

Spring 5-1949

Volume 60 - Issue 10 - May, 1949

Rose Technic Staff

Rose-Hulman Institute of Technology

Follow this and additional works at: <https://scholar.rose-hulman.edu/technic>

Recommended Citation

Staff, Rose Technic, "Volume 60 - Issue 10 - May, 1949" (1949). *Technic*. 69.
<https://scholar.rose-hulman.edu/technic/69>

Disclaimer: Archived issues of the Rose-Hulman yearbook, which were compiled by students, may contain stereotyped, insensitive or inappropriate content, such as images, that reflected prejudicial attitudes of their day--attitudes that should not have been acceptable then, and which would be widely condemned by today's standards. Rose-Hulman is presenting the yearbooks as originally published because they are an archival record of a point in time. To remove offensive material now would, in essence, sanitize history by erasing the stereotypes and prejudices from historical record as if they never existed.

This Book is brought to you for free and open access by the Student Newspaper at Rose-Hulman Scholar. It has been accepted for inclusion in Technic by an authorized administrator of Rose-Hulman Scholar. For more information, please contact weir1@rose-hulman.edu.

The Rose Technic

MEMBER ENGINEERING COLLEGE MAGAZINES ASSOCIATED



M
A
Y

1
9
4
9

Gulf of Mexico is site of newest oil "boom"

OIL WELL SUPPLY COMPANY PLAYS IMPORTANT ROLE IN PROJECT

► "More than 4 billion barrels"—that's what one person has estimated as the amount of oil in one 30 mile strip in the Gulf of Mexico—scene of one of the biggest oil exploration projects in history. More than 20 million dollars has been spent by several companies in leasing properties on this newest oil province.

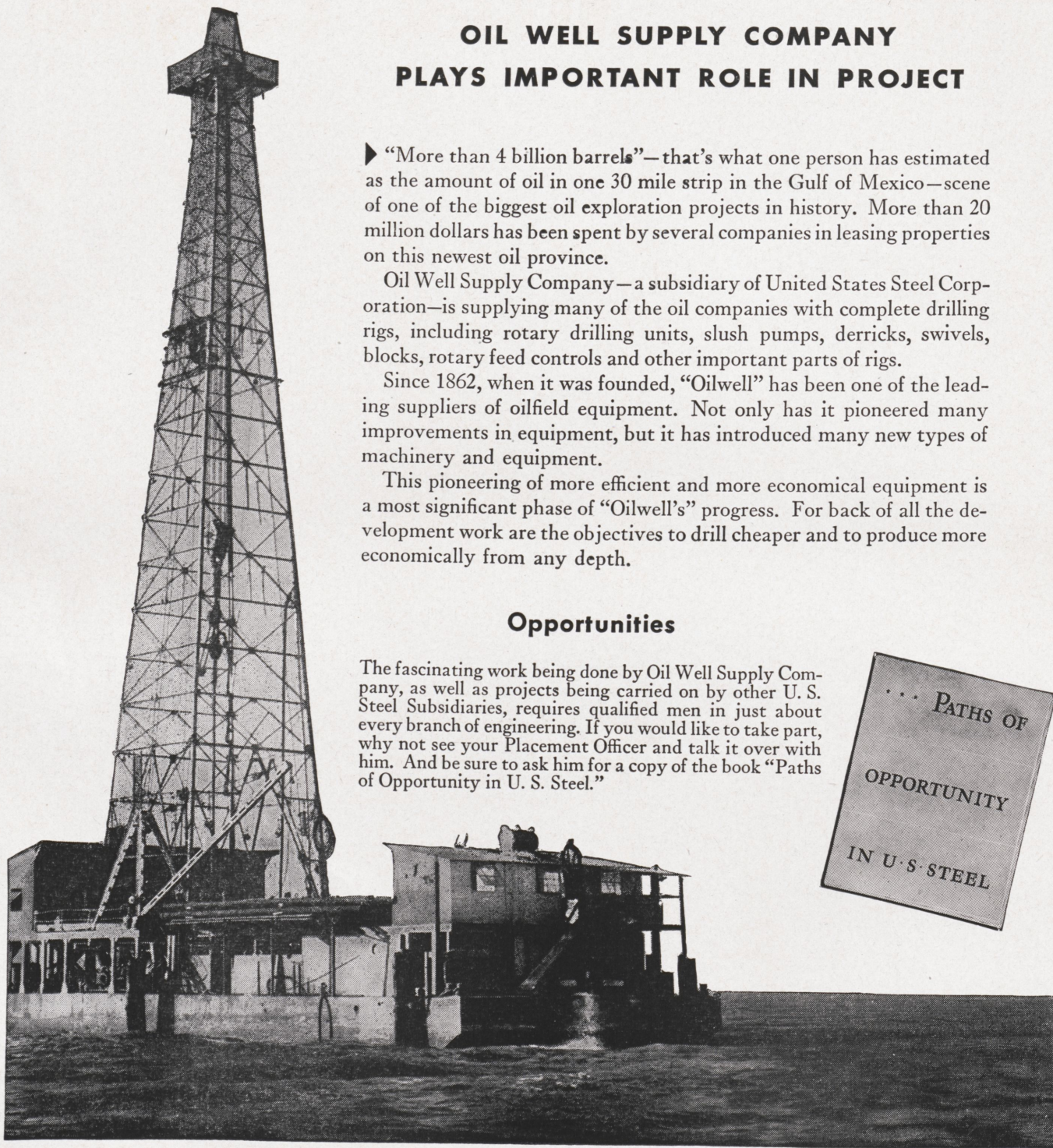
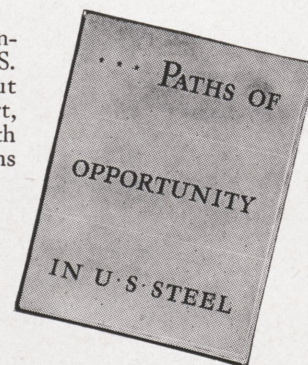
Oil Well Supply Company—a subsidiary of United States Steel Corporation—is supplying many of the oil companies with complete drilling rigs, including rotary drilling units, slush pumps, derricks, swivels, blocks, rotary feed controls and other important parts of rigs.

Since 1862, when it was founded, "Oilwell" has been one of the leading suppliers of oilfield equipment. Not only has it pioneered many improvements in equipment, but it has introduced many new types of machinery and equipment.

This pioneering of more efficient and more economical equipment is a most significant phase of "Oilwell's" progress. For back of all the development work are the objectives to drill cheaper and to produce more economically from any depth.

Opportunities

The fascinating work being done by Oil Well Supply Company, as well as projects being carried on by other U. S. Steel Subsidiaries, requires qualified men in just about every branch of engineering. If you would like to take part, why not see your Placement Officer and talk it over with him. And be sure to ask him for a copy of the book "Paths of Opportunity in U. S. Steel."



AMERICAN BRIDGE COMPANY • AMERICAN STEEL & WIRE COMPANY • CARNEGIE-ILLINOIS STEEL CORPORATION • COLUMBIA STEEL COMPANY
H. C. FRICK COKE AND ASSOCIATED COMPANIES • GENEVA STEEL COMPANY • GERRARD STEEL STRAPPING COMPANY
MICHIGAN LIMESTONE & CHEMICAL COMPANY • NATIONAL TUBE COMPANY • OIL WELL SUPPLY COMPANY • OLIVER IRON MINING COMPANY
PITTSBURGH LIMESTONE CORPORATION • PITTSBURGH STEAMSHIP COMPANY • TENNESSEE COAL, IRON & RAILROAD COMPANY
UNITED STATES STEEL EXPORT COMPANY • UNITED STATES STEEL PRODUCTS COMPANY • UNITED STATES STEEL SUPPLY COMPANY
UNIVERSAL ATLAS CEMENT COMPANY • VIRGINIA BRIDGE COMPANY

UNITED STATES STEEL

RALPH F. CONNOR
Editor

EUGENE GLASS
Business Manager

PAUL GOTTFRIED
Associate Editor

PROF. J. L. BLOXSOME
Faculty Advisor

Rose Technic

Volume LX, No. 10

May, 1949

William OrbaughAssistant Editors
Alex Vogl

Robert G. CassidyEditorial Staff
Jack Holmes
John Barco
Mort Hief

Robert SchwierContributing Editor
Sidney Zeid
Carl Cowing
Paul Ford
David Mullen
John D. Winters
Bill Rinker
Robert Grant

Dale CareyFeatures
George Eddy
Jim Gaston
Richard Kuehl
Wayne Walter
Bill Bannister
Denzil Hammond
Clark Miller
Harold Skelly
Warren Allen
Ray Summerlot
Wayne Barker

Robert RickettsPhotography and Art
Andrew Hallden
Robert Johnson
Warren Jones
Norman Meyer

Max DugginsAss't Business Manager

Ray BakerAdvertising Manager
Robert Mitchell
William Booth
Dave Smith
Robert W. Waid

Robert M. BaughCirculation Manager
Bill Herod
Glen Bickel
Dick Minnick
Albert Seiler
Bill Pitman

In This Issue

Strip Mining	8
Great Men of Science: Henry Ford	11
Synthol via Fischer—Tropsch Process	12

FEATURES

The Rose Poll	6
Campus Survey	10
Research and Development	14
Alumni News	16
Fraternity Notes	18

COVER

The huge dragline on the cover is shown clearing overburden in a strip mine field. Draglines such as the one pictured represent a large investment and must be operated on a 24-hr. basis to operate economically. Yet, the strip mining process can produce coal cheaper than the underground mining process.

The plates to print the cover were adapted from those furnished by OILWAYS, published by Standard Oil Co. (N. J.).

Printed by Moore-Langen
Printing and Publishing Co.

140 North Sixth Street, Terre Haute, Ind.

Published monthly except June and July by the Students of Rose Polytechnic Institute. Subscription \$2.00 per year. Address all communications to the ROSE TECHNIC, Rose Polytechnic Institute, Terre Haute, Indiana. Entered in the Post-office at Terre Haute as second-class matter, as a monthly during the school year, under the act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in section 1103, Act of October 3, 1917, authorized December 13, 1918. This magazine is not responsible for the opinions expressed by the contributors.

Member of Engineering College Magazines Associated

John A. Henry, Chairman, University of Illinois

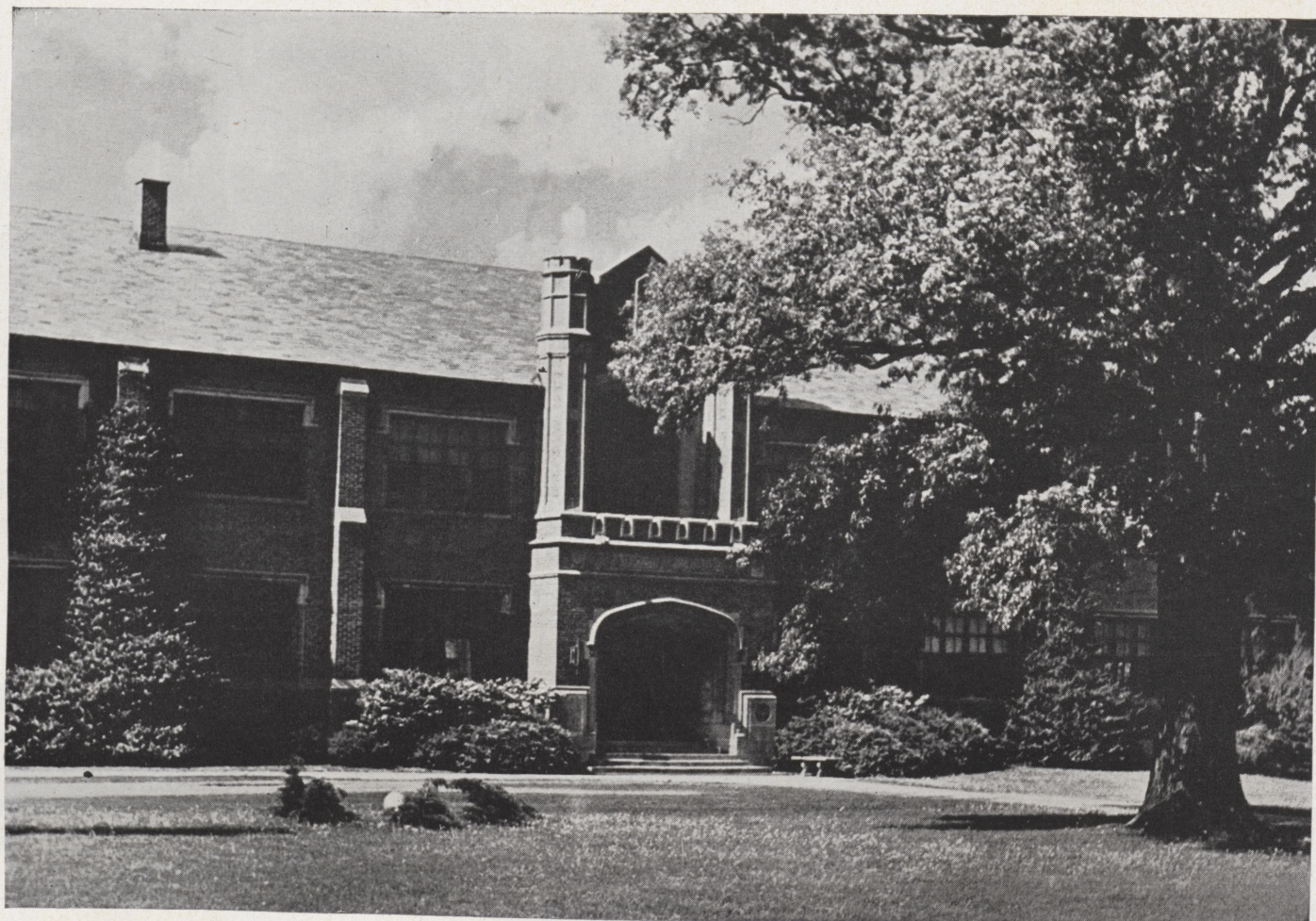
Publisher's Representative—Littell-Murray-Barnhill, Inc.

