## SEVENTY SIX September/October, 1981



## SHALE: the incredible stone that burns

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It is understandable why the Utes were amazed by the rocks. But what they thought to have discovered was far from new.

"The stone that burns" actually had been known for centuries in Europe. The Anglo Saxons even gave it the name by which we now know it—"shale," a limestone rich in a rubbery fossil fuel called kerogen. Shale is found in vast quantities throughout the world and people have been attempting to extract the kerogen within it by various methods for some time. A patent was obtained in England for a process to distill a synthetic fuel from the rocks as early as 1694. To this day, some European countries have a small production of oil from shale.

For the past 300 years scientists and researchers have been aware that it is possible to extract the kerogen, but they were stumped in finding simple and economical ways of doing it. It is only through a series of complex circumstances that today the recovery of the elusive fuel is finally becoming a reality.

Such a promising reality, in fact, that shale today is considered to be the first and most significant contributor to the bright future that lies ahead for the synthetic fuels industry.

Despite all the experiments and studies on shale that

have been undertaken through the years, it's only recently that the once uncharted seas of the rock's future have been mapped. Some 150 years ago, a moderate amount of oil was produced from shale in this country but this production came to an abrupt halt when massive discoveries of cheap, easily accessible Pennsylvania crude triggered the dawn of a new era for domestic oil.

Today, the reservoirs of plentiful crude have been considerably depleted, although they are far from dry. The nearly six million barrels of oil that must be imported from foreign shores daily to keep this country's industrial wheels moving have finally awakened the public to realize that the vast deposits of alternative energies lying within our shores must be produced.

Chief among these sources are shale and coal. Shale, however, holds the upper hand and the brightest outlook because it contains more hydrogen and fewer impurities, thus making the refined oil from it a far more desirable product.

But there's a catch to this.

Although shale—and coal—are plentiful in *solid* forms, it is only through tremendously high costs and careful processing that the oil can be extracted from them.

In that same general area where the hardy band of Ute



Once the explosives are set 10 feet into the mine face, workers wire the charge that eventually will free tons of shale rock inside mine.

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A large truck goes into the mine through one of several mine adits to retrieve freed shale rock. The project will be in full operation by 1983.



A "jumbo" opens a new mine adit on the bench site. Union's properties are estimated to hold 1.6 billion barrels of recoverable oil.

warriors saw the walls of the canyon burst into flames—a 16,000-square-mile zone in Colorado, Utah and Wyoming—America's greatest concentration of shale lies. The rocks in these states are believed to hold an estimated 1.8 trillion barrels of recoverable oil. That figure is at least three times the world's conventional oil reserves and if only one-third of this shale oil is ultimately recovered—or some 600 billion barrels—the United States would be in the enviable position of having on hand over 20 times the proven reserves found in this country today, or approximately 100 years of uninterrupted supply at the present rate of consumption.

These facts have been known for years, but for generations economic realities have forced the huge supplies of energy so prominent in the Rocky Mountain states to remain untapped.

Today, the high price of imported crude and the uncertainty of its availability have made it feasible to produce oil from shale. That is why a handful of energy companies have been taking a second, more careful look at the energy trapped within "the stone that burns."

For Union Oil Company, however, oil shale has long been a subject of consideration. The company is not, by far, a Johnny-come-lately to the oil and shale arena. Even as far back as 1920, a Union geologist named Roger H. Burnham, after conducting extensive studies and surveys through the Colorado shale country, wrote the following: "There are not textbooks on cost of mining, retorting or refining, nor, in fact, any assurance that a suitable oil can be obtained from the shales at anything like a reasonable cost."

The problem, as defined by Burnham's last three words, could not have been better simplified.

But even in those days when the words "energy" and "crisis" would not be joined for another 50 years, the handwriting was on the wall. In the same year of Burnham's study, Union Oil decided to proceed with the acquisition of oil shale properties in the Parachute Creek area in western Colorado's Garfield County.

These shale-rich properties are estimated to hold some 1.6 billion barrels of recoverable oil in what is known to be a high yield Mahogany zone alone, according to John M. Hopkins, president of the Union Energy Mining Division. Hopkins says that these reserves "are large enough to produce about 100,000 barrels of shale oil per day for nearly 45 years."

So promising is the outlook of the company's shale operations that even in the not too recent 1940s—a period



This five-acre site is where the shale retorting complex will stand.

considered as the Dark Ages of oil shale development— Union began to develop these vast resources by operating a small, 50-ton per day pilot retort plant at its Los Angeles Refinery.

From 1955 to 1958, Union built and operated a larger retort plant in Parachute Creek to process up to 1,200 tons of shale rock per day. This produced a daily output of about 800 barrels. During that period, oil shale's ancient nemesis—the availability of cheap crude—appeared once again and the company was forced to suspend its operations. Research efforts, however, were never abandoned, Union Oil having developed a unique upflow retort processing method which is the forerunner of today's project.

Following the oil shortages caused by the OPEC embargo of 1973, Union accelerated its efforts to succeed in the commercial production of oil from shale and thus help alleviate the crisis which set the world in turmoil.

Five years after the embargo, Hopkins appeared before the Garfield County commissioners and announced plans for the first phase of a Union Oil project to develop the first commercial shale oil plant in Colorado and the nation. This first phase included plans for a mine, retort and upgrading facilities to process 12,500 tons of oil shale



Workers sink the retort sealing leg and service shafts on the bench before installing the headframes and hoist foundations for the shafts.



A crane lifts a pre-fabricated housing unit into place during construction of Union's single workers' housing complex.

per day which would result in 10,000 barrels of highquality syncrude. This syncrude would be a preferred petroleum feedstock in any of the country's most modern refineries.

One month after Hopkins made his presentation, Union Oil started the long permitting process that would make the shale project a reality. Today, all the federal, state and local permits for both the mining, retorting and upgrading plant have been obtained and the company's shale operations are now underway.

In the fall of last year, the necessary road work was started and, this year, the pre-development mining operations began. Presently, over 500,000 tons of shale rock have been mined and the opening of various mine adits has been completed in preparation for the production of ore.

According to Hopkins, "Union plans to begin on-site construction of the retort and upgrading facility early in 1982 and we hope to have the project finished by mid-1983."

Visiting the Union property at this time one can see that the underground mine development is proceeding at full pace, the bench site for the retort is completed and even the upgrading facility is being erected in the valley.

Work on the project, despite the massive activity going on at the present, has been underway since 1980 when it was decided that the nation's urgent thirst for domestic energy made it possible that at some time in the future adequate financial assistance could be negotiated with the federal government and it would be wise for Union to start one step ahead.

Soon after, Union received notification that it had been chosen as one of the energy companies selected to negotiate a contract with the Department of Energy.

Months of negotiations and reams of paperwork were still to be done, and it was not until last July that Union Oil entered into an agreement with the Department of Energy to start the nation's first commercial production of oil from shale rock.

As part of this agreement, and starting with actual shale oil production, the company will deliver 3,000 barrels per day of military aircraft turbine fuel and 7,000 barrels per day of military diesel fuel to the Department of Defense.

The contract calls for the price of the fuel at the time of delivery to reflect market price. If this price is below the Department of Energy contract floor price of \$42.50 per barrel, indexed for inflation, the company will receive a payment from the government to equal the difference. The price support will apply for a period starting July 1, 1983, but only if production has started by that date. The contract is scheduled to end on June 30, 1990, or by the date by which the synthetic fuel facility has produced 20 million barrels of syncrude, whichever comes first. In any event, the total price support payment cannot exceed \$400 million.

Hopkins explains: "If the price of oil escalates faster than inflation, the government will pay only the market



Workers put the finishing touches to one of the drainage ditches in the housing complex that offers all the comforts of a modern town.

price and there will be no price support of any kind. Also, all technological risks are Union's. Unless and until the company produces oil from shale, the government has no responsibility or liability."

Obviously, it is no simple matter to start a project of this magnitude.

The steps of mining oil shale, retorting and extracting the kerogen have taken years of preparation. Myriad considerations have been scrutinized, analyzed, studied and debated by literally hundreds of persons before the project had even taken its first step.

One of the foremost considerations given the shale project was the changes that will take place in the sleepy mountain town of Parachute—population about 400—and its surroundings. From the start, Union Oil has recognized that a substantial impact on housing and public services will affect the town and its neighboring communities. Additionally, some changes are expected to occur in the town's water and sewer systems, public safety, schools, recreational facilities, highways and public administration.

To meet these changes, Hopkins says that "the company is prepared to work closely with the local officials  $\xrightarrow{}$ 



Eight miles from the retorting complex workers build the upgrading site where the oil shale will be made acceptable for refining.

to help solve any problems—hopefully before these problems surface. Every effort has been and will be made to assist in handling population growth in an effort to preserve the life style enjoyed in western Colorado."

Union already has expended or committed \$60 million through 1983 to help alleviate the socioeconomic impact the project will have on the area. This \$60 million represents 12 percent of the \$500 million the entire project will cost.

As part of this "impact assistance program" Union Oil has built or has under construction 192 apartment units, 129 condominiums and townhouses and 40 mobile home units. Union also owns property in Parachute and the nearby town of Rifle capable of accommodating up to 1,400 dwellings.

The magnitude of Union Oil's shale project can best be discerned some five miles north of Parachute where an entire community of single workers' housing is sprouting in the middle of nowhere.

Realizing that it is not just a matter of moving into an area to exploit the natural resources, the company has taken painstaking care to see that all the needs of both its workers and the community are met.

Completed in September, this single workers' housing will initially accommodate 750 employees. The facility can be expanded to accommodate 1,400 employees if necessary. The housing provides a private room and bath for each employee and is complete with a cafeteria and a



large, modern recreation center which will ease the impact on limited facilities in Parachute. The housing subsequently can be enlarged to accommodate up to 1,400 workers if the need arises.

Union Oil is providing approximately \$4.2 million of financial assistance for a new middle school to serve Parachute and adjoining areas of Garfield County, building a highway bypass around the town of Parachute and spending \$6 million to improve a county road leading to the site. Parachute also has received \$600,000 as advance payment for 200 sewer and water taps, and another \$250,000 to purchase additional water rights and improve recreational facilities.



The new and modern single workers' complex facilities include a cafeteria, barber shop, commissary, game room, and laundry.

During the construction phase, Union is providing Parachute and Garfield County with funds to hire and outfit seven police and sheriff officers.

