Fall 11-1934

Volume 44 - Issue 3 - November, 1934

Rose Technic Staff
Rose-Hulman Institute of Technology

ROSE TECHNIC

NOVEMBER, 1934

Vol. XLIV Number 3

Member Engineering College Magazines Associated

ROSE POLYTECHNIC INSTITUTE, TERRE HAUTE, INDIANA

In A Jointless-Minded World

Welding would prevail—and old methods of joining could not be restored to favor.

By **E. A. DOYLE***

If welding had become the standard method of manufacture before mechanical types of joints were introduced, it would be difficult, indeed, to convince manufacturers that they should redesign their metal products to use mechanical methods of joining.

NO RETREAT—pipe line constructors would never consent to a change from simple, portable welding equipment to the complicated devices essential to other methods.

Welding Gives Strength

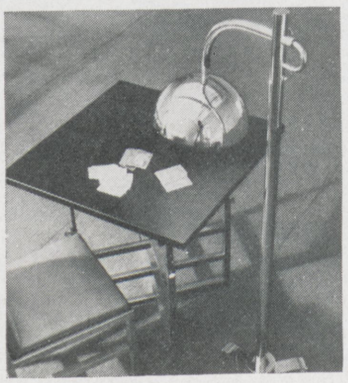
Strength would be a talking point for welding. The welded joint is strong as or stronger than the metal which it joins. The cutting of holes for screws or bolts would naturally weaken the structure. Appearance gives welding another vote. Joints made by welding are smooth in contour and have no depressions, bosses, projections or attachments as is often necessary in mechanical means of joining metals.

Costs Less to the User

Cost would be another argument for welded joints. The greater amount of material necessary with mechanical joints, the increased weight, and the decrease in pay load or performance-to-weight ratio, would make welding the preferred method. Nobody would consent to a joint in piping, which might, through a tiny leak cost much more than the permanently leakproof welded joint. Nor should it be necessary to buy expensive machinery to make mechanical joints which welding can equal in performance, economy and adaptability with a minimum investment in metal fabricating equipment.

Modernizes Automobile Design

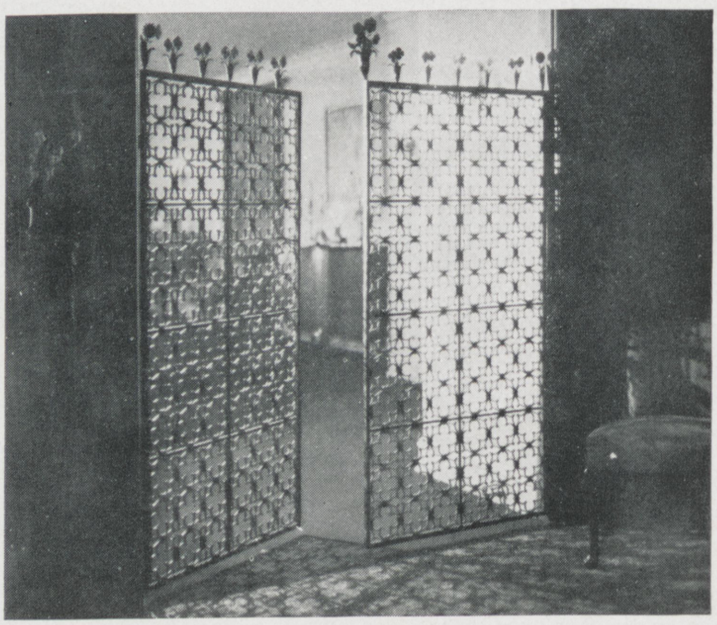
Automobile manufacturers would insist on welding rather than consent to a return to the design limitations imposed by mechanical joints. In face of a change from "teardrop" designs to the old boxlike bodies, with the attendant discomforts, with higher cost due to increased gas consumption and increased tire wear, with the fear of accidents increased by the lack of confidence in the joints, with appearance impaired and lacking the smooth surface for fine paint and lacquer finishes,—the automobile manufacturer would hesitate long before any but welded joints would even get a hearing.



METAL FURNITURE—The welded joints in metal beds, chairs and other similar furniture assure a sturdy and rigid assembly.

In the Future

Farsighted industrial executives can appreciate that a completely "welding-minded" industrial world is not far off. They should use in their own manufacturing operations as many of the advantages of welding as possible. The welding engineers of The Linde Air Products Company can advise how oxy-acetylene welding could best be used in your plant. This service is obtainable without cost or obligation by application to any of the sales offices of The Linde Air Products Company located at Atlanta, Baltimore, Birmingham, Boston, Buffalo, Butte, Chicago, Cleveland, Dallas, Denver, Detroit, El Paso, Houston, Indianapolis, Kansas City, Los Angeles, Memphis, Milwaukee, Minneapolis, New Orleans, New York, Philadelphia, Phoenix, Pittsburgh, Portland, Ore., St. Louis, Salt Lake City, San Francisco, Seattle, Spokane, and Tulsa. Everything for oxy-acetylene welding and cutting—including Linde Oxygen, Prest-O-Lite Acetylene, Union Carbide and Oxweld Apparatus and Supplies—is available from Linde through plants and warehouse stocks, everywhere.



BEAUTIFUL USEFULNESS—typified in this welded ornamental iron gateway. Every joint is strong, sound and was made inexpensively.

*Chief Engineer, Development Section, The Linde Air Products Company, New York. Unit of Union Carbide and Carbon Corporation.

Surveying This Issue

OUR cover this year is something new and has been the cause of much comment. We believe it is good and are proud to say that it is a Rose product. Robert Marks is the artist.

WITH the shortage of water in the past few years it has been necessary to look for new sources of supply. Mr. Butler discusses the possibility of a ground water supply.

THE old enemy rust never quits but Mr. Weaver shows a method of curtailing his activities in his article "Metal Spray Coatings."

MR. LONG has written an interesting article on that fast growing industry, radio.

—A. W. H.

THE ROSE TECHNIC

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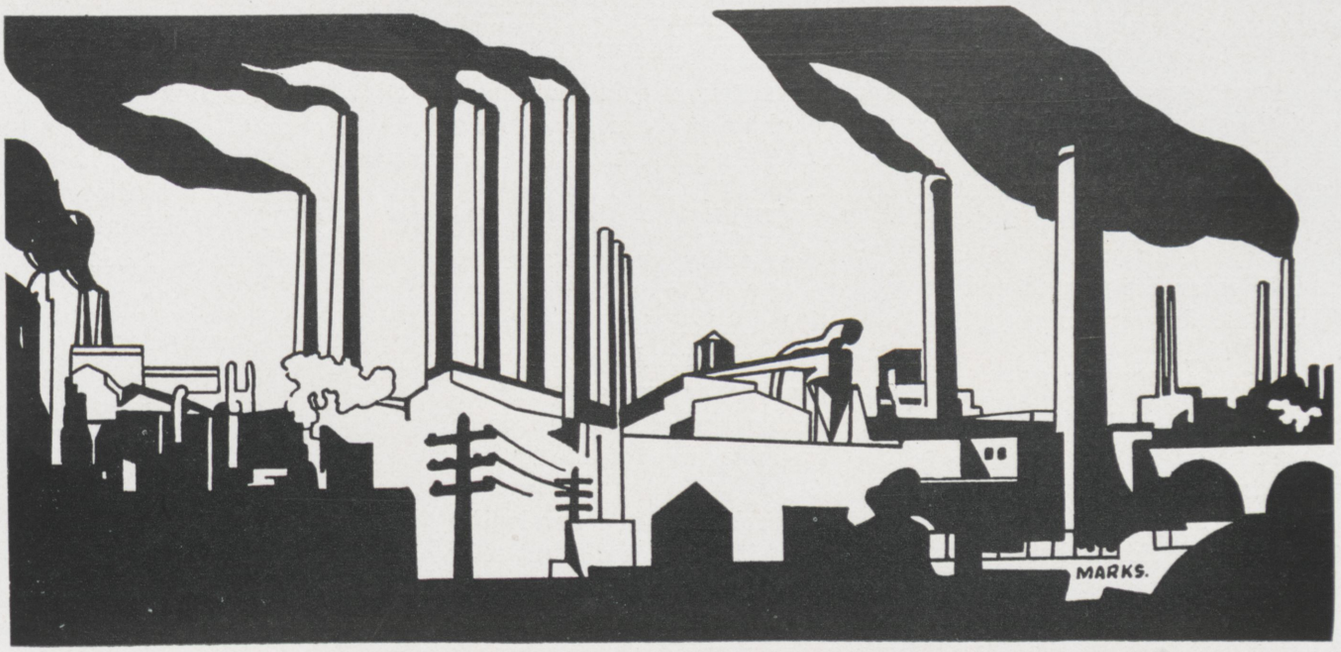
Subscription, per year, $2.00. Address all communications to THE ROSE TECHNIC, Terre Haute, Indiana. Entered in the Post-office at Terre Haute as second-class matter, as a monthly during the school year, under the Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized December 13, 1918.

Published Monthly from October to May by the Students and Alumni of Rose Polytechnic Institute.



THE ROSE TECHNIC

THE TECHNICAL JOURNAL OF THE ROSE POLYTECHNIC INSTITUTE

Volume XLIV NOVEMBER, 1934 Number 3

Groundwater as a Source of Water Supply

E. B. Butler, c.e., '35

DUE to the rapid growth of many communities, the problem of sources of water supply has grown tremendously in importance.

The country is passing through an abnormal water season. Hot summer weather and prolonged dryness have taxed water supplies to their maximum capacity in many parts of the country, and give prospect of continuing to do so through low runoff and reduced reserves. Streamflow is still diminishing, and both surface and underground sources are receding. These conditions place important emphasis on the meaning of adequate supply sources to both engineers and to the public.

Large mountain aqueducts and disease-preventing purification plants have received a major share of the attention the world finds time to give to the problems of water supply. Yet the homely well and spring still remain the most frequently used supply among civilized people. Most municipalities in this country supply themselves from the water stored beneath the ground surface.

Water obtained from the ground is usually of high quality as to freedom from harmful bacteria, but often contains in solution sufficient mineral material to render it unfit for use.

Origin of Groundwater

Groundwater, originating in precipitation, percolates through the porus strata below the surface and finds its way to the open water courses. When rain falls, a part of it is absorbed by vegetation, a part sinks into the ground and is absorbed by the roots of plants, and the remainder, if the rainfall is sufficiently heavy, percolates through the ground and finally finds its way to the nearest water course.