101 Park Avenue, N. Y. 1, N. Y. and 605 N. Michigan Avenue, Chicago, Illinois

Arkansas Engineer
Cincinnati Coop Engineer
Colorado Engineer
Cornell Engineer
Drexel Technical Journal
Illinois Technograph
Iowa Engineer
Kansas Engineer
Kansas State Engineer

Kentucky Engineer
The Marquette Engineer
Michigan Technic
Minnesota Technologist
Missouri Shamrock
Nebraska Blueprint
New York University Quadrangle
North Dakota Engineer
North Dakota State Engineer

The Ohio State Engineer
Oklahoma State Engineer
Oregon State Tech. Record
Pennsylvania Triangle
Purdue Engineer
Rose Technic
Tech Engineering News
Wayne Engineer
Wisconsin Engineer



ROSE POLYTECHNIC INSTITUTE

Four year, accredited college granting degrees in Chemical, Civil, Electrical and Mechanical Engineering. Limited number of vacancies for Freshman Class entering November 21, 1949. For information, address The Registrar, Rose Polytechnic Institute, Terre Haute, Indiana.

ROSE POLYTECHNIC INSTITUTE

TERRE HAUTE, IND.



*There's something here
no photograph could show*

Pictures could convey a clear idea of the buildings of Standard Oil's new research laboratory at Whiting, Indiana. We could also photograph the many new types of equipment for up-to-date petroleum research that are housed in the laboratory, one of the largest projects of its kind in the world.

Or we could photograph the men who work here, many of whom have outstanding reputations in their fields. For many years, Standard Oil has looked for and has welcomed researchers and

engineers of high professional competence. We have created an intellectual climate which stimulates these men to do their finest work.

But no photograph could show the basic idea that motivates Standard Oil research. It is simply this: our responsibility to the public and to ourselves makes it imperative that we keep moving steadily forward. The new Whiting laboratory is but one evidence of Standard Oil's intention to remain in the front rank of industrial research.

Standard Oil Company

(INDIANA)

910 S. MICHIGAN AVENUE, CHICAGO, ILLINOIS



CORNING... DOES THE UNBELIEVABLE WITH GLASS



A new kind of light

where it will lead nobody knows

Soon it will be possible for you to step into your home or office and turn on a light that's different from any you've ever used before.

From a panel in the ceiling will come even, glareless rays to shine on your desk, your chair, your table—but never with uncomfortable brightness, never in your eyes.

The light itself will come from electric bulbs or tubes like those you use now. But it will *behave* far differently because it will shine through a $\frac{1}{8}$ -inch sheet of a new kind of glass—Fota-lite—a recent development of Corning Glass Works.

Formed inside this sheet is a crisscross pattern of strips of white glass extending through the full thickness of the glass. The squares enclosed by the white strips are crystal clear.

Light from the bulb above—shining through this patterned glass at slantwise angles—is diffused and causes no glare. You

get an even, soft light through the entire room—as well as light channeled directly downward through the clear squares to the objects you need to see closely.

This new glass is made by mixing small amounts of rare metals in with the sand before it is melted to form glass. These materials make the whole sheet of glass photo-sensitive—through and through—so that any desired design (such as the one mentioned) may be formed inside the glass by a special process.

In fact, similar photo-sensitive glass is currently being used to print photographs in glass—pictures that can last for thousands of years.

Use of Fota-lite for indoor lighting is its first industrial application. Many other applications—such as its use in instrument panels for cars, in street lighting, and in illuminated signs—are being thoroughly explored.

In 98 years of glass-making Corning has developed glass into one of the most versatile engineering materials there is. There are more than 50,000 glass formulas on file at Corning, and the number is growing continually as new developments such as this photo-sensitive glass come out of the laboratory.

That's a good thing for you to remember. For some day, when you've picked the business you want to work in, one of these glass developments—or one now in the research stage—may be just the material you'll be looking for to improve a product or a process.

CORNING GLASS WORKS
CORNING, NEW YORK.

DU PONT *Digest*

For Students of Science and Engineering

TEN UNIVERSITIES TO BENEFIT BY GRANTS FOR UNRESTRICTED FUNDAMENTAL RESEARCH

With a view to stock-piling basic knowledge, the Du Pont Company has announced a program of grants-in-aid for the college year 1949-50 to 10 universities for unrestricted use in the field of fundamental research in chemistry.

The grants-in-aid of \$10,000 each are to be used for research that has no immediate commercial goal. The universities themselves are to select the projects in which the grants will be employed, and results of the research are to be freely available for publication.

HOW FUNDS WILL BE USED

Du Pont's purpose in offering the grants is to help insure the flow of

fundamental knowledge in science upon which the future industrial development of our country is so dependent. It is intended that the funds be utilized for such expenses as employing additional research personnel or lightening the teaching load of a professor who is eminently capable of research of a high order. They may also be expended for the purpose of obtaining supplies, apparatus or equipment.

GRANTS ARE EXPERIMENTAL

This program of grants-in-aid is largely experimental. However, it is Du Pont's hope, should the program work out satisfactorily, to continue each grant for a period of five years.

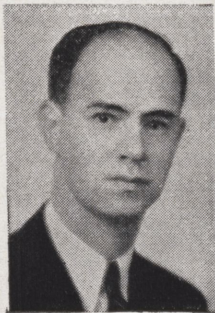
Four of Many Outstanding Du Pont Fellowship Winners



STANLEY



MARVEL



WALKER



FAWCETT

Dr. Wendell M. Stanley, at University of California, is Chairman of the Department of Biochemistry in Berkeley and in the Medical School at San Francisco; Director of the Virus Laboratory. Bachelor's degree at Earlham College, 1926; M.S. at Illinois, 1927 and Ph.D. in Organic Chemistry, 1929. Honorary Doctor's degrees from five prominent American universities and the University of Paris. Has received more than 10 medals and awards for distinguished work in chemistry and biochemistry; co-recipient of the Nobel Prize in Chemistry in 1946. Du Pont fellow at Illinois in 1928-29.

Dr. Carl S. Marvel, Professor of Organic Chemistry at the University of Illinois since 1930, received his A.B. at Illinois Wesleyan University in 1915, A.M. at Illinois, 1916 and Ph.D. in Organic Chemistry, 1920; Sc.D. (honorary) at Illinois Wesleyan, 1946. President American Chemical Society, 1945, Director 1944-46. Has received numerous honors

such as the Nichols Medal and memorial lectureships at outstanding universities. Du Pont fellow at Illinois in 1919-20. Consultant on Organic Chemistry to the Du Pont Company at present.

J. Frederic Walker is a Research Supervisor on formaldehyde products in the Electrochemicals Department. Trained at Massachusetts Institute of Technology. Awarded Bachelor's degree in Chemistry, 1925; Master's degree 1928, Ph.D. in Organic Chemistry, 1929. Author: "Formaldehyde Chemistry," "Organic Chemistry of Sodium," "History of Chemistry." Du Pont fellow in 1926-27.

Frank S. Fawcett is now doing synthetic organic research with Du Pont's Chemical Department. Received Bachelor's degree in Chemistry, Furman University, 1940; Master's degree, Pennsylvania, 1944; Ph.D. in Organic Chemistry, Massachusetts Institute of Technology, 1948. Du Pont fellow at M.I.T. in academic year 1947-48.

77 DU PONT FELLOWSHIPS MADE AVAILABLE TO GRADUATE STUDENTS

Again in the academic year 1949-50, the Du Pont Company is awarding post-graduate and post-doctorate fellowships to universities throughout the country.

This is a continuation of the company's 30-year-old plan to encourage advanced studies in the fields of chemistry, physics, metallurgy, and engineering.

It is hoped that the plan will continue to help maintain the flow of technically trained men and women who will go into teaching and research work at the universities and into technical positions in industry. Some of

What Fellowships Provide

Each post-graduate fellowship provides \$1,200 for a single person or \$1,800 for a married person, together with an award of \$1,000 to the university towards tuition and fees. Each post-doctoral fellowship provides \$3,000 for the recipient and \$1,500 to the university.

them, as in past years, may come to work for Du Pont when they finish their studies, but there is no obligation to do so; fellowship holders are free to enter any field of activity they choose.

The students and their research subjects will be selected by authorities of the 47 universities participating. In this year's program, 45 of the post-graduate fellowships are in chemistry, 4 in physics, 15 in chemical engineering, 5 in mechanical engineering and 2 in metallurgy. There will be 6 post-doctoral fellowships as an incentive to those who would prefer to remain in academic work in order to obtain additional advanced training in chemistry.



BETTER THINGS FOR BETTER LIVING
... THROUGH CHEMISTRY

Entertaining, informative — Listen to "Cavalcade of America" Monday Nights, NBC Coast to Coast

Alabama
Arizona
Arkansas
California
Colorado
Connecticut
Florida
Georgia
Illinois
Indiana
Iowa
Kansas
Kentucky
Louisiana
Maine
Maryland
Massachusetts
Michigan
Minnesota
Mississippi
Missouri
New Hampshire
New Jersey
New Mexico
New York
North Carolina
North Dakota
Ohio
Oklahoma
Oregon
Pennsylvania
South Dakota
Texas
Virginia & D.C.
West Virginia
Wisconsin
Wyoming

B & W BOILERS
installed or ordered since
V-J day for central
station service

STEPPING UP AMERICA'S POWER ... WITH B & W STEAM

Privately-owned power companies are keeping ahead of America's insatiable appetite for kilowatts by providing new steam-electric generating facilities at the greatest rate in history. For example, dots on the map below represent central stations where steam requirements for over 9 million kilowatts of new capacity are being supplied by B&W Boilers either placed in service or ordered since V-J Day. Included in these new units are the largest capacity central station boilers ever designed. Nation-wide acceptance of B&W Boilers is as old as the central station industry itself.

BABCOCK & WILCOX CO. General Offices: 85 Liberty St., New York 6, N. Y.
Works: Alliance and Barberton, O.; Augusta, Ga.

N-68

THE ROSE POLL

By Wayne Walter, sr., m.e., and Denzil Hammond, soph.

How would a plan of rating of instructors by students work at Rose?

NEWSWEEK for April 4, 1949, reports in its Education column that the college of liberal arts at the University of Michigan has been trying an instructor - rating plan. The magazine says: "The University of Michigan felt quite sure that it had an impressive faculty, studded liberally with scholars. Practically every man and woman was a Ph.D. or on the way to being one.

Like many another university, Michigan was worried. Had it placed too much emphasis on scholarship and not enough on teaching? Just how many of its professors were really good teachers?"

Last December, the college asked its 7500 students to fill out a questionnaire, marking their professors and instructors on such points as (1) clarity, (2) intellectual honesty, (3) fairness in grading, (4) general effectiveness.

For an engineering college the wording of these standards probably would need to be changed somewhat, but the principle would remain the same. Instructors could be rated on knowledge of subject instead of intellectual honesty. Using method similar to the questionnaire circulated recently among Tau Beta Pi members, the questionnaire was seen only by the instructor concerned.

Question: DO YOU THINK THAT A RATING OF TEACHERS BY STUDENTS COULD BE USED BY THE SCHOOL TO DETERMINE THE QUALITY OF INSTRUCTION BEING GIVEN?

YES—86% NO—14%

Rose has many good instructors and probably a few poor ones. According to the answers to our question, a number of students would like to express their opinion on their instructors so that, if possible, they might improve and increase the good reputation the school already enjoys.



