Winter 12-1950

Volume 62 - Issue 3 - December, 1950

Rose Technic Staff
Rose-Hulman Institute of Technology

Rose Technic

Seasons Greetings

MEMBER ENGINEERING COLLEGE MAGAZINES ASSOCIATED

DECEMBER, 1950

CARGO: Big Business for Little Businessmen!

YOUR Mobilgas dealer has a stake in this tanker—and in *all* facilities we own or charter. So do 46,400 dealers and jobbers like him!

For fine quality product, efficiently supplied, competitive in price, is the very life-blood of "little" business, any business.

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The same thing is true of Socony-Vacuum's modern laboratories—the advanced refining methods and equipment with which we work to produce the *most* product of *highest* quality at *lowest* cost.

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YOUR NATION
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YOUR INDUSTRIES
are only as strong as your Companies

YOUR COMPANIES
are only as strong as their ability to give you

Your Biggest Money's-Worth!

SOCONY-VACUUM

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Rose Technic

VOLUME LXII, NO. 3 DECEMBER, 1950

In This Issue

Cover

A Christmas design by Richard B. Deane, Rose Polytechnic student.

Frontispiece

Wire vaporized by five million volts of man-made lightning. Courtesy of the General Electric Company.

PHOTO CREDITS: Pages 8 and 9, The American Bridge Company. Page 11, E. I. du Pont de Nemours & Company, Inc. Page 12, U. S. Air Force.

PRINTED BY MOORE-LANGEN PRINTING AND PUBLISHING CO.
140 North Sixth Street, Terre Haute, Ind.

Published monthly except June, July, August, and September 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.

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and 605 N. Michigan Avenue,
Chicago, Illinois

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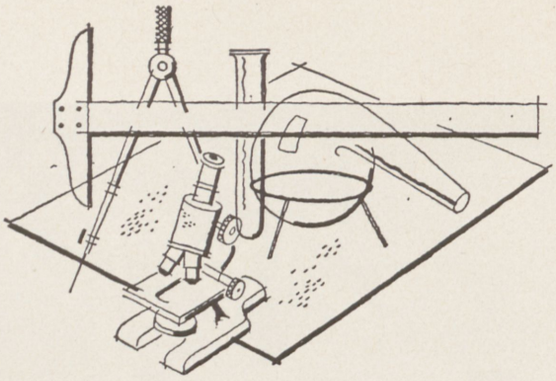
FRESHMAN DORMITORY

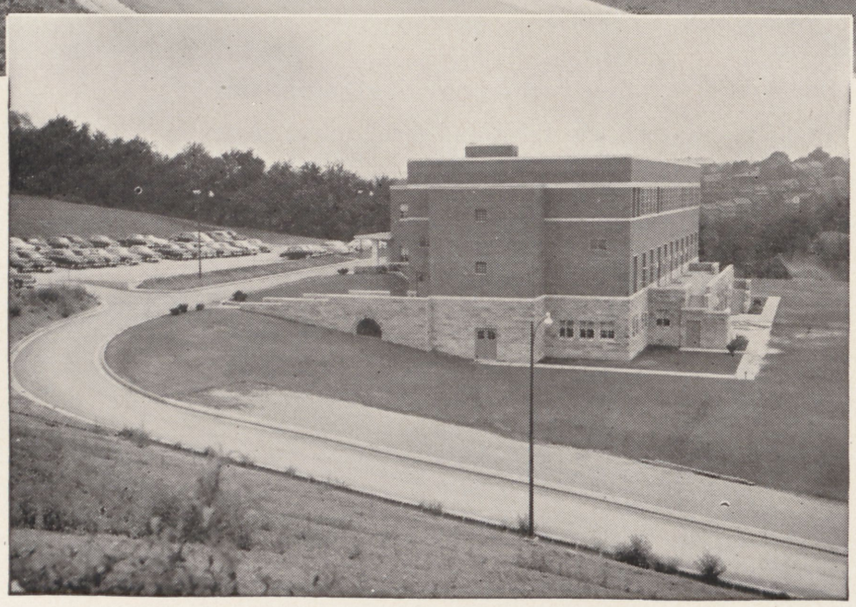
Rose Polytechnic Institute offers four years, accredited courses leading to the degree of B. S. in chemical, civil, electrica and mechanical engineering. For information about entrance requirements, scholarships and curricula, address the Admissions Counselor.

ROSE POLYTECHNIC INSTITUTE

Terre Haute, Indiana



Dedicated to



The new home of the Westinghouse Educational Center where new employees from engineering colleges receive an orientation and training program to help them find the kind of work they like to do and are likely to do best. Hundreds of experienced professional people help carry out this program. A Graduate Study Program is also made available through which advanced degrees may be obtained.

A PRICELESS ASSET...

Building solidly for tomorrow is an important phase of modern business . . . building men for positions of leadership.

For more than half a century, Westinghouse has placed major emphasis on this activity . . . pioneering in student training . . . graduate study courses . . . encouragement of scientific training through scholarships and fellowships . . . and in many other ways.

Now we dedicate an entire new building to this purpose—the Westinghouse Educational Center—a building devoted to the self-improvement of men . . . dedicated to developing leadership.

Here, top students who are recruited at leading engineering schools for positions in engineering, manufacturing, sales and research, come for an orientation and training course that provides their first intimate view of the electrical manufacturing industry . . . and the varied opportunities it offers.

Every facility has been provided to help these men get off to a firm, fast start . . . modern class rooms equipped for visual education . . . a large auditorium with complete stage and projection room facilities . . . and a large, comfortable library and study hall. Here an intensive course of study is given by engineers and scientists who are top-ranking men in their fields.

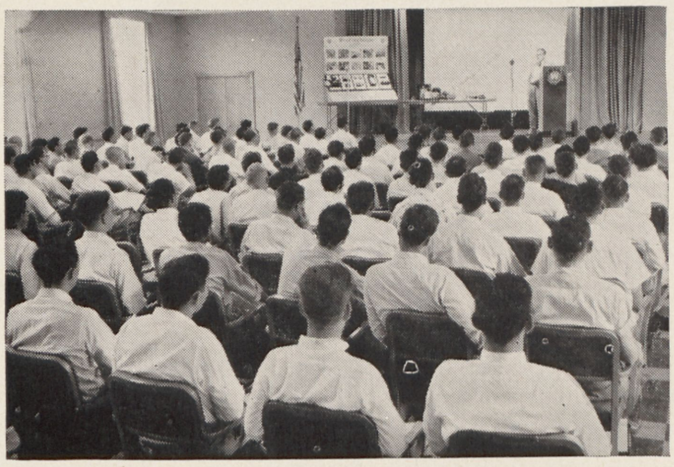
These same facilities are also adequate to take care of the needs of post-training-course employees who are participating in the Graduate Study Program and the many other educational activities of Westinghouse.

For their convenience and comfort, there is a cafeteria and generous space for formal and informal gatherings. For relaxation and recreation, there are hobby, billiard and game rooms and outdoor recreation facilities.

Here, then, is a building dedicated to developing leadership . . . that priceless asset of a strong organization . . . able management and professional leadership for tomorrow. Another reason we say with confidence . . .

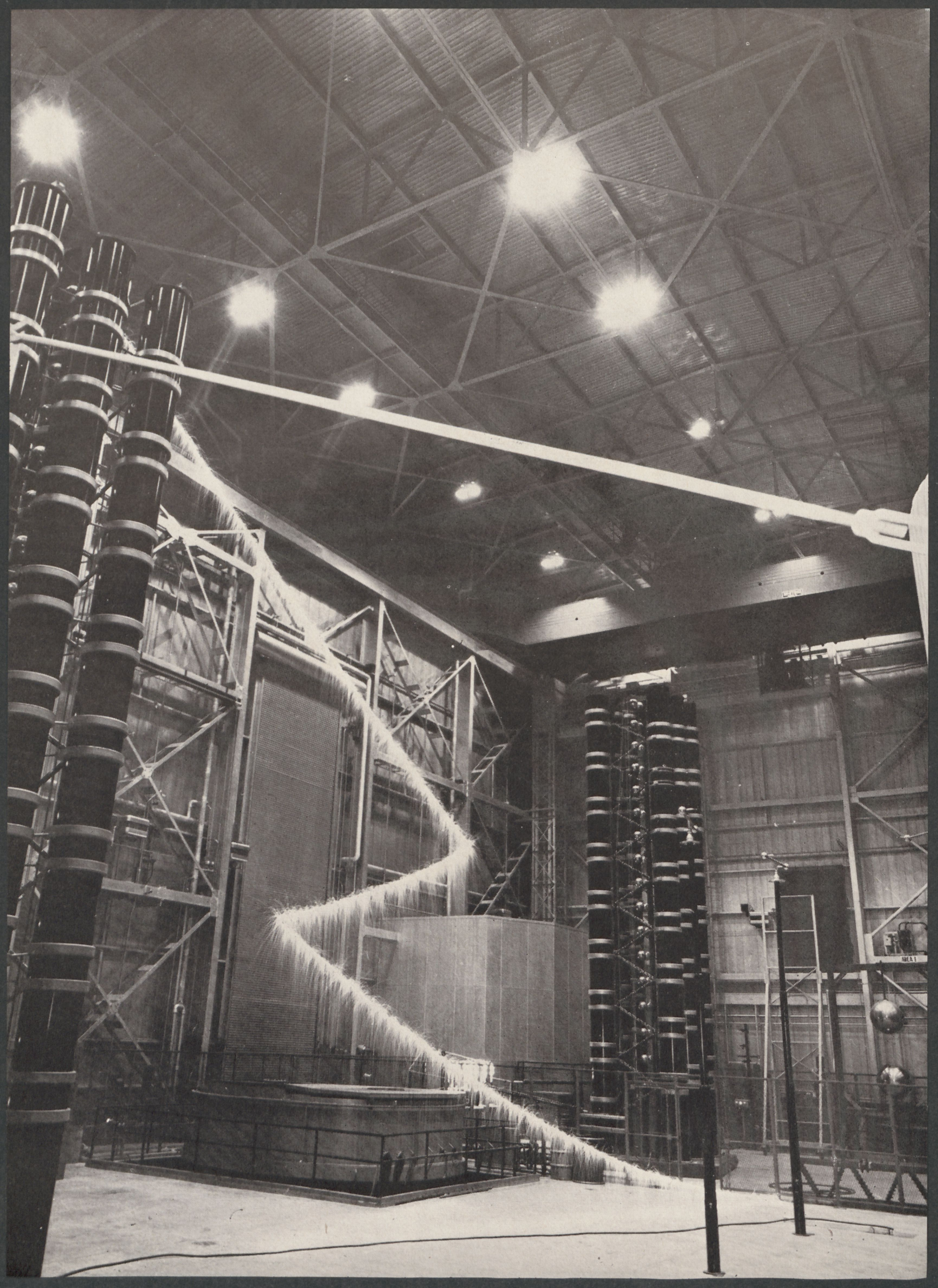
G-10116

YOU CAN BE SURE..IF IT'S Westinghouse



Aided by the most modern facilities, experienced professional people provide a panoramic view of the research, engineering and manufacturing that go into Westinghouse products and the techniques used in marketing them.

In planning the new Educational Center, careful thought was given to recreation. A spacious lounge, hobby and game rooms, a billiard room, facilities for indoor and outdoor sports along with a convenient cafeteria—all contribute to a well-rounded program.



A Merry Christmas

And

A Happy New Year

From The

Technic Staff

Oakland Bay Bridge

By Thomas B. O'Brien, sr., c.e.

History reveals that in 1856, eight years after the discovery of gold in California, the pioneers dreamed of a bridge joining San Francisco with the east shore of the bay. By 1900 the need for the bridge was generally recognized; however, the disastrous fire and earthquake in 1906 caused plans for such a bridge to be abandoned. A ferry system was organized a few years later that did much to relieve the ever-increasing flow of traffic across the bay.

By 1929 the need for the bridge had become so great that President Hoover announced the appointment of the Hoover-Young Commission, and the state legislature passed the California Toll Bridge Authority Act. The Hoover-Young Commission was organized to aid the state put the project under way.

Aerial View

The Commission placed C. H. Purcell, State Highway Engineer and Secretary of the Commission, and C. E. Andrews, Bridge Engineer, State Division of Highways, in charge of studies and investigations of the engineering and location problems. It soon became evident that a bridge from Rincon Hill in San Francisco to Yerba Buena Island, and then to Oakland would be in the most advantageous location.

During the next two years the engineers and architects designed the giant structure and studied the problem of obtaining suitable underwater footing for the numerous piers that would be necessary before the actual bridge could be started. Bonds were sold to the Reconstruction Finance Corporation to obtain funds for the structure, and a final permit for construction was issued by the War Department in accordance with the plans submitted.

