.R. 39 have not had a mineral assessment, and none is planned. There just might be a life-sustaining mineral wealth on these lands that should be developed.

Restrictions on land usage, withdrawing millions of acres from production or past those currently estimated at over 20 tons of mineral production per person per year. And no matter what any of us thinks he can do to control population growth, the fact remains that the number of people in the United States and the world will continue to increase. The lives of these people will depend upon intelligent environment management. And use! Please bear in mind that federal lands benefit no one unless they are allowed to be used.

It is almost a bureaucratic scandal that so little is known about our land withdrawal program. Although I am told an inventory of withdrawn federal lands is in current preparation, at this time there is no central record of withdrawn lands nor of the reasons for their withdrawal. It would appear that in some instances withdrawn areas have become essentially bureaucratic fiefdoms jealously guarded by local agencies from whom permission to enter such domains on camping or hiking expeditions can require as long as six weeks to obtain.

Moreover, permits to drill wells on leased lands are rarely issued in less than 90 days, and leasing of federal lands in some western states has been delayed for years pending environmental impact statements. Record keeping in various local agency offices has been at best haphazard, and revocation or restoration of withdrawn lands to general use is tied up in a processing morass with a considerable backlog of applications, many over five years old.

Is there any wonder that these deplorable conditions prevail if we take into consideration that the federal bureaucracy has expanded in recent years to the extent that today there are 23 departments and agencies that administer 112 land-oriented programs!

When our country was younger, when our population was smaller, when there was an abundance of usable land, restricting land use was not an important survival concern. It is now!

Petroleum geologists serve a multiple role in this country that is at least traditionally conceived to be a capitalistic democracy. As professionals our training qualifies us to advise; as members of an industry our experience equips us to inform; and as citizens our birthright entitles us to speak out on matters that relate to energy and environment.

We now speak out, advise, and inform that federal land management programs as they exist today are archaic, inefficient, and detrimental to private sector efforts to resolve the energy crisis. These programs must be geared to maintain an expanding population, to assure a robust economy, and to preserve American free enterprise as a way of life.

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Counterproductive Government

Someone commented recently that current debate over our national energy policy has produced no results, only a proliferation of experts.

That comment was probably intended ironically, because never before have so many known so little about a national problem affecting every one of us. Accordingly, the challenge facing the energy explorationist today is not the finding of oil and gas, but coping with the vexing blunders, mismanagement and excessive regulation which thwart his professional efforts on all sides.

The moral equivalent of war has become an endless war of words on Capitol Hill. But Congress aside, some of the blame can surely be traced to the federal government's irresponsible squandering of taxpayer's dollars on consultant hiring; its exclusion of qualified personnel from key positions on energy; and the patently inefficient, do-nothing attitude of bureaucracy.

Energy professionals were dismayed to learn that last week, for example, that the Energy Research and Development Administration contracted with a major corporation to evaluate the uranium mining potential of the Cook Inlet area in Alaska. Most properly, this was a job for the U. S. Geological Survey, which was already a couple of years into the project.
And what did the corporation do? It immediately got in touch with the U. S. G. S. to see if its data could be used in the report.

Recently the Department of Energy contracted for a study of drill bits and drill rig automation to see if improvements could be made to hasten well drilling. An admirable undertaking -- unless one considers the group assigned to make the report had never seen a drill rig before!

While the consulting boondoggle is counterproductive, more serious is the exclusion of qualified personnel from energy regulatory positions.

Our industry is regulated by amateurs, because competency aside, those positions today have to be filled by those stipulated to be "clean" -- meaning that the candidate owns no energy company stock, no mineral interests, receives nothing from energy ventures, and possesses no residual benefits if by chance he once worked for an energy company in the past.

These "qualifications" imply the professional energy exploration is "cleaner" than "industry-bias," and "greedy," and he is therefore excluded from regulatory, advisory, and managerial positions where he could help his country find an energy program that might work.

And as a result, the day-to-day administration of our federal government, in the energy field and in other agencies, is entrusted to a comatose, entrenched bureaucracy that outlasts administrations and congressional terms.

In the energy business, the explorationist can wait up to five years for the federal government to prepare an environmental impact statement. But then there was the operator in Wyoming who had been unsuccessful for months trying to gain location approval on a federal lease until he demanded disapproval in writing. Two days later he had his location approved!

While the bureaucrat who never takes visible action is one who ideally fulfills his role, the compilation of rules and regulations even in excess of congressional authority is another story. Rules and regulations are drawn up on bills which haven't even been signed into law. One shudders at what will happen when Congress finally passes the energy legislation it has so long been wrangling over.

It is simply incomprehensible that we continue to entrust without protest the administration of energy matters to a befuddled, inept bureaucracy which threatens the free enterprise system on which our economy is based.

Our federal government must be made to realize it is our oil and gas industry that searches for, produces, transports, refines, and markets 74 percent of our national energy. And this was only made possible by a technological supremacy which flourished in a climate of protective, not punitive regulation.

Clearly, we cannot do our work of finding the oil and gas we need to solve our nation's energy problems as long as counterproductive government stands in our way.

Thus, while it is not AAPG's policy to support or oppose various bills, or candidates, or agency rulings, we have decided that it is in the best interest of our profession -- and the nation -- to speak out on energy problems.

We have learned, at least, they read our letters!

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LETTERS TO THE EDITOR

Dear Editor:

At the San Antonio meeting the question was asked regarding the availability of "Malpractice Insurance." Similar inquiries have also been made of Headquarters. Therefore, the following may be of some help to those who are interested.