*Terre Haute's Largest
Selection of*

ARROW

SHIRTS, TIES,
HANDKERCHIEFS
AND UNDERWEAR

CARL WOLF, Inc.

631 Wabash Ave.



PRODUCING ENGINEERED GLASS

Modern Techniques
Employed by
KOPP GLASS, INC.

Illustrate Effective
Utilization of **GAS**

ENGINEERED GLASS—produced for signal, technical, and industrial purposes—involves small-batch operations and specialized glass-making practices. At Kopp Glass, Inc., Swissvale, Pa. engineers have applied modern production machinery to these highly technical processes, utilizing flexible GAS for all heating requirements.

As large users of fuel, Kopp executives are concerned with the operating economies made possible by effective utilization of GAS in modern Gas-fired Equipment. But equally important is the automatic controllability of GAS for the varying temperatures used for melting, annealing, tempering, mould heating, in this specialized glass business. The importance of GAS in the Kopp plants is stressed by the wide range of equipment using this efficient fuel—

- 2 pot-type regenerative furnaces
- 2 special heat treating lehrs
- grinding and polishing plate heaters
- 4 day tank furnaces
- 3 annealing lehrs
- 1 mould oven
- 2 pot arches
- 2 ring ovens
- 1 cut-off machine
- 1 trial-pot furnace

In commenting on the use of GAS for heat-processing in the manufacture of engineered glass, supervisor



Molten glass from the Gas-fired regenerative furnace (rear) is placed in the mould for pressing.



Continuous Lehr in which GAS is used for annealing signal and industrial glass products.

of Equipment J. B. Fullen says, "The automatic controllability and the speed of GAS are of great importance, but we can't overlook the cost of fuel in our type of operation. That's why we use every device for effective utilization of GAS."

You'll find it worthwhile to investigate modern Gas Equipment for heat-processing in glass manufacturing.

MORE AND MORE..

THE TREND IS TO **GAS**

FOR ALL
CERAMIC FIRING

AMERICAN GAS ASSOCIATION
420 LEXINGTON AVENUE, NEW YORK 17, N.Y.

Open Cut Strip Mining

By Malcolm R. Meurer, sr., c.e.

ter, the thickness of the coal vein, the general quality of the coal, and various other information which is used in its entirety in determining if the operation of mining the coal is worth while.

Overburden is removed by use of a strip shovel, a drag line, or a combination of both. The depth of the overburden that can be moved by a shovel is more limited than the depth which can be reached by a drag line. It is obvious that the deeper the coal lies the more costly an operation it becomes to mine the coal. In some cases a shovel is used to uncover the coal and a drag line is used to relay the spoil, giving room for the shovel to place the overburden. Drag lines with very long booms are sometimes used to remove a portion of the top earth when the coal lies at depths beyond the limit of a shovel and by this method the shovel can then remove the remaining portion.

After the coal is uncovered a small shovel which is identical to the shovel used to remove the dirt except for size is used to load the coal into trucks or into small rail cars. The early source of power for these shovels was steam; today this type of power is almost extinct. The modern equipment is either powered by electricity, diesel engine, or by diesel-electric units.

The capacity of the trucks which haul the raw coal from the pit to the preparation plant ranges in size from 12 tons up to 32 tons. They usually are diesel powered. The roadways from the pit to the processing plant must be built for heavy loads; to carry these trucks; however; the undisturbed vein of coal is sufficient to use in the pit as a roadway. Outside the pit very thick layers of shale and rock are used but constant maintenance must be employed to maintain adequate roads for the loads.

When the raw coal reaches the preparation plant, it is dumped into a large hopper which has an opening in the bottom for the purpose of feeding the coal onto a conveyor belt, which in turn, conveys the coal to a maze of complicated machinery in the preparation plant. This machinery consists of washers; conveyor belts, where large pieces of dirt are removed by hand; screens; oil treating equipment; loading bays; and crushers.

The flow of raw coal from the hopper is onto the "feed conveyor," and by this conveyor the coal is delivered to a crusher which reduces all the coal to a desired size or less. The resultant is then screened into different sizes and passed through a washer. The heaviest impurities are then removed in the primary compartments of the washer. The banded coal containing mixtures of coal and impurities is then rewashed in the secondary stage where the varying densities are used to remove the remaining impurities. Coal from this washing process is crushed again and then rewashed. From here the washed coal is conveyed to screens which divide the coal into various sizes and then, by the use of gravity chutes, it is loaded onto railroad coal cars for delivery. The dirt from the washers is directed by gravity through chutes into a storage bin and then transported by trucks to waste piles. The slurry which is the result of washing the coal is pumped into slurry ponds.

Little has been said pertaining to oil treatment as this process is not

one of the routine procedures for the preparation of coal. It is a fairly new process used only in case the heating content of the coal is below that required. By spraying the coal with an oil preparation the BTU content is raised. Few coal companies at present have either the equipment to oil treat the entire daily output, or the mining technique to make it profitable.

Strip mines keep a laboratory fully staffed for purposes of maintaining a strict and continuous control of the cleaning efficiency and the quality of coal produced. Raw coal, washed coal, refuse, and slurry are sampled daily and percentages of yield, efficiencies, coal losses, slurry loss, and ash content are determined.

The process of strip mining is in general as described here and analysis from the economic point of view shows two great advantages: (1) ultimately the coal reaches the consumer at a lower cost than the underground mining process could produce assuming comparable grades of coal and more important (2) that coal is produced with less chance of loss of human life.

This Preparation Plant is at Maumee Collieries Mine 28 near Jasonville, Indiana. The line drawing at the left shows the coal progress from the truck located at far left in this picture to the rail car in the left foreground. Any size or combination of sizes of coal can be loaded from any of the loading booms. Also, the booms can be lowered or raised to cut free-fall distance to a minimum insuring uniform size.

Photograph Courtesy Maumee Collieries



Campus Survey

By Harold Skelly, jr., e.e., Jim Gaston, jr., m.e.
and Warren Allen, soph.

Glee Club

The Rose Poly Glee Club is having an exceptional season under the direction of Mr. Emil Taffinger and accompanied by Mrs. Edris Bennett. The Glee Club, with thirty members, is one of the best groups to be organized in several years. An octette has been organized of men from the Glee Club and has sung before several groups this season.

The past term the Glee Club gave two concerts. The first, at Garfield High School, was very successful and cordially received. The Glee Club was invited to return for an evening concert and dinner in May. At Garfield the Glee Club was assisted with two songs by the Rose Wives Octette, and three songs were sung by the octette from the Glee Club. This concert was a "warm up" for a concert given at Prais, Illinois for the Paris Women's Club on Sunday afternoon, April 3rd.

The concert in Paris was held in the High School auditorium assisted by the Women's Department Club Chorus of Terre Haute and the Rose Wives Octette. The concert was exceptionally well presented and attracted people from distances as far as Robinson, Illinois. After the concert the Glee Club and the Octette were invited to the Paris Elks Club for refreshments.

The Glee Club will have several more concerts this season in the Wabash Valley, ending the season with the final formal concert in July.

Track

The track season got underway at Rose on April 9 in a meet with Indiana Central, which Rose dropped by a score of 77½ to 53½. It should be remembered, however, that on the basis of events participated in, Rose more than held her own. Because of a lack of trackmen, it is impossible for Rose to participate in all events, which means that 27 points are given to the opposing team before the meet ever starts.

Rose also lost a meet with Earlham on April 11 by a score of 88 to 43.

The track schedule for the remainder of the season is as follows:

April 22	Anderson College	here
April 30	Third Annual Invitational	
	Rose Relays	here
May 3	Hanover College	there
May 11	Canterbury	here
May 14	Little State Meet	
		at Muncie
May 18	Hoosier Conference	here

A. S. C. E. Banquet

After an excellent meal, the student chapter of the American Society of Civil Engineers received some expert information about surveying from Mr. Arthur D. Kidder. Mr. Kidder, Rose graduate in 1899, is a retired agent of the United State Public Land Survey Company and is now associated with the firm of Kidder and Thoma, Washington, D. C. Being unable to complete his talk after the dinner, he came to Rose the following week to do so.

Baseball

Rose Poly's Engineers started this season with a little more experience than last year's team. With the aid of several freshmen the team shows possibilities of improving as the season progresses. Also, the batting average is better at this stage of the campaign than it was a year ago.

Rose opened the season at Canterbury on April 5. Although losing 10-1, Rose collected six hits. Waldo George, the first baseman, got two hits, one a double that brought in the only tally for Rose during the game. Roy Wright also hit a double down the right field foul line.

The second game was played against Franklin. Mac Meurer pitched good ball for four innings, but weakened in the fifth and with the aid of several errors gave up four runs. Jim Phillips and Nelson Havill finished the game for Rose. This game was lost by a 13-1 count.

Losing to Indiana Central 7-2; the team showed definite signs of improvement. The opponents did not get a hit off Gene Hudson after the fourth inning. Harold Monroney, Don Owens and Bob Owens got two hits each out of four trips to the plate. Herb Patterson and Harold Monroney each batted a run in.

The following is the schedule for the remainder of the season.

May 20,	Franklin,	There
May 23,	Earlham,	There
May 27,	Anderson,	There
June 1,	Canterbury,	Here



Technic Photos

The Octette entertains the Paris Women's Club with some of their well-known harmony.



The \$64 dollar question is 'where'd they come from.'

GREAT MEN OF SCIENCE

Henry Ford

By John Barco, fresh.

Henry Ford, American manufacturer, was born on a farm near Dearborn, Michigan. He went to school until he was about 15, but worked on the farm after school and during the summer. At an early age he began to develop an interest in mechanics. When 13 he took a watch apart and put it back together again. Since he wanted Henry to become a farmer, not a mechanic, his father discouraged him in this work.

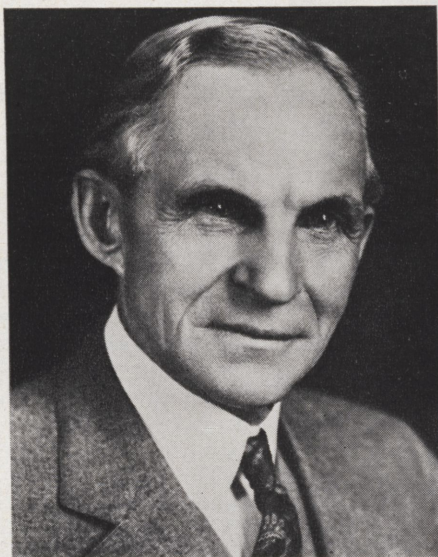
At 16 Henry could tolerate farming no longer. He left home and walked to Detroit, where he became an apprentice in a machine shop. At night he worked for a jeweler to help pay his expenses.

In about a year he turned from the machine shop to an engine shop to learn something of the building of engines. A company selling small steam engines needed a man to repair and install their engines. Ford took the job and for two years or more set up and repaired these engines. He had returned to the farm to live; there he spent all of his time in a small workshop, trying to build a small tractor.

His experience with portable engines, as well as his own farm experience, had convinced him that power should be put to work on the farm. Eventually he built a single-cylinder steam-engine tractor, but could not devise a boiler to provide pressure enough to keep the tractor at work plowing and yet be light enough for his requirements. For the time, he gave up his tractor until he could find a suitable boiler. Large steam tractors were already in use, but Ford's thoughts even then were in the direction of inexpensive and simple apparatus.

Ford's father gave him some land to draw his attentions away from mechanics. He then moved his workshop from his father's farm to his new home, which he built. Securing a job with the Detroit Edison Company, he moved to Detroit.

He again set up his workshop and after hours worked at building a gasoline motor car. He completed this in 1892, and after selling it and building a stronger and lighter one,



Henry Ford

he left his job with the Detroit Edison Company to devote his full time to building automobiles.