An economic study by the company indicates that once the 10,000 barrel per day unit is constructed and in operation, the taxes and other revenues received by the state, county and local communities will more than offset the cost of additional services and facilities required.

With all this activity it is obvious that the time for shale oil to make inroads in the energy world has come. There are many hurdles, chief among them are a series of environmental considerations which had to be thoroughly studied and meticulously explored. But thanks to the extensive research conducted by Union scientists, satisfactory solutions have been found for these problems.

The water for the project will be recycled in the retort process. Union plans to compact the retorted shale rock and then add a layer of topsoil before re-seeding the area with native vegetation.

All the activity in northwestern Colorado is signalling the birth of a new era in America's domestic energy picture. It signals the not too far-off day when automobiles will be powered by fuels wrung from the strange rocks that once awed and then terrified a band of Ute warriors countless years ago.

## How oil is extracted from shale

Oil shale is a marlstone four times the strength of concrete. By heating this rock to 700 to 900 degrees Fahrenheit, kerogen is released to form crude from "raw" shale oil.

Shale for the initial project will be mined from the rich Mahogany zone of the Green River geological formation. The entrance to the underground mine is located about 1,000 feet above the valley floor. Mining plans call for rooms 55-foot wide and 60 feet high, with the roof supported by 50 by 100 foot pillars of unmined rock.

In the first zones being mined, an average yield of 34 gallons of shale oil per ton of ore is anticipated.

Large hydraulic drills called "jumbos" will bore holes for explosives in the mine face. Explosive charges will wrest the rock and large front-end loaders will load the ore into 50-ton off-road trucks which will haul the shale to the primary crusher in the underground shale preparation area.

The shale ore will then be crushed in two stages to less than two-inch pieces to produce a size suitable for the retort. It will be transported to the surface by conveyor belt and given a final screening before being fed into the retort.

Union Oil's upflow retort, located on a five-acre bench



site just outside the mine entrance, is a large piece of machinery 20 stories tall. The crushed ore enters the rock pump underneath the retort where a 10-foot diameter piston will force the ore upward into the retort.

Heated gas enters the top of the retort, releasing the kerogen contained in the shale and producing the raw shale oil in both gaseous and liquid forms. Most of the hot vapors will condense, leaving a high quality gas which can be purified and burned to heat the recycled gas inside the retort



system and to provide steam to operate the retort equipment.

The retorted shale, with all the oil removed, will be forced up and over the edge of the retort cone, falling by gravity through a cooling system.

The cooled retorted shale is moved by conveyor belt to an enclosed chute which transports it to the canyon floor. There it is spread, compacted, contoured and vegetated with native flora to blend into the surrounding landscape. Solids suspended in the raw shale are removed and the oil is transported by pipeline to the upgrading facility some eight miles away from the mine and retort.

There hydrotreating, a process in which the oil is subjected to high temperatures and pressures in a hydrogen atmosphere and in the presence of a catalyst, will remove the impurities. The resulting synthetic crude can then be readily converted into a full range of petroleum products by any of the nation's modern refineries.



# MARILYN,

## **Union's Angels**

**N** O ONE KNEW WHO the seductive blonde was. At the time, she was just another ambitious and struggling young actress hoping to get a break in what is considered the toughest of all businesses. When she, in a silky, sexy voice, purred about putting Union Oil's Royal Triton Motor Oil into her car, it was the first and only television commercial she was ever to make in her short but dazzling career.

That was one of the first breaks the actress who would soon be internationally famous as the blonde goddess herself, Marilyn Monroe, received in her brief and legendary career.

It was 1949—not more than two decades after the first cathodes were shot through a picture tube—when television was the new marvel of the day. Hal Roach Studios, pioneers of early comedy movies, were just beginning to experiment in the relatively new field of television advertising when Hal Roach, Sr., met Union Oil's then President Reese Taylor and suggested the company do a commercial in the new medium.

The classic ad features Monroe arriving at a Union Oil station and pointing to a little sports car she tenderly calls "Cynthia" while declaring in her inimitable little girl's voice, to an enthralled attendant that "Cynthia" is to get the best care possible. "So put a quart of Union Oil's Royal Triton Motor Oil in Cynthia's little tummy," she coos.

Without question, Monroe is definitely the most celebrated of all the stars that have appeared in Union Oil commercials, but she is not without good company.

Old videotapes of the company's ads reveal, among others, an

# FARRAH

unknown, even then angelic-looking, Farrah Fawcett and an all-American youngster, Larry Wilcox.

Even those less well-known, such as Richard X. Slattery, who portrays Murph in the company's nationally televised commercials; George Ralph Di Cenzo, who plays Nick and Jean Rasey, who becomes Jill in Union's television commercials have a solid, established footing as actors and actresses.

It's all in the casting, an undertaking which Carroll Sugar, account executive of Leo Burnett U.S.A. Advertising, the company responsible for Union's television image, considers an art form all to itself. "You can have the greatest top banana but if he or she doesn't fit the part well, the whole commercial can be ruined," says Sugar.

The process of producing a commercial begins with Union's advertising people and Burnett's creative personnel working with a preconceived idea of what the company thinks should be conveyed in the commercials. The idea evolves to take the form of "story boards" several large pieces of cardboard divided into four frames, each displaying a graphic artist's conception of the significant scenes and the commercial's accompanying text, sound and other effects to be used.

"This is a good way to present our ideas to clients without committing the concept to film or tape, which is very, very expensive. The proper people have the opportunity to say 'this is great,' or 'this is great but must have some modifications.' Then, at this time, when everyone has agreed, 'the story board' becomes approved for filming," explains Sugar.





Farrah Fawcett gets some help at a Union Oil station.

It's the responsibility of the producer to organize, coordinate and execute everything necessary to make the commercial and to hope for its effectiveness; and along with Burnett's creative director, and Union Oil, have the talent needed for a successful commercial.

Because most commercials are produced in series that often last a number of years, diligence must be taken to cast just the right personalities to vaunt Union Oil on national television. "We took about four months to select the talent for the Murph commercials because we knew these commercials would run a long time like the previous Union Oil one, those which featured George and Marge," says Doug Huse, producer at Leo Burnett who began the Murph series in 1973 and stayed with it until 1979.

The George and Marge series, a very successful Union Oil promotion, ran for four years. "George was a sort of know-it-all guy and he'd get himself into various and sundry situations which would eventually get him talking about gasoline and various Union Oil services. Marge, his wife, was usually the smarter of the two and she played the straight 'man.' She always extracted George from the sticky situation he'd gotten himself into," Huse explains.

On one occasion, George got himself into an embarrassing jam with a tennis attired Farrah Fawcett. The scene called for an attractive young lady to drive up in a sports car with its horn malfunctioning. A bumbling George steps in for the rescue, only this time it was a trusty Union Oil attendant, rather than Marge, who deftly solved the rather noisy problem.

"It was a very minor part for Farrah Fawcett," says Sugar. "Occasionally people go beyond to attain the fame that Farrah Fawcett did. It does happen, but not very often," says Huse as he flips through old files in his Hollywood office.

"It seems to me that all of the actors we have picked for Union commercials have gone on to become a big character backbone in the acting community. They may not be the stars, but they're always there." Sometimes the producer will hire a casting director to conduct a casting session but often he, along with the writer, will do the casting himself as Huse did for the Murph series.

A casting session normally lasts two or three days. The actors and actresses come in and read the script with whomever is conducting the session. They only have two or three videotaped minutes to give a convincing performance.

Five or six will clear this first hurdle and have a second or sometimes a third or fourth chance, to another casting session where they will be given 20 minutes to an hour to work with the role. The producer, film director and creative director review the videotapes and make their first and second choices. Videotapes of these are sent on to Union Oil for approval.

Each person develops his own method for rating the actors in the casting sessions. Some use numbers, but Huse uses words. In weeding out actors while the casting sessions to find the Murph character were being held, for example, he made some of the following notes: "too old, much too broad, no range."

In New York and Hollywood, Huse sat down with 70 to 80 Murph-type actors and had them read the first script ever written for this series. To this day, he can recite the commercial almost word-for-word from all the readings he held. Finally, Richard X. Slattery was cast for the part of the man who supposedly was to typify all Union 76 dealers, "a crusty, old guy who had all the training and ran a tight shop," as described by Huse.

Slattery, an ex-New York City police officer, began his acting career during the late 1950s in off-Broadway productions and later moved to Hollywood where he has been a fixture in many movies and television series. Recently he played the commanding officer in Don Rickles' *CPO Sharkey*.

Another character in that first Murph series was Billy, the young gas station attendant who had all the

questions. He wasn't quite as worldly then, but he is now known as California Highway Patrol Officer Jonathan Baker in "CHiPs"; Larry Wilcox, however, proved to be the perfect Billy. "We saw every young kid between 14 and 23 who had heard about the audition. They just lined up. When Larry walked in we knew we had found the character we were looking for. He had just been discharged from the service and had done one Walt Disney movie, nothing else. We found that he had that 'oh gosh, shucks' kind of personality and that he was great for the part," recalls Huse as he watches the old videotapes of that first session.

It's a rare person who can just walk into a part and can fit it perfectly. Sometimes, when a person can't be found to fit the part, the part has to be made to fit the actor as in the case of Nick, who is played in Union Oil commercials by George Ralph Di Cenzo, the smart-alecky foil to the serious yet lighthearted Murph.

"We had a hard time with the character Nick. We wanted a kind of ethnic looking guy but we couldn't find quite what we wanted. We went through so many actors trying to find in them a sense of humor and a simple likeability and came up with nothing," says Huse. "I went through all the tapes again and again hoping to find the right character, but I had developed a different point of view. The character had gone through a complete evolution. I remembered Di Cenzo so we held the fourth and fifth call back. We actually wrote the part around him, tailored it to him and he was great. We knew we had our guy."

Di Cenzo has performed in numerous films and television shows: among the more well known are *Close Encounters of the Third Kind*, and CBS-TV's *Helter Skelter* where he played the part of Vincent Bugliosi, the famous prosecuting attorney in the Charles Manson trial.

It's difficult to detect the nuances during casting that prove a performer is right for the part. After years of experience Huse has acquired the ability to be able to tell, sometimes within two readings, if he has the right person needed for the role.

"You know you have the right actor by the way the actor sells himself. A good actor doesn't just read the copy, which is what 90 percent of beginners do. Good actors give the role—no matter how small it is—a glimmer of hope. They inspire some confidence in you. They are able to take a dull piece of white paper with some typewriting on it and they do something with it, they make it come alive," explains Huse.