I have a policy from Aetna Life and Casualty Company called a "Comprehensive Public Liability Policy." There is a new special category for Oil and Gas Geologists. The policy coverage includes: Operations, escalators, independent contractors (let or sublet work), completed operations, products, and contractual obligations. In addition, there is an endorsement available called the "Contract Pak" which adds the following coverages: blanket contractual oral agreements, broad form property damage, watercraft nonownership, five damage legal liability, host liability, incidental medical malpractice, world-wide coverage, additional employees, personal injury and advertiser's liability, and medical payments.

The coverage rates vary with the states in which you operate, the limits of coverage selected, and the respective age and health of the insured. I personally feel the rates are nominal and recommend those interested explore it further through their local agents.

Very truly yours,

/s/ Fred L. Stead
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Dear Editor:

I need your assistance in a matter of importance to both APGS and the Committee on Divestiture of the Association. This committee was established recently with the purpose of compiling and maintaining a file on matters related to divestiture. To do this job well we need help from the members of APGS. Therefore, I would appreciate your publishing the following announcement in the Professional Geological Scientist:

APGS Committee on Divestiture
The Committee on Divestiture was established by the Association with the purpose of compiling and maintaining a file on matters related to divestiture. To maintain such a file efficiently the Committee needs to have up-to-date information on matters related to divestiture from throughout the country. Therefore it would be appreciated if the members of APGS would bring to the Committee's attention any developments in their respective areas or regions related to this subject. Such materials (newspaper articles, references to publications, etc.) can be mailed or telephoned to: Nenad Spoljaric, 101 Penny Hall, Delaware Geological Survey, University of Delaware, Newark, Delaware 19711; Telephone: (302) 738-2833.

Sincerely,

/s/ Nenad Spoljaric, Chm.
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Professor J. L. Knill. He has been the moving spirit in the five years it has taken to structure and create the Institution and to ensure that from the outset it reflects the wishes of professional geologists as a whole. With Professor W. S. Pitcher (President of the Geological Society), Mr. J. K. Shanklin and Mr. M. J. Barefoot, Professor Knill was involved in the first formal study group on professionalism and stays the course to see his labours bear fruit.

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ALABAMA OIL AND GAS YEWEND REPORT

Alabama now stands a chance to move to the forefront after long being considered the frontier of the nation's energy reserves, State Oil and Gas Supervisor Thomas Joiner (CPGS 2018) says.

Joiner said Alabama will have record oil and gas production when the final figures for 1977 are compiled and he predicted an even greater increase for this year.

At the end of 1976, he said, Alabama has 31 producing oil or gas fields, adding, "Today we have 50, and by later this year we should have about 70. It was a good year in both exploration and production."

Oil and Gas Board projections call for 1977 production of 60.5 billion cubic feet of natural gas, 12.9 million barrels of oil and 6.9 million barrels of condensate, a high-grade hydrocarbon.

The figures are increases over 1976 of nearly 20 billion cubic feet of gas, more than 2 million barrels of condensate and more than 2 million barrels of oil.

For 1978, the projections are higher: 13 million barrels of oil, 10.3 million barrels of condensate, and 95.8 billion cubic feet of gas.

Joiner credited the near-miraculous rise in production since 1972 to increased successful exploration in southwest Alabama and in the Warrior Basin in the state's northwest corner.

The jumps in production caused corresponding hikes in the value of oil and gas brought up from the depths of Alabama: $25 million in 1971, $156 million in 1976, $190 million anticipated for 1977 and a projected $267 million for this year.

And that will bring about increases in severance taxes paid the state by producers for the minerals severed from Alabama land.

The state took in $1.5 million in 1971 and probably will collect $1.4 million for 1977, with a 1978 projection of $16 million.

Joiner said Alabama ranked 18th in oil production and 21st in gas at the end of 1976, but the 1977 figure probably will raise that status.

Joiner, who is also State Geologist, said higher gas prices could be credited for the increased interest in the Warrior Basin.

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GEOLOGICAL POSITION OPENINGS

The Wyoming Geological Survey in Laramie has an immediate opening for a Staff Geologist familiar with geologic hazards and environmental matters. Applicants must have Ph.D. or M.S. with three years professional experience. Preference will be given to applicants with geological engineering background and working familiarity with Wyoming geology. Salary
range $17-$18,000. Submit complete resume to: Director, Wyoming Geological Survey, P. O. Box 3008, University Station, Laramie, WY 82071; Telephone: (307) 742-2054.

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The University of Alabama invites applications for the position of Head of the Department of Mineral Engineering. The successful applicant will hold a rank and be paid a salary commensurate with his or her qualifications and experience.

The Mineral Engineering program deals with the exploration, development, exploitation, and processing of solid and fluid mineral substances occurring in the crust of the earth. It is accredited by the Engineering Council for Professional Development and offers both the B.S. and M.S. degree in Mineral Engineering. The present enrollment is 130 undergraduate and 7 graduate students. Close cooperation and coordination exists between the academic program and a well-established Mineral Resource Institute.

Preference will be given to applicants with several years teaching experience and industrial experience in mining or petroleum production. A Ph.D. in mining or petroleum engineering, or in a closely related field, is required.

Duties will include but will not be limited to teaching graduate and undergraduate courses, development and maintenance of an outstanding mineral engineering program, and assumption of responsibility for that program. There will also be responsibility for preparing or supervising the preparation of research proposals to sponsoring agencies and for seeing that research projects are successfully completed. The department head will also be responsible for student advising and recruiting, developing and equipping laboratories in areas of interest and expertise, and providing liaison with professional groups, industry, and alumni.

