

SEVENTY SIX

May/June 1982





Long-Term Investments Promise Continued Growth

by Fred Hartley,
Chairman and President of
Union Oil Company

I'm pleased to tell you that your company is probably the healthiest 92-year-old you have met in a long time.

I'm confident you have all received—and carefully read—our 1981 Annual Report. As we reported there, 1981 was an excellent year for Union Oil, with record profits and a record return—20.8 percent—on share-owners' equity.

But 1981 is now behind us and it's time to look to the future. Today we plan to focus on several major new capital projects that will help shape Union Oil's future. We will also tell you about our expanding efforts to capitalize on our long-term strength in science and technology—strength that will help us continue our growth in the decades ahead.

First, however, I'd like to make a few general comments about the state of the national economy.

We have been, and continue to be, a strong supporter of President Reagan's efforts to control inflation, to reduce the size and power of the federal government, and to shift the focus of federal tax policy from encouraging consumption to encouraging production. In his first 15 months in office, the President has made outstanding progress in all three areas.

But just because the Consumer Price Index (CPI) is no longer rising at double-digit rates, we must not now become complacent about inflation. I believe the nation's basic inflation problem remains largely unsolved and, once the present business recession ends, inflation could quickly return to the high rates of a year ago. The basic problem is that the nation's "core" inflation rate—that is, the increases in labor and capital costs—remains far too high.

The major causes of rising labor costs are the following:

First, labor has succeeded—and by and large continues to succeed, despite a few cases to the contrary—in extracting wage gains far in excess of productivity gains. In many cases, past federal policies have increased labor's abilities to achieve these wage gains.

Second, business leaders have not been tough enough in labor bargaining, nor have they focused enough of their management skills on the issue of productivity. Exhibit A is the auto industry, where past super-generous concessions to labor and management have almost ruined America's most important industry.

Third, most major industry labor contracts are indexed to the CPI and expire at two and three year intervals, thus producing a steady upward "ratcheting" in wage rates as labor leaders are driven to top the accomplishments of other unions.

I strongly urge the President to use his powers, as he did so effectively in the air controllers' strike, to find ways to limit overall wage gains to productivity gains and to decouple labor contracts from the treadmill of automatic escalations. I also urge America's business leaders to recognize their roles in this problem and to carry out their side of the bargain. In a word, they should become the effective and responsible managers they are paid to be.

The major cause of the rising real costs of capital is, of course, interest rates that refuse to fall, despite the fall in the inflation rate. I need not stress the many economic and political problems these high rates are causing, for they are reported daily in the media and encountered daily in all our personal lives.

What is needed is a quick and responsible solution to the problem of seemingly uncontrollable future fed-



eral budget deficits. Until the Administration and Congress show both the will and the ability to take action to reduce the direction of these future deficits, the nation's financial markets cannot be expected to return to normal. After all, why loan long-term money at, say, 10 percent if another wave of double-digit inflation is lurking a year or two ahead?

The budget solution will require all sides to give a little. The growth in the large so-called entitlements programs—especially in the way Social Security payments and federal pensions are indexed to the CPI—must be slowed; increases in defense spending can be stretched out; and some tax revenues can be increased.

The best and simplest source of new tax revenue would come from prompt action on decontrolling natural gas prices. Revenues from higher income taxes resulting from decontrol would bring in \$10–\$15 billion a year. Further, if it became a political necessity, it would be possible, with the addition of a properly designed “windfall” tax on old gas, to produce an additional \$5–\$10 billion. Decontrol would also encourage conservation of this scarce resource and stimulate the development of new supplies of gas. I again urge the President to put short-term political considerations aside and to deliver on his campaign pledge to decontrol *all* energy prices.

There has been some loose talk of imposing a sizeable fee on oil imports as a way to raise federal revenues. This is a bad idea for several reasons. It would raise regional issues of consumer equity, especially in the Northeast, and upset the competitive structure of many U.S. export industries—especially petrochemicals—that are heavily dependent on oil feedstocks. An import fee would also

adversely affect the U.S. refining industry, already having its problems, and would likely lead to a new round of special interest protective devices and abuses. Further, OPEC might well consider our import fee as an open invitation to raise its crude oil prices. We ask you to join us in letting the President and your senators and congressmen know that a new oil import fee is not the solution to the nation's budget problems.

Let me now shift to Union Oil and to its approach to the future. Our basic approach is two-fold: first, to increase the profitability of our current operations and, second, to make major new investments that will provide long-term future profits and jobs.

Our planned capital and exploratory expenditures for 1982 are \$2.2 billion—the first time in our history they have exceeded the \$2 billion mark. About \$1.9 billion of the total is earmarked for energy-related projects.

A major part of our long-term investment program is in Thailand, where we have thus far discovered 11 separate natural gas fields in the Gulf of Thailand. Earlier this month, we reached agreement with the Petroleum Authority of Thailand on a second natural gas sales agreement.

The new agreement is for 25 years and calls for production of 300 million cubic feet of natural gas per day by the end of 1986, which will bring Union operated Gulf of Thailand production to about 550 million cubic feet per day and 16,000 barrels per day of condensate. An additional 100 million cubic feet per day is expected to be available for delivery in the late 1980's. To put these numbers in perspective, at 650 million cubic feet per day, Thailand's gas production would be about 60 percent of Union's current U.S. gas production.

Union holds an average interest of about 72 percent in this large project. Together with two Japanese partners, we expect to invest over \$1.4 billion to bring this gas and condensate into production. When completed, this will be Union's largest project outside the United States.

We are, of course, continuing our expanded effort to find and develop oil and gas in the United States. Last year we spent \$169 million in bonuses for high-potential offshore acreage, and thus far in 1982 we have spent \$54 million. In our annual report and in prior meetings, we have discussed these efforts, as well as our very successful enhanced recovery program, in considerable detail. Today I'd like to focus on our pioneering work in two new energy sources—oil shale and geothermal.

A year ago we concluded we had taken oil shale about as far as it could go both in the laboratory and in small-scale experimental work in Colorado. So we have taken the next step—to scale up and prove on a commercial basis that oil from oil shale is a viable energy resource.

Near Parachute, Colorado, we are spending about \$550 million on our first oil shale project. This project includes a large underground mine, a retort and oil upgrading facility. Next year it will be the nation's first commercial shale oil venture, producing 10,000 barrels of syncrude a day.

This is a large investment, important to Union's future and to the nation's energy supplies and national security. The project is innovative, but it is not an experiment. It is a solid economic proposition.

We have a commercial contract, negotiated with the Department of Energy, in which we have committed to supply the Department of Defense

with 7,000 barrels of military diesel and 3,000 barrels of jet fuel per day. During the first seven of the contract's ten-year term, the price to D.O.D. will be the market price. If this market price exceeds our contract price, indexed to inflation, there will be no additional payments to Union. On the other hand, if, because of market conditions, the market price is below our contract price, indexed to inflation, we will receive a payment from the Syn-fuels Corporation equal to the difference. Over the first seven years, the total of these support payments could reach \$400 million. Thus, Union and the federal government have worked out an arrangement that will foster the birth of a new energy industry, provide fuels for our national security needs, and reward Union's risk-taking and innovation.

We are the world leader with another innovative alternative energy source—geothermal. Geothermal is a moneymaker for Union Oil Company today, and it promises to be an even better one tomorrow.

We now supply natural steam to power more than 1.2 million kilowatts of electrical generating capacity in this country and the Philippines—enough to take care of the electrical needs of a city of more than a million people, or most of the island of Manhattan.

In the Imperial Valley in southern California, we are exploring new ways to solve the challenging technical problem of processing extremely saline fluids. The trick is to get the energy out without excessive damage to piping by corrosion and scaling. We are already producing geothermal energy there in one experimental project, and starting another this year.

Our leadership in geothermal is demonstrated further by our recent selection by Japan and Indonesia to

explore and develop potential geothermal sources in these two countries.

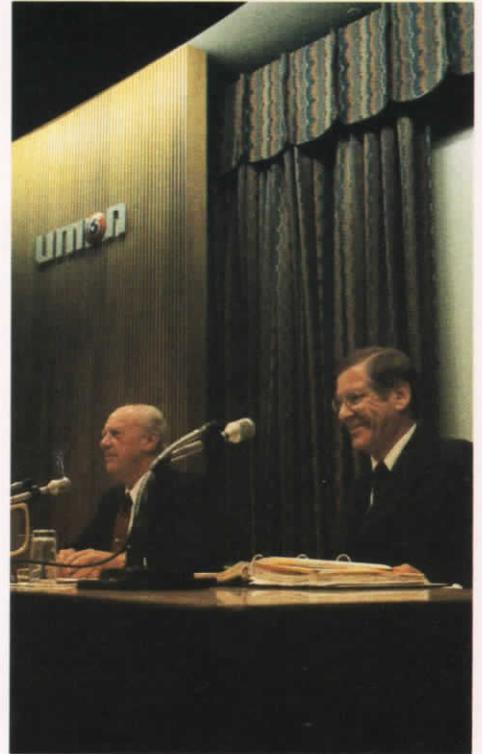
We have discussed Union's broad-based efforts at developing earth resources. The evidence shows that we are moving ahead on all fronts to position ourselves for the present as well as the future.

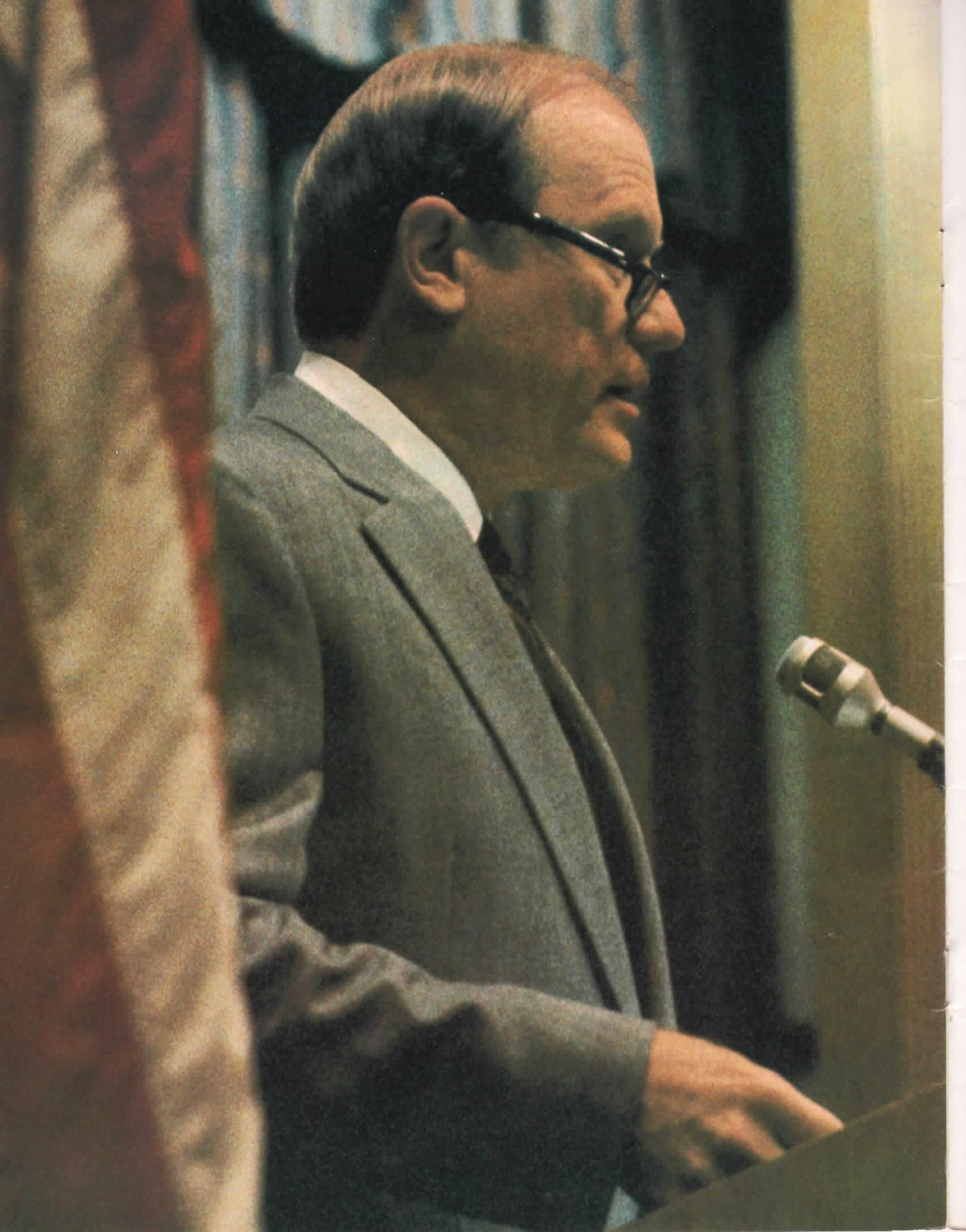
In 1981, Union was one of the few oil companies which improved its financial performance over the previous year. I am happy to report that this trend continued in the first quarter of 1982.

First quarter earnings were \$168.5 million, or 97 cents per share. This is an increase of 9 percent over 1981's first quarter. As compared with a year ago, the major favorable factors were improved margins in refining and marketing operations including the operations of our Korean affiliate, and earnings from natural gas production in Thailand. In addition, we had increased earnings from higher average natural gas prices in the United States. Partially offsetting these gains were higher domestic dry hole costs and higher corporate interest costs. The balance of 1982 has many uncertainties, but I am confident that it will be a good year.

I hope you agree that our comments today demonstrate that Union Oil Company has an exciting future. We are making good profits in the near term, and we have a diverse approach for the long-term, with our strong emphasis on technological innovation in existing and alternative forms of energy, and in metals and chemicals.

I am proud of the fine job being done by Union Oil people around the world. To them, to our Board of Directors and to you, the shareholders, my thanks for your continued strong support.





Leadership in Alternative Energy, A Union Oil Goal

by R. J. Stegemeier,
Director and
Senior Vice President
of Corporate Development

Mr. Hartley has already told you that we plan to spend a record \$2.2 billion for capital and exploration projects this year. More than 70 percent of this will be spent on exploration and development of conventional oil and natural gas resources, mostly in the United States.

I'd like to tell you about most of the other 30 percent of our capital budget.

Union's long-term game plan is to pursue its leadership role in developing new alternative energy resources, chemicals, and minerals. This will provide products vital to the nation's future. At the same time, we are continuing to stress energy conservation through more efficient use of all forms of energy. Our aim is to extend the life of our finite resources and to decrease our dependence on foreign supplies of energy.

While forecasting the future is not an exact science, we believe that more than half of our profits in the 1990's will derive in part from technology being developed in our research laboratories today.

I'd like to discuss some exciting developments that have recently been

completed or are in progress. These new projects have been planned and supervised by our Corporate Engineering and Construction Department, with continuing assistance from the operating divisions and the Union Science and Technology Division.

A year and a half ago, after many years of research effort, the Energy Mining Division began constructing an oil shale mine, retort and upgrading facility at Parachute Creek in western Colorado. As Mr. Hartley has said, this first project, which will cost about \$550 million, will produce 10,000 barrels per day of high quality synthetic crude oil, superior in most respects to any of the world's natural crude oils.

Scheduled to commence production in the summer of 1983, this project will be the first commercial shale oil plant in the United States. It will precede all others by at least four years.

From this syncrude any modern refinery can produce a full range of light oil products, including gasoline, diesel, jet fuels and a gas-oil fraction that can be processed into excellent lube oil components.

After startup and successful operation of this first shale oil complex, we'll be able to dedicate 100 million barrels of oil into the company's energy reserve books. This 100 million barrels will increase our domestic crude oil reserves by 20 percent at a capital cost of less than \$6.00 per barrel.

Union's Parachute Creek Oil Shale Program is an enormous undertaking requiring great quantities of materials, equipment, and the know-how of outstanding people.

Union owns more than 20,000 acres of shale property containing some 1.6 billion barrels of recoverable oil. We

also own another 10,000 acres of valley lands with accompanying water rights sufficient to increase our shale oil production to 100,000 barrels per day in the 1990's should we decide to do so.

The retort and entrances to a large underground mine are located on a five-acre bench site, which is 7,000 feet above sea level. We had to remove almost a million tons of rock to build this bench that was literally carved out of the mountain.

