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The Rose TECHNIC

MONTHLY PUBLICATION OF THE STUDENTS
OF ROSE POLYTECHNIC INSTITUTE

Rose Polytechnic Institute,
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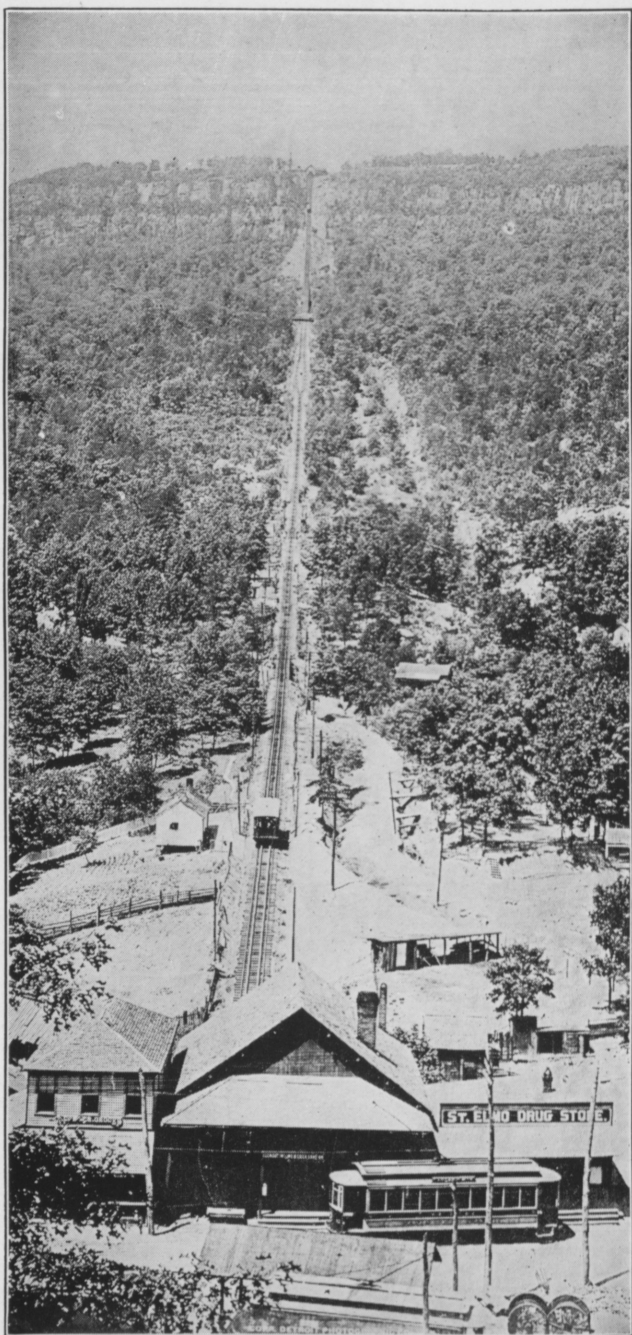
MEMBER OF ENGINEERING COLLEGE MAGAZINES ASSOCIATED

A Good Mountain for Lazy Bones

WHY not be a mountaineer? From the top of Lookout Mountain, near Chattanooga, you may gaze over one of the finest panoramas in the country, and at the same time experience that peculiar thrill which only historic scenes can inspire.

The answer, you think, is obvious. You will leave mountain climbing to those who prefer a withered sprig of edelweiss to the most beautiful rose from an old-fashioned garden; who would rather grasp an alpenstock than the hand of a friend.

Perhaps, then, you do not know that the Otis Company, which lifts men so easily to their offices every morning, is ready to lift you just as easily to the summit of Lookout Mountain, on the Otis Inclined Railway.



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Offices in all Principal Cities of the World

THE ROSE • TECHNIC

PUBLISHED MONTHLY BY THE STUDENTS AND ALUMNI OF ROSE POLYTECHNIC INSTITUTE • ♦ ♦ ♦



VOL. XXXVI

JANUARY, 1927

NUMBER 4

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BURNING MONEY

By Walt Mason

I *T* isn't what we earn that counts; it's what we put away. I took in coin in vast amounts, ere I grew old and gray I said, "I'll gambol as I please, and paint the foolish town, for coin is growing on the trees, and I can shake it down." On Saturday I drew my pay, a goodly roll and fat; on Monday morn I'd take my way to soak my watch and hat. All through my years of youth and health, my ways were wild and rash, I gayly threw away my wealth, I burned the easy cash. Then came the sad and fatal day when I woke up to find that I was old and gray, not equal to the grind. There came a siege of stringent times; the boss was sad and sore; he said, "I'll have to save the dimes," and fired me from his door. And after all my years of toil I had no plunk, that day, to make the old tin kettle boil, or keep the wolf away. I thought of all the costly joys I'd bought in bygone years, of foolish nights with foolish boys, and shed a stack of tears. I thought of chances that were dead, and gone beyond recall; and then I bumped my aching head against the nearest wall. But there is nothing in remorse, except an added jolt, and weeping for an old dead horse won't bring along a colt. So live, young man, that when you're old you've no such luck as mine, and have a parcel of red gold put somewhere safe in brine.

Chemistry Attends the Williamstown Institute of Politics

By Alfred T. Child

Chemical Engineering Department

NOT many years ago Chemistry was largely a pure science with little practical application in everyday human needs. Today all that is changed. For many years metallurgy has required the constant services of many chemists to control the operations of furnaces that extract the metals from their ores. Gradually such industries as soap-making, fertilizers, paper-making, and rubber began to find the help of the chemist a fundamental necessity. They found out that the firms which employed chemists could produce a better product at lower costs. About fifteen or twenty years ago chemical engineering was in the development stage. This branch of engineering consisted of taking the process started on a small scale in the laboratory and designing a plant for commercial production. Chemical engineering has now won its spurs and taken its place in the world of industry.

The Williamstown Institute of Politics

When Chemistry was invited to take part in the proceedings at the Institute of Politics it was definitely placed as being of outstanding importance in the solution of world problems. Mr. Harrison E. Howe, Editor of the Journal of Industrial and Engineering Chemistry, was asked to take charge of a "round table" conference under the title, "Chemistry in World Affairs." Through his untiring efforts a large group of prominent chemists from this and other countries were present and took part in the very interesting discussions at these conferences.

It is well to consider here what the Institute is and how it operates. The Institute of Politics was organized by President Harry A. Garfield of Williams College. Its first meeting occurred in the summer of 1921 and lasted for about a month beginning about the first of August. Some three hundred thinkers of outstanding reputation and ability were drawn to Williamstown from all over the world. Here they discussed questions that were of world interest, questions such as the operation of the Dawes Plan, causes of future wars, poison gas in modern warfare, and similar subjects. The Institute was a success from the first and has continued to meet each year. The

expenses of the first three sessions were generously borne by Mr. Bernard M. Baruch. From 1924 through 1927 the expenses are being borne by the General Education Board of the Carnegie Corporation and Mr. Baruch. President Garfield now hopes to obtain a fund of two million dollars to become an endowment fund for future sessions of the Institute. The ideals of the Institute are of a very high order and the discussions are intended to promote the well being of all nations and assure closer relations. Its sessions have tended to make men of different countries better acquainted with each other's problems and more inclined to take a sympathetic viewpoint in solving them. The men are drawn from many professions to-wit: lawyers, clergymen, teachers, writers and lecturers, and come from many countries. The sessions operate under three different methods. The

round table discussions, general conferences and formal lectures. The round table has become a very important part of the sessions. The large group is broken up into small ones of not over fifty each. In these groups questions of interest to each particular group are discussed very informally under the guidance of an able leader. These take up the mornings until eleven o'clock when the whole group dis-

cusses some larger type of question of general interest. Formal lectures take place in the evenings and to these lectures the general public is invited. A special round table conference was organized under the leadership of Mr. Howe, occupying three mornings each week. A number of formal afternoon lectures were also given by noted chemists on subjects of general interest. The following brief review will attempt to cover the more important points brought out in these meetings. Four major subjects were considered: Energy, Industrial Raw Materials, Food, and Health. Our review here will be confined to the first two subjects.

The Relation of Chemistry to Industrial Raw Material

METALLURGY—Metallurgy involves all kinds of chemical processes; furnace operations such as the

"YESTERDAY belonged to the Mechanical Engineer, but today and tomorrow belong to the Chemical Engineer---tomorrow, more than today, for as great as has been the contribution of the Chemical Engineer to progress, he has only scratched the surface of his art."

Hugh Farrell in "What Price Progress."
Financial Editor of the New York Commercial.

blast furnace process, the basis of the iron and steel industry; electrochemical processes like electrolytic refining by which most of our copper and much of our lead is refined at the present time; also leaching or dissolving operations by means of which very low grade copper ores are being treated at a marvelously low cost. Dr. Charles S. Parsons, Secretary of the American Chemical Society, was one of the chief speakers on this subject and some of his statements are surprising. According to statistics presented by him, the world now uses 75,000,000 tons of metals annually. Our metal resources are now pretty well charted. Our known supplies of iron are sufficient to last 200 to 300 years but our supplies of copper, lead, zinc, tin, and antimony are nearing exhaustion. They will last probably not more than 25 or 30 years. Lead is more expensive than ever before. The time is fast approaching when we will not be able to use lead in paint because of the prohibitive cost. A very large part of our present metal supply comes from the junk pile. Dr. Parsons states that 8,000,000 tons comes from this source. One-half of our copper, one-third of our lead, one-eighth of our zinc, two-thirds of our tin and three-fifths of our antimony come from the junk pile. For our encouragement Dr. John E. Teeple, treasurer of the American Chemical Society, stated that we need have no fear about the possible exhaustion of these metals for the chemist would find as good or better substitutes.

SYNTHETIC CHEMISTRY.—Dr. Roger Adams of Illinois University told how synthetic chemistry is upsetting natural raw materials with products from the laboratory. In 1897 India had 1,000,000 acres of indigo plants for the production of indigo. Now all but one or two per cent of the world's indigo is produced by a chemical process invented by German scientists.

Synthetic rubber has been made successfully in Germany and was used to quite an extent during the war, but it has not yet the qualities to make good automobile tires. Dr. Adames states that it is likely to be made as a by-product from petroleum. To give an idea of the present immense rubber industry in the Far East he stated that it takes all the latex (sap) from two full-grown rubber trees for a whole year to make one Ford cord tire.

The present condition of the wood alcohol market illustrates what synthetic chemistry has done in that field. The wood alcohol industry in this country involves an investment of about a million dollars. Early in 1925 this industry reported that everything was fine and prospects encouraging. Soon however it was reported that Germany was producing it from water gas by synthetic methods at a cost far below what the wood distillers can produce it in this country. Up to date 415,000 gallons have been imported from Germany. The distillers are now demanding a higher tariff. It is very interesting to note in this connection that the President has recently announced a fifty per cent increase in the import duty on foreign wood alcohol. Another interesting possibility exists in the possible manufacture of synthetic wood alcohol by means similar to the German process, under "blanket patents" granted to the Germans prior to the war and now owned by the Chemical Foundation.