Before the Bay Bridge could be started, it was necessary for the engineers to solve numerous problems concerning the 51 piers that were used on the project. In the West Bay it was necessary to put piers down from 100 to 241 feet below water level in the solid bedrock on the floor of the deep channel. In the East Bay the water was not so deep, but the bedrock was covered by a deep layer of mud and silt. For one of the piers in the East Bay, it was necessary to go down 242 feet below the surface of the water.

The solution to the problem was obtained with the development of the Moran Caisson by D. E. Moran, a consultant on the project. Because of the great depth of the piers, it was impossible for men to work in the ordinary type of caisson under

high pressures. The Moran Caisson consists of a rectangular timber box with a number of open steel cylinders inside. The weight necessary to sink the giant caissons was obtained by pouring concrete into the crosswalls and the space above the cutting edges on the bottom. The cylinders can be capped or left open in order to facilitate proper sinking without tipping.

After the caisson was resting in the mud on the bay floor, the cylinder domes were removed, and the mud excavated by clamshell buckets. When the mud had been removed, the cylinders and the spaces between them were filled with concrete to a depth of thirty-four feet. The three cylinders on each corner of the caisson were completely filled to support the top of the pier.

The construction of the substructures proceeded rapidly after the Moran Caisson had been perfected; nevertheless, the engineers all gave a sigh of relief when the last pier had been poured because, as any builder of bridges will tell you, "big bridges are built under water."

The bay between San Francisco and Yerba Buena Island is spanned by the largest twin suspension bridges in the world. They have main spans of 2310 feet and end spans of 1160 feet. The two bridges are placed end to end, tandem fashion, and are connected by a large concrete anchor pier that anchors all of the unbalanced loads acting on the bridge. The anchorage on Yerba Island is formed in solid rock, and the San Francisco anchorage is made of concrete.

The erection of suspension always proceeds without the use of falsework and in a fairly definite order. The normal order of erection is: substructures, towers, anchorages, foot bridges, cables, suspenders, stiffening trusses and floor system, roadways, and cable wrapping.

The cables of the twin suspension bridges over the West Bay are supported by four identical towers. The maximum load on each tower is must be able to move a small disabout 65,000,000 pounds; the towers tance in the vertical plane of the bridge with varying loads and temperatures.

The method used in the erection of the towers followed the general method that was perfected by Roebling on the Brooklyn Bridge nearly 75 years earlier.

A large stiff leg derrick was set up on each pier between the bases of the columns. The tower sections, which were fabricated in the shop, were then towed to the pier site on barges. They were then unloaded and set by the stiff leg derrick to a height of 75 feet. A large hammerhead derrick was then set up in each column on top of a vertical mast that was 108 feet long. The hammerhead derricks were used to pick the remaining tower sections up and set them for fastening, and the stiff leg derricks were used to remove the sections from the barges and set them on the piers. Each of the sections that were erected after the hammerhead derricks were in operation was 50 feet high; after each of these sections were fastened, the hammerheads were raised 50 feet by lines fastened to the top of the steel and made fast in the new position.

The bending moments set up at the top of the main mast by the heavy sections being lifted were re-

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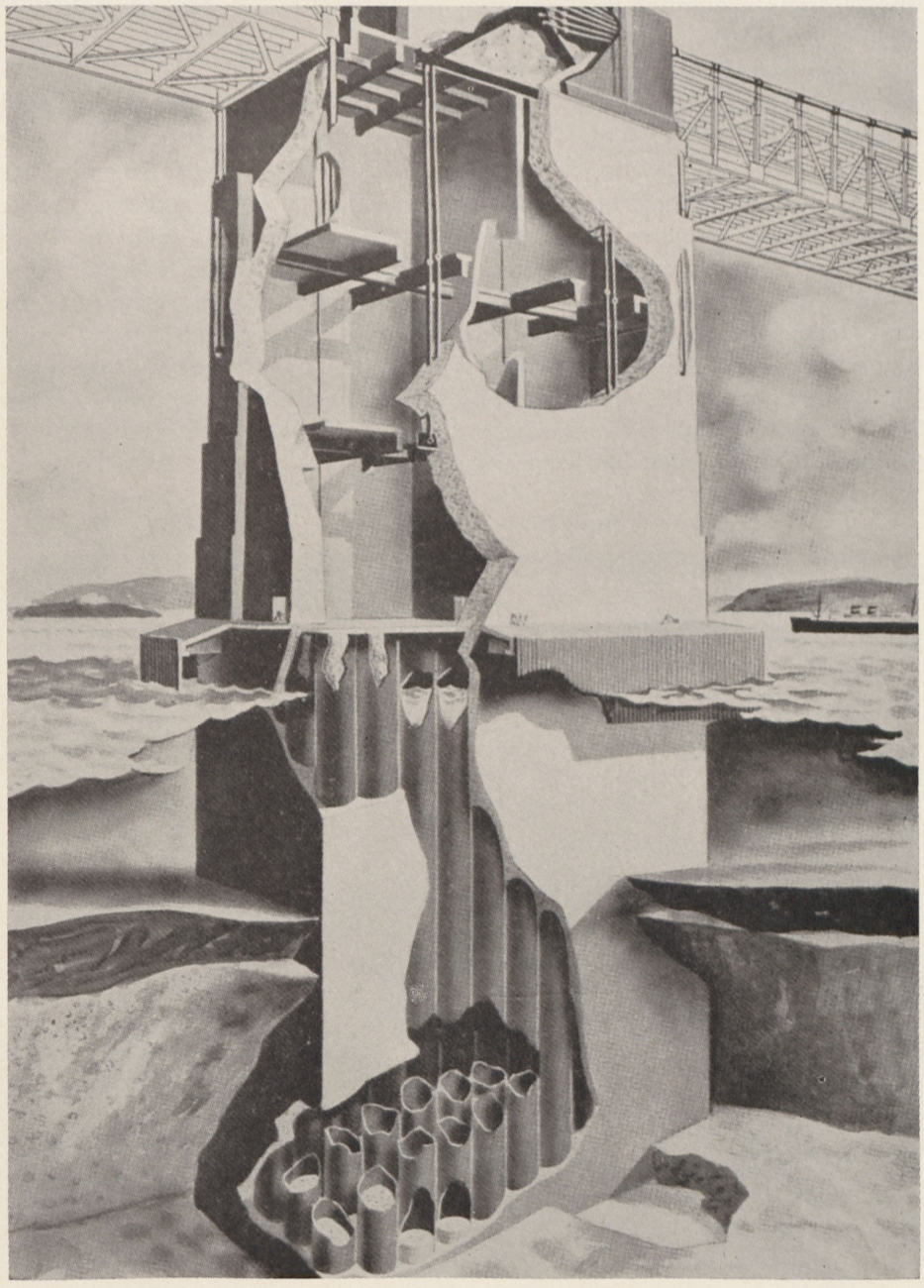
Section of Pier



Campus Survey

By James Myers, jr. e. e., Duane Pyle, jr. c. e.,
Allan Forsaith, jr. m. e., and Carl Bals, jr. ch. e.

"So Long, Rosie"

After her last, infamous journey, the trip to Franklin, Rosie sat forlornly in a corner of the field house, watching sadly as a new Rosie was constructed. Her tires were flat, her sides de-plastered. Briefly, Rosie looked beat.

The old Rosie was mercifully put out of her misery at the half of the season's last football game, at which time she was dynamited and burned.

Her exploits were many; her fame was renowned. Her spirit lives on in the new Rosie.

Basketball Team

The basketball picture for the 1950-51 edition of the Fighting Engineers appears brighter than it has for several seasons past. This year's squad is bolstered by seven returning lettermen: Warren Allen, senior; Ralph Bennett, Bob Delp, Philip Gardner, Leo Little, and Marvin Stohler, juniors; and Harry Badger, sophomore. Completing the team are Don James, senior; Kenneth Brinson, sophomore; Vernon Bertram, Donald Berry, Roy England, Richard Green, Robert Rader, George Ross, and Harry Zorman, freshmen.

This season Coach Jim Carr is blessed with good reserve talent, a moderate amount of height, and some fast, scrappy ball handlers. With plenty of support from the student body the team should be our best of the postwar period.

"The Gray Memorial Entrance"

Work has almost been completed on the colorful, Mansfield-sandstone gateway to Rose. Yet to be added are ornamental lighting and two bronze plaques inscribed as follows: "Rose Polytechnic Institute 1874-1950" and "The Gray Memorial Entrance to the Memory of Chesleigh 'Dolly' Gray, 1913, and of Margaret Melrose Gray, his mother, By his wife and daughters."

The entrance area is to be landscaped by Haas Nurseries with tall shrubs in the background and low shrubs in front. The attractive brown sandstone used in the structure has the peculiar property of hardening as it ages.

At the time of his death, Mr. Gray was the moving spirit in a plan to build paved roads on the Rose campus. Lacking his guidance this plan could not be completed. The roads were, however, recently resurfaced with oil donated by the Ohio Oil Company through the courtesy of H. C. Offut,; equipment and labor were donated by W. L. White and Son of Terre Haute. When weather permits, the entrance will be curbed, with flaring approaches.

The gateway, designed by Wilbur Shook, '11, was contracted to the Terre Haute Monument Company and was sublet to R. G. Maskell, stonecutters. It will be dedicated next Homecoming.

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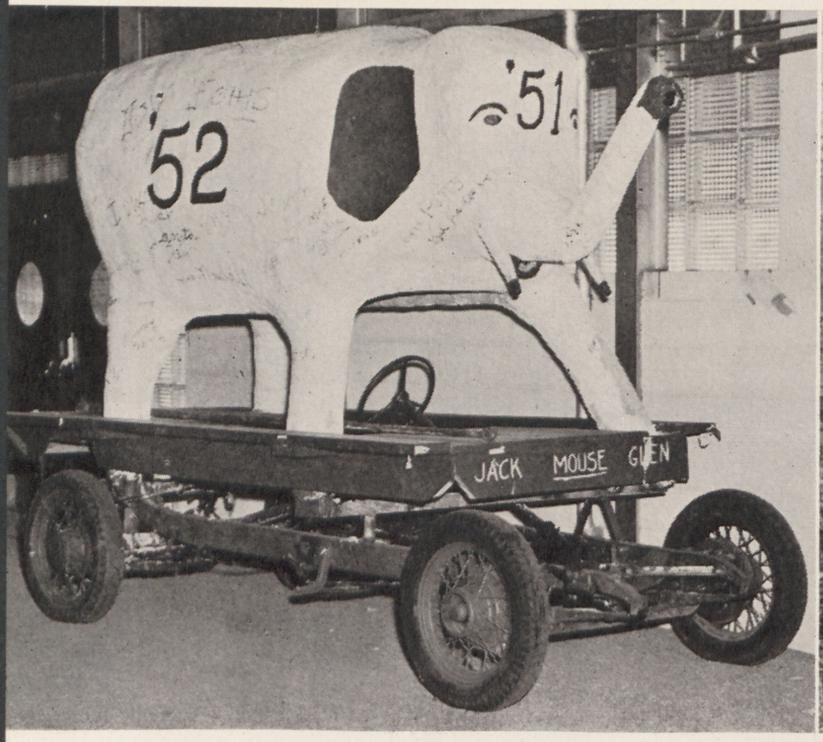
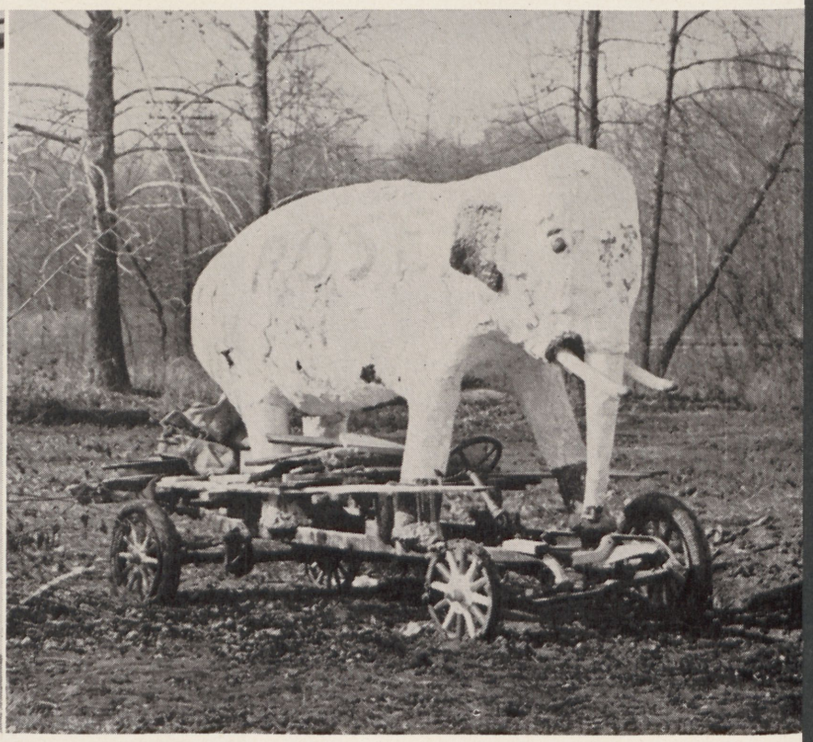
May Our New Rosie Serve . . .



