seventy six

September
October 1983

Well, Hello Moly!

The state of New Mexico is a virtual treasure chest—not of gold and silver as early *conquistadores* thought—but of earth resources essential to industrial America: copper, petroleum, natural gas, uranium, coal, and of course, molybdenum, sometimes called "moly." At Questa, in the shadow of the Sangre de Cristo Mountains of northern New Mexico, Molycorp, Inc., a subsidiary of Union Oil Company of California, has taken advantage of these rich reserves of molybdenum. After ten years and $250 million, Molycorp has unveiled a new, highly efficient underground moly mine.

Molycorp has not been producing molybdenum for several years while it converted from open pit mining to a new underground operation at the Questa site. Now Molycorp's new underground molybdenum mine is complete—and operating.

Most important, at a time when the metals mining industry in North America experienced shutdowns and layoffs of thousands of employees, Molycorp continued its employment of 750 people during the development. Employment at the mine has risen to about 900 since mining has begun. In a state whose entire population is only 1.3 million, that represents a significant number of families. Concern for people and for the community has contributed to Molycorp's success.

Fred L. Hartley, president and chairman of Union Oil, and New Mexico Governor Toney Anaya, officially dedicated the new mine at festivities in September at the Questa mine site. Nearly 3,000 people attended the Indian summer barbecue, including the Union Oil Company board of directors, members of Gov. Anaya's cabinet, civic and community leaders, and Molycorp employees and spouses. Most toured the mine and the mill.

To officially dedicate the mine, Hartley and Charles Cisneros, president of Local 2-659 of the Oil, Chemical and Atomic Workers International Union, pushed an explosive detonator, setting off a series of blasts near the underground mine. At that moment, a videotape of the first ore being dumped onto the conveyor for its trip to the surface and subsequently processed through the concentrator flashed upon an enormous outdoor screen called "Diamond Vision™"—the same type of screen used at Dodger Stadium in Los Angeles to give the fans close-up views of the action. This was followed by a film of the mine development. The grand finale was a shower of fireworks and another booming series of explosive charges on the hillside. The Fourth-of-July style celebration was a fitting tribute to the winning spirit of Molycorp's workforce.

Hartley praised Molycorp for keeping all of its employees on the job during a time when the prospects for the mining industry looked bleak, and he gave the employees much of the credit for that wise choice.

Addressing the employees, Hartley said, "Molybdenum is an essential natural resource that does much for our standard of living. But Molycorp's most important resource is you—the employees who have been dedicated to the completion and the success of this operation.

"Success comes when you are able first to imagine an end result, and then make plans to make that dream a reality. Accomplishing a goal takes the steady effort and determination of a lot of people to carry out those plans. You are the ones who made it happen. Your determination and your flexibility in reaching your important goals made this underground mine possible."

Gov. Anaya also had remarks of praise. "At a time in our economy when most other companies were cutting back, Union Oil had the vision to use that time to modernize."

What is molybdenum used for? This precious commodity is used primarily for strengthening iron and steel, but research is conducted by Molycorp and Union Science and Technology Division scientists on a continual basis to discover new uses—and therefore, new markets—for their product.

In steel, moly acts to inhibit corrosion and increase its strength to endure extreme temperatures. In the oil industry, moly-alloy steels are essential for heavy section pipe such as

Gov. Toney Anaya and Fred Hartley initiate a blast underground while Union Oil board members look on (Left). (Below) *3,000 people heard Gov. Anaya and Hartley praise Molycorp's workforce. R. Gene Dewey, Vice President of Domestic Exploration and Mining for Molycorp, escorts Gov. Anaya and members of Union Oil board of directors on a tour of the underground mine* (Bottom).

Near the 206-foot headframe to the service shaft, the main entrance to the mine, the crowd enjoyed a self-guided tour of mining equipment and a barbecue lunch (Left).

Thomas B. Sleeman, President of Molycorp, and T. Craig Henderson, President of Union Chemicals Division, listen to the dedication ceremonies (Below).

The board toured the service shaft hoist-house (Left).

During the underground tour, board members watch bottom-dump rail cars unloading molybdenum ore (Above).

that used in undersea and arctic pipelines and high pressure natural gas lines. Stainless steel household products contain molybdenum; so do catalysts, lubricants, and some pigments for paints. Even multiple vitamins contain calcium molybdenate, which is required for enzymes involved in energy production for the body. Because of its growth-regulating properties, molybdenum is being studied for use in the treatment of disease and has been shown to aid in the treatment of a certain throat cancer. Clearly, the U.S. and the world would suffer if this valuable commodity were not available for these high-technology applications. Molycorp is determined to meet the demand.

The new mine development is the result of almost ten years of exploration, analysis, and engineering and design. The actual physical development of the mine began in late 1978. Since that time more than ten miles of tunnel have been excavated, an underground railroad installed, support facilities constructed and the mill modernized. And all of this essentially on time, with some segments completed well ahead of schedule.

That's a remarkable achievement, since Molycorp's own workforce was retrained to handle much of the job in an effort to keep people employed during the development. Experienced open pit miners were trained to become construction workers and became the nucleus of the underground operations. Mill operators worked alongside contractors' personnel to modernize the mill and, when that program was completed, mill personnel worked temporarily as underground mechanics or on underground construction projects. This dedicated workforce has been Molycorp's greatest asset, and these employees are understandably proud.

Hartley said, "The winning spirit that prevails all around Union Oil is also evident here. The Questa area has been settled since the 16th century. There is a sense of pride and well-being that comes with a long history. I'm glad to say that Molycorp seems to be in for a lengthy history, too."

Molycorp's history in Questa, in fact, already goes back to 1923. At that time, it produced small quantities of molybdenum from a high-grade mine at Questa. That was a 50-ton per day operation limited by the lack of modern electrical equipment. Early miners followed rich gray veins of molybdenum into the earth using mules to transport the ore to the surface to a converted gold mill. After milling, the ore was sent to Molycorp's Washington, Pennsylvania plant for roasting.

In 1936, the capacity of the Washington roaster was increased to ten million pounds per year, and Molycorp began to evaluate the potential and economics of mining ore at Questa on a larger scale.

In the 1960s, Molycorp geologists found large, near-surface reserves on the Questa property. That discovery spurred development of a thoroughly mechanized open pit mine. By the end of the decade, Molycorp was producing seven to eight percent of the free world's molybdenum supplies from the open pit.

During the mid-1970s, a high-grade underground deposit was located that became the basis for the present underground development. In 1977, Molycorp merged with Union Oil, and about a year later work began on the new underground mine.

Questa's ore reserves are sufficient to supply molybdenum to world markets well into the next century. By year's end, the mine will be producing 10,000 tons of ore per day. It will produce 18,000 tons per day at full capacity. Questa miners hit paydirt in the spring, and actual mining from the new underground began in July 1983. This ore was stockpiled until the mill, which had been shut down since August 1981 for modernization, resumed operations.

Thomas B. Sleeman, president of Molycorp, said, "This ultra-efficient moly mine and mill will allow us to become one of the nation's lowest-cost primary molybdenum producers. Molycorp had been shut down longer than other producers, since we were developing our underground mine. Consequently, our inventories are low compared to other mines. We are stockpiling ore now, and this will put us in a good position when the demand for our product turns around."

It will take about two years to reach full production capacity. Since the steel and related industries, such as automobile manufacturing, are beginning to show the first glimmers of recovery, Molycorp is confident that this bold strategy will prove effective.

Molycorp is northern New Mexico's largest private employer and accounts for 35 percent of the private sector employment in that part of the state. The company's monthly payroll is in excess of $2 million. Molycorp's expansion is responsible for creating one new job within New Mexico for every one created at the mine. That generates millions of dollars in spending to local businesses, and about $3 million per year in taxes to the state.

R. Gene Dewey, Molycorp vice president of domestic exploration and mining and master of ceremonies for the dedication, said it was extremely fortunate for Molycorp to have merged with Union Oil. "It took a company the size of Union Oil, with the capital resources to invest in such a long-term project, to recognize the potential of the Questa ore deposit. Before the merger, Molycorp could not finance such a project, nor could it have exposed itself to such high risk. We are all very grateful and proud to be a part of Union Oil."

C. R. "Bob" Sacrison, general manager of the Questa division, said, "We are proud of our relationship with northern New Mexico, and particularly with our host, the Village of Questa. Without their encouragement and cooperation, this mine couldn't have become successful. This celebration is as much in praise of them as of us."

Hartley concluded, "None of us can know the future with certainty. But that is part of the excitement of life and the setting of new goals. As we achieve each milestone, we set others. I am personally proud of your winning spirit, and Union Oil and New Mexico applaud you on this day of celebration."

Mining and milling again. Molycorp, it's so nice to have you back where you belong!

Molycorp is ready for the next century.

To design and develop an 18,000 ton per day underground molybdenum mine on schedule is no small accomplishment. But that's exactly what happened at Molycorp's Questa division in northern New Mexico. And to keep up with the planned increase in production, Molycorp installed a third generation of improvements in its concentrating mill. The new mine and modernized mill, together with the addition of bigger and better equipment at Molycorp's Washington, Pennsylvania plant, have made Molycorp ready to meet the demand for molybdenum for industrial use well into the next century.

This $250 million mine development and updating of the mill will help Molycorp become one of the most efficient, low-cost primary producers of molybdenum in the country.

The mine itself is an elaborate labyrinth of tunnels that operates on a fairly simple principle called "gravity block caving."

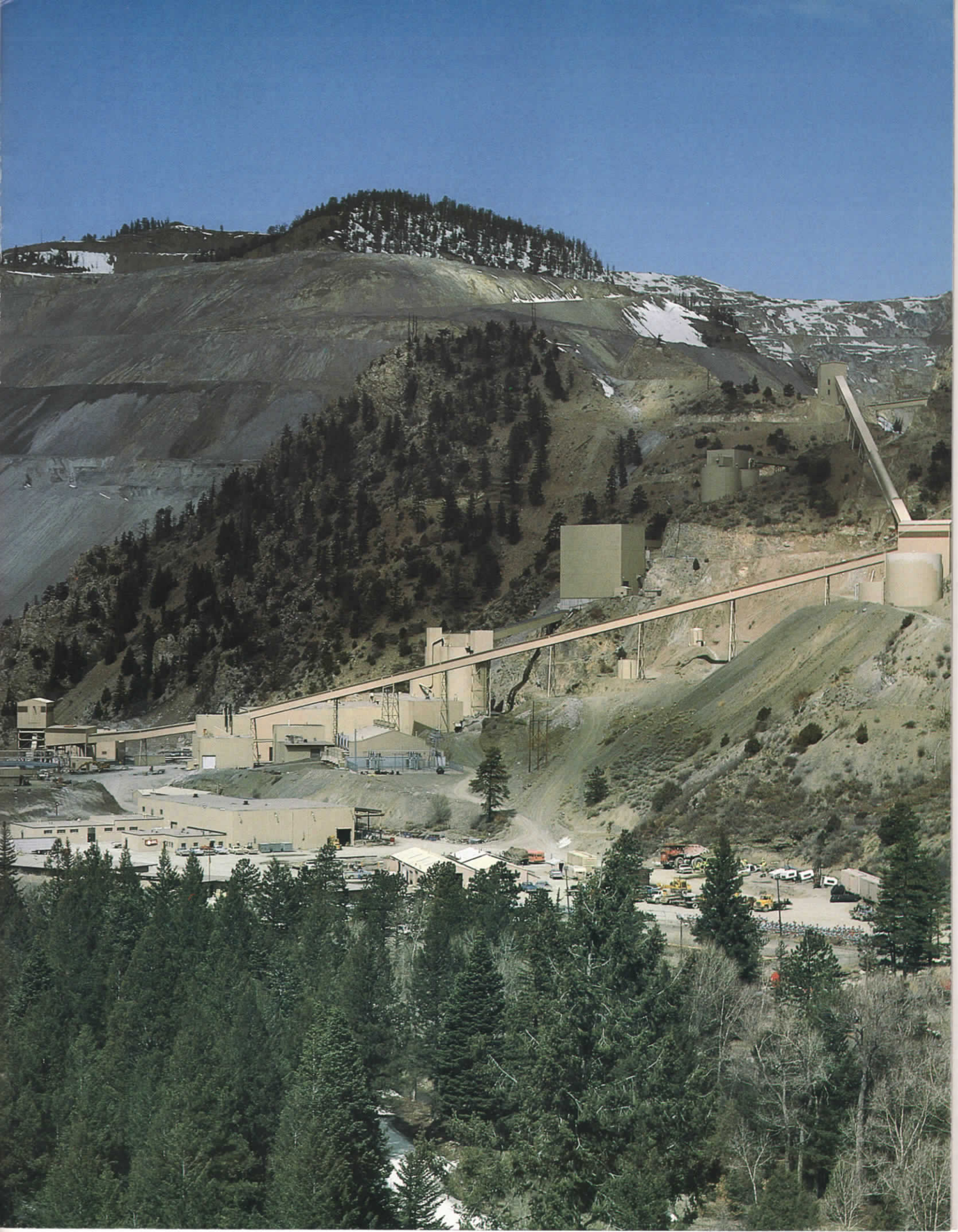
Dave Shoemaker, underground project manager, described this method. "The mine consists of two primary levels—a grizzly level and a haulage level. Above the grizzly level, in a secondary level called the undercut level, temporary undercut drifts are driven, and holes are drilled through the walls and roof of these undercut drifts in fan patterns. The holes are loaded with explosives and blasted in a systematic fashion allowing the undercut level to collapse. Broken ore flows down through draw raises to the grizzlies, and through them by gravity into transfer raises to the haulage level. The grizzlies are fixed screens that cover the opening of the transfer raise and control the size of the rock going into them."

At the haulage level, bottom-dump electric trolley locomotives, monitored above ground by an elaborate computer system, carry the ore to an inclined tunnel called a decline. The mile-and-a-half long decline, constructed entirely by Molycorp employees, was completed 18 months ahead of schedule.

The mine is a vast operation. Harvey Judges, mine superintendent, stated that "five miles of railroad track have been laid in the underground so far, and there will be about 20 miles of track in the underground before the ore is exhausted. Enough concrete is used in the mine support systems each month to pave one-third mile of four-lane highway. Two 1,300-foot shafts were sunk to carry employees and equipment and to provide ventilation. Giant machines called jumbos help drill tunnels that are advanced at the rate of 70 to 100 feet per day."

Bill Renison, underground maintenance superintendent, pointed out that all hoists and the compressed air plant are fully-automated, and the concrete batch plant is instrument-controlled. Most of the maintenance facilities are located above ground for better quality control and working conditions. An automatic conveyor system transports ore to the surface.

Molycorp's modernized concentration mill has ore crushing and storage facilities for the new underground molybdenum mine in Questa, New Mexico.



In the early days the mine ran on water power and pulleys, not to mention man- and mule-power.

The ore then goes through a series of crushing, grinding, flotation, and drying steps at the mill. This process produces molybdenite concentrate, which is shipped to Molycorp's Washington, Pennsylvania plant to be processed into molybdenum oxide, ferromolybdenum and other products for use in the iron and steel industries.

The improvements to the mill were also extensive. When Molycorp employees gathered around the company's first flotation mill (one of the first in the country) and heard the crushers groan and the ball mills roar for the first time in 1923, they could not have anticipated the size of today's operation. This time, a modernized mill churns out the first ore from Questa's new underground mine. Mill operators, who became underground miners, mechanics and construction workers while the mine was under development, are happy to be back in the mill where moly is produced.

Ironically, the more things change, the more they stay the same. While electricity and computer technology have made dramatic changes in the efficiency and the monitoring of mill processes, the crushing, grinding, and flotation techniques used in the mill are much the same as those used in the early days of the Questa operation.