WOOD A RAW MATERIAL.—Chemists believe that wood will be used less and less as a building material but become an almost ideal raw material in

such chemical processes as making artificial silk, artificial rubber, and artificial leather. Fifteen years ago we had no artificial silk industry. Now we import from the Far East about forty million pounds of natural silk annually and make in our chemical works about seventy-five million pounds. Most of this artificial silk uses wood pulp as a raw material.

FERTILIZERS AND NITRATES.—Every nation requires sure supplies of nitrogen in available form, in war time to make explosives and in peace time to make fertilizers and chemical products. Since 1825 Chile has had a world monopoly in the nitrate market. Half the expenses of her government are said to be derived from export duty on nitrates. Since 1825 Chile has exported 67,000,000 tons. During the war Germany learned to make nitrates and nitric acid by chemical methods. Now she has a surplus for export. In this country we now have more than a half dozen plants making synthetic ammonia whose product has completely upset the ammonia market during the last year and a half.

Chemistry in Relation to Power Development.

Few people realize the part chemistry plays in the production of power for industrial and domestic uses. The remarkable expansion in the use of power is one of the most significant features in our modern life. Dr. R. T. Haslam of Massachusetts Institute of Technology read a very interesting paper dealing with this subject. He states that 95% of all power used in the United States is released by combustion, a strictly chemical process. Only 5% is produced from water power.

The power consumed in relation to the number of workers employed has increased amazingly in the last ten years. In the glass industry it has increased 50 per cent., leather industry 25 per cent, cement industry 38 per cent, automobile industry 37 per cent, and in the making of men's clothing 47 per cent. Such increases have only been possible because of increased efficiency on the part of power plants and cheaper rates for power. The chemist has shown how coal can be burned so that more power can be obtained per pound of coal. By pulverizing it so that proper air mixture can easily be obtained, wonderful advances in power production have been brought about. The mine-mouth power plant seems not likely to become more common because for every ton of coal burned 500 tons of water are required for cooling.

We have heard much about the approaching exhaustion of our oil resources. What will our automobiles do then. We are all interested in that for every sixth man owns one, at least in the United States. The chemist has an answer for that too. We can distill coal at a low temperature so that 30 per cent of gasoline can be obtained from the tar and a ton of coal will yield about 30 gallons of tar. Germany again has the most striking solution. Dr. Bergius has now perfected a process for liquifying coal, in other words he can make artificial crude oil from coal. Germany has little oil so even though the gasoline produced in this manner may cost 30 to 60 cents per gallon Germany will be interested in such a process. In fact it is reported that two plants are

(Continued on Page 16)

Synthetic Perfumes and Flavors

An Explanation of a Few of the Things Your Nose Doesn't Know

By Melburn Heinig, ch.. '28

ONE of the most pleasing impressions upon the senses is the fragrance of flowers. This fragrance is due in some cases to "essential oils" in the petals, as in roses and lavender. Again, this fragrance may be due to the presence of glucosides (complex organic compounds) which under favorable conditions are decomposed by enzymes or ferments, as in the jasmine.

A true perfume consists of a large number of odoriferous compounds mixed in such a ratio as to produce a single harmonious effect upon the sense of smell. A fine brand of perfume may contain twenty different ingredients, each of which (if they are natural essences) are complex mixtures or a dozen or so compounds. The cheap perfume maker finds out the chief active ingredients of certain so-called rare scents, such as attar of roses which, incidentally, cost \$400 a pound during the war. In this case the chief constituent is geraniol which costs \$5 per pound, then citronel, costing \$20 per pound, nerol and others. The perfumer thus makes, by bringing these various ingredients together, a cheap perfume from three or four compounds.

Genuine oil of roses, like other natural essences, contains a dozen or so constituents. To leave any of them out of the synthetic product has an effect on the senses analogous to the removing of a number of instruments from a symphony orchestra, leaving only a few loud-sounding pieces. It must not be thought, however that good synthetic odors cannot be produced. To make those which closely resemble all the subtleness of the natural product, careful proportioning and mixing are necessary. Relatively pure ingredients must be used, and suitable solvents must also be employed.

Sensitivity of the Sense of Smell

The human olfactory apparatus is a very sensitive mechanism. As an example, oil of roses, which is one of the most expensive perfumes known, can be detected in as small a quantity as .000000002 grams. Furthermore, butyl mercaptan, which is perhaps the vilest odor thus far invented by man, is detected when only .000000000002 grams are present.

Smell as a Component of Flavor

Flavor is a joint effect of taste and odor in which the latter predominates. The gustatory and olfactory areas in the brain are very close together and the two kinds of impressions are received practically simultaneously. As a result, the brain interprets the result as flavor. There are four kinds of taste—acid, alkaline, bitter, and sweet; all others are merely modifications of these. Acid taste is the perception of hydrogen ions—basic or alkaline taste the perception of hydroxyl ions. The bitter and sweet tastes depend upon the chemical constitution of the compound,

but the laws of the relation have not as yet been worked out.

Odors as Related to Chemical Structure

While it is impossible to work out an absolutely general and accurate classification of odors and flavors as related to the chemical structure of the compound, it is possible to roughly outline the groups of substances according to their scent or flavor.

The "fruity" odors are mostly of the aliphatic series. We have, for example: ethyl acetate, with an odor of ripe apples; amyl acetate, with a pear flavor; ethyl butyrate, a pineapple flavor. The esters of fatty acids are used to flavor candy and beverages. Limburger cheese owes its distinctive flavor to butyric acid. Citric acid is present as such in lemon juice, in oranges, limes, etc.

In the aliphatic series there is another type of odoriferous substances. The esters mentioned above are of the methane series, a sub-group of the aliphatic series. This next class is of the olefin series. If the carbon chain contains one or more double valence linkages, we get the "flowery" perfumes. An example of this group is found in geraniol, the chief constituent of attar of roses. Geraniol has the formula, $(\text{CH}_3)_2\text{C}=\text{CHCH}_2\text{CH}(\text{CH}_3)_2=\text{CHCH}_2\text{OH}$ and is called by the formidable name, dimethyl 1 2-6-octadiene-2-6-ol-8. It is an alcohol which upon oxidation changes into the aldehyde, citral, which occurs in lemons, oranges, and verbena flowers. Another compound of this group, linalool, is found in lavender, bergamot, and many flowers.

The formula for geraniol, already referred to, contains six carbon atoms in more or less of a chain linkage. When compounds of similar structures are shaken up with dilute sulphuric acid, the carbon atoms hook up to form the benzene ring (hexagon shaped), but with other carbon atoms "bridging" across it. These bridges rings of formula C_6H_8 , or some multiple of that, constitute the important group of the terpenes which occur in turpentine and fragrant woody materials such as sage, lavender, caraway, pine needles, and eucalyptus. Going further in this direction we get into the realm of heavy oriental odors—patchouli, sandalwood, cedar, cubebs, ginger, and camphor. The olefinic terpenes are many times associated with the aromatic terpenes, are chemically related to them, but are, nevertheless, aliphatic hydrocarbons.

The aromatic terpenes, as are the aliphatic, common constituents of essential oils of plants. They constitute a large class of closely related compounds of the formula $\text{C}_{10}\text{H}_{16}$. The camphors which have the empirical formula $\text{C}_{10}\text{H}_{16}\text{O}$ are keynotes of this important group.

Also falling in the aliphatic class, we have a group

of delicate odors. If we have a six carbon ring without a double linkage (known as cyclo-aliphatic), or with one or two of such linkages, we get soft and delicate perfumes like the violet, represented by ionone. Ionone is an enormously powerful scent; it is the base of all violet scents.

The chief synthetic perfumes (many of which occur in natural essential oils) are aromatic alcohols, aldehydes, ketones, phenols, and phenolic esters, oximes, lactones, etc.

Methods of Extraction and Purification

There are various methods used to extract the natural odor from plants. Chief among these may be mentioned distillation—fractional and steam, expressed oils method, maceration in warm oil or fat, enfleurage or the absorption of odors by fats, and the method of using volatile solvents.

Many of the processes utilized commercially are very complex and explanation could not well be included here. These commercial processes are of necessity complex because in most instances the substances have to be built up gradually, and the intermediate products purified. Thus often it takes months to perfect one of the chemical bodies to which a certain flower owes a part of its odor. Nevertheless, a remarkable saving to the perfumer has been accomplished by the development of the synthetic method. Jasmine, for example, in the form of the "absolute jasmine flower essence" contains about 65 per cent benzyl acetate and costs, as made from the blossom, \$180 to \$260 per pound. Benzyl acetate can be synthetically prepared and marketed pure at 1/100 the cost of the natural product. Of course benzyl acetate is not the only constituent of natural jasmine odor, for flower oils are, as a rule, exceedingly complex.

Most perfumes can be synthetically prepared from coal tar products; in many cases however, they are merely separated in a pure state from less costly natural oils, sometimes by fractional distillation or other chemical means. Phenols, for example, are separated from aldehydes and ketones by their capacity for dissolving in caustic alkali; aldehydes and ketones are separated by causing them to unite with sodium bisulphite; sweet-smelling alcohols may be separated by union with anhydrous calcium chloride, or by esterifying them with dibasic acids and dissolving out the resulting esters with alkaline carbonates.

The synthetic flavors are usually prepared by starting with some coal tar product or other crude material, and building up the molecule to the desired complexity. As an example of this we have the treatment of phenol with chloroform and potassium hydroxide (Reimer's Reaction). After these substances have reacted, under the proper conditions, the whole may be steam distilled and the product, salicylic aldehyde, obtained. This same substance may be prepared from the oil of the wintergreen plant. From the residue in the distilling flask there may be recovered ortho-oxy-benzaldehyde.

Now if the latter product is methylated with methyl alcohol, we obtain anisaldehyde (Hawthorn scent). From para-oxy-benzaldehyde upon treatment with acetic anhydride is obtained coumarin, which is extracted from tonka beans also. Vanillin, a very important synthetic product, can be prepared from guaiacol $C_6H_4(OH)OCH_3$ by means of Reimer's

Reaction (mentioned above). Vanillin is a m-methoxy-p-hydroxy-benzaldehyde. The natural substance may be extracted from the vanilla bean with alcohol.

Methyle salicylate is the main constituent of oil of wintergreen which occurs in wintergreen berry and birch bark. It may be prepared by bringing together salicylic acid and methyl alcohol under the proper conditions. Another interesting compound is saccharine, sulpho-benzo-imide, is obtained from toluene which in turn is a fraction from coal-tar naphtha distillation. It is 500 times as sweet as sugar.

Extent of the Synthetic Perfume Industry

The scent industry has received a very appreciable impetus from synthetic scents, Germany producing in 1920 scents to the value of £2,000,000. As mentioned in the beginning, the majority of flower odors are due to complex mixtures of different scents. Almost all of these odors have been successfully duplicated by mixtures of synthetic compounds, resulting in perfumes which are both lasting and pleasing.

METRIC URGERS LAUNCH NATIONWIDE CAMPAIGN

With the beginning of 1927, advocates of decimal metric weights and measures for the United States have organized for an energetic campaign. At its recent annual convention in Philadelphia, the Metric Association outlined plans for greatly increased activity.

The All-American Standards Council, with headquarters in San Francisco and Washington, D. C., is urging prompt legislative action by Congress, establishing the decimal metric units for general use in merchandising throughout the United States after 1935. Its executives announce that metric standardization is urged by Thomas A. Edison, John Hays Hammond, Samuel Vaucrain, John J. Pershing, Theodore Roosevelt, Franklin D. Roosevelt, Arthur Capper, E. N. Hurley, William G. McAdoo, Roger Babson and many others eminent in national affairs.

