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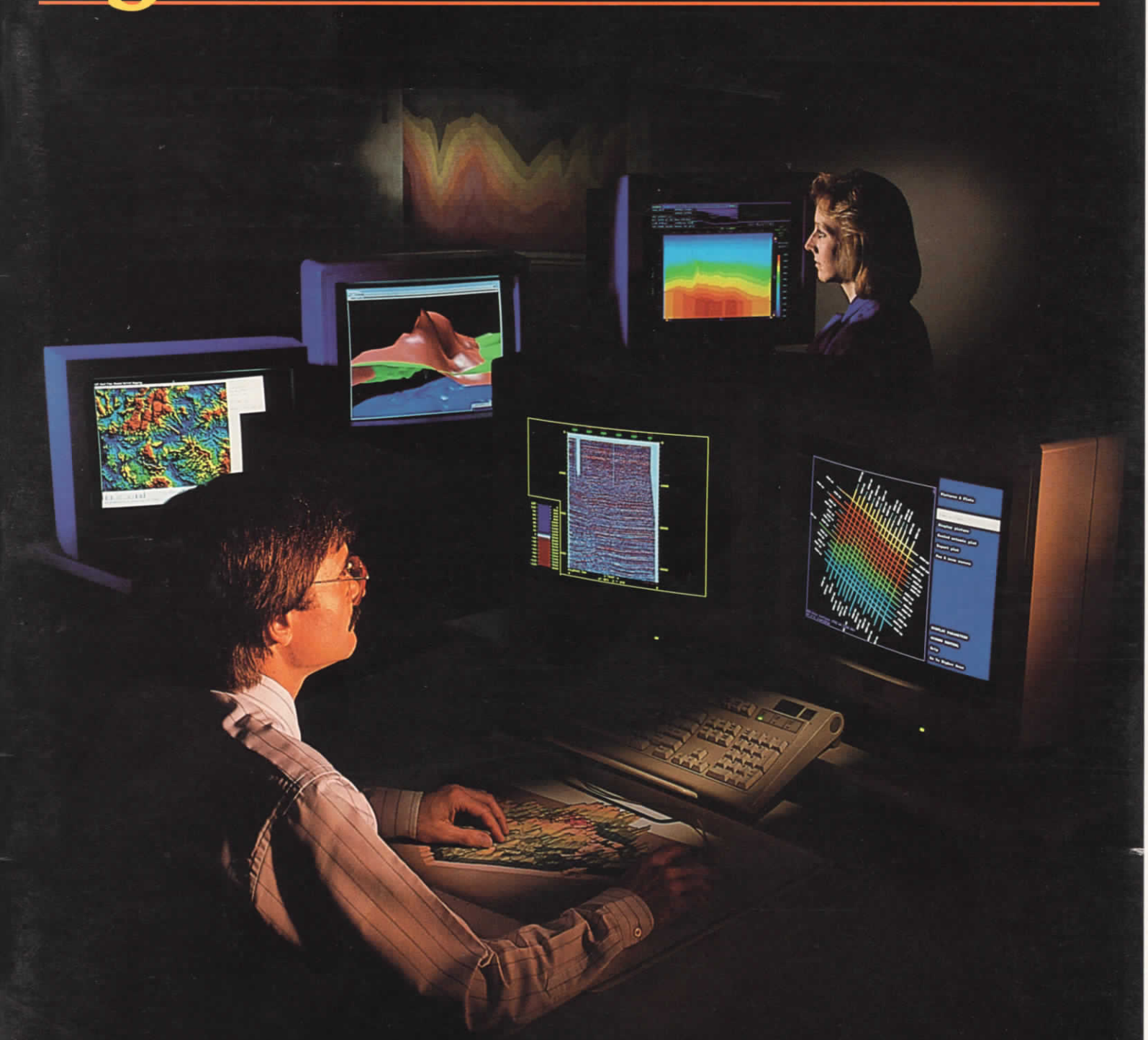
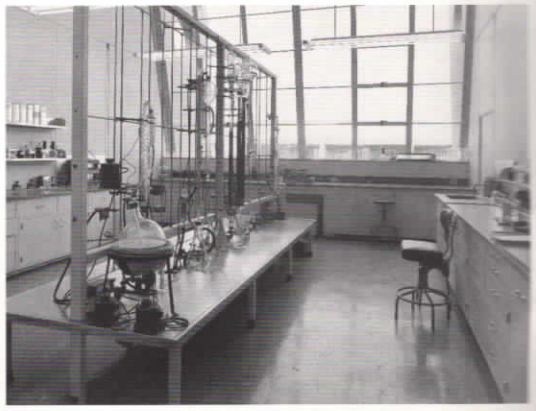
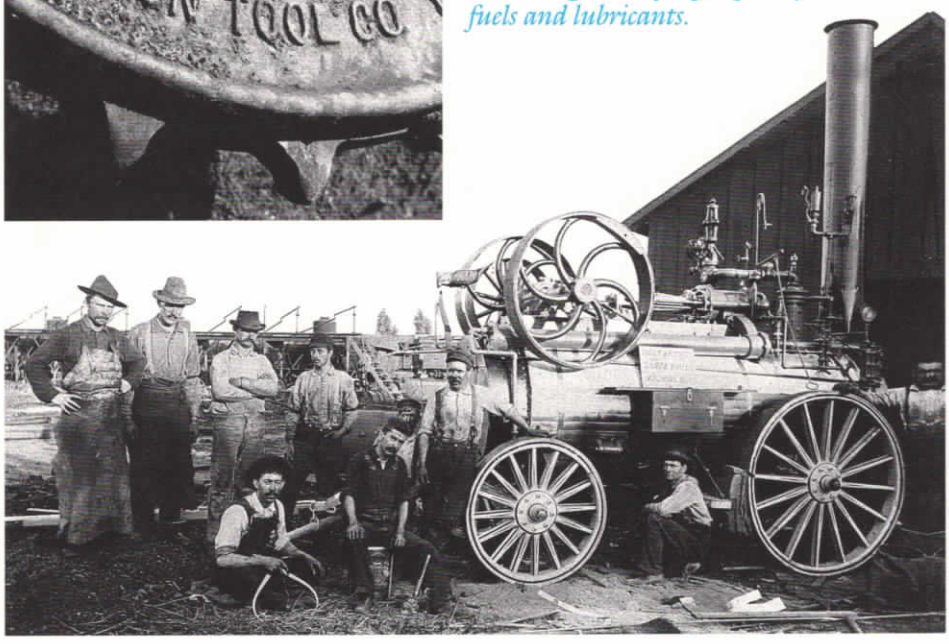


Turn-of-the-century Union Oil workers improvised to solve problems in the field. The company's first full-scale research facility (center) opened in 1922 at the Los Angeles refinery. Early efforts concentrated on the development of high-quality fuels and lubricants.





ON THE CUTTING EDGE

From Unocal's beginnings a century ago, innovation has been at the core of the company's success. Given California's complex geologic formations and a crude oil that was heavy with asphalt, wax and sulfur, the fledgling oil company was compelled to improvise in order to survive.

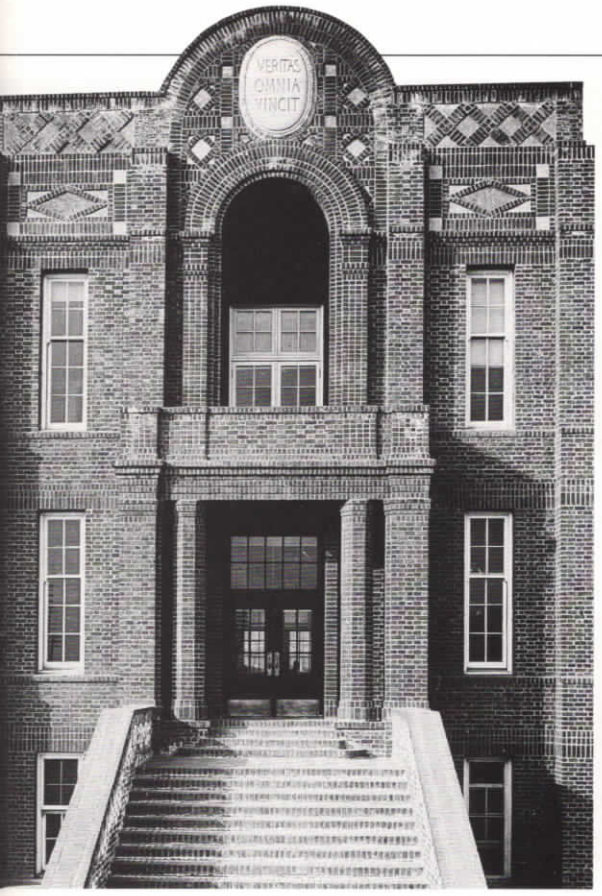
Union Oil's pioneering drillers designed their own specialized tools, forged by clever blacksmiths in the company's shop in Santa Paula. Union's refining engineers looked for ways to make new and better products, and company mechanics devised oil burners to power ships and locomotives in order to open up new markets for fuel oil.

As Union Oil grew, the push for innovation evolved into a continuing commitment to scientific research. In the early years, that commitment was embodied by three remarkable men—William Orcutt, Frank Hill and company co-founder Lyman Stewart. Orcutt, a Stanford University-trained engineer and geologist, established the first petroleum geology department in the western United States. Later, he and Union Oil would also lead the industry in setting up a micro-paleontology laboratory.

Frank Hill, although not college educated, was a brilliant problem solver in the oil field. He was the first to devise a successful technique for well cementing (in 1905), and he later pioneered gas injection for improving oil recovery from depleted and low-pressure reservoirs.

Above all, Lyman Stewart's vision shaped Union Oil Company's character and made research and development an integral part of the company. Because Stewart saw that many different products might be derived from petroleum, Union hired chemist Frederick Salathe to set up the first oil company research laboratory in the west at the Santa Paula refinery. In the following years, the company continued to expand its research in products and refining processes. Laboratories were opened at both the Los Angeles and Oleum (now San Francisco) refineries, each of which had its own staff chemists.

In 1922, Union consolidated these efforts by creating a Research and Development Department. The company built a two-story brick building in Wilmington on the grounds of the Los Angeles refinery to house the new department. R.E. Haylett, an MIT-trained engineer, was appointed manager.



Haylett supervised the construction of the new building after making an extensive tour of industrial and institutional research laboratories around the country. Designed by architect John Galen Howard of San Francisco, and incorporating Haylett's ideas, the center was an early example of modular design. Each laboratory was built as an 18-by-20 foot unit, with movable partitions to allow for flexibility in adapting space to different tasks.

Haylett made it clear that this was not simply a blue-sky research organization, but one that would operate in the service of company profit centers. "We do not know this year what the pressing problems of next year will be," he wrote, "and it is therefore difficult to make plans for the specific requirements of the future. It is desirable that our facilities as well as our personnel be as flexible as possible, in order that they may be quickly shifted from one problem to meet the needs of the next."

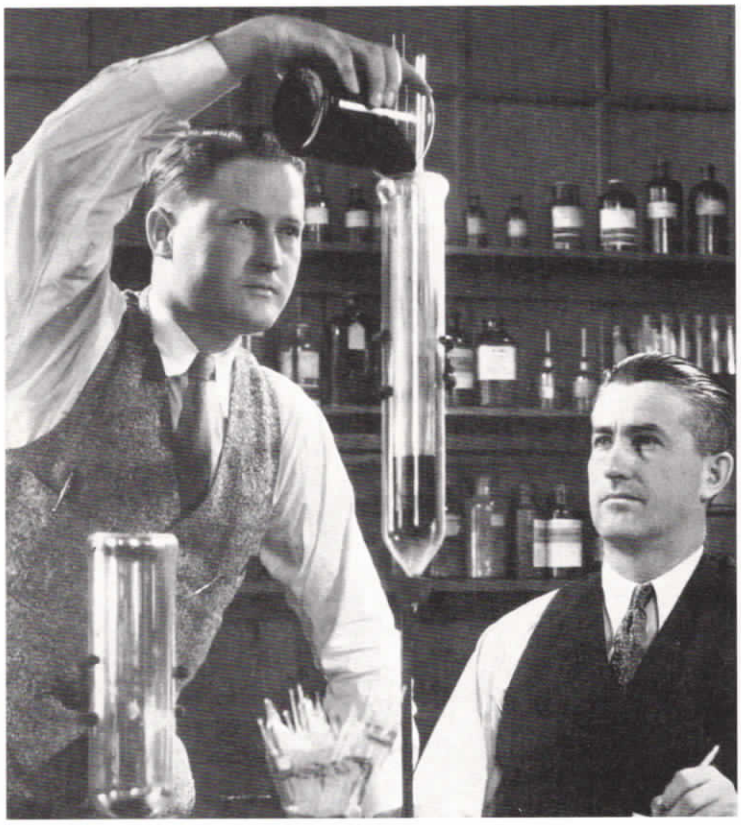
In fact, what the future would hold was an increasing preoccupation with making competitive gasolines and lubricants for the rapidly evolving automobile. By the mid-1920s, Americans were taking to the road in thousands of new automobiles every year. Gasoline, motor oils and automobile lubricants became the major petroleum products.

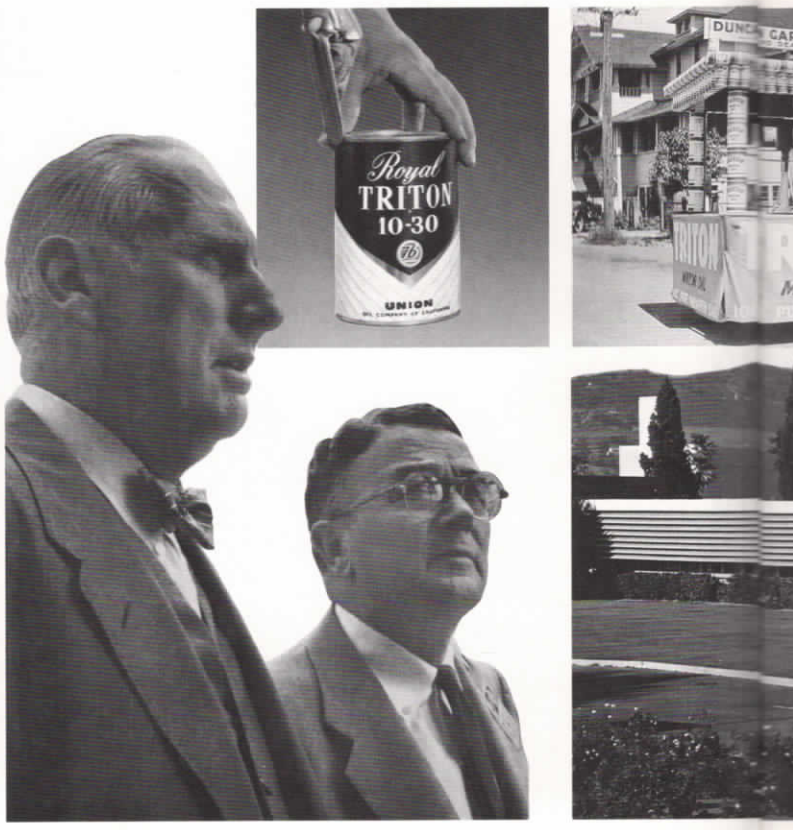
To meet the public appetite for more speed and power, car manufacturers were steadily increasing engine horsepower. As automobile engines became more advanced, the gasolines of the early '20s were no longer sufficient to prevent engine knock and provide adequate power. Lubrication became more critical as well. Union researchers focused their attention in these areas. The company's new research center contained one of the first dynamometer laboratories in the west capable of running scientific tests on automobile engine performance with different fuels and lubricants.

By 1924, the company was advertising Union nondetonating gasoline—a "scientific" gasoline that burned completely, leaving no "raw residue." In 1926, Union became the first oil company in the western states to introduce a premium gasoline with tetraethyl lead, an anti-knocking additive. Union Ethyl promptly became a top-selling motor fuel in the west.

With the onset of the Great Depression in the 1930s, the public's motor fuel needs began to change. Driving was reduced, and some motorists tried to save money by mixing premium and cheaper regular grade gasolines in their tanks. Union saw a market developing for a better performing non-premium gasoline. In January 1932, Union 76® gasoline was introduced to fill the gap.

Union researchers also developed a variety of other products, out of which grew a healthy specialty business. The lab perfected lubricants for specialized uses, including one for railroad locomotives called Locolube. As diesel engines came into more widespread use during the 1920s and 1930s, Union scientists developed some of the best diesel fuels on the market.





There was also an increasing effort to upgrade aviation gasolines, and to improve methods for producing aromatics in the refining process. These were used as solvents in the burgeoning paint and lacquer industries. Other new Union products included cleaning fluids and spray insecticides for the home. Marketed under the brand name "Bif," the bug sprays were tested on insects in a special chamber at the lab.

One of Research and Development's most notable achievements in the pre-World War II period came in the area of motor oils. Although Union's motor oils—Aristo in the 1920s, and Motorite in the early 1930s—were regarded as good products, motor oils produced in the east had increased their market share on the west coast from 15 percent in 1920 to 45 percent of what had become an $80-million market in 1933.

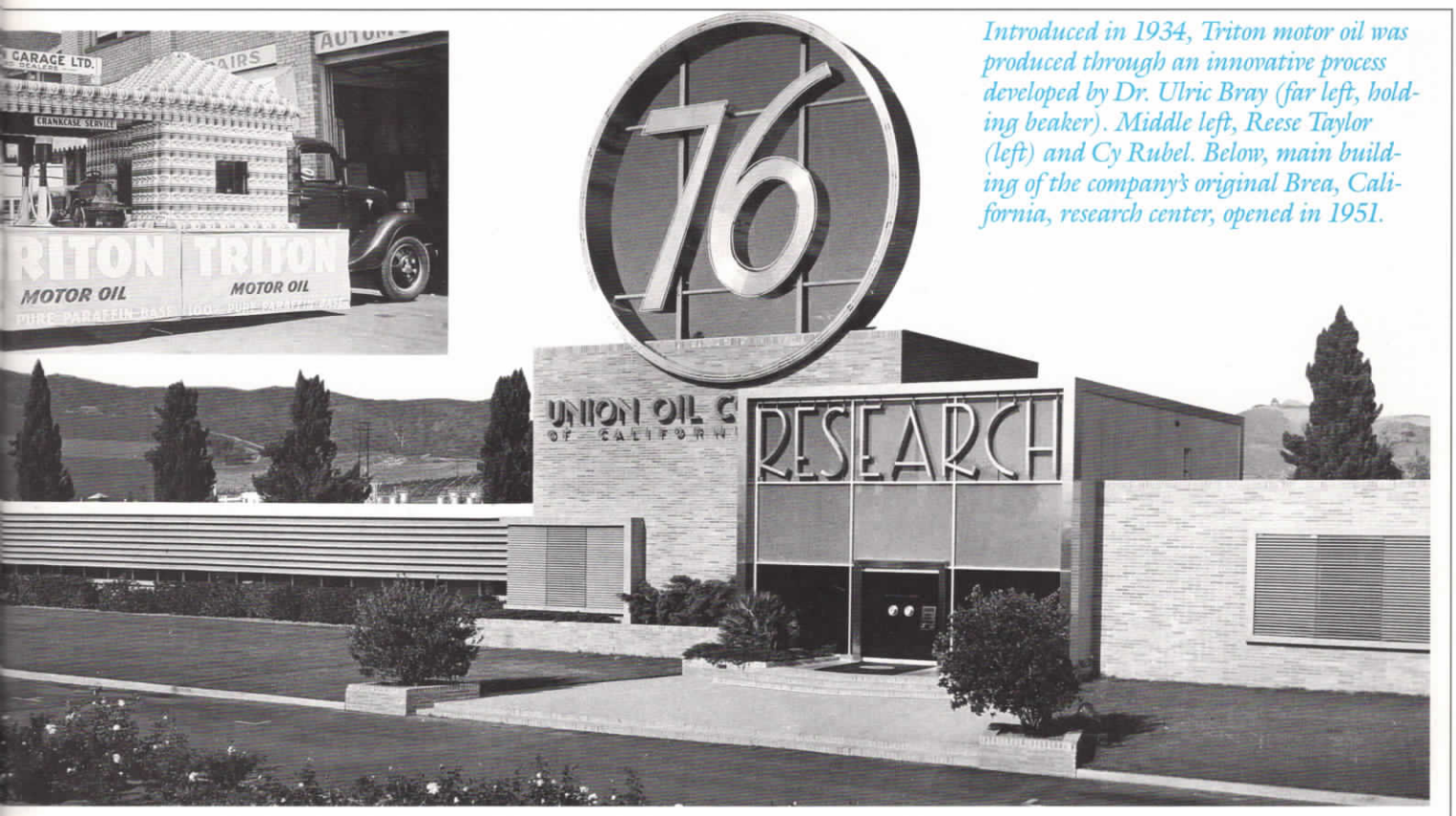
There was a general perception—somewhat justified at the time—that the lighter, paraffin-based eastern crudes produced motor oils that were superior to those made from heavier, asphalt-based western crudes. This was particularly galling to Lyman's grandson, W. L. "Bill" Stewart, Jr., who had taken charge of manufacturing and R&D in 1929.