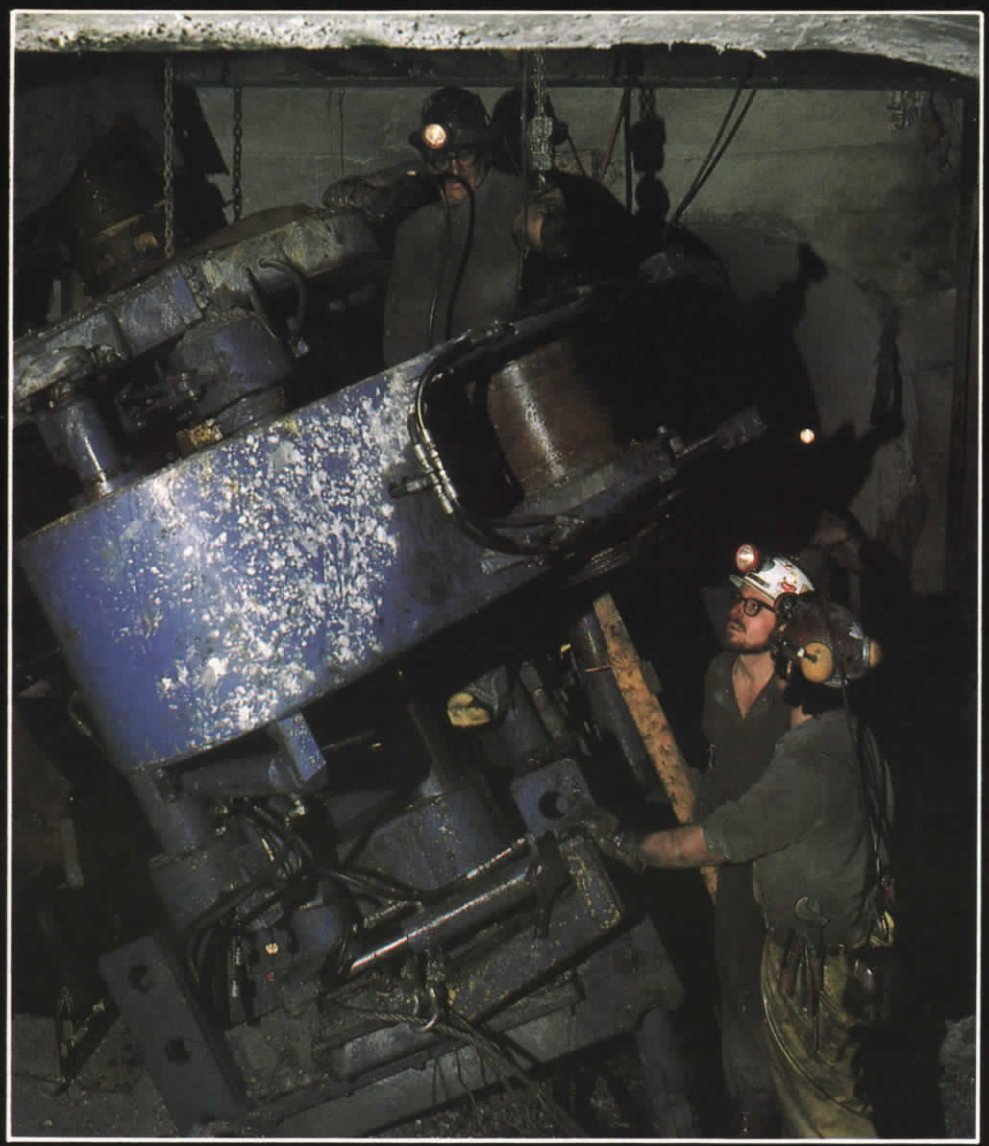
In early 1923, miners laboriously loaded ore into horse-drawn wagons which were lugged uphill several miles to an old gold mill which was converted to extract molybdenum. Not only was the ore transport slow, the gold mill really did not process molybdenum well. The miners decided to build a flotation mill specifically designed to extract molybdenum—not gold.

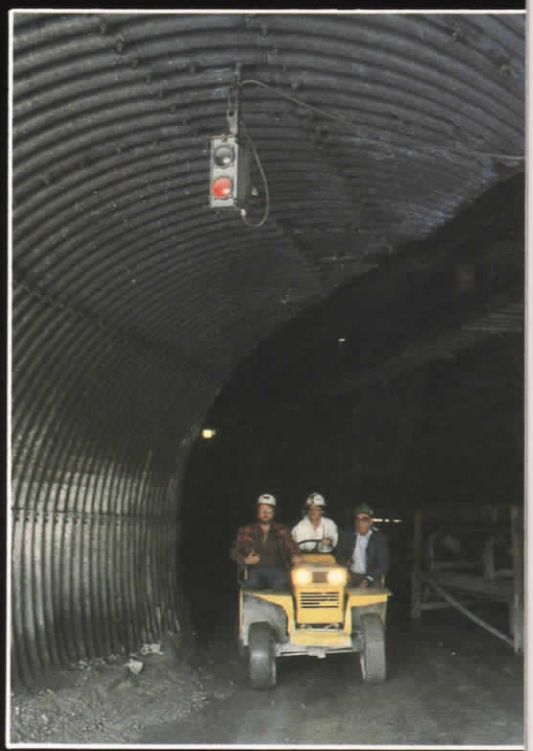
Milling was a tedious process. Water was channeled two-thirds of a mile from the Red River to supply water and power to that first Questa mill, built where the current mill now stands. Upon completion of the mill in 1923, Molycorp operators were helping to produce a major portion of the molybdenum requirements for the United States and Europe—amazing for a small operation running on pulleys and water power!

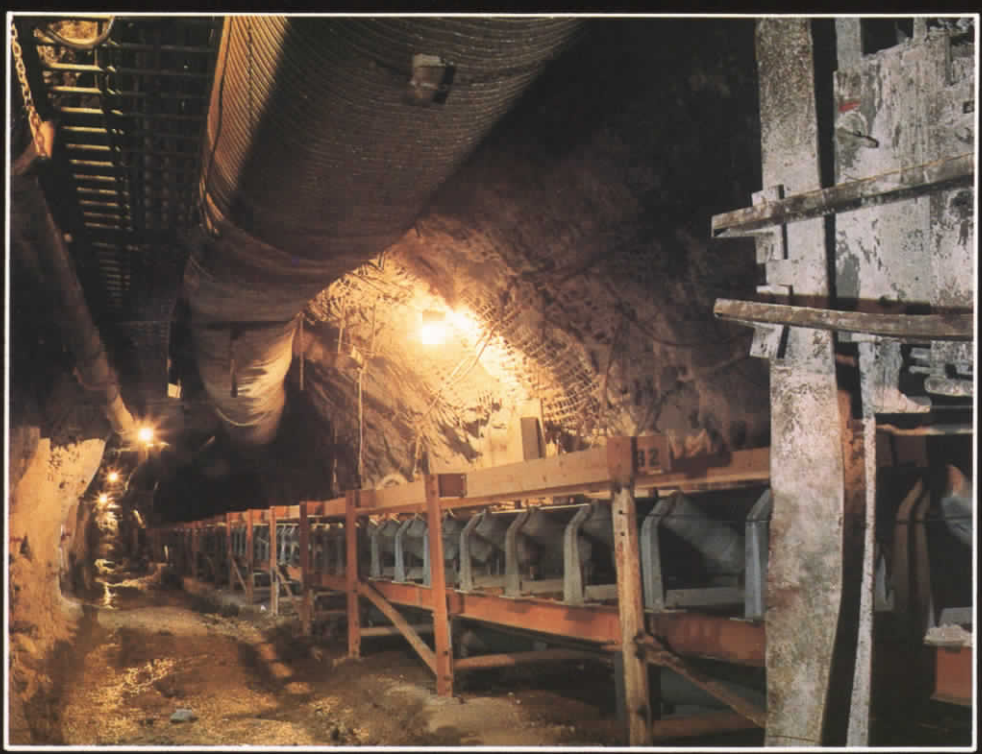
It was not until 1935 that electricity finally came to the Questa mill. That major improvement is the basis for many advancements in the milling process to date. According to Mill Superintendent Bob Sega, "The basic mill process has not changed in the past 60 years—only the mechanics have improved. Electrical power and new technology have enabled the mill to become larger and more efficient, but the flotation process has stayed with us all these years."

Flotation is the process used to recover the molybdenum. Everyone knows that only things lighter than water float. So how can something as heavy as molybdenite particles float? At Questa, molybdenum is floated by a method discovered about 100 years ago by a miner's wife who noticed that mineral particles floated on the soapsuds when she washed his clothes.

Ore is first crushed with a giant mortar and pestle to small pebbles. Water is mixed with the pebbles and the slurry goes into the grinding mills. These large rotating drums contain steel balls (hardened with molybdenum) which grind the ore to powder. The ore and water are piped to a giant whirlpool (a flotation cell) where oil is added to the system. The oil has an affinity for the molybdenite particles. Compressed air and other reagents are introduced to create a froth. The oil-coated molybdenum particles adhere to these air bubbles, rise to the top with the froth, and float out of the cell leaving only ground rock to go down the drain. This waste from the process, called "tailings," is taken to another area for disposal and water reclamation, while the molybdenum bubbles go through nine stages of purification. The 90 percent pure, wet molybdenum then goes to filters and thermal dryers before packaging and shipping. What could be simpler than that? Art Coca, electrical and instrument superintendent's answer, "A mill that runs itself." And that may be what the fourth generation mill will do.





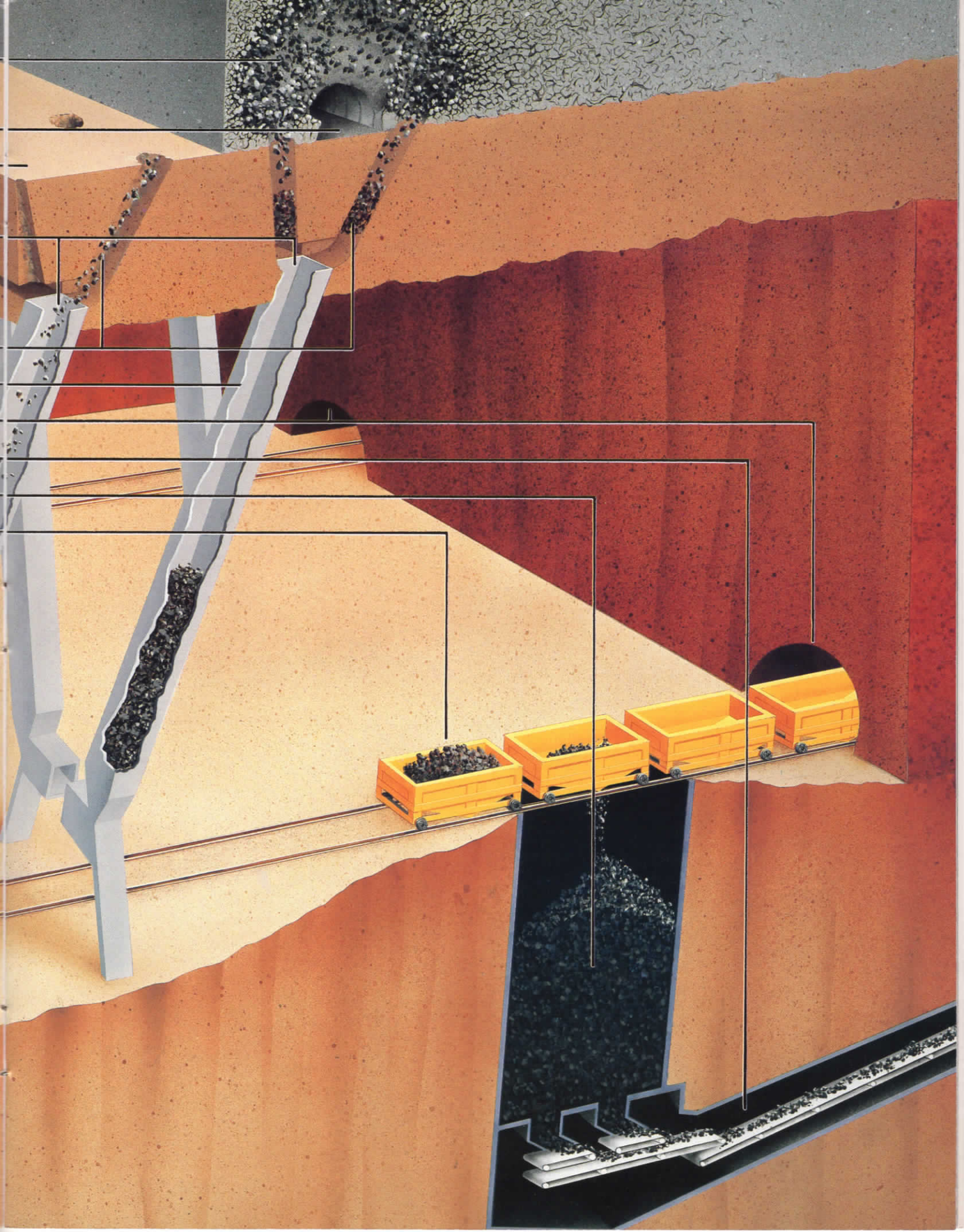


A geologist at work, a safety team at the portal of the decline, and Molycorp employees working to construct the ore storage pocket (Above).

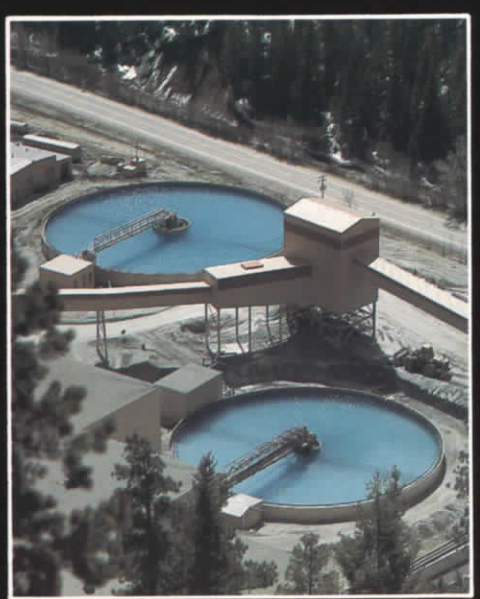
The boring machine is used to develop transfer raises (Upper left).

The 7,500-foot conveyor carries ore to the surface (Left).


Caving ore
Undercut drifts
Drift: horizontal underground passage-way used for access.
Undercut level
Grizzlies
Grizzly: steel rails placed over a floor opening and used for rough sizing of ore.
Grizzly drift
Draw raises
Raise: vertical or inclined opening that connects mine levels.
Transfer raises
Haulage drift
Conveyor tunnel (decline)
Ore pocket
Bottom dump ore cars
Loading station
Haulage level



Ball mills grind the ore to a fine powder, and water is added to produce a slurry for the flotation process (Right).
Nine miles of rubber-lined pipe carry the tailings to a disposal area (Below).
Molybdenum concentrate is thickened in these huge tanks (Lower left).
Storage bins at Molycorp's roasting facility in Washington, Pennsylvania (Lower right).



Molycorp has spent $30 million renovating the mill since it was shut down in August 1981. The improvements include new screens and motors on the crushers, additional regrind mills, larger flotation cells (the first of this type to be used by primary molybdenum producers), and a central control panel containing a microprocessor-based CRT unit. In addition, new automatic feed thermal dryers are a far cry from the hot plates used to dry molybdenum concentrate in the old Grandad Mill.

Like much of the mine development, a substantial number of the mill modifications were done by Molycorp's own work force. Mechanics, mill operators and laborers all became construction employees to rebuild the mill into a larger, more efficient structure. Bill Devine, general superintendent of operations, says, "Our mill crew worked better in this construction project than many contractors I have worked with. I am extremely proud of the crew. The mill project will greatly improve efficiency of mill operations. At Questa the goal has always been low cost, efficient production and our changes over the years have furthered that goal. All of us are looking forward to producing a quality product at lower cost."

Only about three pounds of molybdenum are recovered from every ton of ore taken from the underground. What happens to the waste?

Molycorp's achievements in waste disposal and environmental protection can be regarded as exemplary in the mining industry. The tailings are transported through nine miles of rubber-lined pipe from the mill area to disposal ponds west of Questa. Located in a mountainous national forest, Molycorp has combined innovative technology, continuous research, preventive maintenance, and constant monitoring to provide maximum environmental protection. Recently, the company began a multi-million dollar project to relocate about six miles of tailings line away from the Red River to minimize risk of spillage.

Further, a new ion exchange plant treats waste water, returning it to the Red River purer than it was before the milling process.

Finally, in addition to an ongoing revegetation program, Molycorp has been able to conquer its most overriding environmental challenge—that of blowing dust from the tailings disposal area. A soil stabilizer that resembles synthetic rubber, developed by Union Chemicals Division's Polymers Group, significantly reduced the blowing dust during last spring's high winds, and this technology is likely to become widely used.

The responsibility for turning Questa's molybdenum disulfide into a variety of finished products for industrial use rests with the Washington, Pennsylvania plant. Last year Molycorp dedicated new facilities there that include a 12-hearth roaster that will process 20 million pounds of molybdenum contained in the Questa concentrate. The plant will also produce molybdenum products for use in catalysts and lubricants.

In addition to this modern molybdenum operation, Molycorp owns a 45 percent interest in the world's largest producer of columbium, the company Companhia Brasileira de Metalurgia e Mineracao (CBMM) in Brazil.

And Molycorp is the world's largest producer of rare earths from its facilities in Mountain Pass, California. Some of these rare earths, or lanthanides, are also processed at the company's plants in Louviers, Colorado, and York, Pennsylvania. The minerals from the California mine are used in a litany of high-technology products, ranging from phosphors for X-ray technology, to television sets (to produce the red color), to portable stereo headsets, to catalysts to produce gasoline, and in a host of other unusual applications. Some hospitals are using newer rare earth screens, rather than traditional X-ray technology, that substantially reduce the amount of radiation to which a patient is exposed.

Molycorp is accustomed to being the best. Its reputation as a reliable supplier of precious minerals to world markets is well established. And Questa's new ultra-efficient mine and mill will enhance that image for many years to come. (76)

Special thanks to Cindy Stark of Molycorp's Questa Division for her contribution to this article.

Giving Something Back

by Saundra Woodruff

In the heart of Kit Carson, Georgia O'Keefe, and D. H. Lawrence country in Taos stands the Harwood Foundation, clearly one of the most important social and cultural centers in all of northern New Mexico.