Led by such influential groups as the New Orleans Association of Commerce and the Washington Manufacturers Association, more than 300 important chambers of commerce and industrial organizations are urging liberal metric legislation.

Among other important organizations advocating the metric adoption are the National Wholesale Grocers Association, American Chemical Society, National Wholesale Druggists Association, Associated General Contractors of America, American Institute of Architects, National Congress of Mothers and Parent-Teacher Associations, Institute of Radio Engineers and the National Research Council.

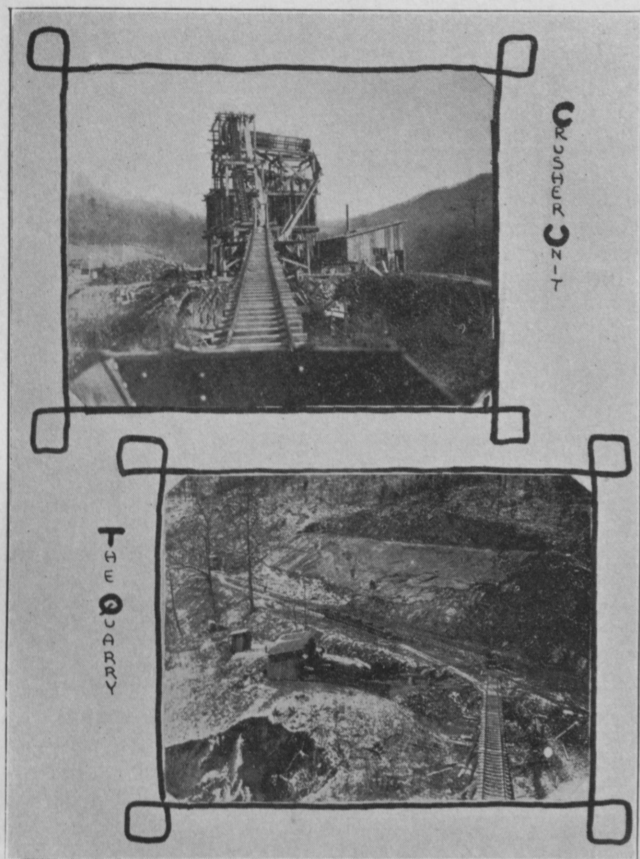
More than 100,000 petitions urging metric legislation have been placed before Congress, and as many of these are from large organizations, altogether they represent several million voters. The States of Illinois, California, Tennessee, North Dakota and Utah are among those which through their legislatures have petitioned Congress to adopt the metric standards for all the people.

The great Pan-American Standardization Conference, to be held in the United States during 1927, is expected to emphasize the need for the world-uniform decimal metric measures in commerce. All the American republics except the United States are already on the metric basis in merchandising.

Unique Aggregate Plant Placed in Operation

Rose Graduate Designs Novel Plant Utilizing Sandstone for Concrete Aggregate on Highway Job

By C. Hunnell, Jr., Civil, '26



changes in aggregate supply within the next few years.

The plant is located at Molus, Kentucky, approximately mid-way between Harlan and Page, and is on the banks of the Cumberland River on the site of the road being constructed. The plant consists of two major operations, the quarry and the crusher and washer.

The quarry face is at the cut on one side of the road and the stone is removed by first shooting off the dirt, stripping to the sandstone, or by washing it by means of high pressure stream of water pumped from the Cumberland River. The stone is then blasted out and placed in quarry cars with a $\frac{3}{4}$ Yard Osgood shovel. The blasting and drilling at this point is rather a hazard due to the strata of the rock being faulted. After the stone has been placed in the quarry cars it is hauled over a 36 in. industrial track to the base of the incline to the crusher plant by mules. A cable is then hooked onto the car and it is pulled up the incline to the dumping chute where it is dumped into the crusher.

The crushing plant consists of two No. 6 American Road Machinery Company jaw type crushers for the coarse aggregate and one No. 41½ crusher of the same type and make for the fine aggregate. This plant is operated by a 120 h.p. full Diesel oil engine (Fairbanks-Morse). After being crushed the stone passes through the grading screens where it is washed by means of a perforated water pipe within the screens. All of the material is washed, one of the reasons being that the stone sometimes contains shale seams or dirty bands of which all of the aggregate must be free.

After the stone and fine material have been washed and graded it is dumped into a 250 ton capacity bin divided into two compartments, one for coarse aggregate, stone which varies between $\frac{3}{8}$ to 2½ in. or under. This in turn is delivered by means of batcher hoppers to trucks which haul the material onto the job where the road paver is located. It is estimated that the maximum haul will be about 11½ miles.

The plant has a capacity of 600 tons per day, and it is the intention of the company to begin operations about February first in order that some three to four thousand tons may be stored for use in the spring as the plant will be unable to otherwise furnish material with two or more paving units at work at the same time. The plant will be supervised by Engineer Jas. A. Wallace, Civil, 21, a member of the engineering staff of the Foulkes Company. The road construction is under the supervision of Superintendent Paul G. Lindeman, also a Rose Civil graduate.

THE Foulkes Contracting Company of Terre Haute has constructed and put into operation a very unique aggregate plant to be used in constructing twenty-six miles of paving between Page and Harlan, Kentucky. The plant was designed and erected by Chief Engineer Thos. T. Hardman, Civil and Mechanical of the class of '14.

This plant is unique from several standpoints, primarily that this is one of the first experiments in which a company has utilized sandstone aggregate in its entirety. This was done partly because of economy; the hill country in this particular part of the state being largely sandstone. In using this stone, roads may be built at points where the expense of such construction would be prohibitive if material had to be shipped in and placed on the job. The United States Bureau of Public Roads and the Kentucky State Highway Department are making very close studies of this plant and it may result in many

St. Patrick Was an Engineer

While "scrubbing out" the Technic office one day last month, the editor had the audacity to read a few scraps of paper which had been idly left on the table. Among the numerous "dailies" and student bulletins from other colleges which cluttered the table the following drama from our own environment struck his eye. The following is as authentic a reproduction as possible—discounting misspelled words and unnecessary modifiers. We publish it not because of intrinsic merit, but because the thing struck us as being indicative of a "disease" which has crept into our camp—the disease of blind conformity to past tradition.

Luckily there is abundant proof that the toxins of this disease—indifference and unprogressiveness—are being beaten out of the student mind. What we need is a few fearless "horns" to push the fence down so that fellow classmen can enter the fairer fields of initiative and new thought.—But here is the drama—he who runs may read.

ONCE upon a time—not longer than three or two weeks ago—the following conversation came floating edgewise through one of the ventilator-transoms in the door across from mine in Deming Hall. If you have seen those ventilators, you'll know the probability of the conversation being a little bit twisted, for even an ordinary breath of air has to turn around twice and whistle "There'll Be a Hot Time in the Old Town Tonight" to the tune of "The World's Growing Colder Each Day" before it gets straightened out, and even then it's dizzy for a week and has all the skin knocked off it by centrifugal force. So if any of you think that these ideas are somewhat distorted, just remember that the best information is that that comes straight. Editorially we can not vouch for a word that is said here. Without reading another word you can just bet a sweet kiss against a bid to the Junior Prom that, like an economics quiz, it's either all true or all false, or it is part true and part false. Here's what our all too insufficient and incomprehensive powers of comprehensibility believed ourselves to have recognized as intelligently understandable:

Facetious Freshman. You fellows talk like two crows on the opposite end of a log. One of you says, "Ye Cawn" and the says "Ye cawn't." Can't what?

Sappy Soph. Careful, Frosh. You're addressin' superiors. Talk respectful.

F. F. Yes, sir. I'm very careful. I always give respect—where respect is due.

Senile Senior. Come baby. Come to papa. You need a warming for the hidden sarcasm of that remark. Forward! Bend! Take the stance of humility.

F. F. Gladly, and with extreme unction, but wait a minute. I asked a respectful question before I made this disrespectful remark. I asked what it is you fellows can or can't do.

Se. Se. I've had so many beans for dinner that I'd rather explain than swing a paddle, so we'll just let you see who has the better side of this argument. You've heard of St. Pat's, of course.

F. F. I never have. What is it?

Sappy Soph. Holy Pete! The ignorance of 'im!

Se. Se. Never mind, Sappy. You were once just as green. Here, infant, is the story. Years and years ago, in the good old Emerald Isle, the people lived most happily in grand and noble style. Enough to eat, enough to wear—good shelter overhead, and yet in spite of happiness, they had one constant dread. They simply couldn't sleep at night, nor sit to eat their cakes without the fear and constant dread of clammy, crawling snakes. The reptiles killed off

all the dogs. The cats were in despair. The people's dreams were much awry for snakes ran through their hair. They couldn't sail the briny sea, for big snakes filled the poop, and every meal was colorful with green snakes in the soup.

About that time came Patrick then—an engineer, I'm thinking. He pulled some simple little trick, and all the snakes went slinking. Just what it was you'll never know. He threw them into panics. My guess is, though, he dosed them all with Mack's Applied Mechanics.

F. F. What's Applied Mechanics?

Se. Se. Nobody knows but Mack, and he doesn't seem to be able to tell anyone else. But don't interrupt me. I'm just at the point where my argument with Sappy begins. They've been celebrating this wonderful feat of chasing the snakes out of Ireland in the engineering colleges all over the world ever since. Here at Rose they can't find any snakes, so they get together like a bunch of silly kids and "play like" they had some. In fact, they get so swelled up on themselves and go St. Pat one better. They spend three or four weeks dodging every class that they can get out of in order to make some little things to push along the street like some kid with a toy train yellin', "See me. Here I come. I'm a real he-man. I'm an engineer."

Sappy Soph. Si, Senior, but as I was sayin' a while ago, you're pokin' fun at one of the oldest and most sacred traditions at Rose.

Se. Se. (sound of a chair pushed back as though Senile Senior were rising to his feet) Traditions! Traditions! Traditions! You fellows give me a traditional pain that's equal to the seven-year itch. A fellow'd think that you were livin' in the deceased ages when men, for lack of brains, followed only the customs of their grandfathers. You're worse than the heathen Chinese believin' that just because a great aunt's father's cousin's grandpapa used a certain twist in his tail, if they had tails then;—that is, I mean pig-tails, that a kink—any kind of a kink was neither according to Hoyle, nor in keeping with Roberts rules of parliamentary procedure. Why, in the name of all that is progressive and scientific don't you break away from the dead, dim, petrified, ossified, putrid past and do

(Continued on page 25)

EDITORIAL

Rose and Precedents

Maurice L. Pike, '30

There may be many of the students and professors to consider this statement as somewhat far-reaching, but the opening statement is to be as this—Rose campus life seems to be carried on merely by the precedents set by our august graduates, some of many years ago, some of more recent years, due to the school's having been moved and various new rules being necessary. This may be good or bad as one sees fit to consider, but the main objection is that precedents will not always fit the numerous occasions that arise in different lines, and sometimes bring about results that may be injurious to the morals and spirit of students and faculty members alike.