Travel of groundwater is very slow even where the most favorable conditions exist. Its rate of travel is only a few inches per day. Fine gravels are the greatest water producers although the flow through fine sands is almost negligible. Most rocks are practically impervious to water flow. Limestone permits the passage of water

through crevices and solution passages. Some sandstones are sufficiently porous to deliver considerable water through the body of the foundation itself, but their capacity is relatively small compared with that of coarse sand. Between 30 and 40 per cent of the total rainfall can usually be expected to enter the ground and be available for development.

Nature of Groundwater

In the study of bacteriology it has been shown that groundwater is comparatively free from bacteria and that the cities served by groundwater suffered little from water borne diseases. Unfortunately however, in its travel from the place where it falls on the ground to the place where it is developed, the water dissolves various mineral substances and may become so highly mineralized as to be unfit for domestic use. Many groundwaters containing iron and manganese are healthful, but the minerals render them undesirable for household and industrial use. Today many of these highly mineralized supplies are being softened and purified, and are the best available sources in their localities.

As a rule, wherever the bedrock is granite or some other relatively non-absorbing rock and where the ground overlying it consists of the abrasions from igneous rocks, the groundwater is quite soft and well adapted to domestic use without treatment. If the igneous rocks are overlain by limestone and later deposits derived from the sedimentary rocks, the water is likely to range from moderately hard to very hard. Surface waters which pick up carbon dioxide from decaying vegetable matter have the ability to absorb iron and manganese, which sometimes makes them objectionable. Conditions are rare, however, in which the hygienic quality of groundwater is bad, because the surface of the earth is largely made up of granular materials well adapted to filter out bacterial impurities at the slow rate at which water percolates through the ground. Exceptions occur when the groundwater passes through crevices in rock or through solution passes without having been thoroughly filtered at the surface.

Development

In developing groundwater by the use of wells, communities must usually depend on the flow through the coarser sands. Sufficient groundwater for such development is available almost everywhere in the habitable area of the United States.

The problem of developing enough of it becomes difficult only when the demands of the population concentrated at one place exceeds the absorbing and carrying capacity of the soils and rocks that underlie the surface in that vicinity. In most cases cities of more than 100,000 population have found it impracticable to develop sufficient underground water, and consequently, these cities have had to resort to surface supplies.

Groundwater supplies may, in general, be developed by either of two methods: first, by infiltration, in which the water is taken from a watercourse by constructing collecting galleries along the course of the stream and collecting filtered water from the stream; and second, by wells, where the wells are driven down to a groundwater supply. By means of a system of wells driven over a large area, the desired quantity of water is obtained.

An example of the method of infiltration is to be found at Des Moines, Iowa, where nearly all of the water developed is derived by percolation from the bed of the Des Moines River by means of collecting galleries located on land about 200 feet or more from the water's edge and paralleling the course of the river. This installation has been successful in producing a minimum of 300,000 gallons per day per acre of riverbed. The river flows through a valley about one mile in width, the bottom and sides of which consist of impervious formations, with the bottom overlain by water bearing sand 10 to 20 feet in thickness. The galleries were built some distance from the bank of the stream in order to get comparative uniformity of infiltration. The supply is supervised by a sanitary chemist, and gives substantially the same result as a modern filter plant.

Types of development by wells vary widely, because methods of pumping depend upon local circumstances. La Crosse, Wisconsin is a typical city supplied by means of wells. At La Crosse, five groups of four 10 inch wells each, with about 1000 feet between groups and with wells located on the corners of a 100 foot square, deliver a maximum of about 2,000,000 gallons per day per group. Ordinarily not more than two or three groups are operated simultaneously. Many situations arise which require capacities varying between the two extremes mentioned.

One of the pitfalls to be avoided by a community is the development of apparently large underlying water-bearing areas not supplied by sufficient gathering ground. If the gathering ground cannot be determined through a study of local geology, it is advisable to conduct pumping tests over long periods of time. Several instances have been observed in which wells of high capacity were pumped practically dry within a period of a few weeks by continued pumping.

With the rapid growth of cities and the demand for a softer water, a number of the underground supplies have been abandoned in favor of a filtered water from surface sources. It is now practicable to soften groundwaters and rid them of iron and manganese. Many groundwaters are comparatively soft and well adapted for domestic and industrial use. They will doubtless remain the favored source of water supply for the smaller cities and villages.

Source: Engineering News Record, September, 1930.

Some Features of the New High Power Transmitter at WLW

Martin Long, e.e., '36

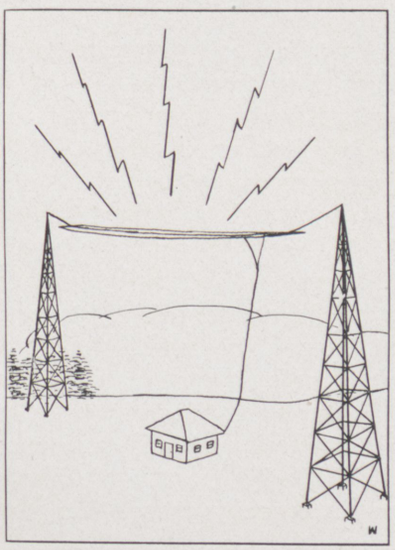
IN November, 1933, a broadcast transmitter of 500 kilowatts unmodulated output power was put into operation for the first time. This transmitter was built by the General Electric Company for the Crosley Radio Corporation and replaced the 50 kilowatt unit which they had used for several years. WLW desired to maintain its consistent reputation of being the most powerful and modern station in the United States. It was felt that 500 kilowatts was the next logical increase over 50 kilowatts, as any less increment of power would not produce the improved results desired. Receiving sets have been greatly improved in selectivity so that high power is capable of extending the reliable range of a broadcast station without increasing adjacent channel interference. High broadcast power is the only effective static eliminator. Reliable high quality reception from several channels, rather than erratic reception from dozens of stations, is the preference of modern radio listeners.

The new transmitter first went on an early morning schedule only, and the excellent results soon justified the continuous use of the 500 kilowatts.

The total cost of the installation, excluding the then existent 50 kilowatt unit and the studio equipment, was $500,000. The expected yearly cost of material operation is $170,000, which is $23 per hour on a 24 hour day basis. This does not include the expenses connected with personnel and depreciation, but only power, tube replacement, etc. $23 per hour is quite low when compared with the total operating expenses of the station.

The most interesting features of the new installation are the complete isolation control system, the modern power supply, and the vertical radiator.

The final stages of the transmitter and the modulator were built in distinct complete units in such a way that if a defect developed, that defect would automatically isolate the unit in which it occurred and permit normal operation of the remaining units. This isolating control acts very rapidly. If a short circuit occurs, overload relays shut down the 2300 volt main power within four cycles time. Immediately the transmitter goes back on the air, and, if the short circuit has disappeared, normal operation continues, but if the short is still present the power is again turned off and the defective unit automatically isolated. Operation then continues with reduced power, if the defect is in the power amplifier, or with a reduced percentage of modulation, if the defect is in a modulator unit. The total time during which the transmitter is off the air to permit the unit isolation is less than three seconds.



All the control switches, indicator lights, and relays of the automatic control circuit are located in one group in order to facilitate checking and repairs. The control devices may be pre-set so that the operator in his position can start the equipment with a single push button (except for two previous manual steps). Likewise, the equipment can be shut down from one push button. All voltages are automatically in the proper sequence.

Another feature of the control circuit is the proper regulation of the cooling water and air. If the rate of flow of water to any one tube falls too low, the power to that tube is automatically removed and the unit containing the tube is isolated. Likewise, if the air supply fails, the tubes are protected. Air is used to cool the filament and plate seals of the tubes, while water is used to cool the plates. 525 gallons of water and 3,000 cubic feet of air per minute is the rate at which the cooling media must be supplied.

Each of the three identical units of the radio frequency amplifier delivers about 167 kilowatts of unmodulated power, using four UV-862 100 kilowatt tubes in a push-pull circuit. The modulator is built in two units using four UV-862 tubes in each.

Radio frequency excitation for the amplifier is furnished by the former 50 kilowatt transmitter. The first tube in the exciter is a crystal-controlled 271. Its output is amplified in four successive stages before it is applied to the 500 kilowatt final amplifier.

The first stage in the speech amplifier is a pair of UV-211's in push-pull. An input of 12.5 milliwatts to this stage is amplified to

350 kilowatts and then used to modulate the radio frequency amplifier. The increase from 12.5 milliwatts to 350 kilowatts is a power amplification of 28 million times. The two output transformers of the 350 kilowatt stage weigh 19 tons each and are 11 feet high, with 3 x 7 feet elliptical cross sections.

To heat the filaments of the twenty 100 kilowatt tubes 4150 amperes at 33 volts are required. This power is furnished by a battery of motor generators. The filament supply, the bias generators, and the pumps are the only rotating equipment in the installation. All the other power is rectified alternating current supplied from two separate 2300 volt lines. Two lines are used to avoid shut down in case one should fail.

The rectified power is furnished by six RCA 870 hot cathode mercury vapor tubes in a full wave, three-phase, 11,800 volt circuit. This rectifier supplies power to all the water cooled tubes. The 870 rectifiers are rated at an average plate current of 75 amperes but in this installation they are operated under their maximum rating, since the total plate current for the water cooled tubes does not exceed 110 amperes. While modulation is occurring the rectifier does not have to supply power at an audio frequency rate because the filter condenser has sufficient stored energy to accomplish this. The capacitor unit is rated at 171 microfarads at 15,000 volts direct current, and is composed of 114 1.5 microfarad condensers in parallel. A one-fourth henry choke is also used in the filter.

Provision is made to light the filaments of the rectifier tubes 30 minutes before applying the plate voltage so as to insure a proper operating temperature. Pre-heated air, thermostatically controlled, is supplied to the bases of the tubes to assist in keeping the temperature constant.

This rectifier installation at WLW is the first commercial application of the RCA 870 tubeh.

A vertical radiator was installed after a thorough study of the various types of antennas. It is an 831 foot tower with a 35 foot square cross section at the 350 foot level and tapering to a point at either end. A rod is fastened at the upper end and mounted so that its height can be varied for tuning purposes. The lower end of the tower rests upon a single porcelain base insulator; the radiator is held in a vertical position by means of guy wires. The porcelain base rests upon a concrete foundation where the load sometimes reaches 450 tons because of weight, down-pull of the guy wires, and wind. Adequate warning signals are mounted on the tower to protect airplanes flying in the vicinity.