Finally, after more than a decade of development work, Union introduced Triton® motor oil, a new product that matched the eastern motor oils in quality and performance. Triton was a major achievement for the Research and Development Department. The product was more than just a new motor oil; it involved an entirely new refining method that employed a unique propane-solvent process to remove undesirable waxes, asphalt and other contaminants. The result was a motor oil of uncommonly high purity, quality and performance.

Triton and its unique manufacturing process attracted wide publicity when it was announced in October, 1934. The new motor oil quickly gained a large market share in the west—and even began to capture some of the eastern market. (Union went on to license the propane-solvent process in four countries as the MIBK Wax Deoiling Process.)

Meanwhile, the Research and Development Department continued to upgrade Union 76 gasoline, increasing the octane by blending in a higher percentage of aromatics. The research team also produced a remarkable new all-purpose, barium-based grease called Unoba,® which replaced dozens of specialized greases in automotive and industrial applications.

Union researchers contributed to advances in exploration and production technology as well. By the 1930s, wells were being drilled to depths beyond 10,000 feet, and the reservoirs being tapped were more geologically complex. Drilling and production techniques used in the past were no longer adequate. Union engineers simulated reservoir conditions in the laboratory, and studied the nature of oil emulsions and flow. What they learned was applied in the field in new equipment applications and improved drilling and production techniques.



Introduced in 1934, Triton motor oil was produced through an innovative process developed by Dr. Ulric Bray (far left, holding beaker). Middle left, Reese Taylor (left) and Cy Rubel. Below, main building of the company's original Brea, California, research center, opened in 1951.

By the end of the 1930s, Union was undertaking a badly needed modernization of facilities. Refiners and researchers worked together to design and build new processing units to produce gasoline and aviation fuel, a product increasingly in demand. When Reese Taylor became president of Union Oil Company in 1939, he firmly voiced his support for research. "Income appropriated for research is not spent, it is invested," he stressed in detailing plans to further expand the company's research effort and upgrade facilities.

From 1941 until the end of World War II, Union's top priority was to support the nation's military needs. As part of the effort to increase fuel production, company researchers began to experiment with a revolutionary new refining process known as thermal catalytic cracking. Unlike traditional refining methods which used heat alone to separate crude oil components, "cat cracking" passed vaporized oil over special catalysts. This new method produced a higher volume of light-end products from a barrel of oil, and delivered cleaner-burning gasoline with higher octane ratings.

A catalytic cracking plant was designed and completed at the Los Angeles refinery by mid-1944. Once on line, the unit helped Union increase its output of urgently needed aviation gasoline fivefold over what it had been just two years earlier.

By 1947 it became clear that the 25-year-old Wilmington research center, which had inspired so much pride when it opened in the 1920s, was becoming outmoded and overcrowded. Even during the depression, Union had continued to increase the research staff, which now numbered almost 300 and overflowed into makeshift offices and laboratories around the Los Angeles area. A new, expanded research center was clearly needed. Members of the department visited some of the biggest and best research laboratories across the nation, picking up ideas to incorporate into a new facility.

In 1951, the new Union Research Center opened—a modern, well-equipped structure set on 100 acres of land in Brea, California, southeast of Los Angeles. The $8-million facility, designed in part by the researchers themselves, was actually a complex of buildings connected by canopied walkways.

Just as the earlier research center had reflected the structure and priorities of the company, so did the new Brea facility. While a team in one area might be working on formulating an improved drilling mud, another in a different lab explored ways to recover more oil from depleted sands. Others worked to develop better refining processes and devise new petroleum product applications.

A.C. "Cy" Rubel, head of exploration and production when the Brea research center opened, explained the effectiveness of the research group: "Union gets more from research than does any other company because our projects are all on the practical side. Each project is guided by a sponsoring group from the field or the refineries."

In the early 1950s, Union researchers perfected and patented an extraordinary new technology for removing sulfur, nitrogen and other contaminants from petroleum products. This new process, known technically as catalytic hydrodesulfurization, used beds of alumina pellets impregnated with cobalt and molybdenum compounds to remove the impurities. A major advantage was the increased life of the catalyst, which reduced the cost of the process to less than one cent per barrel.

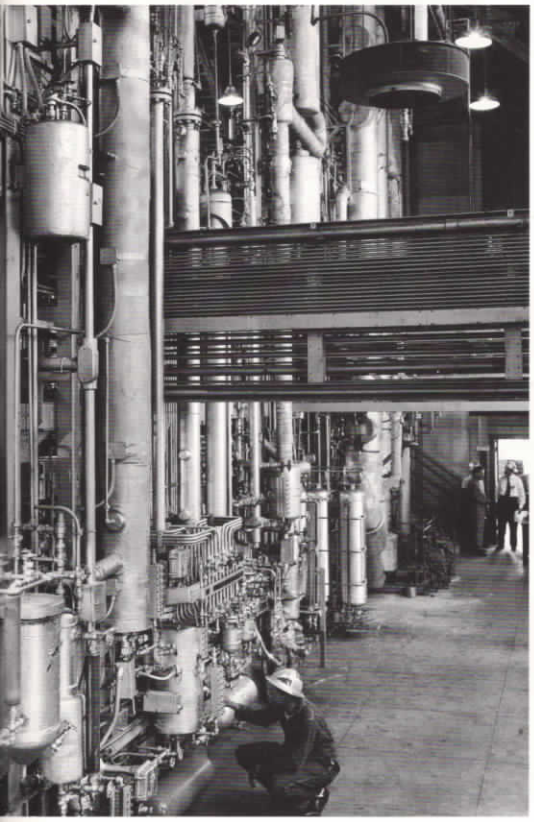
The company called the new process "Unifining" (later renamed "Unionfining"). The manager of the newly formed commercial development section, an up-and-coming young engineer named Fred L. Hartley, went out to sell it on a royalty basis to other refiners. More than 100 refiners ultimately licensed Unionfining, which has earned substantial royalties for the company over the years.

In 1954, a group of top Union Oil executives from research, refining, marketing and finance met to discuss the future of various refining processes. Dr. W. E. Bradley, who later became vice president for research, recalled the meeting: "We knew where we were, and we wanted to find where we should be in the future," he said. "We concluded that the demand for heavy fuel oil was declining. We wanted to develop a process that would convert this low-value product into lighter, more useful products like gasoline, diesel and aviation turbine fuel."

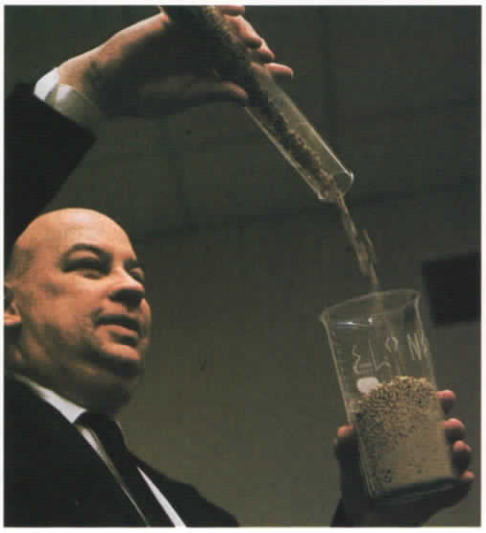
By this time, Union scientists had built up a solid body of expertise in catalysts, those substances that expedite chemical reactions. Basically, petroleum refining catalytic processes are of two main types, those that involve the use of hydrogen and those that don't. As far back as the 1930s, Union researchers had chosen to pursue the hydrogen branch of catalytic refining.

A process called "hydrocracking" looked promising on paper. The theory held that complex hydrocarbon molecules could be "cracked" (or broken down) into lighter molecules in the presence of hydrogen and catalysts under intense heat and pressure. But such severe conditions could not easily be created or contained. A chemist and catalyst expert named Rowland Hansford found the key—a catalyst based on a new synthetic material called Y-zeolite. The new process was christened "Unicracking."

Union president Reese Taylor announced the development of Unicracking to employees in a letter on April 1, 1960. "This new process is based on a novel catalyst which causes hydrogen to react with the feedstock under relatively mild conditions of temperature and pressure," Taylor explained. "Complete conversion of feed to gasoline can be achieved in the new process with a yield of about 115 volume percent." This meant that Unicracking could, in effect, convert 100 barrels of feedstock into 115 barrels of gasoline or other high-value products.



Far left, Research Center staffers pose in 1952. At right, the Los Angeles refinery's Unicracker unit. Research in catalytic refining processes has long been a focus area for the company. Small pilot plants (left) are used for testing new catalysts and procedures. Below, Dr. John Ward, senior staff consultant at S&T, has developed many hydrocracking catalysts.



Union's board of directors optimistically approved a $22-million expenditure to build the first Unicracker at the Los Angeles refinery, and construction soon began. However, the job of scaling up the process from the laboratory to commercial-size proved more difficult than anyone had anticipated.

"In the pilot plant, the first catalyst just fell apart on us," Hansford explained. "It crumbled into a fine powder, and you couldn't have that happening in a commercial unit. We were already committed to building a Unicracker at Los Angeles Refinery. Unless we solved the problem, we might have wound up with a very expensive unit and nothing to make it work."

A task force of 50 researchers worked for six months on the catalyst problem. Hansford and Cloyd Reeg, who would later become head of research, finally found a solution—an alumina "glue" that served to bind the catalyst together. "The result," said Reeg, "was a very rugged catalyst."

As it turned out, Standard Oil of New Jersey (now Exxon) had been working along similar lines. The two managements decided to combine their expertise and license the process to other companies on a royalty basis. Union's first Unicracking unit began operating in 1964, and within a year 10 Unicrackers were being built by other oil companies.

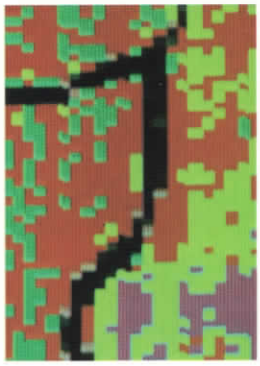
As technology advanced and product demand changed over the years, Union researchers worked hard to keep pace. Jet fuel and diesel fuel became more important in the late 1960s, and researchers invented new Unicracking catalysts and processes to produce improved, essentially contaminant-free blends.

In 1969, the first Unisar process unit was installed at the Beaumont, Texas, refinery. Developed by Union researchers, Unisar removed highly volatile aromatic components from solvents and jet fuels. Unisar has been licensed to a number of refiners for upgrading solvents and jet fuels. The technology also holds promise for helping refiners solve the problem of removing aromatics from diesel fuels.

The 1970s began a period of increasing government regulations designed to protect the environment by reducing industrial emissions. Union researchers responded by developing or sharing in the development of several new processes to remove contaminants—primarily sulfur—from refinery effluents. The first of these, brought on line in 1971, was the Beavon Sulfur Removal Process (BSRP).

Developed jointly by Union and the Ralph M. Parsons Company, BSRP increased the proportion of sulfur that could be removed from escaping refinery gases from 90 percent to 99.9 percent. Within five years there were 30 BSRP units in operation around the world, including seven in Union's own refineries.

Sulfur in residual oil was significantly reduced by a process perfected in 1976 called Unicracking/HDS. First installed in a Japanese refinery, the process was designed to desulfurize 60,000 barrels of high-sulfur-content residual oil per day. The sulfur compounds in the feedstock were converted to hydrogen sulfide and hydrocarbons, with the hydrogen sulfide later converted to elemental sulfur.



These solutions led to a new challenge: how to handle the dust problem associated with transporting sulfur. Working with the company's Collier Carbon & Chemical subsidiary, Union researchers invented a way to combine molten sulfur and water. When dried, the final product was a puffed, dust-free form of sulfur that was dubbed Popcorn® sulfur. The new product soon found a large agricultural market as a soil conditioner and nutrient that was particularly effective because it had a large, irregular surface to react with the soil.

By the mid 1970s, more than 550 refining units in 20 countries were using processes developed by Union Oil scientists. Royalty income was able to cover an increasingly larger portion of the research budget.

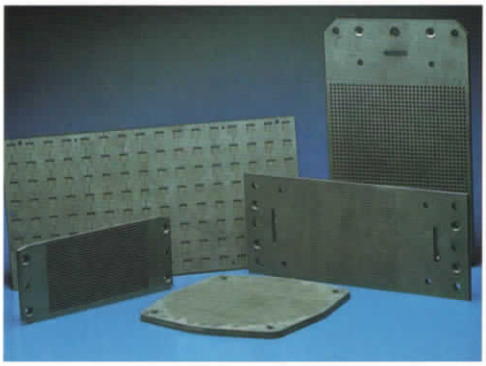
But devising new products and processes wasn't the only task of Union's research group. Under the direction of Dr. Hal Huffman, who succeeded W. E. Bradley as vice president of research in 1974, the department also acted as a "quality watchdog" for manufacturing and marketing. In that role, Union researchers furnished technical services to marketers and customers, and helped to maintain Union's reputation as a knowledgeable, progressive company.

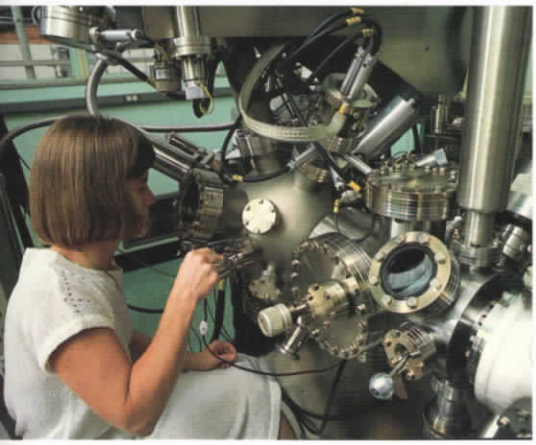
Entirely new areas of research also bore fruit. One successful endeavor was in the area of graphite. In 1965, when Union merged with Illinois-based Pure Oil Company, Pure's research department had been absorbed into Union's. Among the talented scientists that Union inherited in the merger was Hillis O. Folkins.

In 1964, when Pure had purchased a graphite-producing process and plant from the Texas-based LTV Corporation, Folkins had been assigned to the new subsidiary, which was renamed Poco Graphite. Now that Poco was a part of Union Oil, Folkins continued to research the production technology and product applications of graphite.

The results were impressive. The graphite manufactured by Poco was a product of exceptional purity and quality. Resistant to heat, pressure and radiation, it found many uses in high-technology applications (such as digital watches and calculators), in advanced medical equipment, and in components of NASA spacecraft. Because of its strength and uniformity, Poco graphite was found to be a perfect material for use in artificial heart valves. In 1973, Folkins himself had a damaged aortic valve replaced by a synthetic one made from Poco graphite — the material he had worked to develop for nearly a decade.

Bottom left, Pure Oil's research center in Schaumburg, Illinois. Pure and Union consolidated research departments in Brea after the 1965 merger. Far right (top and bottom), a major expansion of the Brea facility was completed in 1982. From agricultural chemicals and graphite applications to oil exploration technology, S&T's research efforts are aimed at advancing the company's business objectives.





The computer brought about a major revolution in Union's research efforts during the 1960s and 1970s. Complex calculations could be accomplished with great speed by computer, and computer-generated mathematical models replaced the laborious, time-consuming bench experiments of the past.

Geophysicists, for example, could enter highly detailed data into computers and construct accurate simulations of underground formations. Reservoir engineers could use similar techniques to determine the best methods for optimizing oil production from specific fields. Computer control of experiments in the laboratories and pilot plants improved and shortened the duration of the tests.

In January 1979, Union's Research and Development group became a division of its own—renamed the Science & Technology Division. Richard J. Stegemeier, who had succeeded Huffman as vice president of research in mid-1978, became the new division's president. A Texas A&M graduate with a master's degree in petroleum engineering, Stegemeier had joined Union 28 years earlier as an engineer at the then-brand-new Brea research center. In the interim, his career had taken him through a wide range of experience.

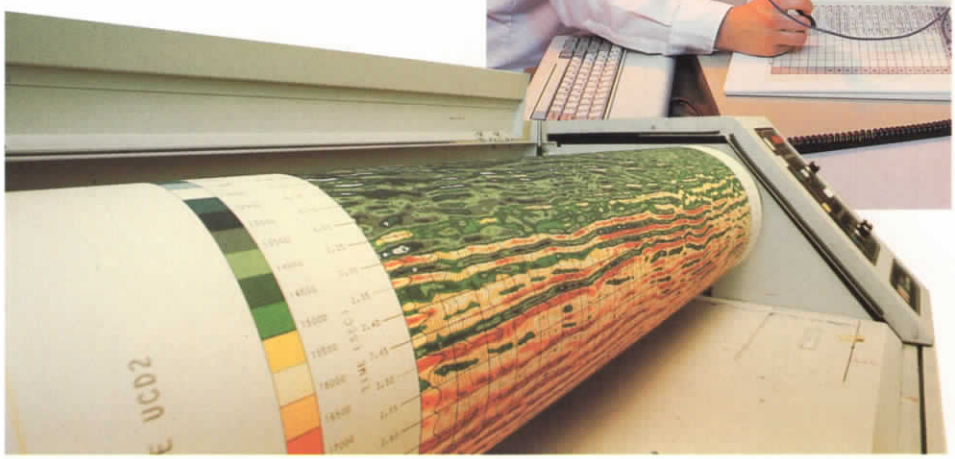
The Science & Technology (S&T) staff, which numbered 530 at the time, was a talented one indeed. Nearly half had degrees in science or engineering. Half of these held doctorates, and most of the rest had earned master's degrees. Stegemeier won approval for a 15-percent increase in the professional staff that year, and the company committed to a doubling of laboratory space. "This is recognition by top management that research has made very large contributions to the success of the company," Stegemeier said.