The 12,500 ton-per-day mine at startup will be one of the largest room and pillar mines in the world.

To reach the mine, we built a mountain road three miles long that climbs 1,000 feet above the valley floor. Each day in the mine, we will blast, load, crush, and convey to the retort the equivalent cargo of a 250-car railroad train nearly 2½ miles long. We've already mined three miles of tunnels and excavated a crushed shale storage area underground which is 1,200 feet long, 50 feet wide, and 100 feet high.

The heart of the oil shale project is the retort which will rise 150 feet above the bench. The retort will be fed crushed rock by a 10-foot diameter hydraulic piston that will force the ore upward into the retort. High BTU gas, heated to 1,000° F, will be forced down through the retort to decompose the kerogen into crude shale oil and high quality gas.

The high BTU gas will be scrubbed and sulfur removed before it is burned to provide process heat for the retort. The hot spent shale will be dropped through two 150-foot deep shafts where it's cooled and wetted before being distributed, compacted and revegetated in an adjacent canyon, 1,000 feet below.

The crude shale oil, after de-ashing on the bench, will be transported eight miles by pipeline to the upgrading plant in the valley.

At this plant, nitrogen and sulfur impurities will be removed using Union's patented Unionfining process. Lastly, the oil will be catalytically dewaxed in a new process called Uni-cracking/DW, developed specifically for shale oil at our research center.

The crude shale oil will be upgraded to a slightly larger volume of clean syncrude. One hundred barrels of crude shale oil will be converted to about 105 barrels of syncrude.

The 10,000 barrels per day of syncrude will be trucked to a pipeline terminal or transported by tanker train to a local refinery where it will be converted to a full range of petroleum products.

This is a big project, requiring large numbers of highly qualified people. Already we have nearly 1,700 workers on-site.

Every effort is being made to protect the environment and to mitigate the socio-economic impact on this sparsely populated area of western Colorado. To this end, we've already spent or committed more than \$60 million.

This money has been used to build two highway bypasses, a new 15-mile paved county road, a \$4.5 million middle school, 350 apartments and townhouses, housing for 750 construction employees, water and sewer systems, and for public safety service.

Another \$85 million will be spent to comply with strict environmental requirements. In some cases, new technology had to be developed to capture air and water pollutants and to dispose of the spent shale.

We're now at the halfway point in our first shale oil project. It's a large investment, involving new technology. It is important to Union's future, to the future of the nation's energy supplies, and to national security.

We are also working toward the goal of energy independence in several other capital projects that rely on existing technology. For example, late last year we completed the installation of two new vacuum towers at our Santa Maria, California, refinery. These units improve our ability to process heavier, lower cost crude oils which are becoming an increasing part of our raw material mix.

Another exciting project that will start construction soon is a \$50 million, 23,000 kilowatt cogeneration plant near Rodeo in the Bay Area. This plant will provide enough power to supply all the electrical requirements for a city of 23,000 people—almost enough for a city the size of Brea. It will be powered by waste process heat at the Union Chemicals Division carbon plant. Plants such as this can play a major role in meeting the nation's growing electricity requirements.

In addition to our work in energy, we are continuing to improve our ability to recover strategic minerals.

Our wholly-owned subsidiary, Moly-corp, is constructing a \$200 million underground molybdenum mine and a modern mill complex at Questa, New Mexico. To be completed late in 1983, this new facility will process some 18,000 tons of ore daily—making it one of the nation's largest underground mines. It will produce 20 million pounds of molybdenum oxide annually for at least 20 years.

At our molybdenum processing plant in Washington, Pennsylvania, a \$30 million expansion to handle the

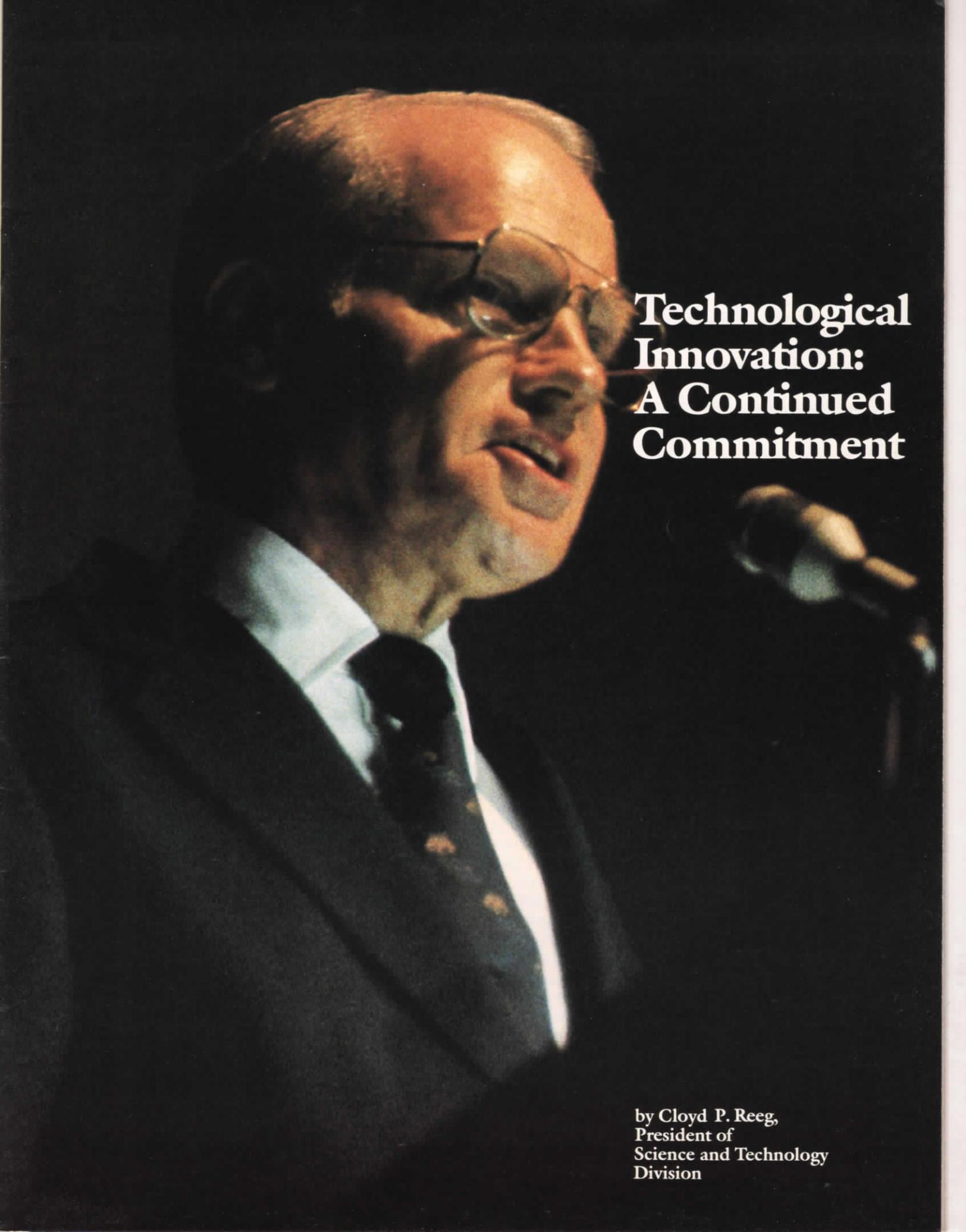
increased production from Questa was completed early this year.

At Mountain Pass, in eastern San Bernardino County, Molycorp has the world's largest rare earth mine and processing plant. A new \$15 million addition to this plant was completed early this year.

The new separation plant is producing samarium oxide and gadolinium oxide. Samarium is used in high-strength permanent magnets for miniaturization of electric motors and for high fidelity tape players, speakers, and headsets. Gadolinium is used in x-ray intensification screens, where it improves contrast and reduces patient x-ray exposure time by more than half. Also, it's used in bubble memory systems for high speed computers.

Now Cloyd Reeg, corporate vice president and president of our Science and Technology Division, will discuss in more detail our expansion program at the Fred L. Hartley Research Center in Brea. That project, to be completed this year, will give our scientists, engineers and technicians even better tools with which to continue their important work.

Reeg will also give you a quick look at our scientists, their laboratories and their accomplishments at the research center where the technology of the next decade is being created today.

A close-up, profile view of a middle-aged man with glasses, wearing a dark suit, white shirt, and patterned tie. He is speaking into a microphone, which is visible in the lower right foreground. The background is dark, and the lighting is focused on his face.

**Technological
Innovation:
A Continued
Commitment**

by Cloyd P. Reeg,
President of
Science and Technology
Division

Technological Innovation: A Continued Commitment

by Cloyd P. Reeg,
President of
Science and Technology
Division

In 1891, less than a year after Union Oil Company was formed, the board of directors authorized the expenditure of \$2,500 to establish a research laboratory at the company's Santa Paula Refinery. This first petroleum laboratory in the west was set up to try to find ways to extract water-white, non-smoking kerosene from California's evil-smelling crude oil.

We have come a long way from that first small laboratory in Santa Paula, but the basic mandate has not changed. The Union Science and Technology Division is headquartered today at the Fred L. Hartley Research Center in Brea. We are involved in developing new techniques and processes for the exploration and development of a broad range of earth resources. In addition, we provide new technology for the commercial conversion of those resources into many products to meet society's needs.

Today, Union Oil Company stands at the forefront of technology in many areas. We are the leading developer of modern refinery processes and catalysts used in the manufacture of the myriad petroleum products demanded by consumers.

We have helped the Union Geothermal Division develop and pioneer geothermal energy technology and Union is the world's largest producer of this important resource.

And, as you already have heard, Union Oil Company will be the first to produce shale oil on a commercial basis in the United States.

In addition, we are conducting the basic industrial research necessary to meet the challenges of the future and the changing energy environment. Our work today is preparing Union Oil Company for the future.

Part of our continuing commitment to technological innovation includes the expansion of the staff and facilities at the research center. Work on this \$32 million addition is nearly complete. It will include an administration building to house executives, the patent and purchasing departments and an auditorium; four new laboratories dedicated to energy research; a new core processing laboratory for the storage and analysis of core samples taken from Union drilling operations around the world and a new 250-seat employee cafeteria. Finally, we have a new ice bank air conditioning unit. It makes up to one million pounds of ice during the night when electricity is available at lower cost. This ice is then used during the day to supply refrigeration for air conditioning the center. This expansion will nearly double the size of the center.

Currently we have more than eight hundred scientists, engineers and supporting personnel on our staff. This is more than a 40 percent increase in the last four years. This buildup has been aimed at increasing our emphasis on energy development.

In terms of priorities, the major thrust of our work is to develop the

technology for Union Oil Company to increase its production of energy resources. Fifty-six percent of our effort is directed toward research on the production of conventional oil and gas as well as alternative energy sources such as geothermal and shale.

That will give you an overview of the Union Science and Technology Division's role in Union Oil Company. Now, I will review some of the specific research accomplishments to come out of the division in 1981.

Historically, the oil industry has been able to recover only about one-third of the hydrocarbons in place in a reservoir using conventional production methods. Union has done much research aimed at increasing oil recovery.

We have developed computer simulation models to improve management of our existing oil fields. The computer determines the proper placement of production and injection wells for optimum production recovery. We have applied this technique in the Heather field in the North Sea. The information gained from the computer simulation models will enable us to increase significantly the total production over the life of the field.

Union long has been a pioneer in the application of enhanced oil recovery techniques. We were among the first to use water flooding, a common practice in many areas today. We have successfully used steam drive techniques to increase production from our heavy oil deposits in California.

However, our research has gone beyond these more or less conventional tried and true methods of increasing oil recovery rates into some special, exotic techniques. In 1982, we have eight tests of new enhanced oil

recovery techniques in progress. Our patented Uniflood process uses a detergent-like material to loosen the oil from the sand and rocks and push it to the wellbore. Two tests are being conducted in Montana, one in Kansas and one at Coalinga Nose in California. A Union-developed caustic flooding technique is being tested at Orcutt Hill near Santa Maria and in two floods in the Van field in Texas. Later this year we will begin a test of a new carbon dioxide process at Union's East Coyote field in California at Placentia.

The Bell Creek, Montana, and El Dorado, Kansas, projects have already shown increases in production rate, and we are hopeful that sustained, higher production will result from the others.

Earlier, Mr. Hartley talked about Union's leadership in producing geothermal energy. A good example of our research work is in California's Imperial Valley. The Science and Technology Division has been working with the Union Geothermal Division to improve production techniques for this important alternative energy source. The geothermal fluids in the Imperial Valley contain as much as 35 percent dissolved solids which can cause severe scale buildup in pipelines. Last year we proved out a commercial means for preventing much of this scale formation, thus enabling us to extract more steam from the fluids.

The major technologies used in Union's Parachute Creek program, including the retorting and upgrading processes and the environment protection methods, were developed by the Science and Technology Division. During 1981, we finished development of a new catalytic process for converting raw shale oil into what is considered to be one of the world's finest crude

oils and our research continues.

Our company is committed to protecting the environment in all operations. During the past year, we finished the development of a process called Recycle Selectox, which converts noxious hydrogen sulfide extracted from natural gas into salable solid sulfur and easily disposable water.

Last year we developed a dozen new or improved petroleum products with the Union 76 Division. They included improvements in several turbine oil, compressor and steam cylinder lubricants and greases. We invented and developed seven new catalysts to improve the yields and qualities of oils from petroleum.

Union-developed refinery process technology continues to be the most widely used around the world. Union Oil processes, such as Unicracking and Unionfining, are in use or under construction in 23 countries and sales are pending in 19 additional countries. Union's processes, which are money-makers, are protected by almost 1,400 active U.S. and foreign patents.

Let me now tell you about some of the new products and processes we are looking into with particular emphasis on energy resources.

New applications of mathematical techniques and high speed computing show promise of providing us with much more useful information from seismic data gathered in oil and gas exploration.

Exploration efforts by the Union Oil and Gas Division and the Union International Oil Division are taking them into hostile frontier areas such as the frozen arctic and deeper offshore waters. We are conducting research into the design of production platforms to deal with unusual conditions. We supported the Oil and Gas Divi-

sion in the design of platform Cerveza. This is the largest single piece platform ever built. It stands in 935 feet of water in the Gulf of Mexico. Gina and Gilda, our newest platforms in the Santa Barbara Channel, incorporate improved and more efficient design as a result of our computer analysis techniques.

With the Oil and Gas Division we are now looking ahead at new types of designs, such as the tension leg concept, which could be used in water depths of five to six thousand feet.

Finally, we are conducting research on other alternative energy sources. Our work in solar energy is directed at the development of photocatalytic means for using the sun to make hydrogen from water, synthesize chemicals or generate electricity.

Since the early days of trying to find ways to manufacture kerosene, Union Oil Company's research group has been an important part of the company. We work closely with the operating divisions to solve the technological riddles of producing earth resources and developing new products.