After first installing the new antenna, comparisions of field strength were made with the former T type. The average increase in field intensity was 39%, and the area of non-fading service for receivers without antomatic volume control was increased 66%. The improvements are due to the new radiator alone, since 50 kilowatts output was used in all the tests. Changing the radiator at WLW produced an increase in field strength equivalent to doubling the power. With 500 kilowatts output the field strength at one mile is six volts per meter.

With 525 kilowatts average output power, 100% modulation from 30 to 10,000 cycles, very low harmonic radiation (the second harmonic radiation being .002 watt as compared to the fundamental radiation of 525,000 watts), WLW surely has operating characteristics that place it far in the lead in the art of broadcasting.

Reference: The WLW 500 Kilowatt Transmitter, Proceedings of the I. R. E., October, 1934.

Metal Spray Coatings

Joe B. Weaver, ch.e., '35

EVER since the beginning of time, men have been battling corrosion. The Department of Commerce estimates that corrosion of structural forms in the United States alone costs $300,000,000 per year. The scientist, chemist, and engineer have stood shoulder to shoulder in this fight throughout the ages. Their united efforts have given us paint and allied products, organic protective coatings, special alloys, plating methods, and newest of all—metal spray coatings.

The metal spray, known originally as MetaLayeR, was developed by the Metals Coating Company of America about 15 years ago, and has been continually improved, untill today it appears to be one of the best known methods of applying a protective coating.

The designers wished to make an appliance which would melt the metal, and at the same time blow it from a nozzle in the form of a molten spray. After many more or less futile attempts, the following satisfactory method was developed.

Wire, which is wound on a conveniently located spool, is used as coating material. This wire is fed into the conical oxidizing part of an oxygen-acetylene flame and melted. Compressed air, some of which operates the feed rolls for the wire, then blows the molten metal through the nozzle in the form of a fine spray. The velocity of the molten particles issuing from the nozzle is about 834 feet per second, which is only slightly

less than that of the muzzle velocity of a shotgun. The molten particles moving at this high velocity wil spread out over an area about 2 inches in diameter when the "gun" is held 5 inches from the surface to be coated. The entire spray gun, which weighs only about 4 pounds, is small enough to be held easily in the hand and may be moved about readily over the surface during the spraying.

One of the most practical features of the equipment is that it uses standard gauge wire as the metal supply. The various sizes used range from 10 to 20 Brown & Sharp gauge, that is, from about .03 to .1 inches in diameter. Some attempts have been made to use wire up to three-eighths of an inch in diameter, but without satisfactory results. In some cases it was found that this large size metal supply, even when low melting point material was used, reduced the amount of metal which could be applied in a unit time by approximately 50 percent. Consequently, it is necessary to choose a suitable size wire for the particular metal used; however a size of about 10 gauge worked very satisfactorily in tests made on various metals.

The amount of metal that can be applied in an hour ranges from about 1¼ pounds in the case of iron to 90 pounds for lead. The thickness of the coat which can be applied most economically is between .004 and .005 inches. This thickness gives an effective coverage without undue expense.

Since the metal issues from the nozzle in such a fine spray, it cools almost instantly upon coming in contact with any surface. Therefore it is possible to coat not only metal objects, but many other articles such as unglazed pottery, bricks, wood, terra cotta, glass, etc. Many beautiful and artistic designs can be sprayed on walls with the aid of stencils. In some cases vases and other ornamental fixtures have been decorated with various metals.

Compressed air is used not only to feed the metal and spray it upon the surface, but when the coating is to be deposited on a smooth nonporous surface such as glass or ferrous metal, it is used to operate a sand blast. The sand blast requires about 100 cfm. at about 100 pounds per square inch pressure, while the spray requires 35 to 50 cfm. at a pressure of from 40 to 60 pounds per square inch. The air for both of these operations may come from the line. After sand blasting, ferrous metals are sprayed immediately to prevent corrosion.

Since the equipment required for spraying metal is not bulky, portable units are built with which exterior structures can be sprayed. The most important examples of exterior applications are the coating of gas holders, oil tanks, and water tanks.

Because of the salt spray which is carried by the wind near the seacoast, corrosive effects on metal structures in these districts are very severe. On Long Island one city water tank was recently sprayed with three coats of pure zinc, at a cost of $1,200. Up to this time the tank had been cleaned with a sand blast and painted with a tar paint about every four years. The cost of the sand blast and paint had been about $700, so the zinc coating would only have to last 7 years to be less expensive than the old paint method; however, it is estimated that it will last from 25 to 30 years.

By utilizing photomicrographs it was found that the metal coatings consist of very small plastic particles, which, because of their relatively high velocity at impact, assume a shape such that they fit and adhere to the underlying surface. The first layer adheres to the surface which is being coated, while the following layers are deposited in like maner upon each preceding layer. The union between the layers is strictly mechanical as no welding effect is obtained. The density of the coat depends upon the size of the particles, which is in turn controlled by the wire, the gas, and air pressure.

When metal spray is used on ferrous metals, the material being deposited should be chosen so that it is electro-positive with respect to iron. If such a material is chosen and a small crack occurs in the coating, the resulting thermocouple which is set up when an electrolite comes in contact with the two metals will cause the coating material to be deposited electrolytically on the iron. Zinc and aluminum are typical examples of metals electro-positive with respect to iron. On the other hand, if a coating metal is chosen which is electro-negative with respect to iron, the coating must be absolutely free from cracks or holes, otherwise moisture will cause electrolytic action, which in time will remove particles from the iron and deposit them on the coating material.

In some cases metals highly electro-negative with respect to iron are used because they may possess certain other very desirable features. Examples of these are lead and tin, which are highly resistant to certain acids, and which therefore are used to coat the interior of tanks in which these acids are to be stored. Again it must be stated that such coatings **must** be impervious to liquids as they render only **mechanical** protection.

In addition to the protective and ornamental features of metal spray, it can also be used to build up worn machine parts to the proper size. In such cases the machine element can be restored to within .012 inches of the correct size with the spray gun. This eliminates removing large amounts of metal by machining.

The wide variety of applications to which this new protective coating process has been applied seems to indicate that it will prove exceedingly useful in the future. Its field of usefulness should increase as more knowledge concerning its chemistry and mechanics is obtained.

THE ROSE TECHNIC

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Mid Term Examinations

Now that the mid-term exams are over the school can again return to normal. To the freshmen these exams are something unlike anything they have experienced in their high school careers. To the upperclassmen they are merely something to look forward to.

The results of these tests are very important. The student making the low grade should not feel too discouraged since he has a chance to redeem himself on the final examination. He should study harder between now and the end of the term so that he will be able to raise his term grade. Maybe the exam was on an "off" day (very probable following the events preceeding mid-term week). This is unfortunate, but should not be taken too seriously.

A high grade on the exam indicates a knowledge of the subject and is of course very desirable. This is especially true of those courses where there are exemptions from the final exam at the end of the term. However a good grade should not be an indication that there is nothing further to be done in that subject for the remainder of the semester, for there are quizzes and class-room work all of which go toward determining the grade for the semester's work.

Therefore the significance of the results of the mid-term examinations considered on the grades made is very important. But there is another aspect to the question, namely thinking under stress. This is a habit valuable to acquire and in this industrial world of the present many important decisions will have to be made under a stress. So considered from several different angles the mid-term exam are of extreme importance and should be regarded as such.

School Spirit

It has been remarked many times lately around the school about the return of the "Rose" spirit. This has been very noticeable. For the two years just past there has been a decided absence of the old spirit.

This year the situation is different. From the senior class down to the freshmen class there seems to be more life and activity than ever before during the years the writer has been at Rose. This spirit seemed to reach a peak at the Homecoming celebration, football game—bonfire—and the dance. At the football game it was very noticeable with all the students in the stand rooting for the team (we won too). The winning of the game probably contributed much to the success of the events that followed, but there still is the revival of the old spirit which is to be reckoned

School life in its entirety seems to have emerged from the rut. The students life seems to have gotten away from the druggery which many people associate with a Rose student. School spirit is responsible for much of this.

Let us, then, strive to keep this spirit and school will assume a beter and more pleasant aspect.

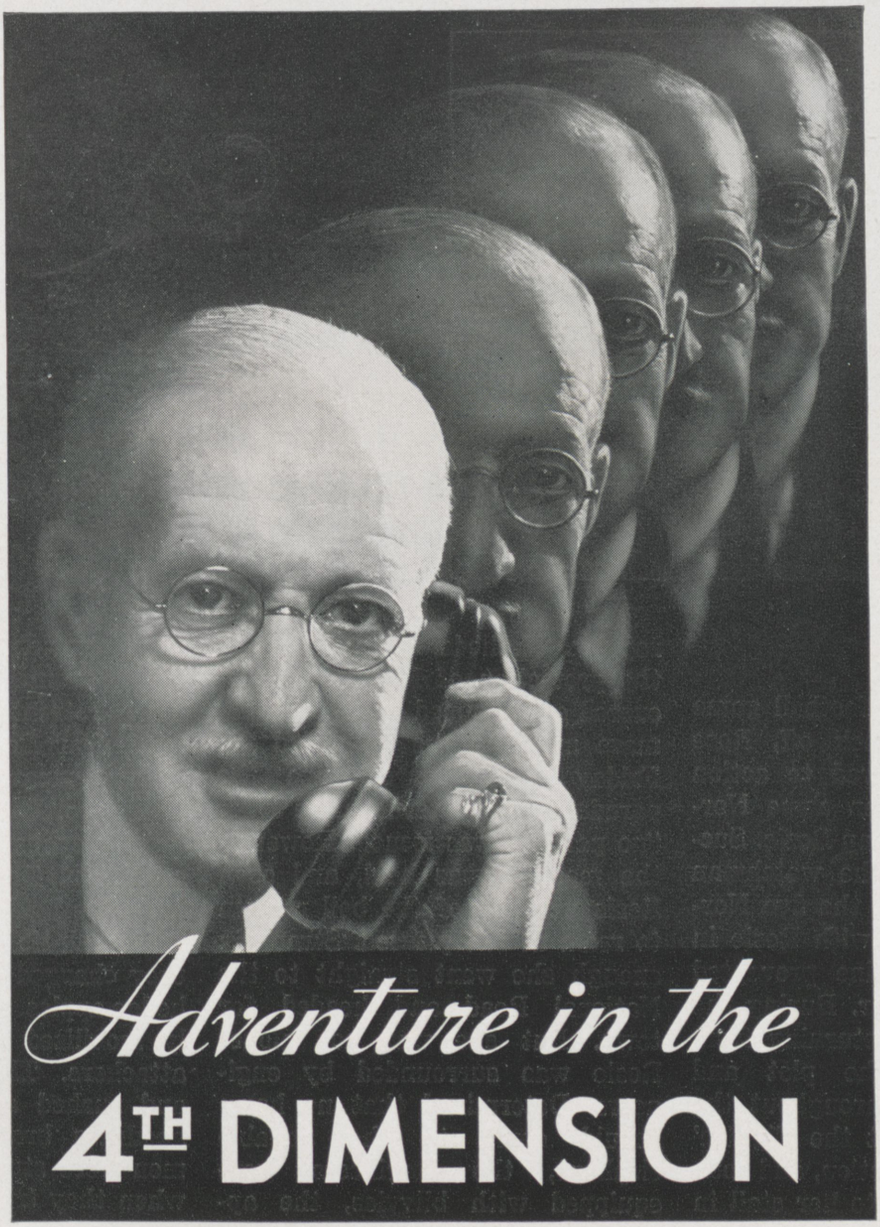
Inspection Trips

This the members of the senior class in some departments have been making some inspection trips. Early in October the senior chemists made a two day trip to Chicago and went through two large factories there. Then in the latter part of October they went on another trip to Limedale and visited a cement plant. The senior civils went to the University of Illinois for an A.S.C.E. meeting and inspected some plants on the way over.