In September 1982, the new additions to the Brea facility were dedicated. Renamed the Fred L. Hartley Research Center, it was almost twice the size of the older complex. The staff numbered some 800 scientists, researchers and support personnel.

"In terms of priorities, the major thrust of our work is to develop the technology for Union Oil Company to increase its production of energy resources," said Cloyd P. Reeg, who succeeded Stegemeier as president of the division in 1980. "Over 50 percent of our effort is directed toward research on the production of conventional oil and gas, as well as alternative energy sources such as geothermal and shale."

Chemicals also became a focus of research, particularly the development of polymers for adhesives and coatings applications. Another S&T group worked with the Geothermal Division to help overcome the severe corrosion and scaling problems associated with development of the company's Imperial Valley resource.

"The future holds many research challenges for Unocal," says Steve Lipman, president of the Science & Technology Division. "S&T is working on new techniques and processes for developing energy and energy-related products that will continue to meet the high standards the public demands."



Earlier research on chemical analysis techniques for refining applications was utilized in the exploration area. With the aid of computers, these techniques could provide more precise analyses of rock and crude oil samples, which helped oil hunters better evaluate new prospects. By the mid-1980s, research and operations teams were integrating seismic, drilling and geological data to improve evaluation of reservoir and source rocks, hydrocarbon generation, fluid migration pathways and trapping mechanisms. This led to better estimates of reserves and more successful exploration and development.

In the mid-1980s, the company consolidated and upgraded its Scientific Computing facilities in Brea. International's seismic processing group and the mapping group attached to Oil & Gas were merged with S&T's computer organization in June 1986. The resulting new department administered scientific computing services to research and operations, and provided technical services throughout the company in seismic processing, mapping and data base areas.

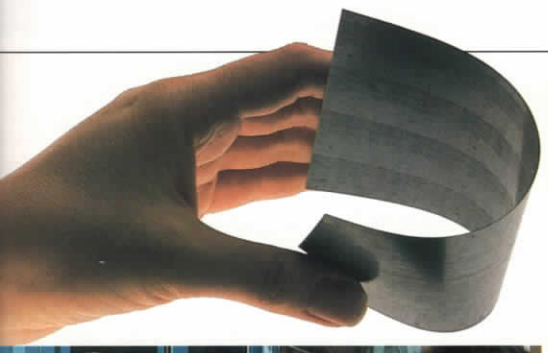
The rising oil prices of the 1970s also gave new impetus to research on secondary and tertiary oil recovery technology. One result was Uniflood, a process in which chemicals are injected into a formation to free hydrocarbons adhering to sand or rock grains. Water flooding can then be used to sweep more of the oil to recovery wells.

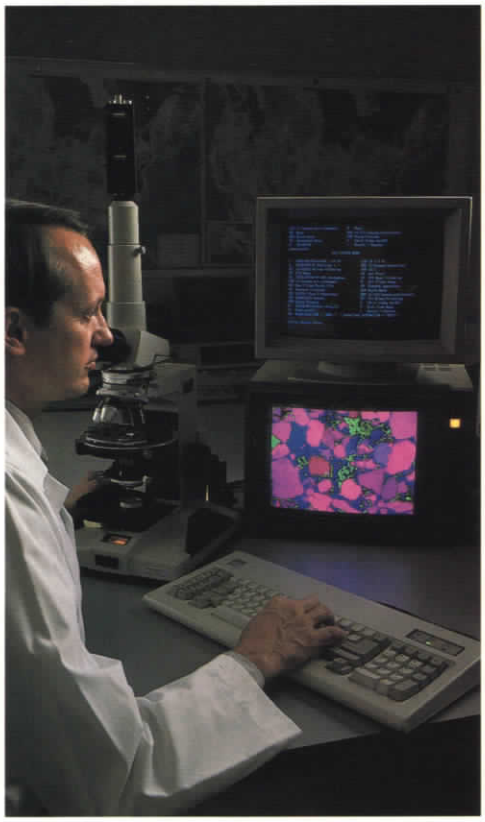
Another major accomplishment of Union Oil researchers was the development of the carbon dioxide flooding process to recover additional oil from reservoirs that had already been water flooded. This process is currently being applied in the Dollarhide field of west Texas—one of the most successful CO_2 flood projects in the industry.

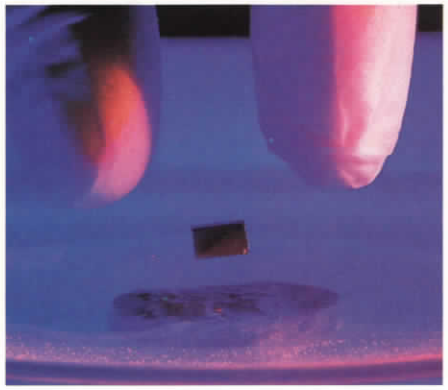
As the new products, processes and technologies developed by S&T continued to increase, so did the number of patents applied for by the company. In 1985, a year in which much of management was preoccupied with fighting off T. Boone Pickens' hostile takeover raid, S&T personnel filed a record 105 patent applications.

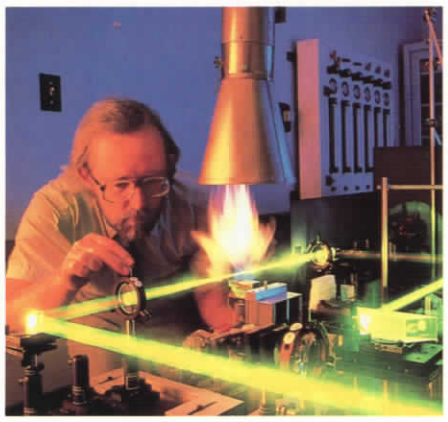
In this same year, 69 U.S. patents were granted to Union (now doing business as Unocal). The patents covered a cross section of S&T's work. Fifteen were for refining catalysts and processes, 10 were for oil shale retorting or refining technology, and others involved everything from agricultural and carbon products to geothermal, solar and oil production technology.

The following year, even as the oil price collapse forced company-wide budget reductions, Unocal was granted 76 more U.S. patents. The sale of company-developed technologies continued to grow in importance as well. From 1986 through 1988, Unocal reached record highs in royalties received for the use of its technology in facilities around the world. In fact, for every process or technology the company bought or licensed, it sold 10 licenses to others—a ratio that continues to be maintained.









The development of specialty products—such as lanthanides, polymers, Poco graphite products, and plant-protection chemicals—began to command more of the division's attention as the 1980s progressed. One result was Unipure,™ a patented procedure for removing heavy metals from industrial wastewater. Working with the Chemicals Division, S&T researchers also developed several new agricultural products. Among them were Enquik,® an herbicide and desiccant that kills weeds and then decomposes into soil nutrients, and Unocal Plus,® a safe form of urea that can be sprayed directly on plant foliage.

In 1987 alone, busy researchers developed 56 new or improved commercial products, including Guardol motor oil for truck engines, new transmission fluids, heavy-duty greases, an improved hydraulic tractor fluid, and a 100-plus octane racing gasoline. S&T scientists also began to pursue cutting-edge lines of research, such as the study of new superconducting compounds and their applications. These materials typically contain lanthanides, of which Unocal, through its Molycorp subsidiary, is one of the world's largest producers.

In 1989, as the end of Unocal's first century neared, S&T scientists were awarded 75 new U.S. patents, bringing the total the company held worldwide to nearly 1,100. Unocal's Unicracking process, which had been steadily improved over the years, now made up more than 60 percent of the world's licensed hydrocracking technology.

In 1990, Stephen C. Lipman replaced Cloyd P. Reeg, who retired, as president of Science & Technology. Lipman, who previously served as president of Unocal's Geothermal Division, anticipates an important role for S&T in the years to come.

"The future holds many challenges for Unocal because the demand for energy is growing concurrent with an increasing public concern for environmental protection," Lipman says. "Science & Technology is working on new techniques and processes for developing energy and energy-related products that will continue to meet the high standards the public demands."

Back in 1940, on the occasion of Union Oil's 50th anniversary, the magazine *Petroleum World* published a history of the company. "There can be no doubt that the constant application of chemical and engineering research has been one of the prime factors in maintaining Union Oil Company as an aggressive, forward-looking organization," the magazine stated. "Throughout the life of the company there has been a constant awareness of the need for more efficient methods and better quality. And the early officers of the company did much more than merely entertain the idea. They were exercised and actuated by it, and the history of the oil industry bears rich testimony to the results of their efforts."

The company's commitment to science and innovation remains as strong today as it was back then. "Unocal has grown and prospered through its use of innovative technology," Lipman says. "We see opportunities for future growth through the application of new technical solutions to the challenges facing us in the years ahead."

A Pioneering Effort

Seven miles up the narrow gravel road that snakes along the north wall of Parachute Creek valley, all vehicles abruptly reach the end of the line. Here, situated on a five-acre "bench" 1,000 feet above the valley floor, is the heart of Unocal's Colorado oil shale project: the mine and retorting complex.

Although the site is pulsing with activity on this summer day, most of it is hidden. Deep within a maze of tunnels behind the canyon wall, the lode of kerogen-rich shale is being mined and crushed. Out on the bench a visitor sees very little motion, and notes only two sounds: the whine of the mine's ventilation fans, and the low rumble of a covered conveyor that transports the crushed shale to the retorting unit.

Inside the 200-foot-tall retort, the ore is heated to over 900 degrees Fahrenheit, decomposing the kerogen locked inside and releasing it as oil. The raw shale oil is piped eight miles down the valley to an upgrading facility, which removes impurities and converts it into high-quality synthetic crude oil that is ready for further refining.

In the retort's control room, several workers monitor the operation on computer terminals. Among them is Tim Heckel, manager of process operations. "We're producing an average of 6,500 barrels a day now," Heckel says. "That's our highest average production rate ever, and we're continuing to increase it. But I think the best indication of our success is that we've reached a new phase of operations. We have solved a lot of difficult process problems, and are now able to concentrate on improving the plant's reliability."

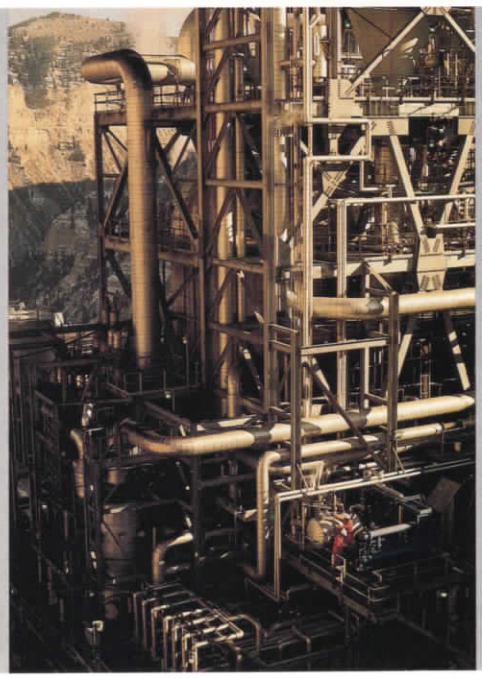
Allen Randle, vice president, Oil Shale Operations, echoes that sentiment. "We have certainly made great strides," says Randle, who has worked on the shale project since 1978. "The retort is up and running about 90 percent of the time now, except for normal turnarounds. We've demonstrated that the technology works. More importantly, the shale project made an operating profit in the first quarter of this year."

The history of Unocal's shale project well illustrates the challenges and difficulties inherent in developing a pioneering technology. Progress has been hard-won and painstakingly slow at times. The project's outlook has been—and continues to be—uncertain due to ever-changing political and economic realities. But the company has persevered, and today stands alone in successfully operating a commercial-scale oil shale operation.

Lying in a 16,000-square-mile area that encompasses parts of Colorado, Utah and Wyoming, America's oil shale deposits constitute an enormous energy resource. As far back as 1920, Unocal (then Union Oil) conducted geologic studies and surveys in the region, and began acquiring properties in the Parachute Creek area of western Colorado. The company ultimately gained title to 38,000 acres of oil shale lands that are estimated to hold over 3 billion barrels of recoverable oil—enough to produce 100,000 barrels per day for nearly 90 years.

Unocal's research effort in shale oil extraction technology began in the early 1940s. The company first built and operated a small pilot retort plant at the Los Angeles refinery, extracting the oil by subjecting crushed shale ore to heated gas. From 1955 through 1958, Unocal field tested its retort technology on a larger scale at Parachute Creek, producing up to 800 barrels of shale oil per day.

Further work was put on hold until the 1970s, when rising world oil prices made shale development more economically feasible. In 1978, John M. Hopkins, then president of the company's newly formed Energy Mining Division, announced a project to develop the first commercial shale oil plant in the nation. The mine, retort and upgrading facility the company proposed to build was designed to produce 10,000 barrels per day of high quality synthetic crude oil.



Construction began in 1981. In July of that year, Unocal was awarded a contract under the Energy Security Act established to encourage production of alternative fuels. Under the contract, the company is guaranteed a product price of $42.50 per barrel of refined product, adjusted for inflation. The government pays Unocal the difference between the guaranteed price and the market price. The contract expires 10 years from the date the first payment was made, or when the total payments reach $400 million, whichever comes first. Unocal shouldered the investment cost of the project, and took the technological risk.

The magnitude of that technological risk soon became apparent. From the moment the plant was completed in late 1983, the retort—the centerpiece of the project—experienced a series of thorny, unanticipated problems. Most of these involved the system for cooling the retorted shale, which is moved by enclosed conveyor to the valley floor where it is spread, compacted and planted with native vegetation.

"The retorted shale had a much finer consistency than we expected," Randle explains. "This caused flow, temperature and pressure-control problems in the cooling system." Ultimately, the retort's cooling and shale removal systems were extensively redesigned. The abrasive nature of the shale necessitated further metallurgical and design improvements to the plant. These and other modifications were completed in July 1986. The first barrel of synthetic crude oil was shipped in December of that year.

"The time prior to that first shipment was a frustrating period," Randle recalls. "Our progress was slow and incremental, but that's not unusual when you're developing a pioneering technology. In fact, a 1981 Rand Corporation study of 44 commercial-scale solids processing plants built by private companies in the U.S. and Canada found that the average start-up time was 33 months. Our start-up required 34 months. In retrospect, our experience was typical for this type of process."

Since the first product shipment at the end of 1986, the plant's performance has steadily improved. Design and process modifications continue to be made to improve efficiency and reliability. "We're still on a learning curve, both operationally and mechanically," says Randle. "We want to continue advancing in those areas. We're also identifying and implementing additional cost-saving measures and other efficiencies."

Two other areas of focus for the shale project are safety and the environment. As Unocal did at the corporate level, Energy Mining established a new Health, Environment & Safety department to consolidate these responsibilities in one organization. "Our purpose in forming a separate department is to reemphasize the importance of these issues, and underscore our commitment to running a safe, clean operation," says Bob Mitten, Health, Environment & Safety manager for the shale project.

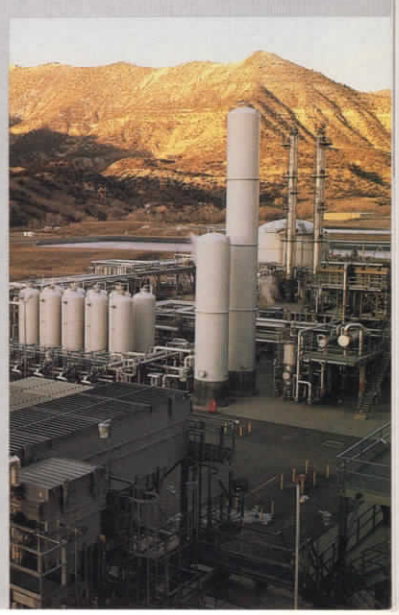
That commitment has paid off. The project's reclamation effort—designed to restore disturbed land to its original use as a wildlife habitat—received a Governor's Award from the state of Colorado.

What does the future hold for Unocal's oil shale venture? If the project can continue to show an operating profit, it will most likely keep running until the government price support contract expires. This is now projected to occur at the end of 1995.

"Beyond that, our future status depends on our success in increasing production, reducing costs, and on the future market price for crude oil," Randle says. "But we don't dwell on that here. Instead, we prefer to focus on our efforts to make further improvements. We've participated in the creation of a brand-new industry—an important one in terms of national energy security. Overall, I'd say there's a feeling of great satisfaction here."

"The shale project has proven the technology for tapping a vast energy resource, and shown that the environmental challenges are manageable," adds Steve Lipman, president of Unocal's Science & Technology and Energy Mining Divisions. "As the plant becomes more and more reliable, our costs per barrel of syncrude are coming down to very reasonable levels, and we're most encouraged by that. The operation needs to continue that kind of performance at a higher rate and on a longer-term basis. Looking ahead, I'd say we are cautiously optimistic."

From far left: a technician examines crushed shale, a view of the Parachute Creek retort complex, overview of the plant site, inside the underground mine, a view of the upgrade plant. "The shale project has proven the technology for tapping a vast energy resource," says Steve Lipman.



TAKING THE LONG-TERM VIEW

The ultimate measure of a public company's success is its return to shareholders. Unocal's profitability and effective use of capital resources are key determinants of return to shareholders, necessitating careful planning of financial objectives.

The Corporate Budgets, Planning & Economics department (BP&E) is charged with managing the company's financial planning. The department maintains standards of economic analysis for the company to make sure each division conducts financial reviews in a consistent manner.

To plan Unocal's overall financial strategy, BP&E must consider many different factors which affect the company's cost of doing business. The department looks at fundamental economic trends, examines company operations for weaknesses and strengths, and determines where capital spending should be increased or cut back.

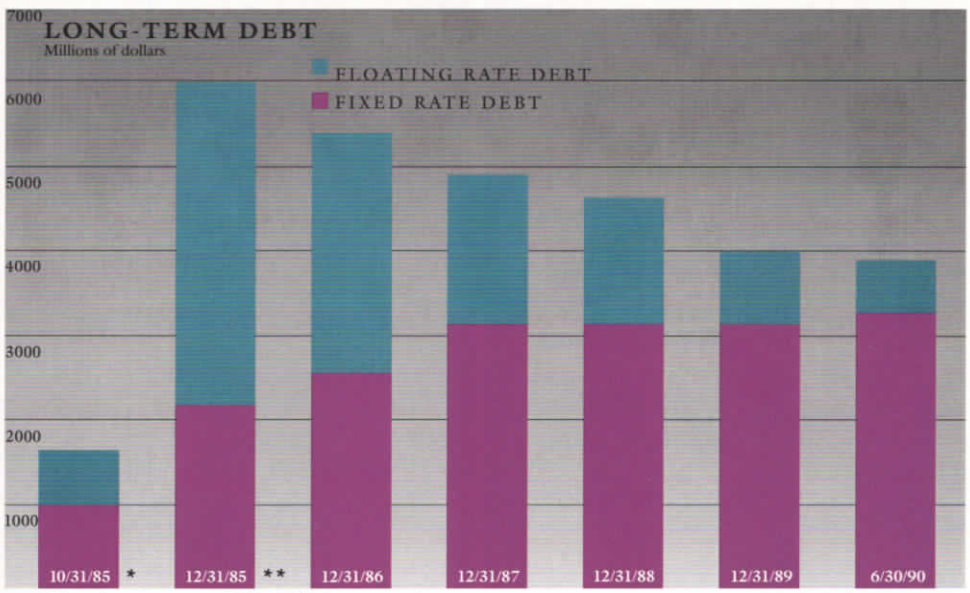
"The overriding goal is to enhance shareholder value, and all economic decisions are pointed toward that end," says Gary Sproule, vice president, Budgets, Planning & Economics.