Qualified applicants should write to: Search Committee, Professor Reynolds O. Shotts, Chairman, P. O. Box 1408, University, AL 35486.

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TESTIMONY
BY KEROS CARTWRIGHT

(Rehearsal of House Government Affairs Committee, Subcommittee on Environment, Energy and Natural Resources)

Thank you for the opportunity to appear before this Subcommittee. My name is Kerros Cartwright, and I am head of the Hydrogeology and Geophysics Section of the Illinois State Geological Survey. Jack A. Simon is Chief of the Illinois State Geological Survey. Although I am a member of several scientific organizations and am a Certified Professional Geologist in the Association of Professional Geological Scientists, I am here today representing only the Illinois State Geological Survey. The Illinois Geological Survey is one of the three Illinois scientific surveys charged with the responsibilities for research and public service relative to the state’s natural resources, including water resources. The Illinois State Geological Survey has long been recognized for its studies of geology and mineral resources in Illinois. We presently have a staff of about 80 geologists, chemists, and engineers and an equal number of support personnel. Our role in the state is to provide geologic data and geologic interpretations to government agencies, industry, consultants, and individual citizens. The Illinois State Geological Survey has no regulatory function in Illinois.

I would like to present testimony on four subjects: the history of our research on the disposal of waste on land; the history of our involvement in the Sheffield radioactive waste site and the Morris nuclear fuel reprocessing plant; the hydrogeology of the Sheffield site as it pertains to the burial of low-level radioactive waste; and research needs.

History of Research in Land Disposal of Wastes

For many years the Illinois State Geological Survey has been called upon for information pertaining to the potential of ground-water pollution from waste disposed on the land. Beginning in the early 1960’s, the number and complexity of the questions began to increase. At the same time, we became aware of a deficiency of data on the behavior of waste in the earth. There had been only two major efforts at field studies, one in Great Britain and one in California, and the reaction of the soil in North Dakota. In this country, the California study has received modest acceptance. However, our observations in Illinois and the North Dakota work suggested to us that the results of the British studies had greater applicability to Illinois, and perhaps to the eastern two-thirds of the United States. This is because climatic and geologic factors control the behavior of the contaminants in the earth, and there are few similarities, climatically and geologically, between Illinois and southern California, where the studies were made.

We mounted a series of major field and laboratory studies beginning in 1965, and have conducted continuous investigations of the effects of disposal of wastes on land since that time. We have installed monitoring systems and studied the details of the hydrogeology at a large number of waste disposal sites in a wide range of hydrogeologic conditions. Our initial studies were concerned primarily with domestic waste; the techniques were then applied to hazardous chemicals. Complementing the field studies we have conducted a series of laboratory investigations of the geochemical reactions of soil and rock to the introduction of wastes.

Our studies have concerned the migration of garbage leachates and toxic components such as lead, mercury, arsenic, cadmium, cyanide, PCB, PBB and others. The research is continuing at this time. The results to date show that earth materials have a high capacity to attenuate or reduce contaminants by fixing them in the soil and retard their movement to the biosphere. However, each ion species has different properties, and the rates of migration vary widely. The migration rate depends in part on the other ions in solution and the affinity of the particular ion. Although we have carried out the laboratory and the radionuclides buried at Sheffield, the results of these studies may be directly applied to such ions and the soils at Sheffield.

History of Illinois State Geological Survey Involvement in Sheffield and Morris Sites

The Illinois State Geological Survey, upon request routinely provides geological information to companies and individuals planning projects in Illinois. The Survey also acts as a technical advisor on geologic matters to several state agencies in Illinois, including the Illinois Department of Public Health and the Illinois...
asked of our geologists concerned geologic conditions related to construction of the plant and the seismic risk in the area. To a degree we have served in a technical advisory capacity to the NRC in these matters. The number of contacts related directly to the site has increased significantly since 1974 when it became apparent that the reprocessing plant would have to be significantly expanded.

In addition, we have been asked for hydrogeologic information pertaining to the development of industrial water supplies in the immediate area of the Morris site.

Geology of Sheffield Disposal Site

The disposal site is located on a low hill six miles west of the village of Sheffield. The area around the Sheffield site has been mined for coal, and strip mining operations have taken place to the west, north and northeast of the property. The property itself was not mined, although it was under the ownership of a coal company at one time.

The site is impounded by a series of fine-grained glacial deposits and bedrock shales. Research has shown that these types of materials are well suited for the disposal of wastes. They have low hydraulic conductivities (that is, they transmit water very slowly), have high cation exchange capacities (that is, they interact readily with many contaminants in the water) and have sufficient free carbonate and clay to control the pH (acidity) of migrating solutions.

The surficial geologic materials at the site consist of windblown silt (loess) over glacial deposits (drift) on the upland and stream deposits (alluvium) in the bottom of the small valley at the southeast corner of the property. The alluvium is the youngest material found in the area. It consists of a mixture of silt, clay, sand and gravel 2 to 20 feet thick.

The combined thickness of the loess and drift varies across the site from less than 10 to more than 50 feet. This variation is related to several factors: (1) the undulating surface of the underlying Pennsylvanian shale bedrock, (2) deposition and erosion of the overlying glacial drift, (3) the subsequent deposition and erosion of a thick sequence of wind-blown loess. The loess is composed of silt with traces of sand and clay; it was derived from fine sediment carried by glacial meltwater and subsequently picked up and redeposited by the wind. There are two separate loess beds representing two major periods of deposition. The total thickness of the loess ranges from a few to about 40 feet.