As Well As The Old .



Metal of Importance

By Robert Ray, soph., m.e.

One metal used extensively in modern manufacturing is sodium, one of the highly reactive light metals. Although millions of pounds of sodium are used annually in industry, very little of the metal exists for any time as pure sodium. Sodium compounds, however, are used in a wide variety of industries.

Sodium chloride finds the greatest market of all the sodium compounds. Salt is used in brine solutions, in the soda ash industry, where sodium carbonate and bicarbonate are manufactured, and in every kitchen.

Next to sodium chloride, from which it is produced, soda ash, or sodium carbonate is the most widely used of all sodium compounds. More than 1,500,000 tons are consumed yearly in the United States as the starting point for compounding other sodium chemicals. An equal amount is used each year to make glass, soap, cleaning compounds, paper, leather, and water softeners and to help refine oil.

The tetraethyl lead industry consumes the greatest amount of metallic sodium in creating a fluid that raises the octane number of gasoline and cuts down engine knock. Metallic sodium is also used in synthesizing bluing, the laundry bleach which originally was extracted from the indigo plant of India and the East.

Sodium peroxide and sodium cyanide are two important compounds made from metallic sodium. The moving parts in many machines—such as cars and sewing machines—are made more wear-resistant by treatment in a molten bath of sodium cyanide. Electroplating, which utilizes millions of pounds of this chemical, increases the beauty and utility of automobiles, silver plate, radios, lamps, and the like. Sodium peroxide is an important bleach for paper and textiles. For instance, the paper in magazines contains ground wood that has been bleached with sodium peroxide.

Other important products manufactured with the aid of sodium, but containing none of this versatile material, are chemical intermediates and pharmaceuticals. The latter include healing sulfa drugs, barbituate sedatives, anti-histamines for the treatment of colds. Some of the alluring scents of perfumes have been synthesized through chemical reactions using the metal.

Experimental treatment to stop tooth decay was recently conducted on a group of school children. The tests were completely successful, and it is thought that tooth decay in children can eventually be wiped out. A dilute solution of sodium fluoride in water, when allowed to act on teeth, forms a hard acid-resisting coating on the teeth which has been found to be almost impenetrable by decay. The treatment is inexpensive, easily administered, and may, it is hoped, someday be a part of the health program of every school in the country.

A pinch of bicarbonate of soda may someday be used to improve the performance of athletes and others engaged in tasks requiring physical exercise. Dr. W. E. Berg, of the University of California, found that the rate at which the body can rid itself of waste carbon dioxide is an indicator of physical fitness and of the efficiency of the circulatory system. In his experiments, Dr. Berg found that bicarbonate of soda can increase the rate of elimination of carbon dioxide from the body and thus increase physical efficiency.

Sodium is used extensively in the manufacture of compounds which

Continued on Page 28

Casehardening With Cyanide

Research and Development

By Fritz Wheeler, soph., e.e.

U. S. Air Force planes in trouble will soon be able to call for help with a chain of automatic distress signals, thanks to an emergency keyer.

When a plane equipped with the new keyer gets into difficulty, the pilot must only flip a simple switch and here's what happens: The unit will automatically retune the aircraft's radio transmitter to the emergency channel and transmit the plane's identification or call sign plus a series of SOS's and radio signals that will aid ground direction equipment in establishing an approximate location. This sequence is repeated until the unit is either turned off or rendered inoperable.

Normally, when a pilot realizes his plane is in danger he must notify the radio operator who in turn must tune his transmitter. This, plus actually sending the distress signal, consumes so much time that often the radio operator is unable to complete his sequence before the crash or forced landing occurs.

Now, with the new emergency keyer the distress signal sequence can be transmitted during the time the crew is readying for a crash—transmitted automatically and without further aid of a radio operator.

Designed for use with any present standard airborne communication transmitter as well as any transmitter now under development for future standardization, the keyer is slated for installation in most USAF aircraft. It requires no shock mounting and can be installed any place in a plane suitable for wiring into the communication transmitter system. Including its control panel, the tiny device measures 3 ½ by 4 by 6 inches and weighs only 4 ½ pounds.

The keyer's design permits operation without interference with the normal operation of the communication equipment to which it is connected. A warning light on the control panel and control box tells the pilot or radio operator when the keying unit is operating. When the unit is switched out of operation, the transmitter with which it works automatically returns to its original operating frequency. Code wheels are constructed and arranged so that the call sign of the aircraft may be easily set up or changed by the operator or regular maintenance personnel.

Visor for Jet Pilots

A spherical visor that virtually glues a crash helmet to a flier's head in bailouts of more than 500 miles an hour has been developed.

This important new advance in protective helmet design for the first time insures a pilot that his helmet—with its life-giving oxygen equipment—will stay with him in high speed escapes from jet aircraft. Before the visor's development, no protective helmet would remain on in bailouts that approached the 400 mph mark.

The visor, which is now being standardized by the USAF, will be added to the old P-1 protective helmet and its newer sister, the P-1A.

Portable Abrasion Tester

A portable yet highly dependable device for testing the abrasion resistance of floor surfaces has recently been developed by D. W. Kessler of the National Bureau of Standards. By providing a simple, convenient method of testing each floor tile before it is laid, this field abrasion tester has successfully provided the means long sought for in preventing unequal wear of floor surfaces. Difficulty in the past has grown out of the fact that floor tiles exposed to severe traffic must have approximately the same abrasion resistance; otherwise the floor surface will become uneven with time. Moreover, the device is also proving useful in the development of better purchase specifications for natural corundum; this is possible because corundum grains rather than an abrasive wheel is utilized in the tester.

Visor for Jet Pilots

BELL TELEPHONE SYSTEM

Alumni News

Professor Knipmeyer Honored

Professor Clarence Carl Knipmeyer, was named Engineer of the Year 1950 in Indiana last night at the Annual Convention of the Indiana Society of Professional Engineers held in Ft. Wayne.

Professor Knipmeyer is head of the School of Electrical Engineering of the Rose Polytechnic Institute in Terre Haute, a position he has held since 1920. He has taught electrical engineering there since 1909.

The award was announced by R. P. Cheesman, Ft. Wayne Professional Engineer and Chairman of the selection committee, at the closing Banquet of the Convention, held at the Hotel Van Orman.

A University of Michigan graduate in Electrical Engineering, Professor Knipmeyer taught at Massachusetts Institute of Technology for two years before joining the staff of Rose Polytechnic Institute. He also acts as Engineering consultant for many industries in the Terre Haute area.

He was recognized for his outstanding record as a teacher of engineering, and also for his advancement of the engineering profession. He is chairman of the Indiana State Board of Registration for Professional Engineers and Land Surveyors, having served on the Board since 1933, and contributed greatly toward the present advanced laws covering engineering registration.

As chairman for the last five years of the Southwest Region Committee of Engineering Schools, a part of the Engineers' Council for Professional Development, Professor Knipmeyer has had charge of the program of inspecting and accrediting engineering schools in the entire Southwestern region of the United States.

He was recognized internationally when in 1942 he was one of ten leading engineers from this country initiated into the "Calling of an Engineer" by the Engineering Institute of Canada.

He was commissioned as a major in the Army Specialist Reserve, where he was responsible for studies of the projected mid-west power pool for mobilization purposes.

A Professional Engineer, Professor Knipmeyer holds membership in the National and Indiana Societies of Professional Engineers, the American Society for Engineering Education, the American Association of University Professors, the American Association for the Advancement of Science, Sigma Xi, Tau Beta Pi, and a life membership in the American Institute of Electrical Engineers.

Alumni News

'93 C. E. Albert, associated with the United States Playing Card Company for fifty-four years, and a former president of the company, was recently elected to the post of chairman of the board for the company.

'17 Harry Knox, factory manager of the American Laundry Machinery Company was made assistant chairman of the Bloody Run Boy Scout District.

'97 Maurice C. Rypinski passed away November 7, in La Jolla, California. He was born in Texas and graduated in Electrical Engineering from Rose. Beforing retiring in 1931 he had been associated with the General Electric Company, the Westinghouse Electric Company, and the Kolster Radio Corporation in engineering, sales, and administrative capacities.

During his association with the Westinghouse Company, Mr. Rypinski, foreseeing the tremendous possibilities of what was then known as "wireless", was largely responsible for that company's founding of the first broadcasting station KDKA and its entrance into the radio manufacturing business.

At the time of his retirement, Mr. Rypinski was vice-president of the Kolster Radio Corporation and shortly thereafter came to California where he lived in the Los Angeles area.

Mr. Rypinski was an enthusiastic amateur photographer for most of his life. He was an active member and a past president of the La Jolla Camera Club and an active member of the Photographic Society of America and former member of the Royal Photographic Society of Great Britain.

'25 Henry L. Maury, Jr., is a plant superintendent for the Ohio Edison Company at Shadyside, Ohio.

'27 Raymond R. Davis is now located in Campbell, California, where he operates the Pacific Blueprint Company.

'23 Colonel Harold T. Lentz has been assigned to the Engineer Section of the Japan Logistical Command, with headquarters in Yoko-

Helping the world get its bearings

ALL THE WORLD MOVES ON BEARINGS—bearings of steel, of wood, of plastic, of rubber, of carbon, yes, even bearings of ruby and sapphire. All of them reduce the friction of moving parts. Every time you start your car or plug in your vacuum cleaner it is bearings that make possible smooth, efficient action at a variety of speeds and under almost any operating load.

Great roller and ball bearings of special alloy steels, running on their own smooth tracks, support our giant locomotives. Small bearings that fit in the palm of your hand are vital to your lawn mower, your washing machine motor, your mixer. And bearings, known as jewels, of ruby and sapphire, smaller than the head of a pin, increase the precision of your watch.

Other materials bring you other kinds of bearings, too. Carbon provides bearings in special cases where chemicals would attack metals. And in many ships the propeller shaft turns in plastic bearings that are not affected by salt water.

The people of Union Carbide have a hand in providing better materials that go into bearings of all sorts. Perhaps they can help solve your problems with materials of these or other kinds.

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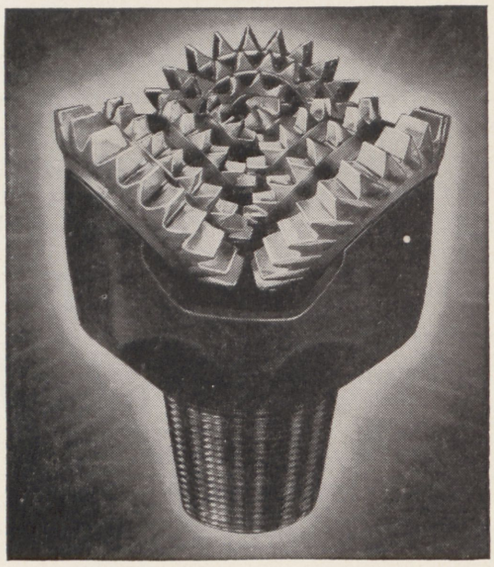
Only STEEL can do so many jobs

PRELUDE TO A SQUARE MEAL. Today, about 12½% of our population works on farms and ranches, supplying food for America and the world. And steel, more than any other material, has helped to make their work easier, their production greater, their lives pleasanter. For steel not only gives them strong, weather-proof roofing and siding for farm buildings like these, (U·S·S Stormseal and U·S·S Tenneseal are famous names in rural areas) but helps to bring them modern farm machinery and equipment, the blessings of electricity, fast transportation and scores of other benefits.



THE CAP IS THE CLIMAX. Many of the things we need to keep us healthy and happy these days come to us in handy, closed containers. And the caps, or closures, of these containers are actually the climax to a painstaking effort on the manufacturer's part to keep the container's contents pure and safe. Last year, 53,592,563,699 of these closures were used in America—many of them made from U·S·S Tin Plate... steel with a very thin coating of tin.

