

# Cat Cracker 1 turned around

The job many considered "the" turnaround of the year, ended November 2nd, when maintenance work on Catalytic Cracking Unit No. 1 was completed, and the unit was turned over to Operations for bring-up.

The big plant had been shut down since September 7th. Immediately upon shutdown, work crews were assigned to virtually every area of the unit, implementing the work plan developed by Engineering Field.

Simultaneously, crews were starting work on the Rectified Absorber Unit. It, and later the Cracked Absorber Unit were both shut down for maintenance and repair work along with Cat Cracker No. 1. The three shutdowns were undertaken concurrently for operational reasons, according to Bill Thompson,

Superintendent, Operations, Light Oil Processing.

One of the factors enabling the swift start of the work on the shutdown was operations personnel making the plant as catalyst-free as practical in their shutdown procedures.

Primary on the list of major work to be done on the Cat Cracker was the replacement of the regenerator plenum and cyclones. The original carbon steel cyclones and stainless steel plenum were replaced with those of a new design.

Other work, according to Harry Fidoe, Senior Engineer, included extensive heat exchanger work, replacement of reactor stripping cylinders, extensive piping revisions to air blowers, a new roof for the CO heater, and major refractory repairs to catalyst-carrying lines.

One major job that was not anticipated was the installation of a stainless steel liner in the Reactors replacing the refractory liner which had failed to provide the necessary corrosion protection.

The Cracked Absorbing Unit Furnace needed substantial renovating; another major unexpected job. Other than those two instances, however, the Cat Cracker and attendant units were pronounced in unusually good shape.

The Cat Cracker turnaround ended Thursday, November 2nd, and Operations had fed back into the unit three days later.

According to Thompson, no reduction in refining crude intake was necessary due to careful management of Cat Cracker No. 2 feedstock and the Hydrocracker.

Nearly 400 craftsmen throughout the refinery were involved at one point or another in the Cat Cracker and attendant turnarounds. Shutdown Supervisors Denzil Dyer and Don Waters praised the craftsmen involved, saying they "performed their jobs well, in a safe and professional manner." To their credit, the job was finished on schedule despite the unexpected difficulties in the CAU and the Cat Cracker Reactor.

Chief Engineer John Nicholson, reviewing the shutdown, put it into perspective as a "difficult job, accomplished in minimum time, with maximum results." John Menzie, Engineering Services Inspection Supervisor, added: "I think all the people involved deserve to be commended. They did a lot of work and did it well."



Review

Wood River, Illinois



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WOOD RIVER REFINERY

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## New pollution regulations

This Spring, the Illinois Pollution Control Board enacted new air pollution control regulations. As part of these regulations, companies in the State (there are over 19,000) were required to obtain permits to operate various types of equipment. For the refinery this meant submitting operating permit applications which included detailed data on tanks, pumps, compressors, furnaces and boilers, and other processing equipment. This information is to be reviewed by the Environmental Protection Agency in considering our permit applications.

To accomplish the task of preparing our applications it was necessary to

complete literally thousands of forms, hundreds of drawings, and other specified documents. A group of 70 employees from Engineering Office, Engineering Services, Treasury Department, various operations groups, and virtually the entire Technological Department was assembled to complete the task.

The refinery was divided into 29 areas comprising related processes so that each one became an individual permit application. Three months and 10,000 man-hours of work were needed to complete the applications, which totaled 2,100 pages and included 260 drawings.



Gene Benner, Pipefitter 1st, at work during the Cat Cracker shutdown.



Babe Wisnasky feeds one of his whitetail deer. The deer is just one of the unusual and foreign animals Babe has on his farm.

## The Babe and his animal farm

There are farmers, and then there are farmers. Take the case of Babe Wisnasky, for instance. Babe is a Pipefitter 1st at the Refinery, with 28 years service; he also has a farm. Not too unusual among refinery employees, really, but what he raises on that farm is.

Babe has what amounts to a menagerie running around his 28 acres of land near Worden. He has a brace of white tail deer, three African sheep, eight different kinds of pheasant, chukker partridge, three species of peacock, Canadian geese, African geese, and a bunch of wild turkeys.

