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Rose Technic Staff
Rose-Hulman Institute of Technology

Rose Technic

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Rose Technic

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The Cover

A pipe-smoking Rosie isn't poetic license. "She" is a 51-year old male! But more about that next month. Design by Staff Artist Richard Bosshardt.

The Frontispiece

A 35-cubic-yard electric shovel, used in stripping operations. Courtesy of WESTINGHOUSE.

PHOTO CREDITS: Pages 8 and 9, GENERAL ELECTRIC; Pages 10 and 11, *Speed Age;* Pages 12 and 13, WESTINGHOUSE; Page 22, GENERAL ELECTRIC.

In This Issue

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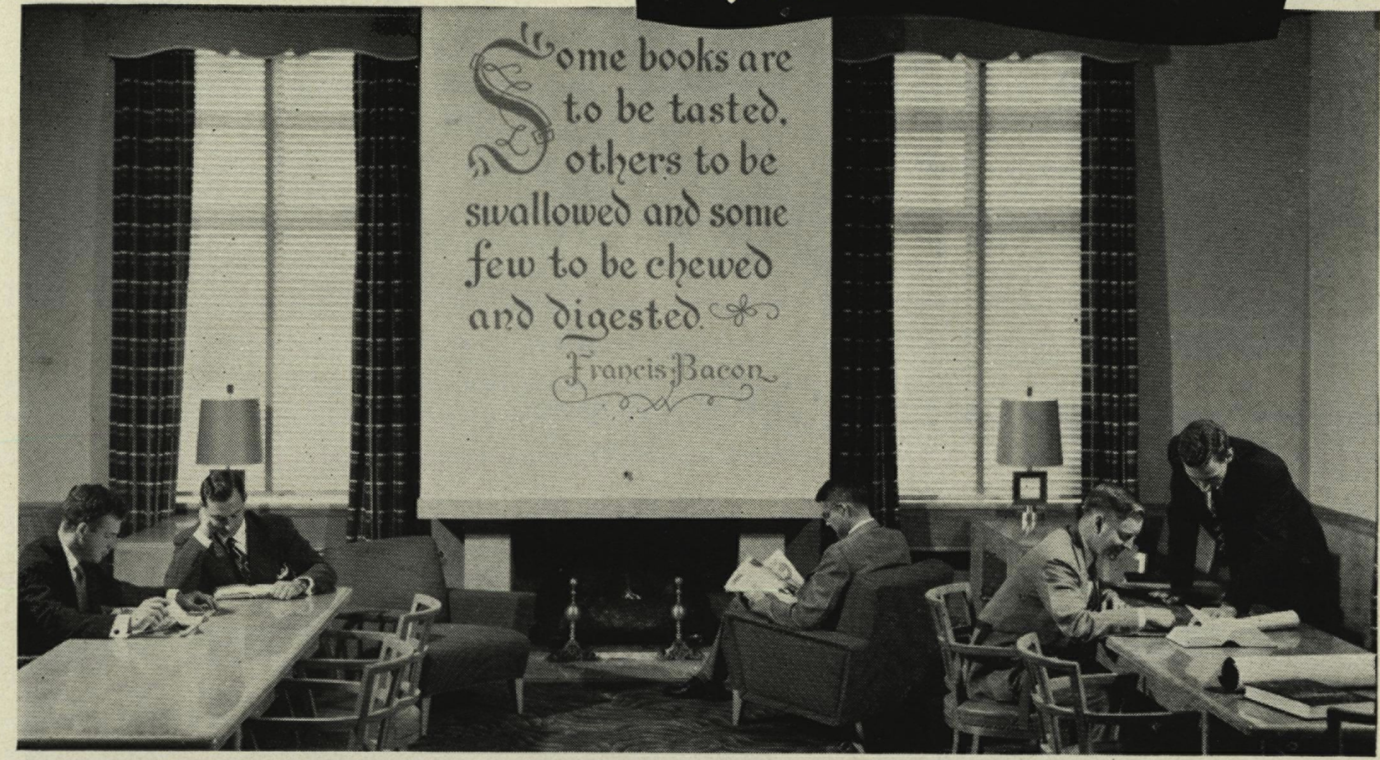
The Westinghouse Plan . . . . . to help you Achieve Success



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Takes a lot to lay a carpet in the jungle

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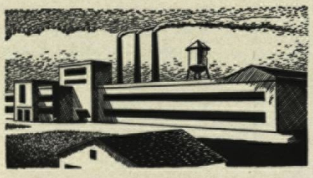
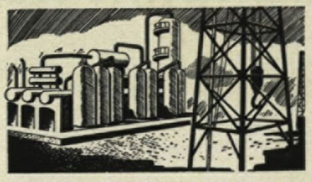


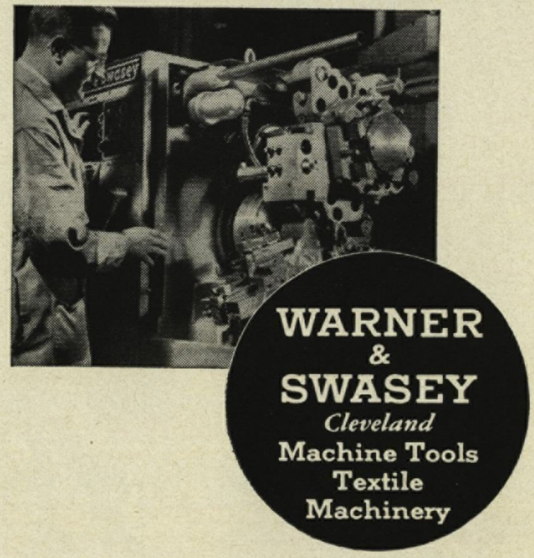
Lower-Cost Manufacturing—pumps compressors · steam turbines · motors power transmission · air conditioning



Petroleum Products—compressors engines · pumps · chilling equipment refrigeration · decoking systems

More Abundant Food—compressors fertilizer mixers · air conditioning refrigeration · pumps

* *



WARNER
&
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Machine Tools
Textile
Machinery

An Accurate Measure?

Perhaps if the question, "Are grades all-important?" were asked of practically any student or member of the faculty, the answer returned would be "No." However, just what is the situation which actually exists concerning this topic? When a student prepares for an examination his first thought is usually not a consideration of how much he really knows about the subject but rather what grade he will be able to make on the test. But isn't a grade an indication of the student's mastery—or lack of the same—of a course? Frankly speaking, not always! This problem in itself would provide enough material for a full-scale debate, but the point is that so many factors are involved that a true evaluation is often quite difficult.

For instance, the type of test—subjective, objective, problem-type, or "quickie quiz"—has much to do with the results obtained. Furthermore, it has been vividly illustrated to anyone who has taken a course in psychology that different instructors may grade identical tests anywhere in the range from A to F. This has even occurred on studies of the grading of non-essay-type mathematics examinations. Thus if the basis on which a grade is given is not particularly substantial, it is evident that the grade itself may have little significance.

Perhaps the importance of certain tests, such as finals, is exaggerated particularly when one considers that the work done in three hours at the end of a semester may account for as much as one-third of the evaluation of eighteen weeks' study. Moreover, an examination may fall on one of those "bad days" when some mental or physical condition causes everything to be muddled. How is this ever taken into account? The usual tendency is for the instructor to assume, if grades are low on a particular test, that the students are putting in too little time on the course. Is it not just as likely that the professor may be failing to get his subject across and is also assuming his test to be perfect? On the other hand, even when grades are high, the individual may feel that he is learning practically nothing.

Several years ago, interviewers of senior students *first* looked at the grade record of a prospective employee. Now the situation is just the reverse in a majority of cases. Employers have come to realize the fallacy in picking a man solely on the basis of his grades. Interviewers look first at the record of a student's participation in extracurricular activities, talk with him to learn his personality traits, and *then* make a final check on his grades.

Should the conclusion then be drawn that grades have no significance whatsoever? Of course not! But if tests are to be measures of a student's understanding of a subject, they must concentrate on the most important parts of the course. This cannot be accomplished by quizzes which demand rote memorization of insignificant facts. Similarly, a well-constructed test does not necessarily reveal the ability of the student if the instructor in his lecture is merely a "textbook-wired-for-sound," droning on in a monotone without emphasizing anything as being particularly important. Tests must be correlated with lectures on the basis of important portions of a course.

It would be futile to search for a complete substitute for examinations. The challenge, therefore, is the formulation of tests which cover significant parts of the subject and the realization that such tests indicate the effectiveness of presentation of the instructor as well as the ability and willingness of the student.

R.A.K.

Enter -- Th

By Paul

It won't be long before we'll be polishing up that putter for another season of that great sport—golf. Soon you'll find yourself standing at the tee, ready for the first drive—or dub—of the year. And on that first drive, if you manage to hit the ball, don't be surprised if you hit one of the longest shots of your playing career. Why? Same club, same golfer, same course—but not the same ball. It hasn't been treated with radioactive rays or filled with uranium-235—that golf ball simply has a center of silicone "bouncing putty."

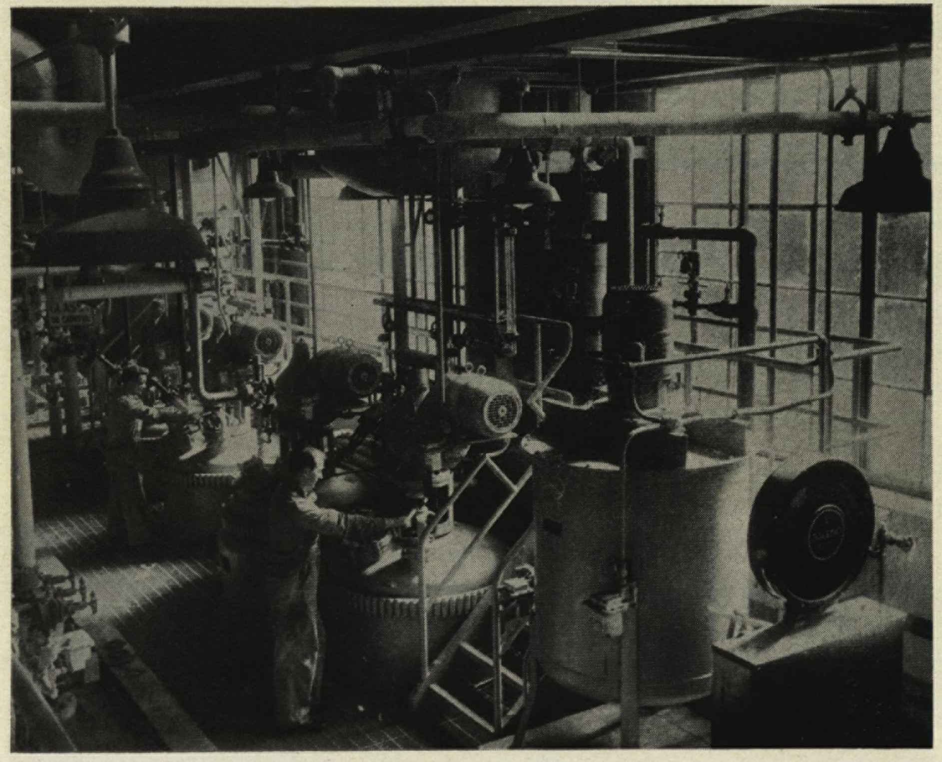
Yes, these silicones are becoming more a part of our daily life all of the time. Polish your car, wax your floor, grease your skillets, or waterproof your clothes—there's a silicone product to fit the bill for them all.