KEY TO BURIED TREASURE. This is a rock bit, the steel drilling tool that chews its way down through the earth to tap our deeply-buried treasures of oil and gas. For such bits, U·S·S Alloy Steels supply the super-strength, the extra toughness, the high resistance to impact, shock and abrasion needed for drilling to great depths.

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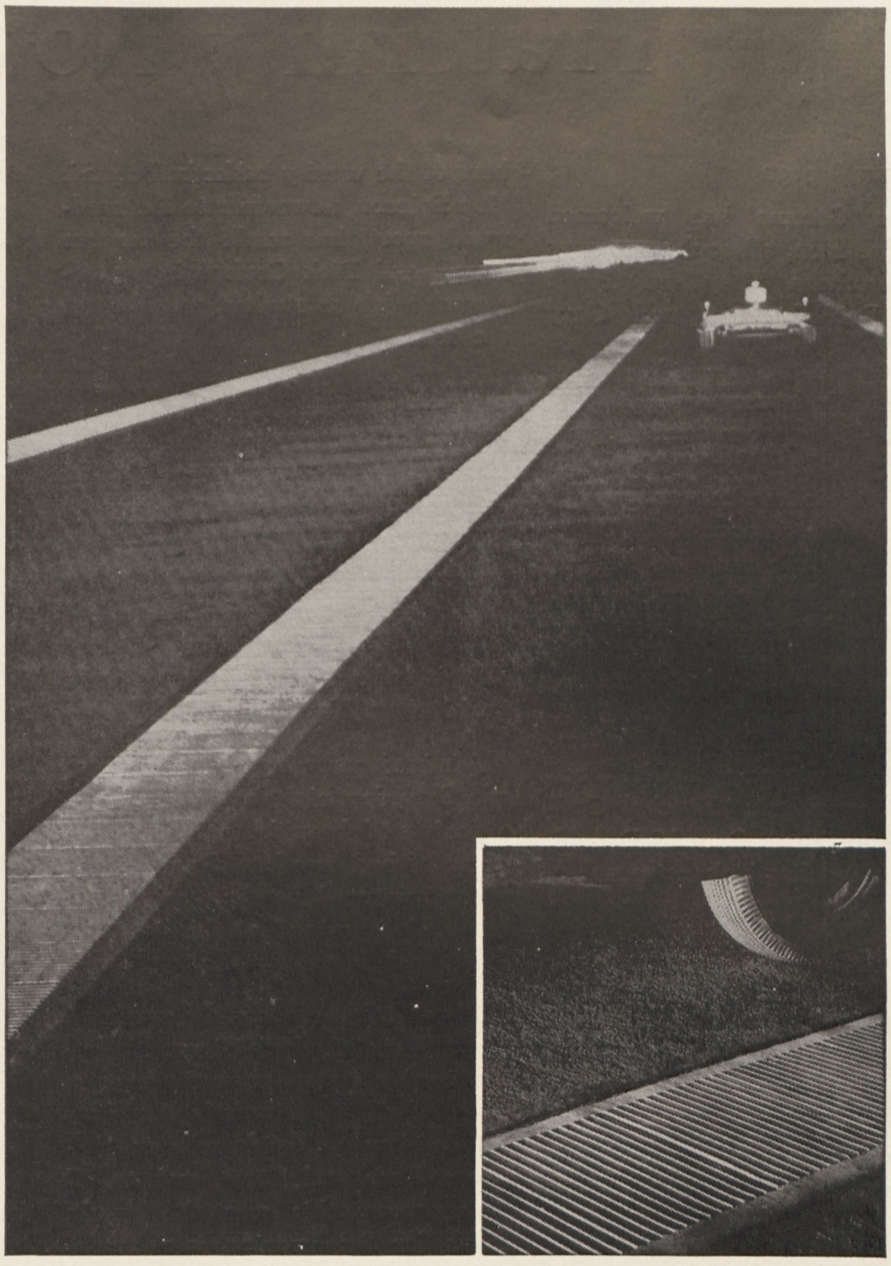
so well...

STORM WINDOWS LAST A LIFETIME. When your storm windows are made of U·S·S Stainless Steel, they're an unmixed blessing. They cut fuel costs, increase room comfort, of course. But what's more, they're corrosion-resistant, won't warp, bend or twist; they never need painting; they last a lifetime!



ROAD SEPARATOR THAT TALKS. Supplying reinforcing steel and cement for modern highways is one of the important jobs of United States Steel. Making highways safer is another one. This traffic lane marker, developed by Universal Atlas Cement, does double safety duty. Made of Atlas white cement, it is clearly visible at night. And its corrugated design (inset) actually causes it to sound a plainly-audible warning should you veer out of lane and your car tires ride on the corrugations.

Listen to . . . The Theatre Guild on the Air, presented every Sunday evening by United States Steel. National Broadcasting Company, coast-to-coast network. Consult your newspaper for time and station.

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Fraternity Notes

Alpha Tau Omega

Gamma Gamma has welcomed three more men, all sophomores, as pledge brothers. They are Chuck Rinker, Don Latham, and Gary Moore.

The chapter house is undergoing some face-lifting operations at present just to keep everyone busy, especially the new pledges. Through the combined assistance of the A. T. O. Mothers' Club and the Alumni Corporation, the living and dining rooms are being repapered and partially refurnished; the hall, too, is taking on that "new look."

On campus, A. S. M. E. officers include the following ATO's: Fred Reynolds, president; "Pancho" Godwin, vice president; Gene McDonald, secretary; and Ray Baker, treasurer.

Spirits were high, and so were some of our happy-go-lucky seniors, at the A. T. O. Christmas Formal, held at the I. S. T. C. Student Union Ballroom on Saturday, December 16. Billy Fread's orchestra furnished some fine music for the affair, which is always the highlight of our winter social season.

Stan Updike and Jim Myers represented Gamma Gamma at a meeting on November 30 at DePauw University, where plans were made for State Day, which will be held sometime in February. The following weekend, chapter officers attended the Province XVII Conclave held at the University of Illinois.

If anyone wants to know whether or not U. of I. has some "queens," just ask "Casanova" Harris; for the other side of the story, see Stan Updike.

Sigma Nu

With the basketball season in full swing, Harry Badger and Chet Good, star cagers of the 1949-50 season, are again in the limelight as members of the varsity basketball squad. Ken Brinson, newcomer to the hardwood sport, has made the reserve squad, and Dick Grubaugh has accepted a job as student manager of the team.

On Friday, early in November, Beta Upsilon entertained a number of upper-classmen at a stag rush party held at the house. The guests thoroughly enjoyed an evening of singing, card-playing, and varied conversation. Accepting pledgeship to Sigma Nu were Sam Wooley, Bill O'Brien, Bob Dedert, and Maurice Mardis, who took the sacred vows on Monday, November 27.

A mixed party began at the house one Saturday night as the result of a postponed hayride, called off because of bad weather. Some of the group ventured bowling, while the less athletic stayed at the house to dance and play canasta.

Completely successful was the house party at which Sigma Nu entertained a group of young women from I. S. T. C. The party was planned to develop better relations between Rose and State, and to all appearances, this was the result. Plans for the evening were spontaneously accepted by all, and included dancing, card playing, and group singing around the ever-popular Sigma Nu piano.

To boost the boys into the Christmas season, Beta Upsilon threw a gift-exchange party for its members and their chosen ones on Saturday, December 16. A hilarious affair, the party included caroling, dancing, and general merry-making.

Lambda Chi Alpha

With the fun of the last hayride a fond memory, John Barco, social chairman, decided to have a second hayride. More than twenty brothers and guests arrived at the house, but unfortunately, a severe rainstorm vetoed the outdoor frolic, and the party attended the theater.

On the night of November 21, 1950, Glen Rout and Howard Pedigo were initiated to the brotherhood of Lambda Chi Alpha. Following the ceremony the group attended Franks' Restaurant for sandwiches. Glen and Howard are both members of the sophomore class.

Congratulations are in order for Miss Elenore Wheelhouse and Carl Wokasein, who will be married on Sunday, December 17, 1950, at Owensville, Indiana.

Theta Kappa Zeta of Lambda Chi Alpha has pledged three good men. They are Roy Moody, Allen Forsaith, and Ralph Schmidt. All are members of the Junior Class.

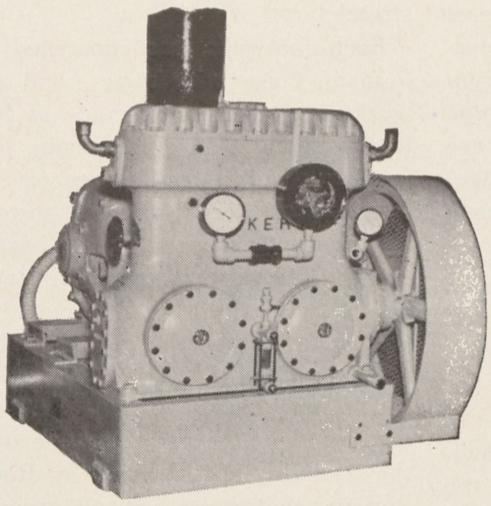
At the last honor assembly, Carl Bals and Duane Pyle, both juniors, were elected to Tau Beta Pi.

John Barco, and his assistants, Gunter Thiel, Leo Little, and Carl Wokasien, are hard at work with final plans for this year's gala Christmas dance, The Holly Ball. Leo Baxter's Orchestra will furnish the music for the semi-formal affair which will be held at the Mayflower Room of the Terre Haute House on the evening of Friday, December 15, 1950. An open house is planned following ing the dance. The plans call for a buffet, and the singing of Christmas carols around the tree.

Following the basketball game between Rose and Concordia, open house was held at the house on South Sixth Street. The carpets were rolled back and the brothers and guests enjoyed an evening of dancing, sitting out, and chatting. Mrs. Walter Gunjen did a "hula" for us, while her husband told jokes all evening long.

Congratulations to Arkie Bennett who has pinned Miss Betty Bailey.

Another page for **YOUR BEARING NOTEBOOK**



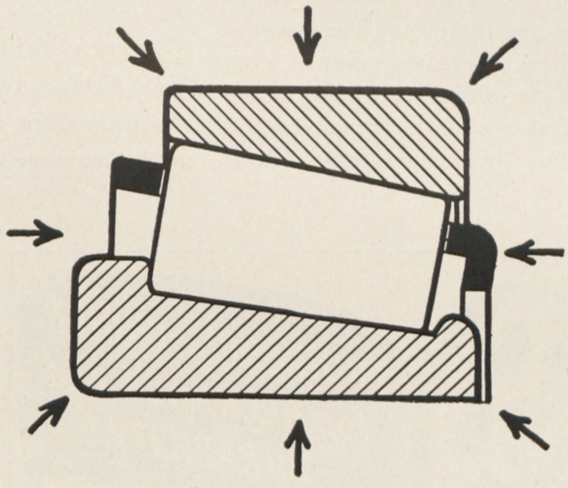
Crankshafts stay rigid ... foods stay frigid

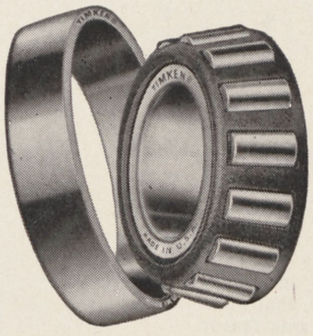
Designers of a compressor for refrigeration plants were looking for a way to insure smooth, dependable crankshaft operation. They couldn't risk the chance of breakdowns—and the food spoilage that might result.

They stopped possible trouble at the design stage—by mounting the crankshafts on Timken® tapered roller bearings. Timken bearings take the heavy radial, thrust and combination loads, prevent shaft wobble, insure trouble-free service with minimum maintenance.

Q: Short on space? A: TIMKEN® bearings!

Because Timken bearings have a *tapered* design, they carry loads from all directions. No separate thrust devices needed. Also, Timken bearings have *line* contact between rolls and races. This gives them greater load capacity, permits use of smaller bearings. The space-saving feature is another reason why 9 out of 10 bearing applications can be handled more efficiently by Timken bearings.





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TAPERED ROLLER BEARINGS

Want to learn more about bearings?

Some of the important engineering problems you'll face after graduation will involve bearing applications. If you'd like to learn more about this phase of engineering, we'll be glad to help. For additional information about Timken bearings and how engineers use them, write today to The Timken Roller Bearing Company, Canton 6, Ohio. And don't forget to clip this page for future reference.

NOT JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ⊕ AND THRUST ⊖ LOADS OR ANY COMBINATION ✳

Continued from page 9

duced to within the allowable range by hanging a concrete counterweight on the other end of the derrick. Four hoisting engines were used at each tower, two being used for each hammerhead derrick.

