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the way, industry could solve all the problems that face us, including the enormous millions of tons of coal annually in produ-
ction 43 percent of our electricity from coal. It takes about 1.5 tons of air to burn a ton of coal.

Recently I have been told by a number of my colleagues that, in the past, we have not given enough coverage to the environmental implications of our work.

I represent, as the Secretary's Special Assistant, the Interior in seven Missouri river basin states—Colorado, Wyoming, Utah, Montana, North Dakota, South Dakota, and Nebraska.

The "Sagebrush Rebellion" that started in Nevada has spread to some of those states. Although the stated purpose of the rebellion is to restrict federal government owner-
ship of millions of acres of public lands, the real reason behind the rebellion is frustration with federal regulations and a lack of local control over land use and management.

I am also aware of the feeling in some quarters that the government, and especially the federal government, can and should solve all problems.

Neither extreme, of course, is correct, and the real world is somewhere between the two.

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• Minimize our ability to forecast production and demand.
• Research to develop solutions for the major environmental problems associated with mining and processing metals, nonmetallic minerals, coal and crude oil.
• Research into development and the benefits of low grade or complex ores.
• Work on sophisticated methods of locating mineral deposits.

The need for information between dependency and vulnerability is a problem which must be resolved by the Federal government. The decision must involve both Department of Energy and Department of Commerce. A basic part of that decision making process, however, must be analysis of mineral supply and demand projections.

The Bureau of Mines in the Department of the Interior has just recognized itself around the concept of becoming the Federal government's national agency for mineral problem and mineral policy analysis. The Bureau is developing the ability to analyze mineral trends and policy alternatives that are suggested for implementation.

As the first step, the Bureau's Minerals Availability System, or MAS, is being developed. MAS will contain information on the world's minerals, deposit by deposit. This will permit it to assess the world-wide availability of nonfuel minerals. The Bureau recently published "Copper Availability—Domestic," which uses MAS data on 75 key domestic copper deposits of either reserves or resources. The Bureau then develops a detailed estimate of the costs of mining and milling the ore from each deposit, including capital expenditures and operating costs for every step from exploration through concentration. The result is a tonnage-price relationship that shows how much domestic copper is available over a range of prices, at rates of return varying from break-even to 15 per cent.

A study such as this will be a building block for the Bureau's Analysis group, which will use the MAS copper study—and future studies—to construct scenarios for possible future developments. These projections and analyses will permit quantitative definitions of "dependency" and "vulnerability." MAS, however, is only one part of the mineral information systems being developed by the Bureau of Mines. The basic program is the Automated Minerals Information System (AMIS). This is an integrated data base system which will include information on the distribution of the trace or fugitive elements. My third point under this subject is the role of trace or fugitive elements, which are major contributors to the distribution of the trace or fugitive elements, and which may have important direct or indirect effects on the economy.

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The Bureau of Mines has helped to discover and to assess numerous domestic chromium deposits. The Bureau produces acceptable ferrochromium, chromite refractories, chromium metal, and chromium chemicals. Consequently, presently submersal deposits could become sources of metallic materials in some future time. Current Bureau research includes recovering chromium, nickel, cobalt, and other valuable metals from laterite deposits and also from flue dusts, plating wastes, and other residues.

So far we have been dealing with known deposits, whether they be reserves that can be mined and processed profitably at today’s level of technology, at today’s level of costs and prices, or whether they are resources—those deposits presently uneconomic but which may become economic to develop at some future time. But we also know that mineral resources are nonrenewable and are finite, and at some point in history deposits of various minerals will near exhaustion. This is the reason we are so interested in these resources at an increasing rate, as I have pointed out. The world population has grown from 2.5 billion in 1950 to 4.2 billion today, an increase of 70 percent; but world energy production in that period has increased more than fivefold on a tonnage basis and the value of that period has increased more than fivefold on a tonnage basis and the value of minerals the United States itself is in a favorable position.