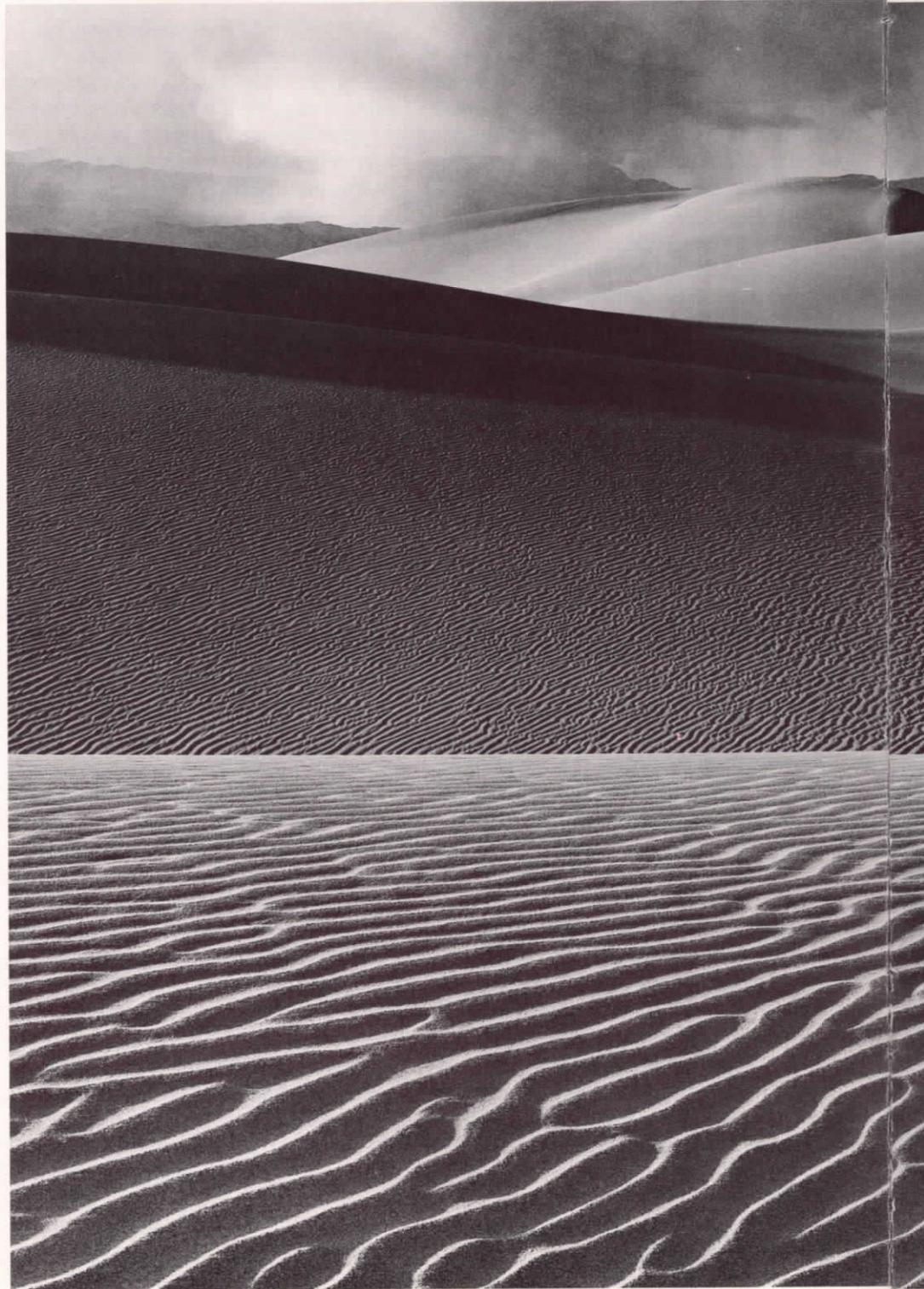
Our continued commitment to technological innovation as shown by our expansion program, is the insurance to you, the shareowner, that your company is ready to meet the challenges of the future. (76)

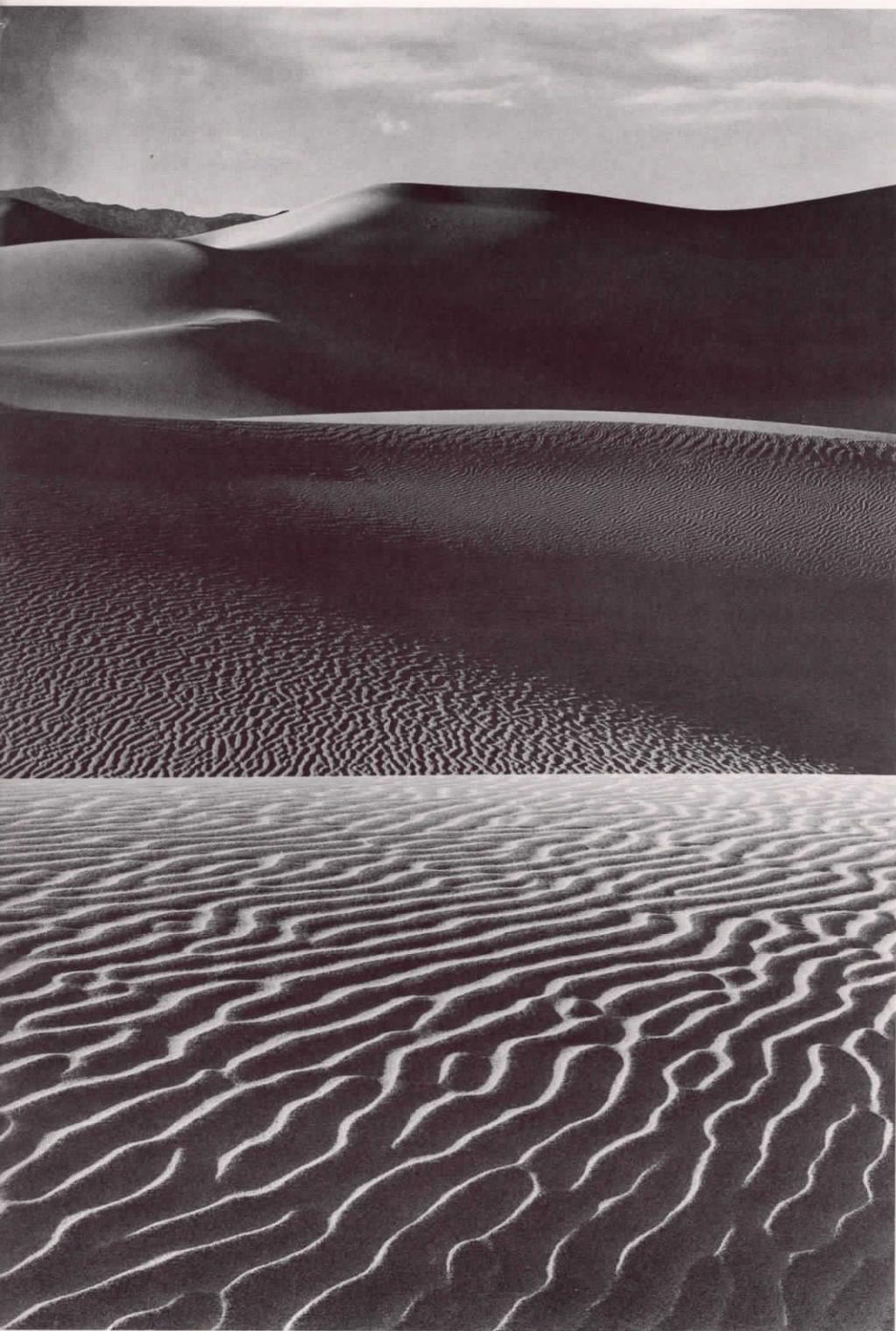
SEVENTY SIX MAGAZINE PHOTO CONTEST WINNERS

Faced with the challenge of depicting "Energy and its thousand and one uses"—the theme for *Seventy Six* magazine's Second Annual Photography Contest—Union employees, retirees and their family members rallied right up with their endless variations. More than 200 skillfully crafted photographs were submitted, enough to make the task of judging extremely difficult.

Three experienced photojournalists from the *Los Angeles Herald Examiner* sifted through the entries to select the grand prize along with first, second and third place prizes for both black-and-white and color. The winning photographs are on these pages.

The *Examiner's* Senior Editor Jim Roark, known for his widely published photograph taken at Dodger Stadium of Rick Monday rescuing a burning American flag from demonstrators at Dodger Stadium. Roark has been at the *Examiner* for 13 years, 10 of them as a sports photographer. Dean Musgrove, another judge, has been assistant photo editor for the past three years. Musgrove was hired as a staff photographer when his talent was recognized while serving an internship at the newspaper as a student from California State University at Long Beach. Michael Haering, chief photographer, was a judge for last year's contest as well. Haering, an *Examiner* photographer for 13 years, was runner up for the 1980 Pulitzer Prize for Photography for his dramatic photograph of an Iranian demonstrator being hit by a car. Haering has also been a contributing photographer for *Life* magazine for a number of years.





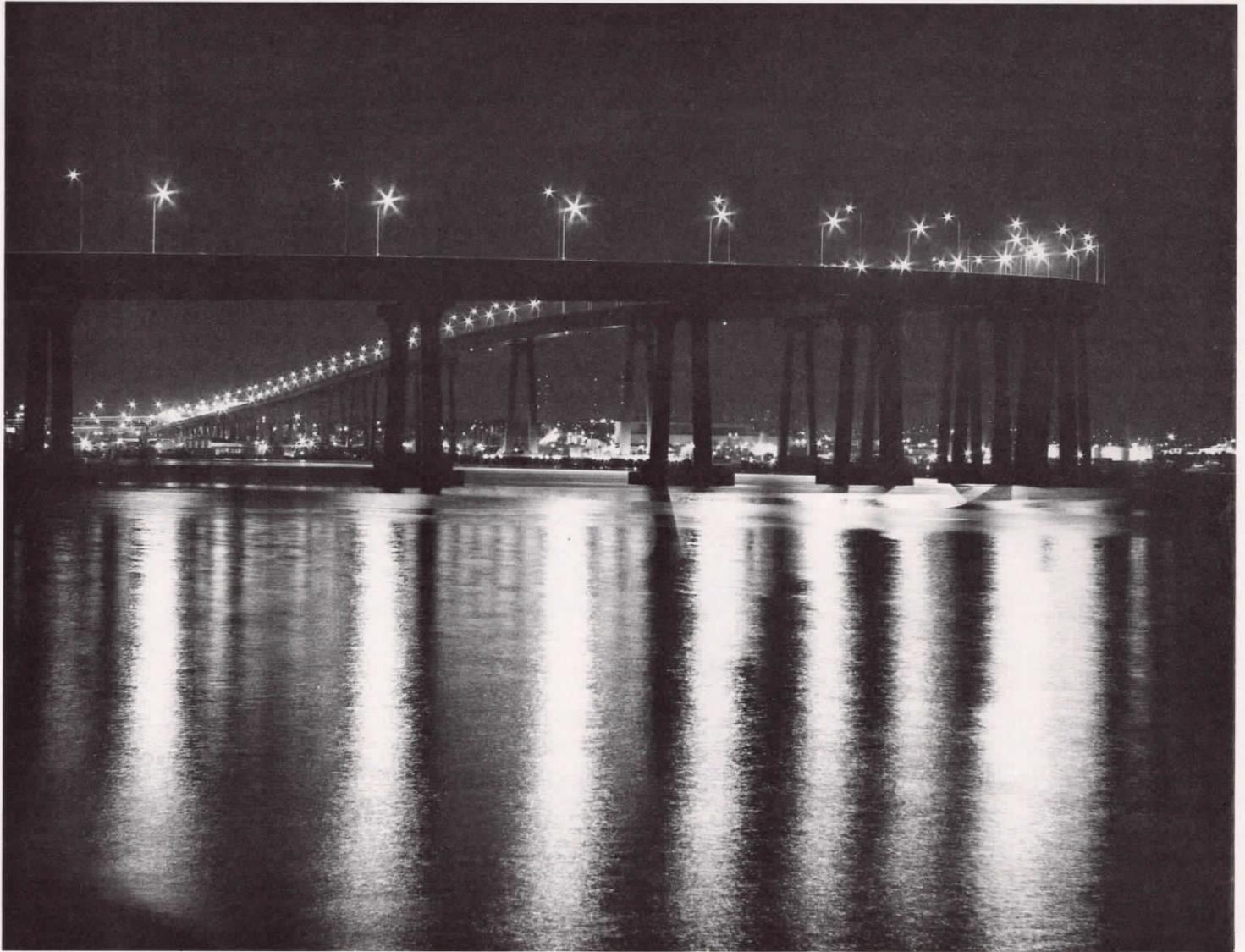
Grand Prize—\$400

Last year's winner for first place in black and white moved up to take this year's grand prize with "Wind—Nature's Sculptor." Tom Sawyer's powerful photograph was the result of rewarded patience as he waited for several hours at the Death Valley National Monument for a ray of sunshine to peek through stormy skies and accentuate the graceful forms and texture of the dunes. Sawyer, project manager for Corporate Engineering and Construction in Los Angeles, used a Horseman Dress camera (2¼ x 3¼ format) and a 105 mm lens with a Y-2 yellow filter. Kodak Plus-X was exposed for ¼ second at f/22. Sawyer feels he "graduated" from color photography with the discovery that black and white portrayed nature scenes more dramatically with the varied lighting and contrast techniques available to the photographer both on location and in the darkroom.



First Place
Black and White—\$200

"Cache Creek Rapids" was taken near Ramsey, Ca. by Ross Walker, systems analyst at the San Francisco Credit Card Center. Walker used a Minolta SRT 201 with a 200 mm lens, exposing Kodak Technical Pan Film, ASA 32, at 1/30 second, f/22. Walker is the past president of the Alameda Photographic Society and an associate in the Northern California Council of Camera Clubs.



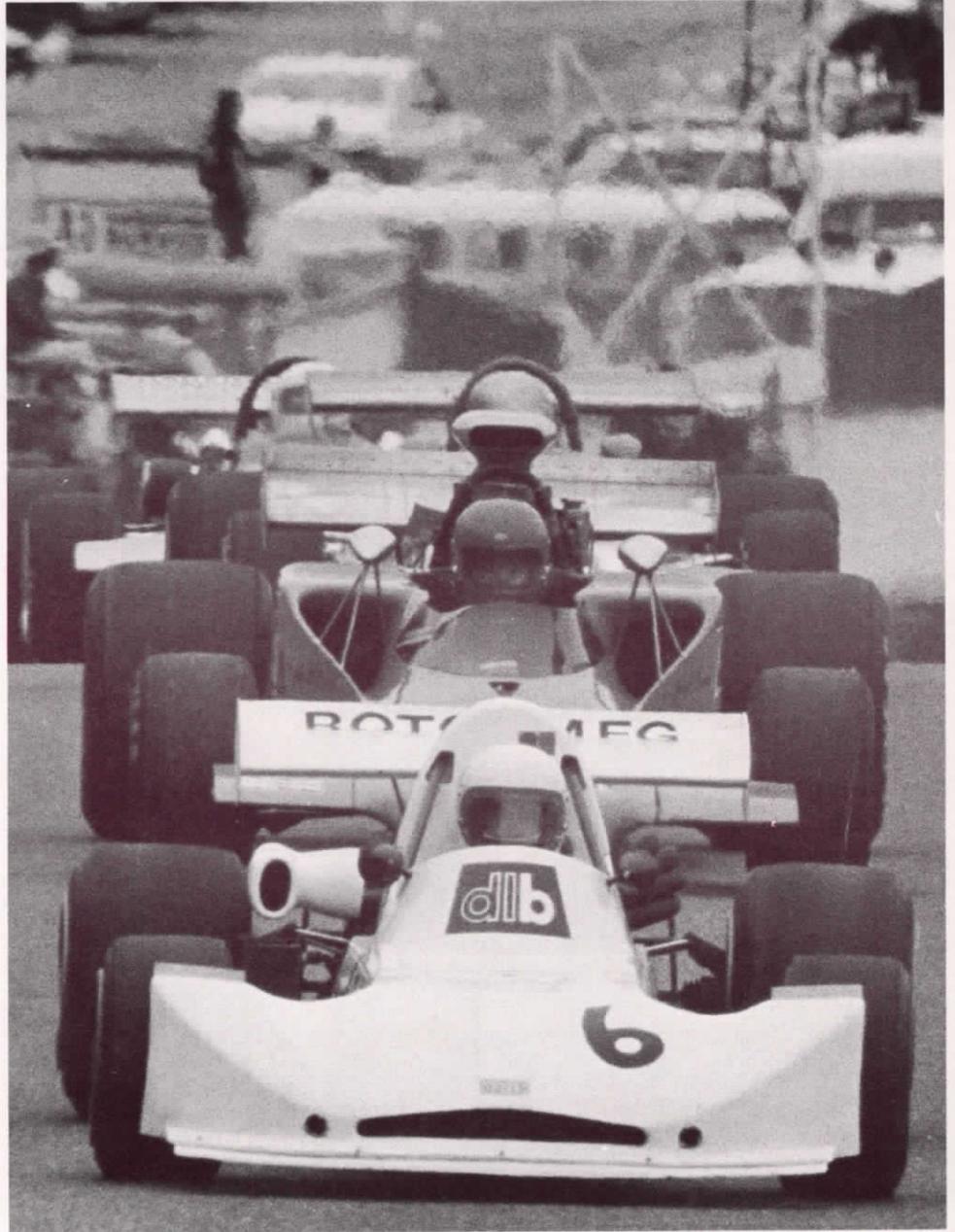
Second Place
Black and White—\$100

Another dramatic nighttime scene won Don Ambler, senior analyst for the 76 Western Region in San Diego, a prize in *Seventy Six* magazine's photo contest for the second year. Ambler took third place in black and white for last year's contest. This shimmering scene of the San Diego/Coronado bridge was taken from Coronado Island with a Konica TC using Kodak Panatomic-X film.