Unocal's operations are structured into 33 distinct business units, each having separate financial reporting and operating responsibilities. Viewed as stand-alone entities, the performance of each company segment is clearly evident, making it easier for management to pinpoint operating weaknesses. If a business unit or corporate asset is not earning an adequate return on investment, BP&E and operating management evaluate the operation and explore possibilities for improving its performance.

In some cases, the best strategic alternative may be to dispose of such underperforming assets and redeploy the capital elsewhere. Within the past few years, for example, Unocal sold its 12.6-acre headquarters property, its Norwegian oil and gas operations, and its coal mine in Canada. The Beaumont, Texas refinery was shut down and converted into a marketing terminal. "These were all assets that were underperforming, or no longer fit strategically into the company's operations," says Sproule.

Unocal can redeploy revenue gained from asset sales to expand other company operations, reduce debt or make prudent acquisitions. Earlier this year, Placer Dome Inc. put its subsidiary Prairie Producing Company on the market. BP&E and North American Oil & Gas Division personnel evaluated the company and found it fit well with Unocal's existing operations and energy objectives. The acquisition increased Unocal's Gulf Coast lease holdings, as well as its oil and gas reserves.

A company's ability to take advantage of such business opportunities is affected to a large degree by its level of corporate debt. In 1985, when Unocal became the target of a takeover attempt by Mesa Petroleum, the company carried relatively little debt. To fight the takeover attempt, Unocal undertook a massive stock buyback that increased its debt from $1.6 billion to $6.1 billion. The high debt level severely constrained the company's financial flexibility, and reducing the debt became a top priority.



*Pre takeover attempt **Post takeover attempt

"The overriding goal of Unocal's financial planning is to enhance shareholder value," says Gary Sproule, vice president, Budgets, Planning & Economics. At left, the floor of the New York Stock Exchange, where Unocal's stock is traded. Above, Unocal has steadily reduced its long-term debt in the years since the 1985 takeover attempt. "Our debt is now at a manageable level for a company our size," Sproule says.

Over the past five years, Unocal has succeeded in that effort, steadily reducing the debt incurred in the takeover battle. Interest rates and terms have also been improved through prudent refinancing. "We've now got our debt down to about $4 billion, which is a manageable level for a company our size," says Sproule.

BP&E's goal is to maintain a level of debt that allows the company to act on attractive opportunities that arise with changing economic trends. Sometimes joint ventures are the appropriate structure to strengthen the company's competitive advantages and lower operating risks. In late 1989, Unocal's refining and marketing business in the midwest was made part of The UNO-VEN Company, a joint venture with the Venezuelan state oil company Petroleos de Venezuela, S.A.

"To be successful, a joint venture must be profitable for all parties involved," says Jack Laak, manager of economics. "The UNO-VEN Company, by combining Unocal's existing refining and marketing operations with a secure long-term supply of Venezuelan crude oil, improved the financial position and long-term prospects of both companies."

Over the past three decades, several external influences have dramatically affected the economic climate for oil companies. In the 1970s, OPEC emerged as the major market-controlling force. Corporate raids and mergers became a factor during the 1980s. In the current decade, the political situation in the Middle East has become predominant, along with heightened concern for environmental issues.

"Increasing environmental regulation has a very direct impact on Unocal's planning," says Sproule. "The company's refining and marketing strategy for the west coast is a good example. New refinery emissions standards will require large capital expenditures to bring facilities such as the Los Angeles refinery into compliance. BP&E reviews the economics and evaluates funding alternatives for these types of environmental projects."

Environmental regulations are not the only form of legislation that can affect economic planning. Tax laws, for example, directly affect the company's bottom line. When Unocal formed Union Exploration Partners, Ltd. (UXP) in 1985, federal tax laws favored limited partnerships. Recent changes in the laws, however, have made partnerships less attractive. So last August, in line with its goal of enhancing shareholder value, the company converted UXP into a corporation — Unocal Exploration Corporation (UXC).

Above, drilling in Unocal's Van field, east Texas. The company's Gulf Coast presence was expanded with the acquisition of Prairie Producing Company earlier this year. Right, exploration in Mobile Bay, where Unocal has made several natural gas discoveries.

BP&E regularly examines long-term oil and gas price movements, looking for fundamental economic trends. Contemplated projects must be able to operate profitably within a range of possible price scenarios. "We avoid forecasting oil prices based only on the economic climate of the moment," says Sproule. "As the recent events in the Middle East emphasize, prices can change dramatically in the short term."

A basic planning strategy is to concentrate on strengthening those business areas in which Unocal is firmly established or has acquired a competitive advantage. For example, Unocal has gained expertise over the years in producing heavy California oil, in finding and developing natural gas resources in the Gulf of Mexico and offshore Thailand, and in developing geothermal resources in California and overseas.

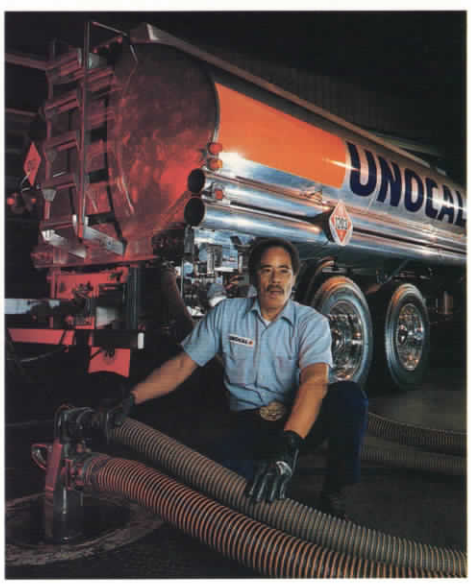
On the downstream side, the company holds a strong position in California's retail gasoline market, one of the largest in the world. Unocal's chemicals businesses are also solid performers.

"These are business areas you'll see the company building on in the years ahead," Sproule says.

Another strategic turn will be an increasing shift from domestic to foreign oil exploration. This is due to government-imposed restrictions on domestic oil and gas development, and reduced prospects for large new discoveries in the United States. Unocal's international exploration activity has expanded significantly in recent years, and the shift is directly reflected in the company's capital spending allocations. For the first time in Unocal's history, budgeted foreign exploration expenditures for both petroleum and geothermal energy now exceed domestic expenditures.

"In the years ahead, the overriding goal of our financial planning will remain the enhancement of shareholder value," Sproule emphasizes. "Ultimately, we are paid by the shareholders to create value for them. That has to be our primary objective in formulating and implementing the company's financial strategy."

In addition to natural gas production, geothermal development and west coast refining and marketing are business areas that Unocal will build on in the future. Clockwise from above: geothermal operations in California's Imperial Valley, gasoline delivery at a west coast service station, the Los Angeles refinery's control center.



FOCUS ON THE FUTURE

A conversation with Neal E. Schmale, Senior Vice President, Corporate Development

"One of Unocal's primary objectives is to expand the company's resource base, so a good deal of our research now is focusing on exploration."

Neal E. Schmale, Senior Vice President, Corporate Development

Corporate Development contains six different groups: Science & Technology; Engineering & Construction; Budgets, Planning & Economics; Real Estate; Corporate Information Services and Corporate Communications. What ties them together?

In broad terms, all of the groups are concerned in some way with the future direction of the company. That's the common theme that runs through their activities.

Unocal has a long history of achieving growth and success through its research effort. What areas will Science & Technology focus on in the years ahead?

The overall research effort is geared toward supporting the business goals of the company. One of Unocal's primary objectives is to expand the company's resource base, so a good deal of our research now is focusing on exploration.

Because the "easy" oil and gas deposits have all been found, exploration is becoming more challenging and more global. One way to gain a competitive edge is through technological expertise and innovation—specifically in the area of geophysical technology. S&T has had a lot of success in this area, working with the latest computer programs and developing new applications and techniques. This will continue to be a top research priority in the years ahead.

Clockwise from above: the Unisulf plant at the company's Santa Maria refinery removes sulfur from refinery gases; exploration drilling offshore Thailand; steam injection in Unocal's Cymric field, central California. Environmental systems, exploration technology and enhanced oil recovery are three focus areas of the company's research effort.

Is S&T also looking at enhanced oil recovery techniques and other ways of increasing oil production?

Yes, that's another area of emphasis. A lot of oil remains trapped in developed fields—oil that may be recoverable using EOR technology. A third area of concentration is environmental systems, particularly those technologies associated with emissions control and other environmental demands being made on our refineries. Product and applications research is also being conducted in lanthanides, chemicals and other areas where the company has a competitive advantage. And of course, S&T provides technical support for the company's different business groups.

One of the lessons of the 1980s, from a business standpoint, is that you shouldn't try to be something you're not. Many companies tried to diversify in the '80s, and nearly all of those efforts did not pan out. I think the companies that succeed in the future will be those that "stick to their knitting." We're primarily an energy company, and our research effort will serve us best by focusing on those areas I've described.

Engineering & Construction is another group that provides support for the company's business operations. Is their work also becoming more focused?

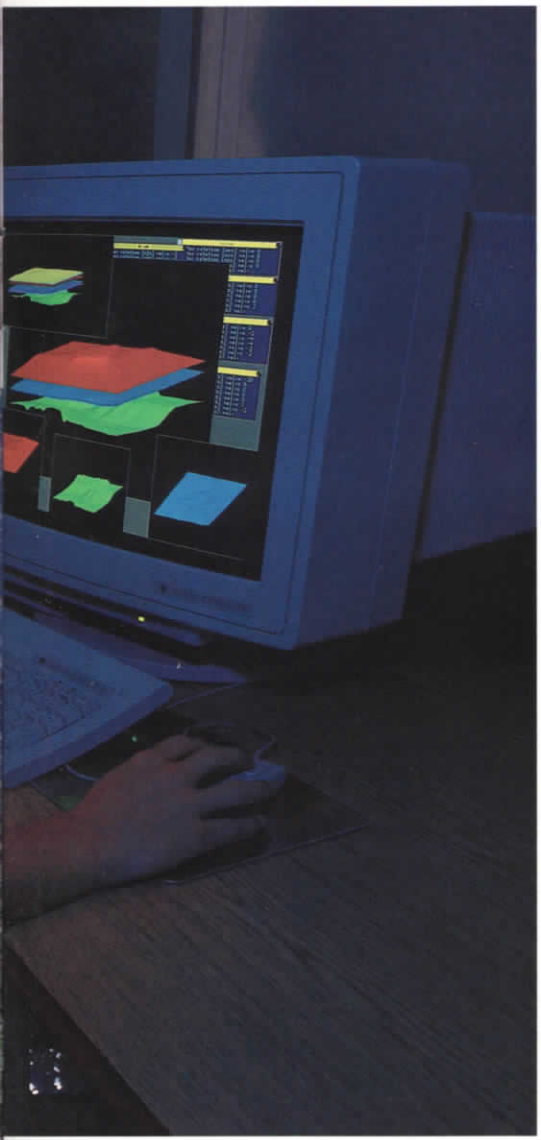
Yes. The single biggest project that E&C has to deal with is the environmentally required work at the Los Angeles refinery. They also handle the environmental remediation of real estate properties before they are sold or developed. So more and more, the work of E&C is related to environmental obligations of one form or another.

Of course, we also have several conventional construction projects going on: unit installations at the Santa Maria refinery, the chemical plant expansion at West Sacramento, and the new polymers plant at Kankakee, Illinois, to name a few. The success of these projects—particularly the environmental ones—depends in large part on whether we're able to keep costs under control. That's why an absolutely critical role for E&C is to see that these projects proceed on schedule, and are carried out efficiently and safely.

"Now that we've got our debt down to a manageable level, we can concentrate once again on growth."

Clockwise from above: computerized controls at one of Unocal's Mountain Pass, California lanthanide processing plants; geophysicists at work in Brea's Scientific Computing Center; Unocal's headquarters building, one of several properties sold by the company in the effort to redeploy assets.

Pictured at right are Corporate Development senior executives who report to Neal Schmale. Clockwise from top left: Gary Sproule, vice president, Budgets, Planning & Economics; Karen Sikkema, vice president, Corporate Communications; John Dietzman, director, Engineering & Construction; Steve Lipman, president, Science & Technology and Energy Mining; Paul R. Jones, director, Corporate Information Services; Richard K. Jemison, president, Real Estate.



Lets' move on to Real Estate. In recent years, Unocal has sold a substantial amount of land and other properties. Is that activity going to continue?

The overriding mission of our Real Estate Division is to maximize the return on the company's land assets. That includes many land sales, which generate cash for the company to redeploy elsewhere. This means that the Real Estate Division's importance to the company is greater today than it ever has been in the past.

We are still involved in real estate development, particularly in areas like Brea, where we have substantial land holdings. But capital constraints make it likely that we will do less development than we did in the past.

In the Budgets, Planning & Economics area, how have we changed our priorities and strategies compared to a decade ago?

In the early 1980s, we were not cash constrained, and we were able to pursue a number of projects that we would probably not pursue today. Then in the mid-'80s we went through a very difficult period, with the takeover battle followed by the oil price collapse. We took on an enormous debt in the takeover battle, and reducing that debt became our top priority.

Now that we've got the debt down to a manageable level, our priorities have shifted. We can concentrate once again on growth. But we use a sharper pencil than we did 10 years ago, and we have to take more of a short-term view. We've seen a shift in our shareholder base from relatively patient small investors to relatively impatient institutional investors. We're certainly not unique in that respect, but it's something we have to respond to.

The BP&E group's role in developing corporate strategy has not changed that much. They are focused on the overall strategic direction of the company, and their function is to make sure that the operating plans and the financial plans and the technological direction of the company are all compatible. We can't have the research center pointed east, the financial group pointed north and the operating groups going west. They've all got to be heading in the same direction.

Given the unpredictable nature of the oil business, how can we forecast and plan effectively?

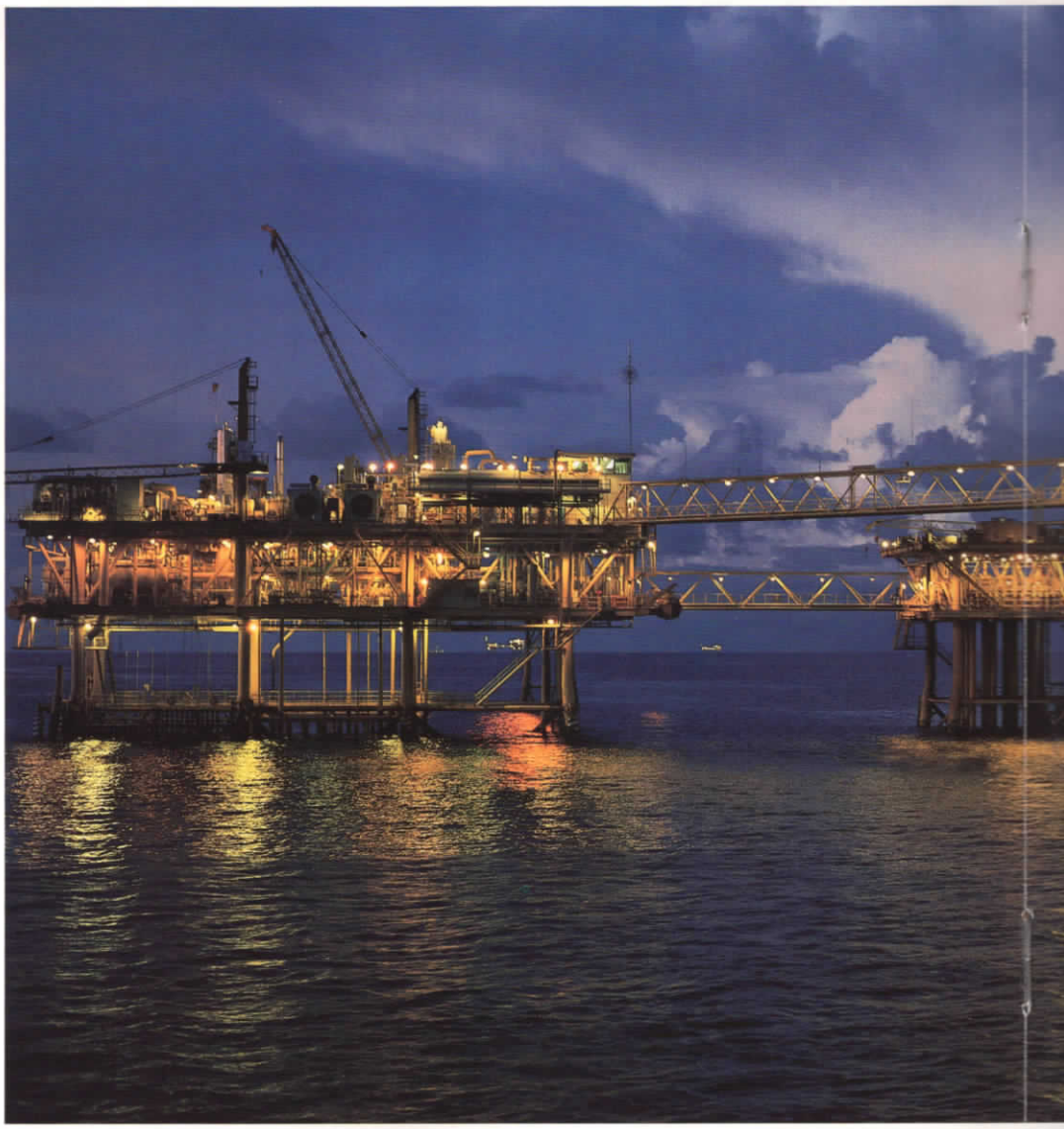
It's difficult, because more than any other single factor, we're a company driven by oil prices. And as we've all learned repeatedly, oil prices are very volatile and virtually impossible to forecast. The key is to stay flexible. It's also important not to overreact to recent events that have affected oil prices, because today's situation is bound to change. If prices are up, usually some economic force will come into play to correct them. Other corrections occur if prices are down. So we have to step back and keep a broader perspective.