But before going any further telling you about the many uses of silicone products, let's see just what they are. Well, to make it short, they're synthetic substances resulting from the practical application of organo-silicone chemistry—notably used to make rubber, grease, oils, and resins, of a unique nature. Here's the technical name for all of you "walking encyclopedias" to remember — the polyorganohalogenopolysiloxanes (better remember that for the next chem quiz.)

Just what's so remarkable about these silicones? They possess the unique qualities of being resistant to both heat and cold, have amazing durability, shed water like a duck's back, and make wonderful insulators—to mention only a few of their unusual properties. Perhaps this may give you a better idea why these silicones are becoming so important to so many.

The raw materials for the production of silicone products are sand, brine, and coal, which are extremely cheap and abundant. The sand supplies the elemental silica, which is, next to oxygen, the most plentiful element in the crust of the earth. The fact that these silicones can be cheaply produced, combined with their extremely versatile nature, leads many to believe that we are starting out in what scientists may some day call the "Silicone Age." Undoubtedly we can say that many "miracles" from silicones are in the not too distant future.

Hydrolizers in which reactions produce the base products to make silicone oils and rubber.



Although silicones have become known only recently to the commercial world, they have been known as a laboratory curiousity for over 100 years. The possibility of the synthesis of organic-silicon compounds was first suggested by the experimentation of J. B. Dumas in 1840. While the work of Dumas attracted some attention, the first real progress in the field of silicon chemistry came in 1868 when the German chemists A. Ladenburg and C. Friedel made tetrachlorosilane, which was used to produce oxychlorides of silicon. This work was followed by the production of other organic-silicon compounds, such as trichlorosilane, chlorosilane, and dichlorosilane. During the rest of the 19th Century scores of organic-silicon compounds were produced on a laboratory scale, but nobody thought to make a serious determination of their usefulness. Dr. Frederick S. Kipping of the University of Nottingham, England, was responsible for the beginning of organic-silicon synthesis on a useful basis. Dr. Kipping made and studied many of these curious substances for a period of more than forty years, and it was he who gave them the name by which they are now known—the silicones. Just before World War II many industrial firms saw the great usefulness of the silicones and began ex-

Silicone Age

liott, fresh.

tensive work on the development of the production of silicones commercially. Many patents dealing with the commercial production of silicones were soon issued to chemical industries throughout the United States and the "Silicone Age" had begun in earnest.

The process for the industrial production of silicone products is quite interesting. The vital raw material of this process is the element silicon. This elemental silicon is produced from sand by coke reduction. In the first step of this process, powdered silicon is mixed with powdered copper and dumped into a 15-foot-high agitated reactor. In the reactor the silicon-copper mixture is treated with methyl chloride, which is produced by the reaction of methyl alcohol and hydrochloric acid. Under high temperature and pressure, accompanied by continuous agitation in the presence of the copper catalyst, a reaction resulting in the formation of a gaseous mixture of methylchlorosilanes occurs. The gaseous products of this reaction are condensed, stored, and used as needed in the completion of the process. From storage, the methylchlorosilanes are sent to distillation towers, which are built on the same principle as those shown in the photograph of the pilot plant. In the distillation towers the mixture is separated by means of heat and pressure into its three basic constituents—methyltrichlorosilane, dimethyldichlorosilane, and trimethylchlorosilane. These three compounds are used as the basic substances for the production of silicone products.

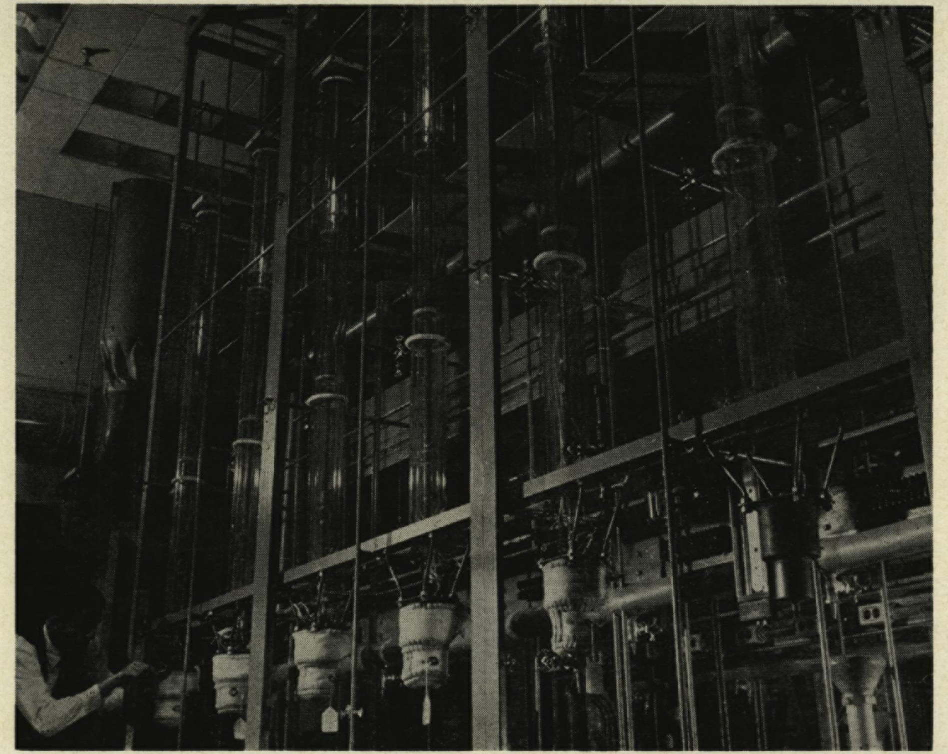
When the dimethyldichlorosilane is hydrolized, the resulting product is dimethyl silicone, a liquid much resmbling mineral oil. Dimethyl silicone is used in the production of two silicone products, commercial silicone oil and silicone rubber. When dimethyl silicone is heated with hydrolized trimethylchlorosiane, commercial silicone oil is formed. The silicone oil may be formed into silicone grease by reacting it with an inorganic soap. If dimethyl silicone is heated with a catalyst to bring about polymerization, silicone rubber gum is formed. This gum is allowed to solidify in cooling trays, after which it is cut in strips and shipped to users.

When a mixture of dimethyldichlorosilane and methylchlorosilane is hydrolized in the presence of toluol, a silicone resin-solvent mixture and hydrochloric acid are formed. After the hydrochloric acid solution has been drained off, the silicone resin-solvent mixture is heated to evaporate the excess toluol and to polymerize the resin into a high-viscosity liquid. This resin is now ready for shipping to the users of the product.

One of the most interesting of the many silicone products is silicone rubber. The most useful property exhibited by silicone rubber is its high resistance to both heat and cold. Silicone rubber can be exposed to temperatures up to 325° F. for long periods, and up to 520° F. for shorter periods, without becoming tacky or decomposing. Silicone rubber can also withstand temperatures as low as -70° F. without becoming brittle or cracking. This heat-resistant property puts silicone rubber in great demand for both industrial and military use. This rubber is ideal for use as gaskets in high or low temperature devices, such as turbo-jet engines, baking ovens, locomotive cylinders, diesel motors, refrigeration units, arc-lighting fixtures—to mention only a few of silicone rubber

Continued on page 20

Glass distillation columns used for control tests and as a pilot plant in the study of new organic-silicon products.



Allard's K2 Sports Two-Seater, with accessories

The Allard has evolved from a Ford hot rod to become the King of Sports Cars in England and America, and almost the world.

The birth of the Allard was in 1935 when a driver already known in British trails and hill climbs entered a home built Special in the Rough Gloucester Trail. The car was nothing more than a hopped-up roadster with a Ford V8 racing chassis. High in horsepower, the engine hauled the car to the winning of the Northwest London Cup—a premier award. The driver happened to be Sidney H. Allard.

Allard started experimenting with his Special. To begin with, he took a Ford chassis and shortened it in the best California tradition. To this he added a beat-up Bugatti Body. With this he began winning just about everything that he entered. Later in 1936 he took the regular Ford front axle and cut it in two in order to get independent front wheel suspension.

Allard began scoring so many wins that several of his friends wanted Allards also. So after World War II a company named Allard Motors Ltd. was organized. It formed to build and market a limited number of Specials. The first Special that was turned out had a V-12 head Lincoln Zephyr engine with aluminum heads and a downdraft carburetor. This engine developed 110 bhp. at 3800 r.p.m. It developed the car into a bucking broncho that called for the highest driving skill. From then on the "Allard lads" really went to town.

The original J series model, fitted with either a two-seater turtleback body, a four-seater sport body or a drophead coupe, was distinguished by a long tapering hood curving below the level of the front fenders to give excellent road vision close up. A

The Allard: Chassis Supreme

By Harry A. Harris, jr., c.e.

souped-up Ford V-8 engine developing 100 bhp. at 3800 r.p.m., powered the rear wheels through a Ford three-speed gear box. Lockheed brakes did the stopping.

Ford transverse-leaf suspension was used fore and aft, but a reinforced spring and a divided front axle now offered a more geometrical and less independent form of front suspension. A ground clearance of 9 1/2 inches enabled the car to buck the roughest roads without damaging the underside.

Let us look now at the Model J2. Allard considered many points especially important in the basic layout of a car; throughout the design these were followed closely. Low cost; low weight; moderate wheelbase of 100 inches; four-wheel independent suspension designed for best road holding and a weight distribution of about 55% of the total weight on the rear axle.

Frame stiffness is very essential in any high-speed car in order to form a perfectly rigid base for the wheel suspension. Allard has achieved stiffness by using box section side rails at the front, welded tubular cross members, and building up the body bracing as part of the frame. The resulting structure is rigid and fairly inexpensive.

On the front suspension Allard uses a very unorthodox layout. It's nothing more than an old-style Ford beam axle cut in two and pivoted at the inner ends; coil springs are used as the suspension medium, and the swinging arms are located by radius rods running back to pivots on the frame rails. This layout gives high roll center at the front which greatly increases the roll resistance and stability in cornering, and saves costs.

Rear suspension is the big secret of the J2's amazing road performance. When it comes to getting around a road in the shortest possible time, the conventional solid rear axle is not too good.