These trips prove valuable for the student. He is thus brought into more intimate contact with actual conditions existing in the operation in an industrial plant. The processes described in the textbook may be seen in actual operation and therefore mean considerably more to the student.

Some years ago it was the custom at Rose for the entire senior class to take an inspection trip. Now it has come to the place where the students in each department make the trips which prove of more value in this way, since industries akin to the particular field of engineering are thus visited. This is probably the better system and such trips should be encouraged.

—J. J. H.



Adventure in the 4TH DIMENSION

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Why not drop in at home tonight — by telephone? For a lot of pleasure at bargain rates, call by number after 8:30 P. M.

BELL TELEPHONE SYSTEM

CAMPUS

Rose Spirit

WITH the Normal football game less than a week off, Rose engineers were stirred to action one dark night when some Normalites tried to kidnap Rosie. Successful in talking the watchman out of the elephant, the five Normalites started out with Rosie in tow. Lack of gasoline prevented them from going far. During the delay a freshman returning from town discovered the plot and spread the alarm throughout the Dorm. In an instant the Fightin' Engineers were in action, and soon Rosie was returned to her stall in the boiler room. Not to be outdone, some of the Engineers decided to take the plush-seated stage coach of a Normal fraternity for a short ride. This they accomplished very satisfactorily, and with the Normal men out of jail (technicalities of trespass and forgery overlooked), both sides retired temporarily. It was estimated by those in authority that the score was ten to two in favor of the Engineers. Raiding parties of one sort or another and anxious telephone calls from Normal occupied the next two days. It was rumored that the plush seats of the coach were very wet by this time.

Then came Friday, the day before the game. Enthusiasm was rampant. Plans for a parade moved rapidly. Methods and tactics for the protection of Rosie were discussed and mapped out. A general mass meeting was scheduled for Friday night to organize the parade. Friday afternoon the order "no parade" was issued. However, the meeting was held, and soon Rosie was out of the boiler room to roam as she pleased. Strangely enough she went straight to the National Road and headed for town. But she was not alone; Rosie was surrounded by engineers. Determined that no harm should come to the amiable elephant, the Engineers were equipped with blivvies, the approved weapon (ask Sarge), broom sticks, and boards, not to mention hedge apples and tomatoes. At Seventh and Wabash the Normal force estimated at ten thousand was waiting. Here the first pitched battle raged. Blivvies whacked and tomatoes flew, but Rosie was untouched. The parade proceeded with only minor encounters, and soon Rosie was once again in her stall. Discontented at having been frustrated in their attempts to stop the parade, the Normalites drove out to Rose to stage a comeback. The Engineers, being hospitable souls, invited their guests in. Activity centered about the boiler room. Fire apparatus was called into action. Fire hose from the gymnasium and chemical laboratory supplemented that of the boiler room. The Normal forces soon retreated without having been near Rosie. This defeat for Normal meant certain trouble at the game. Both crowds assembled quietly enough and Rosie was escorted in. Things went smoothly until the half when Normal again mustered its ten thousand. Then they charged amidst a barrage of hedge apples. The Engineers quickly mobilized and warded off the attackers. The enemy withdrew and rushed again. An honest-to-goodness brawl followed. Policemen were struck by hedge apples when they tried to interfere. The fight raged on. The bombardment knocked several pieces of hide off Rosie, but she stood by bravely.

ACTIVITIES

Edited by

Carl Wischmeyer, m., '37

The Normal army, which by this time was disorganized to the extent that its members were beating each other, retreated to charge no more. Rosie was safely returned to her stall once again. All was quiet on the eastern front and has remained so. Since the Engineers did not lose Rosie, they tipped off the Normalites as to where the old hack might be found. Now Rosie is enjoying the best of health, and the hack has been returned.

The revival of inter-school antagonism has been the cause for much reminiscence. Many students and alumni have recalled similar pranks played in the past. It has been apparent that the renewed rivalry has marked a revival of the old Rose Spirit.

Homecoming

One of the most successful homecomings of the past several years was held at Rose November 9th. The pre-game spirit was quite high, due partly to the various "Rosie" episodes of the past few weeks. The introduction of a new school song added much to a pre-game pep session.

With a huge bon fire prepared by the freshmen and a hot dog—cider feed prepared by the dormitory under the administration of Coach Phil Brown and financed by Tau Beta Pi, the team just couldn't lose and they didn't, 15-13.

As a very fitting climax a most successful homecoming dance was held that night at the Trianon. Fifty pounds of confetti and myriads of balloons helped the jubilant Engineers to celebrate a justly deserved victory. Many alumni were back for the occasion and we are confident that they returned to their homes feeling that Rose has at least almost as much spirit, zip, and go as she had in those good old days.

Rifle Club

THE annual meeting of the Rose Rifle Club for the purpose of organizing was held in October. A very encouraging number of students turned out for the meeting and a successful season is anticipated. The following officers were elected: President, Burril McIntyre; Vice President, Tom Wells; Secretary-Treasurer, Harold Reintjes.

The purpose of the Rose Rifle Club is to promote interest in small-bore rifle marksmanship, and to form a group from which the Rose Small Bore Rifle Teams may be selected. Last year the varsity Rifle Team competed in postal matches with twenty-seven other leading schools and universities throughout the country, and also entered teams in the Hearst Trophy Match, the Fifth Corps Area Intercollegiate Match, and the Society of Military Engineers' Match. The personnel of the team changes from week to week depending on the scores made during the previous week of firing. Last year nine attractive medals were awarded to the men having the best score in certain matches. Rifle firing is rated as a minor sport at Rose, and members of the club who fire in seventy five percent of the matches and make an average score of 345 out of 400 receive minor sports sweaters. Five men were awarded sweaters last year. The indoor range is now open for practice. The matches will start the first week in January and will continue until the middle of March. Warrant Officer (Sarge) Kearns is the team coach and is a very able instructor.

Camera Club

THE Rose Tech Camera Club, one of the most active organizations on the campus, is offering in-

struction in many phases of amateur photography. Included in the schedule are such topics as composition, exposure, lenses, filters, developing of films, printing, and enlarging. At a recent meeting Edd Coons and Joe Weaver were appointed to take charge of the instruction. This service is for the benefit of Rose students, including freshmen, and it is hoped that all men interested will take advantage of this opportunity. The Camera Club extends a cordial invitation to students interested in photography to join and share in the facilities of the club. Membership entitles the student to free use of the two club darkrooms and of chemicals.

A. S. C. E.

The Rose chapter of the American Society of Civil Engineers were guests of their sister chapter at Illinois University on Monday, November 5th. In spite of frowning skies a multiple arch bridge was inspected at Danville, Illinois. Arriving at Illinois, the boys ate lunch either with fraternity friends or at local chop houses. Luncheon was followed by an inspection of the campus with Illinois men as guides. The building which in all probability attracted the most attention on the tour was the Materials Testing Laboratory for which Illinois U. is justly famous. At the time a test was being made on a reinforced concrete arch.

During the afternoon the Rose men were fortunate in meeting Dr. Savage the engineer in charge of construction at Boulder Dam. Dr. Savage discussed informally his views concerning the future of the civil engineer and he was quite optomistic. At 6:30 a banquet was held at the Southern Inn and was followed at 8:00 by the high light of the trip, Dr. Savage's lecture and movies on the construction of Boulder Dam. The members of the Rose chapter of A.S.C.E. feel that the trip was well worth the while and wish to express their appreciation to those who made it possible.

Student Council

THE first meeting of the school year was held on Wednesday, October 24, 1934, for the purpose of organizing. The following officers were elected: President, Virgil Shaw; Vice President, Bert Pearce; Recording Secretary, Allan Greenland. In its capacity as a student governing body, the Student Council imposed certain restrictions on the freshmen. It was ruled that the freshmen pull "Rosie" at all home games, carry matches for upper-classmen, wear no corduroy, walk on the roads and not the paths of the campus, wear green caps, smoke only in the Dormitory or smoking room, and give the upper-classmen the right-of-way generally. All infringements of the above rules should be reported to the sophomores, who will take care of these matters at little get-together meetings. The seniors issued due warning concerning the use of the senior bench. So freshmen, take care—the lake is so handy.