A decidedly unusual crop for an Illinois farmer/pipefitter, eh? "I've loved wildlife and the outdoors all my life," Babe said. Raised on a farm, Babe leaped at the chance to have a place of his own about eight years ago, and promptly began his collection.

Before that, Babe and his wife Emma lived in Rosewood Heights for a number of years. "There was nobody around when we first moved in there," Babe

recalls, "and after a while it just got too crowded for us."

Emma, in particular supported the move; "you couldn't get her to leave the place," Babe said. Well and good, many people in this somewhat crowded urban age seek a little elbow room. But what about the unusual animals? Again, Babe answered simply that he had always loved wild animals, the prettier and more pleasing in appearance the better.

"We always have them running around the yard," he said. "We have a pond in the front yard, and there's always ducks and geese around there." Babe's flock is constantly in a state of flux as to membership. "We're always changing around," he said. "In a little while I'll be adding some new types of birds."

The Wisnasky place has become sort of a children's zoo for local schools, also. Just recently, Babe pointed out, some seventy elementary school children and their teachers visited the farm to observe the animals, a rather common occurrence these days.

# Bridges speaks on technological advances

The oil industry is about to make some of its most significant technological advances and will need them to meet a rapidly increasing demand for energy, Shell president Harry Bridges said recently.

Technologists are now confronted with the problem of bringing such future "horizon" sources of energy as nuclear fusion and solar energy to the stage of economic feasibility, Bridges said in a speech to the Texas Mid-Continent Oil and Gas Association in Houston.

In all the talk about the development of these energy sources, he said, "the highly important role of technology in the field of oil and gas is apt to be overlooked."

Bridges said this development is a "challenge for men of today," and he urged young scientists to meet it, rejecting the idea of many that the oil industry is so mature that it offers few exciting research challenges.

He then outlined various technological advances and difficult future requirements for finding, extracting, transporting and refining oil.

Bridges noted the "almost astronomical volumes of petroleum that we must find, produce, transport, process and distribute," and said:

"This means we must find ways to work on the ocean floor, to drill into and produce from great ocean depths, to go into hostile environments such as the region beneath the Arctic ice cap."

The industry, he said, needs more certain ways of locating exactly where to drill for oil, and faster, more efficient drilling.

Then, as oil becomes more difficult to find, he said, "there is an increasing premium on higher recovery rates of oil in place." Also, he added, "we face the compelling need to diminish to levels approaching zero the emissions from the vehicles using our products and pollution from plant effluents."

The most fascinating challenge of all, he said, may be "to find more efficient ways of doing today what we have already been doing apparently satisfactorily for many years." There is, he said, "wide scope here for the best innovative brains, for the man who has the originality and imagination to ask the right questions."

As examples of new technology and of what will be required, Bridges noted:

--A new capability in stratigraphic geophysics, enabling scientists to predict the physical properties of rocks as well as their structural attitude, and ultimately, perhaps, to detect hydrocarbons. Bridges cited Shell's recent success in the Northern Michigan Basin where the company solved a difficult seismographic mapping problem and achieved a rare 60 per cent success ratio on 15 wildcat drillings.

--Computer-controlled dynamic positioning to stabilize floating drilling rigs, and safer, more reliable subsea drilling systems.

--Improved technology to overcome the high pressures and temperatures in land wells four and five miles deep.

--Increased research in high-pressure drilling including use of high-speed liquid jets to fracture rock. This is expected to reduce future drilling costs.

--Development of subsea drilling and completion systems allowing personnel to work in natural environment on the ocean floor. One of these is in place off the Louisiana coast.

--Sturdier offshore structures and transportation systems in the harsh environment of the Arctic.

--Chemical flooding to recover oil remaining in a well after water flooding. Such a process might lead to recovery of an additional 15 billion barrels of oil from known fields in the United States.

--Improved technology for the recovery of oil from oil shale, tar sands and coal and environmentally acceptable systems for disposing of the large amount of waste from such operations.

--Development of advanced supertanker technology, offshore superports and pipeline systems.

--Improved methods of removing sulfur from fuel oils, particularly residuals.

--Possible development of "fuels refineries" which would produce synthetic natural gas and low sulfur liquid fuel as the only products from crude oil.

Bridges said the industry must develop non-polluting automotive fuels and fuels required by new forms of propulsion, and herein, he said, lies the opportunity for a "broad area for application of future technical effort."