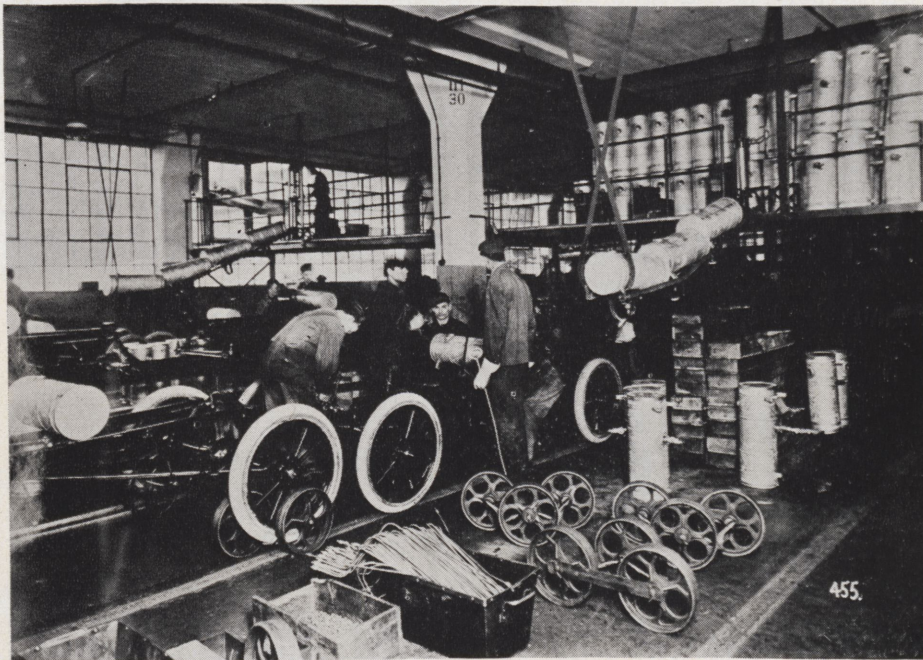
He first worked as chief engineer with the Detroit Motor Company. This company wanted to build auto-

mobiles on order, and Ford wanted to build automobiles in quantity; so he left them to go into business for himself when the opportunity should arise. In the meantime, in his workshop, he began working on an automobile solely for speed. Here he built the now famous "999" and the "Arrow."

The "999" won every race it entered, and in 1903, on the reputation of this speed car, Ford formed the Ford Motor Company. During the first year the company built a two-cylinder car with chain drive, and of these 1,708 were built and sold. The automobile at this time was considered a pleasure vehicle, but Ford had conceived it as a universal method of individual transportation.

He worked to produce a light car of great strength, which would require minimum care and upkeep. To fill this desire he built the model "T." In 1909 Ford announced that thereafter the company would build only the Model T chassis, and that "any customer can have a car painted any

Concluded On Page 20



Photographs Courtesy Ford Motor Corp.

This conveyor line was the first to be applied in the assembly of automobiles. The picture was taken at the Ford Motor Company plant in Highland Park, Michigan, in 1913.



Cut Courtesy Oilways

These two Germans, Franz Fischer, left, and Hans Tropsch, right, combined their efforts to obtain gasoline from coal.

The petroleum reserves in the United States are being depleted at a rapid rate. This fact is causing a diligent search for efficient methods to synthesize petroleum products at costs approximating those now in prevalence.

Fortunately, within this country's borders lie vast deposits of coal and natural gas. Estimated reserves of each embrace numbers that are for all practical purposes knocking on the door of infinity. Here then are the logical building blocks for the engineers to start their intricate castles — minarets of smokestacks, towers of column stills, and fortresses of tanks reenforced with bastions of pipework in preparation for the siege with the enemy, the U. S. dollar.

As a tool for the task, the engineers have the Fischer-Tropsch reaction tucked away in their belts. Originated by the two German chemists at the Kaiser Wilhelm Institute, the process utilized as its primary reactant any carbonaceous material from coke to the German *Braunkohle*, a "super peat." From the reactors of their chemical equipment poured a mixture of a low grade gasoline, Diesel oil, lubricating oil, and alcohol.

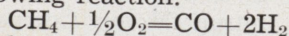
Political events coinciding with the scientific endeavor dictated the terms for development of the process. Petroleum-starved Germany with her mad dreams of the third empire was the first to push the project but with thoughts of "conversion at any cost." In comparison to the revolutionary chemistry of the process, the design of their chemical equipment has been described as "Gothic Engineering."

The highly efficient chemical transformation principle of fluid catalysis, developed in the United States, was ignored in the pell-mell rush for the finished product.

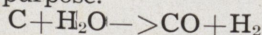
Synthetic Gas Production

Chemically, the Fischer-Tropsch reaction involves the combination of hydrogen and carbon monoxide through the mechanism of catalysis to yield hydrocarbons and their derivatives. The hydrogen and carbon monoxide are introduced as a mixture known as synthesis gas. The proportion of each component is dictated by the products desired.

Since the raw materials available determine the type of treatment to produce the synthesis gas, those methods pertinent to the conversion of coal and natural gas are illustrated. Methane-rich natural gas may be converted to synthesis gas by the following reaction:



When using coal as the starting material, principles similar to the well-known water-gas reaction serve the purpose.



Steam passed over red-hot carbon is converted to the desired synthesis gas.

Although more recently developed catalysts may prove to be more favorable, one route to the finished products destination is the utilization of members of the iron group, which form unstable carbides upon exposure to carbon monoxide. These are iron, cobalt, nickel, and ruthenium. Catalysts of this type will be discussed in this article, for lack of information concerning newly developed material or methods.

CO, in intimate contact with the finely divided metal, forms the aforementioned carbides in the superficial layers of the catalyst. The hydrogen present combines chemically with the carbide to yield the methylene radical (CH_2). The carbon part of this material has only two of its four possible valence bonds filled; therefore, its life as such is infinitesimally short.

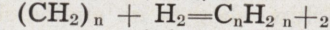
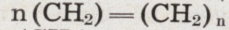
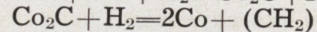
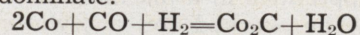
Synthol

via

Fischer-Tropsch Process

By C. G. McGlone, s.r., ch.e.
and R. G. Cassidy, sr., ch.e.

Undergoing immediate chemical action, the methylene groups add to themselves, or polymerize, to form polymethylene $(\text{CH}_2)_n$. The polymethylene in the presence of excess hydrogen is transformed to the saturated paraffin $\text{C}_n\text{H}_{2n+2}$. Using cobalt as a catalyst, the following reactions predominate:



Since none of the reactions involved in this scheme go to completion, a variety of by-products results. The methylene or polymethylene is not completely hydrogenated, and there is, therefore, the appearance of unsaturated hydrocarbons in the final product. Also, some of the methylene or polymethylene may combine with some of the unreacted carbon monoxide to form oxygenated compounds, carboxylic acids, aldehydes, ketones, and alcohols. The ratio of saturated hydrocarbons to unsaturated hydrocarbons to oxygenated products is controlled by reaction conditions.

Effect of Reaction Conditions on Products

In the study of the synthesis reaction, it has been recognized that five factors influence the product. These factors are: (1) reaction temperature, (2) reaction pressure, (3) feed composition, (4) catalyst, and (5) space-velocity. Full information on the effect of each of these factors has not yet been found, but important indications have been obtained.

Hydrocarbon synthesis over an iron catalyst is apparently possible to some degree at any temperature above 500° F; however, maximum yields of condensable hydrocarbons are obtained in the range of about 550°-650° F. Higher temperatures

produce increasing quantities of methane and gaseous hydrocarbons.

It has been shown that pressures above one atmosphere favor the formation of oxygenated organic compounds and high-molecular-weight hydrocarbons, but the yield of the normally liquid hydrocarbons is reduced. At 15 atmospheres, liquid hydrocarbons result.

No other factor so markedly affects the final product as does the catalyst. Nickel tends to form highly saturated, low-molecular-weight hydrocarbons which are generally of higher molecular weight than those saturates formed by cobalt. Paraffin waxes of extremely high molecular weight result when ruthenium is the catalyst. Use of an iron catalyst in the United States in preference to the cobalt used by the Germans is desired because iron lends itself to the production of unsaturates. Unsaturated products are desirable as their octane number is considerably higher than that of the saturates.

In the German process cobalt catalysts in the solid, pellet or granular form were used. U.S. preference runs to the more efficient and economical "fluidized iron" type. The fluid catalyst consists of extremely fine particles of iron which form a suspension in the synthesis gas as it is blown through the reactors. Advantages gained in the use of catalyst in this form include improved heat dissipation, a factor which influences product yield. The ever-present problem of catalyst poisoning is more easily coped with using the fluidized catalyst.

Products

The liquid products may be separated into a gasoline, a Diesel oil fraction, and a lubricating oil fraction. Cobalt catalysts yield a gasoline having an unleaded octane number of about 20, whereas iron catalysts form a fuel with an octane number of approximately 80. The heavier products compare favorably with similar petroleum-derived materials. The unsaturated gaseous hydrocarbons polymerize to form a high-octane fuel.

The paraffin wax produced can be transformed to synthetic fatty acids from which soaps, cooking fats, and artificial butter can be produced. The higher oils are converted to detergents by treatment with sulfuric acid.

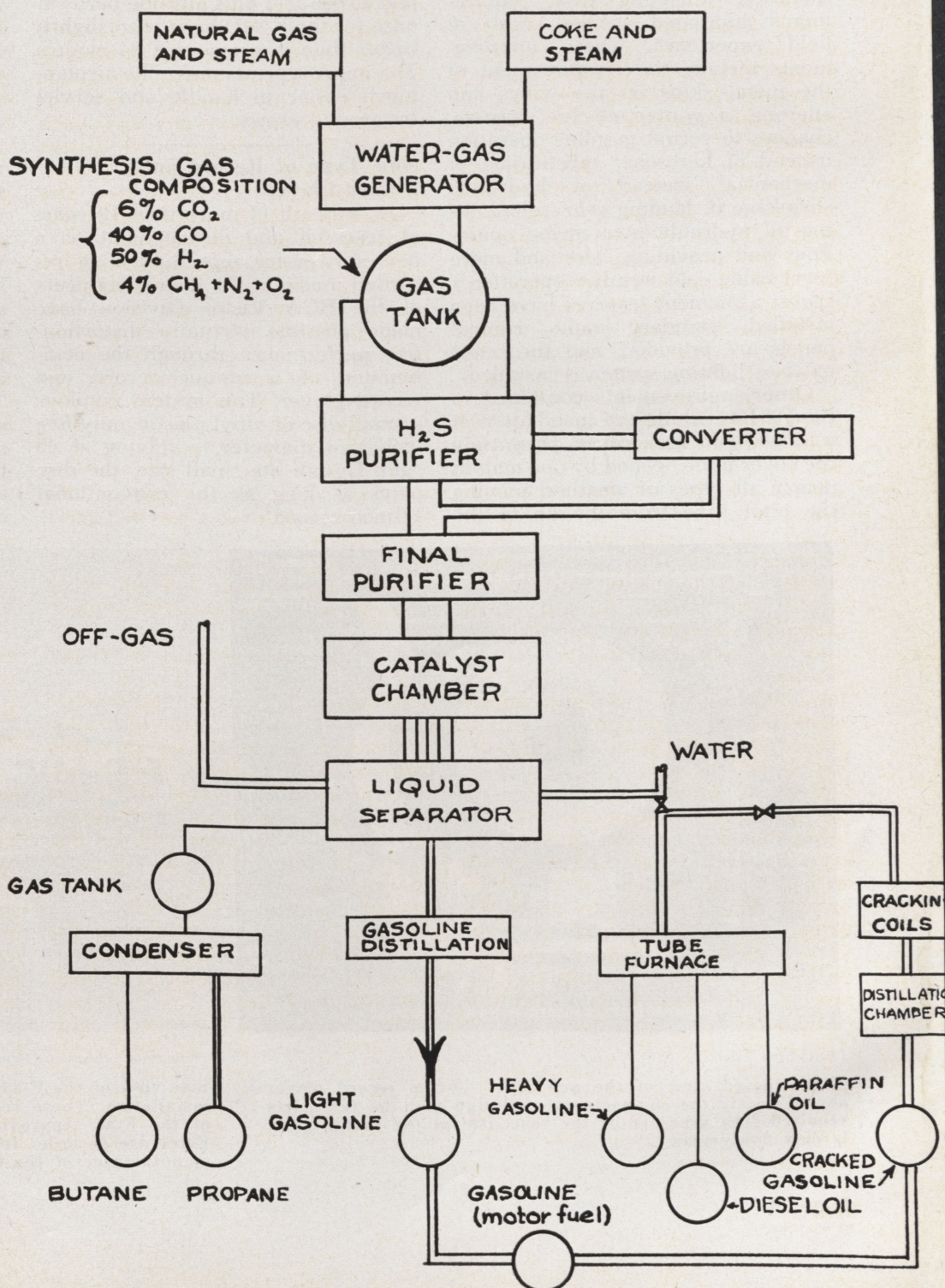
The oxygenated products such as fatty acids, ketones, aldehydes, and alcohols find use in other chemical and related industries. The process is sometimes used only for the exclusive production of alcohols or aldehydes.

Economic feasibility in the near future hinges on the potentialities of producing a gasoline that will successfully compete with the now prevalent five-cents-per-gallon refinery cost of the petroleum-derived product. Several large U.S. companies have estimated that Synthol can be synthesized through Fischer-Tropsch methods for 7 to 8 cents per gallon.