Going back into history, a few years ago a young man was faced with the problem of selecting a school after completing high school work. Of course this was hardly attempted until the line of work had been decided upon with the aid of the members of the family and numerous "round-table discussions." After the "line" had been chosen there arose the institution problem—where should the boy go? To make the story a little shorter, Rose was chosen and then came the true opposition from the family. Strange enough the entire opposition could be summed up in the following manner—would any mother want her son "spoiled" in such a "rough-neck" school. Odd. Yes, without a doubt. But that was the entire opposition; the brothers repeatedly stated that no knowledge could be obtained in the best possible manner, taking advantage of the essential principles and fundamentals that are studied and afterward applied by an engineer.

The mother thought only of this—those boys who appeared in town in muddy boots, army clothes, and various other costumes, strange and outlandish, and with such airs of importance and independence, could scarcely be considered as students and surely not boys who would be the important men of tomorrow in directing the destinies of industry and other problems in the daily life of a country or community. She only stopped to consider the matter from the most apparent angle, that is, the appearance of the boys and not their true characteristics.

After the decision had been made to enter the school for engineers, the boy had to face the problem without the aid or direction of anyone, solely through his own ability and thoughts. But he was only one of some ninety or more of his fellow beings in that they were freshmen also. They probably had to face the same situations, probably not in the same identical manner, but each boy from the city of Terre Haute has heard at some time in his life of the supposed rough atmosphere of Rose campus life. True or not there is always the sentiment that Rose has the type of students



that hardly appears to be that of anybody seeking intellectual advancement.

But after the smoke of the first few weeks has cleared away, things don't seem so bad after all. Are conditions so bad as reputed? Hardly; as a matter of fact it seems that the old atmosphere is rapidly changing. The particular student of the preceding discussion had known a number of Rose men, graduates and students, but their recounts of their daily ventures into Rose society do not compare with that of the freshmen of the class of today. Their lot was much harder; they were forced to conform with many rules that seem idiotic today; they lived in continual fear of the sacred institution of the PADDLE, something almost obsolete to the present freshmen.

Now comes another question for all of us that will serve to test the consensus of opinion on this matter. Are the present freshmen being "let off" too lightly? Or should they be subjected to the same routine of the freshmen of the past? Do you think that the school spirit will be aided or handicapped? Will the freshmen naturally fall into an air of equality with their school superiors?

Ask yourself these questions and then compare them with those of the writer who is directly concerned. Since these questions concern only one major topic the answers will be readily understood when the major thought is expounded. Rose will have better class spirit, scholastic standing, better school and fraternity spirit when most of the old precedents are abolished. There have been too many criticisms made to the writer by men who are considered as influential and ambitious to witness the expansion and rise of standing of our school to doubt this statement.

So many upper-classmen have talked this matter and arrived at the same conclusion that the truthfulness of the statement is made far more secure in its rights. Others state that there would be no benefit in disturbing precedents. That is an easy way to escape discussion over a serious matter when they are little concerned. Wouldn't this be a progressive nation and world if the commerce were carried on by means of the old masted schooners? If freight was transported on flat boats and prairie schooners, how many rush deliveries would be filled? If our mail was delivered by the old rider, what would be the use of air service and special delivery stamps? Then if there is a way to better Rose, why not do it?

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The Rose TECHNIC

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Research and Progress

Conducted by C. M. Ploch, m., '29

RAILROAD BRIDGE RAISED 21 FEET

BRIDGES have often been reconstructed and repaired, but to raise a bridge 21 feet, and not require traffic to stop, is a rather unusual happening. Such was the case when the construction of a 1,700,000 acre-foot reservoir on the Snake river for the American Falls project made necessary the reconstruction of about two and a half miles of railroad. Grade reduction work required that a bridge across Snake River be raised a total of 21 ft. 4 in. This was accomplished by jacking up the spans, a little at a time and supporting them on precast concrete blocks. Then concrete was poured around the blocks, raising the piers the same amount.

Before raising, the bridge was 890 feet long, made up of deck plate girders and a pin connected truss measuring 250 ft. To complete the job it was necessary to bring the total length up to 962 feet and to add two girder spans.

Hydraulic jacks were used to raise the bridge. Steam pumps developing a pressure of 6,000 lbs. per sq. in. operated these jacks very effectively.

Concrete blocks, 8 in. by 8 in. were precast and placed under the shoes as the bridge was raised, to serve as a temporary support. Every time four of these blocks had been built, concrete was poured in so as to encase the blocks as part of the finished structure.

The raising was carried on progressively from one end of the bridge to the other. The complete cycle required from seven to eight hours. During the work four regular passenger trains and approximately fourteen freight trains crossed the bridge during the eight hour day.

IMPROVING PANAMA CANAL

PANAMA CANAL, from year to year, is consistently providing a passage for more ships between two oceans. In reality the Panama Canal has never been totally completed, for, with an annual maintenance

appropriation of \$300,000 to \$500,000 a year, many projects are always being suggested. Each of these, no matter how small, is indicative of some improvement, and is done in the order of apparent need. Three projects of note have already been completed; two of which dealt with cutting off banks at channel bends, the other with with a \$2,000,000 channel widening job.

Dredging seems to be the most important of all the work. In the early days of Panama Canal operation, three of the biggest dipper dredges in the world were purchased. The results accomplished with them have been world famous. Since 1924 several dredging projects have been started that will make the canal easier and more quickly transited. From all indications a 24-hour day traffic requirement is not so far off, and it is then that this dredging will really be useful and effective.

Without a doubt these projects require a long time, for example, one on the Pacific side will require seven years. When it is completed 8,000,000 cubic yards of earth will have been removed.

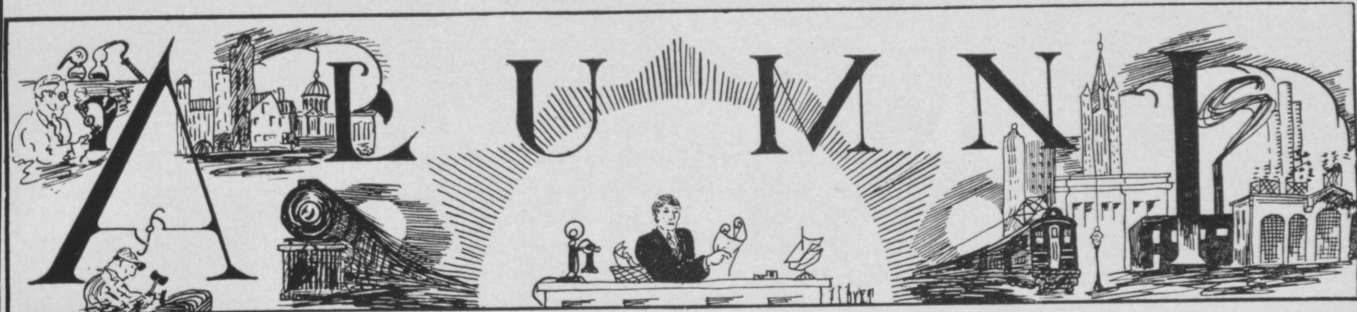
Through this improvement and maintenance allotment, many advantages can readily be seen; there are longer and wider turns, greater visibility along the channels, wider channels at the lock entrances, etc. Efficiency and safety in handling traffic is the result, and of course the equipment can be shifted to emergency work in a short time.

POWER PROJECT AT MONTGOMERY, ALABAMA

AMONG the most notable construction operations in the hydro-electric field is that of the new Martin dam and power house located approximately forty miles north of Montgomery, Alabama, on the Tallapoosa River. The completeness of the entire construction method is the main cause for the interest it has created.

Briefly put, the new dam and power house form a

(Continued on Page 24)



George Rockwell Putnam, Scientist

AMONG the many alumni of Rose Polytechnic Institute who have attained distinction in the engineering and scientific fields and are contributing to the welfare and comfort of human kind in no small way, there stands out prominently George Rockwell Putnam of the class of 1890.

Born in Davenport, Iowa, May 24, 1865, he entered Rose Polytechnic Institute in 1887 and was graduated with honors, earning the degree of Bachelor of Science in Mechanical Engineering in 1890. In 1895 he was granted the degree of Master of Science by Rose Polytechnic, and in 1922 was granted the degree of Doctor of Science by Stevens Institute of Technology.

Dr. T. C. Mendenhall, the President of Rose Tech from 1886 to 1889, was called to the high office of Chief of the United States Coast and Geodetic Survey by President Harrison. Recognizing the exceptional ability of Mr. Putnam, he encouraged him to enter the service of the Coast Survey in a competitive test with several candidates from eastern universities. The results of the test showed Mr. Putnam to be the best qualified, whereupon he entered that service in 1890.

Though not generally appreciated, this bureau is one of the most important scientific bureaus of the government. It is charged with the accurate surveys of the coast and the contiguous waters of the United States. The dependencies and its territories are accurately triangulated and precisely leveled. On the level surfaces they make magnetic surveys, gravity surveys, and gravity determinations. These furnish material for the special publication of thousands of charts and maps upon a large scale furnishing authoritative sailing charts to make navigation safe, as well as maps for establishing compass variations and data in latitude and longitude of stations, often necessary to determine disputed state and other boundary lines. The greatest accuracy and refinement is required in the execution of these duties, which composed the kind of work that Mr. Putnam was engaged with. Some notable tasks assigned to him were service in the Mexican and Alaskan boundary surveys. It may be remembered that the establishment of the boundary line between Alaska, purchased by the United States from Russia in 1867, and the British

North American possession became of grave importance with the gold discoveries in the Klondike region. The ultimate settlement of the dispute did not come until 1913.

Being entrusted with an extensive series of gravity determination in 1895, Mr. Putnam made use of the half seconds pendulum, which was devised and perfected by Dr. Mendenhall. These data were used to form a part of an international study of the earth's crust and were largely supportive of the isotatic theory of the earth's crust which partially considers the solid crust is in a condition of floatation upon the interior and explains the gradual changes going on in the form of the earth and the elevations of the continent.

The following year found him a member of a survey party of a scientific expedition to Greenland and the next year he was ordered clear across the continent to Alaska. The survey of the Pribiloff Islands, so important in the connection with treatise to protect the seal from

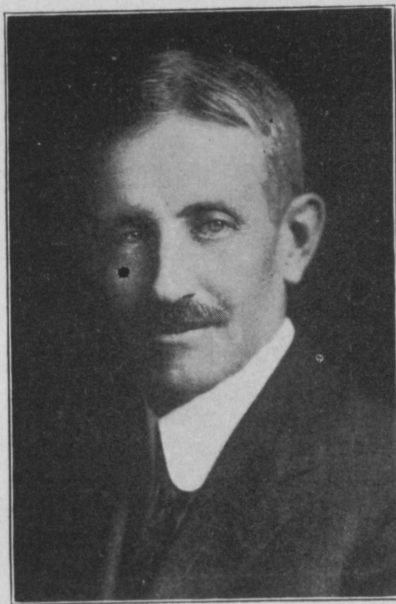
extinction in those waters, was assigned to him. He completed a survey of the delta of the great Yukon River for the purpose of making pilot charts which were

becoming so much in need in the tremendous development of Alaska. The entire planning and directing of a survey of the Philippine Islands was entrusted to him which consumed his time from 1900 to 1906. Following this he was commissioned to revise entirely the plans for the recharting of the coast of the United States.