The drift beneath the loess averages about 15 feet thick. It consists mainly of silty, sandy, pebbly clay (till) that was deposited directly by glacial ice. The till often resembles the underlying Pennsylvanian shale bedrock from which it was derived during glaciation. There are at least two different tills, representing deposition of different ages.

Discontinuous sand lenses have been found at several positions within the glacial materials. Sand is found at the base of the loess, within the till (probably between two till units), and at the base of the till. The sands encountered vary in texture from very silty fine sand to sand and gravel. The thickness of individual sand lenses varies across the site, generally being only a few feet thick at the most. Some of the sand lenses seem to be continuous over short distances, but there is not enough evidence to indicate the degree of continuity over the site.

Underlying the glacial deposits is Pennsylvanian-age bedrock, sometimes referred to as the "coal mea-
sures." These rocks have an aggregate thickness of about 450 feet in this area and consist primarily of shale, with some coal, siltstone or sandstone, and thin beds of limestone. There are two coal seams present at the site, the Danville (No. 7) Coal (about two feet thick) and the Herrin (No. 6) Coal (about 4.5 feet thick).

The Silurian dolomite, encountered at about 500 feet, lies immediately below the Pennsylvanian-age rocks. It is a highly productive aquifer in the northern quarter of the state, and is the source of water at the unincorporated village of Mineral five miles north of the site. Water in the Silurian at the site may have a sulfur odor and taste.

The deep Cambrian-Ordovician aquifer system is the principal bedrock aquifer in Illinois, and is extensively used in the northern third of the state. The two principal water-yielding formations in this aquifer system are the St. Peter Sandstone and the ironstone-Galesville Sandstone. The intervening rocks sometimes yield small, additional quantities of water. The aquifer is separated from the Silurian dolomite aquifer above by the Maquoketa Shale.

Water in the deep Mt. Simon Sandstone is highly mineralized.

The glacial drift, although yielding ground water in some areas of the state, is unproductive at the Sheffield site. The nearest major productive region for the glacial drift is the Green River Lowland to the north; it is from this aquifer that the village of Sheffield obtains its water.

The Sheffield site is isolated from all the productive regional aquifers I have described. The site is bounded on three sides by the coal strip mining operation and on the south by a small intermittent creek. It is several miles to an area where the glacial drift aquifer yields large quantities of water, although local deposits capable of small yields may be closer. The shallowest bedrock aquifer, the Silurian dolomite, is separated from burial operations by the thick sequence of Pennsylvanian-age rock. Thus, the only means by which radionuclides might reach the biologic realm after burial would be by migration through very shallow deposits to local surface water bodies, such as the strip-mined pond or the small intermittent stream to the southeast. Routes for long travel of radionuclides through the ground-water system are unlikely.

Research and Information Needs

The U. S. Geological Survey is currently conducting an extensive hydrogeologic study at Sheffield. Although this study is being conducted primarily to derive general principles which may be used to evaluate future sites, it will also provide a better understanding of the hydrogeology of the site.

We see the additional need for a more detailed study of the surficial materials in which the waste trenches are constructed at Sheffield. The initial drilling at the site revealed the presence of some sand lenses in the glacial drift. However, subsequent drilling in conjunction with recent regional geologic studies suggest that more sand is present than originally indicated. Its continuity or lack of continuity are significant if remedial action is needed in controlling radionuclide migration. Detailed stratigraphic studies should be undertaken to determine whether the sand lenses encountered in various borings are the same or different deposits.

There are other areas of research which I believe could have wide application to low-level radioactive burial sites as well as to other types of waste disposed in the earth. More research should be undertaken on the mechanisms of water movement into and around burial trenches in the humid regions of the country and on the interaction between natural earth materials and the fluids which contain radionuclides or other contaminants. In addition, I believe studies are needed on the long-term integrity of trench covers and the compaction (settling rates) of the buried waste.

SUMMARY

In summary, the Illinois State Geological Survey has been making geological observations and assessments of the Sheffield site for about 12 years. We believe the geologic deposits at the site are generally suitable media for the burial of wastes; they are "tight" and are likely to capture most contaminates such as radionuclides that may be released by buried waste. The burial trenches are well isolated from regional aquifers that occur at depth in the bedrock and that occur in the glacial deposits in the Green River Lowland to the north.

The fact that tritium has been detected in some of the monitoring wells warrants additional study of the glacial deposits and the extent to which radionuclides may migrate at the site. The apparent movement of tritium in itself does not constitute a threat to the public or mean that the site has failed. The purpose of the monitoring wells is to detect such phenomena as a signal for further assessment. The Illinois State Geological Survey is prepared to assist the Illinois Department of Public Health and the U. S. Nuclear Regulatory Commission in conducting investigations that may lead to a more complete understanding of the pertinent geologic and hydrologic factors at Sheffield.

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STATE SECTION NEWS

Mississippi

The President
1600 Pennsylvania Avenue
Washington, DC 20500

Dear Mr. President:

The dismissal of Dr. Vincent E. McKelvey as Director of the United States Geological Survey by Interior Secretary Andrus has caused great concern among the members of the Mississippi Section of the Association of Professional Geological Scientists. We understand that it is normal for the Director's resignation to be submitted with a change of administration. However, this resignation has never been accepted in the 98-year history of the U. S. G. S. because the position has traditionally been non-partisan.