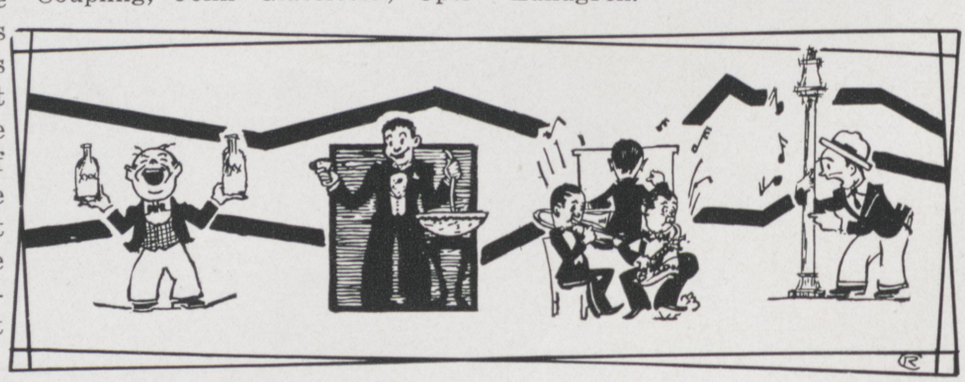
"Hamfest"

PLANS are going forward rapidly for the Hamfest to be held at Rose Saturday, November 17. The Rose Radio Club in conjunction with the Wabash Valley Radio Club of Terre Haute is sponsoring the meeting. Registration will be at 10 o'clock in the Assembly Room, followed by meetings throughout the day. Several prominent amateurs, both local and out of town, are to give talks of a more or less technical nature on topics of general interest. The following demonstrations are planned: The "Q" of Coils, Paul Reedy; Optimum Coupling, John Giacoletto; Optimum Power Output of a Tube, John Straw; Remote Control, Kenneth Barr; Color Organ, Albert Lotze, Jr.; Impedance Matching, Mr. Moench; Checking Modulation by Means of the Cathode Ray Oscillograph, Mr. Hunter. The school has donated ten dollars to be used for prizes for the Hamfest; other prizes will be furnished through manufacturers and distributors. A very nominal registration fee of twenty-five cents will be the only charge made. Many amateurs from surrounding states as well as from this vicinity are expected at the meetings. All those interested are invited to attend. The Rose Radio Club hopes to have the club station W9NAA in operation.

Class Elections

The following officers were chosen as a result of the recent class elections: Senior Class—Nelson B. Trusler, President; Fred W. Wiles, Vice-President; E. Ewing Carrico, Secretary-Treasurer. Junior Class—Ray R. Laughlin, President; Joe H. Walker, Vice-President; Dick W. Spain, Secretary-Treasurer. Sophomore Class—Edd A. Coons, President; James A. Hughes, Vice-President; Tom N. Wells, Secretary-Treasurer. Freshman Class—J. Allan Greenland, Jr., President; Harland Vondersaar, Vice-President; Ralph White, Secretary-Treasurer.

The following men were elected athletic representatives: Senior Class—Louis S. Lyon, Deforest W. Colburn. Junior Class—James F. Hufford, Edward B. Leever. Sophomore Class—Robert A. Averitt, Alechi F. Garzolini. Freshman Class—Charles Cantwell, Clemens Lundgren.

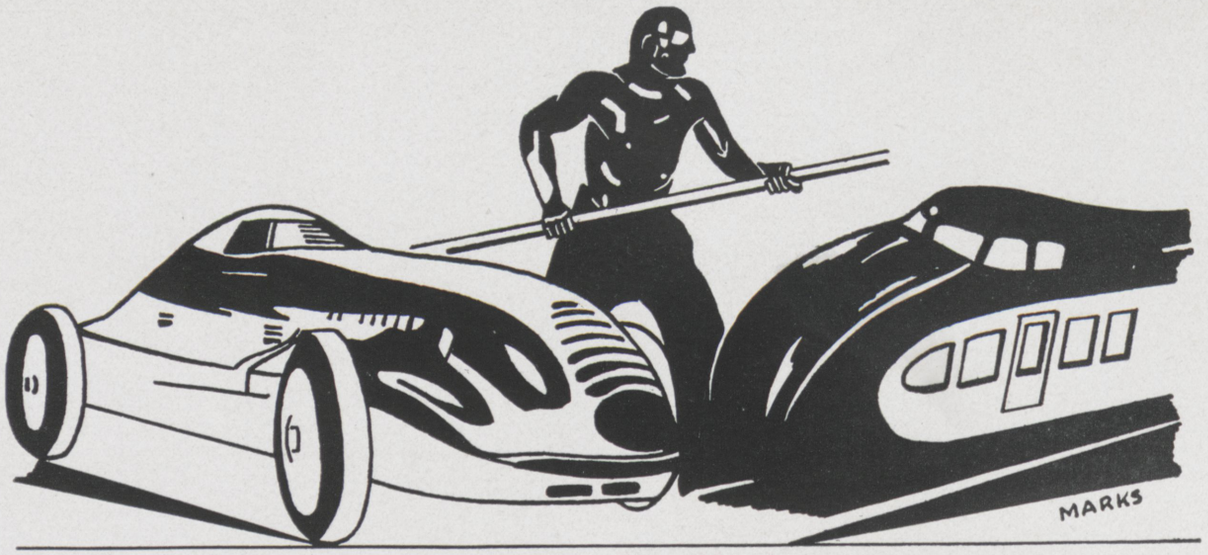


Plan to Attend the MILITARY BALL

NOVEMBER 8

9:00 P. M.

$3.00 per couple



Research and Progress

Edited by Albert V. McEowen, c., '35

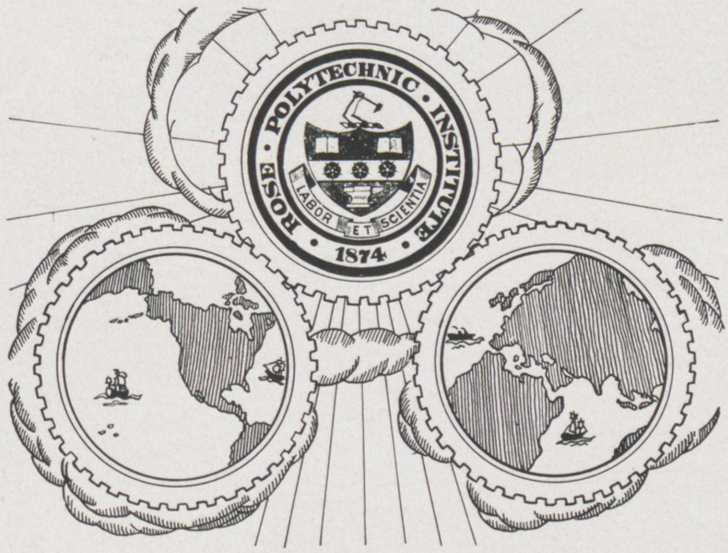
Television

SEVERAL years ago television seemed destined to supplant the radio as a source of entertainment for the general public. Interest was high, experimental units functioned with a slight degree of effectiveness, and commercial applications seemed certain of realization. However, it was found that the development was too expensive for general use and not yet efficient enough to be commercialized; so the subject was returned to the laboratory for further experimentation. Recent developments bring the matter to the front once more, and two in particular indicate the probability of some form of visual entertainment within the next year.

The first of the two developments referred to is an invention by Wm. H. Peck, who has done other work on motion picture appliances; and so it is natural that his design would be applied to motion picture work. He has a system for the transmission of standard films, along with their sound accompaniment. To create the illusion of continuous motion with any series of pictures, it is necessary that the separate pictures follow one another at a rate of at least 16 per second so that the retention of one image by the eye may cause the various forms to run together. Most motion picture units operate to show 24 pictures or frames per second. In order to transmit these units, each frame must be scanned by a small moving pin-point of light which sweeps across the picture at least 60 times. With the frames changing at the rate of 24 per second, the problem becomes quite involved. Mr. Peck has developed a new scanning device for such speeds. The source of light is a 32 candle-power bulb, of the type used in automobiles. The light beam passes through a series of lenses and is reflected onto a combination of lenses and mirrors shaped in the form of segments of a sphere. These lenses are mirrored on the back so that the light is reflected at the angle of incidence. By mounting the mirror lenses properly on a scanning disc, it is possible to cause the reflected beam to sweep across the picture, each lense covering a separate line, and thus 60 mirrors on the disc will scan one frame in a revolution. The light passes through the film onto a photo-electric element and is converted into proportional electric energy, which can be transmitted to the receiving set by radio means. The lines are here reconstructed and a similar scanning disc reflects them upon a translucent screen. The procedure is naturally just the reverse of transmission. Since light control is just as important in this case as volume control is in radio, a Kerr cell is so situated that the light passes through it before reaching the scanning disc. This cell controls the brilliance and can be regulated as desired from the receiving set amplifier. Mr. Peck, as an added need, developed a small synchronous motor with a speed of 1240 rpm. for sending and receiving, making it possible to synchronize the two processes if the same source of power is used. Incidentally, the problem of keeping step is one of the greatest in television.

The second of the two developments was contributed by Mr. Priess, and concerns the scanning system. The scanning disc is eliminated by means of a vibrating mirror which is controlled by the moment of inertia of the mirror

(Continued on Page 16)



WILL YOU BE READY?

Industry is awakening. Already it is demanding technically trained men, men with engineering educations. Will you be called? Will you be ready?

Since 1874 Rose Polytechnic Institute has trained men for Industrial leadership. Well planned courses in Civil, Chemical, Electrical and Mechanical Engineering are offered. For complete information, write to the registrar.

ROSE POLYTECHNIC INSTITUTE

Terre Haute, Indiana

Research and Progress

(Continued from Page 14)

and the elasticity of the rod to which it is fastened. Two magnets control the axes of vibration. The original light beam would be reflected on the screen as a small dot, but the vibration of the mirror in a vertical plane causes it to move horizontally across the screen, and a simultaneous horizontal motion causes the lines traced to travel up and down. Mr. Priess uses a one-quarter inch square mirror spot welded to a steel piano wire 3 inches long. The vibrations are controlled by a special signal transmitted with the television signal so that synchronism is possible. The other features of the transmission are similar to those already described.

The Peck system was recently reviewed in certain laboratories, a complete news-reel being transmitted and received in a separate room. The pictures were clearly visible on a screen in a lighted room, so that the first difficulties seem to be disappearing, and television may possibly become more than an inventor's dream to the general public.

Instrument Progress

THE stroboscope is an instrument which enables one to study rapidly moving parts while they are in motion. In a new type of instrument, the moving part is observed through a slit in a moving disk, the speed of which can be regulated to coincide with that of the moving object. The only time the object can be seen is when the slit passes the eye-piece. Since the speeds coincide, only one certain part of the object is visible; and therefore the body appears stationary. The apparent speed of the object can be regulated by controlling the speed of the disk, so that the whole or any part of the object can be inspected at will. This particular stroboscope can be used as a tachometer to measure speeds up to 140,000 revolutions per minute without being in contact with the moving part at all. All that needs to be done is to bring the apparent speed of the body to zero and measure the speed of the disk in the stroboscope, with perhaps a little more complicated action at the extremely high speeds. The instrument is also equipped with a set of prism binoculars to allow close inspection of the moving part, and to permit inspection of parts when it is dangerous to approach closely. The range of speeds that can be studied with this instrument is quite wide, being controlled by the use of various slit disks which have a range of from one to twenty-four slits. The stroboscope is portable, being equipped with a tripod, and because of it's movability, is suitable for laboratory or shop observation.