There are three reasons why a solid axle is unsatisfactory: When one wheel goes over a bump it causes the opposite wheel to deflect a little, which breaks traction and causes instability at high speeds. The high unsprung weight of a solid rear axle causes in a light car a high speed bounce. Crosswise or transverse engine torque on a solid axle tends to lift the right rear wheel when accelerating hard, which, off course, breaks traction.

There are several solutions to this, but the one that Allard used was an inexpensive deDion rear end. There is a separate dead axle tube fixed to each hub, linked together at the center so they can pivot independently; they are mounted to the bottom of the differential case which in turn is bolted to the frame. The drive to the road wheels is transmitted through splined universally-jointed shafts; the shafts can move in and out as well as up and down to accommodate the vertical movement. Radius rods from each hub to the center of the frame locate the wheels. Coil springs carry the load. The American-built Dodge truck, called the Root Van, has a rear suspension similar to this deDion system.

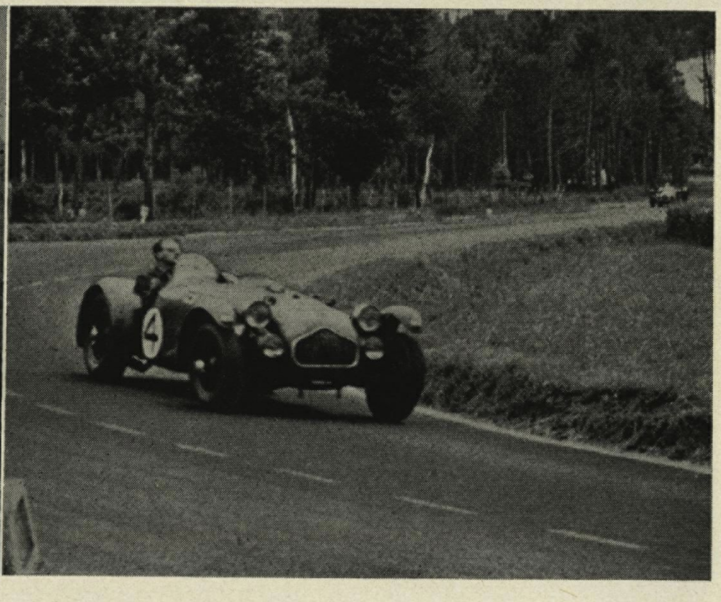
There are several power plants that will fit in the J2, but at the present time the Allard does not install the power plant; instead they sell the chassis and the buyer installs his own power plants. For a long time the standard power plant was a regular Ford V-8 100 H.P. engine. This same engine could be had with special Allard dual Solex manifold and $7\frac{1}{2}$:1 aluminum heads developing 120 H.P. at 3800 r.p.m.

America's Willy Frick and Phil Walters installed the first Cadillac engine ever to sit between an Allard's frame members. After this, the Cadillac Allard became an outstanding winner. With the introduction of the Chrysler V-8 engine, which happens to fit very well in an Allard, many records have fallen.

The price of the Allard in comparison with other sports cars is fairly low. With a Cadillac engine it sells for under $5000 delivered in America. This is low as compared to the price tags on the Ferraris, Alfas and even Aston-Martins.

Sydney Allard, in his Steyr-engined Allard Special, takes off during the "Rest-and-be-Thankful" Hill-Climb in 1949.

In June 1950 Sydney Allard set a course record while winning his class in the Le Mans 24-hour race in his Allard J2.



Research and

By Fritz Wheeler, jr., e.e., John Rink

Better Sawing

One of the most spectacular industrial operations is the sawing of huge logs into lumber. The log, if it be a douglas fir in the Pacific Northwest, may be up to 8 feet in diameter, 30 feet long, and weigh 20 tons. It is placed on a log carriage, which shuttles back and forth before the continuously running bandsaw, under the sawyer's control. The sawyer's job is one requiring great skill, for it is one of judging each log and making rapid decisions as to what sizes and shapes of stock to make out of the log so the total value of the product will be the largest possible. He follows his decisions by signaling his carriage borne assistant or assistants in a sign language peculiar to his trade and by appropriately manipulating the carriage drive control. Anything that can be done to reduce the physical effort involved in these manipulations will quite naturally reduce the sawyer's fatigue and enable him to do a better job, resulting in a more profitable use of his raw material.

Two amplifying devices were paired last year to do this. They are the Rototrol and magnetic amplifier. Together, they permit control of the powerful output of the adjustable voltage d-c log carriage drive from a small, very low effort, sawyer's master switch. This combination gives the sawyer, almost literally, finger-tip control of carriage movements. Any speed from maximum to zero and to maximum in the reverse direction is obtained by movement of the master switch handle through a travel of only 11 inches and a force never exceeding the weight of a man's hand. The switch itself incorporates a slight modification of the series of metal leaves with silver contacts, such as are used in the Silverstat regulator. Successive closures of contacts are made by applying an increasing pressure to the outer leaf. The resulting small changes in current are built up by the combined amplification of the magnetic amplified and Rototrol, and applied to the field of the drive generator where it acts to control drive speed. By means of feedback in the system, accelerating rates are automatically limited to safe values and running speeds are held constant.

Log Carriage Control.

Radioactive Wastes

Cremation of radioactive wastes from the Knolls Atomic Power Laboratory near Schenectady, N. Y., reduces their volume about 50 times and generates non-radioactive gases which are discharged into the atmosphere.

The laboratory is operated by General Electric for the Atomic Energy Commission. A major activity of the laboratory is in the development of an atomic power plant for use on U. S. Navy submarines. In addition studies are being made of chemical separations processes.

Because the laboratory is near a populated area, no detectable radioactivity can be discharged into the ground water or into the nearby Mohawk River.

Liquid wastes are handled through an elaborate plant treating 3,000,000 gallons per year. First the liquid is distilled, and then redistilled if necessary, leaving radioactivity behind in a thick mud, or "slurry," made of the material which was dissolved or suspended in the original liquid. Water distilled off, which is nonradioactive and actually of a high degree of purity, is discharged into the river.

The remaining mud is collected in stainless steel cans. This material represents about one three-hundredth the volume of the original liquid wastes.

Development

, ch.e., and Jack Vrydagh, jr. m.e.

In addition to the liquids, the laboratory has a considerable amount of solid wastes. Those that are burnable are "cremated" in a cylindrical furnace seven feet high and three and one half feet in diameter, at a temperature as high as 1000 degrees or more. This handles about 40 pounds of combustible materials every hour.

In order to remove from the chimney gases any solid smoke particles which may be radioactive, the gases are washed by a water spray and then filtered.

The final solid wastes from the two processes are now temporarily stored in a special building, but in the near future the company is going to ship these stored wastes to a site in an unpopulated area where they can be stored above ground indefinitely with safety.

"Center of Gravity" Mounting

High-precision controls and other devices for jet aircraft of the future may be nearly shock-proof as a result of a new "center-of-gravity" type mounting.

The new mount was designed to isolate the controls from vibration and shock encountered in modern high-speed aircraft. It resembles a small platform suspended by a coil spring at each of its four corners.

Key to its effective operation is the location of the control to be protected. The control is placed on the mount so that its center of gravity is an equal distance from each of the four supporting springs, and in the same geometric plane. This eliminates unbalanced movement and enables the springs to withstand shock from any direction.

In addition, each spring is constructed of metal layers of different thicknesses. These layers have widely differing reactions to vibration so they tend to "snub" or neutralize one another and thus eliminate resonant vibrations.

In their first use in arcraft, the new mounts will carry voltage regulators, devices which maintain a constant output of electric power for the plane's generators—all-important in highly-electrified modern aircraft.

About the size of a box camera, a voltage regulator weighs 3½ pounds when at rest. Under shock conditions, however, this weight is multiplied greatly as forces equal to ten times the earth's gravitational pull are exerted. This much force might be encountered in extreme shock during landing, pulling out of a steep dive, or in a sharp turn.

Radio Control System For Airborne Lifeboat

Completion of final acceptance tests on a new radio control for an airborne lifeboat that can be dropped by parachute from an airplane and unerringly guided to survivors in the water has been announced.

An electrical control system uses the radio signal from the air to control the engine and equipment for driving and steering the boat.

After the 30-foot-long craft is dropped by parachute into the sea from the rescue airplane, radio signals at five different frequencies take over complete control in individual stages. The stabilizing fins that hold the boat steady as it leaves the plane are jettisoned. A guard protecting the propeller and rudder is freed. The engine air vents are opened. The motor is cranked up and automatically choked. Following this, the clutch is engaged and the throttle advanced to send the craft forward under the guidance of the radio controller.

When the lifeboat reaches the survivors, the airborne operator can bring it to a halt until the survivors board and then set the boat on its

Continued on page 26

Radio-Controlled Lifeboat with Fins

Basketball Review

By Allen Forsaith, sr., m.e.

Engineers Edge Blackburn 50-48

Saving his lone contribution of the evening until it would count the most, Harry Zorman broke up a 48-48 tie in the final seconds of the ball game with a brilliant under-the-basket fielder.

Rose came from behind midway in the first quarter to tie the score at 11 all. A basket by Ralph Bennett in the dying seconds of the quarter put the Polymen in the lead 14 to 13. The Beavers couldn't keep the pace in the second quarter and fell behind 22 to 21 at the half. They rallied in the third frame, however, and tied the score 42-42 at the three quarter mark. Blackburn continued the hot pace in the fourth quarter and led going into the last five minutes. Then a basket by Harry Badger and charity tosses by Badger and Leo Little set the stage for Harry Zorman's game winning score.

Harry Badger was high man with 22 points and Ralph Bennett ran a close second with 13 counters.

Bearcats Win with Free Throws 73-53

The Bearcats of McKendree College cashed in on 31 of 42 free throws to sew up a foul ridden contest in which 63 personal fouls were called, 73 to 53.

Harry Zorman and Ralph Bennett chalked up 13 and 11 points, respectively, to lead the Polymen.

Carrmen Overtake Concordia (Springleld) 56-55

Fielder by Ralph Bennett, Harry Badger and Don Snape in the final minutes of play demolished a Concordia lead and sewed up the contest for the Rose and White.

Concordia led until the Rose rally in the final quarter. They held a slim 13 to 12 margin at the end of the first quarter but widened it to a 7 point gap, 29 to 22 at the half.

Midway in the third quarter the Engineers caught fire and pulled to within 4 points of the front running Concordia quintet by the end of the quarter. In the last quarter the Carrmen overtook Concordia and stalled the remaining minutes of the game.

Scoring honors went to Harry Zorman with 14, Harry Badger with 12 and Ralph Bennett with 11 points.

Rose Trounces Principia 67-54 To Close Season

The Fighting Engineers wound up their first winning season since 1941 by drubbing the Principia five, 67 to 54.