A Taos County commissioner recently said, "Taos without a library would be like Tibet without the monks." Apparently, the possibility of losing the Harwood Library, to which he referred, was unthinkable. Union Oil agrees. Since the Harwood has given so much to Taos County for 60 years, including to Union's employees in New Mexico, Union decided to give something back.

The Harwood Foundation, owned and operated by the University of New Mexico, has been at the center of the artistic and cultural life of Taos County since it opened in 1923—the same year Molycorp, Inc., began mining at Questa just 30 miles north of Taos. Until recently, the library, along with the other Harwood facilities, has been funded by the state. But the library faced possible reduction in services, or even closure, since the state cut assistance in half for this year.

The Union Oil Company of California Foundation, at Molycorp's recommendation, came to the Harwood Library's rescue with a $20,000 gift to sustain it at full operating levels through this year, and a promise of $10,000 next year contingent upon community matching funds for the $20,000 gift. The gift was welcome support.

The foundation has a history of giving in the state of New Mexico. In 1981, it contributed to the renovation of the Alcade building of the Harwood, and it has been a long-time supporter of the Santa Fe Opera and the Santa Fe Chamber Music Society, as well as other organizations.

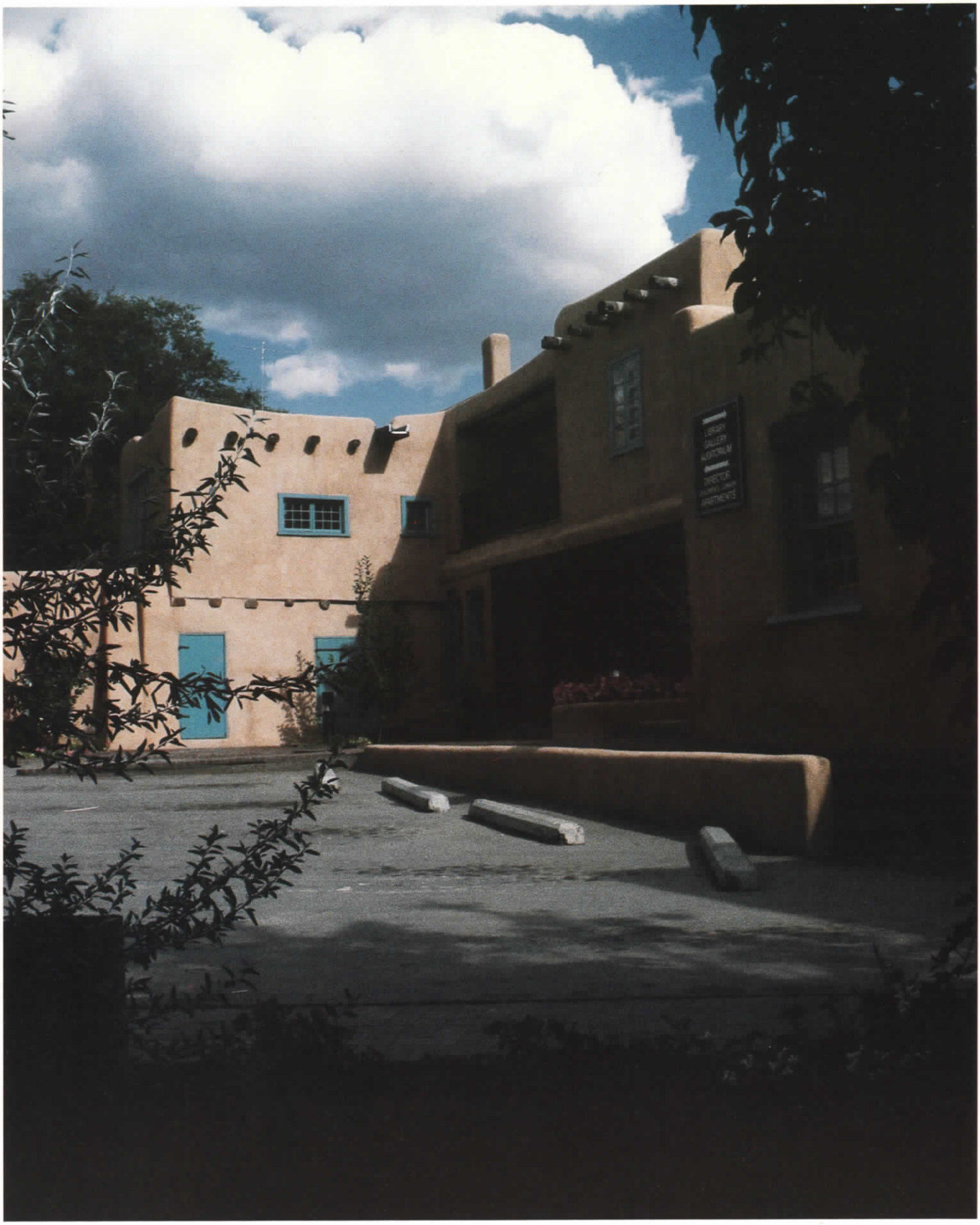
Molycorp, too, has a history of contributing generously to its host communities. In addition to some improvements in the Questa area, such as a new bridge and street lights, Molycorp recently contributed over $100,000 to a Questa Community Assistance Project which includes a new ambulance, funding for a new Village of Questa administration building, and the salary for a police officer. And students at New Mexico Highlands University in Las Vegas, New Mexico, will benefit from Molycorp's recent donation of computer equipment to the school's computer science classes. But few gifts will have benefits as far-reaching as a gift to the library.

Since Lucy Case Harwood donated the building to the University of New Mexico in 1935, the Harwood Foundation has been funded by the state. Recently, the Bureau of Educational Finance of the state of New Mexico reduced its funding for the library, since it is located so far from the university's campus in Albuquerque and does not benefit the university directly. Complete funding will be withdrawn in June 1984.

The Union Oil Foundation's gift represents nearly one-fifth of the Harwood's annual operating budget. The rest of the operating funds were provided by the state's 50 percent contribution, and aid from private and corporate citizens and local government.

From its modest beginnings as a semi-public library and exhibit area, the Harwood evolved into a multi-faceted facility which houses the public library for the town and county of Taos, a public museum of Taos art (one of only three in town), and a children's library (the largest and most frequently visited in the entire Southwest). In addition, the Harwood offers a variety of on-going programs including films, concerts, lectures, classes, an oral history project, and continuing education workshops.

The Harwood Library is actually three libraries in one: a public library, the Padre Martinez Collection and a children's library. The public library, opened in 1926, is especially strong in art books and literature of the Southwest. The Padre Martinez Collection specializes in Taos art and books by or about D. H. Lawrence. This portion of the library also provides space for books about the theater and play anthologies. The children's library opened in 1978 and offers programs in art, music, film, and storytelling, as well as readers' clubs.



The museum buildings of the Harwood (which will continue to be funded by the university) contain the works of Ernest Blumenschein, Victor Higgins, Bert Phillips, Oscar Berninghaus, Emil Bisttram, Patrocinio Barela, and many other famous Taos artists, as well as the Santo Collection of *retablos* and *santos.* (The *retablos* are religious paintings on wood, usually in the image of saints, by Hispanic artists and were originally collected by Mabel Dodge Lujan. *Santos* are carved figurines of the saints.) Even tinware and Spanish colonial furniture are on display.

The Harwood building itself is one of Taos' most impressive structures. The large two-story adobe at the end of historic Ledoux Street has been an architectural landmark since Captain Smith H. Simpson, a contemporary of Kit Carson, constructed the nucleus of the complex in the early 1860s (although some parts of the buildings are thought to be over 150 years old). World War I brought E. Burrit (Burt) Harwood and his wife Elizabeth (Lucy Case) to Taos, and they purchased the house in 1917. Although important additions were made between 1917 and 1940 (including a second story, the first in Taos), the original design of Simpson's house is still evident.

The University of New Mexico has made additional improvements to the house during the past decade, and the Alcade buildings have been restored under a federal Economic Development Administration grant. In 1976, the house was placed on the New Mexico Register of Cultural Properties and the National Register of Historic Places. The oldest structures house the children's library, director's office, and the Alcade building meeting rooms.

The Harwood has a children's library (Top) *and a public library* (Right). *The Padre Martinez art collection includes "Mongolian Monastery" by Leon Gaspard* (Top far right) *and "Out of Space" by Emil Bisttram.*

Mrs. Harwood founded the Harwood Foundation in 1923, a year after her husband's death. As artists themselves who had emigrated from Paris, she and her husband had always opened their home to other artists, and it was the only place in town where artists could exhibit their work. According to one historian, Lucy Case Harwood did more for the artists and for the cultural life of Taos than anyone else, with the possible exception of Mabel Dodge Lujan. Mabel was more influential beyond Taos, while Lucy was a lady of the people. The famous Taos Society of Artists, sometimes called the "Founders," met at the Harwood Foundation, and, along with other members of the Taos County community, contributed their works of art for exhibit there.

The library portion of the Harwood began from Mrs. Harwood's private collection and was so small that no formalized circulation system was established. As community members began to contribute their treasured volumes to the collection, it took on a distinctive historical character and now contains some of the most prized antique books selected by those early patrons among its 28,000 volumes.

The fine arts collection alone includes about 3,000 volumes selected for quality and scope not only by the Harwood staff, but also by several generations of Taos artists.

Having exhausted her personal resources, Mrs. Harwood willed the property to the University of New Mexico in 1935 with the stipulation that it be held in perpetuity to carry on the work for which it was designed.

The property came without endowment to cover operating expenses, however, and so was state-supported. Since the university was not permitted to sell the library and museum when the state cut off its funding, it needed to find another way to support the Harwood Foundation. Various avenues for funding are still being explored, but Union's assistance is a significant interim measure.

"It was this year's miracle," said David Caffey, the director of the Harwood Foundation. "As of a year ago, such a gift was nowhere in sight. It came unexpectedly, right when it was needed, and filled a specific void. It allows a full level of staffing and services for the coming year, and provides encouragement as we work toward providing a secure future for the library as a locally owned and administered resource."

C. R. "Bob" Sacrison, general manager of Molycorp's Questa division, presented the check to Caffey at a luncheon sponsored by Molycorp at Taos in August. About 50 community leaders were present, including members of the Friends of the Harwood board, the only formalized fund-raising organization for the Harwood. Sacrison said, "I'm proud of Union Oil for recognizing the important function of the library to this community. I couldn't think of a better organization to support."

Dr. Alex Sanchez, Associate Provost for Community Education at UNM, told the gathering at the luncheon, "This is indeed a significant day which marks a transition point in the history of the Harwood Foundation in Taos. Today the focus changes from the University of New Mexico to the community of Taos. This transition started several years ago, but today is symbolic because it is the first overt act which changes the focus to the local scene."

At least some Taoseños agree that shifting the focus to the local scene is as it should be. Taos Mayor Phil Lovato said it was "a shame that this community has not had a library without support from the state. Now we have a library of our own." Mayor Lovato has been instrumental in heading up a major community outreach program to gather funds for the Harwood.

In a published letter to Molycorp, Lovato thanked Union Oil for its contribution to the Harwood. He said this contribution was "further indication that Union Oil and Molycorp are extremely good corporate neighbors. I applaud your actions. Please rest assured that the Town Council in concert with our colleagues, the Taos County Commission, will continue the efforts to have a community library of our own. The cooperation of you folks as well as the Taos County community will make it that much more meaningful."

Union Oil's contribution was intended, in fact, to help the community while the torch is passed from the state to local entities. Sanchez recognized the spirit of Union Oil's gift when he told the luncheon guests, "By accepting this gift from Union Oil Foundation, you, the people of Taos, have been handed a challenge as well as cash. This gift signifies your willingness to accept the responsibility for preserving this library for future generations. This is not just a library but a very unique and special library very fitting for Taos." He promised the university's assistance in assuring a smooth transition.

Union Oil's gift provided the spark of encouragement to all parties interested in preserving the Harwood. Caffey said, "Although we still face a major challenge in completing the transfer of the library from UNM and state administration to local funding and local control, it is heartening to know that we finally have all interested groups moving in the same direction —UNM, the Town of Taos, Taos County, the Friends of the Harwood, and other private individuals, and our corporate citizens as well. With everyone working together in the same direction, I think we can expect good things to happen."

Union Oil expects continued good things from the Harwood, too. Over the years, Union's employees have received much from the Harwood, and we're glad to give something back. (76)

SHEDDING LIGHT ON COMBUSTION:

LASERS AT BREA

by Richard A. Condon

When the laser was first invented, scientists were unsure as to what uses the device might have. One researcher called it "a solution in search of a problem." The question of practicality of this new invention, however, was short-lived. Today, lasers are used for such diverse purposes as accurately measuring the distance from the earth to the moon (which lasers can tell us to within a fraction of an inch), transmitting telephone calls and television programs, welding detached retinas in the eyes and cutting cloth for the fashion industry.

Lasers have also found many uses in the research laboratories of the Union Science and Technology Division in Brea, Cal. One of the division's interesting and promising applications of laser technology is studying the combustion process. In effect, Brea is conducting an examination of how fuels burn.

As recently as the 18th century, many scientists believed that every object contained a mysterious substance called phlogiston. When something burned, they reasoned, it gave up its phlogiston. (We retain the phlogiston myth in contemporary language when we speak of something as "burning up.")

In 1774 Antoine Lavoisier realized that the apparent disappearance of matter during the burning process is an illusion. What in fact was happening, Lavoisier said, was that an invisible component in the air (which he later named oxygen) was chemically combining with hot matter, yielding heat and a variety of combustion products. Today this concept still defines a fuel —i.e., any substance that can participate in a heat-releasing chemical reaction with oxygen.

Americans burn a great deal of fuel—for example, gasoline, coal and natural gas—to provide the energy needed to power our civilization. The fuels we burn are in finite supply. Hence there is a compelling need to burn them as efficiently as possible.

Further, "unburned" by-products of inefficient combustion can enter our atmosphere and eventually have an injurious effect on human health and the environment. Scientists need to know not only the general features of the combustion process, but also the details of the intricate network of molecular processes we simplistically refer to as "burning."

Thus we can no longer treat the internal combustion engine as a "black box," indifferent to what is actually going on inside it.

At Brea, the laser is used as a research tool in discovering how to burn fuels as efficiently, intensely and cleanly as possible.

One of the traditional problems of studying combustion has been that the instruments used to examine the process can change the process itself and, therefore, yield erroneous or ambiguous results.

Traditionally, probes have been placed within the combustion system to measure temperature and the concentration of chemical species. The probes can affect the chemistry occurring during combustion, either by disturbing the flow of the reactants and products of the combustion process, or by providing a surface that promotes other chemical reactions. Similarly, probes which remove samples from flames can dramatically alter the nature of the samples before they are analyzed.

On the other hand, lasers emit light beams that are nearly all the same frequency. This light can pass through flames without disturbing them significantly, and provide qualitative and quantitative data on what is *actually* happening as a fuel burns. "If we use lasers, the fundamental chemistry in the flames can be examined without significantly disturbing the chemistry of the flames," says Dr. Peter Jessup, a senior research chemist at Union's Science and Technology Division. "Lasers offer us a greater versatility than other methods."

Knowing the chemical details of what is actually happening inside an internal combustion engine may lead to a rethinking of the combustion process. Because of lasers, your automobile engines and the fuels they use may someday be very different from

A portion of the Nd:YAG laser beam is diverted to provide the energy for the dye laser (Left).

Diane Dillon and Steve Brass fine tune the set-up. The prism in the foreground is mounted on an adjustable track so that pulses from the two lasers can be synchronized at the critical focus in the flame (Right).

those that are currently manufactured. Union scientists at Brea are working intently to make sure that Union products will be ready to meet the future-shock of these potential developments. "Not only are we working on the future," says Don Clark, supervisor of Product Evaluation, "but we are also trying to solve problems that have been plaguing the petroleum industry for decades."