When Jean Rasey auditioned for the part of Jill, the petite assistant to Murph, she did just that. "You see, Jean just had a spark. She had a little twinkle in her eye. She was off the cuff and kind of funny. She knew she was reading a mixture of legal jargon and advertising copy, which is what we originally asked her to read," explains Huse, "and in that piece of copy there were a few lines that made it a believable situation. She picked those lines up."

The character Jill, a perky female

Union Oil service station attendant, was first added to the Murph campaign in 1977. Rasey previously had done some minor acting and later, after having done the Union Oil commercials, she landed a part in the *Nancy Drew* mystery series.

Huse calls Union Oil commercials "the actors delight" because they (the commercials) always have an element of drama in them—in 30 to 60 seconds a character must be developed, along with a sales message. "They are little vignettes and an actor can get a lot of mileage out of the small roles. We used to pull our actors out of the unknown files, but now the agents are sending us the cream of the crop simply because it's a Union Oil commercial and it's quite a respectable role to have had," he adds.

Union Oil's commercials have been building an advertising tradition—even as far back as the early days when Marilyn Monroe sultrily sauntered out of her sports car called "Cynthia"—that has gained the company much respect in today's advertising world.









By Fred L. Hartley Chairman and President of Union Oil Company

HE WORLD ENERGY picture is a very broad subject—one that we could discuss for the next several weeks. Instead, I would like to focus on the changes that we have seen in the supply and demand picture for energy in the world, and offer my ideas on where we are going for the rest of this decade in terms of energy.

It is now generally accepted that the energy shocks of the past decade were no passing phenomena. The Arab oil embargo in 1973 and the Iranian cutoff in 1979 showed the world how painfully dependent it was on OPEC for its energy lifeblood—oil.

Furthermore, in the 1970's we became aware of the replacement cost of energy which had been masked by the abundant supplies of the previous decades.

The economies of nations around the world have been buffeted by this dramatic increase in the price of oil. The 150 percent increase in the price of OPEC oil since 1978 has compressed and synchronized business cycles, accelerated inflation, induced restrictive monetary policies and forced a general slowdown in business spending.

Energy, once taken for granted, has catapulted into the forefront of factors considered in economic planning for nations around the world. No nation has been immune from the sting of OPEC.

The almost universal reaction to this new energy reality has been reduced energy consumption, increased energy efficiency and a new willingness to develop both conventional and alternate energy resources.

Taking these points, I hope to focus on the scope of the changes that have taken place in respect to energy usage. Last year, as the world reeled from the effects of higher energy prices, worldwide demand for oil products fell below sixty-two million barrels per day, the first such decline since 1975.

Demand in 1981 is forecast at slightly more than 59 million barrels per day, down nearly four percent.

This reduced consumption has been mostly at the expense of OPEC producers. In the first half of 1981, OPEC production declined more than 15 percent as compared with the same period last year. Buyer resistance to out-of-line high prices charged by many OPEC producers chopped the cartel's oil flow by nearly four and one-half million barrels per day to 24 million. That is down from more than 28 million barrels per day during the first half of last year. And it is the lowest level of OPEC production since 1971.

In fact, OPEC oil production accounted for less than 42 percent of the world's non-communist production this year, down from a high of nearly 54 percent in 1976.

At the same time, free world non-OPEC oil production has been on the rise, increasing about five percent a year. New production increases in the North Sea, Mexico, Latin America, India and Indonesia added about 600,000 barrels of oil per day to world supplies.

The higher prices and the potential for severe shortages have led many nations to guard their precious supplies and make important strides towards improved energy efficiency. On a worldwide scale, the rate of growth for energy is expected to slow to two and onehalf percent a year to the end of this century. This

Energy, once taken for granted, has catapulted into the forefront of factors considered in economic planning for nations around the world.

compares with a little more than three percent a year for 1974 and 1979.

More importantly, though, the ratio of energy growth to income growth will decline by one-fourth.

We are also seeing a dramatic transition in the mix of primary fuels. The growth in demand for oil is expected to average four-tenths of one percent a year to the end of this century. Between 1973 and 1979 demand for oil had been increasing at 2.2 percent a year.

The growth in the demand for natural gas is expected



to slow similarly. However, we can expect the demand for coal to increase at an accelerated rate in addition to seeing a greater contribution from hydro, geothermal and other energy sources.

By the end of the 1980's, petroleum's share of the fuel supply will decline to around 58 percent from 76 percent in 1979. By the year 2000, oil and natural gas will account for only 50 percent of the world's energy supplies.

Demand in 1981 is forecast at slightly more than 59 million barrels per day, down nearly four percent.

The contribution from coal, including synthetic applications, could amount to 30 percent by 2000. The nuclear, hydro, geothermal and other resources category is expected to increase its relative share of energy supply about in step with oil's decline.

During this transition, important differences will be evident among regions in their demands for fuel. The developed industrialized economies will be shifting away from oil and gas into nuclear, coal and nonconventional forms of energy such as geothermal, shale oil, solar and other alternatives. The developing countries, however, will increase their oil consumption for transportation and industrialization purposes, but cut back on wood and other primitive fuels, while also leaning toward greater nuclear, hydro and coal utilization.

There is no doubt that conservation and reduced reliance on OPEC has made the world energy picture more favorable today. The world has made significant progress toward putting its energy house in order.

These numbers are just part of the story, though. What is happening today is a change in attitudes about energy and energy development. There is a new, strong commitment.

The southeast Asia region is a good example. The nations here have experienced significant economic progress in recent years. Countries such as Hong Kong, Singapore, Indonesia, the Philippines and Taiwan have become major economic entities in world commerce.

Much of this progress has been fueled by imported oil. Now these nations face the challenge of maintaining historic growth rates in an era of higher energy prices.

To meet this dilemma head-on, there has been a higher level of investment to develop domestic energy sources—and this investment is being made principally by foreign firms, notably American energy companies. In the past, the political climate in many nations has been a major obstacle to investment by U.S. companies and others in energy resource ventures. Today, many of those nations have struck a new balance between the desire for economic growth and economic nationalism in order to attract the participation of foreign companies and risk capital which is needed to develop domestic energy resources.

The most spectacular example is in the Philippines. This country has been blessed with enormous geothermal energy resources. In less than seven years after Union Oil Company drilled the first commercial scale discovery well, geothermal steam was being delivered to an electrical generating plant. Today, the Philippines is the world's second largest producer of geothermal energy after the United States.

The political climate in many nations has been a major obstacle to investment by U.S. companies and others in energy resource ventures.

The two project areas, Tiwi and Makiling-Banahao, provide about ten percent of the Philippines' electrical energy needs. At Tiwi, geothermal steam is powering 220,000 kilowatts of generating capacity, with another 110,000 kilowatt generating plant due to start operation later this year. At Mak-Ban, a total of 220,000 kilowatts of generating capacity is currently on-line and another 110,000 kilowatts is planned.

Under an accelerated development program, the Philippines intends to have more than 1,700 megawatts of generating capacity, enough to supply 18 percent of the nation's electrical energy needs, powered by geothermal energy by 1985.

The success of the geothermal energy development program in the Philippines has not been solely the result of technological advancement. The rapid development of this important energy resource has been possible because of the participation and support of the Philippine government and its agencies, the National Power Corporation and the Philippine National Oil Company, with the Union Oil Company.

The Philippines has lifted the legislative and contractual barriers which in the past have deterred such transfers of technology and investment and Union and the Philippines have both benefited. The result has been a significant move toward secure, domestic energy which is cheaper than OPEC oil. At the same time, this venture has increased local employment while allowing a reasonable profit to Union Oil Company.

The pattern developed in the Philippines experience with geothermal energy is now being repeated in Indonesia and Japan. In Jakarta, the Indonesian government is negotiating with Union Oil Company on a joint venture agreement with the state-owned oil company, Pertamina, for a geothermal development program on the island of Jawa. In Japan, Union has joined with Japan Petroleum Exploration Company and Nissho Iwai Corporation in a joint venture to explore for geothermal energy on the island of Hokkaido.

Both of these ventures could provide significant contributions to the energy picture in those nations in the years ahead.

The entire Asian region has become a very active energy development area. Offshore northern Japan, a new oil field is being developed which will help reduce that country's dependence upon foreign oil. In Thailand, the first natural gas production from offshore fields developed by Union Oil Company has begun. Based on estimates of reserves discovered so far, Thailand may well become energy self-sufficient in the coming years.

The People's Republic of China has an ever-increasing need for energy as it moves toward industrialization. China has opened its doors to foreign oil companies to explore for and develop its potentially vast offshore reserves. In addition, water is a major untapped resource. China has 18 large hydropower stations and 90,000 small micro-hydro units, which utilize only about three percent of China's 370,000 megawatt hydro potential. Another part of its energy program is to promote biogas plants. About seven million biogas units are now in use in China, almost all in Sichuan province.

India and Pakistan, too, have big programs to promote

Asia uses just nine percent of its hydropower potential, Latin America eight percent and Africa five percent, compared with industrialized nations 32 percent.

biogas plants which turn animal and crop wastes into methane for both cooking fuel and fertilizer. Nearly 200,000 of these plants have been installed on private farms on the Punjab Plain, which lies within India and Pakistan. India also underutilizes its hydro potential. Only 11 percent of 75,400-megawatt hydropower potential is tapped.

On a worldwide scale the story is the same. Asia uses just nine percent of its hydropower potential, Latin America eight percent and Africa five percent, compared with industrialized nations' 32 percent.

This new consciousness about energy—not just oil and gas, but energy in all forms—is worldwide. Throughout the world, we are seeing a drive to develop new energy resources. In Africa, throughout Latin America, in Asia—the search continues.

A review of the world energy picture makes it evident that we should be both cautious and confident about the future.

First, we should avoid being lulled into a false sense of security which might dull our efforts to develop new



energy sources. The industrialized and developing nations continue to be dependent upon OPEC for more than 40 percent of their oil.

Oil demand is expected to peak at about 73 million barrels per day by the year 2000, and considering the expected moderate growth rate, it will be necessary to discover and develop 50 percent of the world's estimated one trillion barrels of undiscovered conventional oil.

There is an awesome task ahead of us. It will take much effort and investment to develop this additional production.

On the other hand, there is ample reason to be confident about the future. The progress made by consuming nations over the past two years shows that increased energy security lies within our grasp. Changes in the attitudes of governments have provided the stimuli to massive energy development. We are using energy more efficiently and discriminately.