However, we must keep in mind the dynamic nature of estimates of demand, reserves and resources. Unforeseen uses may eliminate demand, new discoveries may engulf reserves and resources, and restrictive actions may move presently proved reserves back into the subeconomic resource category.

We must also keep in mind another important point—the policies of governments are important ingredients in the natural resources of the world. There are no substitutes available, and the only responsible action one can take toward them is to continue the pursuit of knowledge so that will bring each successive one closer to the truth. It is to this end that the efforts of the U.S. Geological Survey have been dedicated. It is to the chemical disciplines of detection, description, and interpretation of these halos form the basis for hydrogeochemical prospecting.

The Survey is using isotope geology to determine the limits of potential host rocks. Under such conditions, the Survey is producing a geologic assessment of the potential for as yet undiscovered mineral deposits. In addition, comprehensive geologic, mineralogic, and geochemical studies are being conducted in an effort to degree quadrangle areas across the country and in the United States Mineral Appraisal Program, a combination of geological, geochemical, and geophysical studies. These studies are designed to provide better estimates of the potential for the Survey to discover new mineral resources in potentially mineralized areas and to evaluate existing mineral deposits and characteristics of ore bodies. In evaluating the geological and physical environment, the Survey is conducting varied field and laboratory investigations.

These include the study of mining districts, deposits, ore bodies, and experimental work on the physical and chemical properties of minerals and associated rocks. Many such studies are currently focusing on Wilderness and National Park areas; in Idaho, a chemical and geophysical study of certain elements in hydrogeochemical prospecting involves the analysis of the surface, certain elements will increase in concentration to form a geochemical anomaly. Detection and interpretation of these halos form the basis for hydrogeochemical prospecting.

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Engineers and Media—Why? How?

by Charles M. Kittrell

Whether your career decision has been slide-rule engineering or administration, management, chances are that sometime during your career you'll be communicating with the public. You'll communicate with other engineers, other professionals, such as lawyers and scientists, and with your own management. Then the general public, some who like what you're doing, others who would just as soon throw tomatoes at you, stockholders, and with government.

How you will communicate with government?

Some of this communication is bound to wind up in the newspapers and on TV. Your success in dealing with the press may well determine the success of your industry, your company and your career.

The second reason you'll have to deal with the press is that, regardless of your business you're going to be accountable to the public.

Business, especially the energy business, is being called on to account for its actions. The people leading this call for accountability are reporters and editors.

The days are gone when business thought it could avoid public dialogue by looking it in the eye and then saying, "Work is the enemy." Any businessman who thinks he can do that these days had better update his resume.

Business has a right to know what business is doing. How does business behavior affect laws, and affect the future?

Far beyond any legal requirements for disclosure, business has a moral obligation to respond to the legitimate concerns of the public.

In the oil business do not do very well in responding to the concerns of the public when they first became concerned. The result is hostility and criticism.

"Fortune" magazine published an article dealing with this very subject. The article was titled "Why The Oil Companies Are Coming Up Dry In Their Public Relations." The conclusion of the article was that the petroleum industry has failed in this obligation to inform the public...and that because of our stubborn silence, we've done serious harm to ourselves and to the national interest.

My industry has been stubborn and silent but we haven't been silent recently. We can't afford to be. Here's an example of what we're doing.

Top management at Phillips, vice presidents and above, have aggressively sought out the public and the press in public appearances and in interviews. We're not doing it to put ourselves on the back. We want the public to know what we're doing and why we're doing it.

Oil companies haven't always been this open. Ten years ago, Phillips top management gave a total of 17 speeches for the entire year. In 1978 that figure was 64 and in 1979, it was 112.

That means that on an average of every third day last year that either the chairman of our board, our president or one of the vice presidents gave a public speech and answered open-ended press interviews in more than 16 states and three foreign countries.

This year there will be more executives on the road...more speeches to you...more interviews to more reporters. It boils down to this.

The oil industry has a whole decade of mistakes to live down.

If we don't tell our story it's going to be told anyway by somebody else. And that's a lot harder to handle.