Glass Heat Insulation

A NEW and unique material has been introduced in the heat insulation field which not only fills all the standard requirements, but also adds a few of its own. The new product, known as glass wool, was first evolved in England in 1930, and has now been perfected until it assumes some importance. Threads are spun from small electric furnaces and are wound upon drums rotating at high speed. A high quality glass is used, giving a thread of remarkable resilience which also possesses a "fire polish" similar to old English crown glass. The skeins manufactured in this manner are formed into protective blankets of any desired size and thickness, the threads being taken from the drums, raveled, and spread in mats of the proper dimensions. These mats are easily applied to the surface in question. They can be wired together without any backing as the simplest application. Another method utilizes wire netting to hold the mats in place. Sewing with asbestos thread is possible. Any protective backing such as asbestos or jute can be used advantageously. The large sizes of sheets available facilitate application.

There are many other advantages besides the physical one of installation. The fibers are quite resilient, an important feature, since this quality allows the material to give way when the metallic surface it covers is affected by temperature changes.

Vibrations are also rendered unimportant by this characteristic; witness an installation in a train ferry. Glass has certain inherent qualities that make it an acceptable covering. Its chemical resistance leaves it proof against all but hydrofluoric acid; it is quite stable at temperatures as high as one thousand degrees Fahrenheit; there is no tendency to disintegrate; and the surface presented reflects heat quite efficiently. As for heat conduction, laboratory tests gave thermal conductivities of various thickness in a range from 0.28 to 0.21 B.t.u. per degree Fahrenheit per square foot per hour per inch of thickness. The application seems quite ingenious, and the producers are enjoying a volume of business which would indicate that the product meets the

requirements of the trade.

Silver Purifies Water

AN electro-chemical process for sterilizing water by treatment with silver has been introduced into this country from Germany. The Katadyn process, developed by Dr. G. A. Krause of Munich, is based upon oligdynamy, the property of minute traces of certain metals sterilizing water. Silver is particularly applicable. A slight trace of silver in solution with the water being treated gives it certain bactericidal properties thta last as long as any silver is present. In small installations the metal is added by direct contact of the water with a coating of silver on a porcelain plate, but any large plant would render this method unfeasible because of the large amounts that would be required. When large quantities of water are to be treated, the electrolytic process is used, the water being charged with silver ions from bar electrodes. A specially lined iron tank is used, the lining insulating the container from the liquid. The passage of current between silver electrodes produces the necessary ionization. The current is reversed at regular intervals to prevent polarization. A very small voltage must be applied to prevent electrolysis of the water.

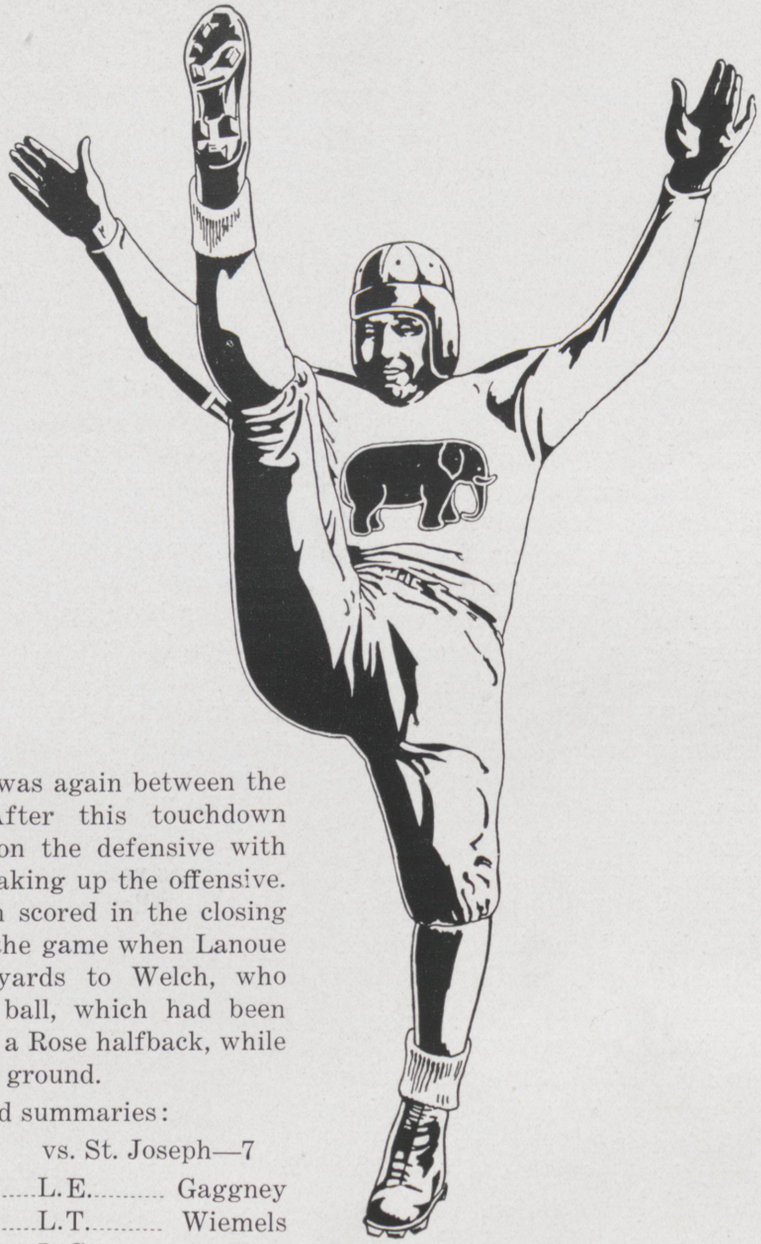
The condition of the water naturally has a great effect upon the design of the plant. The salts and acids present, along with the temperature of the water, have a marked action upon the conductivity. The pH value, which is a measure of the acidity or alkalinity of the water, affects the sterilization, alkalinity accelerating and acidity retarding the action. The amount of suspended matter should be noted also, since absorption may cause a loss of silver. The cost of operation naturally varies with conditions, but energy consumption is less than .001 kw.-hr. per ton of water treated, and the cost of silver used is from .1 to 1 cent per ton.

The process is applicable to sterilization of water for drinking purposes, swimming pools, ice-making, brewing, and other industrial uses. A water-purification plant near Heidelberg has a capacity of five tons per hour and is run from a storage battery, a practical example of the simplicity of the method. The German cruiser Konigsberg has an installation which has been so effective that other units have been ordered for the German navy. In this country a unit was recently installed in the 150,000 gallon swimming pool for the Congressional Country Club in Washington.

SPORTS

Edited by

Harry Richardson, m., '35



Rose vs. St. Joseph

Rose took a trip up to Rensselaer, Indiana, and took St. Joseph's college into camp by the score of 14-7. The Fighting Engineers showed superiority in every department of the game and made a number of first downs, but were able to score only twice during the game.

Rose received the opening kickoff and made four successive first downs, carrying the ball to the St. Joseph 25 yard line, where the ball was lost on downs because of an error by the head linesman. The play for the remainder of the quarter was practically even until the closing minutes. With one minute to go in the first quarter, Richardson passed from the St. Joseph 30 yard line to Fox, who was downed on the 6 yard stripe as the quarter ended. The Engineers scored on the first play of the second quarter when Richardson crashed off tackle for a touchdown. Richardson's kick for the extra point was good. Rose continued on the offensive for the remainder of the half, but was unable to score.

In the third quarter the play see-sawed back and forth between the Rose 40 yard line and the St. Joseph 30 yard line, the advantage, if any, being held by Rose.

Early in the fourth quarter Rose brought the ball up to the St. Joseph 18 yard line by means of passes and off-tackle drives. On the next play, with first down and ten to go, Rose was penalized 15 yards for pushing. On the following play Richardson broke away on a triple pass and was run out of bounds on the 10 yard line. Campbell then made 5 yards off left tackle, and Richardson came back with 5 more yards and a touchdown off right tackle. Richardson's kick for the extra point was again between the uprights. After this touchdown Rose went on the defensive with St. Joseph taking up the offensive.

St. Joseph scored in the closing minutes of the game when Lanoue passed 35 yards to Welch, who caught the ball, which had been deflected by a Rose halfback, while lying on the ground.

Lineup and summaries:

Rose—14		vs. St. Joseph—7
Laughlin	L.E.	Gaggney
Vondersaar	L.T.	Wiemels
Eyke	L.G.	Foos
Tucker	C.	Gloriofo
Lyon	R.G.	Paterman
Presnell	R.T.	Leuterman
Tait	R.E.	Heckman
Hufford	Q.B.	Smolar
Richardson	L.H.	Lanoue
Campbell	R.H.	O'Grady
Fox	F.B.	Hatton

Score by periods:

Rose	0	7	0	7	—14
St. Joseph	0	0	0	7	— 7

Scoring: Rose — Touchdowns; (2)—Point after touchdown; Richardson (2, place kicks).

St. Joseph—Touchdowns; Welch —Point after touchdown; O'Grady (place kick).

Substitutions: Rose—Bard, Sentman, Garmong, Wodicka.

Rose vs. Normal

Rose again failed to overcome the Normal jinx when it lost the 1934 game by the score of 31-0. The Engineers played good ball, but let Bush, shifty Normal quarterback, get away two or three times for long runs resulting in touchdowns.

The first quarter saw a nip and tuck struggle between two seemingly evenly matched teams. Normal recovered a Rose fumble on the Rose 30 yard line and rushed the ball down to the three yard line where they were in possession of the ball with first and goal to go. However, at the end of four plays Rose took the ball on downs

on their own 5 yard line, after a great goal line stand.

Normal scored twice in the second quarter on long runs by Bush. Both tries for the extra point failed as the kicks sailed wide of the uprights. Rose followed up the kickoff after the second touchdown with three successive first downs just as the gun sounded ending the half.

Rose got away to a very bad start at the beginning of the second half when Bush shook himself loose and ran 60 yards for a touchdown on the first play. The kick for the extra point was blocked. Normal scored again when Bush returned a punt 65 yards for another touchdown, and again the kick was blocked. The play for the remainder of the quarter and the first ten minutes of the last quarter was on practically even terms, although Rose held a slight advantage. The Engineers threatened when, after Bard had returned a Normal punt 20 yards to the Normal 30 yard line, two first downs gave them the ball inside of the 10 yard stripe; but here the attack wilted and Normal took the ball on downs.