The Engineers started with a rush in the first quarter, building a 15 to 8 lead before Principia found the range and narrowed the count to 23-19 at the quarter mark. A spurt by the visitors at the start of the second quarter was quickly squelched as the Engineers piled up points to go ahead 45-32 at the half.

The Carrmen maintained their 13 point lead throughout the second half. The game and season ended in a 67 to 54 triumph.

Harry Badger scored from all angles to pace the Polymen with 11 fielders and 3 free throws. Leo Little and Harry Zorman counted 17 and 16 points respectively.

51-52 Basketball Campaign Best in 11 Years

The Fighting Engineers closed the 1951-52 season with three straight victories for a 9 and 8 record and their first winning season since 1941.

Coach Carr and the team can be proud of this record as it was achieved without a man over 6-1 on the starting five. In the light of today's game in which no team is considered complete without a self propelled goliath or two, this record is remarkable.

The team won two games by a single point and four games by two points. They also dropped a pair of heartbreakers, one to Principia by two points and one to Concordia (Ft. Wayne) by three. The opposition outscored the Engineers by a margin of 4 points a game as the Rose and White scored 956 points during the season and their opponents 1024. The Polymen still ended up one ahead in the games won column thanks to cool playing by all hands during the close ones.

This season was the last for pivotman Ralph Bennett and guard Leo Little, both played brilliant ball and will be hard to replace in the lineup next season. At forwards were Harry Badger and Don Snape, junior and freshmen respectively. Both are expected back next year unless Uncle Sam steps into the picture. At guard was sharpshooter Harry Zorman. Harry is a sophomore with two more seasons to go.

Bob Dedert, Joe Buscher and George Ross spelled the forwards until mid-term when grades caught up with George. The guards were ably seconded by Dick Green, Jim Matthews, Roy England and Mike Dragon. Mike spent the last half of the season on the sidelines, another casualty of midterms.

A king sized orchid to Coach Jim Carr for the outstanding job he did with this year's aggregation. Overcoming the lack of height in the team and the short practice time he molded the Engineers into a basketball machine for the first winning season in a long, long time.

In classes like this at the Bell Telephone Laboratories' school for communications development training, college graduates study electronics, oscillations and waves, switching and transmission.

THEY'RE HEADED FOR NEW FRONTIERS

Each year the Bell System selects hundreds of college graduates to learn how to develop, maintain and administer our country's telephone system. Thanks to the competence of our nation's professional educators, these graduates come with an excellent grounding in fundamentals.

Those specially fitted for research, work in the Bell Telephone Laboratories to develop tomorrow's telephone service. In the Western Electric Company, others are planning manufacturing processes or supervising production operations. And in the Bell operating companies, still others are engaged in the engineering and administrative side of telephone service.

More than ever, America's future must depend on men and women who are trained to think far ahead. They are needed both in technology and in administration.

By joining forces with such people, and helping them progress, the Bell System works to keep America's telephones the world's best, and to help the armed forces keep our country safe.

BELL TELEPHONE SYSTEM

Fraternity Notes

Bob Miller, soph., e.e., Dick Myhre, jr., m.e.,
Jack Freely, soph., c.e., Erv Ulbrich, soph., e.e.

Alpha Tau Omega

Pledges are once again buzzing around the halls of ATO. With the passing of rush came the new class of pledges in the form of John Gregory, Al Furlan, Bill Supp, Phil Homes, Bernie Greenwell, Ralph Llewellyn, Kermit Morris, Bob "Lafe" Stewart, Don Powers, and Dick Bosshardt. The first get-together was a dinner held at the house on Wednesday night, March 5. Pledging ceremonies were held immediately after dinner.

The following Saturday evening 63 Gilbert was rocking to the tune of a bang-up house party. Contests, dancing, and plenty of refreshments helped to make the affair a real success.

Indiana Gamma Gamma brought home the bacon from the recently held ATO State Day. Worthy Master Joe Perona, representing the chapter at the speakers' table, accepted the two trophies awarded the Rose Chapter. One silver pitcher was given for leading the seven chapters of Province XVII, which are Indiana, Purdue, Monmouth, Northwestern, DePauw, Illinois, and Rose, in scholarship. The second pitcher was awarded for one hundred per cent attendance at State Day.

Sigma Nu

Honors recently bestowed upon brothers of Beta Upsilon at the honor assembly held on February 20 were: Harry Badger and Richard Grubaugh tapped for Tau Beta Pi; and Robert Ray and Ric Werking tapped for Blue Key Fraternity. R.P.I. Honor Keys were awarded to Richard Grubaugh, Harry Badger, and Ric Werking.

The halls of Sigma Nu have recently undergone a redecorating job. Of special note is brother "Porky Stewart's room which is now a "passionate red." What, no chartreuse?

In preparation for the state Sigma Nu basketball contest, to be sponsored by the Beta Zeta chapter at Purdue University, the men of Beta Upsilon have been working diligently to have the team in shape by spring. Hopes are high for a successful team with Gurdon Hunnington as coach and "round-ballers" Badger, Green, Fyfe, Dedert, and "12 gauge" Leonard.

George Washington's birthday was "properly" celebrated by the brothers and their dates with a picnic at Turkey Run State park. The picnic turned out to be a completely enjoyable event; but uneventful in one respect, no one did a swan dive into the creek this time —water too cold? This picnic served as a preliminary for the several picnics scheduled on the social calendar for spring.

Lambda Chi Alpha

On February 20, Theta Kappa of Lambda Chi Alpha initiated Warren Jones '52 and Chris Paris '54. During the evening of the Military Ball, a couple of our young heroes threw caution to the winds and pinned their favorites. Miss Norma O'Rear was pinned by Gunter Ludwig Thiel I; also, Miss Lois Williams was pinned by "Skip" Zoph. Bill Lamb took the same precarious step a few weekends ago and pinned Miss Carolyn Traylor. We are happy to report that all of these gentlemen have generously presented their cigars. It's old news now but for the record Miss Betty Bailey gave notice of her successful winter offensive when Ralph Bennett announced their engagement.

An enjoyable house party was held after the Military Ball; Cameraman Bob Barton was present and the chapter photograph album benefited. "Skip" Zoph was elected to replace Abe Samuels as rush chairman. Skipper, with the help of house manager Jack Farell, got the chapter in gear for the big push.

Theta Xi

This month has been a busy one for Kappa chapter; for it culminates in Rush Week. The house at 1701 Chestnut has been renovated for this event both inside and out. After the Military Ball, a very successful floor-warming and open-house party was held in honor of this "new look" in houses.

Congratulations to Brothers Grinslade and Griffiths on getting Honor Keys at the recent Honor Assembly; also to Brother Kawano on his initiation into Blue Key and to Brother York on his initiation into Tau Beta Pi.

On Wednesday, Feb. 27, as many of the chapter as felt able gave blood at the Blood-mobile. Thanks to Brother R. C. Miller and Brother W. L. Miller for organizing the donations.

Although Kappa's house-mother was ill for a while this month, the cuisine suffered none. This was due to the here-to-fore hidden, expert culinary efforts of Brother Scharpenburg, who plays a mean griddle.

Best of luck to all of Kappa's members who are out for the various spring sports.

Alumni News

By Chris Scharpenberg, sr., m.e.
William Scharpenberg, fresh.

'28 Robert F. Alexander, C.E., a colonel in the Corps of Engineers, has been assigned as a Regimental commander at Fort Sherman in the Canal Zone.

'28 Morris T. Shattuck, Ch.E., has been transferred from Charleston, Virginia, where he was a production Superintendent, to Kearny, New Jersey, where he has become an Assistant Plant Manager of the duPont Company's Arlington Works.

'29 Word has been received by Rose that H. Paul Shewmaker has passed away. Mr. Shewmaker was the Benzol Foreman for Inland Steel Company.

'30 Milo M. Dean, C.E., formerly the Chief Engineer for Grayhound Corporation in Chicago, has become the Director of Engineering for Raymond Lowey Associates of Chicago.

'33 Norris V. Engman, C.E., has been named as the assistant to the Secretary of the American Railway Engineering Association. Mr. Engman was with C. M. St. P. & P. Railroad before accepting this position.

'34 Maurice Tucker, E.E., together with Dr. Herbert Ribner, will present a paper titled "Turbulence in a Contracting Stream" at the second Midwest Conference on Fluid Mechanics in Columbus, Ohio, on March 17 to 19, 1952. Mr. Tucker is now an aeronautical research engineer in the division office of the Eighty-by-Six-Foot supersonic Wind Tunnel at NACA's Lewis Flight Propulsion Laboratory in Cleveland.

Mr. Tucker started to work at the NACA Langley Laboratory in Virginia in 1940, and he was transferred to Lewis in 1943. The research program at the Lewis Laboratory is centered primarily on the propulsion problem created by the advent of supersonic speeds.

Mr. Tucker lives in Shaker Heights, a suburb of Cleveland, is married, and has four children.

'35 John J. Hager, Ch.E., formerly with the B. F. Goodrich Company in Akron, Ohio, is now the Manager of Automotive Products Sales for the Pioneer Latex and Chemical Company in Westfield, New Jersey.

'35 Harry H. Richardson, M.E., is now an assistant to the vice-president in charge of Production for the Bull Dog Electric Products Company of Detroit, Michigan.

'41 Carlton L. McWilliams, C.E., is now an Aeronautical Research Engineer. His duty is as the Chief of the High Speed Track Section at Edwards Air Force Base in California.

'41 John E. Tracy, E.E., has moved to Denver Colorado, and is now an Electrical Engineer with the Austin Company.

Dec. 45 Joseph B. Durra, Ch.E., is a Pfc. at the Army Chemical Center, Maryland. He is presently assigned as an assistant project engineer, and his duties are in the Scientific and Professional Personnel Program, which is designated to reduce the expense of research and development in the specialized fields which would otherwise demand highly-paid civilians.