When the towers had been erected, the derricks were used to pick up a large guy derrick and the saddles that were used for the suspension cables. The guy derrick was used in the cable spinning operations and also to dismantle and lower the hammerhead derricks.

Only one tower was erected at a time so that the same equipment could be used on all of the towers. The finished towers were 414 feet high and the entire erection procedure was completed on one tower in about three five-day weeks, using two six-hour shifts per day.

The next big job after the completion of the towers was that of spinning the suspension cables. This job is done on all big bridges by use of the traveling sheave, which was perfected by Roebling on the Brooklyn Bridge. The cables of the Bay Bridge are 28 3/4 inches in diameter and are composed of 17,464 galvanized steel wires that are laid parallel to each other.

Before the cables can be spun, a working platform, called a footwalk, must be erected. The footwalks follow the same parabolic path as the completed cable; therefore, the engineers must have a thorough knowledge of the characteristics of the supporting wire cables. Such properties as the required length, tendency to stretch, and the modulus of elasticity are of prime importance. On the Bay Bridge, two 1/4-inch wire ropes were used for the supporting cables, and they were prestressed in order to minimize their tendency to stretch.

Each footwalk was supported by four of these wire ropes, and the working platform was made of 100-foot lengths of cyclone chain link fencing covered by a layer of fine mesh wire. Steel was used instead of timbers to reduce the fire hazard and the effect of wind on the structure. Lights were strung up on the footwalks so that the cable spinning could be done at night.

The only improvement that the engineers on the project made over the traveling sheave used by Roebling was that theirs had two grooved spinning wheels instead of one; this improvement made it possible to string four wires across the span simultaneously. The wires were taken from spools at one end of the span to the other anchorage where

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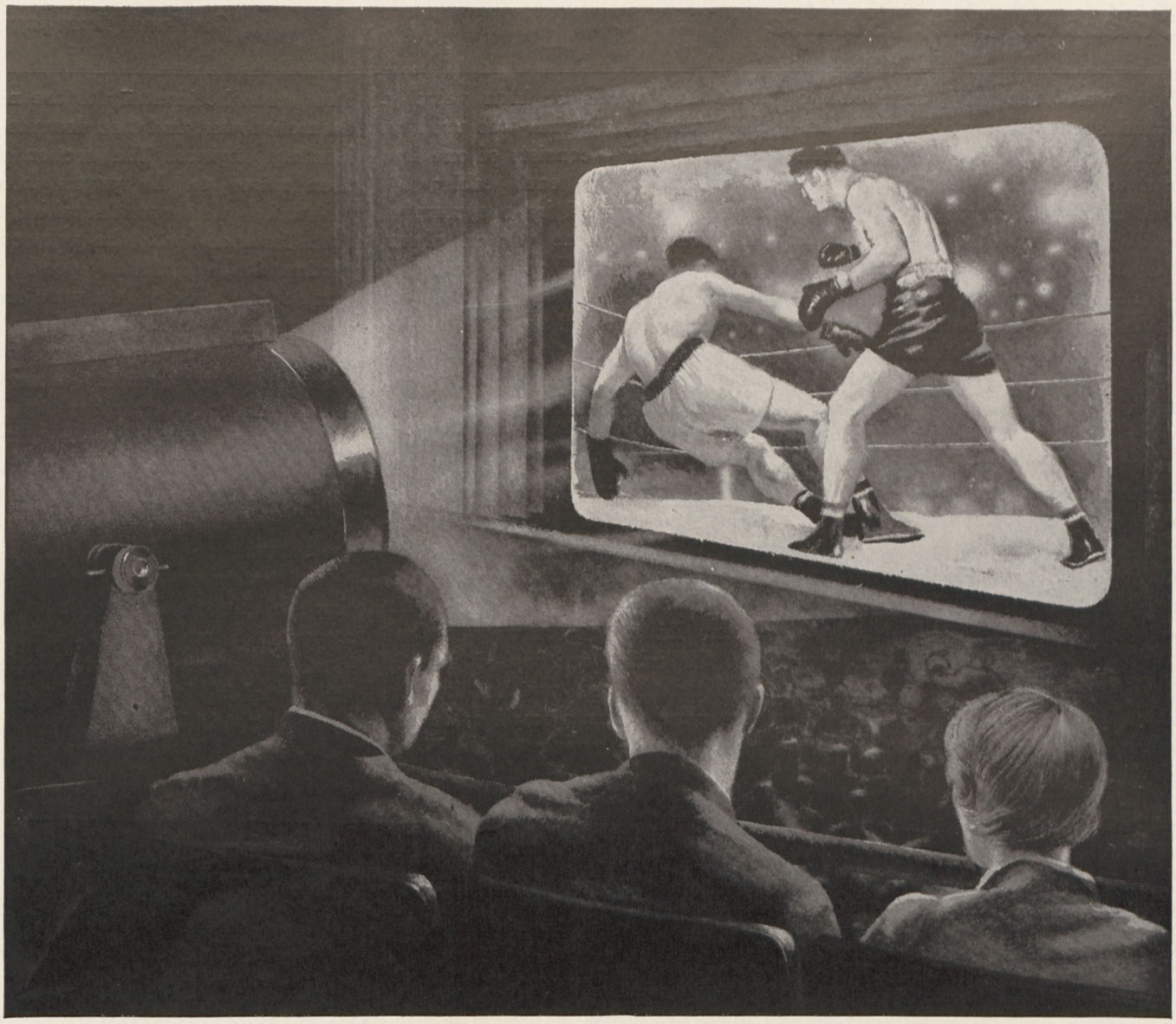

New RCA Theatre Television System projects 15 x 20 foot pictures of television programs.

Giant size Television—"shot from a Barrel!"

You've seen television. Now you'll see its finest form—giant projections of special events, transmitted *only* to theatres on private wires or radio beams to make movie-going more fun!

Success of the system comes from a remarkable RCA kinescope, and something new in projection lenses. The kinescope, developed at RCA Laboratories, is in principle the same as the one on which you see regular telecasts. But it is *small*—only a few inches in diameter—and produces images of high brilliance. These are magnified to 15 x 20 feet by a "Schmidt-type" lens system like those used in the finest astronomical telescopes.

Because of its size and shape, the new projector is referred to as the "barrel." It's already going into theatres, where you'll be seeing giant television—shot from a barrel.

* * *

See the latest wonders of radio, television, and electronics at RCA Exhibition Hall, 36 West 49th St., New York. Admission is free. Radio Corporation of America, RCA Building, Radio City, New York.

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

Continued from page 20

they were securely fastened to strand shoes. This process was repeated until enough wires had been spun to form a small cable; the cable was then banded together. These small cables form the large cable in the same way that they are made up of the single wires. Parallel wire cables are used because they have less differential tension than twisted cables at the point where they go over the saddles on top of the towers.

The next step was cutting up the footwalk cables into proper lengths for suspenders and to place the suspender hangers on the suspension cables. The cables were then wrapped with No. 9 soft annealed galvanized wire and painted to prevent corrosion.

On all large suspension bridges, there is introduced a stiffening truss which reduces the static deformations caused by concentrated live loads and winds of high velocity. The truss system that was used on the Bay Bridge consists of one line of trusses under each cable; the trusses are braced by a system of "K" bracing in the vertical plane, and by transverse floor beams in the horizontal plane. The trusses are thirty feet deep and are divided into thirty foot panels; the transverse floor beams connect each panel point. The truss sections, or panels, were fabricated in shops and shipped to the bridge site.

The sections were towed under the bridge spans on barges and manuevered into position for lifting. The lifting was done by four hoisting engines placed at the base of the main towers. Lifting struts were hooked onto the cables and moved directly over the desired position for the truss panel. Then a small cable was run from the panel to the lifting strut, then horizontally to the nearest main tower, and then down to the hoisting engines. The section was then raised to the proper height, fastened to the suspender cables, and then fastened onto the preceeding section. On exceptionally good days, three sections, or panels, were erected per shift.

After the truss units were complete, three guy derrick travelers of 14-ton capacity, running on the upper deck, placed the remaining floor steel and bracing. The bridge has two traffic decks that are 58 feet wide; one is directly beneath the other.

The traffic on both decks passes through Yerba Buena Island by means of a tunnel that is 540 feet long. The maximum clear width of the tunnel is 65 feet, and the maximum height is 53 feet.

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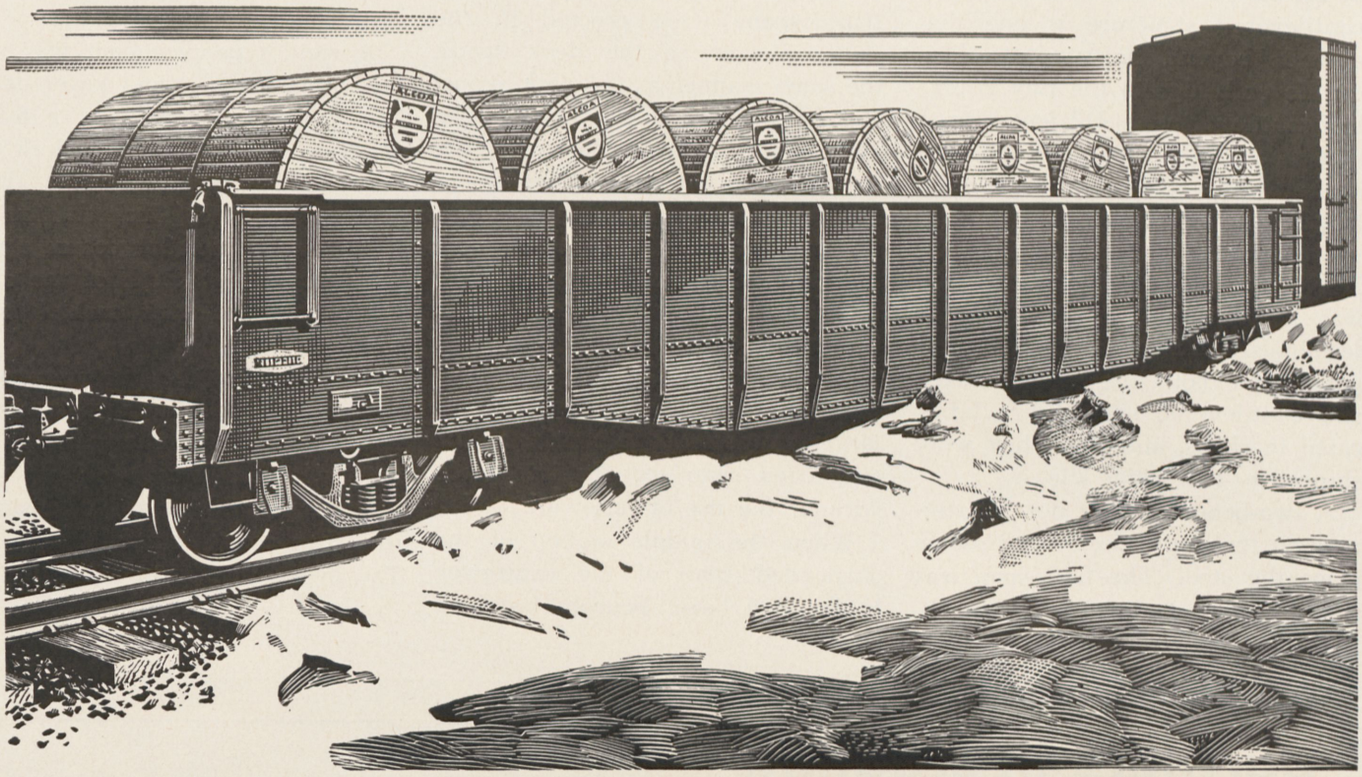
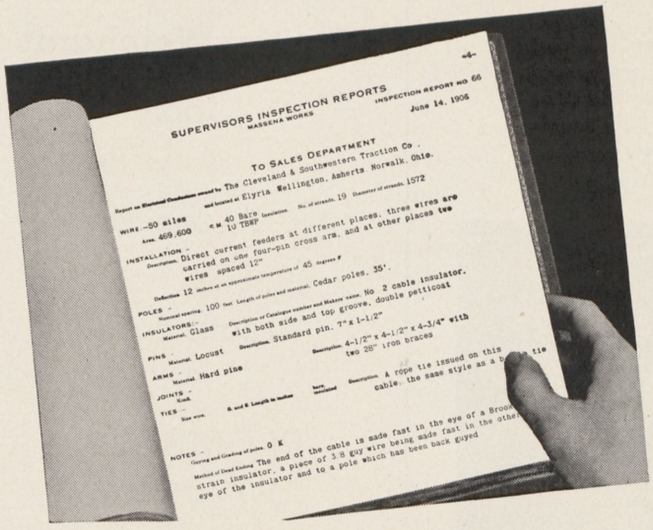
A CARLOAD OF IMAGINEERING



That gondola of 954,000 circ. mil. Alcoa ACSR (Aluminum Cable Steel Reinforced) is only one of forty-five similar carloads for one 230-kv transmission line.