Late in the fourth quarter a series of inside tackle thrusts, combined with a successful 15 yard pass, gave Normal a first down on the Rose 2 yard line. Two line plays were unsuccessful, but Bibbs went over on the third try. The kick for extra point was good just as the game ended.

Lineup and Summaries:

Rose—0		Normal—31
Laughlin	L.E.	Micklozek
Tucker	L.T.	Ashworth
Colburn	L.G.	Downey
Fuller	C.	Budd
Lyons	R.G.	Brammer
Eyke	R.T.	Fessenden
Tait	R.E.	Snow
Hufford	Q.B.	Wey
Richardson	L.H.	Hoffman
Campbell	R.H.	Wernz
Fox	F.B.	Bibbs

Score by periods:

Normal	0	12	12	7	—31
Rose	0	0	0	0	— 0

Rose vs. Wabash

Rose journeyed up to Crawfordsville and took another one on the chin to the tune of 25-0. The Engineers played much better football than the score indicates and a complete review of the statistics from the game would convince even the most skeptical person of that fact.

Berns scored for the Little Giants in the second quarter on an 18 yard run around his right end. In the third quarter Riggs, substitute right half, dashed around left end behind perfect interference for the second touchdown. Berns scored in the same period on an end run from the 12 yard line, and Snyder kicked the extra point. The scoring for the afternoon was completed when Gerow plunged over from the one yard marker in the middle of the final period.

Rose gained over 200 yards from scrimmage during the afternoon. At the start of the game the En-

(Continued on Page 23)

Fraternity Notes

Blue Key

Blue Key met Thursday, Nov. 8th at the home of Dr. Prentice. Plans were begun for the Fall election of new members. The test for eligibility of active members is "that the proposed men are of good character and personality, recognized as leaders in scholarship and college activities," according to the National constitution. The local constitution limits the membership to 15% of any one class. Only men who have completed at least two years of college work are eligible.

The first biennial national convention of this service fraternity will be held in Chicago, Dec. 28 and 29. The purpose of the meeting is to establish a stronger bond among the chapters and to formulate fraternity policies. Earl Butler has been elected a member of the National Chapter and will in that capacity represent the local chapter at the convention.

At the October dinner meeting it was announced that all Rose alumni who are members of Blue Key may become alumni members of this chapter and thus further strengthen the fraternal bond which they formed as undergraduates by attending the biweekly meetings.

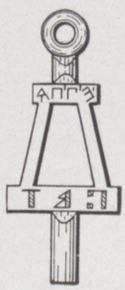
Alpha Tau Omega

William R. Creal ch., '36, of Terre Haute and Albert B. Mewhinney, e., '36, also of Terre Haute were initiated into Gamma Gamma chapter of Alpha Tau Omega on Sunday, October 27th.

Open house was held on October 14th. Cider and doughnuts were served during the evening. Prof. and Mrs. Wischmeyer were the chaperones.

A large number of grads have returned to visit the chapter and the college in the last few weeks. Theron Bell has been in Terre Haute for several weeks. Harry McGurk spent a week-end here recently. Carl Ehrenhardt was down at the same time. Both of these men were Worthy Masters of the chapter. Jack Keller was home the week-end of homecoming.

Tau Beta Pi



Indiana Beta of Tau Beta Pi was represented at the annual convention of the fraternity in New York by Arthur W. Hess. Mr. Hess traveled by air and can hardly refrain from telling of his experiences. Tau Beta Pi takes great pleasure in announcing the pledging and initiation of the following men: Gordon L. Burt, Earl B. Butler, John A. Straw, Joe B. Weaver, Martin Long, and Warren Sentman. We wish to congratulate these men upon their high scholastic standing, character, and breadth of interest which rendered them eligible for this honor.

Theta Kappa Nu

Indiana Gamma is pleased to have one of its alumni, Wayne Bovenshen, back and living at the chapter house.

Paul Froeb is now teaching auto mechanics at the Englewood High School in Chicago.

Bill Haynes is working in the

Signal Department of the Pennsylvania Railroad in Baltimore, Maryland.

Charles McGillivary is with American Airways in Chicago.

Sigma Nu

Beta Upsilon chapter of Sigma Nu is glad to state that its men are again out for another record breaking year. Already they have figured in the activities on the Rose Campus. Earle B. Butler has been elected to the honorary degree of Tau Beta Pi. Deforest Colburn is president of the athletic association. Richard Spain is the secretary-treasurer of the Junior Class. Ewing Carrico is chairman for the Homecoming Dance to be held on November 9th.

John Richardson E.E. '31, who is now with the Cleveland Illuminating Company of Cleveland, Ohio, spent the week of October 7th in Terre Haute visiting his alma mater. While staying here he lived at the Sigma Nu House.

Several Sigma Nu's from different engineering schools throughout the country, stayed at the Sigma Nu House while attending the convention of engineering magazine editors. They left letters stating that they enjoyed their visit very much.

Tau Nu Tau

The first regular meeting of Tau Nu Tau military fraternity was held Monday, October 29th. Plans for the Military Ball to be held December 8 were discussed at great length, and the fraternity has high hopes of a very successful ball. We take pleasure in announcing the pledging of the following men: Paul Bennett, James Campbell, William Creal, Louis Duenweg, Harry Garmong, William Kasameyer, Ed Leever, Daniel Overholser, Warren Sentman, and Joseph Walker.

A NOON HOUR RIDE

Listen, my friends, to what I may say
Of the noon hour ride of John Bradley,
On the ninth of October, in thirty-four,
He rode a steed, as never before.
A two wheeled, rubber shod, gas burning steed,
Made for young gentlemen, who go at high speed.

With joy and great courage he climbed in the saddle,
Resolved to ride forth and to enemy give battle.
He stepped on the starter, and turned on the gas
So all slow vehicles, he easily could pass.
He called to his friends, "Tell Prof. I'll be late."
But he failed to consider the farmer's white gate.

Down the road like a flash, with a roar and a bang
The exhaust of his engine merrily sang.
But alas! for poor John, he had failed to ask
His friends how to stop this consumer of gas.
Like the hero of old, who the windmill did fight,
Just one little failure, placed John in bad plight.

He pushed on a button, and pulled on a lever,
Twisted one grip and turned on the other.
From under the wheels the cinders did fly,
While John rolled merrily down the front drive,
Crossed the highway, where many a car, both trolley and gas,
Allowed our hero much room to go past.

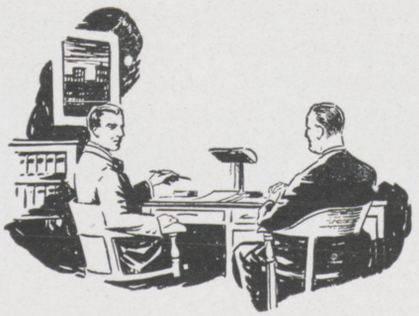
But here gentle readers, this story must end
For between two white posts, some thoughtless men
Had placed a large gate, all painted white,
Which stopped our brave John in his wild flight.

HARVE N. CHINN

Alumni

Edited by

Jay F. Hall, e., '35



As was announced in the last issue of the Technic, the Engineering College Magazine Association Convention was held at Rose October 15 and 16. A banquet was held at the Terre Haute House on the night of October 15, at which Mr. Arthur M. Hood, '93 of Indianapolis was the speaker. Mr. Hood was accompanied by his son Mr. Harold B. Hood, who graduated from Rose in 1924. On the following page will be found Mr. Arthur Hood's picture and biography.

Mr. Allan G. Stimson, who was Vice-Chairman of the Association, was present at the Convention.

Here and There With the Grads

'03 Brent C. Jacob is back with Industrial Brownhoist in Bay City, Michigan, working on a half million dollar order which they have received.

'09 Carl W. Piper is now with H. O. Swoboda Inc., Consulting Electrical and Mechanical Engineers of Pittsburgh, Pa. He is located in Cincinnati.

'19 Adolph A. Geiger, who is with the York Ice Machinery Company, has been transferred to Omaha.

'26 Max C. Sherwood is engineer and estimator for the District Improvement Corporation in Buffalo, N. Y.

'27 Lowell E. Muehler visited Rose in September and announced the presence of a new member in his family, Alice Jane, born in June.

'28 Wendell A. Watkins, who is with the Duriron Company, has been transferred to Buffalo, N. Y., where he is Branch Manager of the district sales office.

'30 Joseph J. Sperotto is employed at special telegraph work with Armour and Company in Chicago.

'32 Charles N. McGillivray is with American Airlines Inc., at their overhaul base at Chicago.

'33 Merrill L. Bradfield is now living at 61 North Arlington Street, East Orange, New Jersey.

'34 Brent C. Jacob Jr. obtained a position last June with NELA of the General Electric Company. At first he was doing electrical work, but later was transferred to glass work, and at the present time is working in the chemical laboratory of the Pitney Glass Works in Cleveland. He will be in that department for about a month, after which he will spend about a month each in the ceramics and physics laboratories. Then for a few months he will be in the glass factory proper, spending a part of that time in the office. After that Mr. Jacob will be in Niles, Ohio, where the large glass factory is situated.

Jackson Landenberger started working with G. E. shortly after he graduated last June, and at the present time is located in Erie, Pa. From the time he graduated until he started working Mr. Landenberger was at Camp Custer in the O. R. Cs.

'32 Mr. Bertschinger is now teaching in the Central High School at Jackson, Mississippi.

Marriages

Mr. Robert M. Clark of Terre Haute, last August 12th. Mr. Clark Helen De Lisle, also of Terre Hatue, last August 12th. Mr. Clark graduated from Rose in 1932 and is now employed with the National Tube Company of Lorain, Ohio. Mr. and Mrs. Clark are at home at 1326 Second Street, Lorain, Ohio.

Mr. William Paton was married October 25th to Miss Mary Catherine O'Leary, both of Terre Haute. Mr. Paton graduated from Rose in 1933 and is now employed in the engineering department of the Indiana State Highway Commission. At the present time they are living with the bride's parents.

Arthur M. Hood

MR. ARTHUR M. HOOD was born in Indianapolis, Indiana, December 25th, 1871.

In the summer of 1886, after having completed two years of high school, he became an apprentice in a general machine shop where he learned the trade of pattern maker, both wood and metal. By the fall of 1889 he was receiving journeyman's wages in the trade—(25 cents per hour; 60 hours a week).