Representatives of the five Junior Achievement Companies sponsored by Shell in the Alton area pose at the center behind their various products. From left to right: Steven Kleffner, Steve Corbin, Susan Cummings, Dave Douglas, Jack Stalcup, Kathy McConnell, Robert Dizmang, Jeff Krepel, Linda Rhoads, Bill Sanders, Susan Noble, and Linda Bloodworth.

## JA companies start up

The eight Junior Achievement companies sponsored by the Wood River Refinery are off to a good start this year, according to Mike Anderson, Shell Co-Ordinator. "Achievers are enthusiastic and involved which in turn, has made the program more fun for both the achievers and the advisors alike," he said.

The 130 Achievers in the companies have elected officers, gone into production on starter products, selected company names and applied for corporate charters. "Sales programs are in force," Sales Advisor Newt Peters said, "and presently are being reviewed by the Vice-presidents of Sales in order to appraise the profit picture of each company."

The eight companies-five in Alton, three in Wood River-have recorded over \$800 of sales volume in the initial three weeks of the program. Average production of each company is approximately 30 products per night. The JA companies meet one night a week, and do all their planning and production at these meetings. At present, each company is experiencing \$30 to \$40 per night sales revenue on their various products, which range from Christmas products to auto winter kits. Prices, incidentally, for all products range between \$1.50 and \$3.50.

The five JA companies in the Alton area are: the FLASHERS, producing cookie sheets and automobile trouble lights; WORK, UNLTD., which is busy making lovelights and Christmas wreaths; NAVCOM, making Christmas candles; QUALICO, which produces Yuletide logs,

with candles; and JASCO, busy packaging an attractive winter automobile kit, including among other items, battery cables.

The three Wood River companies are: SUNCO, making lovelights and cork coasters; UNIQCO, producing Christmas candle holders and cookie sheets; and SHELL'S BELLS, also producing a Yuletide log.

Quality and professional appearance are stressed by each company on each individual product. As the year progresses, the companies will intermittently switch to other products, in some instances producing two or more at the same time.

To this end, each company has set up a Research & Development team to investigate new products, and further to appraise packaging, production, and promotion of the items currently being made.

All companies, according to center Co-ordinators Bob Shultz and Jesse Celis, met their first payroll towards the close of November, another sign of success. The good start of the companies this year is attributable to the careful planning and organization of the Advisors, Shell employees who voluntarily spend one night a week with each company.

The products made by the Shell-sponsored companies will be displayed at the Refinery in December, for order-form sales and to provide employees an opportunity to observe some of the finished goods produced by local youth through Junior Achievement.

## Shell announces new tires

Shell Oil Company has rounded out its quality tire line with introduction of the Super Shell Steel Radial, the first such tire to be marketed in the United States under an oil company's private brand.

Available in the seven most popular sizes, the Super Shell Steel Radial is a 78 series radial tire with an 0.38-inch white sidewall stripe. Its two radial plies are made with polyester cord and are reinforced with two belts of steel cord, which provide toughness and road hazard resistance.



## Speaking of safety

For a safer holiday season this year, take a few simple precautions with your decorations. For instance, if you use a real tree this Christmas, make sure it has plenty of water at all times; a dry tree combined with hot lights can cause a potentially nasty fire.

Watch your electrical outlets and avoid over-loading any one socket with too many connections. Also, check all the wiring on lights for defects and replace as deemed necessary. Lights on a metal tree can be an invitation to a bad electrical shock for someone in the home.

Again, if you use a real tree, keep it a

safe distance away from open fireplaces and other sources of fire. It's a good idea to dispose of Christmas wrappings immediately after opening the presents.

As the weather gets colder, fire hazard increases. To avoid this, your home heating system should be checked for any defects which might be potentially dangerous as the home heating system is pushed to keep up with the drop in temperature.

Keep sidewalks and steps outside the house as free of ice and other obstacles as possible in this slippery season.

**Fred Hess**



# The Wankel: where do we go from here?

The Wankel rotary engine. Is it an improvement of the internal combustion engine we all know so well, or is it simply the same old story in a different package? Is it the wave of the future, or just another passing fad?

With the increase of automobile pollution, the major car manufacturers have begun not only to modify the existing piston engine, but to look to alternatives. The gas turbine, the steam engine and the electric car have all been researched and studied since the early 1960s.