At the present time, the natural gas synthol future appears much brighter than that of coal by virtue of price and ready accessibility. With more efficient mining methods mak-

ing a substantial cut in the \$2.00 per ton labor cost for coal, this raw material will come into closer competition. The industrial development of cheap, high-tonnage oxygen will tend to drive the synthol price down also. The future of underground coal gasification is being eagerly observed in the hopes that favorable developments will result along this line. With further refinement in engineering technique and marked decreases in petroleum reserves, "synthol" may be expected to become an important commodity in future markets.

TYPICAL FLOW CHART FOR SYNTHOL



Research and Development

By Dale Carey, jr., e.e.,
and George Eddy, jr., m.e.

New Improvements in F-84 Thunderjets

The production of two new models of Republic Thunderjets, the F-84D and the F-84E, is now underway.

The F-84D has been in production for the past several months and scores of this model have been accepted by the Air Force. Its major improvements are along the lines of increased structural and maintenance qualities, reflecting new requirements stipulated as the result of field experience. These improvements include the reinforcement of the metal skins on the wings and ailerons, a winterized fuel system, changes to permit gasoline operation instead of kerosene, substitution of mechanical instead of hydraulic shrinkage of landing gear (eliminating all hydraulic sequencing operations and providing safer and more serviceable cold weather operation.) Latest armament features have been installed, standard radio control panels are provided, and the latest exterior lighting system is installed.

Other improvements contained in the F-84D include the installation of a hinged gun deck cover, permitting the cover to be opened by one man in nearly all types of weather, moving the pitot tube from the fin to the

nose duct divider, thus making it more accessible for covering, and eliminating disconnection during engine change, and rearrangement of the cabin air pressurization system to provide better distribution of air for the pilot.

None of the changes involves any loss of performance in flight or in ground servicing. In fact, the 600 mph speed, 600-mile combat radius and 40,000-feet plus altitude performance for the F-84D have been slightly better than in previous F-84 models. The improvements make the airplane much easier to handle and service by ground crews.

New Type of Record and Record Player

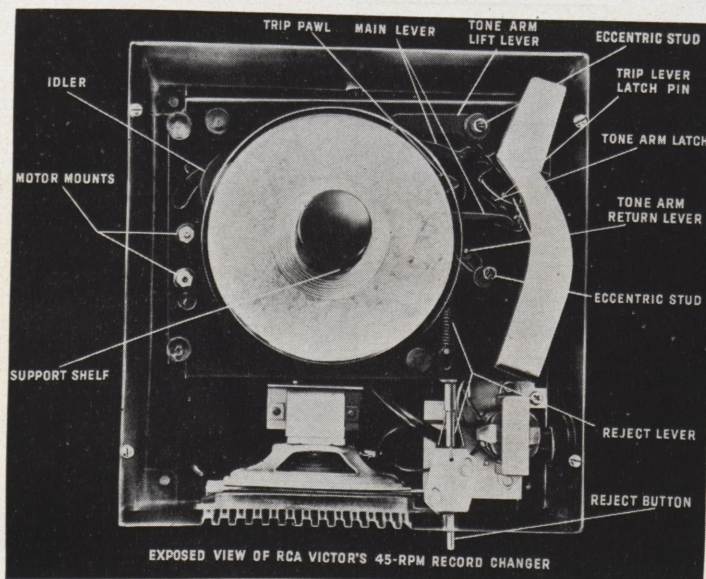
As a result of more than 10 years of research and development on a new system for reproduction of recorded music in the home, engineers of the RCA Victor Division have made possible virtually distortion-free performance through the combination of a unique record and record player. This system employs a small disc of vinyl plastic, only $6\frac{7}{8}$ inches in diameter, revolving at 45 rpm. Despite its small size, the disc plays as long as the conventional 12-inch record.

By establishing better relationship among several factors, including the size of the reproducing stylus, the desired length of playing time, and the minimum diameter for the inside turn of the groove spiral at different speeds, beyond which distortion would occur, it was determined that the optimum operating speed is 45 revolutions per minute.

To eliminate surface noises and sound distortion, a wafer-thin, non-breakable plastic record only $6\frac{7}{8}$ inches in diameter, with the playing area confined to the "quality zone" which lies outside a critical central area, was developed.

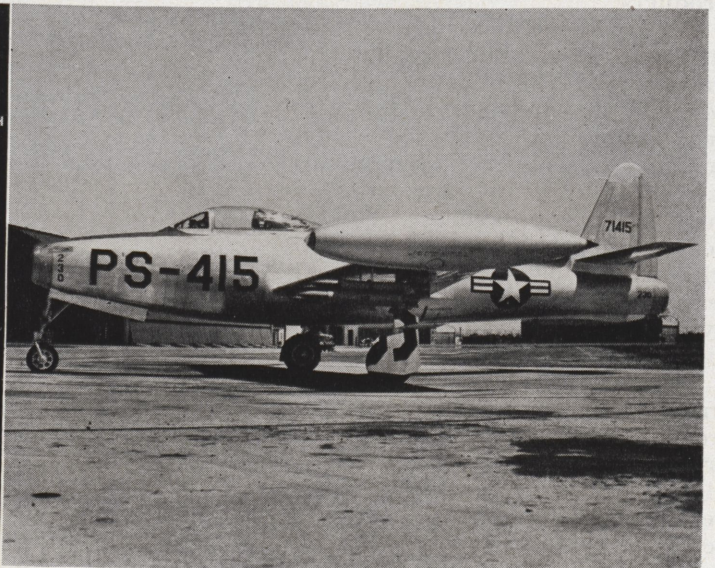
The smaller record size materially reduced manufacturing costs. The label areas of the new records are made thicker than the center hole edges and the playing surfaces, preventing damage to the latter by keeping them out of contact with one another when records are stacked, and providing air spaces between the inner edges for free action of the changer blades.

An ingenious trigger-action drop mechanism housed in the center spindle of the turntable contributes to faster, quieter, and safer record changing and eliminates 25 per cent of the parts required on conventional



Photograph Courtesy RCA Victor

This exposed view of the new RCA 45-rpm record player shows clearly the compactness of design and the few parts required. The pressure of the tone arm at the needle point is only five grams.



Photograph Courtesy Republic Aviation Corp.

Side view of the F-84 Thunderjet showing the HVAR rocket installation. These rockets greatly increase the fire power of the F-84. Approximately 1,000 Thunderjets for the Air Force are on order from the Republic Aviation Corporation, manufacturer of the famous P-47 Thunderbolt.

changers. Extending a fraction of an inch from two sides of the 1½-inch spindle are supports or shelves which can hold a stack of up to 10 records.

When records are changed, the two shelves recede into the spindle, and simultaneously two changer blades move out through slots in the spindle to form a new shelf for all records except the bottom record. The latter then drops noiselessly on the turntable, the shelves emerge again to replace the changer blades as a support for the remainder of the record stack, and the blades disappear into the spindle. The blades of the new changer slip between the inner edges of the records without touching them.

Until this new system was perfected, the operating speeds employed were selected without considering the possibility of undistorted reproduction. Many years ago, turntable speeds in the industry varied from 70 to 90 revolutions per minute. Later, record manufacturers adopted a speed of 78 revolutions per minute, a speed which seemed best suited to the future possibility of rotating phonograph turntables by power drawn from 60-cycle electric lines.

A speed of 33⅓ revolutions per minute was arrived at many years later as an expedient for sound motion pictures, which then required sound discs whose operation could be synchronized with film speeds. By using 16-inch records revolving at 33⅓ rpm, motion picture technicians were able to get a playing-time relationship of one disc to one reel of film.

Flight Recorder

A new type of flight recorder, which automatically records air roughness, altitude, and operation of automatic pilot and de-icing equipment on aircraft, has been developed.

The instrument will be installed

by Capital Airlines on one of its DC-3 aircraft under a test program directed by the Air Transport Association.

Use of flight recorders will provide commercial airlines increased information on their flight operations, and make possible greater operational control.

The flight recorder, which makes a record of flight data from take-off to landing, is so accurate in measuring altitude that it indicates changes as small as 10 feet.

The actual record is made by a stylus, which scratches through a thin coating on a slowly-moving strip of paper and leaves a black trace.

The recorder to be used by Capital Airlines is the result of more than two years of development and testing.

Engine Assembly Balancer

An engine assembly balancer that balances dynamically a complete Buick eight-cylinder "Fireball" engine was displayed at a recent automotive industry convention. The balancer handles the highly accurate production assignment of checking and eliminates any possible unbalance in the manufacture of vibrationless automotive engines.

The machine functions on a production line after the rotating parts of the engine have been individually balanced. It is designed to check unbalance resulting from possible "stacking" in a single direction or any other off-center condition that may develop during assembly of the various individually balanced parts.

The entire engine is placed in a cradle delicately suspended with metal reeds. A shaft from a 20-horsepower motor on the balancing machine drives the engine during the test cycle, reaching speeds up to 1,800 revolutions per minute, ap-

proximately 36 miles an hour.

Any vibration in the engine is picked up and amplified on a pair of sensitive light ray indicators together with the speed indicator.

The machine not only locates the angle of unbalance in the engine flywheel but also determines the amount of unbalance. This unbalance can be corrected by using a drill on the machine which drills holes in the engine flywheel, depending on the amount of unbalance that needs to be overcome.

The Rotary Internal Combustion Engine

An engine with greater efficiency, fewer moving parts, and less weight, an engine which costs less to build and maintain, has long been the mechanical engineer's dream. A design which shows promise of fulfilling this dream is the rotary combustion engine which eliminates pistons, crankshaft, and poppet valves. The only conventional parts are a spark plug, a carburetor, and a take-off shaft.

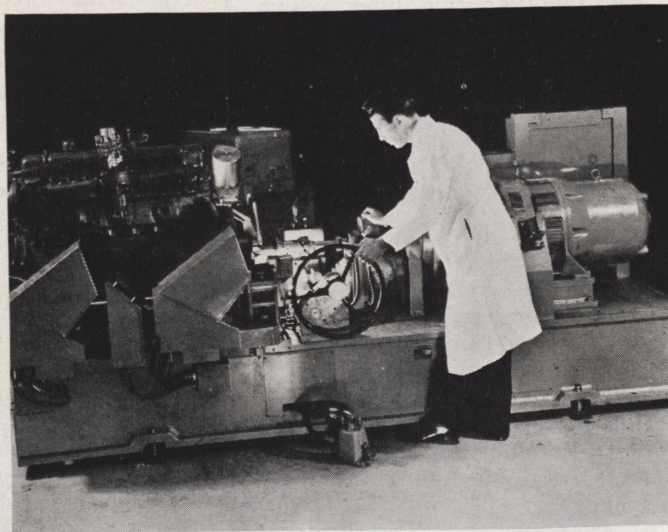
The rotary engine is so simple in design that it only requires three moving parts: the power rotor, the exhaust rotor, and the combustion rotor. A constant rolling contact between rotors at all times is assured by three gears in a train behind the three rotors.

There is no cooling problem in the rotary engine. Because of the continuous flow of air and fuel in one direction around the power rotor, the intake side of the engine will always be cool, while the expansion side will always be hot. It can readily be seen that less work is required to compress air in a cool intake cylinder than in a hot one. The expansion of gases and thermal efficiency are best in a hot cylinder.

Continued On Page 22



Flight Recorder *Cut Courtesy General Electric*



Engine Balancer *Cut Courtesy General Motors*

Alumni News

By Mort Hief, jr., m.e., Bill Bannister, soph.,

and Richard J. Kuehl, jr., e.e.

Westinghouse Fellowship Awarded to Burandt

Richard P. Burandt, a graduate of Rose Polytechnic Institute and an instructor in the electrical engineering department, has been awarded a Westinghouse fellowship in power systems engineering at Illinois Institute of Technology. Announcement of the award was made by the dean of the graduate school at Illinois Tech, W. A. Lewis.

Made possible through a grant to the Institute by the Westinghouse Education Foundation, the fellowship provides for free tuition and \$750 to Mr. Burandt for three semesters of study leading to a master's degree in electrical engineering.

Selection for the award was based upon personal qualifications, interest, and scholarship. Applications were received from electrical engineering graduates of engineering colleges throughout the nation.

Mr. Burandt will begin the first of three semesters work in September. The courses of study includes practical and theoretical training and provides experience with the \$90,-

000 A-C Network Calculator used in actual systems studies for utility and manufacturing companies.

A native of Chicago, Mr. Burandt entered Rose in July, 1943, under the Army Specialized Training Program. He later served in the army as a signal corps technician.

After the war he returned to Rose where he received his bachelor's degree last October, ranking first in a class of 58 graduates.

Mr. Burandt is a member of Tau Beta Pi, engineering honorary society, and a junior member of the Indiana Society of Professional Engineers. He has also been a member of the student branch of the American Institute of Electrical Engineers and was awarded the Heminway Medal for scholastic achievement at Rose Polytechnic Institute.