Mr. Hood entered Rose in September of 1889 and graduated in 1893 in the course of mechanical and electrical engineering, which were at that time combined.

The following October he became a Fourth Assistant Examiner in the United States Patent Office under the Civil Service. He matriculated at the Columbian University Law School (now George Washington) on October 14th, 1893, receiving an LL.B. in May, 1895.

He took his examination for Assistant Examiner at Chicago with six other applicants and was the only one in that group who passed.

In July, 1895 he resigned from the Patent Office and became

ARTHUR M. HOOD

junior partner with his father, H. P. Hood, in the practice of patent and trade mark law at Indianapolis. Because of ill health his father retired the day following the formation of the firm.

Mr. Hood practiced alone, under the firm name, until January, 1902, at which time he became junior partner in the firm of Bradford & Hood, this partnership continuing until the death of Mr. Bradford in April, 1911.

He became the senior member in the firm of Hood & Schley in the spring of 1913. This firm continued until 1921, at which time Mr. Schley withdrew.

In the spring of 1924 Mr. Hood became the senior member of the firm of Hood & Hahn. This firm still persists, with his son H. B. Hood (Rose 1924) becoming a member in the spring of 1932.

At the age of 12 he made his first drawing which became part of an application for a patent for one of his father's clients, and the successor of that client is still a client of his.

His practice has been a general one, and he has had litigation in the United States Courts scattered over the country from coast to coast.

Mr. Hood was married in the spring of 1895 to Alice B. Johnson of Washington, D. C., who became the mother of two daughters and one son. She died in the spring of 1920. One of his daughters has three children and his son has two. Mr. Hood was married again in the summer of 1932.

Mr. Hood was one of the organizers of the Rose Technic, and his son was also on that Board, being Editor-in-Chief one year.

He has visited the school on a number of occasions and has talked to the student body a number of times about patents.

He was secretary of the Alumni Association from 1906 to 1915 inclusive; president of the association in 1922 and 1930; vice-president in 1917 and 1924; alumni representative 1907 to 1911, and 1913 to 1917.

A considerable proportion of Mr. Hood's clients have been served by him continuously since 1902.

Sports

(Continued from Page 19)

gineers started with the ball on their own 10 yard line and weren't stopped until they failed to make the last yard on fourth down on the Wabash 20 yard stripe. In the closing minutes of the first half Rose took the ball and advanced from its own 15 to the Wabash 40 before the gun sounded. Those two drives were the main threats made by the Engineers during the first half.

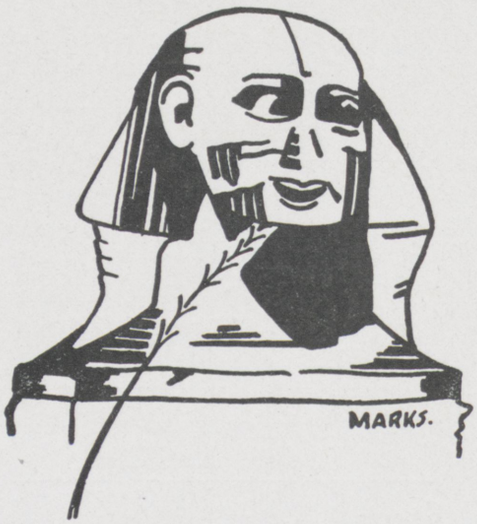
Rose did not again threaten seriously until after the final Wabash score. A short time after this finfial score, Rose gained possession of the ball on its own 15 yard line and went to the Wabash 10 yard marker before a pass was intercepted to end the rally. On this last march all of the plays used by the Engineers, with the exception of one line play, were forward passes. The Wabash secondary was very much bewildered as the Rose passing attack with Richardson on the throwing end and Bard, Sentman, Wodicka, Campbell, and Tait on the receiving end worked to perfection. It was a tough game and the Engineers deserved a better break than the score indicated.

Score by periods:

Wabash	0	6	13	6	—25
Rose	0	0	0	0	— 0

Substitutions: Rose—Campbell, West, Lyons, Laughlin, Fuller.

CENTRIFUGAL DISSIPATIONS



Edited by

Edd A. Coons,
Ch., '36

Doc Sousley, it seems has become a little astigmatic and of necessity purchased glasses, but he has been hesitant about wearing them beacuse of his lack of experience behind glass. May we recommend a few lessons under the tutorship of Prof. "Alfie" Child, who is an authority on spectacle manipulation. After two lessons you should be able to initiate your "specs" in grand style, Doc, and perhaps with practice break the all time record of Prof. Child as to the number of times said glasses are removed in one period.

We always laugh at teacher's jokes,
No matter what they be,
And not because they're funny jokes,
But because of policy.

—The Warbler.

A little Canadian boy had never seen a negro before, so when he saw one he asked his uncle, "Why does that woman black her face?"

"She doesn't; that's her natural color," was the reply.

"Is she black like that all over?" the boy pursued.

"Why, yes," said the uncle.

The boy looked up beaming, "Gee, uncle," he exclaimed, "You know everything, don't you."

—Wataugan.

Destruction

(To tune of "America")
My Physics 'tis of thee,
Short cut to lunacy,
Of thee I rave.
Another month or so,
Of studying thee I know
Will send me straight below,
Into my grave.

—The Riddle

SACRED

to the memory of
ROBERT SEARS
who has fallen a victim of Cupid. May his condition serve as an eternal warning to future students.

YIELD NOT TO TEMPTATION

He: "You've a faculty for making love."

She: "Oh no,—just a student body."

—Dirge

If all the freshmen were placed in a line, arm in arm, they would reach more than half way across the lake. A lot of upperclassmen are in favor of this.

A good way to practice public speaking is to ask a girl for a date over the dorm phone, especially when Hunter is blowing off.

The remodeled building is a boon to the chemical engineers; and some one was mean enough to suggest that they used their "influence" to get it. The chemists, being the only ones in school who carry on any exacting scientific experimentation which needs watching all the time, could not leave their posts of duty when the interesting wrecks occurred out front last year. This year, because of the new corridor, they can stand on the National Road, watch the wreck with one eye and their experiment with the other.

A sleeper from the Amazon
Put nighties of his gra'mazon—
The reason that
He was too fat,
To get his oun pajamazon.

Last week "Doc" Sousley put in an appearance at school at 8:40 A.M. (twenty minutes until nine to the Freshmen) and someone was overheard asking him, "What's the matter, 'Doc', got an 8 o'clock?"

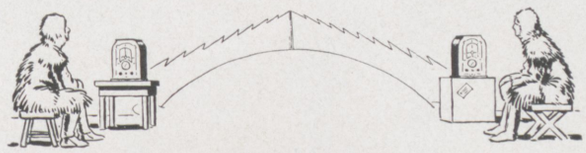
I Wonder

Why the front of a book is part of the back.

Why you need a bridge on your nose.

If a grass widow married a grass widower would the off-spring be grasshoppers?

G-E *Campus News*



TWO POLES IN ONE

Radio entertainment and "airmail" have been sent to the Antarctic through General Electric's short-wave station W2XAF, ever since Rear Admiral Byrd arrived there last year. Recently, in conjunction with a Byrd program, another was sent out to Rockwell Kent and his son in the Arctic region—thus linking simultaneously Americans who are, in the matter of latitude, farthest apart. Governor McNutt of Indiana and other prominent Hoosiers spoke to the Byrd Expedition from Indianapolis in a program sponsored by the *Indianapolis Star.* Immediately afterward, the Coffee House Club, an organization of artists and writers to which Rockwell Kent belongs, sent music and greetings from New York to him on the island of Ubekjent, just off the coast of Greenland, 600 miles within the Arctic circle. Features of this program were special greetings from Mrs. Kent and her daughter, and a talk in the Eskimo language by Vilhjalmar Steffanssen, Arctic explorer, for the benefit of the natives. Both programs were broadcast over a coast-to-coast NBC network as well as by short waves.

GOOD-BYE, SMOKESTACK

For many years, the old central heating plant at Mt. Holyoke College in Massachusetts, with its tall, unsightly smokestack, barred the way to certain necessary improvements and landscape developments on the campus. This summer the old boilers and the smokestack were torn down. In one of the buildings of the old plant stand 120 General Electric oil furnaces arranged in circular groups of five. Fifty-two more G-E oil furnaces are installed in the smaller or more isolated buildings of the campus, operating singly, in pairs, and, in one instance, in a battery of 10. In the central plant, only as many groups of furnaces will operate as are necessary to maintain the required steam pressure. The remainder will be shut down, avoiding stand-by losses. The individual furnaces and small groups in distant buildings permit the abandonment of some of the longer runs in the underground steam-distribution network. The high efficiency of the system is expected to produce savings which will pay for the installation in five to seven years. In addition, as a result of the more careful regulation of temperature, it is expected that health conditions at the college will be considerably improved.

The main plans for the system were drawn up by C. W. Colby, consulting engineer. D. W. McLenegan, Wisconsin, '21, assistant engineer of the Air Conditioning Department; W. O. Lum, and H. R. Crago, Penn State, '18, both of the same department, handled engineering details for General Electric.

FLYING POWER PLANT

Gold was discovered in 1925 along the Bulola River in New Guinea, an island just north of Australia. Prospectors worked the richer veins by hand methods, and packed their "take" on the backs of natives through 40 miles of cannibal-infested and nearly impassable jungles to Lae on the coast. After the best veins had been worked out, it became apparent that placer operations on a large scale would pay if the necessary dredges and other machinery could be brought to the location. Land transportation was impossible, so a plane was sent in. The pilot found a spot to land, and a flying field was cleared off.

Four 875-kv-a. General Electric waterwheel generators were among the equipment ordered. When they arrived at Lae, they were transferred to huge all-metal Junkers freight planes and flown to the location piece by piece. The largest single pieces had a net weight of 6545 pounds. As the load limit of the planes is 7000 pounds, it was a tight squeeze. D. B. Gearhart, Iowa State, '27, of International General Electric, Inc., handled the order for the Company.

96-83DH

GENERAL ELECTRIC

I'm no dirt farmer
but I was brought up on a
tobacco farm and I know
mild ripe tobacco . . .
have a Chesterfield

Down where tobacco is grown folks say . . .

"It's no wonder that so many people smoke Chesterfield cigarettes.

"To begin with they buy mild ripe tobacco . . . and then they age it.

"It costs a lot of money . . . but it's the one way to make a milder, better-tasting cigarette."