One of the industry's first mistakes was the handing of the Arab oil embargo in 1973. We were unprepared for the crisis in public information that developed as the gas lines grew longer and suspicous grew deeper.

Up to that time, the industry's main concern seemed to be pumping gas. Remember the four-corner gas wars ten years ago? We were hustling free glassware, soda pop and double Green Stamps to get you to fill 'er up. We told you about replacement cost and deferred taxes and two-tier pricing and how all this affected your pockets.

We passed the crying towel...from one end of America to the other and wailed "And it awful!"

The past seven years have been a learning process for the oil companies. We've made our share of mistakes and we've learned some valuable lessons.

One of the most important has been how to work with the press. We've learned that we've got to be open, even when it means taking some lumps, and we've learned that we've got to be prepared. There's a new breed of energy reporter today. They know more about the business than energy reporters knew seven years ago.

Energy reporting is more accurate today, more expensive to wind up and more understandable. And even on such controversial subjects as the control of domestic oil prices, newspapers such as the New York Times and other major papers...by and large, with the industry viewpoint.

The public has benefited from this new dialogue. The public is beginning to understand the energy business and the energy problem.

For example, the public is beginning to understand that the energy problem is not a shorts problem. Short supplies cause high prices. But there's a lot more that needs to be done in our relationship with the press. Part of our challenge in the minerals and energy industries is to make the most of that relationship.

The first challenge will be gaining an appreciation for news—what it is and answer questions that a month earlier nobody would have given two hoots about. I believe that what resulted back then was a severe case of motor mouth. Winds us up and we'd tell you everything we knew about the oil business. We went on all day about the government's pricing and allocation system and its effect at the gas pump.

Well, 1973 put us in a whole new ball game. We wound up playing to a capacity crowd of hostile fans. We were called on to answer questions that a month earlier nobody would have given two hoots about. I believe that what resulted back then was a severe case of motor mouth. Winds us up and we'd tell you everything we knew about the oil business. We went on all day about the government's pricing and allocation system and its effect at the gas pump.

Well, 1973 put us in a whole new ball game. We wound up playing to a capacity crowd of hostile fans. We were called on to answer questions that a month earlier nobody would have given two hoots about. I believe that what resulted back then was a severe case of motor mouth. Winds us up and we'd tell you everything we knew about the oil business. We went on all day about the government's pricing and allocation system and its effect at the gas pump.
When it does, it's usually because a reporter committed one of what I call the four mistakes journalists make: Our journalism is in dealing with the press is to help reporters and editors avoid these pitfalls.

The first pitfall is the inability to consider the complete picture. 

More and more, reporters and editors are people with journalism degrees, and people with journalism degrees tend to be generalists. To a degree they have to be. There's nothing wrong with being a generalist until the reporter has to deal with a complex issue. That's when he or she starts to generalize.

Most reporters are generalists because they were trained that way, and large, and they have a liberal arts background. Most have never had the opportunity to specialize.

Being a generalist is adequate for describing the human condition, but it is usually inadequate for describing a complex issue like energy and resources management in which five or six academic disciplines are involved.

For instance, the wellhead production excise tax on domestic oil, repeatedly and inaccurately called the "windfall profit tax," is not being covered by energy reporters. It is being covered by political reporters because the tax is a political action and is happening in the political arena.

But the impact of the tax is on energy development and energy reporters ought to be able to tell about that. They aren't. They don't usually, and justifiably, say, "Story isn't happening on their beats."

Well, it surely is! But, political reporters usually have the straight story of the mistaken belief around most reporters. That what a good reporter is a good reporter.

It isn't necessarily so. And this usually happens when the second pitfall of journalism—false time makes things going right.

How was it reported? Someone at the Washington Star whipped out a pocket calculator and came up with this headline:

"'79 PROFITS ROSE EIGHT THOUSAND PERCENT FOR OCCIDENTAL PETROLEUM"

Eight-thousand percent? That headline was over a three-paragraph story. You'd think that a story like that would rate more than three paragraphs. What this story lacked in specifics it made up for in bias and implication.