We also recommend continuation of the method whereby USGS directors have been selected - by choosing from a list of candidates submitted by the National Academy of Sciences. In our opinion, this method eliminates the possibility of political influence in the filling of a scientific post.

This position has historically been above politics, and has always been continual throughout the change of administrations. We hope that you restore this tradition which has resulted in the placement of

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superior career scientists as head of the USGS.

Yours very truly,

/s/ Ernest H. Boswell
President

Montana

Officers for 1978 are as follows: Henry G. McClellan, President; Frederick McCotter, Vice President-East; John Montagne, Vice President-West; John Tonnsen, Secretary-Treasurer. The section address is 113 North Broadway, Billings, Montana 59101.

The Annual Meeting was held in Bozeman, Montana on January 21, 1978. According to John Tonnsen, about 25 members and guests attended. Each speaker presented his topic during the morning session, and then submitted to the traditional "Ox Tossing Session" in the afternoon which was moderated by Cottie Seager.

The program is indicated below:
8:00 am - 10:00 am Registration and Coffee
10:00 am - 12:00 noon Program - Multiple Use and Environmental Concerns on U. S. Forest Service Lands
Speakers: Ross MacPherson - Information Officer Galiatin National Forest -- "Rare" - Roadless Areas Review and Evaluation
Bruce Ramsey - Minerals Staff Officer, U. S. Forest Service -- The present extent of oil and gas leases in the overthrust and disturbed belt- Proceedings and problems in leasing U. S. Forest Service lands.
Dr. Leslie B. Davis - Associate Professor, Anthropology at MSU and Assoc. Curator of Anthropology, Museum of the Rockies -- Cultural Resources in Forested Areas
12:15 pm - 1:15 pm Luncheon, Business Meeting and installation of Officers
1:30 pm - 3:30 pm General Discussion of the Theme from the floor - Moderator: O. A. Seager.

New Mexico

The nominating committee which consisted of Ben Donegan and John Shomaker, selected the following as nominees for Section offices in 1978: William R. Speer, President; Robert L. Borton, Vice President; Lee Halterman, Secretary; Don Sargent, Treasurer; and Charles Brown, Editor.

The following is taken from the President's Page of the New Mexico Geological Scientist (Russell E. Clemens, President, 1977):

Having prevailed upon Ben Donegan, Ed Stumon and John Shomaker to write up their comments on several of the more critical issues confronting geologists in New Mexico, I really have little to add. While reading some Newsletters of other state sections, I found some quotes which pretty well convey my thoughts and "I wish I had said that."

"Lack of active members (not number of members) continues to be one of our big problems. The APGS will never reach its full potential of being a viable organization on a national, state or local level without your input of ideas, opinions and efforts."

"It is certainly no revelation to you that we are all affected by politics ... often irresponsible and misdirected politics. Part of the APGS charter is to "maintain positive political involvement at local, state and national levels." We can no longer afford the luxury of silence on political issues, nor do we need to convince each other of the pros and cons of relevant issues. We must make ourselves heard by the general public and our elected (and appointed) representatives."

"After reading the Detailed Fact Sheet on the President's Energy Program, which was released by the White House Press Secretary, I was (1) shocked, (2) baffled, and (3) mad as hell. After cooling off, I wrote all 24 of the Texas Representatives and both Senators ..." "I urge each of you to "get mad" and make yourself heard. Spend 20 or 30 minutes a week and write a letter, send a telegram, or speak to a group. They have changed since the time when we were legislated out of business. As many of my predecessors have done, I again urge each and every member of the New Mexico Section to make themselves heard. Times have changed and there is little if any future for the quiet geologists who just want to do their "thing" and be left alone!"

"We the unwilling, led by the unqualified, have been doing the unbelievable for so long, with so little that we now attempt the impossible with nothing." --Anon

The above quote is a just challenge for us. However, substitute "professional knowledge and freedom of speech" for "nothing."

Pennsylvania

The annual meeting of the Pennsylvania Section was held on November 18, 1977 at the Sheraton Inn in Harrisburg. A well-planned luncheon and very interesting panel discussion on the nation's energy picture was arranged for by Ron Landon, program chairman, and Grover Emrich. The highlight of the meeting centered about the nation's energy dilemma and was addressed by Tom Angerman, of Angerman Associates; Derek Tatlock, of Peoples Natural Gas; Jim White of Consolidation Coal; and Tim Merrill of Industrial Gas Sales, our guest speaker.

On the business side of the ledger, officers and executive committee members elected for the 1977 term received membership endorsement to remain in office for the coming calendar year and continue their pursuance of Legislative support and passage of the Geologist Registration Bill. These officers and committee members are: Richard E. Wright, President; Carlyle W. Westlund, Vice President; Grover H. Emrich, Secretary-Treasurer; and Executive Committee members B. Roger Carter, Ronald A. Landon, and Lane D. Schultz.

Oregon

The Oregon Section has submitted to APGS a brochure of the summary of the Provisions of the Oregon Geologist Licensing Law. Information and application forms are available from: Department of Commerce, Board of Geologist Examiners, 403 Labor
and Industries Building, Salem, Oregon 97310 Telephone 503-278-4294.

The Geologist Licensing Law, effective July 1, 1977 allows for reciprocity with other states providing the registration law of another state is comparable to those of Oregon in the opinion of the Oregon Board.

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West Virginia

1. The Executive Committee has decided to resubmit the Geologist Registration Bill in the 1978 session. New sponsors will be contacted personally so that they understand the bill and would be willing to follow it through various committees. A fiscal note has also been prepared.