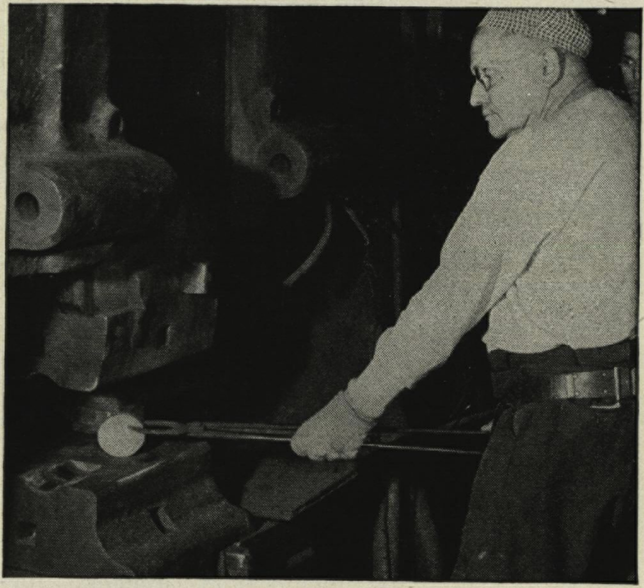
What's Happening at CRUCIBLE

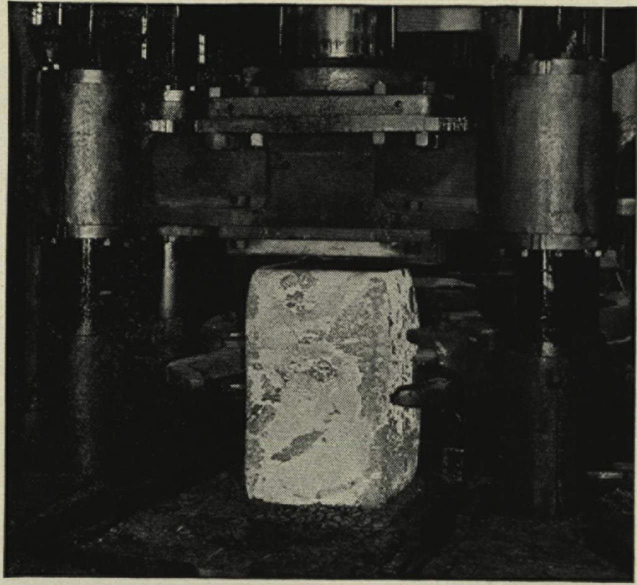
about tool steel forgings

Whether 1½ pounds or 7 tons . . . forgings get the same sensitive handling

Crucible's reputation as the specialty steel leader is built on a devotion to the smallest detail . . . regardless of the size of the order.

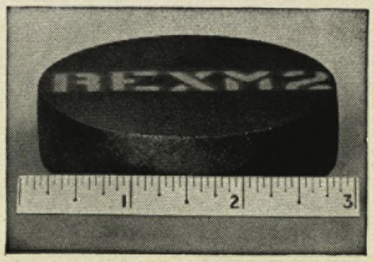
These forgings are good examples of Crucible specialists at work:

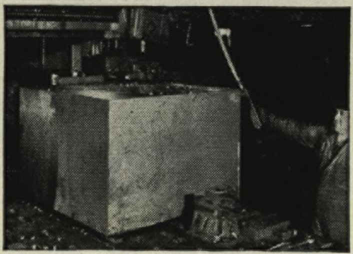




Rex M-2 High Speed Steel Disc Forging (1½ pounds)

Pancake forgings such as these are used extensively by small tool makers. Extreme care is taken in the preparation of the slug stock. The upsetting insures proper flow lines. Milling cutters, gear shavers and similar cutting tools that require maximum toughness, coupled with the best cutting ability, are made from these forgings.





CSM-2 Plastic Mold Forging (14,000 pounds)

This CSM-2 plastic mold steel forging was made from a 25,000-pound ingot. This block will be heat-treated and worked to produce a mold for the manufacture of large plastic parts. The finished weight of the forging is 14,000 pounds. And it is the largest mold forging yet produced by Crucible.

Engineering service available

Crucible's engineering service is geared to meet your research and development problems. If you use special forgings, or any special purpose steel, check with Crucible. Crucible Steel Company of America, General Sales and Operating Offices, Oliver Building, Pittsburgh, Pa.

CRUCIBLE first name in special purpose steels

52 *years of* *Fine* *steelmaking*

Midland Works, Midland, Pa. • Spaulding Works, Harrison, N. J. • Park Works, Pittsburgh, Pa. • Spring Works, Pittsburgh, Pa.
National Drawn Works, East Liverpool, Ohio • Sanderson-Halcomb Works, Syracuse, N. Y. • Trent Tube Company, East Troy, Wisconsin

Enter -- The Silicone Age

Continued from page 9

uses which are based on its temperature resistant quality. Silicone rubber has also found great use in the chemical industry. This is due to silicone rubber's high stability in the presence of industrial solvents and chemicals, such as alcohol, acetone, salt brine, and ammonium hydroxide. It also shows a high resistance to oxidation, ozone, ultraviolet light, and fugus growths. Because of its stability, as well as its temperature resistance, silicone rubber has been found useful as gasket material between parts of vessels containing chemicals. Silicone rubber shows good insulating and dielectric properties at all temperatures. For this reason it has found application as the insulation on ignition cable in Army tanks, trucks, and jeeps, in which ruggedness and adaption to all types of weather conditions are very necessary.

One other silicone is a fluid that looks like highly refined petroleum oil. When the chemical composition of this liquid is determined, it is found to have an 80% silica content. With that much silicon, one would think that this substance would solidify when chilled, but it does not freeze until the temperature reaches about -95° C. This property is characteristic of the silicone oils. Besides having a low flow point, these silicone oils have a high temperature stability (to about 300° C.) and a minimum change in viscosity from low to high temperatures. These and other properties of the silicone oils make them of interest as hydraulic fluids, heat transfer fluids, and lubricants. They also have excellent electrical properties which make them of interest as dielectric liquids for transformers and capacitors. One application of the silicone oils is their use as lubricants for molds handling rubber, synthetic plastics, and other materials. Because of their insolubility in petroleum, these oils may also be used as an anti-foaming agent in various petroleum products.

A silicone product quite closely related to the silicone oils is silicone grease. These silicone greases have semi-lubricating properties which have been developed for the lubrication of plug cocks and valves. They also have found important application as a dielectric compound for insulating ignition systems. The temperature stability and freedom from carbonization of silicone greases have led to their being used as mold release agents or lubricants, as are the silicone oils.

Another product, silicone resins, shows great promise as a material for bonding insulators to wire conductors. These resins dry at temperatures as low as 300° F. The main use at the present time is to bond asbestos and glass cloth to wire conductors. They are excellent for this use because of their high temperature stability, which reduces the probability of electrical fires. Silicone resins have also found use as ingredients in paints and other types of surface coatings. These silicone resins make the surface coating very durable under high or low temperatures, and also make it resistant to corrosive acids and alkalis. Silicone-base paints have found use for coating incinerators, mufflers, furnace casings, smoke stacks, and other industrial hot spots.

Another silicone product, with which people are more familiar than any other, is a substance resembling ordinary putty, that can be drawn out in long threads like taffy, but when made into a ball and bounced has a greater rebound than that of natural rubber. These are only a few of the unique properties of silicone "bouncing putty." Under ordinary circumstances "bouncing putty" is plastic and free flowing, but if subjected to a sudden stress, such as being struck with a hammer or dropped from a rather great height, it will shatter like glass. The viscosity of "bouncing putty" is only slightly affected by low temperatures.

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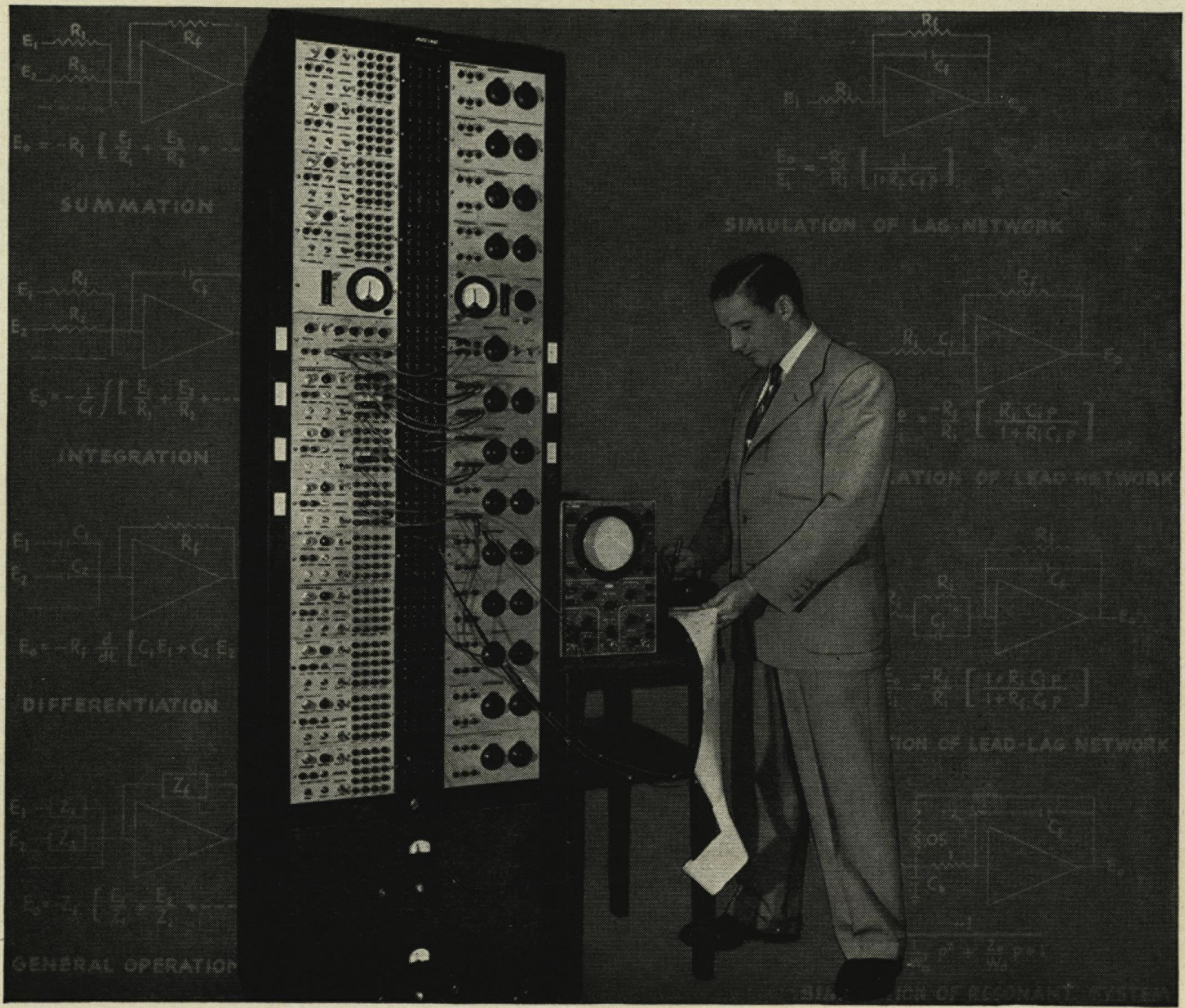


Solving a dynamics problem with the Boeing Computer; oscilloscope at right shows result.

What's it like to be a Boeing engineer?

Boeing engineers enjoy many advantages – among them the finest research facilities in the industry. These include such advanced aids as the Boeing-designed, Boeing-built Electronic Analog Computer shown in the picture above.

This is part of the stimulating background that helps Boeing men maintain the leadership and prestige of an Engineering Division that's been growing steadily for 35 years.

If you measure up to Boeing standards, you can share that prestige. And you'll work with renowned engineers on such vital projects as guided missiles, the still-classified B-52, the record-shattering six-jet B-47, and other outstanding developments.