The United States, once branded as the world's most profligate energy user, has been the leader in adopting this new approach to energy. Our actions have made a major contribution toward stabilizing the world oil market. Since the Iranian cutoff in 1979 we have removed two million barrels per day of demand from world markets. This reduction in the demand for oil is now helping to keep petroleum supplies plentiful and hold down crude oil prices.

The pace of our synthetic fuels development effort

There is an awesome task ahead of us. It will take much effort and investment to develop this additional production.

has picked up. Union Oil Company, for example, will have a 10,000 barrel per day shale oil project in operation in mid-1983, less than two years from now (see page 1). This will be the first commercial synthetic oil production from shale rock in the United States. Coal production has increased. We are drilling more oil and gas wells than ever before.

In terms of the rest of the world, the efforts by the United States are having a double effect. First, it is reducing overall demand for OPEC oil production, and second, the development of alternate energy sources is serving to keep a lid on the price of OPEC oil.

I have outlined the world energy picture as I see it. It is obvious that there is a need to continue to press ahead in the search for a lasting solution to our energy problems. To subscribe to the commitment that is necessary will put a heavy burden on the already scarce supply of the high level technical and managerial manpower inventory of many nations as well as on the limited supply of capital resources. The American energy companies which possess the requisite talent and financial strength will play a leading role in this effort and countries like the Philippines will benefit.

The energy issue is pervasive, affecting all aspects of production and resource use. It is central to the development prospects of the entire world.

As I see it, by pursuing policies which generate and promote the financial and technical support needed for expanded energy production and wiser energy use, nations will be taking an important step along the road toward future economic well-being and political stability.

These are remarks made by Fred L. Hartley to the American Chamber of Commerce in Manila last month.

# Keeping Memories Alive



E. O. "Swede" Tudor lovingly cares for a landmark that was part of his past.

VEN THOUGH E. O. "Swede" Tudor has retired he's still hard at work.

And some work it is.

For the past four years, the 74-yearold Union Oil retiree has been looking with tender loving care after the Dallidet Adobe House in San Luis Obispo, Cal. No one has been found to match the affection the dedicated caretaker gives the old adobe since Tudor tried to retire from his duties there last May—only to faithfully appear at eight each morning to unlock the chain link gates of the house and begin his daily chores.

The Dallidet Adobe, built in 1853, has been declared a state historical landmark. Only a few of this type of unique architectural structures still stand. The style, which dates back to ancient Egypt, has been passed along from one civilization to another and was introduced to North America by Spanish priests building missions along the west coast in the 1800s.

Tudor declares that he acquired his job as the adobe's caretaker "because I was just too handy." This handiness has resulted in the installation of a fire alarm system in the structure and the clearing of paths that enable visitors to enjoy the expansive garden surrounding the quaint little adobe. "When I first came here it (the garden) was like a jungle," he says. "I got a machete and went through the place like a wild man. After an hour or so, two people could walk side-by-side on the paths." Keeping the growth at bay and grooming the foliage is an almost fulltime job for him.

Tudor's ties to the landmark extend above the requirements of daily upkeep and go beyond the call of duty. He spent his boyhood just a few blocks away from the site and was close to Paul Dallidet, the last of the clan, who willed his family's then 100-year-old manse to the San Luis Obispo County Historical Society in 1958. As a member of the society himself, Tudor has devoted much to the historical research of the family and the dwelling.

During the summer (the adobe is closed in the winter) and on Sunday afternoons Tudor spends his time greeting visitors and retelling the Dallidet history which began in 1851 when Pierre Hyppolite Dallidet, Sr. arrived in San Francisco. In 1853, the French vintner and his new wife built the front room of their new home in San Luis Obispo and established a winery. As the Dallidets' seven children were born, wooden additions, including a loft where the four sons slept, were made to the original adobe.

Tudor recalls the neighborhood's youthful mischief that went on around Dallidet's vineyard. "I can truthfully say that Dallidet picked grapes in the daytime and we kids picked them at night. In those days, the high school was nearby and, you know, on the way home we all had to reach out and grab a handful of grapes," the white-haired man says with a smile.

A rose garden now graces the site of where the winery once stood. Footpaths wind their way through thick vegetation on all that's left of the once plentiful, 19 acre vineyard, now on a one acre lot where the adobe, surrounded by small, modest homes,



The 138 year-old adobe still stands on a one acre lot-all that's left of the 19 acre vineyard that once surrounded it.

peacefully sits. A newly laid brick patio opens up to a jungle of greenery. There are no grapes left but Tudor, as he strolls through the grounds, occasionally plucking a just sprouted weed from the earth, points out the graceful old avocado and orange trees that Dallidet planted years ago. A new roof and a fresh layer of plaster protect the sun-baked adobe bricks made from the same fertile soil where grape vines once flourished.

Aside from a light installed for the safety of touring visitors, the inside of the house remains as it did when the Dallidets occupied it. A baby grand piano stands in the corner of the front room. A wooden chest carved by one of the Dallidet women hangs on the wall. Scattered throughout the house are paintings made by a member of the family. "Dallidet had a very talented family," explains Tudor. All of the Dallidet furnishings remain there.

It's easy to imagine the dim light once cast by a whale oil lamp illuminating long shelves of old leather bound books, magazines and papers. From this room, Tudor has uncovered much of the family's history. "Sometimes I like to come up here and just read," he says. "There's a history to everything in here. I wish we knew a lot more about some things because going through old newspaper clippings, I've found quite a few contradictions." Tudor also



In years past the small town of San Luis Obispo had its own thriving street car system.



Remembrances of days gone by, like this old carriage, are plentiful on the grounds.

draws on memories of his acquaintance with Paul Dallidet, who at one time also worked for Union Oil. "I'm sorry that I wasn't more inquisitive about things then," he adds.

The premises even have a small railroad station which now only houses a street car. "Now, in the old days," Tudor begins, "the only way to get into town was by stagecoach or steamship into Port San Luis. The first railroad into town was a little narrow gauge that ran from San Luis Obispo to Avila and Los Olivos near Mattie's Tavern. It (the railroad) was a thriving business for a long time. There was a big wooden hotel, the Ramona Hotel, across from the railroad right-of-way," he continues, pointing at a map. "They put this station here to accommodate the people who were going to the hotel. The streetcar went out of service in 1901."

Tudor began his 40 year career with Union Oil in 1925 while he was still in high school. He started as an office boy for the pipeline division in San Luis and upon graduation went to work in the pump station at nearby Avila. His job took him to Taft, Bakersfield, Santa Maria and finally to Union Oil's birthplace in Santa Paula where he was a foreman before retiring to return to his home and family in San Luis Obispo. "Then I made the mistake of joining the Historical Society," he adds laughing.

For more than a year, Tudor has had some assistance in caring for the 125-year-old adobe. In exchange for summertime work, California Polytechnic Institute student Steve Sukke lives rent-free in the caretaker's quarters. The student installed an irrigation system to help with the almost continuous watering needed to keep the ground's flora thriving and green. For his senior project, Sukke, an ornamental horticulture student, has started putting up wooden markers bearing both the botanical and common names of all plants and trees on the grounds. "The markers are really helpful because we've gone round and round with some of the visitors who argue about some of these plants," explains Tudor, who prefers to boast of the student's contributions rather than his own.

Sukke isn't the only one with a green thumb, however. The bright California poppies scattered about are all there due to Tudor's tireless efforts. Tudor once took a cutting off of a fig tree in the garden, one of the last in town, he points out, and has been carefully nurturing its growth. "Someday...," he says thoughtfully, as he watches the little tree taking root.

## The long, arduous task of recruiting

N THE EARLY 1930S, John Rockfellow was Union Oil on campus. Leather suitcase in hand, he would embark on six-week train tours of West Coast colleges to enlist new technical degree bearers as Union Oil employees. He was the company's sole recruiter.

This fall, close to 100 Union Oil employees will visit 105 college campuses across the nation to perform the same function for which Rockfellow laid the ground work so many years ago. They will be seeking out technicians, geologists, engineers, geophysicists and scientists.

Carl Bowden, Union Oil's manager of employment services, has been responsible for the recruiting effort at Union Oil since 1979. "There's a tremendous amount of competition, not only within the oil industry but with other industries as well, for the recruitment of technicians," says Bowden.

This year Union Oil recruiters will be screening anywhere from 2,500 to 2,700 students in order to hire about 100 geologists and geophysicists and more than 140 engineers and 150 in other technical and non technical categories.

The hectic recruiting year, beginning July 1, and ending on June 30, starts when manpower requirement forms are circulated to all the Union Oil Divisions. The divisions determine the company's employment needs for the next year. Each division has one or several coordinators who, in addition to their regular jobs, act as liaisons with the personnel office and also select the company representatives who will do the actual interviewing of students. The completed forms indicate to the personnel department the number of people in the different disciplines the recruiters will be seeking to hire.

These representatives are carefully selected. Individuals who are compatible, who are enthusiastic about the company and who have been successful in their own careers are likely candidates to become recruiters.

"This is what makes the recruiting program so effective. All of them are technical people doing their own jobs. They're more aware of the needs," says Bowden. Rich Keller, district production superintendent of the south-





Recruiters watch intently as Carl Bowden skillfully demonstrates the finer techniques of interviewing students.

ern region Oil and Gas Division, has been recruiting for three years. "It's good to get people who are actually involved to talk to students because we're better able to give explanations of what they would be doing if they decide to work for us," says Keller.

From the beginning of September through the week prior to Thanksgiving, company representatives will be visiting larger schools in teams, following a strict schedule that has been made a year in advance. Spring recruiting runs from the last week in January through March and is not as busy as fall recruiting because many students have already made employment decisions by then. Extra time provided by the light spring schedule gives recruiters a chance to talk with faculty and department heads.

The company has built relationships and maintained contact with many schools for nearly 50 years. "During that time, we established a good reputation for being an honest company and very conscientious about meeting our commitments with students," explains Bowden. "This is a key element to the success of the program."

While the company deals with 105 schools, there are about 30 key schools which are drawn on most heavily. "They consistently turn out the kind of people who do well in our company. They have stable faculties and are good, reliable institutions," says Bowden, adding the company also relies on schools that are close to Union facilities.

Before the representatives begin their busy tour of colleges, they attend a one-day seminar where Bowden and his staff discuss the recruiting process and conduct mock interviews. Employees new to Union Oil visit the seminars to share their experiences while being recruited and to relate positive and negative points.