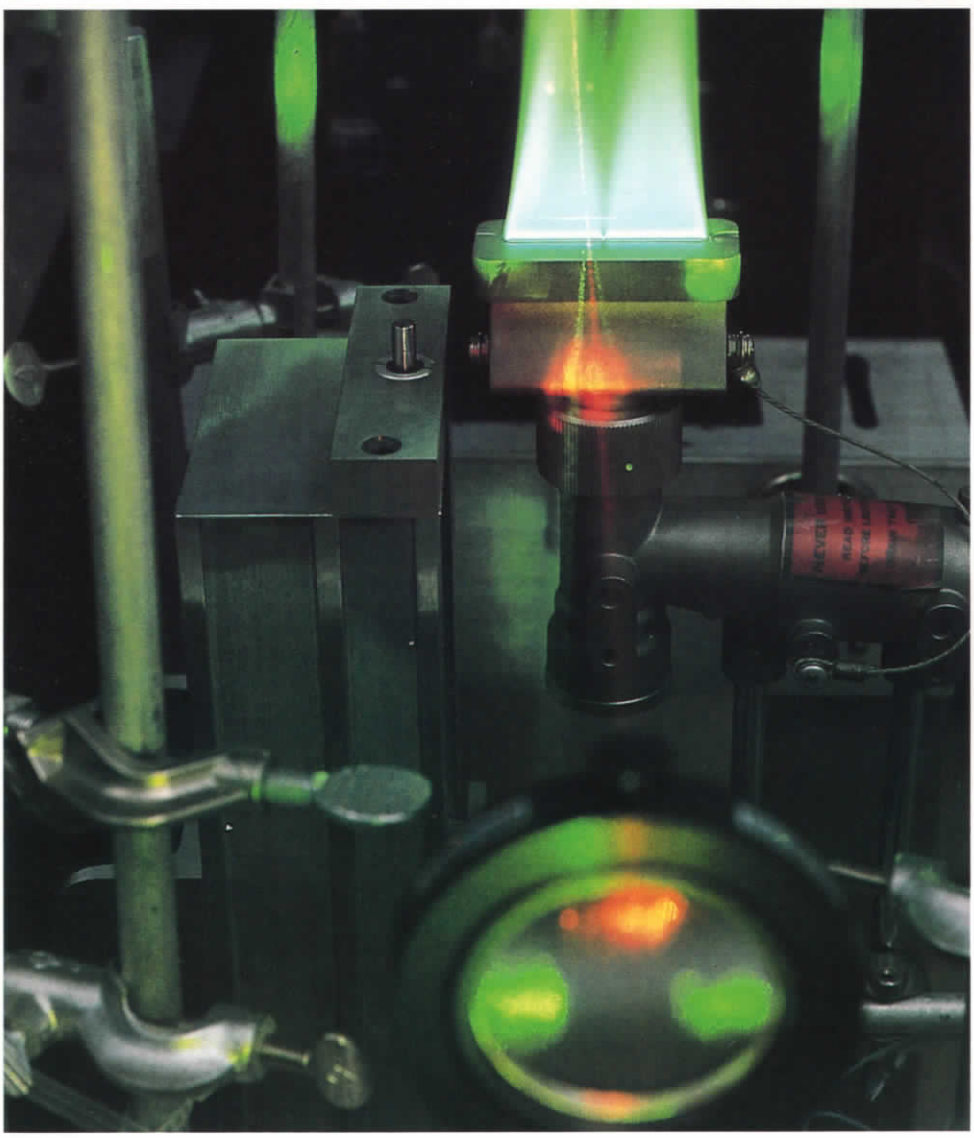
At Brea, two kinds of lasers are used to study the combustion process—a neodymium-YAG laser (Nd:YAG), which uses rare earths similar to those produced by Molycorp at Mountain Pass, Cal., and a dye laser. The Nd:YAG laser is pulsed—that is, energy is stored up and then suddenly released as a burst of light, much like the flashbulbs used in cameras. Unlike a conventional flashbulb, however, lasers yield very short exposure times—not just major fractions of a second, but nanoseconds (a nanosecond equals one billionth of a second). They can thus "stop" or "freeze" an extremely rapid process such as combustion within a car cylinder, so that the events occurring can be examined in exquisite detail.

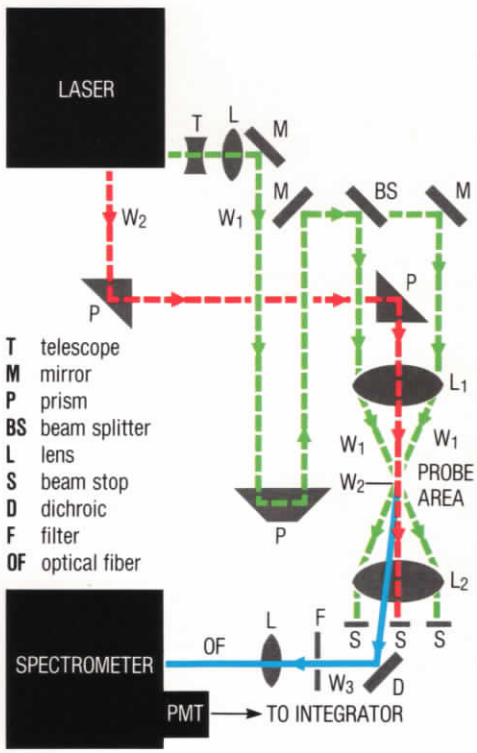
Further, a laser beam can be focused down until it is very small. It can thus be used to study a tiny portion of the combustion process—a volume, for example, of about one-third of a cubic millimeter. (That's about the size of a newly-born gnat.) Lasers thus enable scientists to study tiny segments of the combustion process so that its cellular details, not merely its gross anatomy, can be examined.

Using a combination of a dye laser and a Nd:YAG laser, Union scientists can perform both qualitative analysis (i.e., they can tell what substances are present) and quantitative analysis (i.e., they can tell how *much* of a substance is present). They can also measure transient temperatures.

The passage of laser light through a flame causes a phenomenon called Raman scattering. Raman scattering is laser light which has been shifted in frequency (changed in color) to an extent characteristic of the molecules it encounters. Each type of molecule shifts the laser light in a fashion unique to itself.

High-powered lasers are used in order to create a Raman effect large enough to be measured. In the Raman experiments being done at Brea, the beams from the Nd:YAG and dye lasers are mixed in the probe volume and result in a new beam which is collected and analyzed. In this way





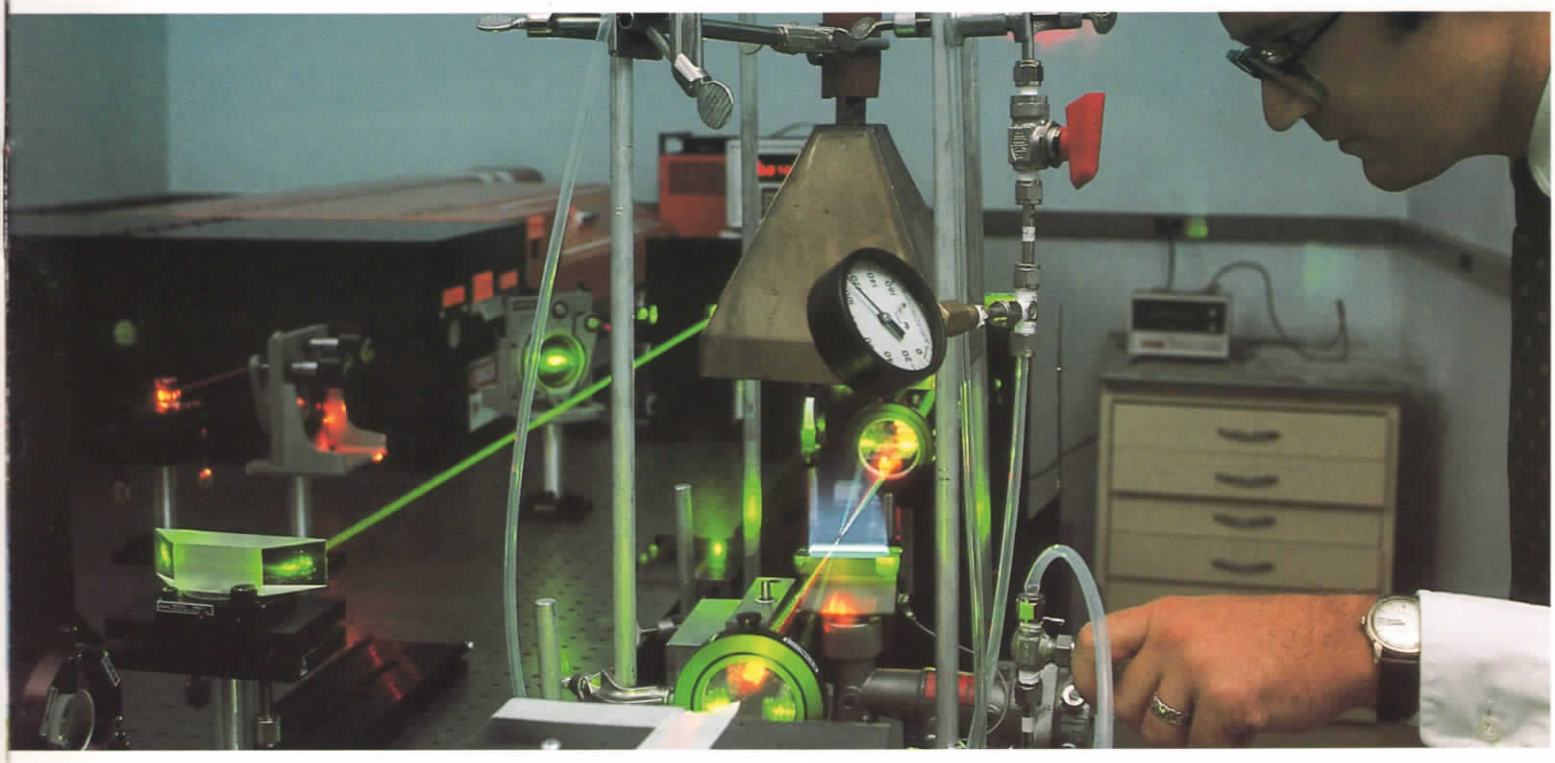
Three laser beams (the Nd:YAG beam is split in two) define an area of flame about the size of a period for study. A dichroic (which reflects only certain light frequencies) and an electronic integrator clarify the Raman effect beam (W3) for study (Above).

temperatures in the flame can be measured and mapped with a high degree of spacial resolution.

Chemical species in flames are most easily measured using a technique called laser-induced fluorescence (LIF) spectroscopy which uses the light from the dye laser. "The great advantage of the dye laser," says Union's Dr. Pat Ritz, "is that it can be used to generate high powered beams of light at any wavelength throughout the visible and ultraviolet spectrum. By selecting the appropriate wavelength, we can excite any given type of molecule to a higher energy by selective absorption of the laser light. The molecules then lose the extra energy by giving off light at a new characteristic wavelength. The new light is collected and measured to yield data on the concentration of the selected molecules and sometimes on their temperature."

The result of these experiments is a chemical fingerprinting which will enable scientists to track down (among other things) the villains of combustion: soot, unburned hydrocarbons or other inefficient by-products of the combustion processes. A sensor called a spectrometer is used to analyze the Raman-scattered or LIF light and scientists use computers to analyze and identify details about these chemical criminals, establish where they reside and give clues as to their *modus operandi.*

To compete in today's oil industry, a company must use the most advanced technology it can—electron microscopes, state-of-the-art computers and microprobe analyzers, for example. Always noted for its high tech capabilities, Union is today using such equipment to pursue the same kind of advanced research it started only one year after its birth (1890) in Santa Paula, Cal. Its technical balance of trade vis-a-vis the rest of the oil industry is outstanding: for every technical license Union purchases, it sells ten to other companies. The laser combustion studies currently being conducted at the Fred L. Hartley Research Center at Brea are just one example of this research tradition. They should give us all great confidence in both the present and the future of Union Oil. 76



Mike Croudace adjusts one of the gases that feed the flame.

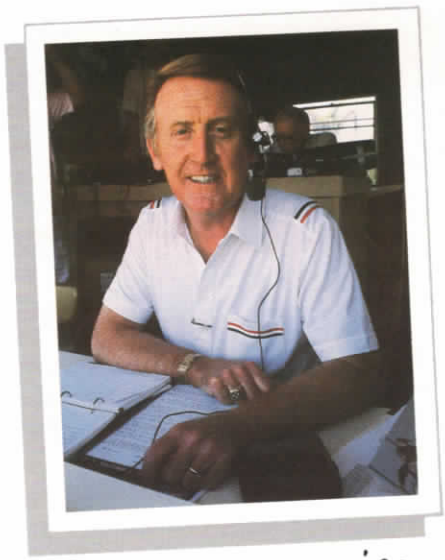
DODGERS CELEBRATE ANGELIC SILVER ANNIVERSARY

Twenty-five years ago—in 1958—the Dodgers moved from Brooklyn to Los Angeles, giving the city its first major league baseball team. Just one year later, these same Dodgers finished first in the National League pennant race, then defeated the Chicago White Sox in the World Series to give Angelenos their first taste of Dodger mania.

Union Oil Company began sponsoring the team's broadcasts shortly after its arrival in southern California and the relationship endures to this day. In fact, Union and the Dodgers boast the longest sponsor relationship in major league baseball, not counting a corporation's actual ownership of a team.

It is estimated that games sponsored by Union and broadcast through the Dodger network each year in Arizona, Nevada, California, Hawaii and Mexico have a listenership of more than 200 million fans.

To recall the great thrills provided by the Dodgers over the past 25 seasons, Seventy Six *magazine asked Bob Hunter, a well-known sports writer in Los Angeles, to write his impressions of Dodger Blue.*



Vin Scully... voice of the Dodgers.

Twenty-five years of Dodger baseball in Los Angeles merit a special celebration, but hoopla isn't exactly new for their fans.

They've had plenty to whoop about since that historic opening pitch in the Los Angeles Coliseum on April 18, 1958, when Carl Erskine faced the San Francisco Giants.

All of us have had many thrills etched in our memories since that opening day 25 years ago. The Dodger imprints have been lasting, indelible, tingling.

What are your favorites over 25 years?

There are hundreds from which to choose. Shut your eyes and dream. Take a pin and stick it in almost any of the Dodger highlights over the seasons and you come up with a winner.

My three favorites are Don Drysdale pitching 58.2 consecutive scoreless innings in 1968, Maury Wills' 104 stolen bases in 1962 that broke Ty Cobb's "untouchable" record, and Sandy Koufax's four no-hitters, notably his perfect game against the Cubs in 1965.

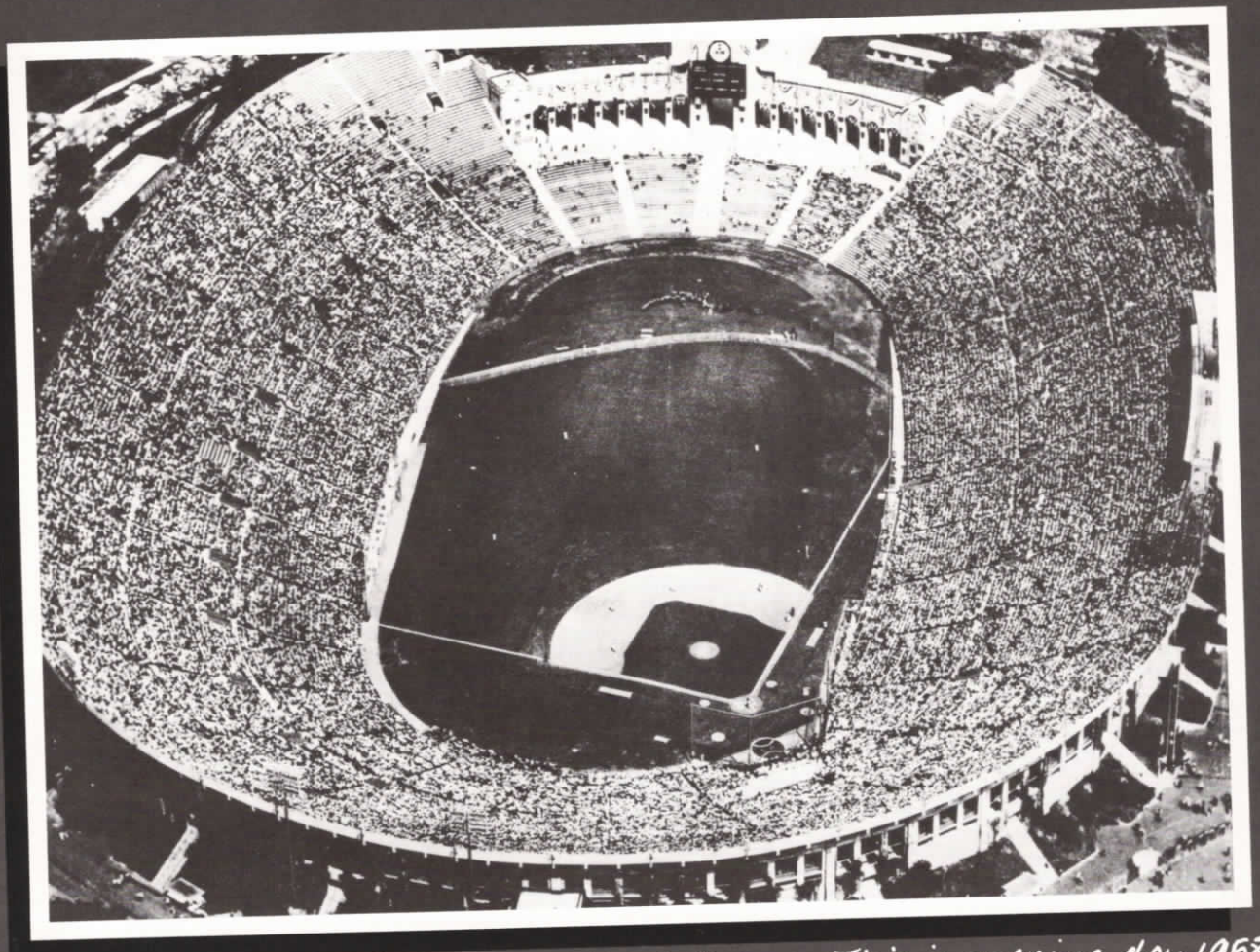
Oddly, the Dodgers had just one hit in that Koufax classic themselves, but that was plenty in those days of "K-000-000-000-fax," Drysdale, Johnny Podres and Wills.

One reason my favorite feat is Drysdale's string of shutout innings, spanning more than six full games, is that I don't think it will ever be broken.