The implication was that Oxy's profits and all oil company profits are huge gains that must be compared to the previous year, or the previous quarter.

Not much is said about the reinvestment of company profits or the search for more energy. And you don't hear much about the profits of other industries. And, besides, the public, so he tells himself, "Hey, if I don't someone else may get the story. If they can, better stay on top of that story. If they can't, we have all seen how oil company profits are reported.

EXxon UP 55 PERCENT" "CITIES SERVICE UP 72 PERCENT"

It's nothing but a numbers game, and by playing this numbers game, the press is doing a genuine disservice to the public. And it is dissecting itself.

The emergence of another oil company last spring is an example of what I'm talking about. In 1977, Occidental Petroleum reported net earnings of 153 million dollars, and average return of 31 percent for that company. But the next year, 1978, Oxy had to halt construction of a refinery in Great Britain. It had to take a 122 million dollar write-off on another refinery in Belgium. It was plagued by three months of strikes in the United States. And the Libyan government seized some of Oxy's assets. So Oxy's profits were down in 1976. Way down. Down to less than five percent of the previous year, or the previous quarter. Five percent.

But 1979 was different. Oxy bounced back. Net earnings were 561 million dollars. That should have been good news.

That kind of recovery means new capital investment—jobs and opportunity. Renewed profits mean the system is working, that something is going right.

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get people's attention and rouse
their own sense of importance.

This all sounds critical of the
Fourth Estate, but these pitfalls of
journalism are the exception today, not
the norm.

And on this score, newspapers are
way ahead of television. Possibly this is
because newspaper reporters have more time to develop a story. Certainly most
newspaper reporting on energy
today is better.

But good reporters have picked up
the energy story. Reporters like Anthony
Parisio of The New York Times, Linda
Grant of the Los Angeles Times, Stan
Benjamin of Associated Press are excellent
eamples.

There are two promising energy
reporters in Denver: Bill Ritz of the
Denver Post and Mike Rounds, who has
joined the Rocky Mountain News.

The same can't be said for much
of the energy reporting on television.

Maybe that's because television is the
medium for the energy reporting on television. When you're discussing your projects,
you're going to solve the public's
problems.

I have found that the public
doesn't care about the magnitude of oil
compny profits as much as how those
profits are being spent. If you're in
the position of having to answer ques-
tions about why your projects exist
then you'd better talk about how
those projects serve the public; not just
the company.

I can't over-emphasize openness—
the obligation of business to respond to
the legitimate concerns of the public.

When you're discussing your projects,
and your company, and your profits
with the press, don't overlook the
whole time criticizing those who make
your job more difficult. I realize it's tempting to take a few shots at Washington—I've
done it myself. There's more to be said,
however, other points to make.

There's a lot of good news about
energy, and that's what people want to
hear. They want to hear about how
we're going to solve the problem.

Charles M. Kittell is a Vice-President, Phelps
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The mines magazine • october 1980
ARAMCO, where he was senior superin­
tendent, to attend graduate school in the
Chemical Engineering Department.
Robert C. Munson, MSc.Geop.E.,
associate director of the Office of Field
Operation of the National Ocean Survey,
was recently named president of The Hydro-
graphic Society in London. Jay Manning,
P.E., is president of Manor Ridge
Engineering, Inc. Kenneth N. Wallace, E.M.,
is currently business development
manager for Brown & Root.

'68 Gary Williams, E.M., with his wife
and family, visited the alumni office recently while
in Galen. He has recently returned to his
position with Tractem Banks Co. Ltd. in
Baltimore.

'70 Terry J. Lawerty, E.M., in new opera-
tions staff engineer for Exxon Minerals Co.,
USA, in Spring, Texas. Anton W. Bosch,
E.M., USA, in Spring, Texas, with his wife and
'69 Gary Williams, E.M., is currently working for
Engineering, Inc., ARAMCO. Where he was senior superin­
tendent of Exxon Minerals Co. He was
with that company since 1976.