SUPERVISORS INSPECTION REPORTS
MASSENA WORKS
INSPECTION REPORT NO. 66
June 14, 1906

TO SALES DEPARTMENT

Report on Electrical Construction erected by The Cleveland & Southwestern Traction Co. and located at Elyria Wellington, Amherts Norwalk, Ohio.

WIRE —90 miles — Area 469,600 — 40 Bare 10 TBMP — No. of strands 19 — Diameter of strands .1572

INSTALLATION — Description: Direct current feeders at different places; three wires are carried on one four-pin cross arm, and at other places two wires spaced 12"

Deflection 12 inches at an approximate temperature of 45 degrees F

POLES — Material treating 100 feet — Length of poles and material Cedar poles, 35'.

INSULATORS — Material Glass — Description of Catalogue number and Makers name No 2 cable insulator. With both side and top groove, double petticoat

PINS — Material Locust — Description Standard pin. 7" x 1-1/2"

ARMS — Material Hard pine — Description 4-1/2" x 4-1/2" x 4-3/4" with two 26" iron braces

JOINTS — Kind

TIES — Size wire — Kind Untwisted — Description A rope tie issued on this cable, the same style as a [illegible] tie

Method of Dead Ending The end of the cable is made fast in the eye of a Brook strain insulator, a piece of 3/8 guy wire being made fast in the other eye of the insulator and to a pole which has been back guyed

NOTES — Clearing and Grading of poles. O K

Even before the first ACSR line was strung, Alcoa supervisors were on the job. The report above is dated June 14, 1906, covering the erection of all-aluminum conductors. Thus, the Alcoa "Book-of-Knowledge" has grown rich with on-the-job experience.

The two million miles of Alcoa ACSR that carry electricity across the country today are a product of Imagineering. Back in the 90's, Alcoa started with a fact: Aluminum is a good conductor of electricity.

Imagineering involved building labs long enough to mount whole spans of cable which would be vibrated and mauled as the wind does. It meant developing new basic data.

The lifetimes of many people and a good many dollars invested in "Imagineering" Alcoa ACSR speeded the more recent promotion of Alcoa E.C. Aluminum for manufacturers of insulated wire and cable. When the day comes that you are specifying industrial wire and cable you'll discover how Alcoa Imagineering brings savings in both cost and weight when you "Figure it in Aluminum." ALUMINUM COMPANY OF AMERICA, 742K Gulf Bldg., Pittsburgh 19, Pennsylvania.

ALCOA FIRST IN ALUMINUM

ALCOA ALUMINUM ®

Oakland Bay Bridge

Continued from page 22

The bridge spans east of Yerba Island are either of the plane truss or cantilever type. In engineering, a cantilevered structure is one that extends beyond its supports. The cantilever bridge in the Bay Bridge has cantilever arms 412 feet long, a suspended span 576 feet long, and anchor arms that are 508 feet in length.

The erection of the bridge between Yerba Buena Island and Oakland was begun simultaneously at both terminals. The truss sections, or panels, for both the straight truss and cantilevered spans were fabricated in shops, and then they were shipped to the bridge site.

A two-boom traveler derrick running on the upper deck was used to place the steel. The first span was supported by two falsework bents, and the traveler placed the permanent columns and auxiliary falsework ture. All of the deck and through-truss spans were erected in the same manner as the deck spans, the same manner as the deck spans, and both of the anchor arms were erected at the same time. As the travelers erected the sections of the cantilever arm, the weight caused the anchor arm to be raised up, and, therefore, it was an easy matter to remove the falsework bents under the anchor arm.

When the cantilever arms had been completed, it was possible for large guy derricks to cantilever the suspended span sections into place without the use of falsework.

When the middle section of the suspended span of the cantilever bridge had been securely fastened, the greatest bridge in the world was complete except for the comparitively simple job of paving the roadways.

A rigid type pavement was used on both the upper and lower decks. The pavement consists of a 6-inch concrete slab on the upper deck that has a ¼-inch sand and mortar riding surface, and a 6½-inch slab on the lower deck which has coarse aggregate throughout. Both of the slabs are reinforced with welded steel trusses.

The concrete for the pavements was brought onto the structure by a light construction railway on the upper deck. The forms were made of ¾-inch plywood, and so designed that they could be used repeatedly. The forms were supported by 2x4-

Concluded on Page 26

Build Confidence ON BROAD EXPERIENCE

by ARCH COOPER
Manager, Empire Region
ALLIS-CHALMERS MANUFACTURING COMPANY
(*Graduate Training Course—1909*)

YOU NEED the confidence that comes from wide experience, whether you intend to be a salesman, designer, researcher, or production man. Confidence based on knowledge is one of the greatest assets an engineer can have. Here is what I mean.

ARCH COOPER

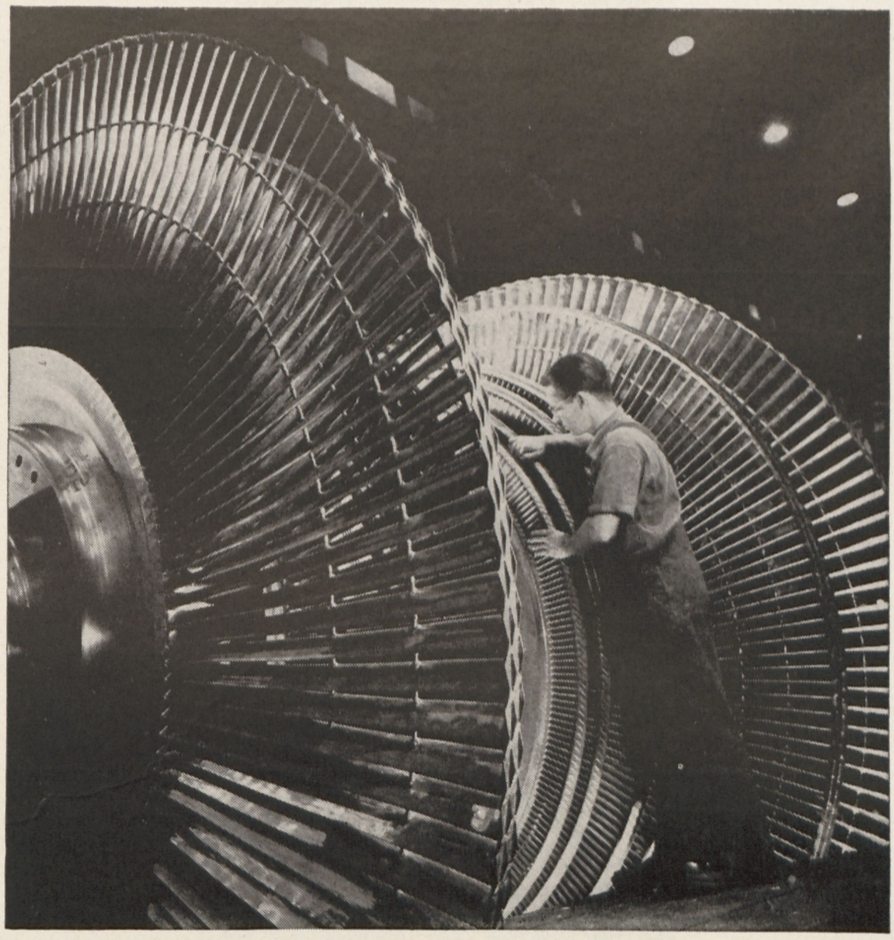
You may visit a mine with the idea of talking about crushing equipment, but find that their engineers have an electrical problem. Or you may visit a utility to talk about electrical equipment and find that they're all excited about a pump break-down.

Offer All-Around Help

Can you help them? Or are you just another peddler who is taking their time when they have problems on their minds. In my work I call on electric utilities, cement plants, machinery builders, textile mills, paper mills, shoe factories and many other types of plants. In each of them, I try to help the engineers and mechanics I call on.

It's a good credo for salesmen, but it takes broad experience to carry it out. It's the kind of experience you must deliberately set about acquiring as early as possible. I had heard of Allis-Chalmers equipment, seen A-C's giant Corliss engines in Australia's biggest power plant and decided to study design at Allis-Chalmers. It looked like the best place in the world to get a broad engineering background.

Textile mills are getting adjustable speed at lower cost by using new automatic Vari-Pitch sheaves on spinning frames as shown.



High temperatures and speeds raise tough design and production problems on giant steam turbine spindles like these.

I joined the Allis-Chalmers Graduate Training Course after graduation from Sydney Technical College in 1908 . . . worked on steam turbines, wound coils of all types, performed tests for the electrical department. After that there were field trips to erect electrical equipment. It was soon apparent that I wasn't a designer at heart, and my sales career started.

Broad Opportunity

Forty-one years later, Allis-Chalmers still offers the same opportunity for broad experience. A-C still builds equipment for electric power, mining and ore reduction, cement making, public works, pulp and wood processing, and flour milling.

And the Allis-Chalmers Graduate Training Course is still flexible. Students help plan their own courses. They can switch to design, manufacturing, research, application, sales, or advertising—divide their time between shops and offices—and can earn advanced degrees in engineering at the same time.

Men at Allis-Chalmers get a close-up of the basic industries. No matter what path they take in the industrial world, experience gained with this broad organization lays a foundation for the confidence that comes with all-around knowledge.

ALLIS-CHALMERS

Allis-Chalmers Manufacturing Company, Milwaukee 1, Wisconsin

Oakland Bay Bridge

Concluded from page 24

inch joists suspended from the upper flanges of the steel stringers. It was important that the loads applied to the suspension bridges did not overstress the cables, so a small model of the bridge was made and tested for the allowable loads.

The Bay Bridge was built in remarkably short time; construction began in May, 1933, and the bridge was completed in November, 1936. The total number of man-hours expended on the project has been estimated at 55,000,000. The San Francisco-Oakland Bay Bridge was built for 78 million dollars; a cost that exceeds that of any other bridge ever built. The bridge is one of the greatest construction enterprises ever attempted, and the finished product speaks well for the engineers and workmen who gave their time and effort toward its completion.

Why they put a glass pipe line underneath Buttermilk Channel

If you've ever driven through a long tunnel, you know how hard the lights are on your eyes.

The reason is you pass under a succession of bright spots of light which are apt to take your attention from the road. And you're made uncomfortable by the reflection of these bright spots from the top of the car ahead.

But New York's new 9117-foot Brooklyn-Battery Tunnel—America's longest, built and operated by the Triborough Bridge and Tunnel Authority—has an amazingly different and better kind of tunnel lighting.

Instead of the disturbing flicker of lights placed at regular intervals, motorists enjoy bright and even illumination—practically daylight—every foot of the way beneath Buttermilk Channel and New York Harbor.

The pipe line for this flood of light is built of 3000 twelve-foot sections of Corning's Pyrex brand glass tubing. Each length of pipe is a self-contained light cartridge, with two slim fluorescent lamps inside.

Should one of the lamps die out, that cartridge is replaced with another, assembled and kept ready on a repair truck. And replacement is made as easily as you'd pop a new bulb into a light fixture in your home.

The twelve-foot sections of Pyrex pipe are only two inches in diameter, with walls only a quarter of an inch thick. But despite their slimness, they're so strong they can withstand washing with a high-pressure hose. They're so sturdy they're not injured by truck tarpaulins which sometimes work loose and slap against them.

Designers of this new tunnel lighting system had no trouble finding a material needed to make it work because, years ago, Corning developed heat-resistant Pyrex pipe for industrial use.

Throughout industry, *Corning means research in glass*—research that has helped make glass a material of practically limitless uses.

So, when you're out of college and busy planning new products or processes, or improvements in existing ones, it will pay you to keep glass in mind. Then we hope you will call on Corning before your planning reaches the blueprint stage. *Corning Glass Works, Corning, New York.*

CORNING
means research in glass

Metal of Importance

Concluded from Page 11

actually contain no sodium in the finished form. Detergents, the new "soapless soaps," are typical examples. By treating with sodium, oils that would go into ordinary soap are converted to the alcohols used in making detergents. No longer is it necessary, after settling comfortably into your favorite easy chair, to respond to the irresistible "Dry the dishes for me, dear?" Even glass drains dry without streaks when washed with these detergents.