After Wills broke Cobb's record with steal number 97 on September 23, 1962, he added three more to make it an even 100 when the regular season ended. He then stole another four in the National League playoffs against the Giants.

Koufax's perfect game still has a special place in my book of memories because, as the official scorer that day, it got me into the Hall of Fame.

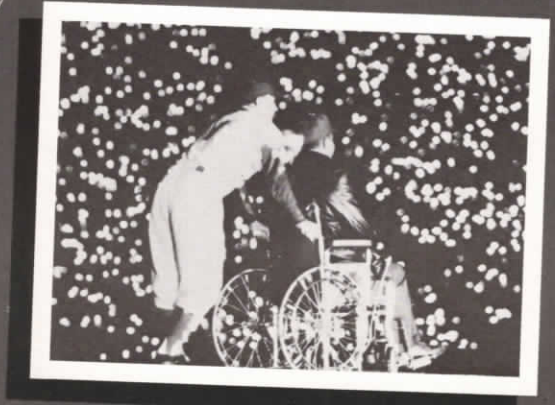
Cooperstown asked for my original scorecard, duly signed, and twice I have seen it in baseball's Shrine and the Koufax "niche."



The Dodgers first home in L.A. was the Coliseum. This is opening day 1958.

The O'Malleys. Peter on the left, father Walter on the right.

Stars of the 60s. Don Drysdale, Tommy Davis Sandy Koufax. Maury Wills.



Roy Campanella night. Baseballs largest crowd ever honored the great star.

That April afternoon opener in 1958 against the Giants was a genuine thrill, as well as an exciting adventure given the Coliseum's "Chinese wall" in left field only 250 feet from home plate. Wally Moon turned it into a shooting gallery the second year, making the "Moon Shot" baseball's answer to a space shot.

While I was as impressed as anyone in Los Angeles that first game in the Coliseum, which truly cemented baseball's geographical claim to be the "national pastime," I think I was more impressed with a game the following year, against the New York Yankees.

While it was "only" an exhibition contest, it also was a "Tribute to Roy Campanella," whose baseball career had been terminated by a tragic automobile accident the winter prior to the Dodgers' move from Brooklyn to Los Angeles.

The game drew an all-time baseball record of 93,103 and, with the cavernous Coliseum darkened, everyone in attendance lit a match, highlighting a dramatic ceremony.

It was a sight I'll never forget.

Walter Alston's club finished far down during their first season. But the following year with a team the Quiet Man termed "my most satisfying," the Dodgers defeated Milwaukee in a playoff, then brought the world championship to the West for the first time by beating the White Sox in six games.

Larry Sherry, now a minor league pitching instructor with the Dodgers, had been called up from the minors earlier that season. In the World Series, he pitched two victories in relief and saved the other two to claim the Most Valuable Player award.

The faith of Walter O'Malley in Los Angeles had been fulfilled after some factions, including a powerful morning paper, once announced that, "Major League Baseball Never Will Draw in Los Angeles."

The Dodgers were to win seven more championships, and three more world's titles, with the most gratifying, according to Alston and hordes of fans, being the spectacular sweep of the Yankees—with Koufax, Podres and Drysdale—in 1963.

Maybe the most climactic last day of the season came in 1977, featuring Dusty Baker, one of the team leaders ever since he came from Atlanta in the winter of 1975.

Ron Cey, Steve Garvey and Reggie Smith already had hit 30 home runs, and on this dramatic final day Baker smashed his 30th, to complete the first quartet to hit 30 or more home runs for one club in a single season.

The fans who stood for half a dozen curtain calls have that afternoon riveted forever among their diamond memoirs.

The last ball park to be built by private enterprise, until O'Malley came west, was Yankee Stadium, called the "House That Ruth Built," after the popular Yankees star, Babe Ruth.

In 1962, after bitter court fights, referendums, and almost a year when I was covering politics instead of sports in the city council chambers, Dodger Stadium, still the most immaculate and beautiful sports edifice in the country, was opened on April 10.

The ceremonies leading up to the occasion, as well as on that day, were as fitting as they were historic.

The park was destined to be the site of some of baseball's most poignant dramas, and largest season attendance figures.

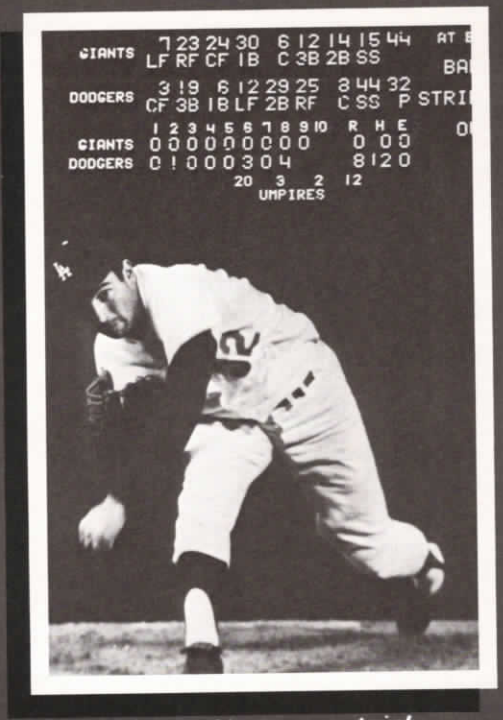
In 1978 the Dodgers became baseball's first team to go over the three million mark in attendance, drawing 3,347,845, then repeated it two times. This year will mark their fourth three million figure. No other club has reached it even once.

There have been many highlights and thrills at Dodger Stadium:

Dodger Stadium became the home of the "Mod Squad," the all switch-hitting infield, and the site of the most colorful of any All-Star game, when 56,058 came out for the pageant in 1980.

Koufax put some frosting on the pastry when, tying the record for the second time, he struck out 18 before the Dodgers had been in their new home more than two weeks.

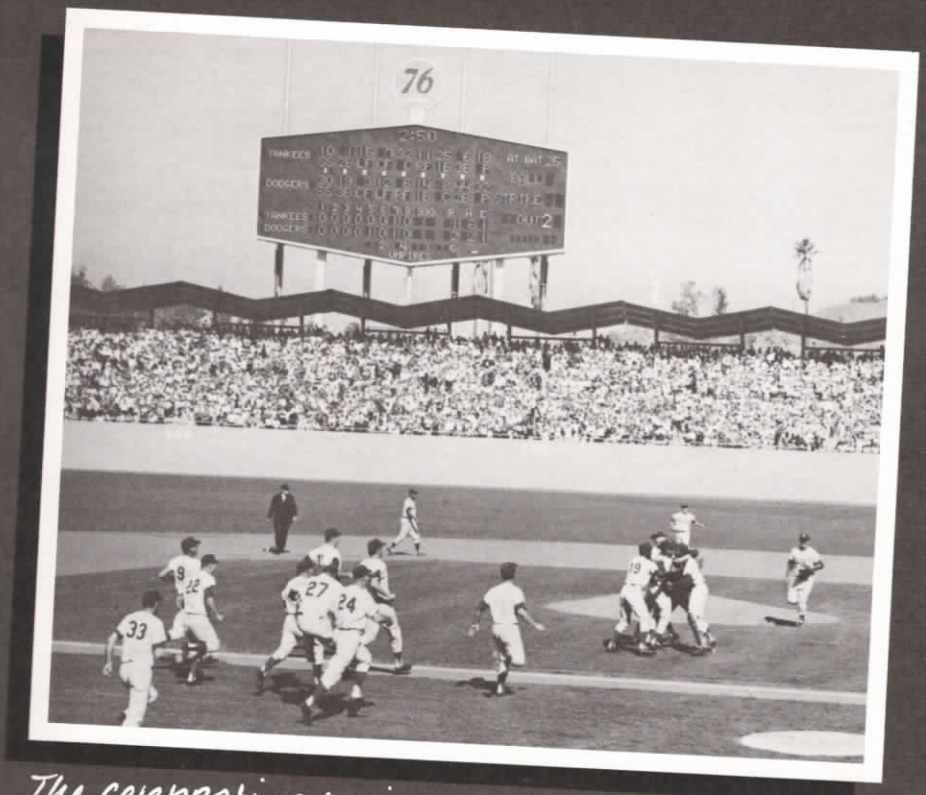
While they also lost a pennant playoff to the Giants that first year in the stadium, they came back the next to enjoy their hour of ultimate glory by sweeping the Yankees in the World Series.



Just another no-hitter for Sandy.

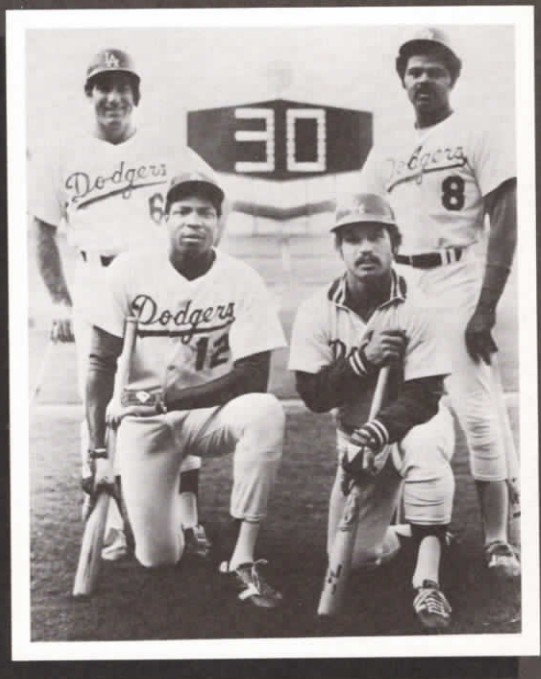
Pedro Guerrero

Dusty Baker.

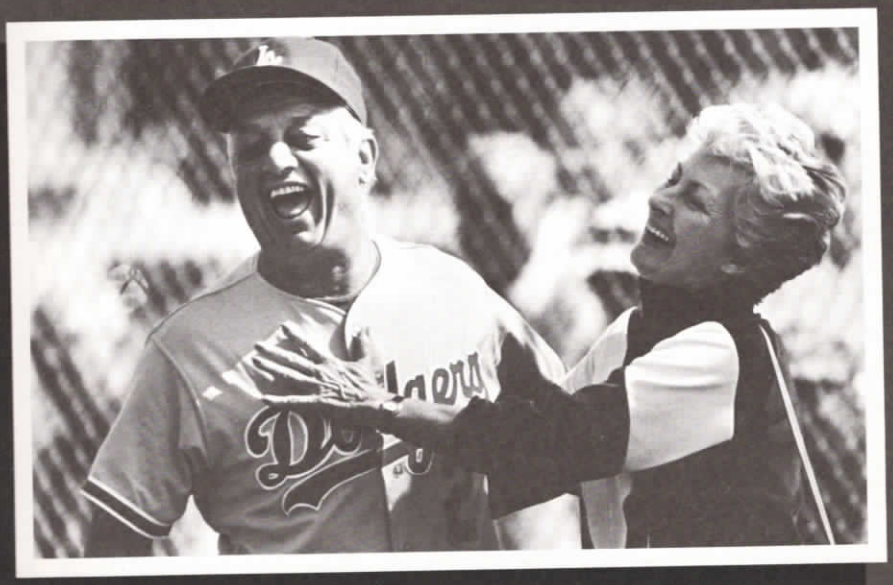


The celebrating begins for the sweep of the Yankees in the 63 World Series.

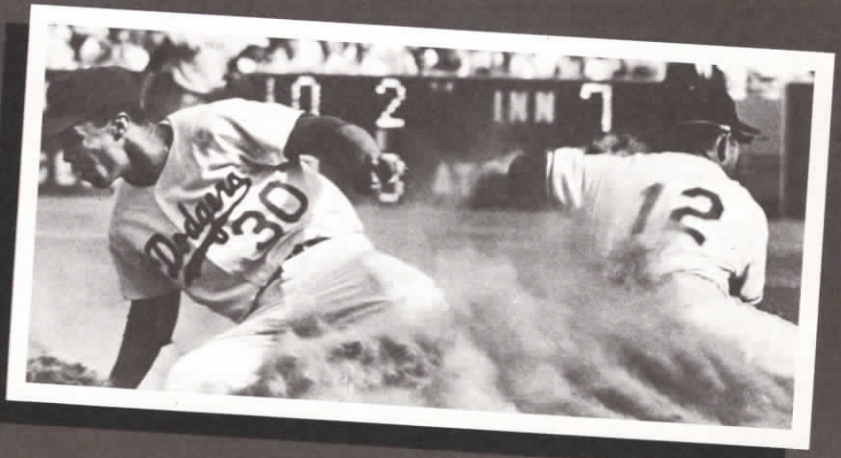
Dodger President Peter O'Malley.



Steve Garvey, Dusty Baker, Ron Cey and Reggie Smith each hit 30 or more home runs in '77.



Manager Tom Lasorda with wife Joan



A steal of third in 1962 gives Maury Wills a record of 104 for the year.

One of the continuing sagas was Manny Mota's relentless pursuit of the pinch hit record, which he broke with his 145th in 1979.

From the dugout, the popular Mota was applauded every time he poked his head into view. He became the first base coach and batting instructor but, on August 29, 1980, he was reactivated, then added enough pinch hits to bring his total to 150, a seemingly untouchable figure.

Meanwhile the Giant-Dodger rivalry, transported from Coogan's Bluff and Ebbets Field to the West Coast, was spinning a running thread through their tale of two cities here, just as they had on the other shore.

There were the bitter rhubarbs when Alvin Dark watered and dumped sand at home plate and around first base in San Francisco's Candlestick Park to slow down speedy Dodger runners until the league president had to put a halt to "Little Malibu Beach."

Then came the even more bitter incident when Juan Marichal hit John Roseboro over the head with a bat, touching off a lawsuit and charges and counter charges about the two-inch gash.

When people tried to prevail on Roseboro to drop his suit, he answered with no little merit, "Yeah, but it was my head." Eventually, the suit was settled for $11,000 and Marichal and Roseboro wound up shaking hands as members of the Dodgers, but the San Francisco-Los Angeles rivalry only flared brighter.

Then everything else took a rear seat as the Dodgers swept to their third Los Angeles pennant in 1965, beating Minnesota in the World Series with Jim Gilliam's great back-handed fielding play closing out the tournament.

The next year the Dodgers ran another pennant up the pole on the final day, but were swept by Baltimore in October.

In that series Willie Davis committed three errors in one inning in center field, but as if in atonement, the gazelle-like 3-Dog thrilled the fans for a stretch of 31 games in '69, hitting safely in each one.

There were somber notes, of course, just to make sure, perhaps, that the many good times were appreciated.

One of these downers came when Sandy Koufax and Don Drysdale, who had astounded the baseball world with their pitching heroics, staged the first double holdout.

It seems like there always was something happening on the Dodger club. Games were Barnum and Bailey productions.

Wes Parker hit for the cycle. In 1970, "Bullet" Bill Singer demonstrated that Koufax wasn't the only pitcher who could fashion a scintillating no-hitter. Then in 1980 Jerry Reuss did it, making the feat unusually meaningful because it was against the Giants.

Remember when, with the fans yelling "Go, go, go," captain Davey Lopes stole 38 consecutive bases?

No pitcher received a more sustained cheer than when Bobby Welch struck out Reggie Jackson in that suspenseful 1978 World Series game.

Iron Mike Marshall established a record for relief appearances in 1974, often entertaining the early arrivals by serving up a bit of batting practice hurling, then going to the bullpen to await Alston's call.

There were a lot of damp eyes among the 50,000 when the uniforms of Koufax, Campanella and Jackie Robinson were retired. Then, as if to recapture the drama, the rare ritual was reprised for Alston, Gilliam and Duke Snider.

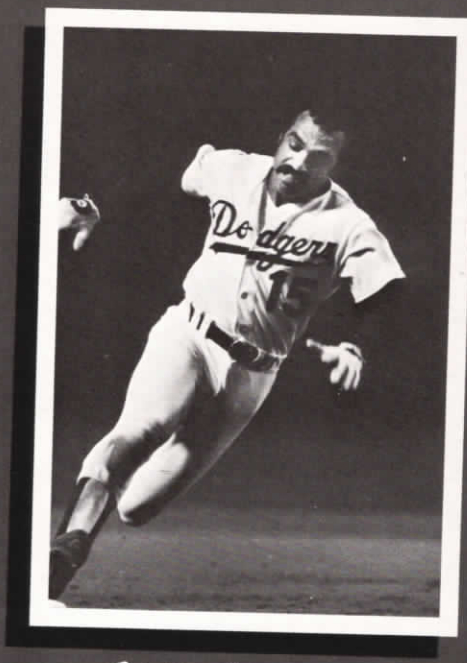
Don Sutton, Tommy John, Phil (The Vulture) Regan being "frisked" by the umpires while the fans howled their protests. The trio was often accused of using "foreign substances" on the ball to give them an advantage over the hitters.

Rick Monday's twilight hour home run beat Montreal and nailed down the 1981 pennant.

The arrival of Fernando Valenzuela, the legend from Mexico, who won the Cy Young award his first year. The resignation of Walter Alston, the hiring of Tommy Lasorda.

Appointment of Peter O'Malley as president of the most successful and exciting franchise in baseball.