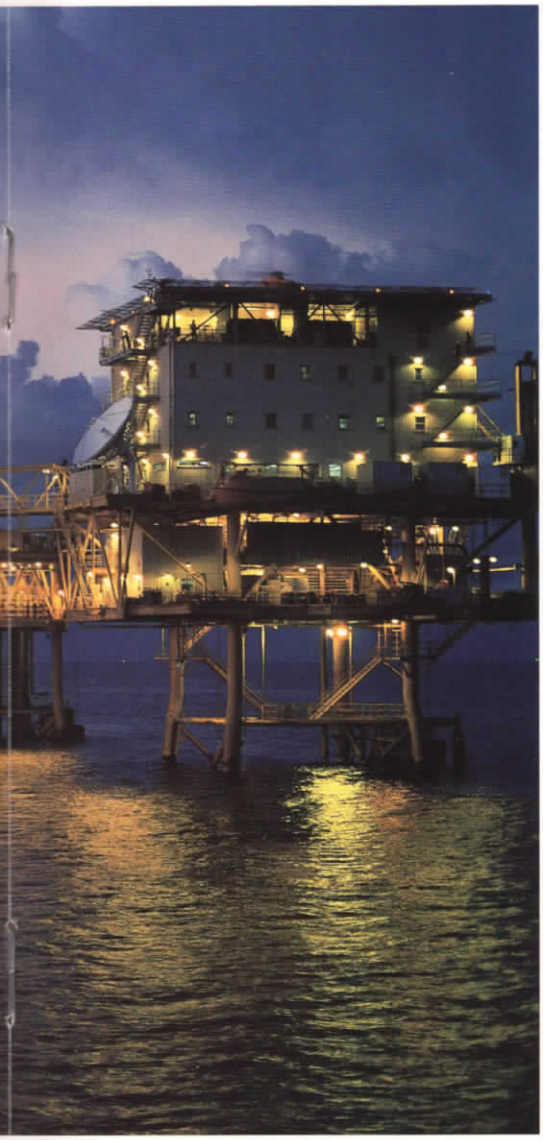
Long-term, there are several key factors that are going to influence oil prices. One is OPEC's ability to control its oil output. Another is heightened environmental concern about oil development, transport and usage. A third is the growing demand for oil in developing countries. A fourth is the political situation in the Middle East. These are the kinds of things we have to focus on in strategic planning.

What will be the role of Corporate Information Services in the years ahead?

We're experiencing an information revolution now, which is as broad in scope as the industrial revolution of the 1800s. Acquiring, processing and disseminating information quickly and accurately are critical in today's business world. The role of CIS is to provide corporate support in the information arena. Specifically, CIS has three major components: a communications side, a scientific computing side, and what I call the business computing side.

"I expect that many of the seeds being planted now will have borne fruit by the year 2000."





Top, Unocal Thailand's Erawan field platform complex, Gulf of Thailand. Unocal has extensive overseas and domestic natural gas reserves; growing demand for cleaner-burning fuels will expand the company's development of these resources in the years ahead. Unocal environmental initiatives such as SCRAP (left) and 76 Protech Patrol have received widespread public recognition through concerted communications efforts.

The importance of internal communications, especially for a company with a global scope like Unocal, cannot be overstated. CIS is responsible for maintaining a communications system that allows the company's various segments to exchange information and make decisions more quickly. They also establish communications links with our operations in remote, frontier areas.

On the scientific side, CIS oversees our computing center based at S&T in Brea. As I mentioned earlier, most of this work is centered on exploration and production, including geophysical interpretation and reservoir modeling. In the context of that work, CIS's most important contribution is in making us more efficient at finding and producing oil.

On the business side, Unocal has two major information-related needs. The company's administrative work must be done efficiently and economically, and we must be able to obtain and analyze financial data quickly. Both of these functions depend on computer systems that are administered by CIS.

Is the function of Corporate Communications taking on added importance in this information age?

Absolutely. As a corporation, we must have a continual interchange with employees, government bodies, our investors and the general public—both directly and through the media. All of these constituencies need to know where we're going and how we plan to get there. Making this known is the responsibility of our Corporate Communications department.

In recent years, we've been focusing more strongly on communicating with the financial community. It's critical that this audience understand our objectives and recognize our successes. That's the reason Mr. Stegemeier has met regularly with shareholders, the financial press and with groups of securities analysts across the country.

In terms of public and government relations, the key element is getting our point of view heard and understood. Our industry in particular is beset by a good deal of misunderstanding. Oil companies historically have been cast in a villainous role, and that's something we can mitigate through effective communication. If we are honest, open and consistent in our communications, we can not only be heard; we can also educate our constituencies about our business.

In the years ahead, communication will be especially important in the environmental area. This year, for example, we've undertaken several important environmental initiatives. These programs—such as SCRAP and Protech Patrol—have achieved success and public recognition in large measure through positive and concerted communications efforts.

Since we've been focusing on the future, where do you see the company 10 years down the road?

I think you'll see us much as we are today in terms of our priorities and objectives. We will be aggressively pursuing our basic business, the development of energy resources. We will be even more of an international company. I would expect that natural gas will be a larger part of our business, as will geothermal energy. We will still be strong in west coast oil refining and marketing, and we'll be strong in certain chemicals markets nationally.

In looking ahead, it's important to keep in mind that all of our activities are evolutionary. Some of the things we're just beginning to emphasize now will have greater significance 10 years down the road—just as, for example, Unocal Thailand has evolved from a modest operation 10 years ago to a very large one today. I expect that many of the seeds being planted now will have borne fruit by the year 2000.

MANAGING THE INFORMATION REVOLUTION

A company's ability to manage its information resources has become increasingly critical to success in today's business world. At Unocal, the Corporate Information Services department (CIS) provides the necessary support for the company's various information systems.

Formed in 1973, CIS first administered systems for accounting and payroll. Since then, the department's responsibilities have expanded to keep pace with the rapid advances in information technology. CIS now administers computer systems that automate refinery operations, monitor product flow through pipelines, provide field offices with detailed geophysical interpretations, and analyze financial data, to name just a few functions. The department also oversees the telecommunications system that allows the company's widespread locations to exchange information reliably and quickly.

Advances in technology have made the computer the primary tool for information management. Just a few decades ago, computers were huge, bulky affairs that used vacuum tubes to store information. Their memory banks commonly needed the space of several rooms. Since then, computers have become increasingly powerful and compact. Technological improvements have made it possible for desktop personal computers to assume a growing number of functions. CIS must respond to such industry trends and direct the company's computer operations with an eye to the future.

The department has the responsibility for assuring that all of Unocal's computer systems remain compatible and meet specified technical criteria. "We keep abreast of the latest advances in technology to make sure the company doesn't invest in equipment that might soon become obsolete," says Paul Jones, director of CIS. "The long-term plans of each division are consolidated into company-wide information systems planning."

Energy Resources is one part of the company that has benefited greatly from advances in computer technology. The CIS department's scientific and technical computing groups, based at the company's Brea, California research center, provide the computer resources for the numerically intensive data processing that helps the division improve exploration and production efficiency. Scientific Computing Services (SCS) at Brea is responsible for much of this work.

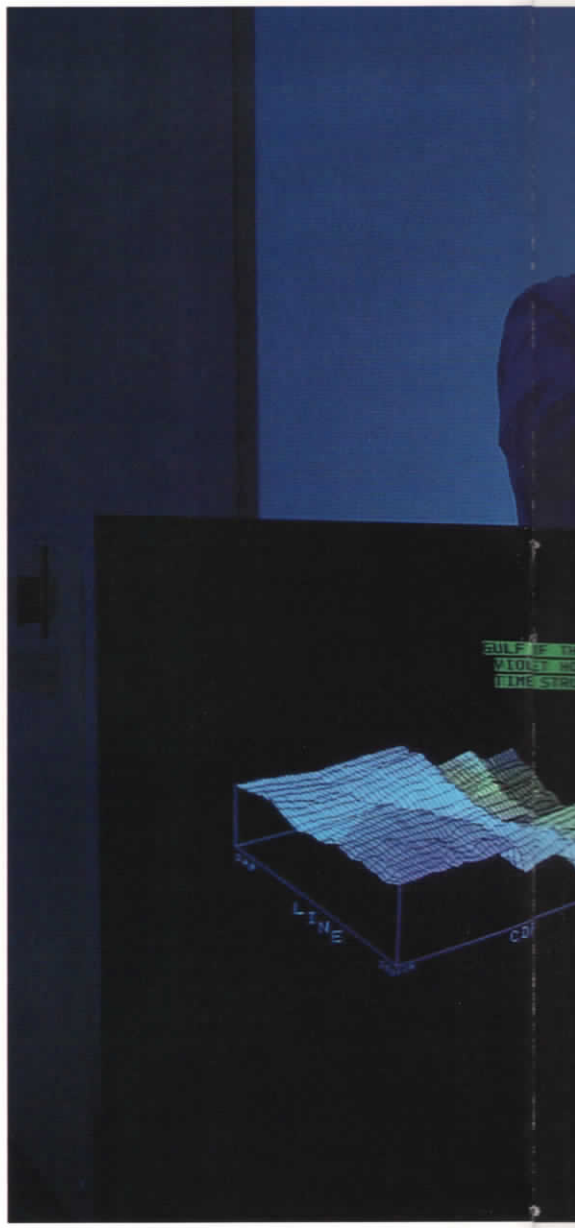
Increasingly sophisticated computer programs—some that compute for days at a time at almost one billion calculations per second—allow for more thorough interpretation of geophysical data, as well as more accurate and detailed reservoir mapping. As a result, potential oil-bearing formations can be spotted with more precision, and oil from proven reservoirs can be produced more efficiently.

The ability to transfer information quickly and accurately is as important as gathering the information itself. CIS oversees the various components that make up Unocal's telecommunications system. In 1976, the department designed and installed the company-owned-and-operated nationwide telecommunications network, including a microwave backbone. The system was established to provide a direct communications link for most of Unocal's domestic offices.

When an individual in one location calls someone in another office on the network, the system's computer routes the call by the least expensive circuit. If all microwave circuits are busy, a WATS (Wide Area Telephone Service) line or an outside phone company line is selected. Leased, high-speed telephone lines are used to transmit computer data as well as voice communications. SCS, for example, can send very large amounts of data directly to computers at other Unocal offices, or even to portable terminals in the field.

"Before the microwave network was put in place, communication and information exchange between company offices were slower and more difficult," says Gordon Dolfie, former director of CIS. "Phone company services could not even reach some of the company's locations. Microwave technology was a cost-effective way to bridge the communication gaps."

Advances in technology have



Right, Corporate Information Services' main computer room is the nerve center for data processing operations at Unocal Center.

made the computer the primary tool for information management.

Above and left, newer and more powerful computer programs help Unocal scientists evaluate potential hydrocarbon reservoirs with improved precision.

"Networking technology is revolutionizing the business environment..."

Thousands of computer tapes store information for data processing applications run each day at Unocal Center.

As Unocal's operations and business activities become increasingly global, international communications take on added importance. Computer systems provide one way for overseas offices to surmount the difficulties posed by distance and varying time zones. Connected by international telephone circuits, foreign office computer terminals can exchange messages and information electronically at any time of the day or night. Even lengthy computer files can be sent directly between distant locations.

The network that supports the international electronic mail functions was installed in 1980. Since then, more sophisticated alternatives to Unocal's communications system have been developed. CIS is currently in the process of converting the network to the newest microcomputer technology.

Even in this age of lap-top terminals, mainframe computers are still relied upon to process extremely large amounts of information. CIS operates several data processing centers for this purpose, with the major ones located at S&T and Unocal Center. The Unocal Center facility enables the corporation to conduct its administrative work as efficiently and economically as possible.

Using the mainframe's stored information, CIS can produce thousands of checks, reports or other communications each month. Financial data pertinent to Unocal can be obtained and analyzed, aiding the company's economic forecasting and planning. CIS also assists corporate staff in responding to government requests for company financial data and other information.

Unocal's data processing activities tie in closely with systems development. CIS designs and customizes many of the programs run by the data center and other company computer systems. In a typical scenario, a department or division will approach CIS with an idea for handling a particular task by computer. CIS evaluates the economics and technology the proposal would involve. If computers can improve the efficiency of a job and reduce operating costs, CIS designs and develops a specific system for the task.

"CIS tries to become involved in the early stages of the planning process," says John Evarts, manager of planning and administration for the department. "Then we give feedback about available technology and how it might fit into a department or division's activities."

CIS develops systems primarily for the Corporate departments, and does some work for the Chemicals and Real Estate Divisions. Energy Resources and Refining & Marketing maintain their own systems development groups.

"Separating responsibility for systems development gives these operating groups the flexibility they require," says Dolfie. "In these cases, CIS plays an advisory role to help ensure that the best and most appropriate technology is obtained."

As better and more powerful computer equipment and software become available, the need to train company personnel increases. CIS coordinates a growing number of training sessions, both within the company and through outside programs that are selected to help keep employees abreast of the latest trends and technology.

In the near future, new technology will bring even more information managing capability to the desktop. Personal computers will handle a growing number of tasks, and the role of CIS will be to integrate these work stations into networks. Local area networks (LANS) already link several Unocal departments, and wide area networks (WANS) connect groups in different cities.

"Network technology is revolutionizing the business environment by providing faster and more economic methods for managing information," says Paul Jones. "Over the next several years, CIS plans to complete a WAN/LAN-based information system to link all of the company's segments. This is a necessary step to ensure that Unocal's information resources and management remain as effective as possible."

Sophisticated computer systems streamline operations at Unocal's Los Angeles refinery.

In the Telecommunications room at Unocal Center, computer-routed calls are transmitted over high-speed telephone lines, which send data as well as voice communications.

REAL ESTATE: an important asset

In the late 1800s, when Union Oil was founded, oil-hunting technology was still in its infancy. Competition was fierce, and oil companies—particularly those in the wide-open west—focused on land acquisition as the key to growth and success.

No one better exemplified this philosophy than Union Oil co-founder Lyman Stewart. Stewart fervently believed that the company's long-term survival depended on the acquisition of potential oil lands. He bought properties at a feverish pace, and by 1909, Union held title to over a quarter million acres in California alone.

The land acquisitions steadily strengthened the company's reserve base, as more and more oil discoveries were made on the properties. And because land values rose substantially over the years, Stewart's aggressive philosophy gave the company an additional asset—the land itself.

By the 1950s, many Union properties were worth far more than the value of the resources they held. The growing potential of the company's holdings demanded an organized and concerted approach to corporate land management. As properties were more thoroughly and systematically evaluated, their underlying profit potential was tapped. Some depleted oil fields and other surplus properties were sold. Union also began to develop housing and commercial real estate projects on company-owned lands.

To consolidate and organize these efforts, Union formed a Real Estate Division as a profit center in 1973. The division holds or sells much of the company's non-operating or surplus lands, provides real estate services in support of the other operating divisions, and conducts the financial planning necessary to ensure that land assets are used to their utmost potential.

"The Real Estate Division has one overall goal: the best, most profitable utilization of Unocal's real estate assets," says John Murphy, the division's vice president. "Toward that end, we've established protocols for looking at our properties and determining how they can best serve the company. This could entail selling or leasing a property, developing it, or simply putting it to a better use."

Existing company operations require a significant part of the Real Estate Division's attention. The Property Services department negotiates leases, rights of way, water rights and other property transactions with private parties and government agencies for Unocal's operating divisions.

"Rights of way, leases and other privileges are needed before we can install a facility such as a pipeline or a communications transmitter on someone else's land," explains Bill Cotrel, manager of Property Services. "The same holds true for someone who wishes to place a facility on our land, or obtain farming or grazing rights from us."

Pipelines generate the bulk of the Property Services department's work. Unocal holds 52 pipeline franchises granted by 42 cities and 10 counties in California alone. Transporting oil, gas, water and petroleum products, these pipelines total more than 1,500 miles throughout the state.

"Any pipeline or telecommunications project—whether in a rural area or an urban metropolis—presents unique challenges because it crosses many different properties and jurisdictions," says Cotrel. "Our role is to navigate the myriad of government regulations, and to reconcile the diverse interests of property owners."

Real Estate also has a key role in helping negotiate leases for company facilities and office space. "A well-negotiated office lease can save a lot of money in the long run," says Ross Caulum, manager of the Planning, Administration and Leasing department. "The Real Estate Division's expertise in this area can considerably lower the company's operating expenses." Unocal negotiates lease agreements from the property-owner side as well. Leases are granted to others for use of Unocal's lands, buildings and surplus water rights.

In the past two decades, much of the Real Estate Division's revenue has been generated by Unocal Land and Development Company (ULDC), a wholly owned subsidiary that the company formed in 1971.

ULDC develops and sells residential, commercial and industrial real estate. Over the years, it has developed and marketed more than 2,400 company-owned acres. Recent California projects have included residential housing developments in Brea, Aliso Hills, Chino Hills, San Juan Capistrano and Walnut Creek, and over 400 acres of business parks in Brea and the Simi Valley. Last year, ULDC completed an 11-year program at Lake Arrowhead, where the company subdivided and sold 131 residential lots for a total of $21.7 million.

Turn-of-the-century California land acquisitions (left and facing page) gave the company oil reserves and another valuable asset—the land itself. Top, this 200-acre business park in Simi Valley north of Los Angeles is one of several development projects undertaken by Unocal's Real Estate Division. The division also manages the rights of way for most of the company's pipelines.

Top, a Unocal residential development in Brea, California, where the company has extensive land holdings. Above, another project was completed at this Lake Arrowhead site last year. Right, Unocal's downtown Los Angeles headquarters and the surrounding 12.6 acres were sold in 1988 for $205 million.

One of the biggest projects currently being undertaken by ULDC is the development of real estate holdings in Orange County. In Brea and Fullerton, 750 acres of properties will be developed into residential, commercial and office complexes, with construction scheduled to begin in Fullerton next year.

Nationwide, ULDC has a large and diverse land inventory, which enables the company to respond effectively to market fluctuations. If the residential market is down, for example, ULDC can concentrate on industrial or commercial developments.

"Sometimes it's a question of timing," says Bill Huston, ULDC's vice president. "Projects that aren't economically feasible now may be more attractive some years down the line. Our land inventory gives us the option of waiting."

This ability to wait has come into play more than once in ULDC's plan to develop the company's extensive real estate holdings in Schaumburg, Illinois. Unocal first acquired the 237-acre property in the 1965 merger with The Pure Oil Company. Part of it was developed through a joint venture in the early 1970s. Three high rise office buildings, a 478-room Hyatt Regency Hotel and a 10,000-square-foot restaurant were constructed. The next phase of the project stalled when the joint venture terminated.

"The market in Schaumburg is cyclical," says Huston. "Over the last few years, development needs changed. We altered our plan to accommodate the changes, and managed to get the property rezoned with new density requirements." Unocal has received approval for a new master plan for the remaining 160 acres, providing for office space, a regional shopping mall and a convention center. The property has been offered for sale.

Though many communities welcome new development projects, some are beginning to adopt restrictive policies to limit growth. The Real Estate Division's government relations group works in conjunction with the corporate Government Relations department to find solutions in these sometimes delicate areas. The task involves everything from interpreting land-use regulations and assisting in permitting requirements to dealing with local planning boards and state government agencies.

When corporate needs and priorities change, some Unocal properties can become surplus or under-utilized. Real Estate's Investment Properties department carefully evaluates the market value and development potential of these assets, which range from former service station sites and terminals to depleted oil fields and agricultural lands. When it becomes evident that a property has no development potential for Unocal, the department wastes no time in putting it on the market.

The Real Estate Division also coordinated the 1988 sale of the company's 12.6-acre downtown Los Angeles headquarters property for $205 million. A three-year lease-back agreement of the headquarters complex was negotiated, with two one-year options. Unocal plans to lease new office space in downtown Los Angeles, and Real Estate is currently evaluating possible new locations.