Wetting agents, compounds that make water "wetter," are products resulting from sodium treatment. This property of wetting agents has been demonstrated by converting normal water, to which a duck's feathers are waterproof, into water that waterlogs the duck's feathers and causes him to sink. Wetting agents are useful in the textile industry, and have made possible inks that write "dry."

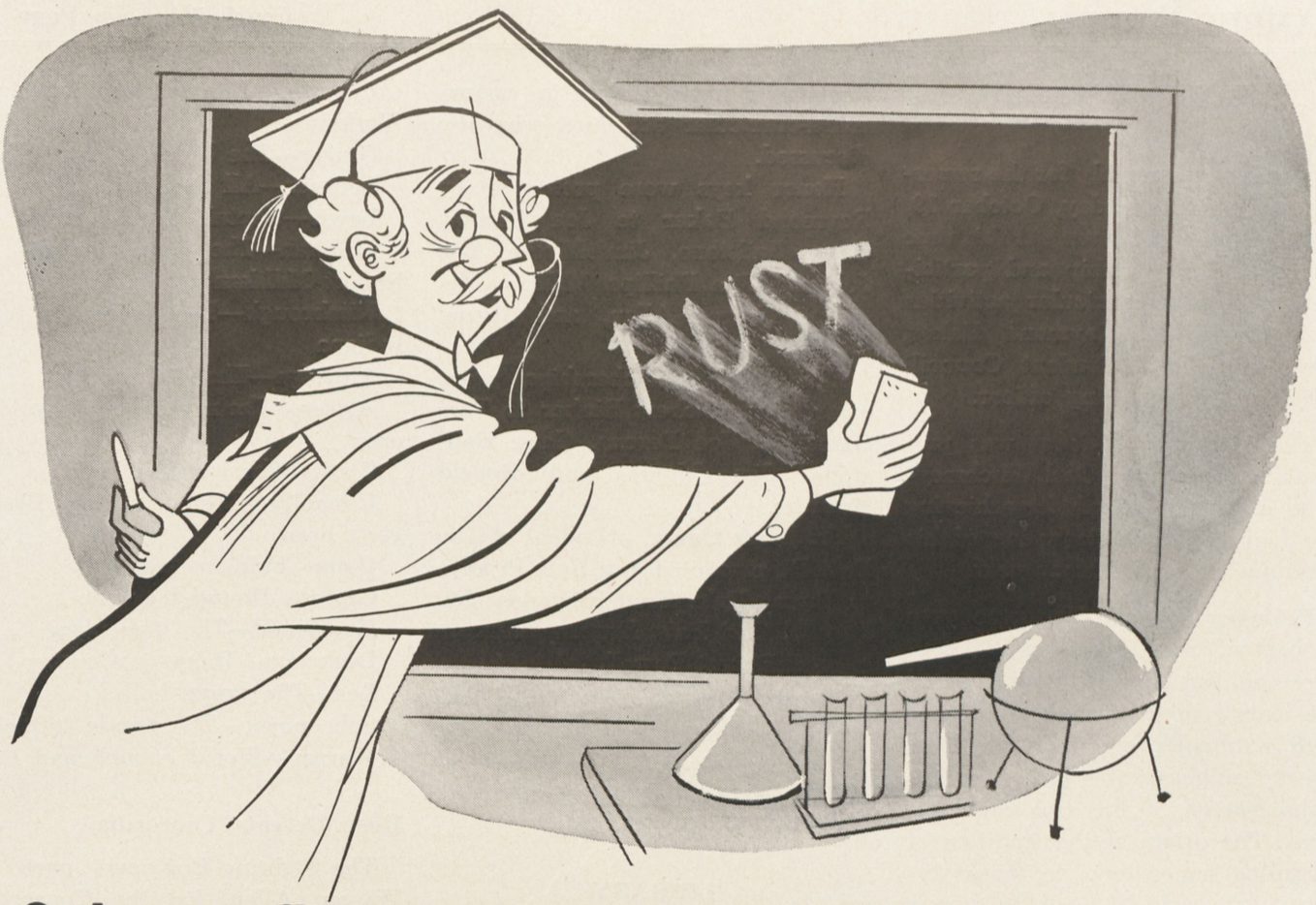
Some sodium is actually used in the pure metallic form. In transportation equipment, the small amount of metallic sodium in each valve gives the internal combustion engines of modern airplanes, large trucks, and buses longer lives. Sodium carries the tremendous heat from the face of the valve to the valve stem where it is dissipated to the cooling system of the motor.

Sodium-vapor lighting, which involves the use of pure sodium, has been found to be of value in outdoor lighting. In Connecticut, for example, sodium-vapor lighting for a seven-mile stretch of highway was recently installed. In addition to its high efficiency sodium vapor provides maximum visibility in foggy and adverse weather conditions and maximum continuity of illumination.

Perhaps the greatest asset of sodium is its high reactivity; however, this should not lead to the false impression that sodium metal must always be handled under protective oil to keep it from burning. It's true that sodium, in finely divided form, will ignite spontaneously in the atmosphere; but in commercially available bricks of one to twelve and one-half pounds it can be safely handled with gloves. It must be kept out of contact with water, however, for even the perspiration of bare hands may start a fire.

Recently research efforts have been directed toward making sodium even more active by dispersing the finely-divided metal in inert liquids that can be pumped through pipes at room temperature.

This story of sodium should show that, though rarely seen in its pure form, sodium is truly a metal of importance.



Science finds a way to wipe out rust

HERE AT STANDARD OIL we are constantly seeking ways to escape the costly consequences of rust and other forms of corrosion. One place where corrosion hits hard is our cross-country pipeline system. Scientists long ago discovered that some types of corrosion are caused by electrical charges that flow away from metal into the soil, carrying with them small particles of metal.

Standard Oil engineers are employing a practical method for protecting our pipelines. It consists of burying deposits of scrap metal or more active metals at intervals along the pipeline and making connection. A weak electrical charge is then used to reverse the natural corrosive force, causing the metal deposit to do the rusting instead of the pipe.

This method has been proved in use, but it is not the final answer. Standard Oil research men are seeking better solutions to the problem of corrosion and of many other problems as well.

For men who enjoy facing up to the challenge of the unknown, there is no better place to work than Standard Oil. In the first place, we deal with petroleum, the master fluid of progress and probably the most versatile raw material in the world. Secondly, we deal every day with questions—corrosion, for example—that are not necessarily inherent to petroleum research.

That is why Standard Oil needs and uses skills from practically every field of science and technology. We provide our scientists and technical men with the finest equipment and try to create a favorable climate in which their ideas may grow. They have responded with outstanding contributions of real benefit to millions of their fellow-citizens.

Standard Oil Company

910 South Michigan Avenue, Chicago, Illinois

STANDARD

Concluded from Page 10

HONOR ASSEMBLY

The honor assembly for the semester was held Thursday, October 19, 1950, in the auditorium. At this time honors for scholarship and participation in extra-curricular activities were presented, Raymond Baker, president of the Student Council, acted as the presiding officer.

The Heminway Medal was presented by Professor Carl Wischmeyer to Robert Bosshardt for achieving the highest scholastic rating of his class during the freshman year.

Professor John L. Bloxsome gave a short address preceding the Blue Key and Tau Beta Pi tapping about the history of the two organizations both nationally and here at Rose. Special emphasis was placed on the requirements of the two organizations. The origin of the tradition of awarding honor keys to those students who were leaders in various extra-curricular activities was also discussed.

Honor keys were presented by Raymond Baker to Joe Perona, Gene Hailstone, Jim Myers, Bob Johnson, Jim Phillips, William McKeen, Warren Allen, and Myron Hawk.

Blue Key memberships were awarded by Robert Rinker to Tom Grinslade, Joe Perona, Gene Hailstone, Jim Myers, and Ronald Brunner.

Frederick Garry, president of Tau Beta Pi, presented Tau Beta Pi keys to Duane Pyle, Fred Reynolds, Joe Perona, Carl Bals, Eugene Schroeder, and Robert Powell.

At this time George Wence was given recognition by Tau Beta Pi for having raised his class standing the most during the latter two terms of the freshman year.

LIBRARY

The library recommends the following books for your vacation reading:

Dunham—Man against myth

Rhine—New frontiers of the mind

Bush—Modern arms and free men

Burchard—Mid-century, the social implications of scientific progress

Peattie—A cup of sky

Audubon—Birds of America

Commager—The American mind

Stevens—The Stevens America

Woodbury—John Goffe's mill

Musselman—Get a horse

Woodbury—Story of a Stanley steamer

Orme—Comes the comrade

Baldwin—Great mistakes of the war

Johnson—Incredible tale

Wees—King-doctor of Utithi

Chrysler—Life of an American Workman

Ginger—The bending cross

Lederer—All the ship's at sea

Lewis—Captain Sam Grant

Millikan—The autobiography of Robert Millikan

Kimbrough—The innocents from Indiana

Aldridge—The diplomat

Algren—The man with the golden arm

Clark—The watchful gods

Connolly—The bump on Branigan's head

Gann—Fiddlers green

Gipson—Hound-dog man

Household—The high place

Lockridge—Raintree Country

Lea—The brave bulls

Schoonover—The gentle infidel

Warren—World enough and time

Rose Defeats Concordia

The Fighting Engineers, paced by Warren Allen, led the Concordia five all the way for their first victory of the season. The final score was Rose 66; Concordia 53.

Starting fast and smoothly the Carrmen maintained a lead which was never threatened until the closing minutes of the game. The Engineers built their margin to 14 points midway through the second half and stalled away the last three minutes when Concordia threatened. In an effort to get the ball Concordia commited seven personal fouls in the last two minutes of the game.

The starting five, Allen, Stohler, Badger, Gardner, and Delp, worked together to pour 40 points through the hoop in the first half while Concordia managed to score only 30 points. Coach Carr substituted freely throughout the fray with Bennett, Green, James, Zorman, and Bertram seeing action at various times.

High man for Rose was Warren Allen with 26 points. Bob Delp and Harry Badger each contributed 10 points to help the cause along. Augie Lubkeman was high point man for Concordia with 22 points.

THE DU PONT DIGEST

The Teflon* Problem:

Given a plastic for which there is no known solvent, how would you turn it into a coating?

Some time ago Du Pont research discovered a new plastic—"Teflon" tetrafluoroethylene resin. It had temperature resistance beyond the range of any previous plastic, excellent electrical characteristics, and the highest degree of chemical inertness among commercial plastics.

But tough-guy "Teflon" was almost *too* tough. It wouldn't melt and flow like other plastics. Hence, it could be molded only in simple shapes. There was no existing technique by which it could be made into thin coatings. Unless this difficulty could be overcome, the very properties that made "Teflon" so promising narrowed its usefulness.

"Teflon" Won't Dissolve

In the past, problems like this have been handled by dissolving plastics in a suitable solvent and using them as the base for enamels and similar coatings. But "Teflon" will not dissolve in any solvent yet known. It even stands up to nitric acid.

At this point Du Pont physical chemists suggested dispersions—minute particles suspended in a liquid—as the answer. After much study, scientists of the Polychemicals Department learned how to suspend "Teflon" particles about 1/125,000 of an inch in diameter. Aided by the fundamental studies of Chemical Department scientists, they devised today's commercial scale process.

Meanwhile Du Pont's Fabrics and Finishes Department was keeping pace with the development. Their contributions to formulating the new products did much to establish "Teflon" polytetrafluoroethylene coatings and wire enamels in many special uses.

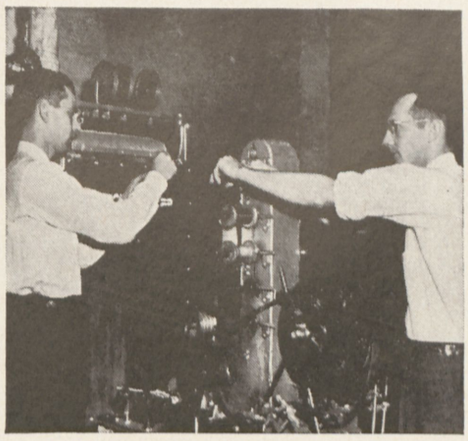
In electric motors, for instance, these enamels are used on wire so the motor can be operated at higher temperatures and will deliver more power per unit of weight. Such motors are more compact and sometimes cost less.

Other uses include non-sticking coatings that cut costs when applied to bakery rolls, rubber molds, heat-sealing machinery and similar equipment. Corrosion-resistant "Teflon" coatings for special uses are currently being investigated.