"Because the campus interview lasts only about 30 minutes it's a fairly pressurized situation for both parties," says Bowden.

The interview poses an opportunity for both parties to share information. "I try to give them an overall view of the company," says Rich Budler, superintendent of



Recruiters get a lesson on how to rate any future potential employees.



Russ Groesbeck (L) and Ted Doss (R) practice their recruiting skills by holding mock interviews with each other.

personnel at the San Francisco Refinery. While part of Budler's job in personnel involves recruiting, he is an engineer as well. "There are, of course, routine subjects we have to discuss, but I also try to give them information based on my experience and give them an idea of what a job in refining can entail. Maybe a student has a great academic record and is very thorough. That person might prefer research where there is time to look at things in detail," Budler explains. "It's no benefit for either party if someone is hired only to discover later he or she would rather be doing something else."

From this meeting the interviewer draws conclusions and with all the criteria available rates the student. That recommendation is matched up with the student's application for employment and is reviewed by a coordinator. The decision to make a job offer is left to the coordinator.

When an interviewer encounters a student who seems particularly promising, arrangements are made for the student to visit a Union Oil facility. The potential employee meets management personnel and has a chance to look over the facility and the community. "These are usually excellent students. I'd say that employment offers are made to 95 percent of them," says Bowden.

While seniors are seeking permanent employment, underclassmen are looking for summer jobs. Most of these students are also recruited in the fall. The more than 300 sophomores and juniors hired for summer work by Union Oil are given meaningful jobs that relate to what they're studying. The summer job program provides an avenue for finding good employees. A large percentage of these students are frequently asked to return upon their graduation or for another summer job.

Bowden estimates that 80 percent of the open positions are filled by February and are all usually filled by April.

"The recruiting function is very important to our company because we do hire at entry level, offering jobs to those just out of school and promoting from within," says Bowden. "Attitudes about careers are changing. Students think they might want to work with two or three companies during their careers. We like to hire people with the idea of starting them on long-term careers or having several careers within our company. It's one of the hallmaks of our company."

When recruiters say those words to students they have proof to back up their promises. In 1939, for example, after having his initial interview with Rockfellow, a young man was hired as an engineering trainee at the San Francisco Refinery, then known as Oleum, and he is still with the company. That man is Fred L. Hartley, chairman and president of Union Oil.

# Oil Museum Offers Glimpse Into Past



Ben Potts relates the founding of Union Oil at the museum building that remains essentially as it did in those days.

N 1889 IT WAS A busy hardware store. Today, the ground floor of the still graceful old building on the corner of Tenth and Main Streets in Santa Paula, Cal. is brimming with the restored equipment of the oil industry's past—relics which pay tribute to the gutsy ventures of pioneer oil men. Aside from the timeworn objects it houses, the building itself once played an important role in the colorful history of the industry, since the California Oil Museum is also known as the site where Union Oil Company was born.

Visitors to the museum, which is open Wednesday through Sunday, are likely to be warmly greeted by Ben Potts, museum curator for the past 11 years. Visitors may



This pumping rig is dwarfed by the real one next to it.

listen to a recorded narration that explains all of the strange old tools on display. With a little gentle prodding, however, Potts may be persuaded to give a tour that reveals much more.

A massive cable-tool drilling rig was constructed expressly for the museum. It was put together with wedges the way it would have been in long-gone days built without the help of today's power tools. The imposing rig is completely outfitted—except for an 84-foot wooden derrick which would tower above—with everything that would have been found at a drilling site in its heyday. The display even has a set of hard hats and a battered tin lantern for which yesteryear's night crews were nicknamed "Yellow Dogs" because of the lantern's yellow glow.

The taped narration describes how a steam engine powered the rig that raised and lowered a heavy string of drilling tools which actually pounded and pulverized their way through rock to formations more than 2,000 feet deep. The wells took anywhere from six months to two years to complete, long enough for the hard-living oil men to set up housekeeping and establish boom towns as oil fever spread throughout California.

The narrator likens the spirit of the time to that of the Gold Rush days of '49. This type of cable-tool rig was used until about 1910, when rotary drills, capable of drilling down to 30,000 feet, were perfected.

"Lyman Stewart and W. L. Hardison used this boiler and steam engine to drill their first well in California. That was in 1883 on Christian Hill in Pico Canyon," Potts adds to the taped narration. "The engine and boiler were built in Buffalo, New York and shipped all the way around South America to be unloaded at Port Hueneme."

Unfortunately, the wildcat well Hill No. 1 in eastern Ventura County had to be abandoned at 1,850 feet when the drilling tools were lost. The two men from Pennsylvania, who were later to form Union Oil Co., met no success until their eighth well, Star No. 1, also in Pico Canyon, struck oil.

Large bellows, anvils and hand-made tools are scattered around a forge in the museum where one can easily imagine the rippling muscles of the blacksmith, or tool dresser, and the resonant clang of metal as he pounded away to forge the crude iron tools.

An old wooden pump jack only slightly resembling the steel grasshoppers used today sits in one corner. An early gas engine and a wooden storage tank is found near it. "This gas engine was run on the natural gas that came right from the field," Potts explains. "There's no ignition. It was started with what was called a glow-plug-a rod heated red hot and inserted into the cylinder head. When the gas was turned on it would operate. It's a 25 horsepower engine and 12 pump jacks ran from it." This was called a "central power unit" and was connected to the pump jacks which made the pump rods move up and down. The oil was lifted out of the wells by pump rods, which are also on display, and stored in a redwood production tank where the water naturally settled out from the oil to be released through a small pipe out of the bottom of the 462-gallon tank.

The walls of the museum are covered with a mosaic of old photographs. "Here's a picture that was taken in  $\longrightarrow$ 



A taped narration that plays in the room describes how the tools suspended by this steam-powered rig pounded the earth.

1886," says Potts, studying the faded image. "The man in the overcoat is Lyman Stewart. The group is building the first oil pipeline to the Pacific Ocean which went from Newhall to Ventura." The primitive, four-inch pipeline was 40 miles long.

There's also a picture of the world's first oil tanker which Hardison and Stewart built in 1889. "It was called the W. L. Hardison and it burned at Ventura Pier the same year it was built," he says. A pan of lard ignited in the wooden-hulled ship's galley and the fire quickly destroyed it. The ship, which carried 6,500 barrels of oil in its steel tanks from Ventura to San Francisco, wasn't replaced until 11 years later. Moving on to the next picture, Potts points out one of Union's first Pacific offshore drilling rigs, Eva, which operates offshore of Huntington Beach. "The rig was built in Houston, Texas and towed on barges through the Panama Canal to Huntington Beach," says Potts. Platform Eva, which was constructed in two parts, was at sea for one month before reaching her destination and being installed in 70 feet of ocean water in January 1964.

A front window exhibits a typical Union service station from the 1930s. A 38-foot diorama sets the backdrop scene of a small Santa Clara Valley community where the station, with its two gravity pumps, might have had a thriving business 50 years ago. An attendant's blue cap





Jo Anne Nance (Top) and Rose Temple inspect museum displays.

rests on an old wooden radio in the station stocked with Union auto fuses, Neverleak tire fluid, Union Oil motorcase oil, Rie Nie spring lubricant, Union Aristo motor oil and other accessories.

A glass case displays old company documents, letters, records and seals that unfold past events which led to the founding of Union Oil Company in the very same building almost a century ago.

Most of the documents are originals that were removed from safes in the upstairs offices.

The Hardison & Stewart Oil Co. had the handsome edifice built in 1888 when it also served as home for the Santa Paula Hardware Store, the U.S. Post Office, and the Mission Transfer, Sespe and Torrey Canyon oil companies. The architecture is typical of the period, with alcoves formed by octagonal bays and ten Italian-tiled fireplaces with carved oak mantels and beveled mirrors on the second floor. High interior doorways with oak doors and trim lead into second story rooms with 12-foot ceilings where the fir floor has been preserved in the brick and wood building. It was here, on October 17, 1890, when the Hardison & Stewart Oil Co. (which owned Mission Transfer) and the Sespe and Torrey Canyon Oil companies consolidated to become Union Oil Company. The new company kept its headquarters there until 1900 when the corporation relocated to Los Angeles. Union Oil's Ventura area offices still conduct business from the second story.

The museum opened in 1950 in conjunction with the company's 60th anniversary. It was assembled by R. G. Daries, now Western Region chief draftsman. It was the idea of Clarence Froome, who was superintendent of what was then called the Pacific Coast Department, and "Cy" A. C. Rubel, then vice-president of exploration.

At that time, there weren't any oil-related museums this side of the Mississippi. Froome and Rubel were concerned about preserving all of the industry's old artifacts and hand forged tools.

When Froome approached Daries, who had only been with Union for three years, and asked him if he could produce a museum, Daries set out to find pieces for the exhibit by scrounging around old drilling sites that had been abandoned for many years. "The result was a pile of old weathered and rusty tools, which amounted to a pile of junk. But after they were sand-blasted and cleaned the junk turned into valuable artifacts," recalls Daries.

The museum serves as a repository and maintains pieces in trust. Many of the items on display were donated by people with interest in the industry.

Two large cross-section wall murals depicting the geological formations of the sulphur mountain and the Santa Clara Valley were painted by Daries who is also a commercial artist, as was the mural of the drilling operations near the Sespe River, north of Fillmore, Cal. "The paint on the murals was still wet when we opened the museum doors to the first visitors," Daries muses.

It's been more than 30 years since that first opening day for the California Oil museum but the exhibit continues to illustrate the story of the pioneers of the oil industry and the crude methods they used which were passed by for modern technology.