In 1989, the division handled two other large real estate sales. A 45-acre portion of the company's tank farm property in Torrance, California brought $44 million, and its 2,600-acre Bonita Ranch property, south of San Diego, was sold for $13 million. Both parcels were targeted for sale after evaluation under the company's "best use" strategy.

Before any property is sold, bought or developed, its environmental condition must be assessed. Site evaluation can range from a simple review of proposed uses of a property to a complex process of mapping, drilling and sampling. If contamination problems are detected, remediation plans are formulated and carried out. The aim is to ensure protection of the environment, compliance with regulations, and to minimize economic risk.

In the years ahead, environmental concerns, water supply and transportation problems will be crucial real estate issues, according to Richard K. Jemison, president of the Real Estate Division. The trend will be toward increased regulation of development and restrictions on growth.

"As the regulatory trend affects a growing segment of the real estate market, the problems faced by both urban and rural communities will also grow," Jemison emphasizes. "The Real Estate Division will meet this challenge through continued careful management of company properties, and by planning projects that offer solutions."

Above, two views of the 478-room Hyatt Hotel constructed on Unocal's Schaumburg, Illinois property. A combination of careful land management, development projects and strategic asset sales enables the company to put its properties to their best, most profitable use.

FROM BLUEPRINT TO COMPLETION

This fall, the Unicracker complex at the Los Angeles refinery will undergo a major overhaul. Appropriately, the job will be managed by the Corporate Engineering & Construction department, which built the Unicracker—the company's first—more than 25 years ago.

In fact, Engineering & Construction (E&C) has managed most of Unocal's major refinery construction projects since the company began to expand after World War II. More recently, E&C has also managed major projects for Chemicals, Geothermal, Molycorp and Energy Mining.

A major project, explains John Dietzman, director of Engineering & Construction, typically costs more than $20 million, and is usually designed and built by a large national or international engineering and construction firm.

"Our primary function is to manage the design and construction work on these projects, with the objective of completing them on schedule and within budget," says Dietzman. "In addition, we must ensure that the facilities we build are safe, reliable, environmentally sound, and able to be maintained and operated to meet all project objectives."

The E&C department has a staff of 31 working under Dietzman, who was manager of the San Francisco refinery before coming to E&C in July of this year to replace Darcel Hulse, now president of the Geothermal Division. Six of these staffers are project managers who oversee the jobs E&C undertakes.

"All of our project managers have demonstrated top-notch ability as engineers," says Robert O'Berg, E&C's manager of project engineering. "As a prerequisite to becoming a project manager, each has gained broad experience working in an engineering capacity on a variety of assignments."

Right, a worker takes a temperature reading from one of the Unicracker towers at the Los Angeles refinery.

The E&C department is geared to work closely with Unocal's operating divisions. After an operating division—Refining & Marketing or Chemicals, for example—has received Executive Committee approval for a major construction project, a project manager is assigned to the job. The E&C team for each project also typically includes process and project engineers, a group of technical specialists made up of electrical, mechanical and metallurgical engineers, and a group which supervises the field construction activities.

Assisted by this team, the project manager oversees every aspect of design and construction, staying with the job through its completion and turnover to the operating division. During the entire project, E&C works closely with the operating division to ensure that the facilities will meet the requirements, standards and objectives of the group that will start up, operate and maintain them.

Even before a project is approved, Engineering & Construction often has a hand in its development. "Our participation in the shaping of major construction proposals varies from project to project," Dietzman says. "Frequently we get involved in feasibility studies, cost studies, and working out the logistics of a proposed job."

The Engineering & Construction department got its start in the 1940s with a single project engineer, Robert Bungay. A California Institute of Technology graduate with a degree in mechanical engineering, Bungay had spent several years in the 1930s with Standard Oil of California. After working in the Middle East and then serving in Asia with the U.S. Army Corps of Engineers during World War II, Bungay was hired by Union Oil in 1946. The company assigned him to Refining & Marketing, where he was soon put in charge of the division's construction projects.

Bungay's skills as an engineer and manager were quickly put to the test. With the nation entering an era of peacetime growth and prosperity, Chairman and Chief Executive Officer Reese Taylor embarked on an ambitious program to upgrade the company's manufacturing facilities. There were often five or six major projects underway at once.

In the beginning, Bungay contracted most engineering work to outside companies, but he soon built up a staff of engineers and technical specialists. By the early 1950s, Engineering & Construction had become a corporate department in its own right, with Bungay serving as director.

Among the major projects Bungay and his group took on were a new catalytic cracking plant at the Los Angeles refinery, completed in 1952, and a new refinery with twin coking units at Santa Maria, California, which came on stream in 1955. In 1962, E&C helped build a natural gas pipeline from the gas fields on Alaska's Kenai peninsula to the city of Anchorage. The line had to traverse miles of rugged terrain, as well as the turbulent Turnagain Sound, and the project was widely regarded as one of the most difficult pipeline-laying jobs ever undertaken. Two years later, E&C completed the Unicracker at the Los Angeles refinery.

Far bigger projects were in store. In 1965, Union's merger with The Pure Oil Company of Illinois added an extensive network of refineries, terminals and retail outlets to the company's infrastructure. Bungay was appointed to a task force charged with assessing the state of Pure's manufacturing facilities.

"We spent two or three weeks looking at what they had," he recalled, "and we realized their facilities—particularly the midwest refineries—were becoming rundown and obsolete." Rather than upgrade the plants, Union's board of directors decided to construct a new, 140,000 barrel-a-day refinery on the site of Pure's Lemont, Illinois facility near Chicago.

Above, coking units at the Santa Maria refinery. Environmental compliance work at Unocal's refineries will be a major area of concentration for Engineering & Construction in the years ahead.

Building a refinery of that scale from scratch would cost $220 million, the largest single expenditure in Union's history up to the time. The project took three years from ground breaking to start-up in 1970. Today, the Chicago refinery (now owned and operated by The UNO-VEN Company) remains a state-of-the-art facility.

In 1976, E&C managed the fabrication of modules to double the size of the company's fertilizer plant at Kenai. The modules, some weighing as much as 540 tons, were shipped by barge from Anacortes, Washington to Alaska and assembled at the plant site. Pushed up by inflation, the $235-million cost of the plant expansion was greater than that of the Chicago refinery. Meanwhile, Bungay had retired in 1973 and was replaced by George Snyder, who had been vice president of the company's Korean joint venture, Kyung In Energy Company, Ltd.

The early 1980s were busy years for E&C, and the department demonstrated its versatility. As the activities and scope of Union Oil expanded, the projects became more varied. Among the jobs completed in the early part of the decade were an expansion of the molybdenum mine and mill at Questa, New Mexico for the company's Molycorp, Inc. subsidiary, and construction of two demonstration plants for the Geothermal Division in California's Imperial Valley.

Following George Snyder's retirement in 1984, Jack Heller took over as head of the E&C department. Upon Heller's untimely death later that year, Darcel Hulse became the department's director, and later vice president.

E&C oversaw the recently completed renovation of Unocal's Santa Paula, California birthplace (top left).

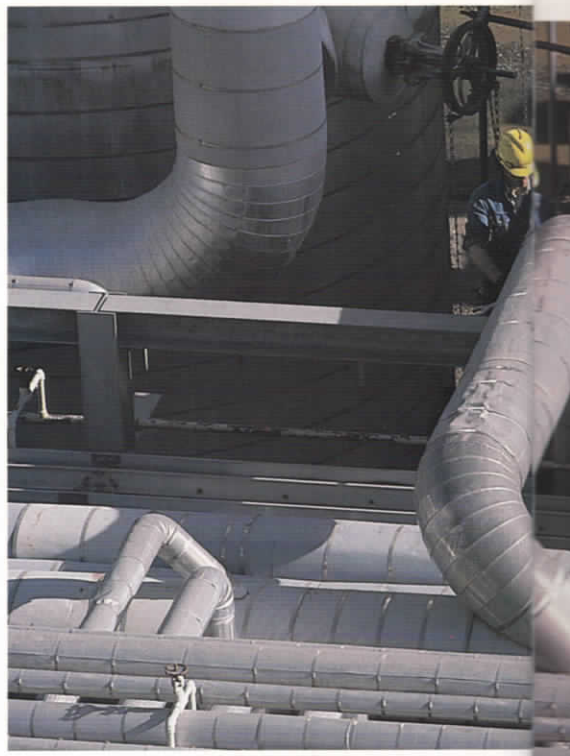
That same year, a major tragedy struck Union Oil. A high-pressure tower at the Chicago refinery ruptured, resulting in a series of explosions and a fire that killed 17 and destroyed a large part of the facility. E&C was called in to rebuild the refinery they had constructed fifteen years earlier.

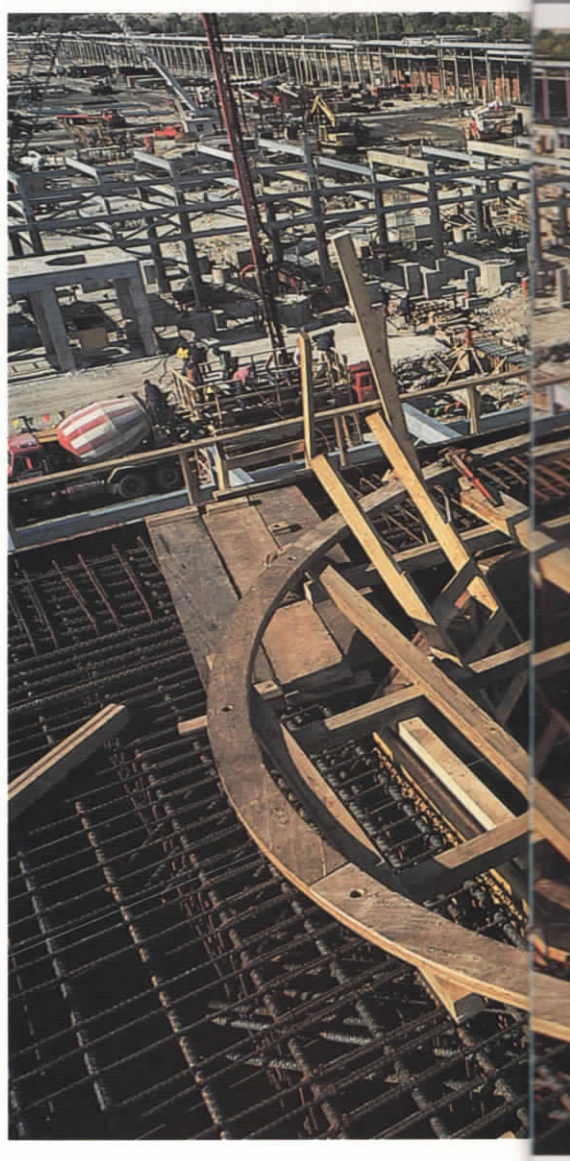
"It took a massive effort to get that facility back in operation," recalled Hulse. Yet in less than a month, everything was running again except the alkylation unit and a damaged fluid catalytic cracker. The cracker was back in action within nine months, and the alkylation unit, which had been the location of the original explosion, was replaced and put into operation in October 1985.

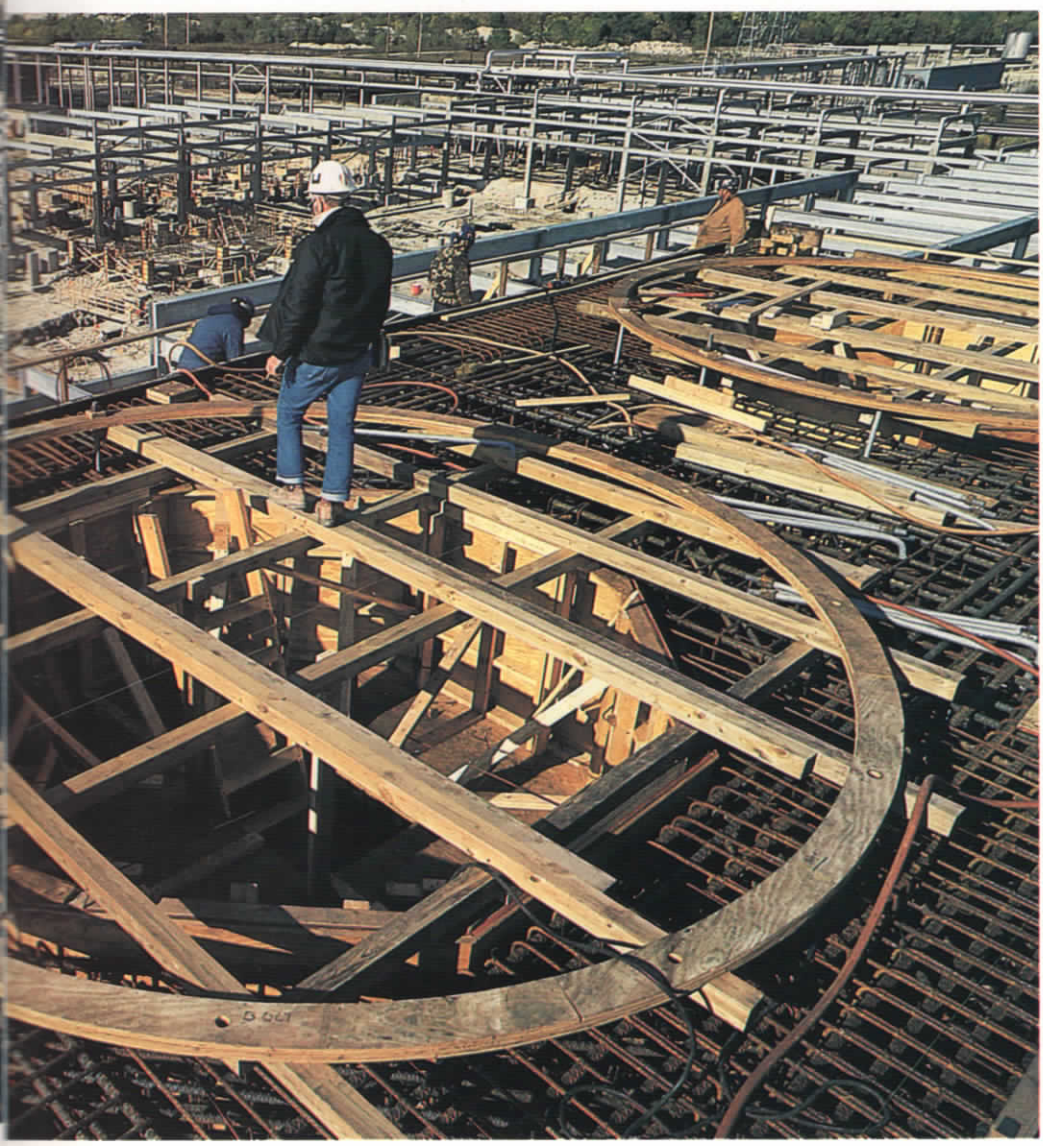
Another project at the Chicago refinery—design and construction of a needle coker—served as a textbook example of cooperation between Union's operating divisions. The Chemicals Division conceived the idea of producing and marketing a premium quality needle coke for use by manufacturers of graphite electrodes. Science & Technology developed the production process, and E&C took responsibility for designing and building the coker itself. On the drawing board in 1981, the unit was completed in 1985.

Perhaps the most difficult project E&C took on during the '80s was the design and construction of the retorting complex at the company's Colorado oil shale project. The construction site was a five-acre "bench" carved out of the side of the mountain at the entrance to the underground shale mine. In winter, when the bench was subjected to high winds and bitter cold, parts of the site had to be covered by tents and heated to allow the construction work to proceed. The location's inaccessibility also made use of some heavy equipment impossible.

"The shale retort was an extremely challenging project in all respects," says O'Berg. "This was pioneering technology, and schedules had to be revised constantly to accommodate design changes." Although further modifications would be required, major construction work on the facility was completed in August 1983, just three years after the project began.







Other significant projects managed by E&C over the years have included construction of a power plant and refinery for Kyung In Energy Company in South Korea, expansion of the Fred L. Hartley Research Center in Brea, and construction of the San Francisco refinery's Unicracker-Reformer complex.

Presently, E&C is building a new polymers plant in Kankakee, Illinois, for the Chemicals Division. Scheduled for completion in 1991, the plant will replace the company's Bridgeview facility, which was destroyed by an explosion and fire in 1988. In one of its smaller-scale projects, the department recently completed restoration of the 100-year-old office building in Santa Paula, California where Union Oil Company was founded. The building now houses a newly expanded and refurbished Unocal Oil Museum.

As Unocal enters the 1990s, E&C has a number of construction projects underway or in the wings. "Much of our work today is environmentally related," says Dietzman. "At the L.A. refinery, for example, we're currently upgrading systems to reduce nitrogen oxide emissions in compliance with new environmental regulations. At Santa Maria, we are modernizing the refinery to improve environmental performance."

Reflecting a heightened focus on environmental concerns, the department added a new group in 1990 to specialize in soil remediation. The group is responsible for site assessment and remediation work on Unocal Real Estate Division properties that have or may have soil contamination problems.

The small, domestic oil company that Robert Bungay joined in 1946 bears little resemblance to the global earth resources company that Unocal is today. But the Engineering & Construction department that Bungay helped start has played a vital role in the company's evolution—and will continue to do so in the years ahead. ⑦⑥

Unocal's Kenai, Alaska fertilizer plant (top) and Chicago refinery (bottom), both shown under construction here, were two of E&C's largest projects. The refinery is now owned and operated by The UNO-VEN Company.

BEHIND THE SCENES

The morning of April 26 was a busy one for Unocal's Corporate Communications department. At 10 a.m., Chairman, President and Chief Executive Officer Richard J. Stegemeier was schedhuled to preside over a press conference announcing three important new environmental initiatives: the South Coast Recycled Auto Program (SCRAP), 76 Protech Patrol and Smog-Fighter. The programs were developed by Unocal as innovative, cost-effective efforts to help reduce air pollution in the Los Angeles Basin by targeting its primary source: vehicle emissions.

The press conference had been meticulously planned. Press kits containing photos and background information on the programs were mailed out with the media invitations. Visual aids and other props were put together to enhance the presentation. Since the electronic news media tend to focus more attention on stories with high visual content, the event's location was chosen with particular care.

To underscore the problem of vehicle emissions and provide good visuals for television crews, it was decided to hold the event on the cafeteria roof at Unocal Center. The roof overlooks the busy Harbor Freeway and downtown skyline—most mornings, like this one, enveloped in a brown haze of smog.

A work crew had spent several hours preparing the displays, setting out chairs, hooking up sound and electrical equipment, and building a platform for television camera crews. But at 9 a.m., just one hour before the event, a potentially serious problem suddenly became evident. Because of high television interest, the media turnout was going to greatly exceed expectations. There were fears that the weight of people and equipment might overly stress the roof.

No one wanted the visiting press to wind up in the cafeteria salad bar, remote as that possibility might be. Fast action was called for—the event would have to be moved. And so it was that anyone glancing out of an east-facing window of Unocal Center at 9:15 saw maintenance workers, technicians and Corporate Communications staffers lined up in bucket brigade formation, hurriedly passing chairs, risers and equipment from the roof to the nearby patio.