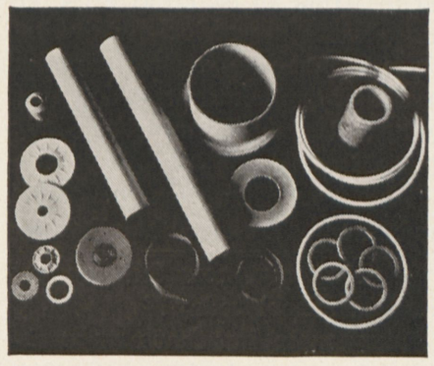
Product of Teamwork

"Teflon" finishes are a typical fruit of the close teamwork of Du Pont technical men of diverse backgrounds. Organic and physical chemists played a major role. Physicists participated by developing fundamental information on the nature of the dispersion. Chemical and mechanical engineers designed the manufacturing apparatus. Working together, they made possible this new and important addition to the Du Pont family of "Better Things for Better Living . . . through Chemistry."

*Reg. U. S. Patent Off.



Philip S. Sanders, *left, A. B. in Chemistry, University of Pennsylvania, 1944, supervises operation of a special dipping machine used to coat wire with "Teflon" enamel in the laboratory. Enamel is "dried" by fusing.*



Number one *plastic in resistance to heat, chemicals and moisture, "Teflon" is shown in forms of gaskets, coaxial cable spacers, tape, rod, pipe, flared tubing, valve stem packing beading as it is supplied to industry.*

In a test *of heat resistance at 390°F., the "Teflon" rod (right) remains intact while two other plastics melt or swell out of shape.*

DID YOU KNOW . . .

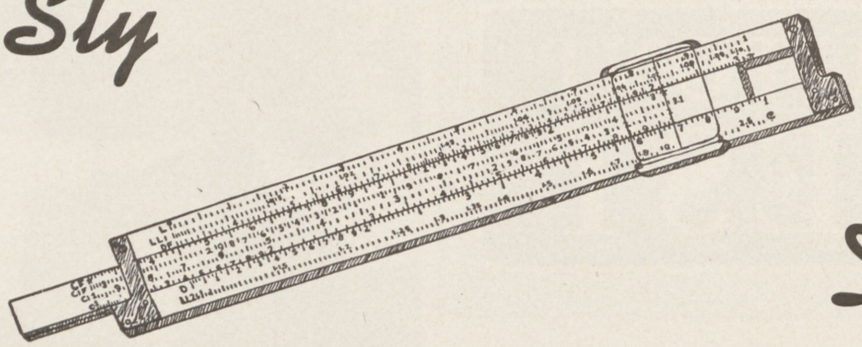
. . . 76 students at 47 universities are currently pursuing post-graduate work as holders of Du Pont Fellowships in science. Awards for 1950-51 total $224,000.

DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

Great Dramatic Entertainment—"Cavalcade of America," Tuesday Nights, NBC

Sly Droolings



By Richard Myhre, soph., m.e.
and Bud Welling, soph., ch.e.

Seven sailors and a lady, the only survivors of a shipwreck, were rescued from an island after seven long years. One sailor was telling his experiences to a minister friend. The minister asked: "And my good boy, was the lady chaste?"

"And how," he replied, "from one end of he island to he other."

"Well Jimmy, how did you get along in school today?"

"Okey, mom, but that new teacher is always asking us some fool questions. Today she asked everybody where they were born."

"Did you tell her that you were born at the Woman's Hospital?"

"Heck no, I didn't want the kids to think I was a sissy, so I said the Yankee Stadium."

Inspecting Officer: "Do your underclothes fit you satisfactorily, sailor?"

Boot: "The undershirt is okay sir, but the shorts are a little snug under the armpits."

Mary had a little lamb,
It's fleece was white as snow,
But everywhere that Mary went
Her calves still stole the show.

She: "No, I don't smoke, drink or neck."

He: " Well, what do you do?"

She: "I tell lies."

She: "They say the cleverest men make the best husbands."

He: "Don't believe it. The cleverest men never become husbands."

Mother: "Now before you get serious with him, be sure he is always kind."

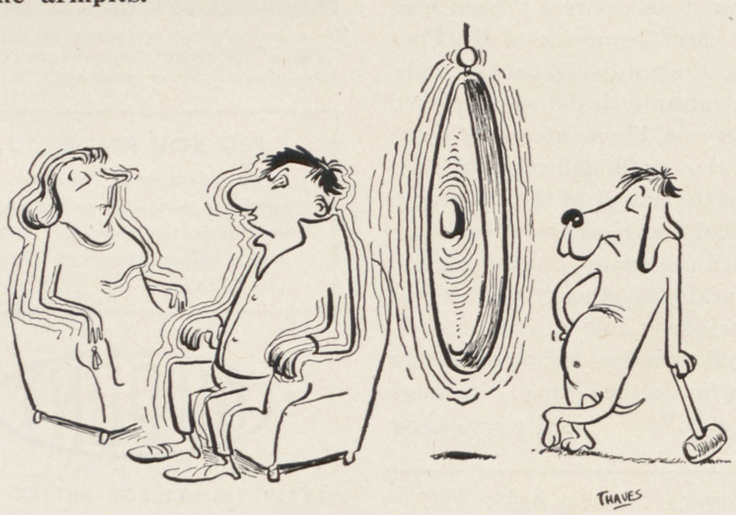
Daughter: "Oh, I'm sure he is; he told me he put his shirt on a horse that was scratched!"

Letters to the Editor Dept.

Dear Ed:

As chief E E at State Pen I am supposed to sit in the electric chair to test it. If it doesn't work I lose my Job. What should I do?

Frantic!



"You'd think he could learn to bark when he wants something."

Pat was determined to pass by his favorite tavern on his way home. As he approached, he became somewhat shaky but, steeling himself he passed on. Then after going about 50 yards, he turned and said to himself, "Well done, Pat, me boy. Come back and I'll treat ye."

Do you know what good clean fun is?

No, what good is it?

Displaying her wedding gifts, the bride came to one from the groom's Army buddy. "I just adore these personalized gifts," she said. "We received towels and washcloths with HIS and HERS on them, but," she blushed, "this is even more personal." And she fingered an olive drab blanket with the letters US stamped in the middle.

Men look twice at Deborah Drew; She has hidden charms but many ....a clue.

A farmer, the story goes, had a ram that was acting up and being ornery. Seeking to quiet the animal, the farmer piped in some radio music into the barn. Then all of a sudden the ram dropped dead and investigation disclosed that the radio at that moment had been playing "There'll Never Be Another Ewe."

"Have you ever sold brushes?" she asked.

"No," he replied.

"Well, you'd better take this one and start selling it to me—here comes my husband."

This is a picture of "PING"

It's a picture that gives automotive engineers clear-cut facts on performance—a picture that suggests how photography with its ability to record, its accuracy and its speed, can play important roles in all modern business and industry.

No, this is not the "doodling" of a man on the telephone. Far from it. It's the photographic record of an oscilloscope trace that shows, and times, detonation in a "knocking" engine. It all happens in a few hundred-thousandths of a second—yet photography gets it clearly and accurately as nothing else can.

Oscillograph recording is but one of countless functional uses of photography in bettering products and improving manufacturing methods. High speed "stills" can freeze fast action at just the crucial moment—and the design or operation of a part can be adjusted to best advantage.

And high speed movies can expand a second of action into several minutes so that fast motion can be slowed down for observation—and products be made more dependable, more durable.

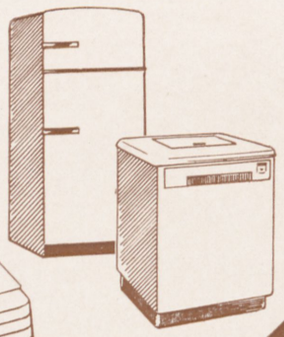
Such uses of photography—and many more—can help you improve your product, your tools, your production methods. For every day, functional photography is proving a valuable and important adjunct in more and more modern enterprises.

Eastman Kodak Company, Rochester 4, N. Y.

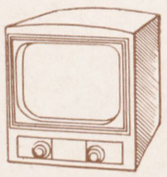
Functional Photography

. . . is advancing business and industrial technics

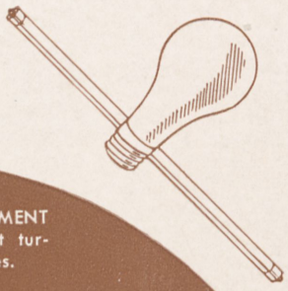
Kodak
TRADE-MARK



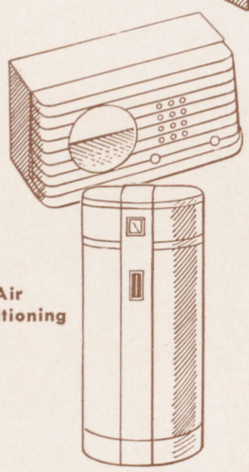
Appliance & Merchandising



Electronics

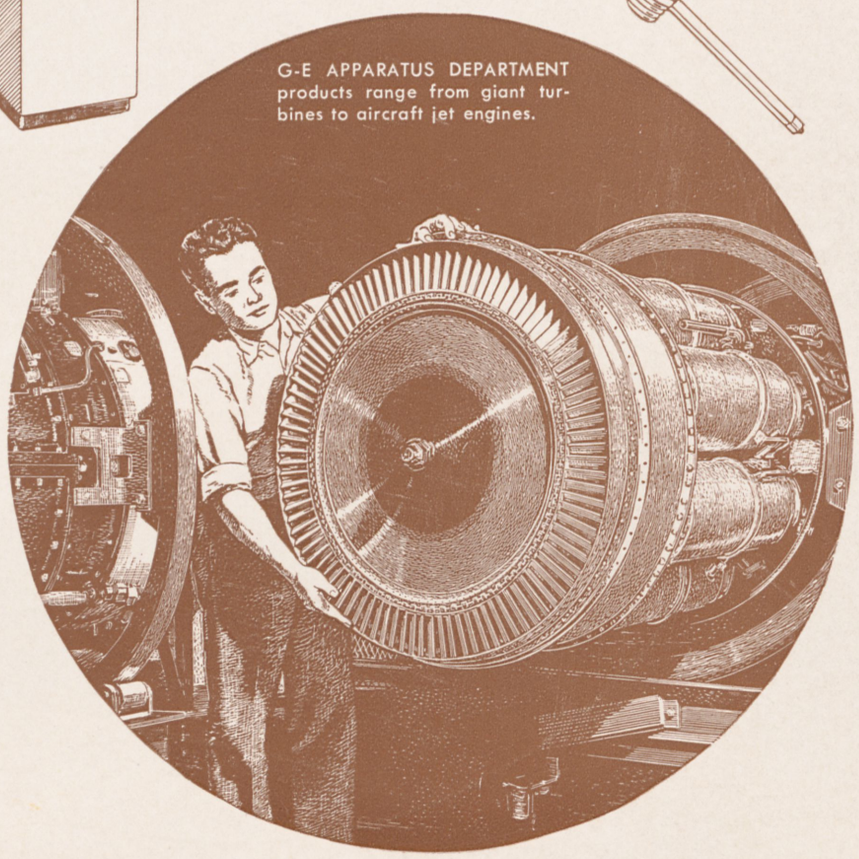


Lamp Department

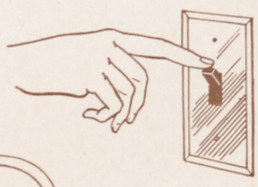


Chemical

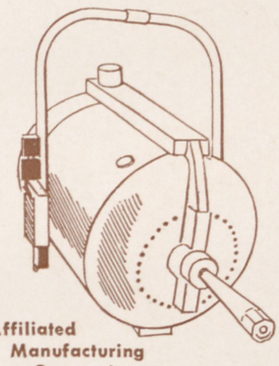
Air Conditioning



G-E APPARATUS DEPARTMENT products range from giant turbines to aircraft jet engines.



Construction Materials



Affiliated Manufacturing Companies

8 reasons why college graduates at G.E. find work that they like

"In seeking to place college graduates in jobs they will enjoy doing," M. M. Boring, manager of the Technical Personnel Divisions, said recently, "we at General Electric find our work made easy by the diversification of the company's business.

"We tell a newcomer to look around, to work in several different fields, to try to determine where he will be most satisfied. The company's eight Operating Departments, ranging from Chemical to Apparatus, from the making of lamps to the building of big turbines and electric locomotives, give him plenty of room for his search.

"Engineers, chemists, physicists, and mathematicians, as well as liberal arts graduates, all find work here that they can be interested in and can do with enthusiasm.

"Their ability to find satisfying jobs with us is, we feel, an important factor in keeping General Electric ahead in electrical research, engineering, and manufacturing."

You can put your confidence in—

GENERAL ELECTRIC