2. At the National meeting in San Antonio, Texas (attended by Woodfork and Lessing) it was determined that out-of-state geologists cannot be members in West Virginia without a West Virginia address. This is true when the out-of-state geologist is in a state that has a State Section (e.g. Virginia and West Virginia).

3. APGS will review the proposed USDA mine reclamation classification and meet with USDA to discuss their esoteric nomenclature.

4. An APGS consultants list was prepared by Jack Wilson and Porter Brown. Thanks to them it now exists.

5. Peter Lessing wished to express his sincere appreciation to the State Section for covering part of the expenses to San Antonio.

6. Peter Lessing is thinking of having a May meeting (in Charleston) with AEG. If you have any thoughts for a program, let him know.

7. The APGS sponsored Career Day at Marshall and WVU will be coming up, so when you get a call to help, don't say "no".

8. Larry D. Woodfork has been appointed chairman of the APGS National Legislative and Regulatory Committee for 1978. Others on the committee are Ad Honkala, Allen Agnew, Russ Wayland, and Norman Bowne. If there are any National legislative or regulatory matters in which you are interested or wish to testify on, please let Larry know at (304) 252-6331.


On January 23, 1978 a meeting was held in the U. S. Department of Agriculture, Washington, DC to discuss the proposed USDA strip-mine spoil classification.

The purpose of the meeting was to discuss proposed USDA terms for geologic materials in spoil material. Mr. McCormack of the USDA assured us that USDA will not use new terms for accepted geologic terminology and technical advisory groups will be set up to provide guidance in this and other matters.

At issue were many specific names, such as: Carbolith - coal, bone coal and other carbonaceous material; Intercale - noun for interbedded rocks; Limestone - included dolomite in definition; Minoisol - synonymus with minespoil; Mudrock - for mudstone; Schlick - new name for mudstone.

The pre-mining plans, actual mining, and post-mining reclamation of surface extraction involved many disciplines (e.g. miners, engineers, geologists, inspectors, planners, soil scientists) and it is critical that terminology is understood by all who are involved. Thus, Kalkig Udispoilent, Schlickig Udispoilent, nigric or skaric mineralogy, aquents, arents, psamments, fluvents and orthents do not convey understandable meaning outside of USDA. Furthermore, the spoil bank subject to classification is only based on the top 25 to 100 cm (10-40 inches).

With the passage of PL-95-87 (Federal Surface Mining Control and Reclamation Act of 1977), such proposed USDA terminology only tends to obfuscate the intent of Congress.

While McCormack orally stated that USDA will not adapt the proposed minespoil classification, additional written support of APGS's position can be sent to: Mr. Donald McCormack, Director - Soil Survey Interpretations, Soil Conservation Service, USDA, Washington, DC 20250 Telephone (202) 447-9218.

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MEETINGS AND CONFERENCES

Perspectives on Risk and Financial Decisions in the Mineral Industry

A short course to be held at the Sheraton Hotel in Spokane, Washington, April 6, 7 and 8, 1978 on this subject will cover the theory and calculations involved in making mineral industry financial decisions and is directed toward field level mining company project managers and geologists; federal, state and local officials who must interact with mining company personnel.

Further details can be obtained from the Northwest Mining Association, West 1020 Riverside Avenue, Spokane, WA 99201; Phone 509-624-1158.

Environmental Impact on Mining

Short course, April 3-7, 1978 offered by the University of Nevada, Conferences and Institute, Reno, NV 89557. For more information contact Jan Dunbar at 702-784-4046.

Engineering Geology and Soils Engineering

Annual Symposium held at Boise, Idaho, April 5-7, 1978. For more information, contact R. G. Charboneau, Box 7129, Boise, ID 83707.

AAPG/SEPM Annual Meeting

April 9-12, 1978 in Oklahoma City, Oklahoma. The theme this year is "Generate in '78." For further information, contact AAPG, P. O. Box 979, Tulsa, OK 74101.

Ground-water Recharge Symposium

To be held at the annual meeting of the American Geophysical Union in Miami Beach, Florida, April 17-21, 1978. For more information contact Silmo Neuman Department of Hydrology and Water Resources, University of Arizona, Tucson, AZ 85721, or Fred Molz, Civil Engineering Department, Auburn University, Auburn, Alabama 36830; phone 205 826-4320.

AAPG/SEPM/SEG - Pacific Section

The 53rd Annual Convention of the Pacific Section of the AAPG/SEPM/SEG will be held on April 26-29, 1978 at the Red Lion Inn in Sacramento, California. The theme of the meeting will be "Energy Exploration and Politics." There will be two continuing education sessions on April 26: Structural Geology for Petroleum Geologists (John Crowell) and Review of Geophysics for Explorationists (R. E. Sheriff, Seismol Delta Corp). A field trip will be held April 29 to cretaceous and tertiary sections at Capay Valley and the productive geothermal area west of Clear Lake. For more information contact James Weddle, 2931 Lacy Lane, Sacramento
California, 95821, phone (916) 483-1810.

GSF - Rocky Mountain Section
The annual meeting of the GSA - Rocky Mountain Section will meet in Provo, Utah April 28-29, 1978. For details contact Morris S. Petersen, Geology Department, Brigham Young University, Provo, UT 84602.

GSF - North Central Section
The Geological Society of America North Central Section will hold its annual meeting May 1 & 2, 1978 in Ann Arbor, Michigan. For details contact Donald F. Eschman, Department of Geology & Mineralogy, University of Michigan, Ann Arbor, MI 48109.