# Service Emblem Awards

#### CORPORATE

CORFOR	AIE
SEPTEMBER	1981
40 YEARS	S
EILEEN R. VAUGHN	Schaumburg, II.
35 YEAR	S
ROSETTA RUSSELL	Union Oil Center
25 YEAR	S
RICHARD CALL	Union Oil Center
15 YEARS	S
CAROLYN BAYES	

NORMA J. BROUSSARD Union Oil Center
JAMES A. McCULLOUGH Union Oil Center
JACK K. RUSSELL Union Oil Center
10 YEARS
JOHN F. MIRANDA Union Oil Center

ROBERT S. STROBEL Union Oil Center
5 YEARS
JOSEPHINE D. McEACHIN Union Oil Center

JUSEPHINE D. MICEAGHIN	. Union	Oll Center
CAROLE A. STEVENS	. Union	Oil Center

### OCTOBER 1981

30	TEARS

JOHN W. PARK	Union Oil Center
	15 YEARS

EDWARD H. EVERETT	Union	Oil Center
ARNOLD E. GAMSON	Union	Oil Center

#### 10 YEARS

BETTY I. BALLARD	Union	Oil Center
HARVEY D. TOWNER	Union	Oil Center

#### **5 YEARS**

ESTELA D. BARRIENT	0	5	25	2	÷.	 3	1		 . Union	Oil	Center
SHIRLEY S. KODANI									 . Union	Oil	Center
ALLAN S. McGREGOF	١.				÷				 . Union	Oil	Center
NORMA A. POND						 			 . Union	Oil	Center
SHELDON L. STEIN .									 . Union	Oil	Center

UNION SCIENCE
AND TECHNOLOGY DIVISION

## SEPTEMBER 1981

40 YEARS

FREDERICK C. WOOD	 Brea,	Ca

#### 25 YEARS

MABEL E.	EWING	 	 Brea, Ca
JAMES M	FRASER	 	 Brea, Ca

#### 20 YEARS

HICHARD D. TATI	 	 Brea,	Gé

#### **10 YEARS**

HOWARD D. SIMPSON	Brea,	Ca
LELAND S. NYLANDER	Brea,	Ca
FRANK TREJO	Brea,	Ca

#### 5 YEARS

SEAN M. CAREY	Brea,	Ca
TIMOTHY L. CARLSON	Brea,	Ca
JUDITH C. WARE	Brea,	Ca

#### OCTOBER 1981 35 YEARS

EARL E. SKONBERG	•••••	Brea, Ca
	30 YEARS	

DAVID J. WATANABE	 Brea, C

#### 15 YEARS

CORTEZ W. HOSKINS	 Brea, Ca
VILLIAM R. MALLETT	 Brea, Ca

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#### **10 YEARS**

JAMES E. LAWTON				-	-	-	-	,	-								Brea,	Ca.	
DENNIS P. McARTHUR	-	•		•		•		•			•	•	•	•	•		Brea,	Ca	l

#### 5 YEARS

DOUGLAS S. HACKLEY	۰.									 			Brea,	Ca	÷
MICHAEL R. WINWARD		*	•	0				•	• )				Brea,	Ca	ł

#### UNION OIL AND GAS DIVISION

#### SEPTEMBER 1981 35 YEARS

LEROY D. ELLINGSON	 	 	 			Cut Bank, Mt.
GEORGE B. HALL	 	 			Ur	nion Oil Center
KERRAGEN C. LEDET	 	 	 			Houma, La.

#### **30 YEARS**

DANIEL R. CRAWFORD	 		2		4				Casper, Wy.
SAM J. DRAGNA	 								Houma, La.
GEORGE M. FARTHING	 						į	Unic	n Oil Center
ULIN S. SMITH	 					-		!	Houston, Tx.

#### 25 YEARS

GAIL LOWE BURKE	Houston,	Tx.
LANGFORD W. HENSHAW, Jr	Midland,	Tx.

#### 20 YEARS

RAYWARD J. FREDERICK	Lafayette, La
EMMETT P. HORN	Lafayette, La

#### 15 YEARS

WILLIAM U. EDWARDS	Santa Fe Springs, Ca.
GILBERT J. GONZALES	Santa Fe Springs, Ca.
JOLENE H. HAMMOND	Union Oil Center
DON B. HAYDEN	Santa Fe Springs, Ca.
AFIF E. KADDOURA	Los Angeles, Ca.
JOHNIE J. SUMMERFORD	Santa Paula, Ca.
WILBERT P. RHODES	Houma, La.

#### 10 YEARS

RANDY W. BARNHILL		 					i.		Houma, La.
VIRGIL R. COCHRAN .		 							. Houston, Tx.
DENNIS L. GROBOSKE	10			 2					Olney, II.
OLLIE L. JOHNSON, III		 		 +					Lafayette, La.
BILLY R. THOMPSON .		 	• •		•				. Andrews, Tx.

#### 5 YEARS

RICHARD L. BRIGGS Casper, Wy.
RAMON B. CERDAOdessa, Tx.
JOHN P. CHANCE Snyder, Tx.
DAVID B. COLLIER Taft, Ca.
GRADY E. FOWLER Van, Tx.
LINDA E. GUY Mobile, Al.
SANDY E. JONES Andrews, Tx.
ROBERT S. TAYLOR, Jr Anchorage, Ak.
HERBERT R. TUCKER Anchorage, Ak.
LINDA F. WILLIAMS Midland, Tx.

#### OCTOBER 1981 35 YEARS

CALVIN L. PICKENS	Woodward, (	0
ROBERT M. QUIRKE	Midland,	Т

#### 30 YEARS

HUGHES C. ALBERTSON									Andrews, To
ROBERT G. BICKEL	4						į.		Brea, Ca
MARYVON T. ROBINSON									Houston, Tr
ROBERT P. HENDERSON		Ç,			į.				Santa Paula, Ca

#### 25 YEARS

CHARLES F. LANNING	 Jr									S	а	n	ta	1	Fe	e Springs	. (	Ca
KELLY R. VAUGHAN		ģ,		į.		÷						÷				Lafayette	e, I	La
EDWARD A. WALGER	à	2	è			ł	è	è	ł							Midland	1, "	Тх

#### 20 YEARS

ELLIS A. CASTNER .....Orcutt, Ca.

#### 15 YEARS

TOMASITA E. BOJORQUEZ	Los Angeles, Ca.
SALVADOR CHABOLLA, Jr.	. Santa Fe Springs, Ca.
JAMES C. COON	Houston, Tx.
PHYLLIS G. FRENCH	Houston, Tx.
KENNETH P. HOWLE	Houston, Tx.
CANDACE W. LOCKWOOD	Anchorage, Ak.

#### 10 YEARS

CLIFFORD J. BELLAMY .	 	Coalinga, Ca.
RICHARD B. CROUCH	 	.Los Angeles, Ca.
ROBERT R. GASTELUM	 	Coalinga, Ca.
WILLIS W. JOHNSON	 	Van, Tx.
MARK J. NAQUIN	 	Houma, La
STEVEN W. OHNIMUS	 	Houma, La
JOHNNY K. THOMAS	 	Van, Tx.

#### **5 YEARS**

JOHNNIE L. BOGUE	Van, Tx
RICKEY L. COSTANZA	Moab, Ut.
VICTOR J. MEYER	Ventura, Ca.
FRANK R. O'CONNOR	. Anchorage, Ak
GARY L. TOLIVER	Olney, II.

#### **UNION 76 DIVISION**

#### MAY 1981

#### 25 YEARS

CLIFTON J. BERRYMAN .....Los Angeles, Ca.

#### JUNE 1981

#### 25 YEARS

JACK W	MULLEN	.Los	Angeles,	Ca.
JACK M.	PECK	.Los	Angeles,	Ca.

SEPTEMBER 1981

#### 40 YEARS

JULIAN H. KIMBALL, Jr. ..... Greensboro, N.C. OLIVE R. STRUEBING ..... Schaumburg, II.

#### 35 YEARS

#### **30 YEARS**

ROBERT A. ARMSTRONG	Los Angeles Refinery
GEORGE E. ROBINSON	. San Francisco Refinery
JOHN H. SMITH	Tampa, Fl.
ALTON E. SNUGGS	Milwaukee, Wi.
EUGENE B. TASHARSKI	Chicago Refinery
HAROLD L. WEEKS	Cincinnati, Oh.
EDWIN K. WILLS, Jr.	Charleston WV

#### 25 YEARS

WILLIAM H. MCNEILL, Jr. ..... Charlotte, N.C.

#### 20 YEARS

DELORES M. BODE	Schaumburg, II.
DELBERT H. BRINCK	Cincinnati, Oh.
RAYMOND J. CZAJKOWSKI C	hicago Refinery
VILLIAM J. ESGAR C	hicago Refinery
ROY M. HESTER	Charlotte, N.C.
MARIAN B. KARST	Schaumburg, II.
OWELL V. SAYERS	hicago Refinery

#### 15 YEARS

JERRY R. BARNHART San Francisco Refinery
BARBARA A. CHRISTENSEN Schaumburg, II.
ANITA H. FLAYER Schaumburg, II.
LINDA C. GALLARDO San Francisco, Ca.
ALVIN E. GIBBS Los Angeles Terminal
DARRYL L. HAMILTON Santa Maria, Ca.
EMMETT E. HARPER, Jr Beaumont Refinery
SALLY K. HOSKINS Schaumburg, II.
BERNICE F. JOHNSON Schaumburg, II.
HARRY W. KAIRYS, Jr Schaumburg, II.
JAMES H. KNOPP Las Vegas Terminal
BARBARA A. SIEBECK Schaumburg, II.
FORREST H. TERRY Los Angeles Refinery

#### 10 YEARS

EDNA M. ALEXANDER	Charlotte, N.C.
JOHN H. CROWLEY	Columbus, Oh.
MARILYN B. COMPTON	Schaumburg, II.
PEGGY A. FRETT	Schaumburg, II.
J. MICHAEL GIBBS	Schaumburg, II.
STEVE T. HOLM	San Luis Obispo, Ca.
STEVE C. HUNH	Los Angeles, Ca.
DEBORAH A. HALL	. San Francisco, Ca.
WALTER K. JENKINS	Chicago Refinery
CHARLOTTE A. KING	Chicago Refinery
CHRISTINE J. LONG	Atlanta, Ga.
GREGORY L. MORRIS	Los Angeles Refinery
VICKIE A. NORWOOD	Los Angeles, Ca.
GRAHAM W. QUAAL	Schaumburg, II.
JAMES A. TYSIAK	Chicago Refinery
CHESTER A. VINCENT	Nederland, Tx.
JOANN R. WATANABE	Seattle, Wa.