News From Lost Alumni

Word has been received of the deaths of Vern Whalen, '17, and Albert Hyde, '12.

Robert L. Anderson, '42, has written Miss Mahley, reporting that he is now an instructor on the staff of Purdue University, at the Hammond Extension Center, teaching mathematical and electrical subjects. After his graduation he worked with Westinghouse in the electrical machinery testing department, and later served with the armed forces. This was followed by a job with the General Electric Corporation, and in September 1947 by the teaching position at Purdue. He married Miss Louise Main in January 1944.

The TECHNIC and the school are anxious to hear from more alumni about whom information is incomplete in the school records.* If you have any information about yourself or other Rose graduates that the school or the Technic does not have please send it to the Alumni Editor, c/o Rose Technic.

'92

Word has been received of the death of Herbert B. Sperry, on February 19, 1949, at Aurora, Illinois. Mr. Sperry was design engineer for the Appleton Manufacturing Company.

'00

Recently an article in the Cleveland Plain Dealer telling of the death of Harry S. Richardson came to the attention of the office of the president at Rose. Mr. Richardson was born in Terre Haute in 1879 and at the time of his death resided in Cleveland Heights, Ohio. He graduated from Rose in 1900, received an M.S. degree in 1902, and in 1931 an E.E. degree. Last October he retired as control engineer from the Electric Controller and Manufacturing Company of Cleveland, after 45 years of service.

'09

Walter H. Garrigus died recently of a heart attack, in Terre Haute. Mr. Garrigus received a B.S. degree in Electrical Engineering at Rose, a B.S. degree from Indiana State Teachers College (1922), and a Master's Degree from Indiana University (1930). At the time of his death he was a faculty member of Gerstmeyer High School in Terre Haute.

'31

Harold Kehoe, a Terre Haute attorney, died on March 12, 1949. He graduated from Rose with a B.S. degree in Civil Engineering, and worked with the Indiana State Highway Commission as Project Engineer until 1938. He then went to Georgetown University Law School where he graduated in 1941. He was a member of Lambda Chi Alpha fraternity.

'46

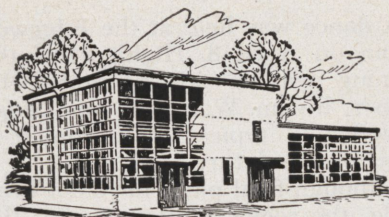
Phil Loring, lately with the California Texas Oil Company, is now with the Bahrein Petroleum Company, Ltd. His present address is Phil Loring, c/o Bahrein Petroleum Company, Ltd., Bahrein Island, Persian Gulf. He is a member of the Alpha Tau Omega fraternity.

CORRECTION

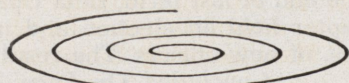
In the April ROSE TECHNIC in the article titled, *Supersonic Flight*, written by David Mullen, the linotype operator ran together two lines which resulted in the absurd statement, "The conventional internal combustion engine has a constant energy output that increases with the velocity of the engine itself, sliding up to incredible peaks at high speeds."

As written the statement was, "The convential internal combustion engine has a constant energy output expressed in horse power. But, the new engines have a power output that increases with the velocity of the engine itself, sliding up to incredible peaks at high speeds."

The Editors.



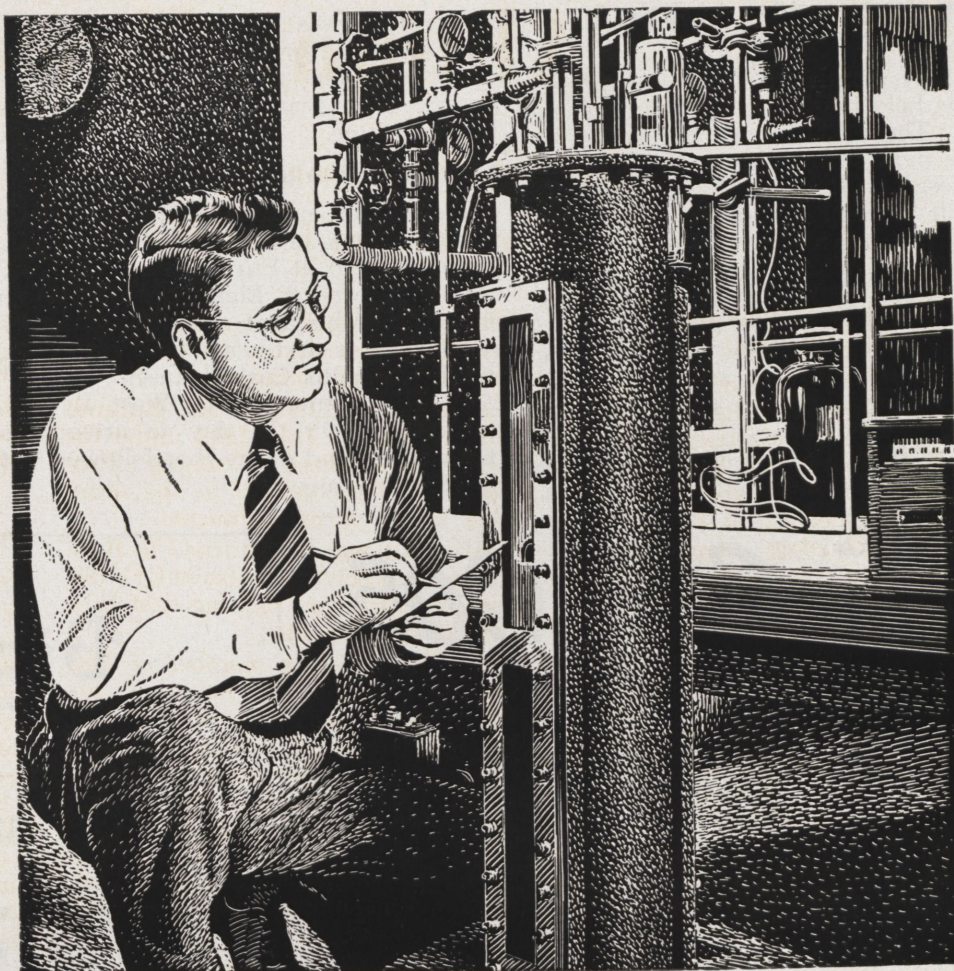
NEW LABORATORY UNIT, part of G-E Research Laboratory, is the center of General Electric research into such low-temperature phenomena as...



SUPER-FLUIDITY of helium—meaning that at near-absolute zero it loses its viscosity, can spin forever ...and



SUPER-CONDUCTIVITY—the loss of all electrical resistance by some materials below about 15° absolute.



Near absolute zero, matter does strange things...

AT 455 degrees below zero Fahrenheit, liquid helium becomes a "superfluid." That is, it loses its viscosity; if it were to be set in motion like stirred coffee spinning in a cup, part of it would theoretically continue to spin forever.

It also becomes a "super-wetting" agent, meaning that it will creep up the sides of a container and flow over the edge.

Other types of matter develop the property of "super-conductivity." Columbium-nitride, for example, loses all electrical resistance below 15 degrees absolute. If an electric current were set in motion in a closed loop of this substance, it would in theory flow indefinitely.

These are some of the facts of cryogenics—the study of low-temperature phenomena—into which a group

of young General Electric scientists are directing their investigations.

So far their studies are in only the earliest stages. But already the facts of this nether world of temperature have aroused enough interest that with the building of a new Research Laboratory near Schenectady, a \$250,000 laboratory unit has been especially constructed to aid and amplify their work.

Through its emphasis on research and creative thinking, through encouraging fertile minds to follow their own imaginative bent and by implementing their work with the best available facilities, General Electric remains "a place where interesting things are happening," and stays in the forefront of scientific and engineering development.

You can put your confidence in—

GENERAL  ELECTRIC

FRATERNITY NOTES

Theta Xi

Last month an election of officers was held in Kappa chapter of Theta Xi. The officers who will serve for the next six months are; Will Ham, President; Roy Potts, vice president; Cliff Hennig, treasurer; Joe Mum-mert, house manager; Jim Sherman, assistant house manager; and Bob Rinker, corresponding secretary. The chapter wishes these fellows a lot of luck in their term of office and wishes to congratulate the officers of the last two terms on their splendid job.

On April 2, the social committee staged a "Bowery Ball" at the house.

Everything was in style, complete with bar and "swinging" doors." Just about everyone turned out and all express their thanks to Al Vogl and his committee.

Lambda Chi Alpha

Dick McLaughlin represented Theta Kappa at the Midwestern Conclave held at Purdue University on April 1 and 2. Eighty men from chapters in this area met to discuss various topics pertinent to fraternity life. Dave Smith, Carl Wokasein, and Mort Hief journeyed to West Lafayette later in the day to attend the banquet and dance that followed the business meeting.

A dance was held at the Edgewood Cabin on April 8. Highlight of the evening was a skit presented by Messrs. Inman, Wokasein, and Lange depicting a typical television program of the future.

Although final plans have not been made, the social activity during the next term will include a picnic at Turkey Run State Park. A dance and several house parties are also to be scheduled.

Sigma Nu

At the end of last term, Beta Upsilon chapter held an election and installation of new officers. The results

Concluded On Page 26



Since 1905

National Electric has manufactured quality wiring systems and fittings for every electrical requirement.



Now

44 years later
National Electric is the
World's Largest Producer of
electrical roughing-in materials.



**National Electric
Products Corporation**
Pittsburgh 30, Pa.

Bigwood's

The Sterling Store of Terre Haute

Since 1877

- ◆ GORHAM ◆ TOWLE ◆ WALLACE
- ◆ REED & BARTON ◆ LUNT
- ◆ INTERNATIONAL

NATIONALLY ADVERTISED WATCHES

- ◆ OMEGA ◆ ELGIN ◆ HAMILTON
- ◆ ROLEX ◆ BULOVA ◆ WALTHAM

Bigwood's

20 N. 6th

Buettner Shelburne Machine Company, Inc.

Exclusive Manufacturers of Supplies for Electrical

COAL MINING MACHINERY

TERRE HAUTE, IND., U.S.A.



"Madame X" was the code name, during research and development, for an entirely new system of recorded music . . . perfected by RCA.

The remarkable background of "Madame X"

Now the identity of "Madame X", the unknown in a long search for tone perfection, has been revealed. From this quest emerges a completely integrated record-playing system—the first to be entirely free of distortion to the trained musical ear . . .

The research began 11 years ago at RCA Laboratories. First, basic factors were determined—minimum diameters, at different speeds, of the groove spiral in the record—beyond which distortion would occur; size of stylus to be used; desired length of playing time. From these came the mathematical answer to the record's speed—45 turns a minute—and to the record's size, only 6 $\frac{3}{8}$ inches in diameter.

The record itself is non-breakable vinyl plastic, wafer-thin. Yet it plays as long as a conventional 12-inch record. The new RCA Victor automatic record changer accommodates up to 10 of the new records—1 hour and 40 minutes of playing time—and can be attached to almost any radio, phonograph, or television combination. The record *player* ends faulty operation, noise, and cumbersome size. Records are quickly changed . . . RCA Victor will still supply 78 rpm instruments and records.

This advance is one of hundreds growing from RCA research. Such leadership adds value beyond price to any product or service of RCA and RCA Victor.

Continue your education with pay—at RCA

Graduate Electrical Engineers: RCA Victor—one of the world's foremost manufacturers of radio and electronic products—offers you opportunity to gain valuable, well-rounded training and experience at a good salary with opportunities for advancement. Here are only five of the many projects which offer unusual promise:

- Development and design of radio receivers (including broadcast, short wave and FM circuits, television, and phonograph combinations).
- Advanced development and design of AM and FM broadcast transmitters, R-F induction heating, mobile communications equipment, relay systems.
- Design of component parts such as coils, loudspeakers, capacitors.
- Development and design of new recording and producing methods.
- Design of receiving, power, cathode ray, gas and photo tubes.

Write today to National Recruiting Division, RCA Victor, Camden, New Jersey. Also many opportunities for Mechanical and Chemical Engineers and Physicists.



RADIO CORPORATION of AMERICA

World Leader in Radio — First in Television

color he wants, as long as it is black."

Principles upon which Ford founded his industries are the following: an absence of fear of the future or veneration of the past, for one who fears the future, also fears failure, and limits his activities; a disregard of competition; whoever does a thing best should do it, placing service before profit; without profit, business cannot expand; manufacturing is not buying low and selling high, it is the process of buying materials fairly, and with the smallest addition of cost, transforming these materials into a consumable product and selling it to the consumer with the lowest margin of profit.

In Ford practice, the cycle starts with the consumer. Ford holds that the commodity must first be designed to fit the needs of the largest number of consumers, both in quality and price. He also believes that the number of consumers will increase as the price is lowered. At the same time, by paying the highest

possible wages to those engaged in production and distribution of the article, he creates a higher buying power.