"Despite the urgency of the situation, the press conference went on as scheduled," says Karen Sikkema, vice president, Corporate Communications. "We generated a lot of excitement for Unocal's environmental initiatives, and received worldwide exposure. We also learned once again the importance of being prepared to deal quickly with the unexpected."

To be sure, careful planning and the ability to react quickly are key to the success of the Corporate Communications department in its daily operations. The department is responsible for a large measure of the company's interaction with employees, government bodies, investors and the general public—both directly and through the media. Much of what these audiences see and know of Unocal's wide-ranging activities—everything from petroleum exploration and marketing to environmental programs and charitable endeavors—is learned of through the efforts of Corporate Communications.

"Our communications efforts are diverse," Sikkema says, "but they share a common purpose: to show that Unocal is a productive, well-managed corporation; that we are an excellent company to invest in and work for, and that we care about the communities where we do business."

Left: Richard J. Stegemeier addresses the media at the April 26 press conference announcing Unocal's environmental initiatives. Far right, Stegemeier is interviewed by a TV crew reporting on the SCRAP program.

Hugo Neu-Proler Metal Recyclers

To accomplish these objectives, each communication must be tailored to an appropriate audience and medium. Unocal reaches the general public via newspapers, radio and TV; and communicates with employees through the monthly Chairman's Letter and quarterly magazine, *Seventy Six*. The business and investment communities are targeted through business publications, speeches and direct meetings with senior executives. Those in government are contacted through lobbying efforts.

The department's Government Relations group, headed by Jack Rafuse, government relations manager, coordinates the formulation of company positions on state and federal issues that affect Unocal. The staff includes three managers who report to Rafuse, a full-time lobbyist assigned to the California state legislature, and four legislative analysts. Contract and trade association lobbyists are also employed. (Unocal's federal lobbying effort is conducted by a separate Washington, D.C. office under Vice President Tom Hairston.)

Government Relations also has a grassroots advocacy manager who administrates the company's Key Contact program. Under this program, Unocal managers are enlisted to keep congressmen from their home districts informed on matters of interest to the company, its employees and customers.

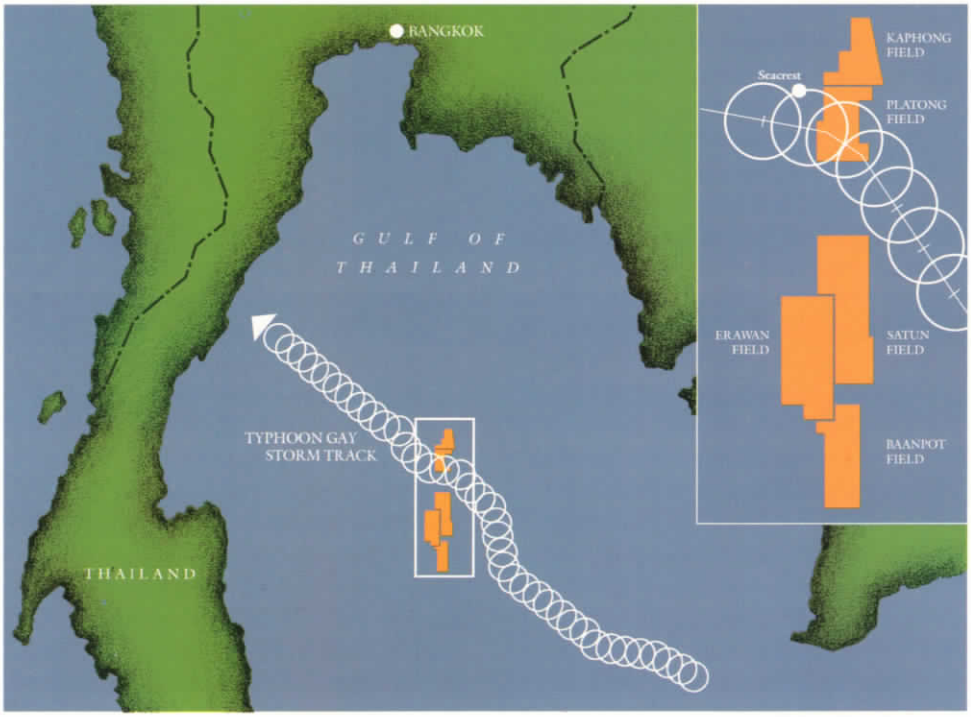
"The overall goal of our efforts is to help ensure that legislation affecting Unocal is as fair and as beneficial to the company as possible," Rafuse says. (For a detailed account of Unocal's government relations activities, see the Summer 1989 issue of *Seventy Six*.)

The department's Public Relations group focuses primarily on publicizing the company's noteworthy activities. These can range from environmental initiatives like SCRAP to a major new oil or gas discovery. The PR group also responds to inquiries from the public and news media, provides communications assistance to the operating divisions, and jointly oversees corporate projects and events such as the annual shareholders' meeting.

To be effective, the subject and presentation of each communication must be well thought-out. In publicizing Unocal's environmental initiatives, for example, care was taken to provide dramatic visuals for television crews. A press conference for SCRAP was held at the scrap yard where old cars purchased under the program were being crushed. When 76 Protech Patrol was launched, the fleet of vans was assembled in front of Unocal Center. Reporters and TV crews were able to accompany the patrollers as they hit the L.A. freeways to dispense aid to stranded motorists.

Each of the department's public relations representatives is assigned a "beat" of one or more Unocal operating divisions. They are responsible for keeping abreast of those divisions' activities, and must serve as troubleshooters when problems or events occur that draw public attention. By providing frontline support to managers at such times, the department

Dramatic visuals helped enhance media coverage of Unocal's environmental initiatives. Above left, a pre-1971 car purchased for SCRAP is crushed. Below, one of the 76 Protech Patrol vehicles that provide aid to stranded motorists in several California cities.



When the Unocal drillship Seacrest *was lost in a typhoon last fall, Corporate Communications implemented a comprehensive program to keep the public informed of developments. Above, John Imle (right) conducts a press conference in Bangkok.*

helps them to communicate effectively in the heat of the moment.

"Good preparation is the key," Sikkema says. "Our department has to be very pro-active, and constantly tuned in to what's going on company-wide. We have to ensure that every communication Unocal makes is correct and consistent." This is particularly important in a time of crisis, when facts can be overlooked or misinterpreted by the media in the rush to report a breaking news event.

"Crisis communications is one of the most critical aspects of public relations," Sikkema says. "If a crisis occurs involving Unocal, we have to make sure the public is informed promptly about what happened—and the response should come from the highest corporate levels. If the public doesn't get the facts from us, they may not get them right."

Staying on top of a crisis as it unfolds requires maximum effort. When the drillship *Seacrest* was lost in a sudden Gulf of Thailand typhoon on November 3, 1989 with 97 people aboard, the story quickly became world news. In Los Angeles, word of the tragedy came at the end of the work day. Corporate Communications immediately implemented a comprehensive program to explain the facts of the situation, and to inform the public of the latest developments as search and rescue efforts continued.

A televised press conference with Stegemeier was held just three hours after the news of the accident became known. A written press release—the first of many—was issued concurrently. John Imle, senior vice president, Energy Resources, immediately flew to Thailand to be personally on the scene, and a round-the-clock situation room was set up in Bangkok.

Through careful coordination of efforts in Bangkok and Los Angeles, PR staffers were available to answer media inquiries 24-hours-a-day for the first four days after the tragedy. Hundreds of calls were handled from Europe, Asia and North America, including several radio and TV interviews.

"The *Seacrest* tragedy was deeply felt by everyone at Unocal," Sikkema says. "But despite the emotionally difficult circumstances, the facts of the situation had to be made available quickly and continuously. Our department's responsibility was to make sure that accurate, up-to-the-minute information was provided to families of the victims, to employees and the public."

Sometimes a crisis external to the company can require a communications response. When the Iraqi army invaded Kuwait in August, Unocal was flooded with media calls for an "oil company reaction" to the situation. Reporters wanted the company's explanations for everything from gasoline pricing to government energy policy.

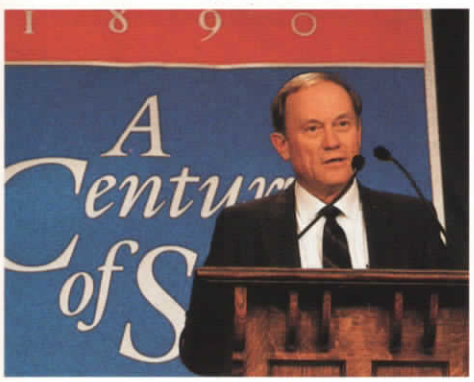
"We had to gear up immediately to track both crude oil and gasoline prices, and explain the relationship between them to reporters who knew little or nothing about the oil industry," says Barry Lane, public relations manager.

Executive communications is another area of responsibility for the Corporate Communications group. This includes speech writing for senior executives, producing the monthly Chairman's Letter for employees, and production of annual reports for Unocal and Unocal Exploration Corporation (UXC).

"Our annual reports are the most important documents we produce," says Mike Thacher, manager of public relations and communications. "Through them, we communicate with our shareholders, with potential investors, and with all of our major audiences. The reports must not only be informative, they've got to be accurate, clearly written, and illustrated in a way that shows Unocal to be the strong, productive and innovative company that it is."

Speeches and public appearances are another way Unocal communicates. "Mr. Stegemeier meets regularly with shareholders, financial analysts and the media to discuss the company's goals and objectives," says Thacher. "He and other senior executives also accept invitations to speak before a variety of employee and external groups."

Corporate Communications staff writers handle speech writing, annual reports and special assignments for the



Top, a sampling of publications produced by the Corporate Communications Department. Above, Richard J. Stegemeier speaks at the Unocal Oil Museum dedication in Santa Paula last spring. Right, a visitor views one of the museum's exhibits. Below, a ribbon-cutting ceremony in front of the building.

department. In researching and writing speeches for the company's top executives, the writers' objective is not to speak for them, but to articulate their positions on various issues with clarity and consistency. "A good speech writer tailors a speech, in both style and content, to fit the speaker as well as the audience," Thacher says. "The executive can then work the text into final form before delivering the speech."

Two publications produced by Corporate Communications are directed primarily to employees. One is the monthly Chairman's Letter, which provides a medium for Stegemeier to discuss developments within Unocal, as well as important issues and events affecting the company, on a timely and regular basis. In addition to Unocal employees, the letter is sent to shareholders by request and to selected individuals in the financial community. (Total circulation is over 43,000.) Readers occasionally write to Stegemeier to express their own opinions or offer suggestions, and he responds personally to every letter.

The department also publishes Unocal's corporate magazine, *Seventy Six*. The magazine, which dates back to 1921, has a circulation of about 40,000. It is distributed quarterly to Unocal employees and retirees, to shareholders by request, and to a limited outside audience.

The magazine's primary purpose is to inform and educate its readers about the company's operations, activities, people and business objectives. Article subjects are chosen to showcase Unocal's diversity, and to give readers an understanding of how the pieces fit together. Three of the past four years, *Seventy Six* has been awarded top honors as "best corporate magazine" by the Western Publications Association.

Corporate Communications is also involved in planning and implementing a variety of special projects and activities for the company. The department staffs and operates the recently renovated and expanded Unocal Oil Museum in Santa Paula. Free to the public, the museum receives an average of 500 visitors each week, and is featured in the October issue of *Sunset* magazine. Unocal's annual shareholders' meeting, a responsibility Corporate Communications shares with the Corporate Sec-

retary's department, has evolved into a major production that includes everything from video presentations to hands-on exhibits and displays.

Special corporate events are another area of major activity. Unocal's efforts on behalf of the Los Angeles-area United Way campaign underscore the importance of community involvement to the company and its chief executive. Stegemeier felt the campaign kickoff event, which Unocal hosted for the first time in the fall of 1989, should have a celebratory feel to transcend the "business as usual" approach that sometimes characterizes the participation of corporations in charitable endeavors.

To make Unocal's effort stand out, the department staged the 1989–90 event as a street fair, complete with food, entertainment, games and attractions that included a CEO dunk tank. "We had a great turnout, and helped establish a new and more vibrant style for the United Way campaign kickoff," Sikkema says.

This year has been an especially busy one for Corporate Communications, which has undertaken several projects related to the company's centennial. "The centennial is a once-in-a-lifetime event that provides us with a unique opportunity," Sikkema says. "It's a chance to look back on a proud past, and look forward to an exciting second century."

As part of the company's centennial observance, the department coordinated a major restoration of the Santa Paula building where Unocal was founded (which also houses the Oil Museum). An expanded shareholders' meeting — complete with special historical exhibits and a gala banquet — was staged in April. Throughout the summer and fall, a series of celebratory events is being held for employees. Two extra issues of *Seventy Six* and a brand new, updated version of the corporate history book are being produced. The department has also overseen the design and production of a special centennial gift for Unocal employees and retirees.

Planning for many of these undertakings began as early as 1987. The history book, *Unocal 1890–1990: A Century of Spirit,* has been the full-time responsibility of Senior Writer Barbara Pederson for more than two years. A copy of the new book will be mailed to every Unocal employee and retiree in November.

"Things should be a little less hectic once the centennial is over," Sikkema says. "But the pace of our activities will remain high in the years ahead. Unocal is an aggressive, dynamic company in an industry that is always at the center of public attention. Communicating effectively, both internally and externally, will continue to play an important role in the company's success."

A gala banquet at Unocal's 1990 shareholders' meeting featured presentation of a huge centennial birthday cake. Bottom, attendees view historical exhibits at the event, held at the Pasadena Civic Center. "The centennial is a once-in-a-lifetime event that provides us with a unique opportunity," says Karen Sikkema. "It's a chance to look back on a proud past, and look forward to an exciting second century."

SERVICE AWARDS

UNOCAL 76

CORPORATE

40 YEARS **Robert O. Hedley,** Unocal Center

35 YEARS **John M. Abel,** Unocal Center
Samuel A. Snyder, Unocal Center

15 YEARS **Walter Albertson,** Brea, Ca.
Christine C. Geller, Unocal Center
Gary Najdowski, Schaumburg, Il.
Michael W. Roach, Unocal Center
Karen A. Sikkema, Unocal Center
Jacquelyn I. Woodhouse, Los Angeles, Ca.

10 YEARS **Richard W. Brown,** Bremer, Ca.
Wayne W. Chen, Unocal Center
Gary E. Davie, Unocal Center
James B. Fallon, Unocal Center
Lilia Fausto, Unocal Center
Raymond H. Groth, Unocal Center
Gilbert Karsenty, Unocal Center
Linda J. Kory, Unocal Center
Aida L. Ngan, Unocal Center
Norman S. E. Richardson, Unocal Center
Christopher A. Robinson, Unocal Center
Bettye J. Thorpe, Rodeo, Ca.

ENERGY MINING

35 YEARS **Dale C. Mooney,** Parachute, Co.

25 YEARS **Allen C. Randle,** Parachute, Co.

10 YEARS **David L. Bell, Sr.,** Parachute, Co.
Darlene M. DePinho, Parachute, Co.
David M. Gilchrest, Parachute, Co.
Robert L. Mitten, Parachute, Co.
Dennis A. Murray, Parachute, Co.
Gregory S. Nisely, Parachute, Co.
Jeffrey H. Noland, Parachute, Co.
Robert E. Swenson, Parachute, Co.
Richard H. Weems, Parachute, Co.

SCIENCE & TECHNOLOGY

20 YEARS **David M. Breen,** Brea, Ca.
Antolin Garcia-Pizarro, Brea, Ca.
Otis Tolbert, Brea, Ca.

15 YEARS **Josefina M. Dumdum,** Brea, Ca.
Steven D. Light, Brea, Ca.
Steven D. Robertson, Brea, Ca.
David V. Wilson, Brea, Ca.
Charles F. Wong, Brea, Ca.

10 YEARS **Samuel R. Aragon,** Brea, Ca.
Pamela J. Bobo, Brea, Ca.
Teresa I. Carranza, Brea, Ca.
Hoai T. Dovan, Brea, Ca.
Michael G. Grecco, Brea, Ca.
Frank G. Martens, Brea, Ca.
William A. Minner, Brea, Ca.
Martha A. Nickus, Brea, Ca.
Roberto Ortiz, Brea, Ca.
Rajanikant H. Patel, Brea, Ca.
Stephen A. Soeller, Brea, Ca.
Robert E. Sweeney, Brea, Ca.
Alan H. Thompson, Brea, Ca.
Jon C. Wood, Brea, Ca.

ENERGY RESOURCES

NORTH AMERICAN OIL & GAS

35 YEARS **John F. Hansen,** Midland, Tx.
Doris A. Hebert, Kaplan, La.
Thomas R. Miller, Midland, Tx.
Joe E. Vaughn, Midland, Tx.

30 YEARS **David L. Burkett,** Midland, Tx.
HD Maxwell, Jr., Los Angeles, Ca.
Billie J. Morris, Coalinga, Ca.

25 YEARS **Betty A. Bean,** Bakersfield, Ca.
Donald H. Davis, Brea, Ca.
Robert J. Marron, Los Angeles, Ca.
Billie L. McFarland, Los Angeles, Ca.
John A. Moody, Orcutt, Ca.
Roland A. Naquin, Houma, La.

20 YEARS **Chester Boutte, Jr.,** Dulac, La.
Richard M. Brunner, Worland, Wy.
Margaret E. Dill, Casper, Wy.
Cheryl J. Goin, Midland, Tx.
Fronzell Myers, Van, Tx.
Luther E. Randolph, Lovelady, Tx.
Donald J. Suhoza, Carpenteria, Ca.
Ruby J. Walker, Casper, Wy.

15 YEARS **Norman R. Ashbury,** Lafayette, La.
Paul J. Brisco, Amelia, La.
Thomas G. Browning, Houma, La.
Cecil R. Cooper, Houston, Tx.
Earl Coxen, Jr., Dulac, La.
M. Josette B. Hebert, Lafayette, La.
Neil B. Horn, Healdton, Ok.
Claude D. Kitchens, Andrews, Tx.
Gary F. Lecompte, Cocodrie, La.
William Love, Van, Tx.
John J. Matthews, Orcutt, Ca.
Garry L. Nolph, Grayling, Mi.
Michael D. Rairdan, Carpenteria, Ca.
Wilfred J. Scott, Kaplan, La.
Thomas H. Smith, Kenai, Ak.
Patricia A. Sonier, Houston, Tx.
Raul Tarango, Orcutt, Ca.

10 YEARS **George A. Alvary,** Orcutt, Ca.
Kevin B. Armstrong, Seminole, Tx.
Lawrence F. Bader, Orcutt, Ca.
Michael D. Buswell, Midland, Tx.
Jeffery L. Dronsky, Santa Paula, Ca.
Jimmy T. Fernandez-Lopez, Bakersfield, Ca.
Larry W. Garrard, Midland, Tx.
Jeffery E. Grant, Houston, Tx.
Laura L. Hammond, Kenai, Ak.
Jesse Hernandez, Jr., Houston, Tx.
William C. Hesse, Carpinteria, Ca.
Patricia A. Hiatt, Bakersfield, Ca.
Dennis E. Lehman, Orcutt, Ca.
Joseph L. Marquez, Orcutt, Ca.
Richard H. McKay, Oklahoma City, Ok.
Robert E. Miller, Midland, Tx.
Gwendolyn Mills, Pasadena, Ca.
Ronald J. Morris, Houston, Tx.
Billy G. Pearce, Madill, Ok.
Timothy R. Popp, Casper, Wy.
Randy W. Randolph, Ardmore, Ok.
Phillip L. Reed, Lafayette, La.
Marcus V. Roberson, Jal, N.M.
Jesus G. Salcido, Jr., Andrews, Tx.
Fred L. Simpson, Oklahoma City, Ok.