'71 Kenneth B. Cumings, BSc.Min., is current­ly M.S.-M.A. at Denver Technical Sup­
port Center. John S. Earlsch, BSc.CIP, has
left The Peco Co. Consultants & Engineers. He
is currently senior partner of Mike Timan
Consulting Group. Terry C. Hult, BSc.Pet., has
joined Worldwide Energy Corporation in
Lakeview, Colorado. William R. Holman,
BSc.Min., formerly assistant superin­
tendent for Lady Jane Collie Mines, is now assistant
superintendent for Worldwide Minerals in
Vermon. Bruce D. Davis. BSc.Pet., is a
service sales engineer for Haliburton
Services Sales. Danny P. Sproess, BSc.Geol.
and MSc.Min Econ., '77, is employed by Exxon Minerals Co., USA, as
senior planning analyst.

'74 Kenneth F. Pucha, BSc.Pet. and
BSc.Chem., is currently senior process
engineer for Intel Corp. Donald L. Presnell, BSc.Pet., has joined Mar­
tel Oil Co. as district drilling engineer.

MINING ENGINEER

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Applicant should have knowledge of the environmental aspects of the mining,
namining, and refining industries. A strong background in pyrometallurgy,
hydrometallurgy and electrometallurgy processing techniques is desirable.
Full range of Federal employment benefits. Salary range is $30,000 to
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Van Donohoe, retired executive vice
president of Tassajara, once worked with
Republican candidate Ronald Reagan.

Recently Norma told a story about those
times 40 years ago, and she has
never given me permission to repeat it (I think).

She used to come to the station to watch us broadcast, but perhaps not

Donohoo "Remembering "Dutch"

It never occurred to me in 1952 that the handsome, debonair, radio sports
announcer I worked with at WHO, Des Moines, Iowa, might one day be the Pre­
ident of the United States. To me, he was just "Dutch" Reagan. This was before he became Ronald Reagan, actor, Governor Reagan, or Ronald
Reagan, Republican candidate for President of the United States.

This was the Depression, and I was a student at Drake University in
Des Moines, where I literally sang for my tuition. I was tenor in the Drake
Quartet and we often made radio appearances on WHO at the time the
most powerful station (50,000 watts) west of Cin­
cinnati.

The quartet, which usually included some sopranos soloists, travelled
throughout the Midwest from Chicago to Omaha, "advertising" Drake. Stu­dents
were hard to get in those times since tuition was almost $50 per
semester. Drake is a church school, affiliated with Texas Christian University
in Fort Worth. Drake is located in
southern Illinois and others.

Eureka College is where Dutch Reagan starred in football. I believe he
was a band. Frankly, I had never
broadcasts of the Drake Relays, the
famously famous track meet which
rivaled the Penn State Relays in those
days. But I was most intrigued by the
announced broadcasts of out-of-toun
baseball games.

When I got to know him a little
better, And so did Norma. Norma
Steigmann, the future Mrs. Donohoo,
was also a student at Drake.

Ronald "Dutch" Reagan as he appeared in
1952 when he worked as a radio announcer
for WHO radio.

The Pine Rider Four was the singing star group of radio WHO's sustaining programs. Donohoo, the
tenor, is on the right.

heard of Eureka College or Dutch
Reagan's broadcasts of out-of-town
baseball games.

Dutch was probably most famous for his
broadcasts of the Drake Relays, the
naturally famous track meet which
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1421 Maine St Denver, Colo. 80202 303-621-0507

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H. Van W. Donohoo retired last year as executive vice president of Texasgulf. His distinguished career spanned some 23 years. But this piece, written by Donohoo as a reminiscence, concerns his friendship with a presidential candidate whom he knew as an Iowa radio announcer in 1932.

Bob Slayton, EM '34 and MED '75, became a folk hero of the aides after relating the story of his discovery of the Mt. Taylor uranium deposit now being mined by Gulf near Grants, N.M.