Third Place

Black and White—\$50

Morgan Lew, a communications engineer at the San Francisco Refinery, took his prize winning photograph "On The Road" at the Laguna Seca Racetrack near Monterey, Ca. Lew exposed Kodak Tri-X film, ASA 400, with a Canon F-1 equipped with a 400 mm lens and a 2X teleconverter to make the sporty picture.

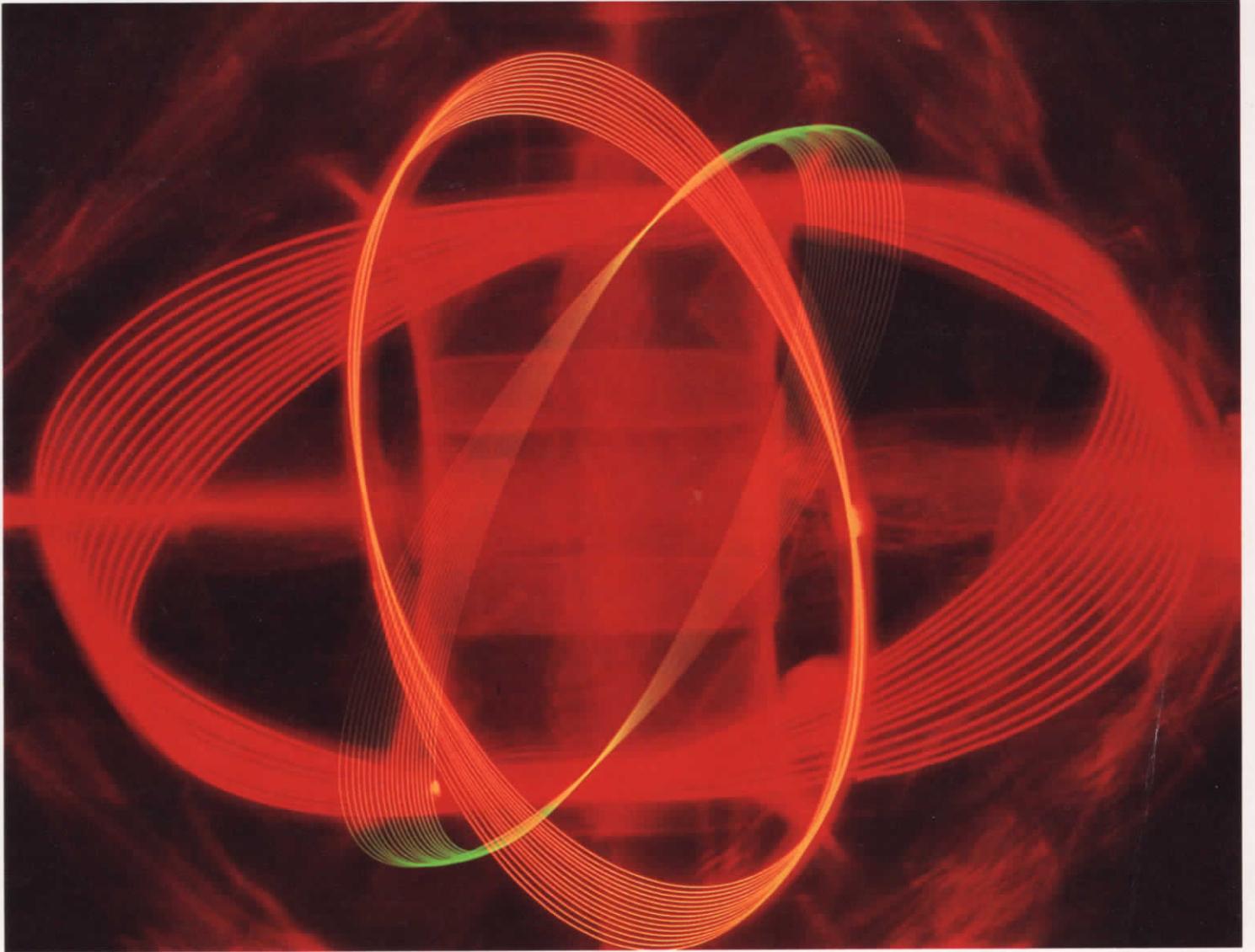




First Place
Color—\$200

The soft hues found in "Nature at Peace" were captured by Michael S. Willett, grandson of retired Union employee Angeline Panusko. Willett made the picture at Lake Namakagon in Cable, Wi. with a Nikon FM and a 500 mm lens on Kodachrome 64. Willett, who enjoys photography "strictly

as a hobby," is a junior at Columbia College, majoring in television production and works as a public relations assistant at WGN Television in Chicago.



**Second Place
Color—\$100**

Another striking multiple exposure photograph won a second year prize for Bernal Peralta, technology sales manager at the Fred L. Hartley Research Center in Brea, Ca. Four images were recorded on Kodachrome 64 with a Miranda Sensorex II and a 50 mm lens to create "Lazer Power. Three exposures were made with different color filters of an oscillating,

point-source light against a dark background. The fourth exposure was made of stationary red lights through a frosted sheet of glass. Each exposure was made at f/11 for approximately 30 seconds.



Third Place
Color—\$50

A striking contrast between a modern Russian ship and an old Chinese "junk" in Hong Kong Harbor inspired Paresh Patel, accountant for the Oil and Gas Western Region in Los Angeles, to make the photograph "The Old vs. The New." Patel used a Pentax ME with a 75-150 mm zoom lens at f/8 for

1/125 second using Kodacolor II at ASA 100. Patel began using 35 mm cameras since 1979 and has developed his technique entirely through experimentation.

76



There were enough LaCoste alligators to stock the Everglades. So many Ralph Lauren polo ponies pranced through the stands that the Los Angeles Tennis Club might have been mistaken for the meadows at Newforest.

The sportswear menagerie—direct from the pages of the Preppie Handbook—gathered in mid-April for seven glorious days of tennis, sunshine and festivity. The occasion: the \$200,000 Union 76 Pacific Southwest Tennis Open, an annual event since 1927—sponsored this year, for the first time, by Union Oil.

Jimmy Connors, 29, once the bad boy of professional tennis, confirmed his widely proclaimed transformation into a publicist's dream by delighting the fans each time he stepped onto the center court. With his ferocious, relentless style, he went all-out in every match, dropping just one set.

Afterwards, he thanked Union Oil for its sponsorship of the event and took home a winner's check for \$40,000.

"I'd be happy to play this way the rest of my career," Connors said after he polished off Mel Purcell, 6-2, 6-1, in a 63-minute final match. "I'd like to take this court everywhere I go—I haven't lost here in ten years."

It had been seven years since he last played at the L.A. Tennis Club, with its intimate stadium and fast-paced concrete court. After winning the tournament two years, 1973 and 1974, he dropped it from his annual itinerary.

This year, Connors decided to reclaim his title. In announcing his decision to play, the former UCLA tennis star said he was returning to lend support to the L.A. tennis "renaissance," a scheme designed to restore southern California's preeminence in the national tennis scene. The center-

piece of the project is a \$6 million tennis stadium to be built on the UCLA campus; Union Oil, along with the Times-Mirror and Thrifty Corporations, is a primary sponsor.

For Connors, it was a relatively easy week of work. Flu sidelined Vitas Gerulaitis, who would have been his toughest foe. Speedy Johan Kriek, who inherited the second seed from Gerulaitis, lost in the first round to Bruce Manson, a USC alumnus.

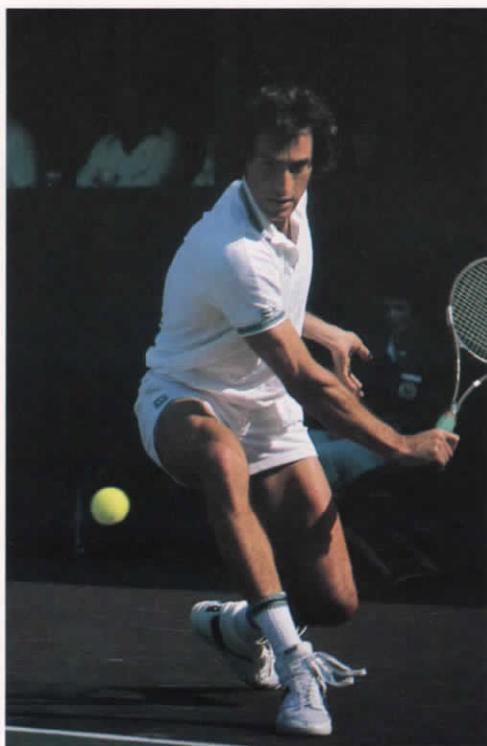
In the quarterfinals, Connors was scheduled to face the blistering serves of Roscoe Tanner, but the No. 6 seed didn't make it past his second-round match with Tim Gullikson. Sandy Mayer, the No. 3 seed who recently ascended into the tennis world's Top Ten, defaulted with a strained back in the second round to Amaya.

Although he hopelessly outclassed most of his competitors (none of his

UNION 76 PACIFIC SOUTHWEST TENNIS OPEN

Story by Pam King

Photos by Michael Haering



Action at the Union 76 Southwest Tennis Open included an appearance by Jimmy Connors, after a seven year hiatus from the L.A. Tennis Club (LEFT). As Australian Phil Dent returns a serve, the ballhandlers and members of the gallery enjoy a fast-paced match.

five opponents was a seeded player), Connors managed to put on enough of a show to entertain the fans. His acrobatic recoveries of shots most players would concede to their opponents helped attract impressive crowds almost every time he competed.

Total attendance for the seven-day tournament was a record 37,391. Never before had as many as 3,793 people squeezed into the Tennis Club at one time, as they did Sunday April 18 for the finals match.

Since the club is in Hancock Park, just south of Hollywood and east of Beverly Hills, celebrities slipped in and out among the fashionable spectators. On the first night of the tournament, Union Oil and the Thrifty Corp. hosted a Hawaiian buffet which attracted most of the players.

Daytime was the best time for people-watching. Those on the look-out

for Hollywood types spotted Johnny Carson, a tennis fan who presented Connors and Purcell with their prizes after the finals. Sonny Bono, who teamed with Purcell in a pro-celebrity tournament last year and has been a fan and friend ever since, sat courtside for most of Mel's matches. Lloyd Bridges attended several sessions, and singer Al Jarreau spent an afternoon in the stands. Connors' wife Patti kept an eye on her husband behind oversized sunglasses. Warren Christopher, the former State Department official who arranged the return of the hostages from Iran, took some time off to watch the finals.

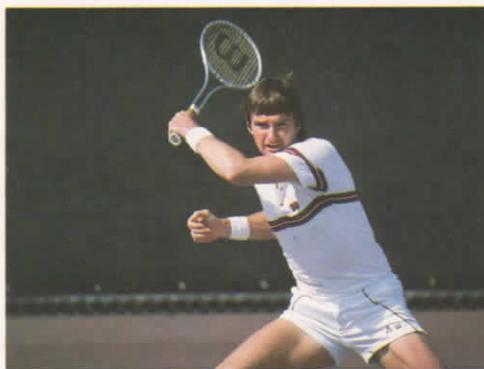
At times the celebrity-filled scene overwhelmed the action. Partially, that was because the L.A. Tennis Club was a pleasant place to spend a week. But also it was because high-quality players lost or pulled out early in the tourna-

ment. Watching an unknown player upset one of the superstars is exciting...until one realized it's usually more fun to watch the star compete against his peers in the later rounds.

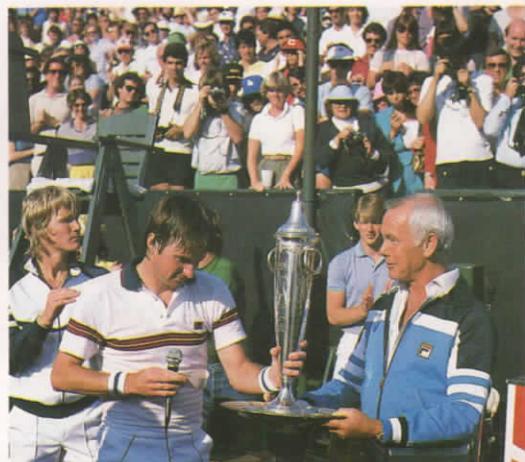
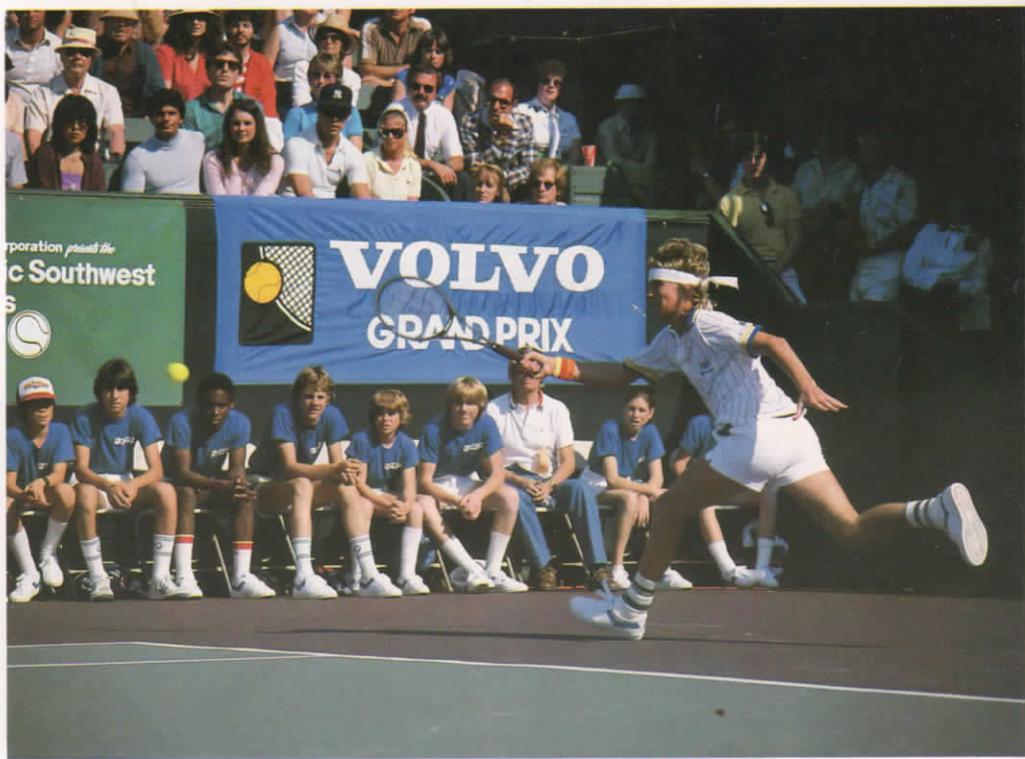
Although there wasn't an abundance of nerve-racking, three-set matches, there were several noteworthy confrontations. On the second night, Chip Hooper—who skyrocketed up the pro tennis computer from No. 235 at the end of 1981 to No. 18 just four months later—faced Ilie Nastase and beat him 7-6, 6-4.

"It's definitely an experience playing against Nasty," said Hooper, who was upset in the next round, 6-4, 7-6, by Purcell. "He does a lot of weird stuff out there, but it's fun. For a couple of points, I forgot I was playing a match."

Later in the week, Connors—having rolled up victories at the expense of Harold Solomon, Ferdi Taygan, Gul-



Highlights of the tournament included Jimmy Connors' powerful strokes as he faced such high-ranking players as Mel Purcell and Gene Mayer before receiving the winner's trophy from tennis buff, television host, Johnny Carson.



likson and Amaya—complained that tennis was losing its personality. “The fans want to see something a little more exciting...someone making a reply, so they feel more a part of the action. In three or four years, you might as well bring a pillow and a blanket.”

Connor’s dire prediction won’t come true as long as Mel Purcell has anything to say about it. A 22-year-old Southerner, with a gap-toothed smile and drawl as thick as Kentucky bluegrass, Purcell scampers round the court with evident delight and zest. His idol is an older player with non-stop guts and determination and an unwavering will to win. Who else but Jimmy Connors?

If Connors’ presence in the finals was virtually set, Purcell’s collision course with his hero was mined with tough competition. En route to the championship match, his ebullience

and perpetual hustle picked up scores of fans and admirers in the stands.