#### 5 YEARS

DAVID E. ALLEN	Portland, Or.
JAMES E. BARROW	Beaumont Refinery
CHRISTOPHER A. BERG	Schaumburg, II.
JAMES H. BRAY	Los Angeles, Ca.
RANDALL B. DASHER	Wildwood, Fl.
DONNA J. GILLIG	Schaumburg, II.
CAROLE L. GLENN	Schaumburg, II.
HAROLD M. GURGONE, Jr	. Chicago Refinery
MAUREEN A. HERTZEL	South Holland, II.
STEVEN T. JACKSON Sa	n Francisco Refinery
GENE JIMINEZ	<b>Beaumont Refinery</b>
BRUCE W. KREN	. Chicago Refinery
ANTONIO A. LANDA	Beaumont Refinery
MICKEY R. LOVELL	. Chicago Refinery
WILLIAM M. MACK, Sr.	Beaumont Refinery
BRIAN L. MARTIN Sa	n Francisco Refinery
JIMMIE R. MAXWELL	Beaumont Refinery
DORIS L. MILLER	Los Angeles, Ca.
KENNETH E. MILLER	. Chicago Refinery
GEORGE M. MILTON	. Chicago Refinery
MONTE B. O'FIEL	Beaumont Refinery
KIRK T. PEREGOY	os Angeles Terminal
THALIA A. ROBERTS	Schaumburg, II.
ROBERT W. SANFORD	Richmond, Ca.
NANCY L. SWIATEK	San Francisco, Ca.
VINCENT R. TORRES	. Honolulu Terminal
JESS H. WOODFIN L	os Angeles Terminal

#### OCTOBER 1981

#### 40 YEARS

#### 35 YEARS

ACK D. ALFORD	Beaumont Refinery
KENNETH D. BENJAMIN	Birmingham, Al.
ALBERT BREAUX, Jr.	Beaumont Refinery
LESLIE O. W. GILKERSON	<b>Beaumont Refinery</b>
RENE M. HACKETT	Schaumburg, II.
ALVIN B. IRWIN, Jr.	Memphis, Tn.
LEROY W. KOCH	<b>Beaumont Refinery</b>
CHARLES A. McGUIRE	Cleveland, Oh.
REDERICKS C. MILLS, Jr.	Columbus, Oh.
NICK NESTERUK, Jr.	Schaumburg, II.
THEO S. PIZIO	Toledo, Oh.
WYRON D. ROBEY	. Minneapolis, Mn.
FRANCIS D. SHUMATE	Schaumburg, II.
ROBERT E. STERLING	Beaumont Refinery
S. T. THOMPSON	
Pure Transportation	Brush, Co.

#### **30 YEARS**

MAUREEN BELL	Los Angeles Refinery
JOHN F. BLAZEVICH	Tukwila, Wa.
LAWRENCE R. LANDRY	. Beaumont Refinery
KENNETH E. RODDEN	Schaumburg, II.
JOSEPH SMUDAK	Tallmadge, Oh.

#### 25 YEARS

DONALD B. CHRISTOFFEL	Schaumburg, II.
RENO A. FROZA F	ortland Terminal
IMANTS KRASTINS	Schaumburg, II.
IRVIN J. STEIN Los	Angeles Refinery
FRED G. WALKER Los	Angeles Refinery
ARTHUR H. WEBBER, Jr.	Schaumburg, II.
ROBERT V. WENTWORTH	. Pensacola, Fl.
D. M. WILLIAMS Sa	in Francisco, Ca.
HENRY B. WOLTER	. Pasadena, Ca.

#### 20 YEARS

GEORGE E. DOSS	<b>Beaumont Refinery</b>
BERNICE L. HERMAN	Schaumburg, II.
EROY K. KALASH	Schaumburg, II.

#### **15 YEARS**

SHIRLEY M. BOLLMAN Los Angeles Refinery
JAMES W. COLEMAN Los Angeles Refinery
JAY L. DORADO Santa Maria, Ca.
MARILYN D. DUNLOP Schaumburg, II.
LARRY R. ELY Los Angeles Refinery
GLENN E. FARGO, Jr Houston, Tx.
RONALD L. JONES Los Angeles Refinery
DONALD I. KRENKE San Francisco Refinery
JUANA MARTINEZ San Francisco, Ca.
MYRTICE L. McKISIC Schaumburg, II.
CAROL A. MILLER Los Angeles, Ca.
MARY F. PAOLI San Francisco, Ca.
ELIZABETH J. PIENA Honolulu, Hi.
STUART M. TAYLOR San Diego, Ca.
BETTIE J. THOMAS Atlanta, Ga.

#### **10 YEARS**

STEPHAN E. CAMPBELL Los Angeles Terminal
PHILLIP W. DESHAZO Santa Maria, Ca.
RICHARD D. HALL Chicago Refinery
ALLEN R. HINDERLITER
Pure Transportation Patoka, II.
SUZANNE M. NELSON San Francisco, Ca.
WILLIAM G. ORR Torrance, Ca.
LAWRENCE E. PRICHARD Schaumburg, II.
CARL PRATHER, Jr Indianapolis, In.
ROBERT J. M. SAMS Charlotte, N.C.
RICHARD A. SCHROEDER Schaumburg, II.
PHILLIP L. SMALLEY San Francisco Refinery
ERIC SPENDLOVE Los Angeles Terminal
DAVID G. SYNSTELIEN Los Angeles Refinery
CECIL G. UNDERWOOD Chicago Refinery
JAMES B. WALLIN Chicago Refinery
KAREN S. WEAVER Los Angeles, Ca.
BETH R. WRIGHT Los Angeles, Ca.

#### **5 YEARS**

ARTHUR A. BEESE	Schaumburg, II.
RICHARD BRAVO	Bakersfield, Ca.
WAYNE A. LAKEBERG, Jr.	. South Hofland, II.
LORETTA M. MALZONE	San Francisco, Ca.
SANDRA L. SCHON	Schaumburg, II.
KATHRYN E. STEELE	Torrance, Ca.
PATRICIA A. STEVENSON	<b>Beaumont Refinery</b>
JON FWHITACRE	Nederland, Tx.

#### UNION CHEMICALS DIVISION

#### SEPTEMBER 1981

#### 40 YEARS

DELBERT R. SPURLOCK ...... Rolling Meadows, II.

#### 25 YEARS

RAYMOND SANTILLAN ..... Arroyo Grande, Ca.

#### **15 YEARS**

JOHNNIE L. ADAMS	Bridgeview, II.
FREDERICK S. BARTHOLOMEW	Rolling Meadows, II.
RALPH H. BAUER	La Mirada, Ca.
RICHARD A. MARCH	Oakland, Ca

#### 10 YEARS

JAMES BIERFELDT	Brea, Ca.
SHIRLEY K. HANSON Schar	umburg, II.
THOMAS R. JANKOWSKY Ca	rteret, N.J.
	$\rightarrow$

## Service Emblem Awards

JOHN F. PRATUS	 ÷	•	1		-		÷.	÷	÷	•	2.5	1		3	. Lemon	t, II.	
NOBUO TSUKADA			 												Kenai,	Ak.	
DAVID A. WHITNEY	÷.	•3	0				-	ė	•				Lá	3	Mirada,	Ca.	

#### 5 YEARS

JOSEPH ADOLF	Kenai, Ak.
DONALD GOODWIN	Arroyo Grande, Ca.
FRANCISCO MENDOZA	Rodeo, Ca.
LARRY MOBLEY	Bridgeview, II.
THERESA T. MORRIS	Charlotte, N.C.
BRENT NICHOLS	Kenai, Ak.
PAUL SCHNEIDER	Kenai, Ak.
WARREN C. SNYDER	Miami, Fl.
CHARLES STEELE	Kenai, Ak.
KENN STEPHENS	Kenai, Ak.
RICHARD TERRILL	Kenai, Ak.
MARTHA WETTERSTEN	Clark, N.J.
LYLE WINTER, Sr.	Kenai, Ak.

#### OCTOBER 1981

30 YEARS

L. G. HENSON		Kansas City, Mo.
	25 YEARS	

DONALD MAUERHAN				 							Brea, Ca
WILLIAM C. O'DONNE	LL	÷.	2		ù,	4	20	i.		Q.	. Carteret, N.J
DENNIS L. ROUGEAU		 	÷								La Mirada, Ca
EUGENE SLAUTER .	133							2		-	Brea, Ca

#### 20 YEARS

ROBERT M. McCOY ..... Bridgeview, II.

#### 15 YEARS

LEE A. DODGION	 		 								 	Schaumburg, I
JAMES K. MERWIN				ĩ		i,			i,	<u>,</u>		Schaumburg, I
LESTER McMANUS			2									. Charlotte, N.C
ANN RICE	 									į		Providence, R.
		~		_		_	~					

#### 10 YEARS

JAMES JONES	Kenai, Ak.
PATRICIA A. WEIHMULLER	Schaumburg, II.

#### 5 YEARS

ALICE B. CASEY	 				 						 	New York, N.Y
EDDIE HILL	 	4		*	 		•	•	•	0	• •	Charlotte, N.C

WILLIAM	McGAHAN	١.		-	 	4		2	 			2		-		Kenai,	A
ALAN Mo	QUEEN .				 					ŝ,						Kenai,	A
ROBERT	L. PUTMA	N			 		į,						1	La	١	Airada,	C

#### UNION OIL COMPANY OF CANADA LIMITED

	SEPTEMBER 1981	
	20 YEARS	
J. J. BOHNET		. Calgary, Alberta
	15 YEARS	
CHICK KOYANAGI RUSS MASON		. Calgary, Alberta . Calgary, Alberta
	10 YEARS	
KARMEN PATACIC		Calgary, Alberta
	5 YEARS	
HOWIE BOYLE		Calgary, Alberta

OCTOBER 1981 10 YEARS

GEORGE McKAY ..... Calgary, Alberta

#### 5 YEARS

ALI MAGDA ...... Calgary, Alberta

#### UNION ENERGY MINING DIVISION

SEPTEMBER 1981 5 YEARS

ROBERT F. LUCHT Rawlins, W	ROBERT F. LUCHT		Rawlins,	Wy
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OCTOBER 1981

25 YEARS

WILLIAM C. FLYNN ..... Grand Junction, Co.

#### MOLYCORP

20 YEARS

JIMMY	SMITH	1.10	* * * *				****	• • • • • • • • •	Questa,	N.M.
				15	Y	ΕA	RS			

FLORENCE ATKINSON ..... Questa, N.M.

ARTURO MONTOYA Questa, N.M. EDWIN TOMASI Louviers, Co.

#### 5 YEARS

WILLIAM ULRICH ...... Mountain Pass, Ca.

OCTOBER 1981

#### **30 YEARS**

20	YEA	RS
_		

BAUM BROWNLEE, J	r		1	1	-	1			Washington, Pa.
CLINTON CARROLL .									 Washington, Pa.
MEREDITH CASHDOL	LAF	3						.,	 Washington, Pa.
RAY MONTGOMERY									 Washington, Pa.
THOMAS TARR									Washington, Pa.