You can work in Seattle, in the Pacific Northwest, or in Wichita, Kansas. You will benefit from in-plant training programs, from merit reviews that enhance advancement opportunities. You'll be part of a distinguished, long-range Engineering Division. You'll be proud to say, "I'm a *Boeing* engineer!"

So plan *now* to build your career at Boeing after graduation. Salaries are good, and they grow as you grow. Boeing has present and future openings for experienced and junior engineers for aircraft

- ***Design***
- ***Research***
- ***Development***
- ***Production***

also for servo-mechanism and electronics designers and analysts and for physicists and mathematicians with advanced degrees.

For further information, consult your Placement Office, or write:

JOHN C. SANDERS, Staff Engineer — Personnel
Boeing Airplane Company, Seattle 14, Washington

BOEING

Enter .. The Silicone Age

Concluded from page 20

Exhibit of bouncing putty—to help you remember the polyorganohalogenopolysiloxanes.

Its high resilient property has brought about its use for golf ball centers. It has also found some application for novelities and as a muscle exerciser.

Another silicone we might add to the long list of silicone products already available for commercial use is known by the trade name of Dri-Film. This highly water-repellent coating is composed of mixtures of silicones, such as methylchlorosilanes. Dri-Film may be purchased in a number of different grades, such as one which may be applied in the vapor form and another which may be used as an emulsion. The applications of this product from silicon are many-fold. Films of this water repellent have been used for coating ignition wires, spark plugs, and radio equipment to prevent the wires from becoming wet during humid weather conditions, thus causing short circuits. Because Dri-Film is so highly water repellent, it has found use as a coating for high-tension ceramic insulators on power lines. Dri-Film, in the emulsion form, is used as a fabric and paper coating. For this type of coating, the Dri-Film is applied in the pulp beater, where it coats the paper fibers before they are formed into sheets. The paper industry first applied a silicone product to this use when it used methylchlorsilane vapor to form a protective coating on paper during World War II. Dri-Film has also found some application in the laboratory. It is used to make filter paper water repellent, so that the filter paper will allow certain liquids like hydrocarbons to pass through but will not permit the water to pass. It has also found a more recent application in the laboratory as a coating for tubes and other glassware in which human blood samples are collected or preserved. It is also used for laboratory glassware when glassware with water repellent properties is desirable. Some types of fluorescent lamps are difficult to start in a moist atmosphere; this difficulty may be remedied by simply applying a coat of Dri-Film to the lamp. Another important use for this silicone is for the coating of automobile windshields. In this manner the windshield is kept clear of both rain and snow. These few applications mentioned here are but a small number of the uses for which Dri-Film may be applied.

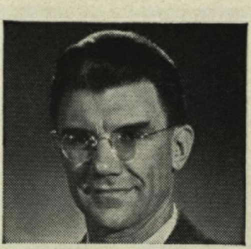
All of these applications of the silicones show that this coming "Silicone Age" is going to be an age of wonders. For example, perhaps in a few years the days of car-washing will come to an end; one application of a silicone polish when the car is new will last it a lifetime. Or perhaps the days of raincoats, umbrellas, and rubbers are limited; we'll simply have clothes that have all been treated with water repellent silicones. The possibilities of the silicones are unlimited.

Now that we have found the key to the production of substances of commercial value from sand, the chemistry of silicone is well on the way to the prominence of organic chemistry.

Yes, it looks as though the "Silicone Age" is just around the corner.

When You Find the Work You Like
STAY WITH IT!

by GORDON W. CLOTHIER, *Manager, Transformer Section, Electrical Department*
ALLIS-CHALMERS MANUFACTURING COMPANY (*Graduate Training Course 1938*)



GORDON W. CLOTHIER

THAT'S a good plan, but there's just one little catch in it; sometimes it takes a good while to *find* the work that's right for you. If you're worried about that, perhaps my own experience will point out a practical shortcut.

I got my E. E. at the University of Washington in 1935, and went on with graduate work and teaching for another year. Then—into the practical business world. That's when I found the shortcut. I enrolled in the Allis-Chalmers Graduate Training Course in 1936, and very soon I got interested in the big transformers. I've been with them ever since, and they've given me a lot in accomplishment and satisfaction.

Back to Stay

Of course, during two years in the Graduate Training Course I got around a good deal in the big West Allis works. Had some time in the shops, got acquainted with the work of many departments, tried my hand at design, test, sales application work. But I came right back to transformers and have always been a lot more satisfied because I'd seen a broad range of other types of products and work at Allis-Chalmers.

In 1941 I became engineer in charge of transformer sales, and in 1947 was made manager of the transformer section.

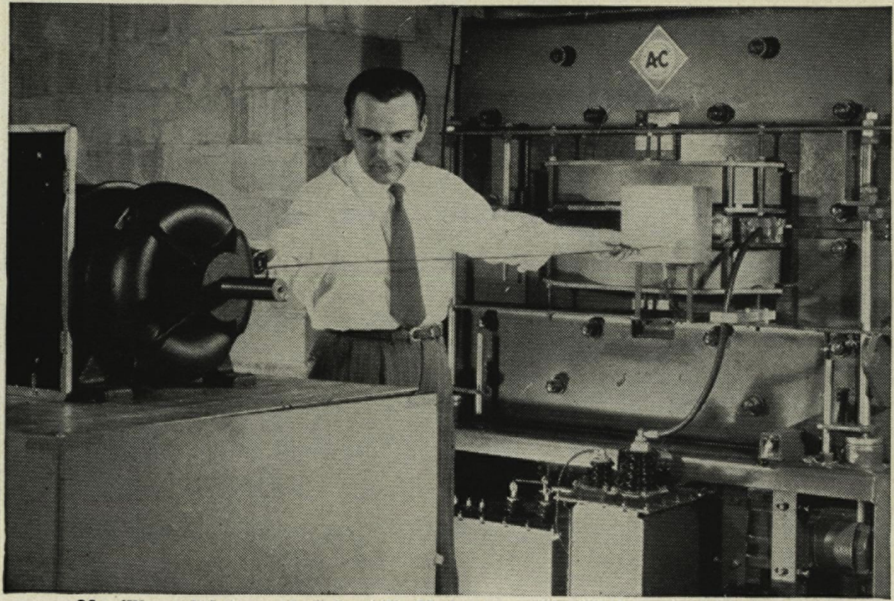
This field offers both challenges and rewards. It needs and seeks men of superior intelligence, imagination and creative ability—men who will strike out into new paths of study and development.

If you think a transformer is an inert mass of iron and copper windings in a tank of oil—look closer. There are advanced problems in magnetostriction that if solved, will eliminate transformer hum and revolutionize the business. It's the same with problems in metallurgy, insulation, measurement and control of electric field shapes and the effects of time on materials. Perhaps some young engineer, even during his Graduate Training Course days here, may make important contributions. The opportunity is waiting.

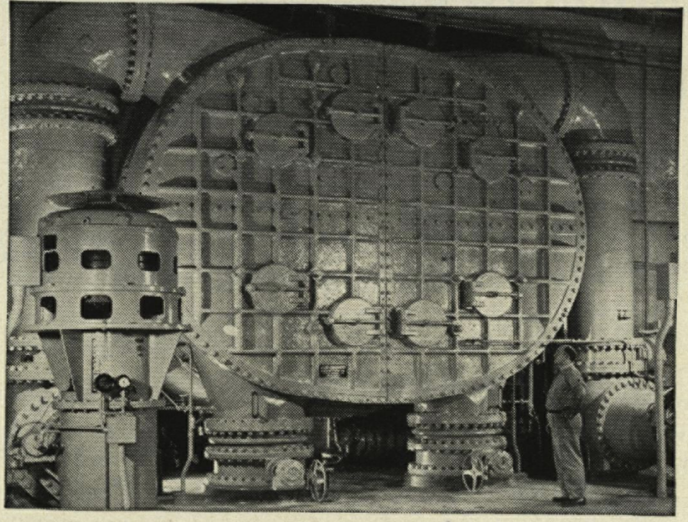
What Do You Want to Do?

It's the same in other departments at Allis-Chalmers. Ore processing methods and machinery—electronic equipment—public works—steam turbine and generator design—hydraulics—manufacturing—research—sales—they all hold opportunities. Here you'll have a chance, as a Graduate Training Course engineer, to look over the widest range of industrial fields covered by any manufacturing firm in the country. You can help plan your own course, get advanced degrees. It's a shortcut to finding the work of your choice.

Write for information and literature, or call on the Allis-Chalmers district office in your locality.



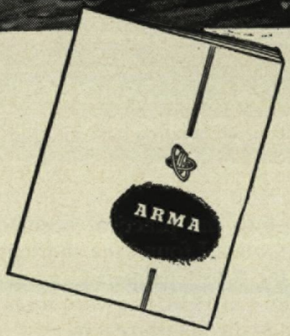
22-million-volt betatron built by Allis-Chalmers can "look" through 20 inches of steel to detect flaws. Here a technician is setting up motor specimen for radiography.



Two-pass 45,000 sq. ft. surface condenser and two 42" x 30" vertical mixed flow pumps. Allis-Chalmers oval design saved space in this big new power plant.

ALLIS-CHALMERS

Allis-Chalmers Manufacturing Company, Milwaukee 1, Wisconsin



ARMA

Television joins the microscope in a major scientific advance, pioneered at the David Sarnoff Research Center of RCA, Princeton, N. J.

Microbes star on Television in war against disease!

Until recently, scientists found it difficult to keep microbes alive for study—at high magnification—in light microscopes. Dyes, used to make them visible, killed some. Others were destroyed by the intense light.

RCA scientists have solved this problem by making television a working partner of the microscope. "Eye" of their new system is a tiny industrial television camera built around RCA's sensitive *vidicon* television tube. No intense light is needed, since this electron tube "sees" at extremely low light levels. And by making the tube sensitive to the red or violet bands of the spectrum, dyes and stains are eliminated.

With RCA's system, research men can watch living germs or cells—immensely magnified—on the screen of a television set. Many are able to watch at a time. Students can be more easily trained. And science *learns more* about disease by watching *live* micro-organisms.

Improving the microscope by teaming it with television is an example of the many paths explored by RCA Research. You benefit directly by better performance from any instrument or service of RCA or RCA Victor.

* * *

See the latest in radio, television, and electronics at RCA Exhibition Hall, 36 West 49th Street, N. Y. Admission is free. Radio Corporation of America, RCA Building, New York 20, N. Y.

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 College Relations 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

Research and Development

Continued from page 13

course again. If the physical condition of the rescued men is good, they can take over control of the boat themselves. If they are too weak for this activity, the airborne operator can guide them to shore or a rescue surface ship. The boat is equipped with triple controls, permitting passengers to break off radio control at any time and operate it electrically or manually.