But even loyal adherents couldn’t help Purcell against Connors. Playing as well as he has in several years, Jimmy yo-yoed Mel across the court with good-natured vengeance.

“That’s why he’s Jimmy Connors and I’m Mel Purcell,” the loser said.

In the first game of the second set, a baby wailed in the stands. Purcell looked imploringly towards the child and said, “That’s just what I feel like.” Connors took a paternal interest in the young man across the net and applauded Purcell’s pertinacity.

At 30-all in the final game of the first set, Connors alternated shots into opposite corners. Five times, Purcell scurried from side to side to lunge for the ball; finally Connors passed him with a vicious crosscourt backhand. With the crowd roaring its approval

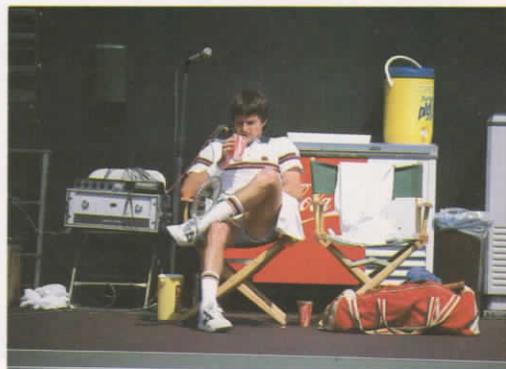
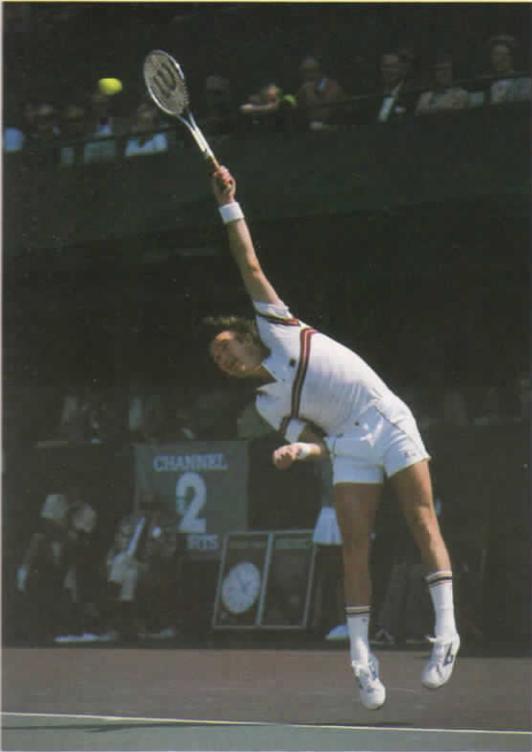
Mel dramatically leaned back on his heels to fall supine and spread-eagled on the court.

“I wasn’t overanxious or impatient,” Connors said later, “but I was hitting the ball with such pace and authority and he still was getting it back”

Connors figured no one could keep that up all match—and Purcell couldn’t. His legs tightened and he felt mentally and physically beaten. “When my speed goes,” he said, “that’s 50 to 70 percent of my game.”

So Connors, gleefully claimed his check and his third Pacific Southwest title. Other three-time winners are Fred Perry, Don Budge, Frank Parker, Jack Kramer, Pancho Gonzalez, Roy Emerson and Arthur Ashe.

A vintage Jimmy Connors played his way into that elite crowd. And an elite crowd—alligators, ponies and all—watched him do it. 76



Purcell and Victor Amaya both fell victims to Connors’ awesome serve during one of many note-worthy confrontations during the week-long tournament at the L.A. Tennis Club. Between matches, the champ takes a refreshing pause.



BANGKOK

A CITY OF
ENDLESS
CHARM



Story and Photos by Sergio Ortiz

E arthy, humid and exotic Bangkok—which celebrates its bicentennial this year—stands as a pulsating center of life and color on the banks of the Chao Phraya River. Its name alone evokes images of Kipling and Conrad and all the exotic lure of the Orient. It's a lively, throbbing city of wonder and magic where the crowds of the East combine with glittering Thai temples

and palaces giving it an atmosphere and a sense of marvelous Thai uniqueness.

It is perhaps the only place on earth where walking is generally a waste of time and effort due to the heat, unbearable traffic and noise. Bangkok defies all urban stereotypes because it does not have a downtown or city center and its six districts are spread out over hundreds of square miles.

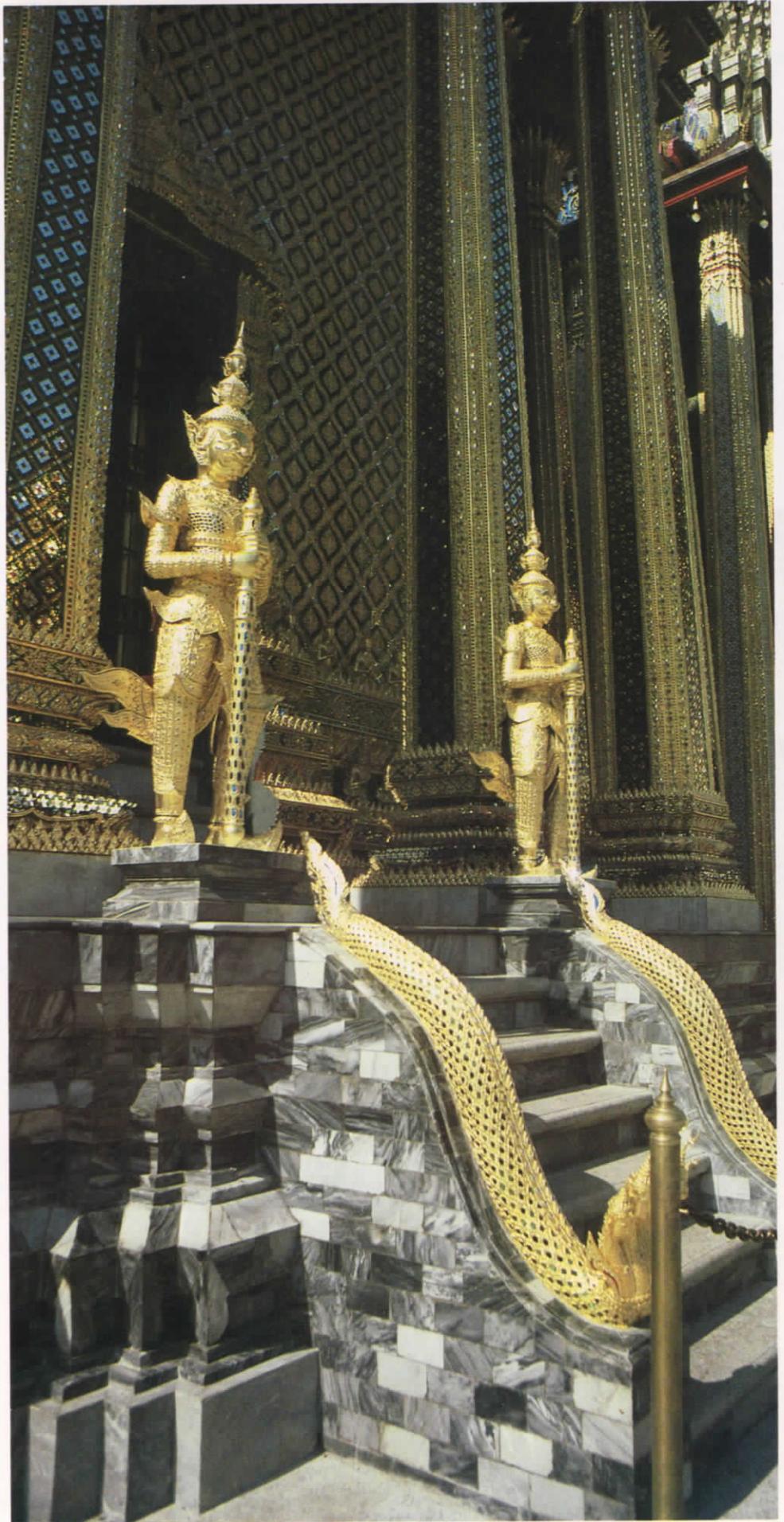


Being in Bangkok is akin to living in a sauna bath gone berserk. The humidity makes even breathing difficult. For an arriving visitor there it is apparent that this is indeed the Orient from the moment the jet lands and the air-conditioned comfort of the aircraft is violated by the heat, humidity and the rich fragrance of the Far East.

It is also a city of definite and sharp contrasts. The slow pace of the long cargo barges sailing down the Chao Phraya in lazy rhythm contrasts sharply with the hectic and manic automobile traffic of the city.

Although Bangkok cannot by any stretch of the imagination be considered a beautiful city, its exotic flavor is unsurpassed. One cannot compare it to the ageless beauty of Kyoto or to the splendor of Peking. But, of course, Kyoto was already an ancient city when it served as the capital of Japan in 732 A.D. and Peking was more than 2,000 years old and a thriving caravan stop when Christ was born.

Despite its prominence as an important and colorful southeast Asian capital, Bangkok was not even planned when the Spanish friars founded a town called *El Pueblo de Nuestra Senora la Reina de Los Angeles de Portola* on the arid landscape of a small southern California riverbank in 1781.



Whereas Peking and Kyoto were natural sites to found great cities, Bangkok's location was determined by accident. Two hundred years ago, the Siamese Empire lay in war-wrecked shambles. Burmese warriors had reduced Siam's then capital, Ayudhya, to rubble and the king, Taksin, was overthrown by a violent army coup. The nobility then replaced Taksin with a general named Phraya Chakri whose armies had once conquered most of southern Laos for Siam.

Phraya Chakri took the more regal name of Rama I and immediately ordered a new capital built on the banks of the Chao Phraya river near an insignificant hamlet called Bangkok. For this ambitious project, Rama forced 10,000 Laotian prisoners from his earlier conquest to construct walls and fortifications and almost twice that number of Cambodians to dig canals for both defense and drainage purposes.

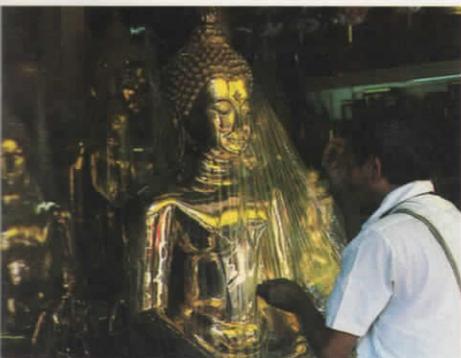
In time, Rama's capital emerged into a marvelous showcase of Thai architecture. Awed at the wonder he had created, he decided to call his city "The City of Gods; the great city; the residence of the Emerald Buddha; the impregnable city of God Indra; the grand capital of the world endowed with nine precious gems; the happy city, abounding in enormous royal palaces which resemble the heavenly abode where reigns the reincarnated God; a city given by Indra and built by Vishnukarm."

Everyone else called it Bangkok.

Today, 200 years after the fact, Bangkok stands as the national symbol of all Thailand and is one of the world's great capitals. Most of all, Bangkok best exemplifies what Kipling once called "the great throbbing masses of the Orient."

The multitudes of Bangkok could certainly stagger the senses.

How many people live in Bangkok? *A temple that once served as the city's university is a perfect example of Thai architecture (ABOVE). Bangkok scenes include a barge cruising down the Chao Phraya river, a man praying to a Buddha in a downtown store and a Bhikku in deep meditation on the banks of the Chao Phraya.*



Officially, the Thai government admits to 5.3 million, but the country's leading architect and urban planner Sumet Jumsai na Ayuthaya estimates the population to be well over seven million, "Counting non-registered newcomers and the full extent of the urban sprawl beyond the city limits." As many as 1,000 people per day immigrate from the countryside, Sumet adds. "It depends on the crops. If it's a bad harvest, we may get a quarter of million new arrivals in a year. And very few return after they have seen the city."

It's a typical case of the "How will you keep them down on the farm after they've seen Pared" syndrome.

Although Bangkok is smaller than either Manila or Jakarta—two of Asia's largest metropolises—it has 40 times as many people as Thailand's second largest city Songkhla. Union Oil has a base of operations in Songkhla to service a prolific natural gas field, called Arawan in the Gulf of Thailand.

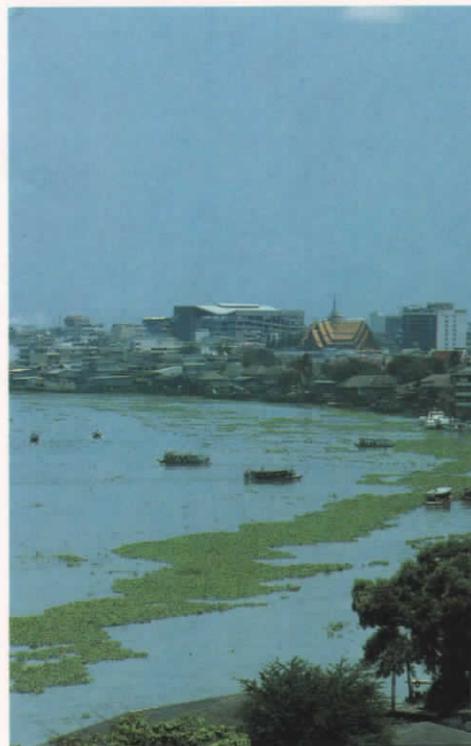
Like any other great city, Bangkok has its showcase. The Eiffel Tower in Paris, the Empire State Building in New York, Big Ben in London, the Kremlin in Moscow, Bangkok has the Grand Palace—a jeweled splendor built in 1783 that once served as King Rama's residence and offices.

This is, perhaps, the prime example of Thai architecture and its history is contemporary with the founding of Bangkok itself.

In the center of the awesome palace, just north of the Royal Residence, the Chapel Royal of the Emerald Buddha stands as the nation's symbol of faith. It is a magnificent temple that serves as the king's private chapel and houses the effigy held in the highest veneration by the Sambuddharani branch of Buddhism, the Emerald Buddha.

The equal symbol of worship for Catholics would be the Shroud of Turin and for Moslems the Black Stone at the Great Mosque of Mecca.

Bangkok residents visit the Grand Palace during bicentennial celebrations at which time the entire country found itself in a festive mood.



THE HOT PHILIPPINES ENERGY PICTURE

Photos by Sergio Ortiz

Amid the tropical fronds of a lush rain forest on the island of Luzon—the largest land body in the

archipelago known as the Republic of the Philippines—a series of incongruous pipes made of shining metal, breaks

the harmony of the jungle's colors. Pipelines of all sizes and shapes zig-zag through the forest. In the distance, an electrical generating plant emits clouds of snow-white steam and, to one side, Filipino workers are engaged in the upkeep of a steam separating plant. The lilting tone of their native Tagalog is overwhelmed by the sound of engines.

This is a typical scene in Bulalo, a geothermal field discovered by Union Oil geologists in 1974 in the Makiling-Banahao (Mak-Ban) area, some 35 miles south of Manila. Thanks to this field, and its sister operations in Tiwi, about 200 miles south of the capital, the island republic ranks second in the world in geothermal production, trailing only the United States, where Union produces geothermal energy at several locations.

In the Philippines, the future of geothermal energy looks bright.

Driving to Bulalo—the car weaving through the maze-like, frantic Manila traffic—Ron Veaudry, manager of administration and finance for Philippine Geothermal, Inc. (PGI), a wholly owned subsidiary of Union Oil, slowly lights a pipe and explains why the prospects for increasing geothermal production in the Philippines are, indeed, excellent.

"I personally believe that (the fields at) Bulalo and Tiwi have large potential on the order of what we are doing in the United States at The Geysers field," he says. "But I really don't know if that's because of the reserves in place or because of politics. You can acquire the permits to drill and build much faster here than in the United States. That is an important factor in the speed with which the Philippines has become such a large producer of geo-

thermal energy. There is definitely a lot of geothermal potential here."

To prove his point, Veaudry directs the driver to detour to a site where PGI is currently drilling an exploratory well.

At the base of the mountain, Veaudry exchanges a sedan for a rugged, four-wheel drive vehicle that will take him to the drill site.

"This is Maibarara," he explains, pointing to the flanks of the mountain where a drilling rig stands like an erector set amid coconut palms and ceiba trees.

A few minutes and miles later, after rounding a turn on a winding dirt road, the hum of motors and the shouts of men engaged in tapping the mountain for energy can be discerned.