#### **15 YEARS**

MILDRED AXE	Mountain Pass, Ca
JAMES CHRISTENSEN	Louviers, Co
JOSEPH CHRISTENSEN	Louviers, Co
GORDON KNAUB	York, Pa
TOMASITO MARTINEZ	Questa, N.M
CLARENCE PEARSON	Louviers, Co
THOMAS WILSON	Union Oil Cente

#### 5 YEARS

DONALD ELLIOTT	Mountain Pass, Ca
JOHN EVANS	Mountain Pass, Ca
WILLIAM SAMPSON	Mountain Pass, Ca
RICHARD SIXBERRY	Mountain Pass, Ca

#### **POCO GRAPHITE**

OCTOBER 1981	
25 YEARS	
EARL CRUMBIE	Decatur, Tx.
5 YEARS	

SHERMAN HOBBS ..... Decatur, Tx.

#### JOBBERS AND DISTRIBUTORS

#### SEPTEMBER 1981

#### 25 YEARS

TURNER OIL CO		Salisbury, N.C
	20 YEARS	
DONAL D. D. LIEUCO	50	Tillement O

HUNALD B. HEUSSE	.n.,			 		maniour	, 0
SALUDA TIRE & OIL	CO.,	INC.		 		Saluda,	S.C
MICHAEL SPANISH			• • •	 	Wa	lla Walla	Wa

#### **15 YEARS**

#### 5 YEARS

LIPSEY PETROLEUM CO.	•••••	Prentiss,	Ms
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#### OCTOBER 1981 35 YEARS

RAYMOND S.	BURNS	Fortuna, Ca.

15 YEARS	
SERVICE OIL CO.	South Boston, Va.
SHEFFIELD OIL CO.	Ozark, Al.
DAVID A. STOHLMAN	Marysville, Ca.

#### 10 YEARS

BLACKMAN OIL CO.	Corning, Ar.
HOME OIL CO. OF	
JACKSONVILLE, INC Jacks	sonville, N.C.
HUGULEY OIL CO., INC I	_afayette, Al.
MILLE LACS OIL CO.	Milaca, Mn.
PECORA OIL CO., INC.	Addison, II.
REMINGTON OIL CO., INC Re	emington, In.
TROJAN OIL CO., INC.	Troy, Al.

#### 5 YEARS

BENVILLE SERVICE & SUPERETTE, INC. ..... Babbit, Mn.

#### RETIREMENTS

#### JUNE 1981

LEW G. DAVIS,	Union 76 Division	
Lomita, Ca.		May 9, 1955

#### JULY 1981

- MAURICE O. DITTO, Oil and Gas
- Paris, Tx. ...... November 28, 1951 CEDRIC E. FAUNT LEROY, Union 76 Division
- Houston, Tx. September 13, 1956 CARSON D. HUDSON, Union 76 Division
- Richmond, Va. June 8, 1959 ROBERT W. MARLOW, Union 76 Division
- Seattle, Wa. ..... June 11, 1945 EVERETT A. OLSEN, Union Chemicals
- Minneapolis, Mn. ..... August 16, 1945 JAMES H. PARRISH, International
- Comfort, W.V. June 12, 1941 MILDRED E. STRAWN, Celanese Corporation
- Charlotte, N.C. July 1, 1973 CLARENCE C. WHITE, West Coast Shipping
- Grass Valley, Ca. ..... November 14, 1957

#### AUGUST 1981

THOMAS ALLEN, Oil and Gas
Nowata, Ok January 1, 1947
JAMES E. BAKER, Oil and Gas
Morgan, Tx
CLEO T. BROOKS, Corporate
Weed, Ca February 25, 1952
R. V. BRYANT, Union 76 Division
Vidor, Tx
STANLEY D. CHAPIN, Jr., Union 76 Division
Concord. Ca
WILLIAM J. CRAWFORD, Oil and Gas
Ventura Ca. July 5, 1951
FRANK L. CONSTANT, Oil and Gas
Midland, Tx
BERNETTA B. DONISCH, Union 76 Division
Palatine II. March 26, 1968
WILLIAM J EKLUND Oil and Gas
Oklahoma City, Ok December 10, 1951
PAUL W EISCHER, Science and Technology
Whittier Ca
ROBERT & GREEN Union 76 Division
Nederland Tx September 26 1944
RUDOL PH S. GROTH-MARNAT Linion Chemicals
Pasadena Ca April 4 1955
LOVD F. HANSON Union 76 Division
Long Beach Ca. March 24, 1946
GEORGE M HARPER Jr. Oil and Gas
Houma La
PAUL K. HELMS, Sr. Union Chemicals
Monroe, N.C. March 31, 1964
STANLEY I. KOVOLISKY, Union Chemicals
Kearney, N.J. August 1, 1949
JOHN C. MANN, Oil and Gas
Houston, Tx, January 16, 1949
HERBERT W MEYER, Union 76 Division
Wahiawa, Hi
JOHN H. MOFFITT, Oil and Gas
Midland, Tx
JOSEPH B. RABA. Union Chemicals
Chicago, II. January 1, 1955
MARY JO ROGERS, Union 76 Division
Honolulu, Hi. January 31, 1966
EARL J. BOSS. Science and Technology
Yorba Linda, Ca. October 29, 1945
J KENNETH TAYLOR, Union 76 Division
Oiai Ca. January 12, 1954
MARVIN L. ZOLLER, Oil and Gas
Midland, Tx. May 7, 1951
SEPTEMBER 1981
RAYMOND CONKLIN, Union 76 Division
Vallejo, Ca
WILLIAM R. CRAIG, Corporate
Whittier, Ca August 7, 1939
LOWELL V. FIRNHABER, Corporate
Chapel Hill, N.C February 14, 1950

- GRANT GRUNERUD, Molycorp Stanwood, Wa. June 16, 1965 BERNICE HERMAN, Union 76 Division
- Rolling Meadows, II. ..... October 16, 1961 ROBERT J. McOUILKIN, Union 76 Division
- La Habra, Ca. April 30, 1956 HAROLD R. RAYBURN, Union 76 Division
- Beaumont, Tx. February 24, 1941 SAMUEL C. ROBINSON, Union 76 Division
- Ft. Lauderdale, Fl. ..... August 17, 1953 ARDIN E. ROULSTON, Union 76 Division
- Carson, Ca. August 25, 1945 EDISON R. SCHOOLEY, Union 76 Division
- Elgin, II. March 18, MARGARET T. SOWEY, Union 76 Division
- Detroit, Mi. ..... February 13, 1973 RUTH C. WILSON, Corporate

#### Mt. Prospect, II. ..... March 15, 1967

#### IN MEMORIAM

#### **EMPLOYEES**

CHARLES H. GLIDDEN, International	
Mendoza, Argentina	July 22, 1981
CHARLES F. KONKEL, Oil and Gas	
Madill, Ok.	June 7, 1981
NORMA M. NISS, Union 76 Division	
Elgin, II.	June 20, 1981
HARVEY R. SLADE, Union 76 Division	
Pensacola, Fl.	July 28, 1981
GLENN I. STRAWN, Molycorp	
Washington, Pa.	January 25, 1981

#### RETIREES

HENRY J. ACQUISTAPACE, Corporate
Modesto, Ca. July 16, 1981 EARL W. BACKUS, Oil and Gas
Shepherd, Mi. June 1, 1981
St. Louis, Mi. July 24, 1981
Lincoln Park, Mi
LAWRENCE BOND, Oil and Gas Ojai, Ca June 29, 1981
EDWARD H. BORSE, Union 76 Division
RUSSELL J. CARLSON, Union 76 Division
EDWARD M. CHAPIN, Union 76 Division
Lynwood, Ca. June 1, 1981 VERA CLABAUGH, W. H. BARBER OIL
St. Louis Park, Mn June 6, 1981
Copperopolis, Ca. June 25, 1981
Honolulu, Hi June 18, 1981
WILLIAM CRESSWELL, Union 76 Division Los Alamitos, Ca. June 19, 1981
LETHA I. COOK, Union 76 Division
RUDOLPH P. ESTRADA, Union 76 Division
FLORENCE GANNON, Union 76 Division
Wheaton, II. June 13, 1981 GEORGE GRAY, Union 76 Division
Arlington Heights, II. April 23, 1981
Marblehead, Ma
GEORGE F. HOGAN, Union 76 Division Pleasant Hill, Ca
IRWIN L. HOSTETLER, Union 76 Division Beaumont Tx June 29, 1981
EMIL G. HUGHES, Oil and Gas
PAUL W. JEFFRIES, Union 76 Division
Tarpon Springs, Fl May 31, 1981 SAM JENSEN, Oil and Gas
Solvang, Ca. June 28, 1981
St. Paul, Mn. July 16, 1981
Portsmouth, Va. June 12, 1981
MORLEY E. JOYCE, Union 76 Division Lincoln City, Or July 22, 1981
CHLOE KIES, Oil and Gas
ERNEST L. LAMBERT, Oil and Gas
JAMES LANNING, Union 76 Division
Newark, Oh May 31, 1981 JAMES L. MABERY, Union 76 Division
Yuma, Az. July 18, 1981
Henderson, Nv. June 11, 1981
CHARLES MORRISON, Union 76 Division Sycamore Valley, Oh January 16, 1981
DOUG W. NICHOLS, Union 76 Division Mt. Herman, Ca. June 6, 1981
MARCEL ORDRONNEAU, Union 76 Division
MANUAL RELVA, Union 76 Division
Rodeo, Ca. July 2, 1981 JOHN R. SNUFFER, Union 76 Division
Torrance, Ca. July 12, 1981
Memphis, Tn. June 28, 1981
Beaumont, Tx
P. N. TOUCHSTONE, Oil and Gas Houston, Tx. July 1, 1981
GEORGE H. TUNNELL, Oil and Gas Van Tx May 16, 1981
ADOLPH E. VOSS, Union 76 Division
BEVERLY D. WILLIAMSON, Union 76 Division
Roanoke, Va June 9, 1981 CHESTER E. WILSON, Science and Technology
Canyon Lake, Ca. July 2, 1981
Phoenix Az April 16 1981



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



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SEVENT	Y SIX
UNION OIL COMPANY	OF CALIFORNIA

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COVER: Western artist Neil Boyle illustrates the Ute legend of a band of warriors who witnessed a bolt of lightning strike a Colorado canyon wall, causing it to burst in flames. This is one of the earliest allusions to the presence of oil shale in western United States. Story on page 1.

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