Observations connecting the European and American gravity determinations already referred to were made by Mr. Putnam in 1890.

From this it may be seen that to Mr. Putnam were assigned some of the most important and varied problems and tasks in the scientific work of the Coast and Geodetic Survey. In the attack and solution of every one, he has shown such skill, organizing ability, and breadth of view, that he has received the acclaim of scientific men everywhere.

In 1910 he was appointed Commissioner of the Light Houses in which position he carried out an



GEORGE R. PUTNAM



entire reorganization of that service. A service, the magnitude and importance of which size is not appreciated by the general public. This, like the Coast and Geodetic Survey comes under the Department of Commerce. It has to deal with the construction, location, and maintenance of all light houses, light ships, beacons, buoys, and marks or fog signals along the coast and navigable water of the United States to insure safety to mariners and shipping. In 1917 the number of lighthouses, lightship beacons, and all



aids to navigation exceeded 15000, but is today far greater. The service maintains a fleet of tenders, construction boats, etc., equal to a small navy. The

technical and scientific problems at present to make the service most effective are varied and of a high order of difficulty, such as radio direction signalling, sound signalling, and improvement in the lighting devices are constantly studied. Millions of dollars are each year expended in this service, all of which is under Mr. Putnam's direction and supervision.

Mr. Putnam has been a frequent contributor to both scientific and more popular journals as the Geographic Magazine, etc. He is the author of a number of monographs such as Lighthouses and Lightships of the United States, Nautical Charts, and Radio Signals.

Every alumnus of Rose Poly, who after a journey abroad and is approaching the home port, first sees the Nantucket Shoals Light Ship that beacons to guide him to a safe entry to New York Harbor. He may not only feel the thrill of welcome home and grateful appreciation of Uncle Sam's care to insure his safe landing, but may almost feel that pleasure which a personal greeting may bring, for George Putnam of the class of '90 is responsible for its proficient service.

Some years ago the Nantucket light ship was destroyed by fire and it is related to me by a friend of a captain of the Hamburg-American Steamship lines that he was approaching our shore with his ship in a fog one night but on his expectation to sight the Nantucket light ship, he could not raise it. He was certain of his position for he had never missed the beacon in twenty-five years of sailing. So he checked his position over and over and yet so loath was he to go on without his bearing on the lightship that he sailed around and around the lightship's station until morning when the fog dissipated. He then proceeded on his course even though he could scarcely believe that the lightship was not on post until landing in New York he learned of its destruction. So important and assuring to mariners are the beacons over which George Putnam has jurisdiction.

C. L. M.

ALUMNI NOTES

'89

Victor K. Hendricks, who has been practicing Civil Engineering in Chicago, Illinois, is at the present serving in the capacity of Assistant Engineer for the

Harbor Plan of that city. Hendricks received his Master of Science degree in 1900.

'93

Robert D. Valentine, a practicing Mechanical Engineer in Minneapolis, Minnesota, is now the chief draftsman with the Minneapolis Heat Regulator Company.

'97

J. Briggs Haney, a Captain in the Ordnance Department of the United States Army, has been transferred to the Raritan Arsenal at Metuchen, New Jersey. He was previously stationed at Aberdeen Proving Ground, Maryland.

'98

Frank A. Whitten has recently taken a change in positions, but is still in the automobile industry. His new position is that of Engineer of Development and Design, American Car and Foundry Motors Company, Detroit, Michigan, while his last position was that of Chief Engineer, General Motors Truck Company at Pontiac, Michigan. He received his Master of Science degree from Rose in 1902.

'03

Earl C. Metzger is Chief Engineer of Power of the Monsanto Chemical Works located at East St. Louis, Illinois. His acceptance of this position allowed him to still remain a resident of the same state, as his former position was that of Chief Operating Engineer for the American Steel Foundry at Granite City, Illinois.

'04

Howard A. Mullett, formerly the Assistant General Manager of the Yellow Cab Company at Chicago, Illinois, has moved to Minneapolis, Minnesota, where he is Assistant to the Vice-President of the Twin City Rapid Transit Company. Mullett was awarded the Hemingway Medal for high scholastic work when he was graduated from Rose Poly.

Haword H. McFarland is manager of the Ohio Power Company at Philo, Ohio. This is but a continuation of his familiar work, for he was previously with the Beech Bottom Power Company, which is located at Power, West Virginia. He was General Manager with that company. McFarland received his Master of Science degree from Rose Poly in 1906.

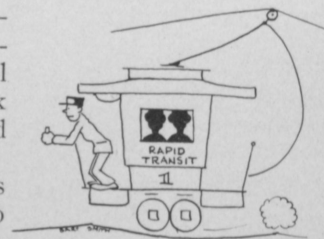
'05

Merle R. Reed is with the Pennsylvania Railroad at Ft. Wayne, Indiana, having been transferred from Chicago, Illinois, where he was Assistant General Superintendent, Motive Power, North West Region. His position at Ft. Wayne is that of Master Mechanic.

Walter E. Johnson, formerly a salesman with the General Electric Company at St. Louis, Missouri, has moved to Emporia, Kansas, where he is a dealer in paint and wall paper.

'07

Alonzo D. Schofield, who is employed with the Walsh and Weidner Boiler Company, has been transferred from Jacksonville, Florida, to Greenville, South Carolina. He was manager of the Sales Office at Jacksonville.



'08

Herbert H. Boyd is Field Engineer for the Pioneer Construction Company of Kansas City, Missouri. Before his change, he was Assistant Engineer for the Union Pacific Railroad at Omaha, Nebraska.

'09

Ernest W. Klatte is Manager of the Straub Cinder Block Company of Indianapolis, Indiana. Before accepting this position, Mr. Klatte was Assistant Chief Engineer for the Insley Manufacturing Company of the same city. Klatte received his Master of Science from Rose Poly in 1916.

'11

Ernest C. Bradford is the Division Manager in the St. Louis Division of the Electric Vacuum Cleaner Company at St. Louis, Missouri. He was recently with the International Time Recording Company of the same city.

'12

Joseph A. Hepp, who is Assistant Superintendent Electrical Distribution, for the Union Electric Light and Power Company at St. Louis, Missouri, has been signally honored by having been elected National Chairman of the Board of Trustees of the Alpha Chi Sigma Fraternity. Mr. Hepp has been for many years actively interested in Alpha Chi Sigma and is



one of the leading members of the fraternity. In his undergraduate days he was a member of the Iota Chapter at Rose Poly and is at present the Alumni Secretary of that chapter. Hepp was awarded his Master of Science degree from Rose Poly in 1914, and received his Chemical Engineering degree in 1921, also from Rose.

'14

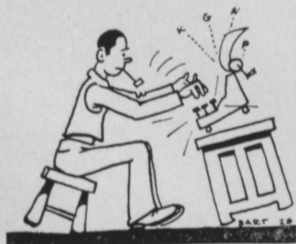
Herbert E. Ransford has been advanced to the office of Vice-President of the Henry N. Muller and Company of Pittsburgh, Pennsylvania. Before this, he served in the capacity of Sales Engineer for the same company.

'15

Joseph S. Gillum, who was with the Engineering Department of the Pennsylvania Railroad at Columbus, Ohio, has been sent to Altoona for special training. He later went to Philadelphia.

'16

David W. Hite, of the Cities Service Oil Company, has been transferred from St. Paul, Minnesota, to Tulsa, Oklahoma. He was the Chief Clerk with the company while located at St. Paul.



Ralph E. Finely, who was formerly Engineer of Design in the Bridge Department of the Indiana State Highway Commission at Indianapolis, is now a member of the firm of James H. Carmine and

Company of the same city.

J. Luther Pirtle is with the Electric Bond and Share Company at 71 Broadway, New York City. He was previously Electrical Draftsman with the Canadian Engineering Agency of the same city.

'17

Frederick W. Hild, who is with the General Electric Company, has been transferred from Chicago, Illinois, to Buffalo, New York. He was formerly the Assistant Manager of the Illinois Lamp Works for the General Electric Company at Chicago. He received the Hemingway Medal upon his graduation, and was awarded his Master of Science degree from Rose Poly in 1925.

'18

David B. Henry is with the Frigidaire Corporation of Dayton, Ohio, as Experimental Engineer.

Robert E. Long, who was formerly the Roadmaster of the Wabash Railway at Montgomery, Missouri, is Track Supervisor for the Chicago Terminal Division of the same company at Chicago.

'19

Clarence E. Pigg is Chemist for the Tampa Gas Company at Tampa, Florida. He was formerly Superintendent of Derivatives Plant of the Indiana Coke and Gas Company at Terre Haute.

Herschell A. Hearn is with the American Brown Boverie Corporation at Camden, New Jersey. He was previously at Indianapolis with the Wagner Electric Company.

'20

Whitcomb W. Moore, who was Engineer of the L.L. Department of the American Telephone and Telegraph Company at Indianapolis, Indiana, has been transferred to Chicago.

'21

Robert R. Gilkison is with the Hugh J. Baker and Company at Decatur, Illinois. He was previous with the Producers Wood Preserving Company at Montgomery, Alabama.

'22

Charles D. Baker has returned to Las Vegas, Nevada, where he is practicing Civil and Mining Engineering. He moved from Los Angeles, California, where he was Field Engineer for the Shell Company of California.

Leslie C. McPeak is with the Phoenix Utility Company of Ft. Lauderdale, Florida. He was previously Gang Foreman of the Pennsylvania Railroad at Terre Haute.

'23

Sylvester J. St. Clair has been transferred to Lorain, Ohio, where he has assumed the duties of Assistant Results Engineer for the Ohio Public Service Company. This is an advancement from his position at Mansfield, Ohio, of Assistant Distribution Engineer.

Arthur W. Griepenstroh is with the Parsons Company of Newton, Iowa.

Harry J. McComb has returned to Hammond, Indiana, where he is Building Manager for the Wachewicz Real Estate Company.

George Y. Jean is with the Monument Mills, at Housatonic, Mass. He was previously with the General Electric Company at Schenectady, New York.

W. Franklin Lisman has been transferred from Ft. Wayne, Indiana, where he was Commercial Engineer for the General Electric Company, to Cleveland, Ohio.

'25

Fred L. Bradford has been transferred from New

(Continued on page 22)

FRATERNITIES

THETA XI

On the evening of Wednesday, December 22, 1926, Kappa of Theta Xi entertained with their annual Christmas Dance. The house was the scene of activities and was decorated with the conventional Christmas colors. The chandeliers were completely covered with red and green crepe paper which afforded a very pleasing lighting effect. Twisted streamers and bits of evergreen along with a large tree in one corner completed the general effect.

The music, which contained all the pep that could be asked of anyone, was furnished by Leo Baxter and his Liberty Boys.

During the holidays a large number of the honorary brothers visited the chapter, among whom were: Bill Junker, Hubert Swartz, Hubert Merrill, Doc Stone, Joe Anstead, Freddie Stockmaster, Haword Newton, Dick Bledsoe, Allen Weinhardt, Carl Royer, Freddie Tetzl, Pooch Armstrong, Leo and Jerry Pllum, and Bruce Walsh.

During the vacation week the house was the scene of several informal parties and the starting point of two thrilling bob-sled rides. Our worthy sled, Pegasus by name, succeeded in flying once and it then deposited the brothers and their fair passengers along the highway at intervals of about one hundred feet. However, this slight mishap only added zest to the party.