And what was Dutch like during the 16 months that I knew him and called him a friend? He was a helluva nice fellow, that's what he was like. He was friendly with everyone (even through Norma and I were younger than he). He had personality. He was honest, a real "straight from the shoulder" man as well as an excellent sports announcer. This was the impression of him that I've always carried with me through the years. He left Des Moines for Hollywood in 1936.

Minutes later (1955) when I was prospecting in Nevada, I saw Dutch on the stage at Las Vegas. At the close of the show, I rushed backstage to say hello. But I was not as fast as Dutch. He was gone. Later I wrote him a note of congratulations when he became governor of California, and for several years I received Christmas cards from Governor and Nancy Reagan.

Our most recent encounter was at Stanford's Italian Center earlier this year when Reagan spoke at a luncheon. At that time, Dr. Charles Fogarty, E.M. '42 and Ed.D. '52, chairman of the Board for Texasgulf Inc., made it a point for us to meet. He seemed pretty much like the old Dutch to me. I think it was a little too much to ask him to remember the association of the "good old days" in the early Thirties.

But I was proud to work alongside him from 1932 to 1934, and it was a thrill to shake his hand as a presidential candidate in 1980.

Western energy issues cannot be resolved without considering the scale, capital costs and site-specific nature of energy development.

That key observation was made by 40 Congressional and executive aides from Washington, D.C. after five-and-one-half days of participation in Colorado School of Mines' third Energy Field Institute. The institute, which stresses the same types of hands-on exposure to issues that SSI boasts for its mineral engineering students, took the participants more than 1,500 miles by bus and chartered plane to surface and underground coal and uranium mines, a uranium mill, oil and gas fields and oil shale facilities.

David Tundermann, director of policy planning for the Environmental Protection Agency, said of the program, "Lectures and briefings simply cannot replace direct observation of the size and complexity of the energy projects.
we visited, and the fragility of the natural and social systems these projects strain."

Added Mark Berkman, associate analyst with the Congressional Budget Office: "There is no substitute for on-site exposure in grasping the magnitude of Western energy development."

A three-state area was covered during the August 11-16 institute, when participants had the opportunity to see the energy sites, as well as discuss them with operating personnel and local people affected by the energy development. The intensive itinerary included the following sites:


—Thursday, Aug. 14. Piceance Basin, Colorado. Occidental Oil Shale’s C-b tract, with plans for modified in situ recovery of the shale oil; Rio Blanco’s plans for either MS or open pit mining of oil shale on the C-a tract; Colony (Tosco and Exxon) room-and-pillar mine and expansion plans on Parachute Creek.

Friday, Aug. 15. Grants, New Mexico. Kerr-McGee uranium mill; Gulf’s Mt. Taylor underground uranium mine; Anaconda’s Jackpile open pit uranium mine. Dinner with local people, including discussion of energy development on Indian lands.

The participants, who advise Congress directly or indirectly about energy issues and legislation, appeared most impressed at week’s end with the scale of individual energy projects—both on-line and planned—as well as high capital costs and the need for both legislation and regulations to consider the site-specific nature of, for example, mining and reclamation processes.

Many of the aides had not been previously exposed to Western energy development. Noted Jennifer Robison, project director with the Office of Technology Assessment: "Having previously visited and studied energy development sites and issues in the eastern United States, understanding the different problems faced—and posed—by development in the West was an invaluable experience for me."

The East-West differences were also addressed by William "Larry" Miller, chief of the U.S. Bureau of Mines’ Research Directorate Staff, who said in his assessment, "The special interests of West versus East are compelling, yet for the nation’s economic and strategic well-being, somehow they must be put aside."

The Energy Field Institute is directed by Dr. Janice C. Hepworth and is part of the CSM Mineral Economics department.

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Dr. Joseph Shaw, Atlantic Richfield Professor, CSM and Mr. E. Paul Mortimer, Senior Vice President, Exxon Minerals Company.