The general theory of production in the Ford plant is that everything must be kept moving, and that the work must go to the man instead of the man to the work. Every part of the motor car has a train of construction and assembly, all converging into final assembly. No man uses more than one tool, all the work comes waist high, and a man never has to stoop or move his feet to get to anything. The speed of the work is controlled, not by the workers' will, but by the pace of the conveyor.

Henry Ford was firmly opposed to paternalism in any form. He believed charity greatly harms those who receive it. With this thought he established a trade school for the education of boys with dependents, in which the boys make useful articles. They earn a wage while re-

ceiving their education.

The Henry Ford Hospital of Detroit, which is open to anyone, is conceived on the theory that a hospital should be self-supporting. All rooms are alike, all fees and services are at a scheduled rate, and all surgeons, physicians, and nurses are on a salary, and have no financial relations with the patients.

The growth of the Ford industries has been due to the principles set down by Henry Ford. His theory of high wages to improve the standard of living of his employees and to increase the buying power of the consumer is successful.

Building the product that the consumers want, and at the price they want it, is the secret of his business success. Ford's use of the production line has made it possible to accomplish this. He was not afraid to venture into the future with new ideas; thus he became one of the world's leading manufacturers, and one of the world's greatest men.

Louisville Bridge & Iron Company

Incorporated 1865

Engineers, Fabricators and Erectors of Steel Bridges,
Steel Buildings

Stock Steel for Prompt Shipment

Offices: 11th and Oak Streets

Louisville

Kentucky

"—The first wealth is health"—RALPH WALDO EMERSON



...and oxygen wins another fight for life!

OXYGEN has saved many a fine baby like this. Born ahead of time, with lungs and heart slow to function, the dreaded blue color was appearing. But oxygen in an incubator won the fight!

From childbirth on through life, the use of oxygen in medical treatment is now becoming routine... far different from the emergency uses of earlier years.

An oxygen-enriched atmosphere makes breathing easier—reduces the strain on the overloaded heart and congested lungs. The result is less fatigue and exhaustion, and greater comfort and quicker recovery for the patient.

And in other situations, where heart action is impaired by shock or obstruction of a blood vessel, oxygen often brings vital relief. All modern hospitals have adequate equipment for oxygen therapy, often with oxygen piped to

beds from a central supply.

The people of Union Carbide produce oxygen and many other materials that help all of us stay healthier, live longer. They also produce hundreds of other materials for the use of science and industry, to help maintain American leadership in meeting the needs of mankind.

FREE: An informative "Oxygen Therapy Handbook" is available free of charge to doctors, nurses, and persons interested in hospital administration. If you would also like information on other products of Union Carbide ask for the free booklet "Products and Processes."

UNION CARBIDE
AND CARBON CORPORATION
30 EAST 42ND STREET **UCC** NEW YORK 17, N. Y.

Trade-marked Products of Divisions and Units include

LINDE Oxygen • PREST-O-LITE Acetylene • PYROFAX Gas • SYNTHETIC ORGANIC CHEMICALS
ELECTROMET Alloys and Metals • HAYNES STELLITE Alloys • BAKELITE, KRENE, VINYON, and VINYLITE Plastics
NATIONAL Carbons • EVEREADY Flashlights and Batteries • ACHESON Electrodes • PRESTONE and TREK Anti-Freezes

Men of Rose

*May we call
attention to our*
**Complete
Printing Service**

*Rapid, accurate
execution of your
printing requirements
at reasonable prices*



**Moore-Langen
Ptg. & Pub. Co.**

140 North 6th St.
TERRE HAUTE, IND.

RESEARCH AND DEVELOPMENT

Continued From Page 15

In the rotary engine the temperature of the combustion chamber walls will be limited only by the ability of the metals to retain strength under the high temperature. The rotary engine should run at about 800° F, the combustion chamber being insulated to retain the heat in the chamber to expand each compression cycle of air in the cylinder. To gain efficiency the expansion ratio will exceed the compression ratio.

The engine also has another advantage in that almost any kind of fuel can be used with nearly equal efficiency. Therefore, high cost fuel will not be needed except where very high power and an extremely light engine are specified.

The estimated weight of the engine is less than one pound per horsepower compared to at least five pounds per horsepower in the reciprocating engine. The complete power unit for a sixty-horsepower

engine should weigh less than one hundred pounds and should occupy a space of approximately two feet by one foot square.

Because of its small overall dimensions a rotary engine can be installed between the two rear wheels of an automobile, thus eliminating the complicated and inefficient transmission gears usually employed to deliver power from the front of the car to the differential gears at the rear axle. The clutch assembly, transmission, and drive shaft universal joint could very likely be replaced by a small fluid drive assembly directly connected to reduction gearing connected in turn to the rear axle.

The rotary engine will produce a nearly constant torque up to the exploding speed of the engine because the friction torque is low and nearly constant. The thermal efficiency of the engine should increase

Concluded On Page 24


Fred G. Heintz
FLORIST
129 SOUTH SEVENTH
TERRE HAUTE, INDIANA

FLOWERS FOR ALL OCCASIONS

Phone C-1425

HUNTER, GILLUM & HUNTER, Inc.

GENERAL INSURANCE—
BONDS

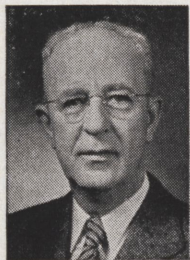
Phone C-1400

16 So. 7th St. Terre Haute

Get a Close-Up OF THE BASIC INDUSTRY OF YOUR CHOICE!

by R. S. FLESHIEM
Manager Electrical Department
ALLIS-CHALMERS MANUFACTURING CO.
(Graduate Training Course—1904)

WHEN YOU GET into daily working contact with an industry, you may find it offers specialized opportunities that you hadn't known about before. That's why it's not always possible—or wise—to pick your final spot in industry until you've had some all around first-hand experience.



I want to suggest a good way to get a close-up of the industries that appeal to you.

Naturally, I can talk with most assurance about the electric power industry. But the same principles apply to others.

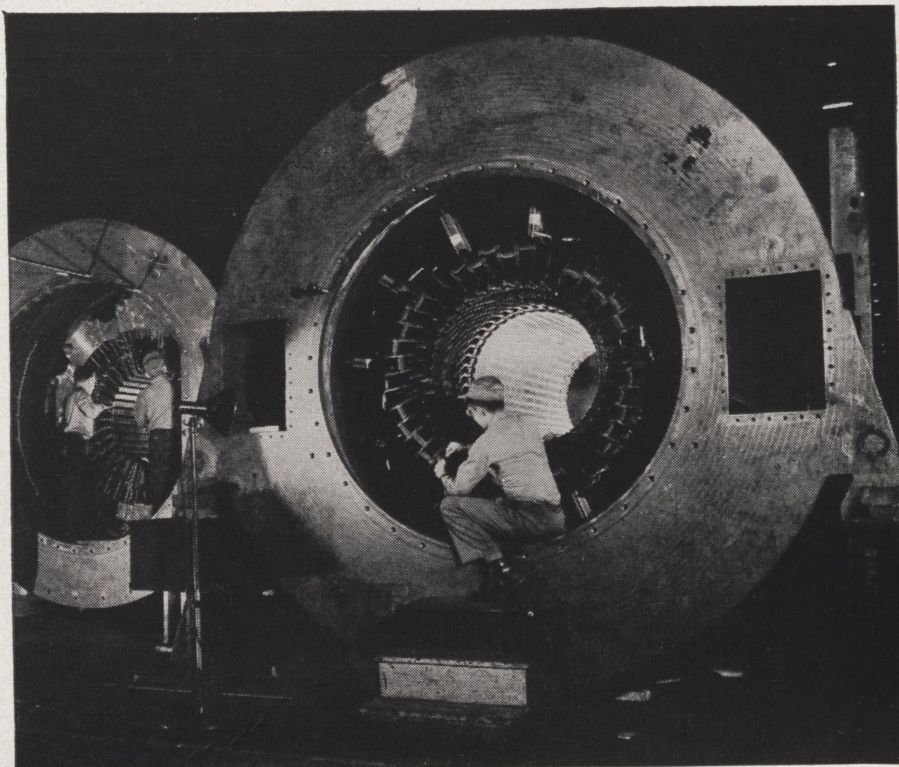
When I got my engineering degree from the University of Michigan, the electric power industry was a fast-growing youngster. I decided to go to Allis-Chalmers, where I joined the company's first Graduate Training Course in 1904. I was sent to Cincinnati and started in the old Bullock Electric Mfg. Co. plant that Allis-Chalmers had purchased that same year. Bullock, incidentally, started in 1884—one of the real old-timers in the electric industry. It was the start of the present Allis-Chalmers Electrical Department.

Opportunities Are Increasing

The industry was growing fast at the turn of the century, but it's growing even faster now. Opportunities were never greater—or more varied.



Studying power and capacity factors in ore crushing, in Allis-Chalmers' complete basic industries laboratory. Camera-recorded data will be applied to commercial mining operations.



Inside View of a hydrogen-cooled steam-turbine generator. A-C Graduate Training Course students may follow important electric power equipment from blueprint to installation.

Today we have Graduate Training Course engineers applying their ability and training to the problems of machine design—research and development—manufacturing and production—sales—application engineering. Here we're working with electric power generation, control and utilization—with advanced industrial uses of electronics—with research in D. C. transmission. We're in intimate touch with the electric power industries—with transportation—with steel, metal working and other big power users. And I know that the field is just as broad in the other major industry departments here at Allis-Chalmers.

What Industry Interests You?

I firmly believe that Graduate Training Course engineers have a unique opportunity at Allis-Chalmers. They have the opportunity here to explore thoroughly not one, but many basic industries if they choose. This company produces the world's widest range of major industrial equipment, and every department is open

to the graduate engineer. That includes electric power, mining and ore reduction, cement making, public works, steam turbines, pulp and wood processing. It also includes the full range of activities within each industry: design, manufacturing, sales, research, application, advertising.

Graduate students help plan their own courses at Allis-Chalmers, and they move around a good deal. It's possible for a man to come here with the idea of designing electrical equipment—later become interested in manufacturing—and finally find his greatest satisfaction and success in sales work. Men move from department to department, getting a practical working knowledge of each. And—the departments get to know the men. Opportunities present themselves according to ability.

At the completion of the Graduate Training Course, you've had a close-up of many industries. You're ready to take your place in the work of your choice.

Write for details of the Allis-Chalmers Graduate Training Course—requirements, salary, advantages. Representatives may visit your school. Watch for date.

Allis-Chalmers Manufacturing Company, Milwaukee 1, Wisconsin

ALLIS-CHALMERS



RESEARCH AND DEVELOPMENT

Concluded From Page 22

CUSTOMBILT-
Pipe

NOW
\$3.50



PIPE REPAIRING
BIEL'S

Terre Haute's Pipe House
420 Wabash Ave.

slightly with increased rpm.

Being balanced statically and dynamically, the three rotors will wear only from the friction contact, making breakdown highly improbable.

If four teeth are provided on the driving rotor to mesh with four rotors, the combustion rotors being placed 189 degrees apart, the unbalanced forces on each pair of teeth will cancel each other. Under these conditions the main rotor shaft will be subjected to torsion only.

If the seals around the piston can be designed to produce a compression of twelve to fourteen atmospheres, an exceptional diesel engine will result. If not, the rotary engine has great possibilities as an automobile power plant.

Ultrasonics

High-pitched sound from a little whistle, focussed to a point by an ordinary headlight reflector, can

perform such stunts as making cotton burn and floating bits of cork in mid-air.

Sound from the one-inch long whistle, which is blown by compressed air, is focussed to a point, like light brought to a point by a concave mirror. When bits of cork are placed directly above the focal point, they remain suspended, ladder-fashion, one-half wavelength apart. When cotton is held at the focal point, its particles are agitated by the unheard sound until the cotton smoulders.

The whistle is a hollow tube with air blowing across its mouth. The pitch can be adjusted by moving a tiny whistle which fits inside the tube. Engineers usually set the whistle to make sound waves with a frequency of about 25,000 beats per second. The human ear cannot hear frequencies much above 17,000 beats per second.

*"When You Say It With Flowers
Say It With Ours"*

THE BLOSSOM SHOP

Gladys Cowan Pound

113 N. 7th Street

Telephone C-3828

TERRE HAUTE, INDIANA

Member of Telegraph Delivery Service

Hillman's
TERRE HAUTE'S MOST INTERESTING STORE
612 WABASH AVE.

Terre Haute's Leading Jewelers for

- ♦ Nationally Famous Watches
- ♦ Fine Diamonds
- ♦ Silverware
- ♦ Crystal
- ♦ China
- ♦ Giftware

Use Hillman's Easy Budget

Pay Plan at No Extra Cost!