1978 Forum on the Geology of Industrial Minerals
The Geology of Industrial Minerals will hold their annual forum in Albany, New York on May 4-6, 1978. Information in regard to the forum may be obtained from William E. Cutcliffe, Dunn Geoscience Corporation, 5 Northway Lane North, Latham, NY 12110.

AAPG - Carbonate Exploration and Exploitation Models and Concepts School
This AAPG sponsored school on carbonates will be offered at Arlington, Texas at the Americana Inn on May 15-19, 1978. The school consists of 45 days of lectures, discussions, exercises and a full day field trip. For further information, brochures and registration form contact Department of Educational Activities, AAPG, P. O. Box 979, Tulsa, OK 74101; phone (918) 584-2555.

Uranium Geology and Exploration Short Course
The session of the short course (the first March 15-17) will be offered by Dr. Richard H. Devoto of the Colorado School of Mines on May 24-26, 1978. The course covers: (a) the geochemistry and geology of uranium; (b) the mechanisms important in the generation of anomalous uranium concentrations; (c) the many geologic environments favorable for the formation of economic and subeconomic uranium deposits; and (d) exploration techniques and programs. For more information and registration forms contact Office of Continuing Education, Colorado School of Mines, Golden, CO 80401; phone (303) 279-0300, ext. 321.

3rd World Congress on Water Resources
To be held in Sao Paulo, Brazil, June 2-7, 1978. For more information contact Tercerio Congresso Mundial de Recursos Hidricos, Caixa Postal 9721, Sao Paulo, Brazil.

AAPG - Clastic Diagenesis School
The school is offered June 5-9, 1978 under sponsorship of the AAPG and will deal with the diagenesis of clastic sediments and the role of diagenesis in reservoir quality and hydrocarbon entrapment. For information and registration brochures contact AAPG, Department of Educational Activities, P. O. Box 979, Tulsa, Oklahoma 74101; phone (918) 584-2555.

11th Congress, International Society of Soil Science
The congress will be held June 19-27, 1978 in Edmonton, Canada. More information is available from the 11th ISSS Congress, Box 78, Sub 11, University of Alberta, Edmonton, Alberta, Canada T6G 2E0.

Computer Mapping Software and Data Base Conference
The conference, offered by Harvard University Laboratory for Computer Graphics and Spatial Analysis will emphasize user applications, software and data base availability, research results on the principals of thematic map design and more effective procedures for computer software and data base distribution.

The conference on July 23-28, 1978 is offered by the Graduate School of Design at Harvard University. For further information contact Peggy Kilburn, Center for Management Research, 850 Boylston Street, Chestnut Hill, MA 02167; phone (617) 738-5021.

Second Circum-Pacific Energy and Mineral Resources Conference
The second circum-Pacific conference will meet July 30-August 4, 1978 at Mid-Pacific Conference Center at the Hilton Hawaiian Village, Honolulu, HI. The general sessions will have both policy addresses and regional papers; workshops on landsat imagery, basin analysis and landslides; and five field trips. Requests for information should be sent to 1978 Circum-Pacific Conference, AAPG, P. O. Box 979, Tulsa, OK 74101.

4th Latin American Geological Congress
The 4th Latin American Geological Congress will be held in the Republic of Trinidad and Tobago, July 7-15, 1979. For further information contact 4th Latin American Geological Congress, P. O. Box 771, Port of Spil, REPUBLIC OF TRINIDAD AND TOBAGO.

RECENT PUBLICATIONS OF INTEREST
Water Resources and the National Welfare - Walter U. Garstka, Water Resources Publications, P. O. Box 303 Fort Collins, CO 80522 (New, 1978). A publications to assist in the preparation of courses to provide a working knowledge of the subject for those who will be responsible for the management of water and related natural resources. The book has 25 sections which include a total of 95 topics - $20.00.

Trends and Opportunities in Seismology - A report of the Committee on Seismology, National Research Council reviews the history, assesses changing trends, accomplishments, and status of seismology in seismological research and applications, and provides recommendations for future directions in light of these changing trends. National Academy of Science, Printing and Publishing Office 2101 Constitution Avenue, Washington DC 20418; paperbound - $6.75.


Water at the Surface of the Earth - David H. Miller, Department of Geological Sciences, University of Wisconsin - Milwaukee. The book explores the dynamics of water in ecosystems especially concerned with on-site hydrologic and hydrometeorological processes, and emphasizes the movement of water in air, vegetation

Nuclear Techniques and Mineral Resources 1977
Comprehensive review and discussion of new concepts in nuclear technology as applied to oil and gas, coal, and other minerals. Includes instrumental analysis of samples, elemental analysis in the field, borehole logging, material handling systems, analysis of slurries, tracers in sorting and handling, mineral exploration, mining and processing. Under the Box 433 Murray Hill Station, New York, NY 10016 - $46.00.

Recognition and Evaluation of Uraniferous Areas
Provides guidelines for analyzing the abundant data generated by uranium exploration, and for finding reliable indicators that point the way to regions where exploration programs would have the best chance of succeeding. Under the Box 433 Murray Hill Station, New York, NY 10016 - $21.00.

PROFESSIONAL PARAGRAPHS

William L. Rader, CPGS, Vice President of Petroleum Exploration and Production of Farmland Industries, Inc. has been elected Chairman of the Board of Directors of Terra Resources, Inc., Farmland's oil and gas exploration subsidiary.

Thomas A. Simpson, CPGS Associate Professor in the Department of Civil and Mineral Engineering at the University of Alabama, Tuscaloosa, has been asked to serve as acting Head of the newly formed Department of Mineral Engineering.