Program: An Exploration in Historical Analogy, and The Western Intellectual Tradition. He added the faculty in reviewing the cultural and intellectual heritage of the west. The participants are afollowed works as Kissinger: The European Mind in American policy; The Revolutionary Ascetic; James and John Stuart Mill: Father and Son in the Nineteenth Century; In Search of Nixon; The Roots of History; The Railroads and the Space Race; Analogy, and The Western intellectual heritage to-day's engineer, forced into different kinds of interactive relationships with many hitherto unknown publics, the program has attracted a large number of highly motivated students.

A tutorial committee screens applicants for the program and recommends qualified people for the experience. It was this committee, together with certain invited guests, who participated in the recent seminar. Professors from the faculties of Engineering, Sciences, and Humanities and Social Sciences met for study and review of readings from the great philosophers and authors of world literature, for a period of two days. Leading this phase of the seminar was Dr. Bruce Mazlish, MIT historian and scholar. Dr. Mazlish's reputation rests on his study of the history of all of these studies is essential for today's engineer, forced into different kinds of interactive relationships with many hitherto unknown publics, the program has attracted a large number of highly motivated students.

The individuals who staff expertise in general reservoir engineering studies of underground storage fields owned and operated by the company. This will include doing material balance, water influx calculations, and basic geological interpretation of storage injection. Will develop and direct well testing, and monitoring programs for detection and control of gas movement; and make recommendations for well drilling and workover programs. The successful candidate should have a BS or MS in Petroleum Engineering or equivalent. Knowledge of reservoir engineering and well drilling is essential. One to two years related experience desirable.

The Southern California Gas Company, the largest distributor of natural gas in the nation, has excellent career opportunities for individuals interested in reservoir engineering and drilling. RESEVOIR ENGINEER

The goal of this program is to explore the challenges of the future and its impact on society. This program is designed to be a unique experience in study and research, and to provide participants with opportunities to work with many hitherto unknown publics, the program has attracted a large number of highly motivated students.

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The Roundtable grappled with questions such as: Liberal education and professional preparation: how much and to what purpose? What challenges lie ahead for future engineering graduates and what qualities of head and heart will assist in leadership and management roles? How best to prepare the talented future graduates to acquire the ideal attributes within the constraints of time and curriculum. How best to integrate the study of humanities and social sciences with the study of science and engineering to aid personal and professional development without impairing the integrity of the disciplines. Following a day long discussion, Roundtable guests commended the CSM Honors Program as an opportunity to exploit the "renaissance in mining." The industry and academic participants agreed that humanistic learning is vitally important to the careers of future business leaders.

Among the CSM participants at the seminar were: Dr. W. R. Bull, Dr. Richard S. Culver, Prof. Donald I. Dickinson, Dr. Dale Foreman, Dr. John Hacking, Dr. Graham Hereford, Dr. Michael S. Nykios, Dr. Thomas Philipose, Dr. Oded Rudowsky, Dr. E. Denny Sloan, Dr. Joseph Shear, Dr. A. Keith Turner, Dr. Roger Wescott, Dr. Thomas Wilkenson, and Dr. Karen B. Wiley.

A BEAUTIFUL campus, and still no place to park. The campus grounds have never looked so good, nor has parking ever been so tight.

A COFFEE BREAK AT FOSS', maybe with a Danish and a place to bone up on their. (Below) BUYING BOOKS. LOTS OF BOOKS at Jeffco Blue Prints. (Below) FRISBEE THROWING on the rugby field, on a warm, fall afternoon.

STUDYING IN THE SHADE of Berthoud Hall. These students won't be able to do that this winter, when ice and snow cover the benches.

CHECKING IN WITH PEGGY in the cafeteria line. After a while, she knows your number by heart.

PAINTING THE "M"... and each other. Seniors Pablo Nathwani and Tim Lambert were the targets of whole buckets of whitewash. (Photo by John Hopkins)

CATCHING UP with all the latest news in the Oredigger.

STALKING THE STACKS for that elusive homework material.