The first set of operations after the boat strikes the water consists of the five separate stages described above. The radio signal controlling these functions is transmitted to the boat at a frequency of 955 cycles a second. Another radio signal—this one at 3000 cycles a second—now goes into action. The gear shift is advanced from neutral to forward and at the same time the throttle is advanced to half speed. To turn the boat left, a radio signal of 650 cycles acts on the magnetic compass steering mechanism. For a right turn, a signal of 300 cycles is used.

For emergencies, the airborne operator uses a fifth frequency of 1390 cycles. In the event that the magnetic compass steering system should not work, this signal bypasses it and works directly on the steering apparatus itself.

If the survivors are too weak to handle the boat manually—and if contact with the rescue plane is lost—a push-button control system is available.

The 3500-pound craft can hold 15 men, with provisions for 10 days and fuel for an 800-mile cruise. It is also equipped with "walkie-talkie" radio sets for boat-plane communications, a machine for distilling fresh drinking water from sea water, and a zipper canopy to protect survivors against the boiling sun.

Applications of Atomic Energy

Although atomic power for industrial use is still in the long-term future, atomic energy is now being used in such diverse jobs as studying plant growth and measuring wear on automobile piston rings. Atomic energy also is being used to detect impediments in pipelines, to aid in determining how metals corrode, and to help in the search for better metals for aircraft gas turbines.

These and numerous other applications of atomic energy are being accomplished through the use of radioisotopes, materials which have been exposed to radiations of atomic reactors and which emit particles and rays that can be detected by scientific instruments such as a Geiger Counter.

In studying processes of plant growth, scientists have mixed radioactive phosphorus with fertilizers. As the phosphorus travels through the roots, stems and leaves, its radiations permit its progress to be closely followed, showing where and how quickly the phosphorus is utilized by the plant.

The wear on piston rings was featured by an oil company, which wanted to test effectiveness of cylinder lubricants. The rings themselves were exposed to atomic rays, and so became radioactive. After they had been used on very short runs, the wear could be determined by measuring the radioactivity that had gotten into the oil.

Another application is to long-distance pipelines, which are cleaned by forcing through a scraper by the pressure of the fluid being carried. Occasionally, a scraper becomes stuck, blocking the line, and it is often difficult to find its position. However, by incorporating some radioactive material in the scraper, it can be located by a man walking along the line with a counter.

Similarly, in working with metals, such methods enable the location of particular atoms to be determined. Thus, one may find just where rust or corrosion forms, or where alloying elements added to a melt are deposited in the solid metal, thus allowing significant study toward better metals.

Concluded on page 28

Will we ever run out of gas?

Running out of the crude oil that powers and lubricates our civilization is not an immediate danger. Scientific methods of exploration, drilling, and recovery keep pushing farther and farther into the future the day when petroleum must be supplemented by other raw materials. When that day comes, however, there is no danger that the American economy will slow down.

Standard Oil already knows how to make high-quality gasoline from coal or oil shale. The supply of these raw materials is far greater than the reserves of petroleum. It is important that the research and development work in the entire field of synthetic fuels continue so as to lower the cost and raise quality still higher.

Work with synthetic fuels is only one example of how Standard Oil plans ahead to serve its customers. By working to keep this company in the forefront of one of America's most competitive industries, our researchers and engineers are helping to keep America itself ahead and to make life better for every American.

Standard Oil Company

STANDARD

Research and Development

Concluded from page 26

There are also possibilities of using atomic by-products. When plutonium for atomic bombs or other uses is made in the great reactors at the Hanford Works, in Washington, the breaking up, or fission, of uranium atoms leaves a wide variety of radioactive fission products which have thus far found little use. Possible applications for them have recently been explored by the Stanford Research Institute, at the request of the Atomic Energy Commission.

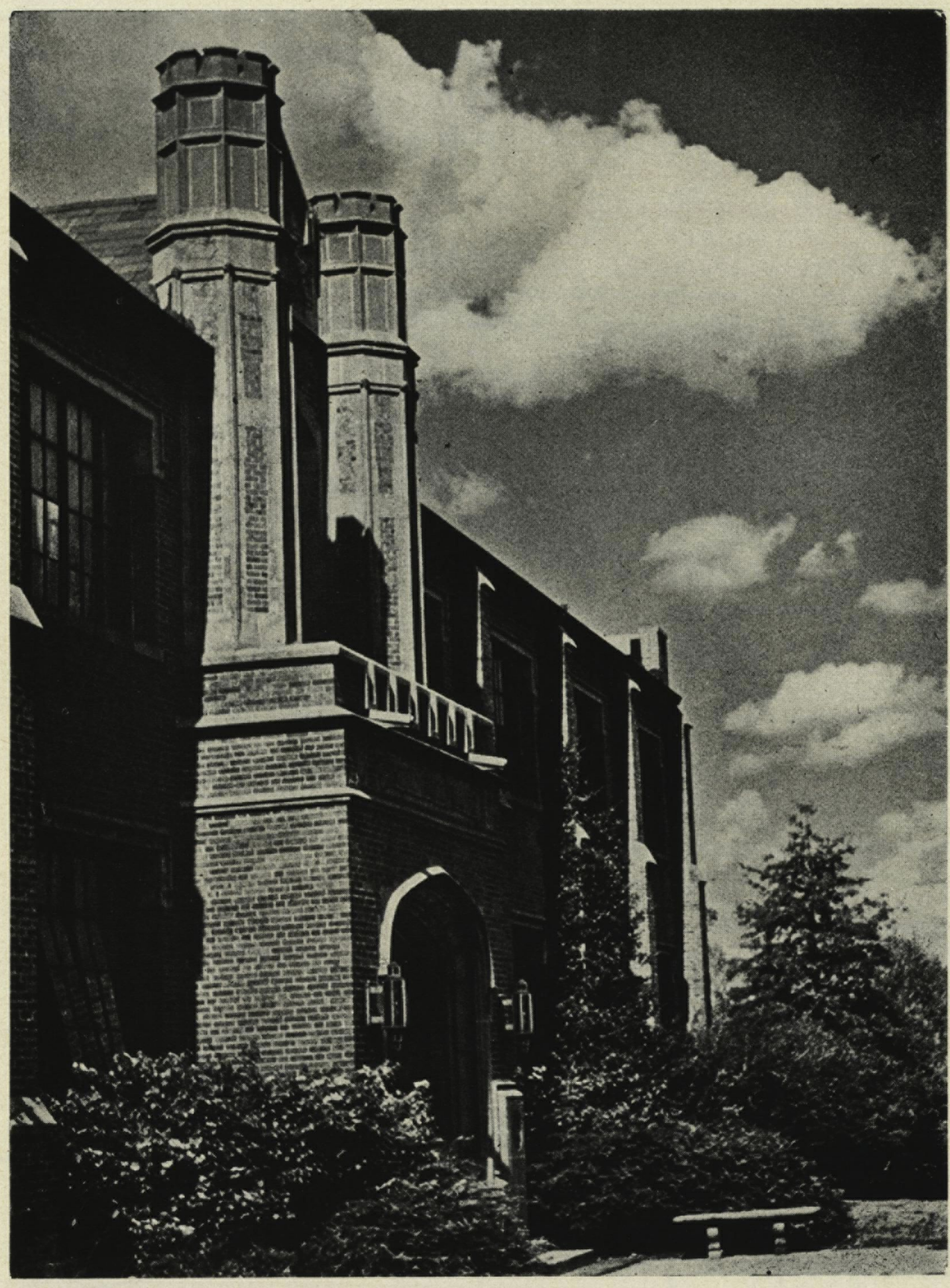
These studies indicate surprisingly large potential markets in various segments of industry. Possibly radiations from these products can be used to sterilize materials without the usual heating. These methods may be especially applicable to pharmaceutical products which are easily destroyed by heat. Although no very tangible results have yet been obtained in generating useful power from atomic energy, it is thought that real progress has been made. There is no foreseeable, possible way to produce significant quantities of electrical energy directly from fissioning atoms, but a great amount of heat can be obtained.

When an atom fissions, the two fragments fly apart at tremendous speeds. Within a submicroscopic distance they are stopped by the surrounding atoms, and thus release their energy as heat. So great is the amount that if we cause complete fission of one pound of atomic fuel, we should get approximately the same amount of heat as from burning 1500 tons of coal, a ratio of three million to one.

The first full-scale application of atomic power will probably be in a submarine power plant. It has the advantage that the initial charge of fuel will be sufficient to run the submarine for many months without refueling. Moreover, since it does not need air to burn, the craft could operate underwater at full power for very long periods of time.

The present world situation may give a bearing on the economic feasibility of atomic central power stations. At present our country seems to need as many atomic bombs as it can afford. Apparently the use of atomic bombs is considered to be an economical way to wage war, if there is any economical way. Therefore the price which the government can afford to pay for plutonium for bombs is many times more than the plutonium would be worth as a power plant fuel. Consider a dual purpose plant, making plutonium and selling it to the government and also generating and selling power to the public; it might pay. Such a plant might be profitable long before we have developed processes sufficiently economical to permit a plant to recycle its plutonium and produce power only. Four groups, each including a private power company, are now studying this problem with a view toward active participation by industry in the atomic power field.


Oxygen



HIGH SCHOOL GRADUATES OF 1952

You are cordially invited to visit Rose Polytechnic Institute during the present school year to learn more about your college entrance and the engineering courses available to you at Rose. The next freshman class will be admitted September 8, 1952.

NOBLE C. BLAIR

Admissions Counselor

ROSE POLYTECHNIC INSTITUTE

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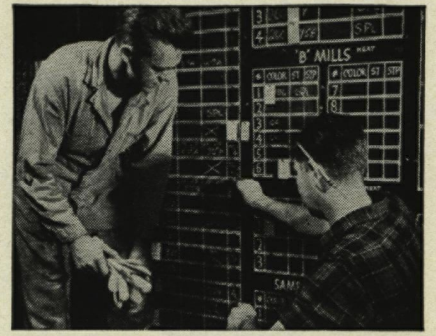
THE DU PONT DIGEST



Operator and foreman *check raw materials on a production control board which records every operation in a Du Pont plant.*

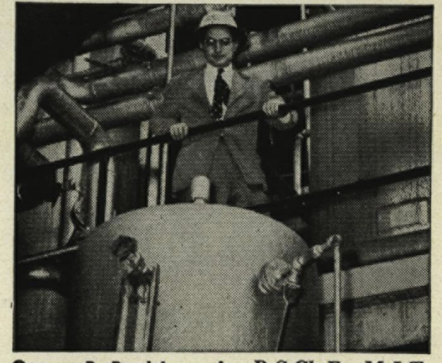
Ch. E's at Du Pont

[THIRD OF A SERIES]

Work as production supervisors prepares chemical engineers for jobs in management

The last issue of the *Digest* described the broad opportunities offered chemical engineers in research and development at Du Pont. Now let's look at the opportunities in production supervision.