As the situation now stands the only alternative that remains viable in the near future is the Wankel. The steam engine is impractical at the present time; the electric car would require major breakthroughs in several different fields of engineering before it could become a driving, economic reality; and the gas turbine was proven costly and gave poor fuel economy.

That leaves the present piston engine, first demonstrated in the late 1800s by Nicholas Otto, and the Wankel-type rotary engine, a prototype of which first appeared in 1956. The first car to use the Wankel-type rotary was the NSU Spyder, which came out in 1965 to mixed reviews.

The NSU car improved however, and later in the 60s, a Japanese firm, Toyo Kogyo, introduced Wankel-powered cars. In the early 1970s, with the piston engine under increasing government and consumer assault, the major domestic car makers began taking a long cold-eyed look at the Wankel, which culminated with the purchase of manufacturing rights

by General Motors.

Rotary engines are, of course, nothing new. An American car company built rotary engined machines between 1904 and 1906, and during the first World War, several aircraft were powered by rotaries, although not of the Wankel type.

In the late 1920s, Felix Wankel, a German engineer and inventor began researching rotary compressors and ran his first rotary engine in 1954. The engines in current use in the Mazdas and the NSU are the result of this work.

But what effect is this going to have on the motorist in the near future? In order to find out, the REVIEW went to the MTM Research Lab and talked to Irv Doty, one of the engineers involved in researching the Wankel and its possible future effects on the oil industry.

"In a way," Doty said, "the future of the Wankel in this country depends a great deal on General Motors." Doty went on to say that GM, naturally, is not going to put something on the road that won't sell and/or work properly. However, it does look as if the American driving public will be seeing Wankel-engined domestic cars on the road in the next decade.

The main interest in the Wankel recently has been in the area of pollution. Here, according to Doty, present Wankel engines have an edge on one of the three pollutants emitted, nitric oxide. CO and hydrocarbons, the other two pollutants emitted by engines are on a par with conventional piston types.

However, Doty is quick to add, the Wankel is not the answer, at least not the complete answer to automotive pollution.

"It accomplishes low levels of nitric oxide at the expense of fuel economy," he said.

"The rotary engine may meet the 1976 federal requirements," he said, "but the controls on the engines will remain complex, and durability of the engine is yet to be proven." Doty went on to point out that an uncontrolled Wankel engine is dirtier in regards to hydrocarbon pollution than an uncontrolled piston motor. The hydrocarbon emissions of the Wankel are easier to clean up, however.

In essence, the Wankel Rotary engine has three small chambers of varying size, each of which completes a regular four-stroke cycle during one revolution of the rotor. The rotor is triangular, while the outer engine housing resembles, as Doty said, "sort of a large peanut," in shape.

The rotor meets the chamber walls at three points, which must be sealed. These seals have in the past been the rotary's Achilles Heel, leading to its questionable ability to withstand the test of time and miles. However, research is continuing steadily in this area, and new sealing materials hold forth much promise, Doty noted.

The Wankel has fewer moving parts in it than an internal combustion engine; no camshaft, valve lifters and so forth. It only requires two spark plugs per rotor. Also, due to its design, the rotary engine uses its cubic inch displacement twice as often as a conventional piston engine.

This leads, as Doty said, "to about the same horsepower at half the size and weight."

To Doty, though, the main excitement about the Wankel rotary is the change it

will stimulate in new car design. "Since it is lighter and smaller," Doty said, "cars designed around the Wankel could save as much as 600 to 1,000 pounds in weight. It is possible to build a car with the interior room of a full size Detroit car on an intermediate chassis."

Various other changes in styling, and the possibility of front wheel drive becoming standard could follow the Wankel into production.

"Could" is the operative word here. As promising as the Wankel rotary engine looks, it is not, as some prognosticators would have, the salvation of the automotive world. Several problems with the Wankel remain. Chief among these is development time. "The Wankel as we know it has only been around since 1956," Doty said. "The four stroke Otto engine has been around-and on the road-much longer."

The Wankel, for instance, has fuel economy problems. It burns fuel slower than its counterpart and is less efficient. Tied in with this, of course, are the mandatory smog controls that tend to make driving the newer model cars difficult. The problem of the engine seals has already been discussed as has the pollution problem.