All a part of 25 years that have sped along at a thrill a minute. (76)



Davey Lopes

Alejandro Pena

Fernando Valenzuela.

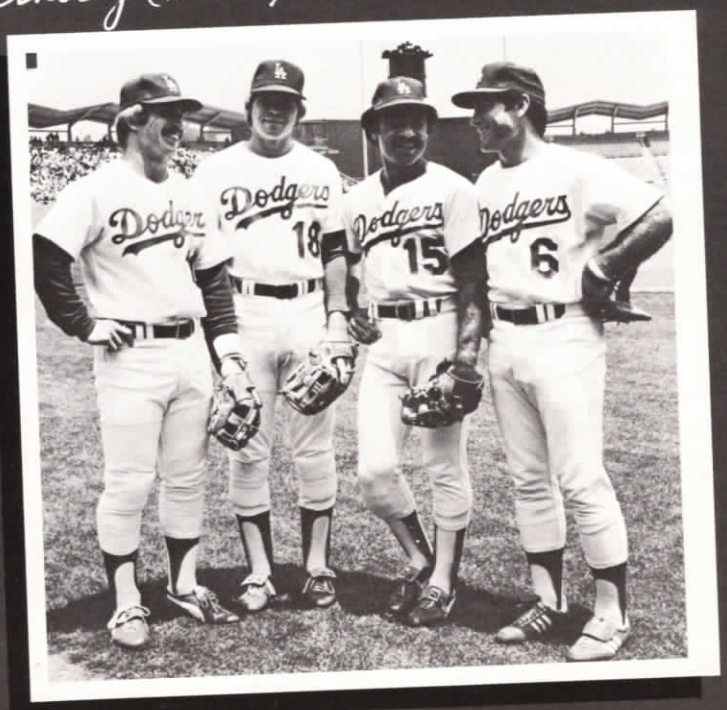
Talkin' Baseball. President Reagan giving advice to two former great managers, Al Lopez (l.) and Walter Alston (r.)

Bill Russell

Bob Welch

Steve Sax

The enduring infield of Cey, Russell, Lopes and Garvey. (l. to r.)



Willie Davis on post-game show with Jerry Doggett.

Union: Staying on Course in Today's Bewildering Market

Today's highly competitive gasoline market is something of a puzzle. Watch the commercials on television touting one brand over the other, for example. Examine the ads in the newspapers and magazines. Then, if you're not already thoroughly confused, pull into a service station that's literally wallpapered with multiple choice prices. So much for self-serve, so much for full-serve. This amount for paying cash, that amount for using credit cards.

With this in mind, *Seventy Six* approached William S. McConnor, president of Union Oil's 76 Division, the arm of the company responsible for domestic refining and marketing activities, to explain why the current market displays such bewildering variety.

McConnor started his career with Pure Oil Company in 1941 and has served in a variety of key positions with Union Oil, including general manager of refining and vice president of Eastern Region Refining and Marketing. He was appointed to his present position in 1972.

Following are his views on the current market and Union Oil's own marketing outlook.

Q: What are the options a motorist faces today, as far as different marketing techniques are concerned?

A: Today, consumers can choose to buy gasoline on a full-serve or self-serve basis, with or without credit cards. Several major companies even offer their customers the option of carrying credit cards but receiving a discount for paying cash. Very soon, consumers will also be able to purchase gasoline using a debit card issued by a bank or oil company.

But it is Union's contention that not all consumers buy on price alone. There are other factors to consider such as quality, convenience, service and credit.

Q: How does Union plan to face today's rapidly changing marketing atmosphere and how is it assured of a place in the marketplace?

A: Given the circumstances of this diverse, fast changing market, and Union's philosophy of customer service, quality, convenience and credit, we feel we have made the proper decision. We remain a full service marketer. We have retained our credit card and we do not charge a processing fee to our dealers and jobbers.

Q: What could you give our readers as a historical perspective to what has taken place in petroleum marketing?

A: Our business has always been dynamic. Past developments have a direct bearing on the fact that today's consumers have many different options when purchasing gasoline.

A glance at these recent changes also helps explain how major oil companies can have contrasting marketing philosophies and still compete successfully at the pump.

Before you saw *Star Wars* in the theater, you saw Gas Wars at your local service stations. Long before one of our competitors decided to blow up its credit card in front of millions of TV viewers last year, there was the "Ten Times Stamp" scheme. You probably still remember the service station give aways and games of the 1960s and 70s. All of these gasoline marketing approaches had one thing in common: they were designed to increase gasoline sales in the short run and to build the kind of market share that is the key to long run success.

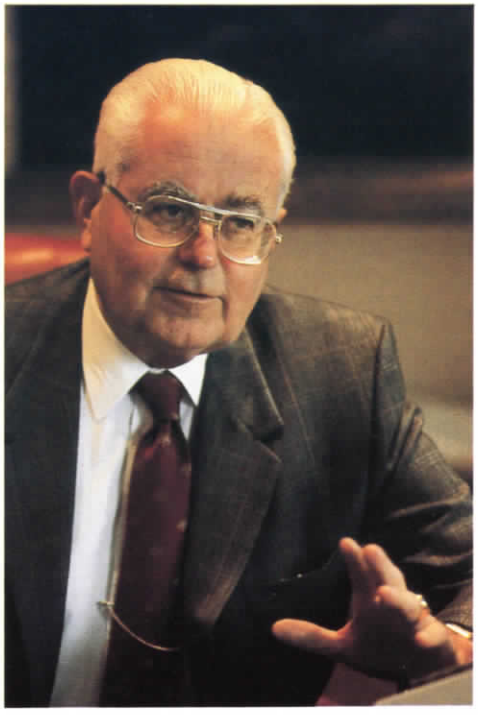
Petroleum marketing took another turn during the 70s. Many majors, seeing the success of the independents, decided to take some of the frills out of a fill-up and instituted self-service in their own right. A customer could pump his own gasoline and save money in the process. Starting out slowly, self-service has grown in popularity. Today, over 60 percent of all U.S. gasoline sales are made on a self-service basis.

Cost consideration was the biggest single factor in acceptance of self-serve. With the price hikes that followed the Arab oil embargo of 1973–74, and the Middle East disruptions of 1979, consumers became increasingly conscious of energy costs in general. Naturally, this included the cost of petroleum products used in the automobile.

As consumers sought to pare their transportation expenses, they also disciplined themselves to drive fewer miles and traded in their gas guzzlers for economy cars.

The result was a smaller overall market. Gasoline sales peaked at 7.4 million barrels per day in 1978. In 1982, they were down to a little more than 6.5 million barrels per day.

As you would expect, this makes the struggle to retain and expand market share all the more fierce.



Q: Considering all this, how would you explain the present shape of the market?

A: What has occurred is a complex segmentation of the marketplace into consumers who have identifiable traits or tendencies when it comes to buying gasoline for their automobiles. According to Union's market studies, consumers are currently divided into five basic groups.

The first is what we term the "self-serve saves money" group. These people enjoy serving themselves as well as saving money and believe that the quality of gasoline is all the same.

Group two feels that "the car is just transportation." These folks typically believe that gasolines are identical. Usually, they buy self-serve.

The third group's view can be summarized as "full-serve is worth the money—if you can afford it." They buy self-serve the majority of the time.

Group four says "full-service is best." These customers enjoy being waited on. They are predominantly credit card users.

Group five consumers are those who hold that "the car is personally important." They enjoy owning a performance car and like taking care of it. They recognize that gasolines are different.

Q: And to what group is Union aiming its sales?

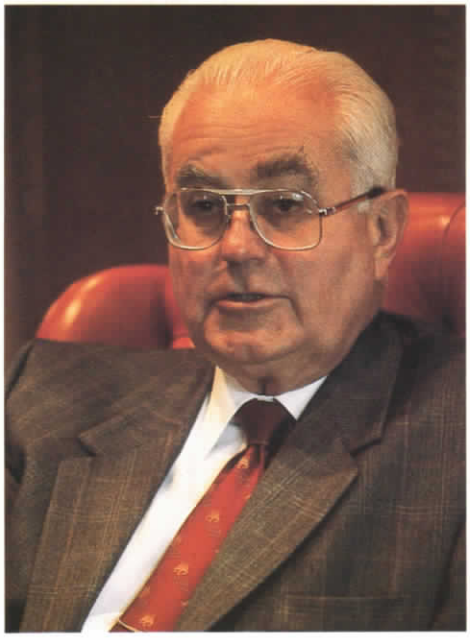
A: Our surveys showed Union scoring highest among customers convinced that "full-service is best." We also seemed to appeal to those who view the car as "personally important."

Our market studies also revealed that a large percentage of consumers prefer to charge their gasoline purchases rather than carry extra cash.

After identifying this market segment our next step was to determine the best way to attract the customers we wanted.

In a clearly segmented market such as we have today, companies must direct their advertising campaigns and marketing programs toward the needs of the consumers they feel best suited to serving.

I'm sure you will agree, it would be a dull world if we all decided to market the same way.



Q: What about the other companies?

A: Their decision to eliminate credit cards seems to be in line with a move to align themselves with consumers in the "self-serve saves money" group. No doubt, this is the fastest-growing segment in the marketplace. Moreover, it does reduce costs.

But Union felt that too strong a focus on one particular market segment raised the risk of our becoming too narrow and inflexible. Sometimes, you can paint yourself into a corner. We wanted to avoid that. Our decision, therefore, was to emphasize full-service...but not to ignore the buying habits of the fast-growing self-service consumer segment.

Q: So how has Union approached the new market?

A: The upshot at Union is a program that stresses all elements of full service—including credit cards, quality products, top notch automotive service and personal attention to the consumer—but one that also offers consumers the option of buying gasoline on a self-serve basis.

The majority of our stations have at least one self-serve island. We have also added a few high volume, strictly self-service outlets in selected locations. They not only offer self-serve, but also offer the convenience of honoring the Union Oil credit card.

You might compare us to a restaurant that specializes in prime rib, but which serves other entrees as well. Our aim is a menu that offers enough variety to please our entire clientele.

Q: What is it that's needed for your marketing strategies to succeed?

A: To succeed with this requires a solid corps of dedicated dealers, distributors and jobbers. Union is fortunate to have just that. Our dealers and jobbers are independent business people, not employees of Union Oil Company. I can't say enough about the importance of their past efforts and the role they will play in the future.

We place a great deal of emphasis on ensuring that they receive the best possible training. Our programs are intensive and cover all facets of operating a service station. We also conduct specialized courses in various aspects of automotive service.

Our new PROTECH program, for example, just now becoming available in Los Angeles after being launched elsewhere in the West, offers motorists a company guarantee on auto repairs that will be honored at all of our participating West Coast stations. This program allows all PROTECH dealers to give customers a written guarantee, backed by Union, for repair work done at their stations. PROTECH will nicely complement our warranty program for Union tires, batteries and accessories.

All of these activities pay big dividends and provide Union and its customers with well trained, informed dealers and jobbers who are the front line in our marketing efforts.

Q: What about advertising?

A: To support our overall marketing philosophy, we have tailored our media advertising to emphasize our commitment to full service, credit cards, and quality products. The overall message has always been "Look to the sign of the 76" for quality gasolines, friendly help and related automotive products and services. The current theme is "Go with the Spirit, the Spirit of 76." The slogan has changed over the years, but the overall thrust is the same.

Q: Can you give some examples of this "overall thrust?"

A: Union's decision to maintain its credit card program is a case in point.

Most of the changes in oil company credit card policies came on the heels of a costly year for credit business.

In 1981, costs for operating and handling our retail credit card system rose dramatically. The immediate causes were the high cost of money and an increase in bad debts. But the root of the matter was the business recession.

We felt that this was a short-term situation and resisted the temptation to cancel or make radical changes to our retail credit program.

Instead, with our commitment to full-service to our customers in mind, we shouldered the challenge of reducing our costs of handling credit.

Our revolving credit program was modified slightly to lower our receivables. We became more selective in the issuance of credit cards to reduce bad debts. Other internal changes were made to streamline operations and reduce day-to-day expenses. We maintain and update our own credit system as opposed to using a contract service. This enabled us to effect the savings.

Finally, to broaden our base, we aggressively solicited new credit card accounts. This, I'm glad to say, brought us about 500,000 new credit card customers.

The combined effect of these tactics did, in fact, reduce our costs. Our credit costs declined between 30 and 35 percent in 1982, something reaching acceptable levels.

As you probably have heard, some major marketers charge their dealers and jobbers a fee for accepting their credit cards. Union does not.

Q: What about cash-on-the-spot rebates? Will Union adopt them?

A: Some companies have suggested that their dealers offer a discount for cash. The customers are offered an incentive to pay cash and the companies generate revenue from a processing fee that helps defray the costs of extending credit.

Still, market studies now show that credit customers who patronize stations that offer cash discounts are paying more than they should for the privilege of using credit. They tend to pay a greater differential for charging their purchases than the dealer is charged by the suppliers.

Union does not intend to adopt a cash discount strategy at this time. We don't wish to penalize the customers who have chosen to patronize our stations and use their Union Oil credit card. On the other hand, those who want to save money by pumping their own gasoline can still use their credit card at our stations without penalty.

Given the circumstances of the marketplace and the makeup of today's consumer, we believe that Union has chosen the best possible course. 76

The World At Work

Fourth annual Seventy Six magazine photo contest

This year's theme will be people at work—on the job or at home, for money, love or both.

The contest will be limited to color photographs. Employees and retirees of Union Oil (its subsidiaries and divisions), and their spouses and children, are eligible. The seven award-winning photos will be published in the May/June issue of *Seventy Six*.

HOW TO ENTER:

Number of entries. There will be one category—color. You may submit up to three entries. For example, one color transparency and two color prints add up to three color entries.

Mounting and labeling. Full 8 x 10 prints can be submitted unmounted, 5 x 7 prints must be attached to 8 x 10 single-weight mounting boards. No framed prints will be accepted. For your protection, slides should be mailed in the boxes that come with developed film, glassine envelopes or plastic mounts. Fill out the entry form; then tape it to the back of each print. Do not write on the back of prints. Write your name and title of the entry on each slide mount. Each entry must be accompanied by a completed entry form or a facsimile of the form.

Mailing. Mail entries in Manila clasp envelopes, including your return address and entry forms. Include any cardboard necessary to protect photographs.

Liability. All entries are to be submitted with the understanding that neither Union Oil Company nor any of its employees will be responsible or liable for loss or damage. Entries may be held beyond the publication date of the contest, but we will attempt to return all entries.

Right to publish. Union Oil retains the right to publish or republish any photograph submitted in the contest. Entrants waive any claims for royalty payments or copyright infringement.

Model release. Contestants must be able to furnish a written "consent to use" statement upon request for recognizable people appearing in the photographs.

Judging. Three professional photographers from outside the company will judge the contest. Their decision will be final.

Deadline. All entries must be mailed by March 1, 1984.

Awards.

Grand Prize	$400
1st place	$200
2nd place	$100
3rd place	$ 50
Honorable Mention	$ 50
Honorable Mention	$ 50
Honorable Mention	$ 50

Entry Form

Send to: Editor, M-17
Union Oil Center
Los Angeles, CA 90051

Name: _____

Title or relationship to employee: _____

Division/Subsidiary: _____

Office Location: _____

Home Address: _____ Zip Code: _____

Phone: _____ (Network) _____

Title of Entry: _____ Print Slide

I have read and agree to the official rules of the contest.
Signature: _____ Date: _____

If under 18, signature of parent or guardian: _____

Service Awards

UNION 76

CORPORATE

June 1983

10 YEARS **Lynda C. Carnahan,** Union Oil Center

September 1983

40 YEARS **Robert A. McKean,** Union Oil Center

30 YEARS **Joseph Byrne,** Union Oil Center
Byron S. Estes, Union Oil Center

15 YEARS **Nestor H. Llerena,** Union Oil Center
Dennis N. Smith, Union Oil Center

10 YEARS **Richard L. Fishman,** Union Oil Center
Edward Hussain, Parachute, Co.
Goldie L. Montgomery, Union Oil Center
Richard M. Reese, Los Angeles, Ca.

5 YEARS **Dorothy A. Galli,** Schaumburg, Il.
Victor Greenspan, Union Oil Center
Mary F. Shlagel, Washington, D.C.

October 1983

40 YEARS **William F. Krick,** Schaumburg, Il.

35 YEARS **Dorothy R. Hanson,** Union Oil Center
John R. C. Phillipp, Los Angeles, Ca.

30 YEARS **Robert L. Depweg,** Union Oil Center

20 YEARS **Sumi S. Kanno,** Union Oil Center

15 YEARS **Richard D. Myers,** Bakersfield, Ca.
Horace M. Neal, Burbank, Ca.
Betty Ann Quinn, Union Oil Center

10 YEARS **Clarine D. Clarke,** Union Oil Center
Michael R. Huff, Union Oil Center
Kenton L. Kunkel, Union Oil Center

5 YEARS **Laval Brewer, Jr.,** Union Oil Center
Karl K. Kasca, II, San Francisco, Ca.

UNION SCIENCE AND TECHNOLOGY DIVISION

September 1983

35 YEARS **J. G. Claypool,** Brea, Ca.

20 YEARS **John Biale,** Brea, Ca.

15 YEARS **Otis G. Erich,** Brea, Ca.
Thomas E. Fordan, Brea, Ca.
Mark L. Garrett, Brea, Ca.
Gerard Grayson, Brea, Ca.
Joe L. Odoms, Brea, Ca.
Rajendra N. Upadhyay, Brea, Ca.
Daniel Valenzuela, Brea, Ca.