Brother Leake was Kappa's delegate to the annual convention held in Philadelphia on December 28th and 29th. He reported that the convention was a huge success from all angles. Two new charters were granted for chapters of Theta Xi at the University of Nebraska and at Oregon State College.

ALPHA CHI SIGMA

The boys enjoyed a pleasant and filling meeting at the home of Bro. James Ross at Fontanet on Dec. 27, 1926. The festivities started with an elaborate chicken dinner and lasted until all were incapacitated. Bro. Lentz claimed the honors of the greatest capacity, but his title was disputed by all present. All voted Bro. Ross and his assistants very able cooks. The meeting broke up at a late hour with all in excellent spirits.

Iota's annual Christmas party was held at the home of Bro. Metcalfe on Dec. 28, 1926. The guests of the evening were Dr. and Mrs. White, Dr. Mees, and Alumni Bro. C. L. Corban. The main feature of the evening was the wedding of Miss Active Iota to Mr. Alumni Iota, Rev. M. Heinig officiating. At a late hour Old Santa arrived with a well-filled pack and distributed presents to all. The party was voted to be one of the best ever held and all agreed that Brothers Metcalfe and Muehler were royal entertainers.

Alumni Bros. Phillips and Corban were among the holiday visitors to the old home town.

THETA KAPPA NU

The annual Christmas Dance which was held at the Edgewood Log Cabin on the night of December 25th was one of the most memorable of all the holiday affairs of the fraternity.

The cabin was decorated in the colors of the season, and a large Christmas tree in one corner helped to keep the Christmas spirit in evidence throughout the evening.

Ada Campbell's Wabash Serenaders furnished the inspiration for the dancers and the interior of the club house soon became a very marked contrast to the cold outside. Punch was served for refreshment.

Santa Claus appeared late in the evening and distributed hand painted powder jars to the feminine guests.

The honor guests of the evening were Prof. and Mrs. O. L. Stock, Prof. and Mrs. Carl Wischmeyer, Robert Wade, Sigma Nu, Arthur Keiser, Alpha Tau Omega, and Ralph Davy, Theta Xi.

The alumni were represented by Brothers Bob Failing, Earl Dawson, Miles Griffith, Leroy Wilson, Harold Lentz, Ralph Reynolds, Sydney Freers, John Bernhardt, Wayne Watkins and Max Sherwood.

SIGMA NU

Through special arrangements with the chapter at the North Pole Beta Upsilon of Sigma Nu was fortunate in having old Kris Kringle make a pre-season trip to the house on Wednesday night, December 22, to distribute gifts to the guests at the annual Christmas Dance. With the utmost audacity, old Saint Nick deftly glided into the fireplace room to his station beside a beautifully decorated Christmas tree while the couples, unaware of his maneuvering, were striving to survive just one more dance at the pace set in the college of today. As Santa Claus doled out the gifts to both gentlemen and ladies, a continuous outburst of laughter was produced by the amusing oddities of the presents. Dancing was again resumed when the last laugh had subsided to a state of tranquility with the last note being heard in phase with the notes from the jingling of the milk bottles on the front door step.

Among the alumni to attend the dance were Glenn N. Maxwell, Royce Wright, Carson Simms, John Moorhead and brothers, Perry Wilson and Harold Evinger from the University of Wisconsin, Brothers Henry Miller, Glenn Sampson from Purdue University. Professor and Mrs. Hutchins and Dr. and Mrs. White were the guests from the faculty. The scintillating tunes for the dancers were supplied by Tot Esminger's Orchestra, whose unlimited supply of pleasant music was in harmony with the decorations of the familiar Christmas red and green. The large illuminated White Star of Sigma Nu dominated the entrance to the house, extending a warm welcome to those who were present.

Resulting in a similar occurrence as in nearly every year in the past, there were many of the brothers who

(Continued on Page 26)

A T H L E T I C S

HUNTINGTON WINS FROM CLARKMEN

Rose was unable to repeat against the Huntington crew at the latter outfit's town and were submerged under an early lead and continued success at the nets that gave the Huntington crew a final decision of 56-28. Without Bob Thompson the Rose men worked hard to register a victory, but several items in the game made it almost impossible to come out victors.

Coach Clark made a vigorous protest at the halfway mark to Referee Gilbert who let the players do almost anything in the first half without inflicting many penalties. Clark went so far as to point to the raw flesh marks on the arms and hands of Rose men as silent evidence of the hacking and other personal fouling as done by the Huntington crew. The score at the end of the first period was 25-5 in favor of the Huntington outfit.

Upstaters "Hot"

It seemed that the victors had too many goals up their sleeves for the Rose defense to guard against, for almost every attempt saw the ball go swishing through the nets to add to the Huntington summary. On the other hand, the Clarkmen had a decidedly "off" night and were able to make only a few of their shots count.

Goshorn was the big point getter for Huntington, making eight field goals before he was ejected from the contest via the personal foul route, Referee Gilbert calling sixteen personals in the final period alone. Taggart worked well for Rose at backguard, while the entire outfit worked better in the final half. Line-up and summary:

Huntington (56)	Rose (28)
Hildebrand.....F.....	Kasameyer
Lash.....F.....	Berry
Goshorn.....C.....	Goddard
Holley.....G.....	Sawyers
Miller.....G.....	Taggart
Substitutions—Huntington: Weschler, Williams, Bowman, Broody, Collins. Rose: Moore, Franzwa. Field goals—Goshorn (8), Lash, Hildebrand (4), Holley (4), Miller (2), Williams, Goddard (3), Berry (2), Sawyers, Moore. Foul goals—Hildebrand (5), Williams (2), Holley, Moore (4), Berry (4), Goddard (3), Kasameyer, Franzwa, Sawyers. Referee—Gilbert (Indiana University).	

ROSE FALLS BEFORE MANCHESTER, 59-35

North Manchester, Ind., Jan. 8.—Rose dropped the final of a road-trip to Manchester in a loose game by a count of 59-35 before a crowd of 2,500 people who jammed into the new gym to witness the game.

Alfred Kasameyer, little forward on the Rose team, tied with Winger of Manchester for high score honors, each making 20 points. Goddard of Rose fought hard and was at his best in the opening half, when he put the ball into the basket for four field goals. The game was fast from start to finish and it was clean and well handled by Referee Geller.

The game started at a fast clip and some clever guarding broke up the attempts of both teams to score field goals. Rose held the lead for only a few seconds, for two goals by McCann put Manchester out in front and the home team soon had the score doubled on the Engineers.

Rose Stages Rally

Then Rose pulled up to within three points of Manchester through the goal-shooting of Goddard, who caged the ball for four field goals in the first half. McCann and Winger bombarded the goal and both got some tip-in shots in spite of the efforts of the Rose guards. Taggart and Sawyer fought desperately to halt the pair of tail men under the basket, but McCann and Winger were just too tall and Manchester was leading by a 36 to 22 score at half time.

It was in the final period that Kasameyer went big, scoring five field goals. Berry played a fast floor game for the visitors. Bryant and Wine proved a strong defensive paid for Manchester and prevented many of the Rose shots from reaching the baskets. Both teams showed some excellent passing and team play was evident at all times.

Manchester (59)—	F.G.	F.T.	P.F.
Winger, f.	9	2	1
Evans, f.	5	0	1
Byreley, f.	3	0	2
McCann, c.	8	0	1
Bryan, g.	2	1	1
Wine, g.	1	0	2
Totals	28	3	9
Rose Poly (35)—	F.G.	F.T.	P.F.
Kasameyer, f.	7	5	1
Berry, f.	3	1	2
Goddard, c.	4	0	0
Sawyer, g.	0	0	2
Taggart, g.	0	1	1
Totals	14	7	5

DINING HALL PLACES QUINTET IN FIELD

This bunch at the new Deming Hall isn't slow in getting started to amuse themselves it seems, for they getting of several Terre Haute organizations and right away decided that they would follow Hoosier inclinations and form a basketball team that would be possibly a credit to the dorm and certainly a good means of amusement for themselves. Thus the first night or so found the usual stillness of the gym being broken quite noisily and enthusiastically as the first residents of Rose's first dorm took charge of the place armed with basketballs and plenty of spirit.

Not only that, they even thought so much about it that they figured that they had got so good that they became rather insolent and challenged Terre Haute's championship church team to a battle to a finish. However, the church lads had pity upon them and agreed that a practice game might be considered, but hardly a scheduled game. But if the Rose lads exhibited sufficient mettle a real contest was to be assured the dorm lads. It is possible that the results of this battle are printed somewhere on this page, for the writer had a secret and a sneaking idea that Rose spirit would be typical of the Deming crew as well as Rose varsity teams.

Several Good Prospects

If the boys venture further into local basketball realms it might be well to explain the team in a personal way. The forwards are Todd, Bovenschien, Hunter and Brewer. Although it is only hearsay, it



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is said that they have eyes for the basket that mark them as worthy calibre. McKillop, Blanford and Renfro are assigned the guard duties and can be expected to make opposing forwards watch their shots with some care. The dopesters offering this bit of information spoke of only one center. This leads to the conclusion that Mr. Brevort would be mighty dependable and as good at basketball as he is at French or some of the worries of a freshie.

After so much of this jesting the writer wants to get into a more serious vein. So here goes—the spirit that these boys have shown might be considered by the other Rose men as something that few Rose organizations have. They have real, honest spirit: they weren't afraid to tackle something that might prove to be difficult in Terre Haute's champion church team which is composed of several former high school stars and prominent independent players. They go about the work with the right spirit, in an orderly manner. If other Rose organizations, not meaning athletic squads, were characterized by this spirit Rose would have a real campus and organization life for the students.

NOTICE—GANG—NOTICE

This is the third edition of the Technic sports page by this writer and never yet has there been any sort of contribution from any students. Let's have a little life in this page. Come on with a little item of particular interest to yourself and possibly others. Leave your notes in the Technic office in care of the sports editor. Thanx.

Chemistry Attends the Williamstown Institute of Politics

(Continued from page 4)

now projected in Germany which will operate on this this process to produce a million barrels of oil.