No, the Wankel is not Super-Engine. It is a machine, with a machine's attendant problems. What this engine provides is a viable, liveable, economically practical alternative to the piston engine.

Dependent upon the swiftness and efficiency of developmental work and research, the Wankel engine stands to be a factor of importance in the future, to the auto industry, the oil industry and to all of us who drive.



Refinery Manager Ed Ballman addresses girls' "10 and over" luncheon.

## 36 honored at '10 and over' luncheon

Thirty-six girls from the Wood River Refinery were honored during a luncheon at Lewis & Clark Restaurant in November, in recognition of their having recorded 10 or more years with Shell.

Following the luncheon, Refinery manager Ed Ballman congratulated the ladies for their achievement. Each received a gift as a token of appreciation. Those with ten or more years of service with Shell include:

Mary Snider, Margaret Stulken, Jane Thatcher, Ruth Holliday, Marian Roller, Roberta Kratschmer, Margaret Middlecoff, Toni Williams, Jean Day, Liz Halliday, Dee Moehle, Doris Jilek, Marg Stroud, Juanita English, Thelma O'Donnell, Trudy Rietveld, Betty Augustine, Arlene Tutt, Maxine Vaughn, Muriel Frazier, Pauline Korbet, Phyllis Carter, Darlene Gross, Hazelle Campion, Libby Woods, Mary Kay Archibald, Gini Jones, Gloris Hanson, Grace Cunningham, Madeline Peters, Mary Henley, Barbara Simms, Pat Rehg, Mary Hyndman, JoAnn Laird, Darlene Wischnick, and Cele McLagan.

## Classified ads

### FOR SALE

Two snow tires and wheels for '66 Ford, 7.35x15, \$20.00. 259-6735.

Four Goodyear polyglass black wall tires, F78-x14. 644-5819.

Two American Motors wheels (1962-72) with snow tires, 7.75x14, good condition. Motorola B/W solid state TV, 120v AC power or 12V. DC. 254-6392.

1970 Dodge Challenger, 318, auto, air, plus extras. Will accept reasonable offer. 254-6912.

McCulloch Power Mac 6 chain saw, 14" bar, automatic oiler, like new. Concord 776 D Automatic reverse tape deck with tapes and misc. equipment. 656-5398.

Two aluminum garage doors 8x7, w/brackets. Two steel doors w/frames, 6'x4", two wash basins, one double well sink, w/fittings, all items in excellent condition. 259-1702.

Two bedroom brick house, for sale or rent, located Rosewood Heights. One bath fully carpeted with attached garage and full basement. 259-1833.

Clarinet, like new, \$85.00. 217-368-2487.

1972 Ford Maverick, auto, accent group, trailer hitch, low mileage. Mantle-type fireplace for electric logs. 377-5918.

Two 8.25x14 whitewall snow tires and wheels. For Dodge Coronet or Plymouth Satellite. \$20.00 for both. 254-0769.

## Shell, others sponsor study

Shell and 11 other interested companies have joined a combined federal, Colorado state and industry study to determine the possible environmental effects of oil shale development.

The study will cost about \$750,000. The 12 participating companies will initially contribute from \$5,000 to \$20,000 each.

"This cooperatively funded study is well-conceived and will help us achieve President Nixon's clean energy policy," said U.S. Department of the Interior Secretary Rogers Morton, who joined Colorado Governor John Love in announcing the combined study.

In a concurrent statement, a group of Colorado legislators congratulated participants for achieving a notable first in environmental history. Never before, the legislators said, have state and federal governments joined industry in conducting advance studies on land use planning, reclamation, water resources and an ecological and wildlife inventory for a total environmental analysis.

The study is to be completed by the spring of 1974.



## Shade-tree restorers wax enthusiastic

America, from the time of the first European landings, has been a country of restless, mobile people. It was not, however, until early in this century that the perfect individual, mechanical expression of this mobility came into existence for the bulk of our population: the automobile.

Increasingly, in the last 60 years, Americans have become a people on wheels. It was only natural, almost inevitable, that Americans have come to take their cars seriously, as extensions of themselves. And nearly as inevitably, as cars today become more standardized, some people have sought out the old and the quaint from the automotive past, cars that to these people have an ephemeral quality variously described as "character" and "individuality." And then you have people that just plain like old cars.