Drilling here is tricky business.

According to Veaudry, this is a directional well which will go into the mountain. "Geologists seem to think the resource is going to be there in an abundance under the mountain," he continues. "But it is conceivable that if this well does not prove to be commercial, or if it's inconclusive like some others have drilled here, then we'll just have to walk away from it. That is the cruel nature of the game."

Add to the "cruel nature of the game" the logistics involved in drilling in the middle of a jungle, the whims of nature that plague Southeast Asia in the form of typhoons, the unbearable heat and the difficult task of drilling in general, and one can begin to grasp the problems involved in tapping geothermal energy in the Philippines.

This wellsite, called Maibarara R27 in geothermal parlance, has a definite aesthetic plus going for it. The rig sits high on the flanks of the mountain and when there are no adverse weather conditions and the rain clouds disappear, the panorama below is nothing short of spectacular.

The green carpet of vegetation stretches all the way to sea and Manila looms in the distance. A few lakes formed by the craters of long dormant volcanoes add a blue tint to the emerald jungle.

From Maibarara, it's another 40 minute drive to Bulalo, where all the efforts made by Union Oil to develop geothermal energy are apparent. Here,



the Makiling-Banahaw operations produce enough geothermal energy to supply a generating station of 220,000 kilowatts (Kw) capacity. It's expected that the project will expand to boost electrical capacity to 330,000 Kw by 1985.

Currently, 550,000 kilowatts of power are generated in the Philippines. This is nearly one-half of the hydroelectric power generated by Hoover Dam in Arizona, an impressive figure.

And, still, that is definitely a long way from only 15 years ago when the Philippine government recognized the huge commercial potential of geothermal energy due to the geographic fact the country is on the "Circum-Pacific Ring of Fire."

When the geothermal energy was found, the government-owned National Power Corporation (NPC) was given the task of developing the resource. NPC, in turn, contracted with Philippine Geothermal, Inc., to prove the existence of geothermal energy in commercial quantities.

In the ensuing eight years, 210 wells were drilled at both fields. The country's geothermal energy production is expected to power over 1,200,000 Kw by the end of 1985.

Today, the Bulalo Mak-Ban plant receives enough geothermal energy to rank as the country's second largest generator of electricity.

According to Veaudry, "This (Bulalo Mak-Ban) is an ongoing project. It has a tremendous reservoir and two generating plants with 220,000 Kw of installed capacity. We have about 70 wells drilled to produce the steam and the whole operation runs virtually trouble-free. It's a viable, commercial enterprise. At the moment, we are in the process of expanding operations."

He expects the capacity to increase by another third, or 50 percent, of the existing installed capacity by April 1984.

"We plan to begin work on it later this year," Veaudry adds. "What we have to do is install the new facilities. Most of the wells have already been completed, so it'll be a relatively easy hook up to the plant because we won't have to supply all the infrastructure that you would normally have in a brand new operation."

The Philippines, an archipelago comprised of some 7,000 islands of which only about 400 are permanently inhabited.

Subsequently, the power generated by the geothermal fields at Bulalo and Tiwi winds up in Manila, a city that, according to Veaudry, relies on geothermal energy to generate about 25 percent of its electricity.

The Philippines' heavy dependence on imported oil has prompted the government to earmark \$347 million to develop its huge geothermal resource during the 1980's. The increase in production will significantly provide more domestic energy.

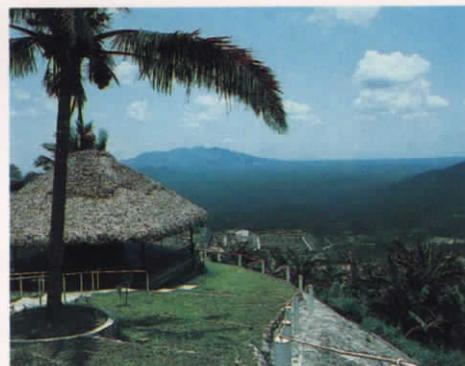
Tiwi is 200 miles from the capital. There, the landscape is the quintessential Philippine tropical postcard. The Mayon, a perfect cone of an ancient volcano, dominates the view. Palm-thatched huts teem throughout the countryside where carabao—Filipino water buffalo—trudge through rice paddies.

It is just past noon and the heat and humidity are at their peak. Pat Dobrocke, an amiable man who is the field superintendent at Tiwi, begins his rounds to inspect the operations.

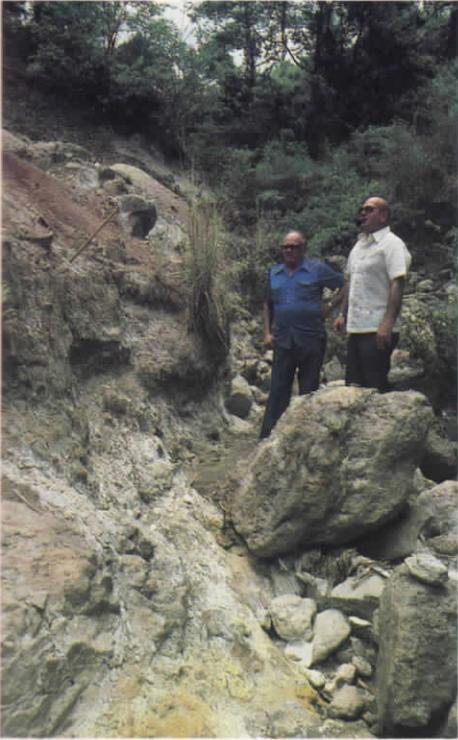
It is apparent from the beginning that Tiwi is much larger than the Bulalo field. This field, called the Naglagbong, in the Tiwi area was first discovered in 1972. It is a moderate temperature, low salinity reservoir and several of the wells in the field have proven capable of individually producing more than one million pounds of steam and fluids per hour.

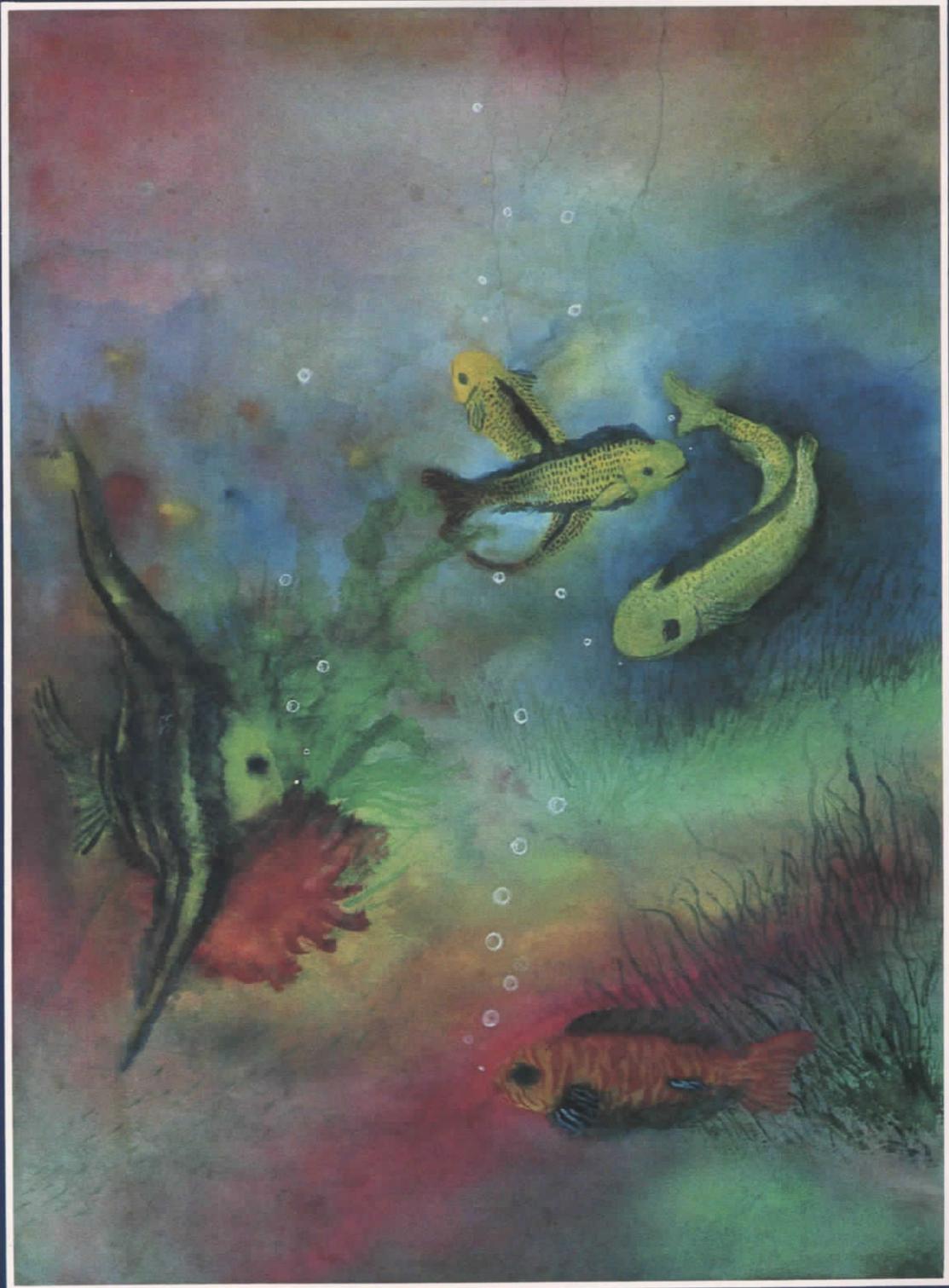
According to Dobrocke, as development continues through this decade, it is possible that geothermal energy production will expand from the current levels produced today.

It all points to a bright energy future for the Republic of the Philippines as it relies more and more on the heat and steam wrested from deep beneath the earth. The entire operation exemplifies the tremendous strides made since April 1967 when the first light bulb was lighted from geothermal energy at Cole, a small barrio in Tiwi. (76)



Typical scenes of the geothermal fields of the Philippines include a panoramic view of the Makiling-Banahaw operations (TOP) and (FACING PAGE) Tiwi, a generating station. While exploratory drilling is conducted at Maibarara, the symmetry of the expansion loops is self-evident.





They were all creations of which any budding artist could be proud. The 64 pieces of prize-winning art, hanging in the California Museum of Science and Industry at Exposition Park in Los Angeles during May of this year, represented the finest artistic efforts of students from the Los Angeles Unified School District—each and every piece well deserving of the museum display.

The artwork here represents some of the winning entries of *Visions and Images*, a Union Oil sponsored art contest for junior and senior high school students in the Los Angeles Unified School District. This was the first corporate-sponsored city-wide art contest ever held in Los Angeles.

The company has sponsored ethnic community youth art contests along the West Coast for several years. During May of this year, *Visions and Images* marked the beginning of another



annual company-sponsored contest aimed toward city-wide recognition and encouragement of talented young artists.

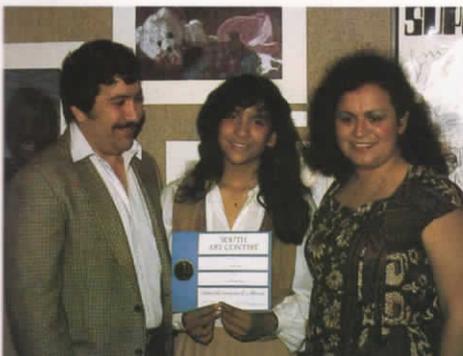
Each of the 64 schools entered its single best piece of artwork in one of the following categories: painting; drawing or mixed media, photography or printmaking. A panel of five judges reviewed the many fine entries, finally selecting first, second and third place prizes of \$150, \$100 and \$75, as well as two honorable mentions at \$50 for each category. Prizes were awarded separately in the junior and senior high divisions.

Serving as judges were John Stillion, Los Angeles County arts consultant; William Lillys, director of the Los Angeles County Museum of Art Education Department; Mabel Enkoji, local artist; Roger Borderud, United Way photographer; and Carl Pevey, display and graphics for the California Museum of Science and Industry.

Joseph P. Johnson, Union Oil coordinator of community affairs and the company's contact for the contest, served as master of ceremonies at the award reception. Joseph Byrne, vice president of Corporate Human Resources and Dr. Phil Linscomb, associate superintendent of instruction for the Los Angeles Unified School District, presented the talented students with their cash prizes totaling \$2,550. The winning artists' creative endeavors also reaped \$100 for their respective school art departments. 76

RIGHT: First prize for painting in the junior high school division was taken by Shu Chong Fong, Burbank Junior High. ABOVE: Winners pose with artwork.

Union Oil Art Contest Benefits Southland Schools



ENERGY SAVING DRIVING A HIGHLIGHT OF ENERGY WEEK

A conscientious driver may be capable of reducing gasoline consumption by about 150 gallons per year simply by practicing energy efficient driving techniques.

That may sound like an ambitious estimate, but it is definitely possible, according to Otis Tobey, Union Oil's manager of energy efficiency. "The potential for huge savings is there for those who develop fuel efficient driving habits," says Tobey who supervises the exhibition of three Union 76 Fuel Economy Drivers' Test Modules designed to demonstrate how driving habits affect fuel economy.

As part of Union Oil's observance of the second annual Energy Week, held during the first week of May, the modules were set up in the lobby of the Union Oil Center in Los Angeles. During that week, energy companies and organizations around the nation conducted special energy programs aimed to inform Americans of the need to reduce the nation's energy consumption by conservation and more efficient use of energy.

Many Union employees took a few minutes to take the test and to receive a "fuel economy score" that reflected the efficiency of individual driving habits.

The modules, devised by Union's Science and Technology Division in Brea, Ca., are highly sophisticated consoles complete with driver seats, steering wheels, dashboards, and instrumentation similar to that found in

most passenger cars. Instructions are displayed above the dashboard to guide the driver through a programmed cycle of stops. The test can be varied to simulate compact, intermediate and standard sized cars. Every 0.2 second a minicomputer scans each of the three modules, calculates the miles-per-gallon and displays this figure on a console meter.

The miles-per-gallon figures are then computed into a percentage score at the end of the test. The computer score is based on data obtained from actual performance recorded under a variety of on-the-road driving conditions by the three classes of cars.

"The average score is somewhere between 80 to 85 percent," says Tobey. "Anything below 80 percent is a definite indication the driver is doing something wrong. Anything above 85 percent is on the smiling side of things."

The modules, which Tobey says "unsell gasoline," are regularly set up at energy expositions around the country and have recently become popular displays at shopping center malls and college campuses. "It's challenging to arouse the interest of a passerby who doesn't expect to see this kind of exhibit. I've heard a gratifying number of comments. Folks are more aware of fuel economy having taken the test," says Tobey. "People are interested to know if they're doing the right things and they want to learn how to conserve fuel." 76



ENERGY WEEK QUIZ

1. Union Oil produces more of this important alternative energy resource than any other operator. It is:
 - a. Natural Gas
 - b. Geothermal
 - c. Wind Power
2. Union is the principal operator of the largest geothermal field in the world. It is located in:
 - a. Northern California
 - b. Hawaii
 - c. Japan
3. Union will be the first commercial producer of oil from shale in the U.S. When the first project is completed in 1983, the company's production will be:
 - a. 5,000 b/d
 - b. 10,000 b/d
 - c. 50,000 b/d
4. New energy development is expensive. In 1981 Union paid the U.S. government approximately _____ for federal offshore exploratory rights:
 - a. \$15 million
 - b. \$65 million
 - c. \$170 million
5. Previously discovered and produced fields will yield even more crude oil when injected with:
 - a. Water
 - b. Chemicals
 - c. Steam
6. Union Oil's "Cerveza," the largest offshore platform ever built and launched in a single piece, is in water deeper than:
 - a. 300 feet
 - b. 600 feet
 - c. 900 feet
7. Union is a leader in natural gas production, and is developing gas fields in one foreign country capable of producing up to 600 million cubic feet of natural gas per day:
 - a. Mexico
 - b. Thailand
 - c. Australia
8. What is the United States' most abundant fossil fuel?
 - a. Coal
 - b. Natural Gas
 - c. Oil
9. Which of the following users consumes the most energy in the United States?
 - a. Residential
 - b. Industrial
 - c. Transportation
10. What energy source represents more than half of the nation's residential use of energy?
 - a. Coal
 - b. Natural Gas
 - c. Oil
11. Which of the following will add as much as 3 percent to your car's gas mileage?
 - a. Underinflated tires
 - b. Overinflated tires
 - c. Radial tires
12. Driving a car 55 miles per hour rather than 70 miles per hour can add how much to your gas mileage?
 - a. 10 percent
 - b. 20 percent
 - c. 30 percent
13. Since World War II, annual energy use in the United States has more than doubled. How does this growth compare with Western Europe?
 - a. Less than Europe
 - b. The same as Europe
 - c. More than Europe
14. How much of the energy that the United States uses is based on oil?
 - a. 25 percent
 - b. 40 percent
 - c. 55 percent
15. Since the 1973 oil embargo, how has the U.S. reliance on Arab members of OPEC changed?
 - a. Half as dependent
 - b. Just as dependent
 - c. Twice as dependent

Answers on following page.