Unocal Canada, Ltd.

10 YEARS **K. M. Cormack,** Calgary, Alberta
J. A. Hauck, Calgary, Alberta
S. G. Leson, Calgary, Alberta
H. E. Rutz, Fort St. John, B.C.
R. J. Wynnyk, Slave Lake, Alberta

INTERNATIONAL OIL & GAS

35 YEARS **E. Dean B. Laudeman,** Los Angeles, Ca.

25 YEARS **Wade O. Lundstrom,** Indonesia

15 YEARS **Ron V. Christensen,** United Kingdom
Conrad J. Perry, Egypt
William P. Purcell, Indonesia

10 YEARS **Myra E. Cordova,** Los Angeles
Graham D. Dryden, Thailand
Michael W. Elwood, Los Angeles
Jose R. Espinoza, Jr., Los Angeles
Brantly S. Goodwin, Indonesia
Linda R. Grijalva, Los Angeles
Elsa B. Molinas, Los Angeles
Craig D. Stewart, Los Angeles
Ing-Jye Tsai, Thailand

Unocal Thailand, Ltd.

10 YEARS **Suthep Suwannapo**
Chalam Veeratamkul

SERVICE AWARDS

Unocal Indonesia, Ltd.

15 YEARS **Amirullah**
Nuriansjah
Suwarso
Tasripin
Herman S. Aguw
Joni Dama
Wahjudi Sutrisno Hadi
Andi Mappesabbi K.
Margono K.
Effendie Kabil
Sukarlan M.S.
Sasventarys Maha
Hendrik Matande
Atiek M. Nelwan
Asep Nugrahana
Martha Oroh
Marthen Mangalik Pabiang
S. Panna
Marthen Dapo Paramban
Frans J. Ratag
Daniel Bua Saleppang
Rachel Samel
Mangasi Tua Sinaga
Irvan Santosa Sukirno
Marthen Arie Wokas

10 YEARS **Rosehan Ismet**
Achmad Kayadi
Mardji Martokarijo
Titus Tiku Palabiran
Suyuti R.
Rampo Rapa
Bambang Soedibjo
Freddy Sumolang

Unocal U.K., Ltd.

10 YEARS **David Montgomery,** Aberdeen, Scotland

Unocal Singapore, Ltd.

15 YEARS **Doris Chua Kwee Eng**

GEOTHERMAL

20 YEARS **Darcel L. Hulse,** Unocal Center
Warren Smith, Santa Rosa, Ca.

15 YEARS **Terry Kelley,** Santa Rosa, Ca.
Philip Messer, Imperial Valley, Ca.
Alvin Timmons, Santa Rosa, Ca.

10 YEARS **Ray Bingham,** Santa Rosa, Ca.
Itan Jordan, Santa Rosa, Ca.
Patrick Kelly, Santa Rosa, Ca.
Gregg Nordquist, Santa Rosa, Ca.
Stanley Penzak, Imperial Valley, Ca.

Philippine Geothermal, Inc.

15 YEARS **Expedito C. Borre,** Tiwi
Simeon B. Ugalde, Bulalo

10 YEARS **Minerva O. Batoon,** Makati
Regina J. Dayrit, Makati

REFINING & MARKETING

40 YEARS **Robert R. Gould,** San Francisco Refinery
John C. Havely, San Francisco Refinery
Don E. Pedersen, Los Angeles, Ca.
Harold M. Runyon, Indianapolis, In.
S. E. Salcedo, San Francisco, Ca.

35 YEARS **Vern E. Grimshaw,** Los Angeles, Ca.
Thomas P. McIntosh, Memphis, Tn.
Lawrence D. Smith, Schaumburg, Il.
Jerry E. Tyhurst, Los Angeles, Ca.

30 YEARS **Frances L. Eirich,** Schaumburg, Il.
Charles H. Erikson, Los Angeles, Ca.
Amos R. Jones, Atlanta, Ga.
William J. Lucchesi, San Francisco, Ca.
Tommy L. Morgan, Juneau, Ak.
Robert J. Theis, San Francisco, Ca.

25 YEARS **Manual V. Castillo,** Los Angeles Refinery
Allan I. Dahl, Stoughton, Wi.
Marilyn E. Dexter, Schaumburg, Il.
Walter B. Eiseman, Portland, Or.
John W. Grubb, Richmond, Ca.
Melvin L. Lusardi, Avila Beach, Ca.
James M. Pederson, Houston, Tx.
Harry A. Thomas, Bloomington, Ca.
Curtis J. Walden, Edmonds, Wa.
Lelia J. Wickham, Sacramento, Ca.

20 YEARS **Velda K. Altig,** Portland, Or.
Michael P. Berry, Schaumburg, Il.
Willie F. Carr, McKittrick, Or.
Robert P. Dunlap, Nederland, Tx.
Robert J. Erickson, Los Angeles, Ca.
Edgar A. Farmer, Edmonds, Wa.
Mack B. Garvey, Sr., Pensacola, Fl.
Michael D. Hawkins, San Francisco Refinery
Kenneth Higa, Honolulu, Hi.
Paul M. Huffines, Andrews, Tx.
Inocencio S. Martinez, Schaumburg, Il.
Wayne W. McBride, Los Angeles, Ca.
Diane M. Minix, San Francisco, Ca.
Elvia D. Sanchez, San Francisco, Ca.
Jeffrey F. Smith, Schaumburg, Il.
Richard M. Stellina, San Francisco Refinery
Henry E. Verdon, Houma, La.
Gerald J. Villa, San Francisco Refinery
Ross V. Walker, San Francisco, Ca.
Jimmie D. Williams, Los Angeles, Ca.

15 YEARS **Dennis M. Caston,** Los Angeles, Ca.
Sandra K. Dodd, San Francisco Refinery
Dominic D. Ferrari, Los Angeles, Ca.
Julie A. Gaul, San Francisco Refinery
Steven J. Giampaoli, Los Angeles Refinery
Lawrence Jaramillo, Los Angeles, Ca.
William R. Krenkel, Avila Beach, Ca.
Barbara J. Olson, Schaumburg, Il.
Robert E. Parmenter, Seattle, Wa.
Fidel L. Rivera, Jr., Los Angeles Refinery
Rand H. Swenson, San Francisco Refinery

10 YEARS **Timothy M. Achorn,** Nederland, Tx.
Julio A. Balacy, Los Angeles Refinery
Marsha L. Brasky, Schaumburg, Il.
Marie A. Steffen-Brown, Los Angeles, Ca.
Frederick J. Caldwell, Los Angeles Refinery
Daniel C. Each, Los Angeles Refinery
Kirk R. Elder, Los Angeles Refinery
Rolf H. Halthen, Atlanta, Ga.
Jay P. Hong, Los Angeles, Ca.
Joseph H. Joseph, Santa Maria Refinery
David R. Keasey, Atlanta, Ga.
Lisa M. Kinoshita, San Francisco Refinery
Gary G. Kojayan, Los Angeles, Ca.
Mary Jo Mills, Los Angeles, Ca.
Douglas A. Nicola, Alabaster, Al.
Michael R. Renshaw, San Francisco Refinery
David R. Roberts, San Francisco Refinery
Harry Roesler, Schaumburg, Il.
Ronald F. Schwab, Los Angeles, Ca.
Susan E. Shearer, Schaumburg, Il.
Steven D. Smith, Beaumont, Tx.
Noel L. Soileau, San Francisco Refinery
Jeffrey A. Strachan, Los Angeles Refinery
David D. Teems, Los Angeles, Ca.

MARKETERS & DISTRIBUTORS

65 YEARS **Scott County Oil Co., Inc.,** Jordan, Mn.

40 YEARS **George Alexander,** Newberg, Or.
Norman S. Buvick, Santa Maria/Lompoc, Ca.
Robert K. Garwood, Bingen, Wa.

35 YEARS **Fort Oil Co.,** Lumpkin, Ga.
J. C. Lansdowne, Visalia, Ca.
Al Troutman, Maupin, Or.

30 YEARS **Tri County Oil Co.,** Virden, Il.

20 YEARS **Baille Oil Co., Inc.,** Brule, Wi.
State Oil Co., Grayslake, Il.

15 YEARS **Eugene F. Jenne,** Talkeetna, Ak.

10 YEARS **Peninsular Petroleum Co.,** Crescent City, Fl.

CHEMICALS

35 YEARS **Andrew R. Brennan,** Schaumburg, Il.
Lyle L. Burnett, Clark, N.J.
Jerome J. Raymond, La Mirada, Ca.

30 YEARS **Charles K. Harkins,** Rodeo, Ca.

25 YEARS **Charles Benfield,** Charlotte, N.C.
Tommi G. Lovern, Arroyo Grande, Ca.
Oscar Rodriguez, Rodeo, Ca.

20 YEARS **Joni L. Bartz,** St. Paul, Mn.
David W. Barthelmeh, La Mirada, Ca.
Irene M. Conti, Schaumburg, Il.
Kathleen G. Derby, Miami, Fl.
Ralph J. Koneski, Carteret, N.J.
Basil L. Mack, Jr., Lemont, Il.

15 YEARS **Joey L. Clark,** Charlotte, N.C.
Lawrence N. Croft, Kenai, Ak.
Daniel A. Harris, La Mirada, Ca.
Richard A. Link, Kenai, Ak.
Lester W. McCoy, Kenai, Ak.
Lawrence E. Nudson, Kenai, Ak.
Donald E. Telshaw, Kenai, Ak.

10 YEARS **Catherine M. Bush,** Kenai, Ak.
Anton C. Brandenhoff, Lemont, Il.
Michael D. Chapman, La Mirada, Ca.
John E. Forbes, Rodeo, Ca.
Leslie L. Hunter, La Mirada, Ca.
Victor Lipke, Lemont, Il.
Macie H. Mooney, Atlanta, Ga.
Fred J. Nahas, Lemont, Il.
Paul C. Staples, Schaumburg, Il.
Jon P. Terhune, Kenai, Ak.
Chester W. Tomala, Lemont, Il.
Mark D. Winchester, Lemont, Il.

MOLYCORP, INC.

25 YEARS **William B. Cook,** Louviers, Co.
Robert L. Jezek, Louviers, Co.

20 YEARS **Geyza I. Lorinczi,** Sydney, Australia
Geoffrey W. Nason, Mountain Pass, Ca.

10 YEARS **Brian K. Darling,** Louviers, Co.

POCO GRAPHITE, INC.

20 YEARS **Wilburn A. Fox,** Decatur, Tx.
Harold R. Robinson, Decatur, Tx.

15 YEARS **Edwin J. Brajer,** Decatur, Tx.

10 YEARS **John J. Brown,** Decatur, Tx.
Ran'Oul G. Greanead, Decatur, Tx.
Addie M. Warner, Decatur, Tx.

RETIREMENTS

Corporate

Lilly A. Abulhassan, September 28, 1964
Sally A. Cheng, August 2, 1965
Roland Clifford, May 15, 1950
Anna L. Lannin, August 21, 1951
Jean Moore, April 1, 1969
Edwin H. Powell, Jr., June 4, 1953
John T. Schaefer, June 1, 1989

Oil & Gas

Marion L. Capitani, June 14, 1945
John A. Grimes, July 11, 1956
Joseph Guerrero, December 2, 1971

Refining & Marketing

Donna J. Anderson, July 6, 1953
Galina G. Armstrong, March 2, 1955
Ronald D. Batte, March 28, 1966
Richard F. Daly, February 24, 1955
Calvin L. Fisher, May 24, 1960
Elery Fleming, November 14, 1966
Thomas A. Foster, December 7, 1959
Robert R. Gould, June 19, 1951
William Graffinius, Jr., December 26, 1950
James O. Green, May 22, 1956
Vern E. Grimshaw, July 11, 1955
Edythe J. Jackson, July 1, 1964
Berlie H. Jones, Jr., February 1, 1964
Erich A. Kroening, July 1, 1964
Lionel J. LeClaire, December 15, 1953
Lyle P. Loflin, March 8, 1951
Walter A. Manzanares, April 3, 1967
Hubert L. McNamara, May 13, 1955
James A. Moller, April 10, 1967
Eugene J. Moscato, April 28, 1980
James V. Shantz, August 6, 1952
Paul J. Shimer, February 2, 1963
Claude Smith, Jr., March 31, 1970
Doris C. Smith, January 30, 1961
Richard C. Uphoff, March 23, 1959
Richard E. Van Deusen, November 6, 1951
James H. Vanderveen, March 4, 1957
William H. Whittaker, April 7, 1969
Robert C. Wilkinson, March 25, 1949

Chemicals

George K. Benson, February 17, 1966
Andrew R. Brennan, September 12, 1955
Mary L. Deuchler, July 7, 1953
Harold Dowell, March 26, 1954
Donald E. Lowe, November 1, 1976
Leonard A. Mortimer, January 29, 1979
George F. Shaw, August 15, 1968

Science & Technology

Duane Flint, January 8, 1958
Cloyd P. Reeg, April 5, 1948
Ryden L. Richardson, July 1, 1954

IN MEMORIAM

EMPLOYEES

Oil & Gas

Charles Edmonds, March 16, 1990

Corporate

Lawrence D. Frankland, May 4, 1990

Refining & Marketing

Homer A. Rue, May 3, 1990

RETIREES

Corporate

Noble John Allen, April 10, 1990
Maxine Bestwick, May 12, 1990
Edmund D. Blum, April 11, 1990
Edwin Leo O'Brien, May 14, 1990

Oil & Gas

Albert Adkins, April 29, 1990
Robert B. Bell, May 16, 1990
Eugene Borax, May 20, 1990
William Culver, April 5, 1990
Odis Gambel, March 25, 1990
Robert B. Graves, April 24, 1990
George Harner, April 20, 1990
Eubern Earl Hawthorne, May 15, 1990
Lynden A. Herbert, June 1, 1990
Charles Vernon Hicks, May 25, 1990
Herbert W. Hill, June 7, 1990
Ralph K. Hill, April 17, 1990
Leroy E. Jones, May 3, 1990
Rex Ludicke, May 13, 1990
Claude Russel Moose, April 3, 1990
Carl L. Morgan, April 20, 1990
Frank A. Nicholson, April 10, 1990
Carl L. Shelby, May 5, 1990
James D. Varner, March 24, 1990
William R. Waggoner, April 20, 1990
Jack D. Welch, May 8, 1990

Refining & Marketing

Melvin Lee Adkins, May 12, 1990
Joseph Alvarez, June 19, 1990
Barnett Bowens, May 3, 1990
Florian E. Brusseau, June 12, 1990
James J. Burns, April 18, 1990
William P. Correll, Jr., March 20, 1990
Richard Cowing, April 22, 1990
A. P. Creel, April 29, 1990
Donald W. Denniston, March 13, 1990
Henry S. Elwell, May 25, 1990
Charles G. Franklin, March 27, 1990
Laverne Gilbert, June 7, 1990
Charles F. Gonzalez, April 23, 1990
Joe H. Green, May 22, 1990
Ernest Joseph Goularte, May 9, 1990
Paul Hackney, June 6, 1990
Gordon J. Hamblin, April 26, 1990
Paul E. Heal, April 16, 1990
Wallace A. Hemphill, April 1, 1990
Walter C. Isaacs, March 29, 1990
Theodore L. Jordan, March 11, 1990
Alvin Kidd, May 1, 1990
Robert Thomas King, May 1, 1990
Mildred Larry, April 28, 1990
Frank C. Lavigne, April 10, 1990
Eulice Ray Lawrence, June 4, 1990
Barbara Lind, May 24, 1990
Orin W. Lindemann, March 23, 1990
Fletcher Lindey, April 8, 1990
Sarah C. MacDonald, February 3, 1990

SERVICE AWARDS

Elo John Malek, April 14, 1990
Donald Marshall, April 22, 1990
Winfield P. McWilliams, March 29, 1990
Robert W. McIlvain, February 19, 1990
William A. Miertschin, April 22, 1990
James C. Openshaw, April 11, 1990
Benjamin S. Orcutt, June 10, 1990
Daniel Ratkovich, April 21, 1990
Marcella F. Rzadecki, April 11, 1990
Odie Simms, June 1, 1990
Grady M. Singleton, Sr., March 25, 1990
Kenneth F. Six, March 28, 1990
Howard W. Smith, April 28, 1990
Erminia M. Sniffen, April 16, 1990
Irvin J. Stein, April 29, 1990
Newman E. Tate, April 7, 1990
William F. Welch, April 11, 1990
Paul J. Williams, Jr., June 10, 1990
Emily A. Withers, May 22, 1990

Chemicals

Alfred G. Herrmann, February 20, 1990
Walter Metcalf, March 29, 1990
Don Mauerhan, May 10, 1990
Kenneth L. Stout, May 12, 1990

Molycorp, Inc.

Claudio A. Archuleta, June 1, 1990
Grace H. Curdie, May 16, 1990
John P. McLaughlin, April 4, 1990

Science & Technology

Paul G. Nahin, May 1, 1990
Edward W. Scott, June 14, 1990

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Unocal Corporation
P.O. Box 7600
Los Angeles, California 90051

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16823 LIGGETT STREET
SEPULVEDA CA 91343

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Unocal's Colorado oil shale project has proven the technology for tapping a vast energy resource.

Taking The Long-Term View Page 12
The responsibility for developing Unocal's financial strategies rests with the Corporate Budgets, Planning & Economics department.

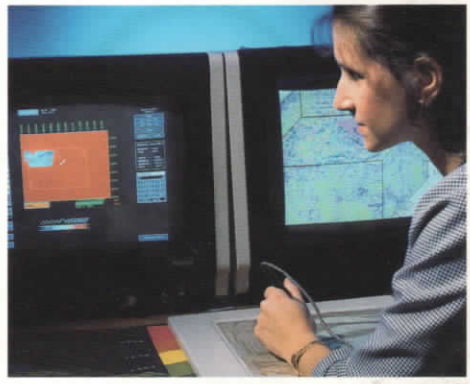
Focus On The Future Page 16
A conversation with Neal Schmale, Senior Vice President, Corporate Development.

Managing The Information Revolution Page 22
Effective information management is critical in today's business world. Corporate Information Services keeps the company abreast of the latest methods and technologies.

Real Estate: An Important Asset Page 26
Unocal's success has always been closely tied to land and its resources. The Real Estate Division makes sure that the company's land assets and other properties are used to best advantage.

From Blueprint To Completion Page 30
The Engineering & Construction department works with Unocal's operating divisions to plan and oversee major construction projects.

Behind The Scenes Page 34
Corporate Communications plays a major role in the company's interaction with shareholders, employees, government bodies and the public.



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Cover: Geophysicists at Unocal's Brea, California research center employ the latest computer technology to evaluate potential hydrocarbon deposits. Exploration research will continue to be a primary focus area for the company in the 1990s. *Seventy Six* magazine's fourth centennial year issue focuses on Corporate Development. *Photo by Warren Faubel.*

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