John Campo, of the Refinery's Technological Department, is a charter member of the latter group. In 1969, in California, John purchased a garage he knew contained old cars from the family of a deceased friend. Upon opening the garage, John knew he had stumbled into a version of a vintage car nut's Valhalla.

In the musty interior were a 1920 Chandler touring car, a 1930 Studebaker sedan, a 1934 Packard four door sedan, and a 1935 Packard convertible roadster. "The Chandler seemed to be in the best condition," John said, "so that was the one I decided to bring back first."

Towing the clunk-uhm, antique back from California to the Midwest, John and his family endured enough trials and tribulations to fill a book, sort of a reverse "Oregon Trail." To begin with, they ran out of gas in the middle of the Great Nevada Nowhere, approximately ten miles outside of a place wistfully named Lovelock. "It was the middle of the night and we had to hitchhike all the way back," John recalls with a mournful glance at his feet.

The next stop it was High Noon in Utah. "We were going up this grade," he said, "and the whole engine just boiled over." There fortunately was a creek nearby, but unbeknownst to the Campos, their modern car had a leak in the radiator.

There was more, but it will have to wait for the book. Eventually, John got the Chandler home, true to the perseverance which marks this breed of hobbyist. "I like old cars, I suppose, because I enjoy looking back to see what the engineers were doing at that time," John said.

John and his son had the thing home a week when they had it running. "All we did on the engine was a little replacement and repair, and she cranked right over," he said. After driving it around the neighborhood awhile, John decided to get to the core of the antique auto hobbyist's calling: restoration.

"It's hard work, no doubt about it," John said. He pulled the Chandler into his basement, put blocks under the axles and simply took the poor old thing apart down to the frame and the engine block.

This is no mean feat; the Chandler is a rather large motorcar. For instance, it has 25-inch wooden wheels that take a 34x4 size tire. "You're so high off the ground, it's like driving a truck," John noted.

John has the seven passenger touring car, with a 123 inch wheelbase, and about 3,000 pounds in weight. It has a standard three speed transmission, two-wheel brakes, drums on the rear wheels. Its 6-cylinder engine is basic Automotive Truth, a venerable L-head design.

"This is really a car-of-the-future," John grinned. "It'll run on no-lead, low-lead, just about anything." The car's body had no rust on it, but the interior needed work and the fenders had to be banged out. Initially, John had planned to have the thing on the road within six months of purchase, but that has stretched into three years, in the inimitable fashion of shade-tree restorers. John has not given up on the ancient beast, however, and plans to have it back together and hopefully on the road by this summer. The Chandler, although it was expensive, at \$1795, and is no longer made, is really considered in the "old car" class, rather than a true "classic" model, in the most common definitions of those words, by virtue of the fact that so many were made and they were around so long. As far as John knows, his Chandler was last registered for the road in 1949. For those who are interested, Chandler was taken over by Hupmobile, which was taken over by Packard. Nobody's interested, huh.

If John Campo likes old cars, Bob Wright likes Classics. Like John and so many others, Bob was in California when smitten with this peculiar disorder. "I've always been interested in old cars," Bob said, "and I then had a neighbor who was a collector." The neighbor made a buying trip to England and through him Bob had a chance to spring a 1933 Rolls-Royce into the Colonies. Nature followed its course, and Wright, Process Manager in Compounding, was the owner of a somewhat rare "Baby Rolls," so-called because of its smaller body dimensions.

"I thought it would be fun to restore it," Bob said, "and it was. But don't misunderstand, it was a lot of work, and it did cost." One advantage this kind of hobbyist has, though over others, is that while it can be an expensive operation, it can be said to be a "good investment."

One would have a little trouble trying to run that chestnut by the family concerning a custom shotgun, say, or a hand-fitted pool cue, or a fishing outfit.

### SERVICE ANNIVERSARIES



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35 years  
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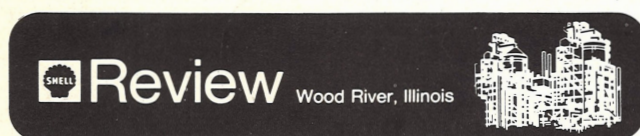
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