In this important phase of plant operation, Ch. E.'s and others are responsible for investment in plant facilities, supply of raw materials, supervision of operation and maintenance, cost and shipment of finished products, as well as personnel relations, training and safety.



George B. Bradshaw, Jr., *B.S.Ch.E., M.I.T. '40, assistant superintendent, inspects a unit used in ammonia synthesis operation.*

Normally, chemical engineers enter production supervision by reason of preference and special abilities. Their first step depends on which of ten operating departments they work in. For example, in one department they follow a training program as student operators. In another, training in a plant laboratory familiarizes the engineers with processes and products.

After the training period, the men are given supervisory responsibilities, usually starting as foreman. At this level they meet problems like these:

1. Occasionally, in a still connected to a sulfonator by a pipe line with a single valve, the product disappeared, and residue increased. The supervisor's study of control data showed that small amounts of gaseous sulfur trioxide were venting into the still causing decomposition of the product. His recommended installation of a positive pressure block in the pipe line eliminated the difficulty.

2. A high temperature batch reaction process was revised to increase production of a critical material. For safety, adjacent reactors had to be shut down as work on each unit proceeded. The supervisor planned maintenance and batch schedules to minimize costly down-time and re-trained personnel for the new process.

In solving such problems, supervisors have an opportunity to use all their knowledge and ingenuity. Equally important, they acquire the background and varied experience that prepare them for advancement to responsible positions in management and administration.

Inspecting nylon *filaments during manufacture. They are made by extruding molten polymer through spinnerets under pressure.*

NEXT MONTH—The fourth article in this series will deal with process development—to many engineers the most interesting part of plant operation.

Conrad R. Graeber, Jr., *B.S.Ch.E., Lehigh '51, control supervisor, examines flow sheets for the manufacture of methacrylates.*

SEND FOR your copy of "The Du Pont Company and the College Graduate," 40-page book describing opportunities for men and women with many types of training. Address: 2521 Nemours Building, Wilmington, Delaware.

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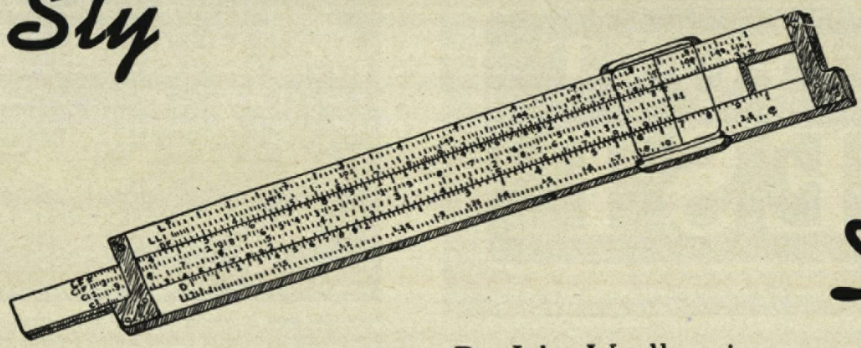


Droolings

By John Voelker, jr. m.e.
John Simpson, jr. c.e., and Dick Bosshardt. fresh.

A woman got into a cab and told the driver, "Quick, get me to the fraternity ward!"

"Don't you mean a maternity ward?"

"Oh yes, I guess I do. But hurry, I have to see an upturn."

"Upturn? Don't you mean intern?"

"Fraternity, maternity, uptern, intern, just step on it. I think I'm stagnent."

* * *

Some girls are like a zippered nightie, pull anything and its all off.

* * *

Flossy: "I was out with an inebriated driver last night and he headed right for a telephone pole."

Tessy: "The dog!"

* * *

"What was that explosion on Si's farm?"

"He fed a chick some 'Lay or Bust' feed, and it turned out to be a rooster."

* * *

Then there was the out-of-town student who got thrown out of his apartment when the landlady heard him drop his shoes on the floor twice.

* * *

The click of the knitting needles, the creak of the rocker and the ticking of the grandfather's clock were all that disturbed the silence of the warm, sunny room. With childish curiosity little Gloria sat watching the purls and the stitches.

"Grandma," she asked. "Why do you knit?"

"Oh," wheezed the old lady, "Just for the hell of it."

Dean of Women: "Are you writing that letter to a man, Miss Bagle?"

Miss B.: "It's to a former roommate of mine."

D.O.W.: "Answer my question."

* * *

New WAC: "Where do I eat?"

Captain: "You mess with the officers."

New WAC: "I know, but where do I eat?"

* * *

Salesman: "Sir, I have something here that's guaranteed to make you the life of the party, allow you to win friends and influence people, help you forge ahead in the business world, and in general make life a more pleasant place and invigorating experience."

Engineer: "I'll take a quart."

* * *

And then there was the deaf mute who fell into the well and broke three fingers screaming for help.

* * *

Textbook Style: "The efficacy of hydrochloric acid is indisputable, but the corrosive residue is incompatible with metallic permanence."

Lab Report Style: "Don't use hydrochloric acid for cleaning pipes. It eats the hell out of them."

* * *

She: My mother told me to say "No!" to everything you asked.

He: Really? Well, do you mind if I kiss you?

* * *

He: Do you like nuts?

She: Are you proposing?

First Communist: "Nice weather we're having."

Second Communist: "Yeah, but the rich are having it too!"

* * *

Breathes there a man so far abnormal.
He can't be stirred by a low-cut formal.

* * *

Mrs. Bunk was going to visit her husbands relatives on H Street.

She forgot the number so she wired him from the depot. "Where shall I go to?"

He wired back: "773H".

Mrs. Bunk read it upside down, and now she's suing for a divorce.

* * *

A man rushed into a saloon.

"What's the quickest way to stop hiccups?" he asked the bartender.

The bartender had a wet towel in his hand, so he smacked the man right in the face with it. The poor fellow was completely stunned.

"What did you do that for?" he gasped.

"You haven't any hiccups now, have you?"

"It ain't me, it's my little son outside."

* * *

Believe it or Not: Adam and Eve invented the loose-leaf system.

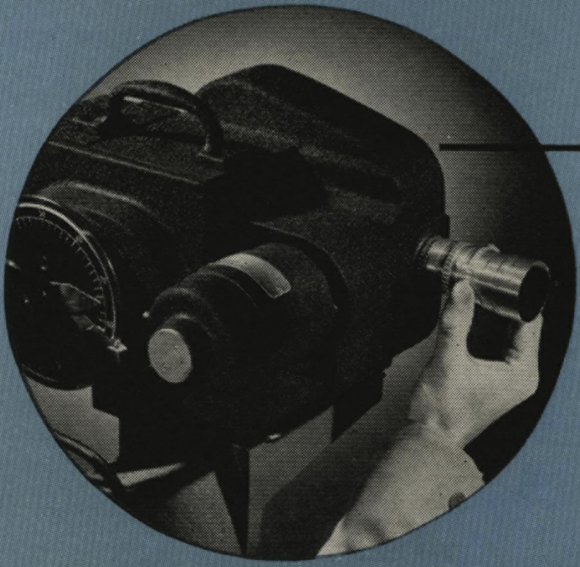
* * *

Confucius say, "Modern woman putting up such a false front, man never knows what he is up against."

* * *

Two mosquitoes were resting on Robinson Crusoe's arm. "I'm leaving now," said one. "I'll meet you on Friday."

Engineering has a precision tool in photography



WHATEVER YOUR BRANCH of engineering, you'll find photography an increasingly valuable aid. With it you can picture lightning-fast operations—or extremely slow processes—at speeds suitable for study. You can capture fleeting instrument traces, study internal stresses in machine parts, examine metal structure and do countless other things.

The application of photography to engineering problems has become a specialty in itself. This has led graduates in the physical sciences and in engineering to find positions with the Eastman Kodak Company. If you are interested, write to Business and Technical Personnel Department, Eastman Kodak Company, Rochester 4, N. Y.

Here high speed motion-picture photography shows a cavity in a column of water produced when a 5-mm rod was shot through it at 12.2 meters per second. By taking the pictures at 3200 per second and projecting them at the standard 16 per second, time is "magnified" 200 times.

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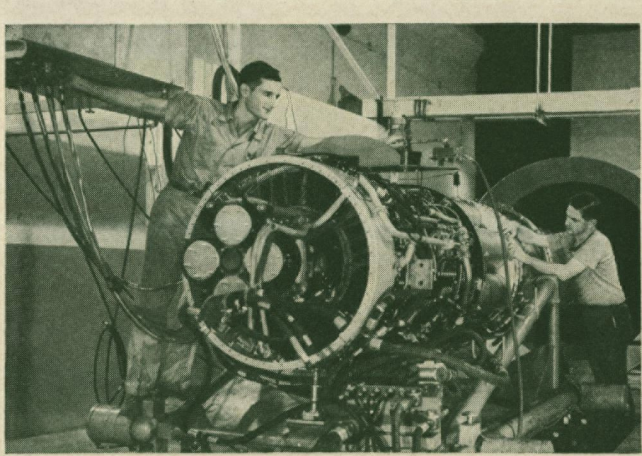
Five Ways to Begin Careers with General Electric



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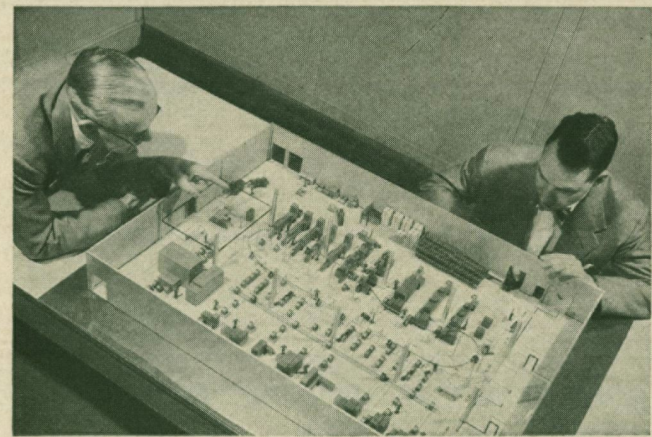

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4. CHEMICAL AND METALLURGICAL PROGRAM—offers rotating assignments and studies for chemists and for chemical and metallurgical engineers.

5. PHYSICS PROGRAM—the gateway by which physics majors begin G-E careers. Program graduates have gone into such fields as research, development, manufacturing, design, marketing.

If you are interested in entering one of these five basic General Electric programs after graduation, talk with your placement officer and the G-E representative when he visits your campus. Meanwhile, send for further information:

- **On Test, Chemical and Metallurgical, and Physics Programs, write to Technical Personnel Services Dept., Schenectady, N. Y.**
- **On Business Training, write to Business Training Course, Schenectady, N. Y.**
- **On Manufacturing, write to Manufacturing Personnel Development Services Department, Schenectady, N. Y.**

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