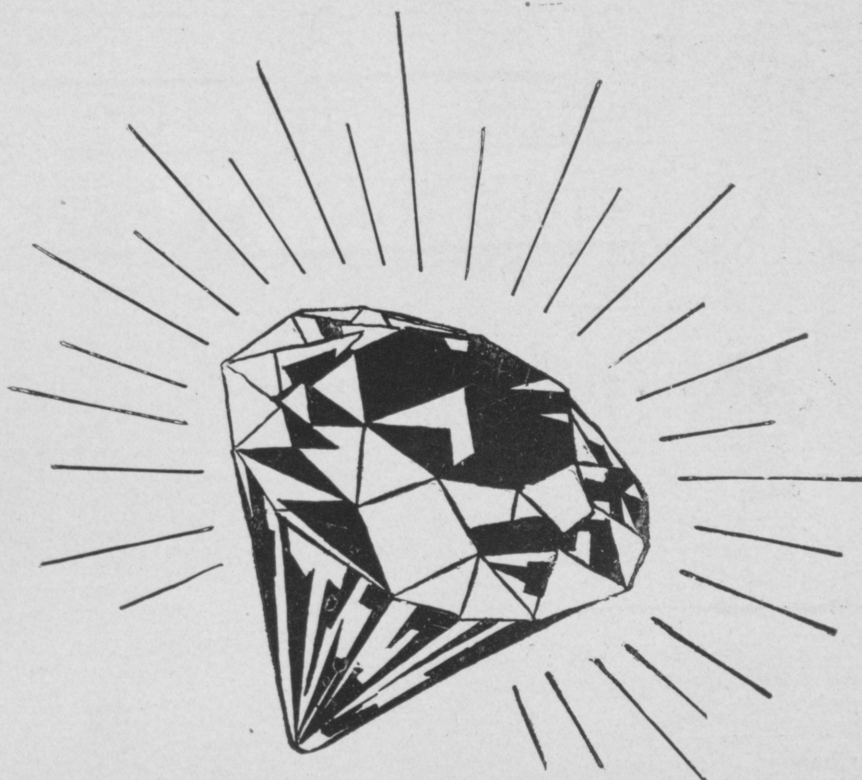
Conclusion

It is too soon to speak in detail as to the effects of this conference, but we know the chemists themselves certainly profited largely. They showed that they were bearing a big share in the development of world resources, and willing to come out and discuss how they were doing it. Certainly the newspapers gave large publicity to the proceedings. The conferences were fully attended and keen interest shown by the visitors from this and foreign lands. Dr. Haslam made the pertinent statement in closing his paper that if chemists are successful in supplying the world with artificial petroleum from coal more would be accomplished for world peace than by any disarmament conference yet held.

The following are several articles published in the Journal of Industrial and Engineering Chemistry. These articles are reprints of papers presented at the Institute of Politics last summer and are absorbingly interesting. Students who want to find out what Chemical Engineering is and does are advised to read one or more of these articles.

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A sermon in stones

CECIL RHODES, the diamond king, had a real idea which he passed on to diamonds in the rough.

"Be well-rounded men, broad in your sympathies," he said, and he made this the basis for selection of Rhodes scholars.

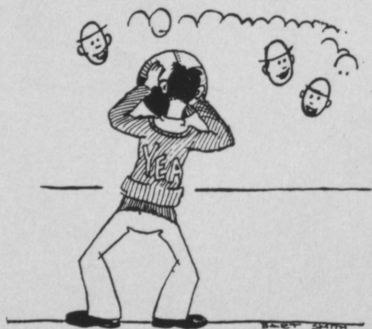
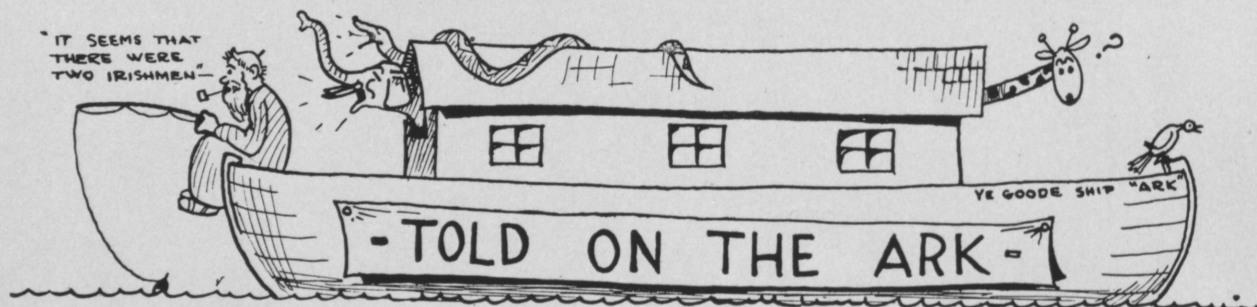
Surely there's a lesson for every man—graduates alike in arts, in pure science or in applied science—to balance the student in him with the athlete, the individualist with the man of sociability, the specialist with the "citizen of the world."

For Rhodes' idea was no theory. It is shared by hard-headed business men today.

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Cheerleader: "Don't sit there like dumb-bells. Let's see you open mouth and throw yourselves into it as if you meant it."

"How did you happen to tip the canoe? Did you change your seat?"

"No. The girl changed her mind."



Young Woman: "And whose little boy are you?"

Sophisticated Willie: "Be yourself! Whose sweet mama are you?"

Senior Advisor: "Alway love your teachers."

Stude: "I tried that once, but she got mad."

Conductor: "Watch your step, Miss."

Edith: "It is not necessary; there are several sap-heads behind doing that."

Doctor (solemnly): "You need more exercise and plenty of fresh air. What is your business?"

Patient: "I'm a steeplejack."

Boss: "There is ten dollars missing from my drawer. You and I are the only ones who have the key to it."

Office Boy: "Well, suppose we each pay five dollars and say no more."

Lies may cover up a multitude of sins, but so do auto tops.

Binks (Phoning down from his room): Night Clerk?

Snippy Clerk: Well, what's biting you?

Binks: That's what I want to know.

"They say that a single oyster will lay from one to eight million eggs a year."

"Gosh. 'Think of the married ones.'"



Cop: "You were making forty-five; I'll have to pinch you."

Fair Motorist: "Oh, if you must, do it where it won't show, please!"

"Jim, how do you like my new dress?"

"Dunno, I haven't got my opera glasses with me."

It is difficult to believe heredity after your only child has made an ass of himself.

"Please reconsider. Helen. If you don't I swear I'll blow my brains out!"

"Oh, that would be a good joke on Dad. He thinks you haven't any."

He—He reminds me of Paderewski.

She—But Paderewski isn't a violinist.

He—Neither is this chap!"

Billie—Pa sent me for a piece of rope like this.

Oilshop Dealer—How much does he want?

Billie—Just enough to reach from the goat to the fence.

Putting on Airs

"He's got an arrogant air about him."

"I hate men who use perfume, don't you?"

Father: "Daughter, it is eleven o'clock."

Daughter: "Yes, I know, father, but William's watch isn't going."

Father: "Well, how about William?"

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THE ROSE GLEE CLUB

Last year the Glee Club was active at Rose for the first time in several years, and put on an excellent act at the St. Pats Show.

The Glee Club held their first meeting of the present school year early in December at which time Bob O'Rear was elected President, Roy Reece vice-president, and Bill King secretary-treasurer.

Thirty dollars has been appropriated from the general fund by the Student Council for the Glee Club. Mr. S. J. Wilton has been obtained to direct the club, and Mrs. T. O. Montgomery will act as accompanist. Mr. Wilton is well known in Terre Haute for his ability along this line, as he has been leading choirs, male choruses, and glee clubs for a number of years. Mrs. Montgomery is a piano instructor, and will make an able assistant to Mr. Wilton.

It is the intention of the Glee Club to be self sustaining. With this in view tentative plans include a concert to be given in the near future at one of the local theatres, and a minstrel show to be given at the annual Rose St. Pats Show.

In order that this program may be carried out, it is necessary that the students support the Glee Club by coming out for it. The first active practice was held on January 6 and the results were very gratifying. There is more talent in R. P. I. and greater number means more strength and a more varied program. This is one of the clubs which is in the field to provide activities comparable to those in other colleges and polytechnic institutes. Professor Child has been selected to act as faculty advisor of the Rose Glee Club.

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Metric Victory Forecast for 1927

That the United States during the present year will take final legislative action to place its merchandising on the decimal metric basis in weights and measures was the declaration made at the annual executive conference of the All-American Standards Council, held in San Francisco, January 6th.

"Metric legislation is now prominent before both houses of Congress," stated Aubrey Drury, director of the Council, "and when a vote is called, victory appears assured for the metric standards, which are on the convenient decimal ratio, like our dollars-and-cents currency. A recent canvass of the United States Senate has indicated an almost certain majority for metric adoption.

"Obstructionists have always fought bitterly to kill in committee any metric action. The great basic strength of this issue in Congress was shown the one and only time it was allowed to come up for a general vote. In the House of Representatives, the Stone Metric Bill successfully passed two of the necessary three readings, but after a dispute on rules of order it was recommitted to the Committee on Coinage, Weights and Measures on request of its author, with expectation of a later vote, indefinitely delayed. The metric legislation was never defeated in a general vote in Congress. It can and will win in the 1927 vote.

"The metric issue has won overwhelming victories in more than 40 of the great parliaments of the world. At one time a metric standards bill passed the House of Lords in Britain; at another, lacked only 5 votes to win in the House of Commons. The House of Representatives in Australia has endorsed the decimal weights and measures by a vote of 36 to 2. All civilized nations except the United States and the British Commonwealths are now on the metric basis in merchandising, and British units are largely different from ours."

Declaring that decimal metric weights and measures for the United States have been endorsed by 7 Congressional committees, but with never a general vote in Congress, metric advocates throughout the country are urging a "show-down" in 1927 and predict a definite victory at the roll-call.

Alumni

(Continued from page 13)

York City to Denver, Colorado, for the Henry L. Doherty Company.

C. Derby McDargh, who was formerly with the State Highway Commission of Indiana, is at the present Appraisal Engineer for the Toombs and Daily Mortgage and Bond Company of Chicago, Illinois.

'26

O. H. Crockett has recently completed a two-weeks salesmanship course in the Commercial School of the Westinghouse Electric and Manufacturing Company. He is now in the Switchgear Apparatus Sales Department at Pittsburgh, Pennsylvania.

Harry Lewis, with the General Electric Company, has been transferred to Erie, Pennsylvania.

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Research and Progress

(Continued from page 10)

reservoir 39400 acres in area and have a capacity of 1376000 acre-foot for a draw-down of 60 feet. The power plant, equipped with three distinct generating units, is of attractive design, and one of the largest recently built. The entire equipment, excepting several derricks used in the yards, is electrically driven.

A camp, containing many of the conveniences of a modern city has been found necessary due to the isolated location of the dam. A community hall, for church and for motion pictures, a school for both white and colored children, pool room, and mercantile and grocery stores complete the small village.

Nearly all of the lumber consumed at the project was furnished from the mills operated by the construction company's forces. Up to the middle of the summer approximately 12000 board feet were produced. Spraying with oil was not neglected. On the surrounding marshy ground 40000 gallons were used during the first three months of work. Furthermore, in the plans for the project, a stone quarry on the west shore of the river was put into use, aiding in lowering the cost of materials. Generating equipment in the power house consists of three, 45000 HP. vertical Francis type inflow turbines with runner and generator suspended on a main shaft supported at the top by thrust bearings.

When completed, as even the preceding brief description would indicate, this power project promises to be one of the most complete and best in the South, if not in the United States.

CONCRETE BRIDGES—THEIR DEFECTS AND REPAIR

CONCRETE bridges have been accepted as the best and the most practical for highway construction. But occasionally upon inspection of the bridges after construction, extensive defects have been found, and despite the fact of their great durability, these structures have been closed to heavy traffic. Such was the case when the California State Highway Commission recently looked over a new bridge in the northern part of the state.

The bridge is of the arch type. In the arch ribs are found the most serious defects: namely the honey-combed concrete. The interior surfaces are weak, due to the lack of bonding between the successive pours of concrete. Often rock and sand pockets in the arches cause 25% of the area to be ineffective, truly a large percentage. In many places water could seep down into the structure for 10 to 14 feet. What was the best method of repair?