10 YEARS **Stephen G. Laktash,** Brea, Ca.

5 YEARS **Ruth H. Bernatzke,** Brea, Ca.
Dennis D. Delaney, Brea, Ca.
Michael J. Hartley, Brea, Ca.
Jonathan T. Kwan, Brea, Ca.
Gordon G. Low, Brea, Ca.
Charles A. Shugar, Brea, Ca.
Keith H. Wrolstad, Brea, Ca.

October 1983

35 YEARS **Herman G. Stanfill,** Brea, Ca.
Allen E. Youngman, Brea, Ca.

15 YEARS **Ramon D. Evans,** Brea, Ca.
Michael H. Laird, Brea, C.
Kenneth C. Sadoian, Brea, Ca.

10 YEARS **Hugh W. Gowdy,** Brea, Ca.
Jeff H. Parsons, Brea, Ca.
David W. Schoen, Brea, Ca.

5 YEARS **Joseph J. Clemens,** Brea, Ca.
Patricia W. Gregory, Brea, Ca.
Carol S. Hemminger, Brea, Ca.
Michael J. Muhvich, Brea, Ca.

UNION 76 DIVISION

September 1983

40 YEARS **Calvin L. Davis,** Beaumont Refinery
Keith E. Niehaus, Chicago Refinery
John P. Shealy, Savannah, Ga.

35 YEARS **Charles T. Dimmick,** Chicago Refinery
William J. Hoppers, Birmingham, Al.
Kenneth L. Kobus, Chicago Refinery
Frank C. Maxwell, Chicago Refinery
John P. Schneider, Jr., Chicago Refinery
Charles W. Williams, San Luis Obispo, Ca.

30 YEARS **Orval V. Arganbright,** Beaumont Refinery
Edward C. Ashburn, Santa Maria Refinery
Grant D. Belcher, Los Angeles, Ca.
Charles C. Curtis, San Francisco, Ca.
Ralph L. Harmon, Charlotte, N.C.
Walker K. Harmon, Savannah, Ga.
Henry H. Johnson, Milwaukee, Wi.
Prue B. Lane, Beaumont Refinery
Norman E. Peterson, Minneapolis, Mn.
Charles A. Ruff, Jr., Beaumont Refinery
Martin J. Schiel, Schaumburg, Il.

25 YEARS **Bruce R. Bigland,** Los Angeles, Ca.
William A. Book, Los Angeles Refinery
Dale E. Kitchen, Los Angeles Refinery
James W. Leech, Los Angeles Refinery
Robert B. McDonald, San Francisco, Ca.

20 YEARS **Harry M. Bundy,** Oregon, Oh.
Clarence Cotton, Jr., Beaumont, Tx.
James L. Durham, Beaumont Refinery
Lucy C. Holden, Schaumburg, Il.
Marran E. Lewis, San Francisco, Ca.
June M. McNett, Schaumburg, Il.

15 YEARS **Antonio Alampi,** Schaumburg, Il.
Warren G. Capers, San Francisco Refinery
Roy F. Chambers, Los Angeles, Ca.
Raul V. Cortez, Los Angeles Refinery
Eleanor H. Hastings, Los Angeles, Ca.
Stephen T. Holland, Memphis, Tn.
Lawrence J. Jaurigui, San Francisco, Ca.
William P. Kates, Chicago Refinery
Harold J. Keller, Oregon, Oh.
Patricia B. Kennedy, Schaumburg, Il.
David H. Larson, Portland Terminal
Warnest H. Pierce, Los Angeles Refinery
Robert E. Racette, Schaumburg, Il.
Carlene S. Riggs, Schaumburg, Il.
Robert G. Roll, San Francisco, Ca.
Martin W. Thomen,, Casper, Wy.
Timothy J. Tomasso, Los Angeles, Ca.
Cecelia B. Volpe, Schaumburg, Il.

10 YEARS **Jerry Aguado,** Torrance, Ca.
James W. Atkins, Richmond, Va.
Carmen Bally, Richmond Terminal
William D. Battenfield, Pure Transportation Co., Van, Tx.
Andrew G. Beaucar, Los Angeles, Ca.
Kay L. Bellew, Schaumburg, Il.
Carol J. Bryant, Schaumburg, Il.
Helmy L. Burtman, Schaumburg, Il.
Eleanor C. Elliott, Schaumburg, Il.
E. Doris Esquivel, Schaumburg, Il.
Linda D. Golec, Schaumburg, Il.
Jerry R. Kachelmeyer, San Pedro, Ca.
Mary Jane Kruger, Schaumburg, Il.
Marilyn S. Leczewski, Schaumburg, Il.
Raymond E. Lorden, South Holland, Il.
Dante L. Macapinlac, San Francisco, Ca.
Frank A. Martinez, Los Angeles, Ca.
Cathleen M. McNeil, Schaumburg, Il.
Tanis C. Nelson, Los Angeles Refinery
Guillermo A. Olaes, Los Angeles Refinery
Joanne E. Splithoff, Schaumburg, Il.
Deborah L. Stoiber, Schaumburg, Il.
Michael C. Wilson, San Francisco Refinery
Kingsley W. G. Wong, Honolulu, Hi.

5 YEARS **Isabel G. Aguirre,** Los Angeles Refinery
Wanda J. Austin, Pure Transportation Co., Van, Tx.
Alvin V. Boyd, Cleveland, Oh.
Steven F. Copeland, San Francisco, Ca.
Sharon R. Dixon, Seattle, Wa.
Howard V. Francis, Schaumburg, Il.
Richard E. Gonzalez, Los Angeles, Ca.
Victoria N. Hall, Los Angeles, Ca.
Kenneth B. Kearns, Schaumburg, Il.
Milos Mandic, Schaumburg, Il.
Joseph M. Monroe, Los Angeles Refinery
Robert Osornio, Los Angeles Refinery
Alice F. Peoples, Los Angeles Refinery
Irene Peterson, Schaumburg, Il.
Jesus M. Robles, South Holland, Il.
Michael J. Sheehan, San Francisco Refinery
Robert R. Stancliff, San Francisco Refinery
Maureen A. Terheyden, San Francisco, Ca.
Carol L. Thill, Spokane, Wa.
Iris Williams, San Francisco, Ca.

October 1983

45 YEARS **Raymond Weber,** Schaumburg, Il.

40 YEARS **Robert J. Billburg,** Los Angeles, Ca.
Vernon H. Nuss, San Francisco Refinery

35 YEARS **Albert B. Adams,** Beaumont Refinery
Eldon N. Bachman, San Francisco Refinery
Warren L. A. Barks, Santa Maria Refinery
Max R. Brewer, Birmingham, Al.
Fred Burkstaller, Los Angeles Refinery
Robert Lee Carroll, Los Angeles Refinery
Richard G. Dowell, Los Angeles, Ca.
Richard D. Jay, Los Angeles Refinery
Carl O. Lundblade, San Francisco, Ca.
Wilson J. Mone, Los Angeles, Ca.
Clarence R. Mostyn, Jr., Beaumont Refinery
Thomas H. Mulligan, Los Angeles, Ca.
Donald L. Ohls, Los Angeles, Ca.
Chester L. Omohundro, Los Angeles Refinery
Richard S. Pearson, San Francisco Refinery
Homer A. Rue, Los Angeles Refinery
Vernon J. Schexnayder, Beaumont Refinery
Fletcher W. Thompson, Beaumont Refinery
Auvy J. Wilson, Beaumont Refinery

30 YEARS **Robert N. Creek,** Schaumburg, Il.
Billy L. Gregory, Los Angeles, Ca.
Edward C. Look, Jr., Schaumburg, Il.
Walter A. Munch, Chicago Refinery
Jerome K. Robinson, Schaumburg, Il.
William M. Shreve, Honolulu, Hi.
Deryl W. Sprague, Orange, Ca.
William C. Sprenger, Schaumburg, Il.

25 YEARS **Kenneth H. Mangels,** Schaumburg, Il.
Lloyd E. Messer, Tampa, Fl.
Laverne L. Raustis, Schaumburg, Il.
John E. Webber, Cincinnati, Oh.

20 YEARS **Joann Cronk,** Portland, Or.
James C. Hamilton, Savannah, Ga.
Jean M. Manachuk, Los Angeles, Ca.
Victoria J. McDonald, San Francisco, Ca.
Garland R. Young, Beaumont Refinery

15 YEARS **Paul J. Benrud,** Schaumburg, Il.
Gerald T. Bergbower, Pure Tranportation Co., Olney, Il.
Frank C. Brune, Los Angeles Refinery
Edward S. Burgess, Los Angeles Refinery
Arturo Canales, Schaumburg, Il.
James M. Davis, Charlotte, N.C.
Donna H. Egan, San Francisco, Ca.
Barry D. Emeneger, Brea, Ca.
Freddie English, Los Angeles, Ca.
Webblee Gautreaux, Beaumont Refinery
Keith T. Howard, Taft, Ca.
John E. Jackson, Jr., San Francisco Refinery
Michael L. Jaramillo, Portland, Or.
Cecilia John, Los Angeles, Ca.
William J. Lindsay, Los Angeles, Ca.
Silverio J. Mattero, Los Angeles, Ca.
Ronald J. McCormick, Chicago Refinery

James T. Pendergrass, Beaumont Refinery
Frank L. Roulst, Portland, Or.
Lyle B. Rusk, Pure Transportation Co., Olney, Il.
Larry C. Shoemaker, Beaumont Refinery
Richard E. Thompson, San Francisco Refinery
Steve W. Van Winkle, Santa Paula, Ca.
James E. Wilson, Los Angeles, Ca.
Joseph L. Zimmermann, Los Angeles, Ca.

10 YEARS **Richard D. Averill,** Schaumburg, Il.
Norma A. Bird, Schaumburg, Il.
Doris L. Bobowski, Schaumburg, Il.
Lillian T. Brunner, Schaumburg, Il.
Richard A. Castleman, Portland, Or.
Bonnie J. Cornis, Schaumburg, Il.
Sylvia A. Costello, Schaumburg, Il.
Rheta J. Fabing, Schaumburg, Il.
Steven W. Fox, Seattle, Wa.
Arlene C. Gudall, Schaumburg, Il.
Jacqueline D. Jakaitis, Schaumburg, Il.
Judith G. Kryca, Schaumburg, Il.
Janet M. MacNair, Schaumburg, Il.
Magdalena P. Martinez, Schaumburg, Il.
Julius A. Mendelsohn, Schaumburg, Il.
Marilyn J. Miloch, Schaumburg, Il.
Deborah E. Morgan, Schaumburg, Il.
Lida S. Napier, Schaumburg, Il.
Carol L. Nelson, Schaumburg, Il.
Danny L. Nelson, Los Angeles, Ca.
Carol O'Connor, Schaumburg, Il.
James G. Overstreet, Pure Transportation Co., Van, Tx.
Betty L. Robinson, Seattle, Wa.
Mari Sakata, Schaumburg, Il.
Rosemary B. Sanderson, Pittsburgh, Pa.
Kjersten F. Siewert, Schaumburg, Il.
Catherine M. Skapura, San Francisco Refinery
Alan P. Smith, San Francisco, Ca.
John E. Smith, Colton, Ca.
Juanita A. Stonebraker, San Francisco, Ca.
Patricia M. Tripoli, Schaumburg, Il.
Elsie Wagner, Schaumburg, Il.
Luis N. Weiss, Schaumburg, Il.

5 YEARS	**Patricia J. Annese,** Schaumburg, Il. **Robert W. Babb,** Beaumont Refinery **Angelina Buckle,** Los Angeles, Ca. **Michael R. Caylor,** Taft, Ca. **Terry N. Evans,** San Francisco, Ca. **Victor Garza,** Avenal, Ca. **Michael C. Griffin,** Beaumont Refinery **Ramona L. Holladay,** Los Angeles Refinery **Coy W. Kelly,** Savannah, Ga. **Dolores J. Marcotte,** Chicago Refinery **Michael Pratt,** Beaumont Refinery **Patricia C. Schlacks,** Schaumburg, Il. **Astrid Semen,** Schaumburg, Il. **Diane M. Haake-Swanson,** Schaumburg, Il. **Conrad V. Tannhauser,** Schaumburg, Il. **Denrick C. Thomas,** Pure Transportation Co., Olney, Il. **Anna R. Thompson,** Schaumburg, Il. **Kristina Vanbredakilff,** San Francisco, Ca. **Esther M. Villa-Lovos,** Pasadena, Ca. **Gary A. Walker,** Los Angeles Refinery **Bruce L. Webb,** South Holland, Il. **Harold A. Webster,** Savannah, Ga. **Dean B. Yabu,** Los Angeles, Ca.

UNION OIL AND GAS DIVISION

September 1983

35 YEARS	**C. J. Bergeron,** Houma, La. **Willard L. Daniels,** Midland, Tx. **Duane A. Foster,** Orcutt, Ca. **Robert T. Jesson,** Union Oil Center **Harry E. Keegan,** Union Oil Center **Clinton C. Putnam,** Casper, Wy. **Freddie J. Richard,** Lafayette, La.
30 YEARS	**Edmund J. Bailey,** Union Oil Center **Marvin N. Bigby,** Midland, Tx. **Joseph L. Terrell,** Santa Fe Springs, Ca. **John F. Wollaston,** Ventura, Ca.
20 YEARS	**Robert E. Amenda,** Coalinga, Ca. **Gale A. Becker,** Midland, Tx. **Vance M. Lynch,** Houston, Tx. **Vernon J. Michael,** Orcutt, Ca. **Bob J. Moffett,** Houston, Tx. **Kenneth G. Oxford,** Mobile, Al. **Gloria I. Santos,** Union Oil Center **Langford T. Taylor,** Union Oil Center
15 YEARS	**Ronnie E. Hartman,** Lafayette, La. **Willard J. Lasseigne,** Lafayette, La.
10 YEARS	**Guadalupe D. Barberena,** Orcutt, Ca. **George C. Dunn,** Anchorage, Ak. **Frances A. Higgins,** Houston, Tx. **Mario A. Rubio,** Orcutt, Ca. **Craig E. Sheller,** Orcutt, Ca. **Gerald P. Veazey,** Lafayette, La.
5 YEARS	**Timothy J. Bennett,** Lafayette, La. **Terry J. Brown,** Taft, Ca. **Daniel S. Erickson,** Anchorage, Ak. **William Hering,** Casper, Wy. **Linda J. Marshall,** Houston, Tx. **Matthew A. Norris,** Ventura, Ca. **Michael K. Phang,** Union Oil Center **Joseph A. Schwab,** Casper, Wy. **Beverly A. Smith,** Anchorage, Ak. **Dale E. Stanley,** Clay City, Il.

October 1983

35 YEARS	**Arthur E. Fangerow,** Santa Fe Springs, Ca. **Arthur V. Lewis, Jr.,** Ventura, Ca.
30 YEARS	**Richard B. Messer,** Union Oil Center **James V. Motley,** Santa Fe Springs, Ca.
20 YEARS	**Alexander S. McGee, Jr.,** Clay City, Il. **Russell R. Noble,** Taft, Ca. **Robert A. Waldron,** Santa Fe Springs, Ca.
15 YEARS	**Vernon R. Brewer,** Woodward, Ok. **Matt Brown,** Santa Paula, Ca. **Richard A. Evenson,** Anchorage, Ak. **Charles L. McCaleb,** Coalinga, Ca. **Wayne W. Strong,** Casper, Wy. **Claudia M. Thomas,** Pasadena, Ca.
10 YEARS	**Rickie M. Bergeron,** Houma, La. **Gerald J. Comeaux,** Houma, La. **Myron J. Lybarger,** W. Liberty, Il. **Roderic D. Spaulding,** Orcutt, Ca. **Donald R. Valentine,** Houma, La.
5 YEARS	**Jeffrey B. Ahbe,** Casper, Wy. **Joan M. Allmaras,** Casper, Wy. **Richard L. Davis,** Taft, Ca. **Kenneth D. Doty,** Clay City, Il. **John V. Doucet,** Houma, La. **Kirby R. Dubois,** Lafayette, La. **Steven L. Fox,** Houma, La. **Lilian Koldre,** Union Oil Center **Charles E. Maize,** Houma, La. **Ronald K. Richardson,** Coalinga, Ca. **Robert D. Shriner,** Orcutt, Ca. **John A. Smith,** Orcutt, Ca. **William S. Welton,** Midland, Tx.

UNION GEOTHERMAL DIVISION

September 1983

15 YEARS	**Gerald R. Stites,** Big Geysers, Ca.

October 1983

25 YEARS	**John E. Mack, Jr.,** Union Oil Center
20 YEARS	**Lino E. Poli,** Union Oil Center
15 YEARS	**Robert F. Cook,** Big Geysers, Ca. **Richard C. Lindwall,** Union Oil Center
10 YEARS	**Louise T. Allen,** Imperial Valley, Ca. **John G. Broadus,** Union Oil Center **William E. Thompson,** Big Geysers, Ca.
5 YEARS	**Gerald L. Peacher,** Imperial Valley, Ca. **Joseph J. Tellez,** Big Geysers, Ca.