ANSWERS TO ENERGY WEEK QUIZ

1. (b) Geothermal energy is a clean and efficient alternative source of energy that Union produces to power electrical generating stations. In 1982, the company will supply enough natural steam to power more than 1.2 million kilowatts of electrical generating capacity in the U.S. and the Philippines, enough to take care of the electrical needs of a city of more than a million people.

2. (a) The Geysers is located in northern California north of San Francisco and produces natural steam to power electrical generating capacity for a major utility. Geothermal energy production is an alternative that is compatible with the environment.

3. (b) The U.S. has abundant oil shale, mostly in the Rocky Mountains. Union Oil's unique upflow retort system will produce 10,000 barrels per day of shale oil when production begins in mid-1983.

4. (c) Before any exploratory work can get underway in highly prospective federal offshore lands, oil companies must bid for and pay large sums for those rights. Moreover, explorers get no guarantees of success.

5. (a, b, and c) Union Oil is improving the recovery of oil from older fields through enhanced recovery techniques. Injecting water, chemicals or steam allows for substantial production previously assumed to be unattainable.

6. (c) Union launched "Cerveza" in 935 feet of water in the Gulf of Mexico in 1981. A leader in deepwater technology, Union will launch a sister platform in the same field this year.

7. (b) Union has discovered 11 gas fields in the Gulf of Thailand.

8. (a) Though only 24 percent of the energy that we use comes from coal—compared with a total of about 66 percent from oil and natural gas—coal is by far the most abundant fossil fuel in the country. It is estimated that we have more than 20 times as much coal as oil or natural gas.

(Source: D.O.E. *Monthly Energy Review*, March, 1982)

9. (b) In 1981 industrial activities accounted for about 39 percent of all U.S. energy use. Energy used in households, stores and offices represented 35 percent. Americans used 26 percent of their total energy consumption for transportation.

(Source: D.O.E. *Monthly Energy Review*, March, 1982)

10. (b) Since the early 1970s consumers have been shifting away from oil for home-heating and instead have been using more natural gas—which is now more than 50 percent of all household use—and more electric heat, which has been installed in more than half of all new homes built in the past few years.

(Source: *The National Energy Policy Plan*, D.O.E.)

11. (c) According to the Alliance to Save Energy, tires should always be inflated to the prescribed pressures. Using radial tires on all four wheels, however, can allow up to 3 percent more mileage.

(Source: *The 25 percent Solution, the Alliance to Save Energy*, Washington, D.C.)

12. (b) The 20 percent that most cars save by driving 55 miles per hour instead of 70 amounts to a daily savings of 200,000 barrels of oil.

(Source: *Tips for Energy Savers*, D.O.E.)

13. (a) From 1945 to 1980, U.S. energy consumption went up 2.5 times; in Western Europe, it went up by a factor of 3.2. By comparison, Latin American energy use increased by a factor of 8, Southern and Southeast Asia increased by a factor of 11, and China, by a factor of 14.

(Source: *Toward a Desirable Energy Future*, Oak Ridge National Laboratory, 1981)

14. (b) The actual percentage of U.S. energy use that comes from oil is 43 percent. The remainder comes from natural gas (23 percent), coal (24 percent), hydro-power and geothermal energy (4 percent), nuclear power (5 percent), biomass and other renewables (1 percent).

(Source: D.O.E. *Monthly Energy Review*, March, 1982)

15. (c) Despite all our conservation efforts, we rely on OPEC's Arab nations for twice as much oil as we did in 1973—from 850,000 barrels a day to 1.8 million barrels a day. This amounts to some 31 percent of all the oil that we import.

(Source: D.O.E. *Monthly Petroleum Statement*, January–December, 1981 and Bureau of Mines *Petroleum Statement Annual*, 1973)



CORPORATE

May 1982

- 40 YEARS **Donald G. Andrews**, Union Oil Center
Jack R. Hannaman, Union Oil Center
- 35 YEARS **Albert W. Schenken**, Union Oil Center
Otis L. Tobey, Union Oil Center
- 30 YEARS **Robert C. Otis**, Union Oil Center
- 15 YEARS **Robert F. Daum**, Columbus, Oh.
Phillip D. More, Union Oil Center
- 10 YEARS **Francine M. Nieves**, Union Oil Center
Ronald Ricchio, Union Oil Center
Eleanor K. Vallon, Union Oil Center
- 5 YEARS **Ben T. Goto**, Union Oil Center

June 1982

- 25 YEARS **Patricia J. Busk**, Union Oil Center
Lyle C. Rutherford, Union Oil Center
- 15 YEARS **Michael Deming**, Orcutt, Ca.
Robert A. Faught, Union Oil Center
Schyr J. Hinrichs, San Francisco, Ca.
John B. Wickman, Union Oil Center
- 5 YEARS **Kimberly C. Carpenter**, Union Oil Center
Ian D. Gass, Union Oil Center
W. Anett Vasels, Schaumburg, Il.
Doug E. Wilbourn, Union Oil Center
Stanley L. Zwicker, Union Oil Center

UNION SCIENCE AND TECHNOLOGY DIVISION

May 1982

- 40 YEARS **Kenneth W. Fort**, Brea, Ca.
- 30 YEARS **Robert G. Hawthorne**, Brea, Ca.
Billy J. Young, Brea, Ca.
- 10 YEARS **Ross A. Clark**, Brea, Ca.
- 5 YEARS **Charles B. Hamilton**, Brea, Ca.

June 1982

- 40 YEARS **Virgil A. Josendal**, Brea, Ca.
- 35 YEARS **Norman W. Lambert**, Brea, Ca.

- 30 YEARS **Devere C. Erb**, Brea, Ca.
- 25 YEARS **Paul F. Helfrey**, Brea, Ca.
- 20 YEARS **Frank B. Booth**, Brea, Ca.
- 15 YEARS **Donald T. Clark**, Brea, Ca.
Carol S. Flohr, Brea, Ca.
Douglas E. Nelson, Brea, Ca.
George L. Tilley, Brea, Ca.
- 10 YEARS **Carl D. McAulay**, Brea, Ca.
- 5 YEARS **Shelley M. Pressley**, Brea, Ca.
Renee M. Robertson, Brea, Ca.

UNION REAL ESTATE DIVISION

May 1982

- 35 YEARS **Helen G. Kemmerer**, Union Oil Center

UNION 76 DIVISION

May 1982

- 40 YEARS **Robert G. Blackwood**, San Francisco Refinery
Kenneth E. Clark, Chicago Refinery
Boyd G. Lyon, Tampa, Fl.
Gene D. Moore, Edmonds Terminal
Antonio Villalobos, San Francisco Refinery
Carl R. Walden, San Francisco Refinery
- 35 YEARS **William J. Anderson**, Detroit, Mi.
Melvin L. Carter, Meridian, Ms.
James R. Cassingham, Pasadena, Ca.
Edward Edwards, Los Angeles Refinery
James A. Fracaro, Chicago Refinery
Harold L. Heiselbetz, Pensacola, Fl.
Delbert G. Horn, Santa Fe Springs, Ca.
Franklin K. Hull, Los Angeles Refinery
Howard M. Jungles, Chicago Refinery
Dale W. Lee, Pure Transportation Co., Brush, Co.
James W. Marvin, McKitttrick Station
Daniel O. Ruettiger, Chicago Refinery
Ida E. Van Kirk, Los Angeles Terminal
- 30 YEARS **Roger W. Downing**, Portland Terminal
James J. Weaver, Los Angeles Refinery
- 25 YEARS **David R. Cook**, Schaumburg, Il.
Richard L. Day, Los Angeles Terminal

- Albert F. Elliott**, Los Angeles Terminal
- Eric J. Falken**, Los Angeles, Ca.
- James J. McMahon**, Schaumburg, Il.
- Ernest E. Molina**, Los Angeles, Ca.
- Alfred C. Nitschke**, Schaumburg, Il.
- John H. Orr**, Schaumburg, Il.
- Wesley Rubidoux**, San Diego Terminal
- Ludmilla Shanske**, Los Angeles, Ca.
- 20 YEARS **Kelley Arena**, Beaumont Refinery
Johnny C. Fontenot, Pure Transportation Co., Houma, La.
Leonard J. Heeg, Chicago Refinery
Kenneth J. Kittell, Beaumont Refinery
Harry S. Lutten, Camp Hill, Pa.
Joseph J. Ressler, Chicago Refinery
William D. Sealy, Chicago Refinery
- 15 YEARS **Leon F. Adams**, Los Angeles Refinery
Raymond E. Adams, Santa Maria Refinery
Donna J. Ball, Schaumburg, Il.
Leonora A. Basilio, San Francisco, Ca.
Dennis D. Bonny, Santa Barbara, Ca.
Larry P. Champagne, Beaumont Refinery
Walter W. Coleman, San Luis Obispo, Ca.
Louise A. Dellert, Schaumburg, Il.
Johnny B. Dixon, Milwaukee, Wi.
William W. Duren, Beaumont Refinery
James H. Eagleton, Pure Transportation Co., Patoka, Il.
Audrey J. Farmer, Schaumburg, Il.
Dell E. Gipson, Pure Transportation Co., Van, Tx.
Vicki L. Holloman, Beaumont Refinery
Spencer L. Jayne, Richmond, Ca. Terminal
Loren E. Johnson, Avila, Ca.
Abraham K. Kaniho, Honolulu, Hi.
Alsaiah Lemons, Beaumont Refinery
Charles W. Lennon, Schaumburg, Il.
Ronald A. Lubbers, Cincinnati, Oh.
Dale R. Mason, San Francisco Refinery
Wayne E. Moores, Beaumont Refinery
John J. Pfister, San Francisco Refinery
David P. Robinet, San Diego Terminal

Kathleen Schmidt,
San Francisco, Ca.

H. J. Stephenson, Chicago Refinery

Ronald H. Strand, Chicago Refinery

Leon Teasley, San Francisco Refinery

Clifford Vogtsberger, Los Angeles Terminal

Robert A. Wilkinson, Jr., Chicago Refinery

10 YEARS **Arnulfo J. Alcalá**, Avenal, Ca.

Frank L. Balin, Colton Terminal

Nena M. Bitango, San Francisco, Ca.

Harold R. Cook, Los Angeles Refinery

James L. Heist, Cincinnati, Oh.

James I. Mullenix, Los Angeles Refinery

Richard H. Ochoa, Santa Maria, Ca.

Eleanor E. Roble, San Francisco, Ca.

Randall O. Schmidt, Schaumburg, Il.

Hollistene Scott, San Francisco, Ca.

William R. Shumate, Los Angeles Terminal

Darrell D. Thompson, Los Angeles Refinery

Richard P. Wells, Los Angeles Refinery

5 YEARS **Ismael Anaya**, Edmonds Terminal

Gary G. Brashier, Los Angeles Refinery

Barbara A. Buckley, Schaumburg, Il.

Bernard N. Carlson, Beaumont Refinery

David E. Castagnetti, San Francisco Refinery

Donald J. Chapman, Beaumont Refinery

Audrey N. Choate, Schaumburg, Il.

Donald P. Clausen, Portland Terminal

Richard E. Cosmer, Cerritos, Ca.

Jay K. Daugherty, San Francisco Refinery

Jackie H. Farmer, Pure Transportation Co., Olney, Il.

Jacklene P. Harris, Wildwood, Fl.

David T. Hocking, Pure Transportation Co., Olney, Il.

Darrell G. Jacob, Beaumont Refinery

Christine G. Jasinski, Schaumburg, Il.

Michael H. Johnson, San Francisco Refinery

Dexter O. Morrison, Portland Terminal

Joseph S. Noreiko, Jr., Chicago Refinery

Roger G. Petroff, Schaumburg, Il.

Gardner A. Potter, San Francisco Refinery

James Prusener, San Francisco Refinery

Gloria Quesada, Los Angeles, Ca.

William G. Recob, San Francisco Refinery

Daniel K. Salyers, McKittrick, Ca.

Ellen I. Silva, San Francisco Refinery

Christopher S. Telles, Los Angeles Refinery

Patrick J. Valente, Santa Maria Refinery

June 1982

45 YEARS **Cameron A. Dystrup**, Chicago Refinery

40 YEARS **Fred J. Andrews**, San Francisco Refinery

Lee C. Harvell, San Francisco Refinery

Joseph D. Schmidt, San Francisco Refinery

35 YEARS **George W. Barker**, San Luis Obispo, Ca.

Alban L. Birdwell, Jr., Beaumont Refinery

Wilfred O. Bowers, Pure Transportation Co., Van, Tx.

Donald F. Driver, Jr., Atlanta, Ga.

Ruth E. Fischer, San Francisco, Ca.

Robert C. Foulk, Beaumont Refinery

Robert W. Massing, Pure Transportation Co., Van, Tx.

Carl C. Russell, Montgomery, Al.

William A. Spence, Detroit, Mi.

30 YEARS **Charles E. Baysinger**, Macon, Ga.

John E. Brennecke, Los Angeles, Ca.

Leslie W. Brown, Seattle, Wa.

Stanley R. Chmielewski, Chicago Refinery

John D. Danforth, Schaumburg, Il.

Marshall F. Doyle, Beaumont Refinery

Merritt E. Edwards, Schaumburg, Il.

Leroy Farmer, Chicago Refinery

Henry J. Grodecki, Chicago Refinery

Michael J. Hrubos, Chicago Refinery

Reginald C. Huggins, San Francisco Refinery

Michael S. Kocsis, Chicago Refinery

Richard A. Longhini, Chicago Refinery

Norbert H. Nagel, Chicago Refinery

Clay C. Petray, Schaumburg, Il.

James S. Quigg, Schaumburg, Il.

Grady A. Russell, San Francisco Refinery

William T. Sanna, Chicago Refinery

Dorothy M. Skibicki, San Francisco, Ca.

Lowell B. Way, Schaumburg, Il.

Alvin G. Welter, Chicago Refinery

John A. Wierschem, Chicago Refinery

25 YEARS **Vincent E. Davis**, Los Angeles, Ca.

Kenneth S. Hagen, Union Oil Center

Edward S. James, Junction Station

Jack L. McLaughlin, Beaumont Refinery

Jack C. Plumbley, Savannah, Ga.

Leroy W. Vyenielo, Richmond, Ca. Terminal

Marilyn G. Welch, Santa Maria Refinery

Ms. David J. Whorter, Schaumburg, Il.

20 YEARS **Mitchell Darkins**, Beaumont Refinery

J. A. Dingeldine, Phoenix, Az.

Robert J. Geer, Beaumont Refinery

Thomas L. House, Chicago Refinery

Nelson McCain, Jr., Chicago Refinery

Lawrence R. McKelvie, Schaumburg, Il.

Donald R. Roseberry, Cincinnati, Oh.

Joseph H. Schumacher, Schaumburg, Il.

James B. Wright, Pure Transportation Co., Van, Tx.

15 YEARS **A. E. M. Barloewen**, Beaumont Refinery

Betty H. Bauguess, Charlotte, N.C.

Richard A. Brown, Los Angeles, Ca.

Anthony Brown-Silva, Santa Maria Refinery

A. J. Eliskalns, Chicago Refinery

John E. Fabing, Schaumburg, Il.

Charles D. Henderson, Schaumburg, Il.

Randall E. Johnson, Schaumburg, Il.

Richard W. Jones, Jr., Pensacola, Fl.

Clarence L. Kirk, Beaumont Refinery

George W. Knox, III, Schaumburg, Il.

Billy J. Lambert, Columbus, Oh.

Edward E. Lopeman, Columbus, Oh.

Virgil L. Marcum, San Jose, Ca.