CLIMBING MINES PEAK and drinking Crafts at the top. This handy crew made it up to the top. (Photo by Steve Gallington)

Buy this magazine: the mines magazine • october 1980

And SO Much More. . .

by Brodie Farquhar
**Book Review**

In the 1980s, hydrogen may replace the word “solar” as the energy buzzword. Hydrogen energy eclipsing solar energy as the glimmering answer and alternative to OPEC and nuclear energy. Yet like many other forms of alternative energy sources, hydrogen technology is still in its infancy. A concise view and analysis of this promising youngster was recently published by Colorado School of Mines & Energy Resources entitled “Hydrogen Technology” by Ted Huston and Thomas R. Wildeman.

Huston, a former CSM chemistry student, and Dr. Wildeman of the CSM chemistry/geochemistry department examine the prospects of a hydrogen economy, where homes, industries and mass transit systems would run on this plentiful, clean-burning fuel. Yet it will not be a simple matter of waving a magic wand over the ocean to produce cheap, inexhaustible energy. Currently, most of the world hydrogen production is a spin-off of petroleum refining and natural gas. As these hydrocarbons become harder to find and use, the answer will build to find an inexpensive production source of hydrogen.

Right now, that production method does not exist. Virtually all methods of “cracking” hydrogen out of water, such as electrolysis, call for more energy than you can get out of the resulting hydrogen. According to Huston and Wildeman, this makes hydrogen a secondary energy carrier, ideal for nuclear reactors or in the ocean or massive banks of solar collectors. The reactors or solar banks would provide the energy used to crack the water molecule, and the hydrogen would be piped off to users many miles away, further than electricity could be economically distributed.

Huston and Wildeman explore the advantages and disadvantages of a hydrogen technology and economy. Their conclusions are surprising and encouraging. All in all, Huston and Wildeman have provided the public with a good primer on one of our most promising energy alternatives.


**Philipp Brothers Professorship in Mineral Economics**

The Colorado School of Mines and Engelhard Minerals & Chemicals Corporation have announced the establishment of the Philipp Brothers Professorship in Mineral Economics, funded by the company’s grant of $50,000 annually for five years. Philipp Brothers, a major division of Engelhard, is an international marketer of ferrous and nonferrous minerals and metals, ferroalloys, crude oil and oil products, fertilizers, pesticides, pharmaceuticals, sugar, grains and other raw materials.

CISM President Guy T. McBride, Jr., in announcing the professorship, said, “The contribution of Philipp Brothers will permit current and future mineral engineers, with technical skills second to none, to acquire economics attitudes and managerial talents that will enhance their abilities to work effectively and succeed in an international free market system.”

The search is underway, he said, to attract a mineral economist of international standing and prestige to fill the professorship. The Mineral Economics Department at CSM, a graduate degree program, is one of only a handful in the U.S. and is the largest in the nation. Organized in 1969, the department’s goals are the training of mineral economists to do the analysis and feasibility studies necessary for mineral project evaluation, financing, and managerial talents that will enhance their abilities to work effectively and succeed in an international free market system.

The mine’s magazine • October 1980
Of the two, people are the more important. There are almost 6,000 men and women whose efforts and abilities have made the company what it is today. The future growth of Texasgulf can continue only with the participation and continued support of these men and women.

Texasgulf, a diversified natural resources company, finds, develops and produces chemicals, metals, oil and gas. The outlook for Texasgulf is better than at any time in the company's history. World consumption for our major products increases and tonnages required are greater each year.

There is also a favorable strategic position with reserves located principally in North America and modern, efficient facilities.

If you would like more information, write us for the latest annual report. Texasgulf, High Ridge Park, Stamford, CT 06904.
Lime mud. And the economics of making paper.

Abrasive lime mud solution is critical to the efficient production of paper. Improperly diluted, it costs the producer valuable time and money to dry and reprocess. That's a pumping problem paper mills, and a lot of other industries, could do without. One that's easily solved with a Wilfley pump.

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It's simple. Wilfley builds better pumps.

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Pumping lime mud without dilution saves money. Wilfley makes it work.