McMillan
ATHLETIC GOODS CO., Inc.

The Newest and Most
Complete Sporting
Goods Store In
Indiana

IT PAYS TO
PLAY

726 Wabash Ave.

Terre Haute
Indiana



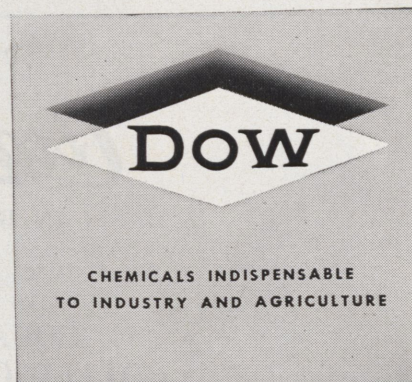
And the Termites cheered too!

SMALL WONDER! Wood stands, like those above that are exposed to damp, rainy weather and snow, rate high on the termite menu. In fact, it's safe to assume, all wood is considered fair game by termites.

Dow produces PENTACHLOROPHENOL to protect wood from the termite menace, as well as from decay due to excessive moisture. Wood protected with "PENTA" lasts years longer than untreated wood! "Wherever wood is used, consider the advantages of PENTA-protected lumber" is a phrase of in-

creasing significance to the farmer, home builder and industrialist. The chemical PENTACHLOROPHENOL is also used in the preservation of hemp, jute, and other cellulosic products that are often exposed to severe climatic conditions.

This is but one of more than 500 essential chemicals Dow produces. It has, however, *one characteristic common to all Dow products.* That is its high, uniform quality—a characteristic that has made the name Dow a standard in the chemical industry.



THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN

New York • Boston • Philadelphia • Washington • Cleveland • Detroit • Chicago • St. Louis • Houston • San Francisco • Los Angeles • Seattle • Dow Chemical of Canada, Limited, Toronto, Canada

Look To . . .

JOSEPH'S

Store For Men

636 Wabash

For New Styles

Greater Selection

Greater Values

In Men's Apparel

FRATERNITY NOTES

Concluded From Page 18

were as follows: Tom Leathers, Commander; Harold Skelley, Lt. Commander; Albert Sieler, Recorder; Donald Newkirk, Treasurer; Pierce Walinsky, Chaplain Bob Atherton, Reporter; Jack Bailey, Alumni Contact Officer.

It is interesting to note that Brother Leathers is one of the newer members of the chapter yet he has shown such enthusiasm that he has been elected commander.

Alpha Tau Omega

Chapter social activity for the past few weeks has included a stag held at Palace Gardens and several impromptu affairs at the house. Plans are in the offing for a dinner meeting to be held downtown, in order to discuss future housing plans with our alumni. With the coming of spring weather, plans are under way for a picnic.

Brother Hugh Hanna provided cigars for the chapter recently. No pin-giver this lad, he uses finger ornaments. The lucky lady — Miss Mary Lou Furst of Bedford.

● ARTWORK ● ENGRAVINGS ● PHOTOCOPIES

● DESIGN	● ETCHINGS	REPRODUCTIONS OF LETTERS
● LAYOUTS	● HALFTONES	● LEGAL PAPERS
● LETTERING	● COLOR PLATES	● BUSINESS RECORDS
● RETOUCHING	● EMBOSSED DIES	● CHECKS, CONTRACTS

Jerre Haute Engraving Co.
... TELEPHONE C-2151 ...



SHOE REPAIRING

Stafford Hat and Shoe Sanitarium

108 No. 7th St.

C-1654

DRINK

Coca-Cola

IN BOTTLES

"The Pause That Refreshes"

COCA-COLA
BOTTLING COMPANY

924 Lafayette Ave.

C-7094

MARTIN'S

PHOTO

SHOP

A PORTRAIT BY
MARTIN MAKES
AN ENDURING
PRESENT

"The Fountain Pen Store"

VIQUESNEY'S

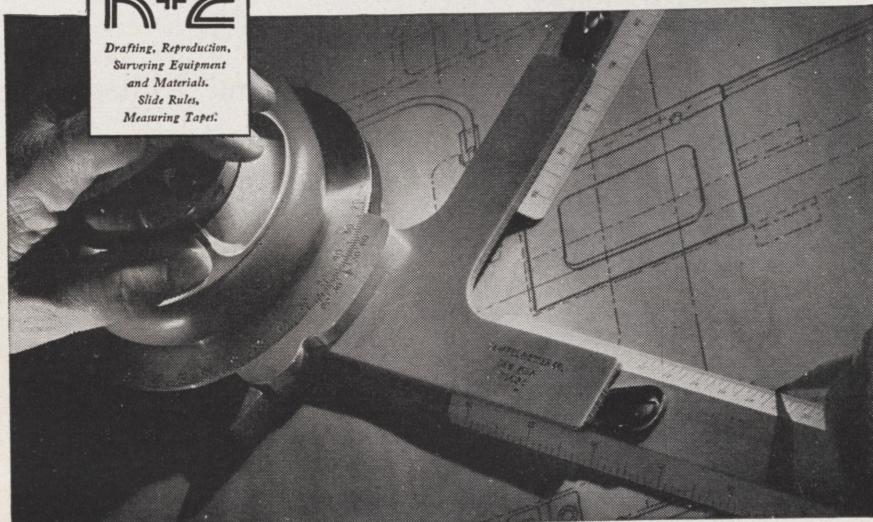
*Drawing Equipment
and
Supplies*

644 Wabash - 815 Ohio

TERRE HAUTE,
INDIANA

partners in creating

K & E drafting instruments, equipment and materials have been partners of leading engineers for 81 years in shaping the modern world. So extensively are these products used by successful men, it is self-evident that K & E has played a part in the completion of nearly every American engineering project of any magnitude.



KEUFFEL & ESSER CO.

EST. 1867

NEW YORK • HOBOKEN, N. J.

Chicago • St. Louis • Detroit
San Francisco • Los Angeles • Montreal



Wedding Rings

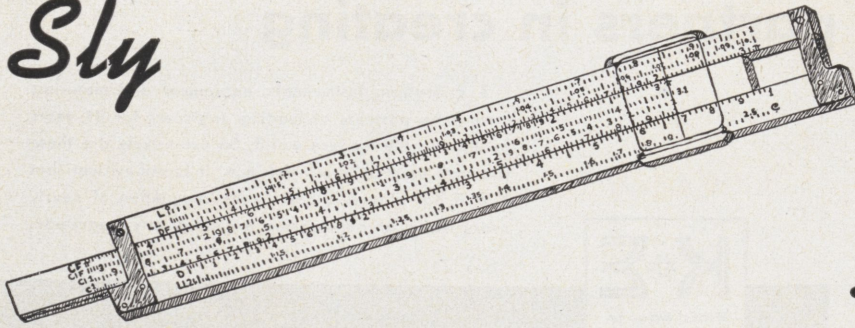
Come to Schmidt's when the necessity arises for that Extra Special Wedding Ring. We have most styles — Plain - Engraved - Diamond Set. Ruby set also in 14 kt Yellow Gold, White Gold, Palladium and Platinum.

Est. 1876

SCHMIDT'S 14 So. 7th St.

Terre Haute's Oldest Established Retail Jewelers

Sly



Droolings

By "Saint" Miller, soph.

Two small negro boys were sitting on the curb. One turned to the other and said, "Ah's five, how old is yo?"

"Ah doan know. Ah guess ah's five, too."

"Does yo dream of wimmen?"

"Nope."

"Yo's only foh."

* * * * *

"Ah wins."

"What you got?"

"Three aces."

"No you don't. Ah wins."

"What you got?"

"Two eights an' a razor."

"You sho do. How cum you so lucky?"

* * * * *

"Waiter! Some tomato juice for an early morning pickup!"

"Very well—and what will you have for yourself?"

* * * * *

W. Ham: "Give me some of that prepared aminoaceticacidester of salicylic acid."

Doc Strong: "Do you mean aspirin?"

W. Ham: "Yeah, I never can remember the name of that stuff."

* * * * *

Inflation

A fellow selected six apples in a grocery store. "\$1.65, please," said the clerk. The fellow handed the clerk \$2.00 and started to walk out of the store. "You forgot your change, sir" called the clerk. "That's all right, you keep it," retorted the customer. "I stepped on a grape on the way in."

* * * * *

Fraternity House Rules

No liquor allowed in the rooms. Do not throw bottles out the windows.

* * * * *

How do you manage to keep drinking the coffee in the dorm every morning?

I take a spoonful of drano every week.

"Do you neck?"

"That's my business."

"Oh, good, a professional."

* * * * *

Coed: "You're awfully bashful, aren't you? Now look out I'm going to scare you! (She kissed him). Now you try to scare me."

Engineer: "Boo."

* * * * *

She: "Where did you learn to kiss like that?"

He: "I eat spaghetti."

* * * * *

Mother, are there any skyscrapers in heaven?

No, son, Civils build skyscrapers.

* * * * *

I guess I've lost another pupil, the professor said as his glass eye rolled down the sink.

* * * * *

Mail orderly at mail call: "Letter for Cdadwinsxkcidnosly."

Voice from the back of the room: "What initial?"

* * * * *

"Are you positive that defendant was drunk?" asked the judge.

"No doubt," growled the officer.

"Why are you so certain?"

"Well," replied the officer, I saw him put a penny in the mail box, look up at the clock on the Burton Tower and shout: 'By God, I've lost fourteen pounds!'"

* * * * *

Mary: "Why do you go to dances with a dope like that? He can't dance!"

Jane: "Maybe he can't dance, but boy, how he can intermission!"

* * * * *

Recent tests conducted by the Physics Department prove that grasshoppers hear with their legs. In all cases the insects hopped when a tuning fork was sounded nearby. There was no reaction to this stimulus, however, when the insects' legs were removed.

The moon was yellow, the lane was bright,

As she turned to me in the night. Every gesture and every glance Gave the hint she craved romance, I stammered, I stuttered, and time went by—

The moon was yellow, and so was I.

* * * * *

Her: "I'm so discouraged. Everything I do seems to be wrong."

He: "What are you doing tonight?"

* * * * *

Three monkeys sat in a coconut tree,

Discussing things that are said to be;

Said one to the other, "Listen, you two,

There's a rumor that can't be true: "That man descend from our noble race,

The very idea! It's a dire disgrace! No monkey ever deserted his wife, Starved his baby, and ruined her life.

"And another thing, you'll never see,

A monk build a fence 'round a coconut tree,

And let the contents go to waste, Forbidding all other monkeys to taste.

"If I put a fence around this tree, Starvation'd force you to steal from me;

Here's another thing a monk won't do,

Go out at night and get on a stew. "Or use a gun or club or knife

To take some other monkey's life: Yes, man descended, the onery cuss,

But, brothers he didn't descend from us!"

* * * * *

Engineers wonder why girls with streamlined figures offer the most resistance.

* * * * *

A true music lover is one who upon hearing a soprano in the bathroom, puts his ear to the keyhole.

Photography can make this page

this  small

IT'S DONE WITH MICROFILM MAGIC

TINY AS IT IS, the little rectangle above is this page in black and white—as it appears on microfilm. Everything there, condensed to a mere spot, but ready to be brought back full size with all its features intact. For photography can reduce tremendously without losing a detail.

As a business or professional man, you can utilize photography's reducing ability in any of many important ways.

You can utilize it to save space . . . to speed reference. With Recordak microfilming, you can "debulk" files 99% . . . keep the records at hand for quick viewing, full size, in a Recordak Reader.

You can utilize photography to make sales presentations more complete, more resultful. With

motion pictures, you can "pack" a plow, a plant, a whole process into a small can of film . . . travel it where you will, show it off "large as life" and much more dramatically.

Only a suggestion . . . this . . . of what photography can do because it is able to condense. And because it has many other unique characteristics as well, photography is becoming an increasingly important tool all through science, business, and manufacturing.

Whenever you want to improve methods of recording, measuring, testing, teaching, or countless other functions, be sure to consider the unusual abilities and advantages of photography.

Eastman Kodak Co., Rochester 4, N. Y.

Functional Photography

—is advancing business and industrial technics.

Kodak

Always Buy CHESTERFIELD

"When you smoke
Chesterfield you get a Milder
cooler smoke - that's why
it's my cigarette"

John Lund

STARRING IN
"BRIDE OF VENGEANCE"
A PARAMOUNT PICTURE



Prominent Tobacco Farmers smoke Chesterfield

JAMES H. DARDEN, Farmville, N. C. says

"I've smoked Chesterfields steady for 12 years.
They're really Milder. They buy mild, ripe, sweet-
smoking tobacco . . . the kind that ends up in real
smoking satisfaction."



THE BEST CIGARETTE FOR YOU TO SMOKE - Milder *much* Milder