UNION CHEMICALS DIVISION

September 1983

35 YEARS	**Virgil Comisia,** Oakland, Ca. **Samuel L. Jackson,** Birmingport, Al.
25 YEARS	**Frances P. Piccolo,** Schaumburg, Il.
20 YEARS	**Jerry Hall,** Brea, Ca. **Terry D. Renfer,** Union Oil Center **Mireya Valjalo,** Union Oil Center

15 YEARS	**James S. Allnutt,** Beaumont, Tx. **Wilhelmina Koppel,** La Mirada, Ca. **Joseph M. O'Toole,** Rolling Meadows, Il. **John Rhines,** Kenai, Ak. **Bernard Strahmann,** Kenai, Ak.
10 YEARS	**Barry A. Alexa,** Rolling Meadows, Il. **Bruce Borman,** Chicago, Il. **Donald Bortou,** Kenai, Ak. **James Hedberg,** Kenai, Ak. **Jerrold Humphreys,** Wilmington, Ca. **Robert Marks,** Kenai, Ak. **David L. Love,** Charlotte, N.C. **Frank Townsend,** Kenai, Ak.
5 YEARS	**James D. Clover,** Tucker, Ga. **Gene Cudworth,** Brea, Ca. **John E. Grout,** Rolling Meadows, Il. **Craig Haile,** Brea, Ca. **Jo Ann Hart,** Brea, Ca. **Virginia C. Horne,** Schaumburg, Il. **Jerry Lessner,** Brea, Ca. **Kimberly M. Lobocki,** Rolling Meadows, Il. **Marvin E. Nelson,** La Mirada, Ca. **Karen M. Yamrick,** Twinsburg, Oh.

October 1983

35 YEARS	**Gregory Gibson,** Arroyo Grande, Ca. **Wesley Morrison,** Brea, Ca.
25 YEARS	**Billy G. Chavers,** Charlotte, N.C. **Edna Marlar,** Union Oil Center **Robert Reck,** Clark, N.J. **Hank Vandernaald,** Wilmington, Ca. **Raejean Wade,** Brea, Ca.
15 YEARS	**Kenneth A. Daley, Jr.,** Clark, N.J. **Myron F. Hassett,** Bridgeview, Il. **Dallas R. Reese, Sr.,** Charlotte, N.C. **James Schroeder,** Kenai, Ak. **Leslie Strickler,** Kenai, Ak. **Wallace W. Whitney,** La Mirada, Ca.
10 YEARS	**James Carlson,** Union Oil Center **Dennis M. Cherepski,** Clark, N.J. **Lynn Jones,** Kenai, Ak. **Donald Ritter,** Kenai, Ak. **Ronald Scherer,** Sacramento, Ca. **Thomas W. Shubin,** La Mirada, Ca. **Marguerite Wuestenfeld,** Schaumburg, Il.
5 YEARS	**John E. Acres,** Birmingham, Al. **Michael D. Cassel,** Charlotte, N.C. **Joseph D. Cooley,** Lemont, Il. **Sylvester Dimonde,** Kenai, Ak. **Ronald Koepke,** Chicago, Il. **Robert Lane,** Portland, Or. **Sarah E. McIlwain,** Charlotte, N.C. **Frank P. Pietrusiewicz,** La Mirada, Ca. **Ralph Willoughby,** Brea, Ca.

UNION INTERNATIONAL OIL DIVISION

September 1983

40 YEARS **Wm. A. Greenwalt,** Los Angeles, Ca.

15 YEARS **Maurice W. Morton,** Thailand

10 YEARS **Maher Ayyad,** Egypt
Kenneth Bradley, Thailand
Philip A. Grove, Singapore
Rodney P. Pitt, Netherlands

October 1983

30 YEARS **Mildred M. Thomson,** Los Angeles, Ca.

20 YEARS **Nancy A. Mundorf,** Los Angeles, Ca.

15 YEARS **John R. Nock,** Los Angeles, Ca.

5 YEARS **Priscilla Avila,** Los Angeles, Ca.
Robert E. Mortimer, Los Angeles, Ca.
Anthony L. Petty, Los Angeles, Ca.

UNION OIL CO. OF CANADA LTD.

September 1983

15 YEARS **Don Gardiner,** Calgary

October 1983

30 YEARS **Norm H. Cridland,** Calgary

15 Years **Dermot O'Hara,** Calgary

5 YEARS **Kevin De Groot,** Calgary

UNION OIL CO. OF GREAT BRITAIN

October 1983

5 YEARS **P. Buckman,** London

UNION OIL OF INDONESIA

September 1983

10 YEARS **Taufic Mursidi Abdullah,** Indonesia
Soedarmadji Adiwidjojo, Indonesia
Augustinus Harsono, Indonesia
Muhammad Kaseng, Indonesia
Kidam, Indonesia
Lasiran, Indonesia
Mohammad Yusran Noor, Indonesia
Herman S. Soeparno, Indonesia
Soeradi, Indonesia
Subagyo Suradi, Indonesia
Sugiman, Indonesia
Herry Sukamto, Indonesia

5 YEARS **Hadji Rusmadi,** Ahmad, Indonesia
Rudjito, Indonesia
Waridi, Indonesia

October 1983

10 YEARS **Gusti Basuni,** Indonesia
Moclyono Hartono, Indonesia
Ruddin Hutagalung, Indonesia
Nasir, Indonesia
Abram Tiwa, Indonesia

5 YEARS **Syaiful Amin,** Indonesia
Sarmin Ismanto, Indonesia
Kamdi, Indonesia
Johanis T. Layuk, Indonesia
Sodata Muslim, Indonesia
Nurwachid, Indonesia
Paimo, Indonesia
F. X. Pramono, Indonesia
Slamet Riyadi, Indonesia
Yunus Salamba, Indonesia
Haryono Santoso, Indonesia
Soewandi, Indonesia
Sukarni, Indonesia
Unang Sunarko, Indonesia
Supardji, Indonesia
Epen Suwono, Indonesia
Muhammad Tang, Indonesia
Wartono, Indonesia
Ketut Widhi, Indonesia

UNOCAL CORPORATION (Singapore)

September 1983

10 YEARS **Molly Sim,** Singapore
Juliana Tun Kin Lan, Singapore

UNION ENERGY MINING DIVISION

August 1983

5 YEARS **William G. Volk,** Parachute Creek, Co.
Robert M. Walker, Parachute Creek, Co.

MOLYCORP, INC.

September 1983

35 YEARS **John Brager, Jr.,** Washington, Pa.
John Phillips, Washington, Pa.

20 YEARS **Thomas Abbott,** Questa, NM
Sam Gomez, Questa, NM
Melesio Quintana, Questa, NM

10 YEARS **Alfred Abeyta,** Questa, NM
William Cordova, Questa, NM
Alex Gonzales, Questa, NM
Jose Romero, Questa, NM
Abel Salazar, Questa, NM
Bonnie Sanchez, Questa NM
Robert Sega, Questa, NM

5 YEARS **Ruth Duff,** Spokane, Wa.
Mary Moore, Louviers, Co.
Henry Sandoz, Mountain Pass, Ca.

October 1983

40 YEARS **William Moran,** Union Oil Center

20 YEARS **Felix Archuleta,** Questa, N.M.
Arnold Cisneros, Questa, N.M.
Claudino Montoya, Questa, N.M.
Julian Romero, Questa, N.M.

15 YEARS **Gordon Barlow,** Union Oil Center

10 YEARS **James Cisneros,** Questa, N.M.
Daniel Martinez, Questa, N.M.
Frank Martinez, Questa, N.M.
Arthur Rael, Questa, N.M.
David Shoemaker, Questa, N.M.
Benjamin Valerio, Questa, N.M.

5 YEARS **Mark Janosky,** Washington, Pa.
Kermit Jones, Questa, N.M.
Michelle Moran, Mountain Pass, Ca.

POCO GRAPHITE, INC.

October 1983

5 YEARS **Charles Dempsey,** Decatur, Tx.

JOBBERS AND DISTRIBUTORS

April 1983

25 YEARS **Jack Coghill,** Nenana, Ak.

September 1983

50 YEARS **Cooper Oil Co., Inc.,** Boaz, Al.
Watkins Oil Co., Inc., Hillsdale, Mi.

30 YEARS **Jack M. Fore,** Leesburg, Ga.

25 YEARS **Moore Oil Co., Inc.,** Manning, S.C.
Service Oil Co., Knoxville, Tn.
Howard Sibley, Othello, Wa.

20 YEARS **Pine State, Inc.,** High Point, N.C.

15 YEARS **Halifax Fuels, Co.,** Weldon, N.C.

10 YEARS **Weatherby Oil Co.,** Columbus, Ga.

October 1983

50 YEARS **Barkett Oil Co.,** Miami, Fl.
N. Georgia 76 Oil Co., Ellijay, Ga.

45 YEARS **Beaty Oil Co.,** Abbeville, S.C.

25 YEARS **Pep Oil Co.,** Canton, Oh.
Knapp Oil Co., Xenia, Il.

15 YEARS **Pioneer Oil Co.,** Bradenton, Fl.

RETIREMENTS

June 1983

Frank A. Quaresma, Union 76 Division, San Luis Obispo, Ca. June 19, 1959

July 1983

Joseph W. Bendik, Jr., Molycorp, Washington, Pa. October 14, 1955

George R. Daigle, Union 76 Division, Lacassine, La. December 19, 1964

Howard L. Farra, Union 76 Division, Barrington, Il. April 4, 1946

Joyce A. Gordon, Union Real Estate Division, Los Angeles, Ca. December 3, 1942

Arthur L. Johnson, Union 76 Division, Lockport, Il. March 26, 1951

Jack Ketchum, Oil and Gas Division, Kermit, Tx. July 29, 1952

Donald O. Noah, Union 76 Division, Theodosia, Mo. September 12, 1955

Dennis L. Rougeau, Union 76 Division, Rosemead, Ca. October 8, 1956

Wyanfred A. Sinklier, Oil and Gas Division, Coalinga, Ca. November 20, 1951

Harold T. Slawter, Oil and Gas Division, Anchorage, Ak. May 1, 1969
Joseph M. Turner, Jr., Oil and Gas Division, Vinton, La. May 15, 1946
Charles N. Whiteside, Union 76 Division, Vacaville, Ca. April 30, 1951

August 1983

Eldon N. Bachman, Union 76 Division, Pinole, Ca. October 21, 1948
Robert G. Blackwood, Union 76 Division, Rodeo, Ca. May 28, 1942
Wilborn F. Braughton, Union 76 Division, San Pedro, Ca. November 1, 1941
John E. Brennecke, Union 76 Division, Peninsula, Ca. June 18, 1952
Michael G. Dalich, Union Chemical Division, Kennewick, Wa. January 26, 1954
Donald R. Fitzgerald, Oil and Gas Division, Santa Maria, Ca. April 16, 1953
Dorothy J. Jackson, Oil and Gas Division, Dallas, Tx. February 25, 1952
Marian B. Karst, Union 76 Division, Palatine, Il. September 16, 1961
Elizabeth L. Kimmich, Union 76 Division, Oakland, Ca. June 16, 1943
Mervin S. Matson, Union 76 Division, Sterling, Co. January 17, 1955
C. D. McEwen, Union 76 Division, Long Beach, Ca. November 4, 1948
Harriet E. McKinley, Oil and Gas Division, Oklahoma City, Ok. November 30, 1950
Paul F. Mitrius, Union 76 Division, Joliet, Il. February 13, 1947
Donald W. Plant, Union 76 Division, Piqua, Oh. July 7, 1969
John P. Shealy, Union 76 Division, Savannah, Ga. September 13, 1943
Dan Stump, Union Chemicals Division, Fullerton, Ca. April 12, 1962
Francis A. Young, Union 76 Division, Houston, Tx. June 27, 1946

September 1983

Charles E. Bledsoe, Union 76 Division, Arroyo Grande, Ca. March 28, 1955
Ralph W. Chapin, Union 76 Division, Lakewood, Ca. October 21, 1947
George D. Cheadle, Science and Technology, Fullerton, Ca. February 1, 1957
Elverna L. DuBois, Union 76 Division, Elk Grove Village, Il. July 16, 1961
William R. Dudley, Oil and Gas Division, Fillmore, Ca. January 7, 1953
Corman E. Glenn, Oil and Gas Division, Grover City, Ca. April 24, 1953
Harold H. Greer, Oil and Gas Division, Midland, Tx. May 26, 1958
Mary J. Hysell, Union 76 Division, Schaumburg, Il. August 21, 1961
Marie D. Jackicich, Union 76 Division, Los Angeles, Ca. June 11, 1955
John W. Lefevre, Union 76 Division, Oakland Park, Fl. February 2, 1950
Eldredge H. Loflin, Union 76 Division, Nederland, Tx. May 20, 1949
Thomas F. Theobald, Corporate, Downey, Ca. August 5, 1953

IN MEMORIAM

Employees

Anita M. Brentlinger, Union 76 Division, Columbus, Oh. June 14, 1983
Kenneth D. Burkett, Union 76 Division, Channahon, Il. June 2, 1983
Steven W. Hubbard, Oil and Gas Division, Missouri City, Tx. June 4, 1983
Ramon E. Marotta, Science and Technology, Brea, Ca. April 16, 1983
Donald L. McCormick, Union Chemicals Division, Santa Maria, Ca. July 15, 1983

Retirees

Clara I. Allen, Union Geothermal Division, Los Angeles, Ca. May 26, 1983
Aryle E. Armstrong, Union 76 Division, Mountain View, Ca. July 5, 1983
John R. Beeson, Union 76 Division, Seal Beach, Ca. July 30, 1983
William H. Bennett, Union 76 Division, Walnut Creek, Ca. June 4, 1983
John T. Bobp, Oil and Gas Division, Long Beach, Ca. July 2, 1983
Kenneth R. Boner, Union 76 Division, Noble, Il. June 8, 1983
Irvin W. Carner, Oil and Gas Division, Brea, Ca. June 9, 1983
Howard C. Carroll, Union 76 Division, Mt. Pleasant, Mi. July 7, 1983
Basil A. Carter, Pure Transportation, Fairfield, Il. July 14, 1983
Alfred C. Crooks, Union 76 Division, Laguna Hills, Ca. July 19, 1983
Connie D. Dodd, Oil and Gas Division, Delaware, Ok. June 19, 1983
Rudolph H. Ek, Union 76 Division, Minneapolis, Mn. May 30, 1983
Frances Ferrand, Molycorp, Evanston, Il. May 8, 1983
Walter Grandview Fuller, Union 76 Division, Anaheim, Ca. July 13, 1983
Oakley C. Gray, Molycorp, Fredericktown, Pa. July 20, 1983
Dewey G. Heard, Oil and Gas Division, Gueydan, La. June 12, 1983
Walter W. Heathman, Oil and Gas Division, Seattle, Wa. April 28, 1983
Johanna C. Jones, Union 76 Division, Madison Hghts., Mi. July 9, 1983
Karl F. Jones, Union 76 Division, Alexandria, Oh. May 28, 1983
Walter P. Kernan, Union 76 Division, Long Beach, Ca. January 15, 1983
Oscar R. Kidder, Oil and Gas Division, Oilton, Ok. June 14, 1983
Frank J. Kodrick, Union 76 Division, Arma, Ks. June 10, 1983
Arnold L. Lauterjung, Union 76 Division, Chester, Il. July 6, 1983
Raymond V. Lillrose, Union 76 Division, Milwaukee, Wi. June 29, 1983
Gordon MacQuarrie, Union Oil Division, Santa Rosa, Ca. May 25, 1983
Harold J. Matthews, Oil and Gas Division, Whittier, Ca. May 25, 1983
John H. McCloud, Oil and Gas Division, Fullerton, Ca. June 4, 1983
Chancey V. McCrory, Union 76 Division, Clay City, Il. June 13, 1983
Allen McInerney, Union 76 Division, Willowbrook, Il. July 6, 1983
Charles H. Rogers, Oil and Gas Division, Muldoon, Tx. May 29, 1983
Charles M. Rogers, Union 76 Division, Modesto, Ca. May 13, 1983
Sam Sabella, Union 76 Division, Alhambra, Ca. June 15, 1983
Lyman F. Scheel, Union 76 Division, La Habra, Ca. July 28, 1983
Charles L. Sherwood, Union 76 Division, Santa Rosa, Ca. July 24, 1983
Rutherford D. Sherwood, Union Chemicals Division, Joplin, Mo. July 25, 1983
Walter T. Soike, Union 76 Division, Lordsburg, N.M. June 1, 1983
Joseph J. Thompson, Union 76 Division, Lompoc, Ca. May 30, 1983
Joseph R. Tomassi, Union 76 Division, Warren, Mi. July 23, 1983
Harley D. Wagle, Union 76 Division, Mira Loma, Ca. July 11, 1983
Robert O. White, Union 76 Division, Costa Mesa, Ca. July 7, 1983

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UNION OIL COMPANY OF CALIFORNIA

Seventy Six

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