Norman K. Barker CPGS, has been named Regional Exploration Manager for the Midland office of Harper Oil Company, a wholly-owned subsidiary of People Gas Company of Chicago. The new southwest regional office is located at 2004 Wilco Building in Midland.

Richard E. Gray CPGS, Vice President of GAI Consultants, Inc. Monroeville, Pennsylvania, has been elected President of the Pittsburgh Section of the American Society of Civil Engineers (ASCE). He will serve as President during ASCE's National convention scheduled for Pittsburgh in April, 1978.

IN MEMORIAM

Ian Campbell, 1899-1978

Ian Campbell, one of the most widely known geologists in our profession, died in San Francisco on Saturday, February 11, 1978 at the age of 78. A scholar, in his honor, has been initiated by the American Geological Institute.

Ian Campbell has had a severe bout with cancer in 1965 but had overcome and he and his wife, Catherine, had enjoyed 12 years of remission. Last fall he suffered a recurrence but, fortunately, was able to stay at home in their beautiful view apartment atop Nob Hill until hospitalization during his last week.

Ian was born in Bismarck, North Dakota, graduated from the University of Oregon in 1922, and received his Ph.D. in geology from Harvard University in 1931. As a boy of 17, he volunteered for duty in World War I and was sent to France as an ambulance driver. In World War II, he was on the Selective Service Board and was also with the University of California's Division of War Research at the Navy Radio

and Sound Laboratory at San Diego.

During his graduate years he spent a season with the Wisconsin State Geological Survey, worked briefly for Vacuum Oil Company (now Mobil), studied at Northwestern University, taught at Louisiana State, and was a teaching fellow in Mineralogy at Harvard while working on his doctor's degree.

Ian Campbell was a man of many talents, an expert in many fields, a friend and mentor to many. He was a generous and dedicated teacher, and a tireless worker in the field of geology.

During his Cal-Tech years, besides teaching and counseling, Ian carried out assignments for the U.S. Geological Survey and the Carnegie Institution of Washington, and, in later years, served as Executive Officer of the department of geological sciences. His services were constantly in demand as a consultant in economic geology and environmental geology, before the latter term was in general use. Through this period he associated himself with numerous professional and scientific societies. He carried on a voluminous correspondence until his final days, when, seriously ill, he expressed regret that it was not possible to personally acknowledge all the cards and letters from his many well-wishers.

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And Sound Laboratory at San Diego.

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I first met Ian in 1931 when he gave his first public lecture at the California Institute of Technology (Cal-Tech) on his work in the Grand Canyon. He had just been appointed Assistant Professor in petrology. In 1937, he led an expedition sponsored by the Carnegie Institution and Cal-Tech, down the Colorado River through the Grand Canyon. He stayed at Cal-Tech for the next highly-productive 28 years. He was a superior teacher of petrology, mineralogy, field geology, and economic geology -- with emphasis on the industrial minerals -- who became known and loved by literally thousands of students who appreciated the personal attention and interest of their professor. Ian never failed to help a student or colleague, or refused to serve on a committee!

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An outstanding teacher, a competent geologist in every field in which he chose to work, and a good writer and talented speaker, Dr. Campbell found that research, publication, and administration had to take lower priorities. His professional associations, including deep involvement in most of our geological societies public service at the local, state and national level, and personal contact and correspondence with hundreds of geologists occupied his prime time. He was one of our leading geo-politicians, in the best meaning of this term. The citation with the Harding medal from the American Institute of Mining, Metallurgical and Petroleum Engineers in 1963 expressed it well: "eminent scientist, author, educator, and administrator, and for his personal warmth, outstanding leadership, and devoted service to the profession." Again, in 1970, the Ben H. Parker award of the American Institute of Professional Geologists (Campbell was CPGS No. 19), and the Public Service Award of the American Association of Petroleum Geologists were highly-prized and well-deserved.

In 1959, Ian Campbell was appointed Chief of the California Division of Mines, and State Mineralogist (State Geologist). During that decade, he reaped the awards and honors due a lifetime of service to the profession. Among national offices, he was president of the Geological Society of America, the Mineralogical Society of America, the Association of American State Geologists, and the American Geological Institute. In California, he was made an Honorary Member of the Pacific Section of the Association of Petroleum Geologists, he was a prime mover in legislation for registration and became chairman of the Board of Registration for Geologists and Geophysicists, was the secretary of the State's Geothermal Resources Board, and was chair-
man of the State's Advisory Committee on Geographic Names.

For the Division of Mines and Geology he was a leader in establishing its geochemical and geophysical sections, he guided us into the first "urban" (engineering) geology and "environmental" programs, and he greatly enhanced our national image as a state geological survey.

Dr. Campbell leaves his wife, Dr. Catherine C. Campbell, of San Francisco; son, Dugald of Whittier; sister, Mrs. Flora Houck of Palo Alto; and two grandchildren.

The profession of geology, and geologists, are the better for the life of Ian Campbell, and we shall all miss him.

Gordon B. Oaksheott
March, 1978

(The Executive Committee of the Association has approved the following statement of official APGS policy)

APGS POSITION ON DIVESTITURE

The Association of Professional Geological Scientists recognizes divestiture as a political, economic and accounting issue which will affect professional geologists and the public. The APGS opposes divestiture because it will cause widespread operational inefficiencies that may ultimately be detrimental to the profession of geology and to the public welfare in general.

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FREDERICK L. STEAD .................................................................. 6440 North Central Expressway, Ste. 819 Dallas, TX 75206