Don C. Martin, Los Angeles Terminal

Robert M. Marts, Los Angeles Terminal

Sheila B. Nagler, Los Angeles, Ca.

Theodore R. Seden, Los Angeles, Ca.

William L. Thacker, Pure Transportation Co., Schaumburg, Il.

Phillip L. Vaughan, Santa Margarita Station

Thomas B. Williams, Los Angeles Refinery

10 YEARS **David A. Bratt**, Schaumburg, Il.

Edwin P. Brooks, Detroit, Mi.

Bernadette B. Brown, Beaumont Refinery

Richard A. Budler, San Francisco Refinery

Sandra E. Colbert, Beaumont Refinery

Gary D. Ephraim, Chicago Refinery

Janet Ford, Schaumburg, Il.

Clarence Forshe, Schaumburg, Il.

Sharon S. Glasshof, Schaumburg, Il.

James C. Hamilton, Los Angeles Refinery

Karen L. Huppenthal, Schaumburg, Il.

Shirley A. Madison, San Francisco, Ca.

Earl S. Mealins, Los Angeles Refinery

Jacqueline M. Mobley, San Francisco, Ca.

76

- 5 YEARS Raymond Baran, Chicago, Il.
Steven Bjork, Brea, Ca.
Neal Kimble, Arroyo Grande, Ca.
Betty A. Leigh, Clark, N.J.
Gene McMullen, Kenai, Ak.
Genevieve C. Mroz, Bridgeview, Il.
Michael Nugent, Kenai, Ak.
Van R. Pogue, Oakland, Ca.
Lawrence Staats, Kenai, Ak.
Robert G. Szoldatits, Lemont, Il.

UNION INTERNATIONAL OIL DIVISION

January 1982

- 25 YEARS John M. Tyler, Aberdeen, Scotland
- 5 YEARS Mark A. Stephens,
Bangkok, Thailand
Loren W. Stock, Aberdeen, Scotland

February 1982

- 10 YEARS Youngjoo K. Park, Los Angeles, Ca.
- 5 YEARS William A. Desantis,
London, England

March 1982

- 15 YEARS Leslie C. Boyer, Bangkok, Thailand
- 10 YEARS Thomas H. Albert,
Bangkok, Thailand
- 5 YEARS Andrew L. Fawthrop, Cairo, Egypt

UNION OIL COMPANY OF CANADA LIMITED

May 1982

- 15 YEARS Bob Goldie, Calgary, Alberta
- 10 YEARS Sandra Babush, Calgary, Alberta
- 5 YEARS Rae Page, Red Earth, Alberta

June 1982

- 10 YEARS Bill Pearson, Red Earth, Alberta
- 5 YEARS Eric Key, Calgary, Alberta

UNION ENERGY MINING DIVISION

May 1982

- 10 YEARS Bobby M. Franklin, Rawlins, Wy.
- 5 YEARS Herbert D. Barela, Rawlins, Wy.
Jack A. Marshall, Rawlins, Wy.
William A. Spears, Casper, Wy.

June 1982

- 40 YEARS John M. Hopkins, Union Oil Center
- 15 YEARS Paul C. Battersby,
Grand Junction, Co.

MOLYCORP, INC.

May 1982

- 15 YEARS Gilbert Gallegos, Questa, N.M.
- 5 YEARS Timothy Ambrose, York, N.M.
Lorraine Cunningham,
Mountain Pass, Ca.
Steve Toomey, York, Pa.

June 1982

- 15 YEARS Pat Ortiz, Questa, N.M.
Joe Valdez, Questa, N.M.
- 10 YEARS Robert Coulter, Washington, Pa.
Robert Hurd, Mountain Pass, Ca.
David Ventura, Washington, Pa.
- 5 YEARS Jacqueline G. Canepa, Questa, N.M.
William Devine, Questa, N.M.

POCO GRAPHITE, INC.

June 1982

- 5 YEARS Randy McKelvain, Decatur, Tx.

JOBBERS AND DISTRIBUTORS

May 1982

- 50 YEARS Odom Oil Company,
Spartanburg, S.C.
- 45 YEARS E. C. Bowman, Corcoran, Ca.
C. C. Brown, Taft, Ca.
- 35 YEARS Mohall Independent Oil
Co., Mohall, N.D.
- 30 YEARS W. D. Bickmore, La Grande, Or.
- 25 YEARS W. R. Nesmith, Oakridge, Or.
- 20 YEARS R. G. Lee, Coalinga, Ca.
- 15 YEARS Alaska Oil Sales,
Soldotna/Homer, Ak.
- 10 YEARS Chastain-Clark Oil Co.,
Thomasville, Ga.
Lake Elmo Oil Co., Lake Elmo, Mn.
Lawson Oil Co., Corinth, Ms.
Prescott Oil Co., Prescott, Wi.
- 5 YEARS Dickerson Petroleum Co.,
Belleville, Il.
Frank & Lisle Russel, Orcas, Wa.
Molokai Petroleum Co., Inc.,
Kaunakakai, Hi.
Wise Oil & Fuel Co.,
Cambridge, Md.

June 1982

- 50 YEARS J. M. Owsley, Pomona, Ca.
- 30 YEARS E. W. Kliever, Dixon, Ca.
- 20 YEARS Barkett Oil Co., Miami, Fl.
Defiance Oil, Inc., Defiance, Oh.
Keister Oil Co., Plymouth, In.
William J. Walt, Cottage Grove, Or.
- 15 YEARS A. J. Haroldsen, Kingsburg, Ca.
Robert M. Weible, Wickenburg, Az.
- 10 YEARS Beck Oil Co., Blackduck, Mn.
Don's Oil Co., Inc., Algona, Ia.
Donald E. Fielder, Newport, Wa.
Valley Oil Corp., Rockport, In.
- 5 YEARS Kenneth Strickland, Coachella, Ca.

RETIREMENTS

March 1982

- George V. Anderson, Union 76 Division,
Eastern Region, Prior Lake, Mn.
November 28, 1951
- Noble L. Cantrell, Oil and Gas
Van, Tx. March 31, 1951
- James C. Edwards, Union 76 Division,
Eastern Region, Vidor, Tx.
February 5, 1951
- Joseph L. Garibaldi, Oil and Gas
Long Beach, Ca. January 27, 1949
- Harry A. Miller, Corporate
W. Covina, Ca. February 25, 1947
- Charles E. Morrison, Union 76 Division,
Eastern Region, Cincinnati, Oh.
September 13, 1946
- Vernon L. Slayden, Union 76 Division,
Western Region, Stratford, Ok.
July 26, 1956
- Charlie L. Tompkins, Union 76 Division,
Eastern Region, Savannah, Ga.
January 30, 1950
- George Veazey, Oil and Gas
Abbeville, La. August 5, 1940
- Loretta H. West, Oil and Gas
Midland, Tx. August 24, 1971
- Edlund J. Wuoric, Corporate
Downey, Ca. October 16, 1945

April 1982

- Howard A. Alves, Union 76 Division,
Eastern Region, Mt. Prospect, Il.
June 28, 1939
- Herbert J. Becker, Union Chemicals
Anaheim, Ca. January 23, 1956
- William V. Bennett, Oil and Gas
Houston, Tx. October 16, 1945
- Ross W. Bishop, Union 76 Division,
Western Region, Carson, Ca.
November 30, 1945
- Wallace J. Blaylock, Union 76 Division,
Western Region, Los Alamitos, Ca.
March 21, 1941
- Wallace L. Conner, Oil and Gas
Kaplan, La. April 3, 1950
- Austin B. Cowen, Union 76 Division,
Western Region, Henderson, Nv.
January 17, 1966
- Oliver M. Frinier, Corporate
Downey, Ca. March 9, 1932
- James A. Graves, Union Chemical
Kenai, Ak. February 28, 1962
- Blaine H. Hague, Union 76 Division,
Eastern Region, Charlotte, N.C.
September 30, 1946
- Clell D. Hanely, Union 76 Division,
Eastern Region, Oregon, Oh.
December 12, 1945
- Beverly C. Hartung, Union 76 Division,
Eastern Region, Cape Coral, Fl.
November 1, 1960
- Barbara F. Huggins, Oil and Gas
Midland, Tx. January 21, 1952
- James E. Johnson, Oil and Gas
Santa Maria, Ca. August 13, 1951
- William O. Lacer, Union 76 Division,
Eastern Region, Brandon, Fl.
September 19, 1945
- Thomas E. Lee, Union 76 Division,
Eastern Region, Nederland, Tx.
April 1, 1947

Clayton G. Longfellow, Union 76 Division, Western Region, Atascadero, Ca. March 8, 1946

Jack R. Lundy, Union 76 Division, Eastern Region, Livonia, Mi. March 4, 1941

Chancey V. McCrory, Oil and Gas Clay City, Il. January 2, 1946

Ethelyn L. Munson, Union 76 Division, Eastern Region, Arlington Heights, Il. May 16, 1960

Helen Nickleson, Corporate Los Angeles, Ca. July 11, 1943

Rudolph F. Prinz, Corporate Alhambra, Ca. December 15, 1952

Ernest R. Rasmussen, Union 76 Division, Western Region, Pinole, Ca. October 20, 1952

Edward J. Rogel, Union 76 Division, Eastern Region, Joliet, Il. May 1, 1945

Harry W. Sibert, Union Petrochemicals Highland Park, N.J. January 24, 1972

Parker C. Smith, Corporate Los Angeles, Ca. September 16, 1969

Jay B. Stanton, Oil and Gas Coalinga, Ca. February 16, 1947

Thomas L. Sudduth, Union 76 Division, Western Region, Vallejo, Ca. August 19, 1955

Glenn G. Weichert, Oil and Gas Houston, Tx. December 6, 1954

Joe F. Wilkinson, Oil and Gas Midland, Tx. December 3, 1945

May 1982

Jose E. Archuleta, Molycorp, Questa Questa, N.M. April 27, 1967

Wayne E. Blake, Oil and Gas Anaheim, Ca. March 1, 1965

Raymond J. Boland, Union 76 Division, Eastern Region, Lockport, Il. April 27, 1942

Carl D. Carlson, Union 76 Division, Eastern Region, Omaha, Ne. November 25, 1960

Olen E. Edwards, Oil and Gas Madill, Ok. February 1, 1943

Edward R. Habegger, Union 76 Division, Eastern Region, Beaumont, Tx. January 20, 1948

John Kovacicck, Molycorp, Washington Washington, Pa. January 12, 1966

George A. La Fortune, Union 76 Division, Western Region, Long Beach, Ca. March 12, 1941

Evelyn L. Mauer, Union 76 Division, Eastern Region, Arlington Heights, Il. February 4, 1952

Preston H. Moss, Union 76 Division, Eastern Region, Americus, Ga. July 2, 1951

Frederick T. Myers, Union 76 Division, Eastern Region, Lakeland, Fl. November 1, 1960

Walter R. Nedlo, Union 76 Division, Eastern Region, Lockport, Il. August 21, 1950

Peter J. Sartori, Union 76 Division, Eastern Region, Lockport, Il. August 1, 1954

Arthur W. Silva, Oil and Gas Santa Maria, Ca. July 12, 1946

Alvin O. Timmons, Oil and Gas Fillmore, Ca. December 22, 1944

Charles R. Tucker, Oil and Gas Lander, Wy. December 11, 1945

Jack N. West, Union 76 Division, Western Region, Santa Maria, Ca. June 20, 1940

IN MEMORIAM

Employees

Homer L. Adams, Pure Transportation Co. Van, Tx. February 23, 1982

Martial C. Bienvenu, Union 76 Division, Eastern Region, Port Neches, Tx. March 21, 1982

Lloyd R. Cain, Union 76 Division, Western Division, Seattle, Wa. February 23, 1982

Tommy Clower, Poco Graphite Bowie, Tx. February 2, 1982

Billy R. Crenshaw, Union Chemicals Chino, Ca. February 20, 1982

Roland O. Dhondt, Science and Technology Long Beach, Ca. February 17, 1982

King R. Heath, Union 76 Division, Eastern Region, Crystal Lake, Il. February 16, 1982

Raymond Hoffman, Union 76 Division, Western Region, Richmond, Ca. February 12, 1982

James D. Mullen, Union 76 Division, Western Region, San Francisco, Ca. February 27, 1982

Ernest C. Rice, Union 76 Division, Eastern Region, Lilburn, Ga. January 30, 1982

William A. Young, Union 76 Division, Western Region, Lockport, Il. February 3, 1982

RETIREES

William B. Ackerman, Sr., Union 76 Division, Eastern Region, Prosperity, S.C. December 30, 1981

Orville V. Anderson, Union 76 Division, Eastern Region, Arlington Heights, Il. December 24, 1981

Eleanor A. Ansley, Oil and Gas Pacific Grove, Ca. January 31, 1982

Elzie M. Bailey, Oil and Gas Madill, Ok. February 18, 1982

Arthur J. Benson, Union 76 Division, Eastern Region, Duluth, Mn. January 17, 1982

John Bergstrom, Union 76 Division, Western Region, Lomita, Ca. January 5, 1982

Jesse W. Bright, Union 76 Division, Eastern Region, Virginia Beach, Va. February 26, 1982

Harold F. Buckholz, Union 76 Division, Eastern Region, Lemont, Il. February 4, 1982

George A. Chlanda, Union 76 Division, Eastern Region, Sun City West, Az. March 7, 1982

Robert L. Clarke, Oil and Gas Midland, Tx. March 1, 1982

Frederick E. Cooke, Union 76 Division, Eastern Region, Minneapolis, Mn. March 15, 1982

Arthur F. Day, Union 76 Division, Eastern Region, Indianapolis, In. March 1, 1982

R. C. East, Union 76 Division, Eastern Region Groves, Tx. March 27, 1982

Claude Endicott, Union 76 Division, Western Region, Eugene, Or. March 12, 1982

George Fish, Union 76 Division, Western Region, Berkeley, Ca. March 8, 1982

John D. Frazier, Union 76 Division, Western Region, Gate City, Va. January 25, 1982

Russell H. Garrett, Oil and Gas Fresno, Ca. December 15, 1981

George T. Golden, Oil and Gas Coalinga, Ca. March 12, 1982

Howard J. Gregg, Union 76 Division, Western Region, Yucaipa, Ca. March 1, 1982

Emerson J. Huff, Oil and Gas Houston, Tx. February 9, 1982

Garl M. Ivie, Petrochemical Las Vegas, Nv. March 6, 1982

Leonard M. Jones, Union 76 Division, Western Region, Fontana, Ca. November 21, 1981

Stephen A. Kashuba, Molycorp Williamfield, Oh. February 28, 1982

Harold W. Lowrey, Union 76 Division, Western Region, Lower Lake, Ca. February 13, 1982

Cecil B. Marshall, Oil and Gas Wichita, Ks. February 15, 1982

William O. Massey, Union 76 Division, Eastern Region, Louisville, Ky. March 4, 1982

John M. Morris, Pure Transportation Co. Flora, Il. March 15, 1982

Leslie S. Morris, Union 76 Division, Western Region, Kirkland, Wa. March 2, 1982

Elmer E. Mounts, Molycorp Washington, Pa. February 6, 1982

Freeman Myers, Oil and Gas Olney, Il. February 16, 1982

Arthur L. Reed, Corporate Sun City, Az. March 3, 1982

Clarence Ripperda, Union 76 Division, Eastern Region, Grand Rapids, Mi. February 26, 1982

Ollis Stallings, Union 76 Division, Eastern Region, Cape Girardeau, Mo. February 14, 1982

George J. Tate, Oil and Gas Fillmore, Ca. February 10, 1982

Onema M. Waggoner, Union 76 Division, Eastern Region, Toledo, Oh. February 12, 1982

Frank Washichek, Oil and Gas Tulsa, Ok. January 31, 1982

Laura B. White, Pure Oil Dry Branch, W.V. December 1, 1981

Richard D. White, Oil and Gas Lafayette, La. February 13, 1982



UNION OIL COMPANY OF CALIFORNIA
 P.O. Box 7600
 Los Angeles, California 90051

BULK RATE
 U.S. POSTAGE
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SEVENTY SIX

UNION OIL COMPANY OF CALIFORNIA

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COVER: A jewel-encrusted porcelain Buddha reflects the glory and splendor of Bangkok as the city—hub of Union Oil's activity in offshore Thailand—celebrates its 200th birthday. **Photo by Sergio Ortiz**

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