Naturally a complete removal of the arch ribs and their replacement by sound concrete would be the best possible method but the estimated cost of this work is nearly \$125,000. After much deliberation the following method was agreed upon: (1) All the existing cavities were to be filled in and pressure grouting applied, (2) keyways were to be cut so as to bond the jacket concrete, (3) the corners of the ribs to be rounded off, (4) the ribs jacketed with re-inforced concrete casing. The cost, by this operation, was reduced \$50,000. This is but another example of the fact that the poorly constructed job is the most expensive in the end.

St. Pat Was an Engineer

(Continued from page 8)

something that is constructively original? No. Year after year you all go jumping over the same high place in the fence, following some half blind old buck that has no idea of what a flock of ninny goats he had behind him, or he never would have jumped. And what's the use of jumpin' high fences into foreign territory when the fences on the home farm are down so that the grazing is just as good or better if you want to walk over one.

Sappy Soph. I fail to see what you're driving at. How are you going to have any school spirit if you don't have traditions?

S. Se. Listen, Sappy (pleadingly) you know that many an organization has gone defunct and started smelling like Limburger cheese just because it wasn't capable of adapting itself to new situations and new conditions. We're not in the burg any longer. We were when this thing started. We're out of town and the friends we have in town don't know us. They've never been out to see us. Why? Because we've never invited 'em. We've never put on our party clothes and shown 'em a good time. Now St. Pat's the time to do that, instead of drilling all the way into town with a few handfuls of cheesecloth bric-a-bracs to stir up the populace with the passing show of a four-minute parade. Out here with the same effort we could entertain 'em for two or three hours with sights and sounds they never saw or heard before.

Sappy Soph: Your imagination's like Bill Harris' Ford. It works easy goin' down hill. Just tell me, will you, what in the name of Chauncy Rose's ghost you'd entertain 'em with? Some of Doc Howlett's instruments of ear torture, I suppose. How'd you get 'em out here?

Se. Se. Let's consider entertainment first. Here'd be my schedule, and there are three dozen ideas floatin' around this campus to every one I'd suggest. Let me number 'em.

First, steam jets on the building with colored changing lights on them.

Second, a loud speaker with a thundering voice to greet every person that comes into the building,—razz the fellows 'bout their girls and to compliment the girls on their escorts.

Third, temporary water fountains in the front halls with colored lights on 'em.

Fourth, a miniature farm in the civil lab with irrigated land, water falls and wheel electric train, toy automobiles running, etc.

Fifth, physics and electric lab teeming with demonstrations,—possibilities galore.

Sixth, shops running half manned, and forge room with forges aglow.

Seventh, arc welding behind glass screen,—eight—ninth—tenth—where would I end if I kept on going?

Now for transportation. If we had a train wreck out here, would people refuse to come? Nope! You'd have to rope 'em off. Just so in this case. It would be a train wreck as far as attraction was concerned if the fellows all work. No foolin'!

Sappy Soph: But what'll you do with the dance and show?

Se. Se. Easy enough. Show can be held as usual

(Continued on page 26)

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Fraternities

(Continued from page 14)

managed to return to their homes in Terre Haute for Christmas. Some of these alumni were this year afforded a double welcome in the nature of a visit to the new Sigma Nu abode at 441 North Eighth Street. As was expected, their enthusiasm over the new house was parallel to that showed by the active brothers on their first inspection trip. Those brothers who returned for the holidays are as follows: Roger Bolin, Joe Reifenberg, Royce Wright, Alfred Kepler, Jake Reinking, Jesse Downen, Ray Biller, Bill Downen, Ed. Hauer, Louis Nattkemper, Paul Mayrose, Derby McDargh, Henry Miller, Harold Evinger, Perry Wilson, Fred Carrol, and John Wardrope.

St. Pat Was an Engineer

(Continued from page 25)

in the afternoon. Start the works here at school at 7:15. If they have to change clothes for the dance they can change at the dorm. Not half as strenuous as the old way, is it?

F. F. Sound easier to me.

Sappy Soph: Well, it may look well on paper, but I still don't believe in doing away with old traditions.

Se. Se. Once more a frosh tops a soph in quantity of grey-matter. Sappy, if some sophs twenty-five years back had established the practice of sticking their heads into a bucket of tar each time they failed to reason straight, you'd be a prize tar-baby.

There was a sound of approaching footsteps (visualize them—some twelve or fifteen), the chatter became more intense—but indistinguishable. As I closed my door the last thing I heard was, "Well, you've got to prove it to me that there's an after life."

That remark came through two transoms, so of course it's twisted and doubtful in content.

NOTHING TO FEAR

"John," whispered his wife, shaking him awake, "there's a burglar trying to get into the flat."

"Eh?" said her husband. "Where? I'll get up and give him the fight of his life."

"Aren't you afraid?"

"Not a bit. Any burglar who thinks this flat can hold all three of us must be a little bit of a fellow."—New Haven Register.

ALMOST NONE

First Cook—I hear Muggsey went up the river for a hitch.

Second Ditto—Yes, he was pinched for stealing a girl's dress. The judge found the attorney for the defense had a very thin argument and sent him up.—Allston Recorder.

"'Sfunny."

"What's funny?"

"The fast women get home last, while the slow ones get home first."



R 1235

To the Future Engineer:

Every progressive industry needs highly trained engineers who can conceive, design, and manufacture its products. Realizing that further scientific developments are inevitable, even in this age, Ingersoll-Rand Company is constantly on the lookout for young engineers whose schooling and training have fitted them for active careers in the technical field.

Ingersoll-Rand has long been known as the world's leading manufacturer of compressed air machinery and power plant equipment. In keeping with this position, the Company maintains seven manufacturing plants and numerous engineering laboratories for the development of new compounds, new devices, new machines, and new methods.

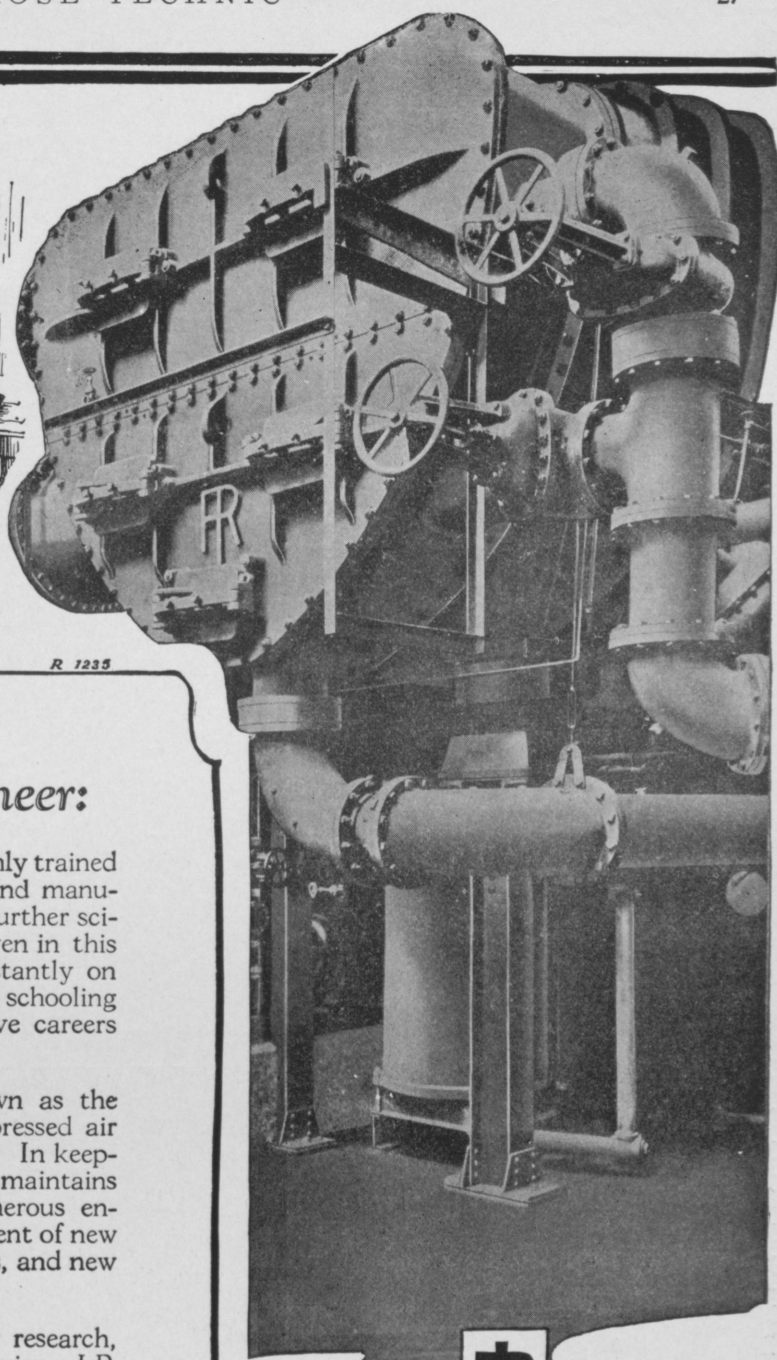
No matter what the field—whether research, development, manufacturing, or service, I-R engineers are playing a prominent role in making each installation an important engineering achievement and a source of satisfaction to its owner.

Ingersoll-Rand Company

11 Broadway

New York City

Offices in principal cities the world over



An Ingersoll-Rand Surface Condenser of the type used in many of the country's largest power plants.

This style of condenser, a development pioneered by Ingersoll-Rand Company, has practically revolutionized central station practice, as it utilizes only about half the surface considered necessary in condensers of the older designs.

Ingersoll-Rand

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TERRE HAUTE, INDIANA.

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The Ideal Gift—Convenient, inexpensive, and appreciated. Nearly all the Better Druggists in Terre Haute sell MEWHINNEY'S Chocolates.

**and Nickle Bars too;
ask 'em at the "Y"**

A. B. MEWHINNEY CO.
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Ring Books-Dance Programs-Engraved,
Personal and Xmas Cards

Quality Printing - Reasonable Prices
Quick Delivery

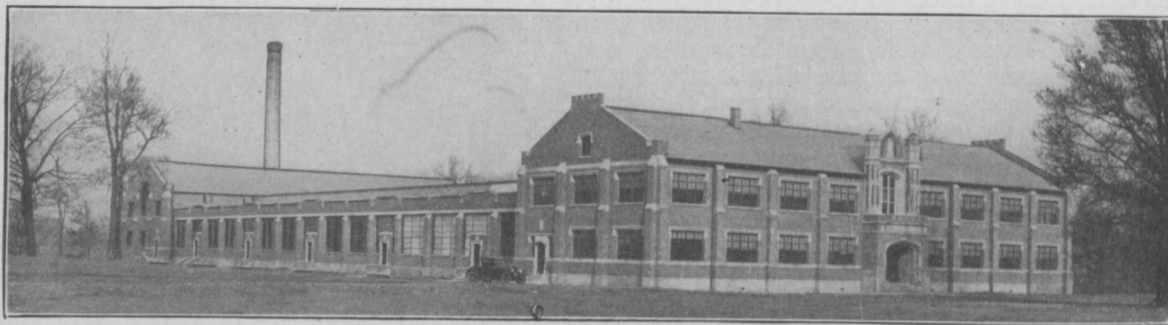
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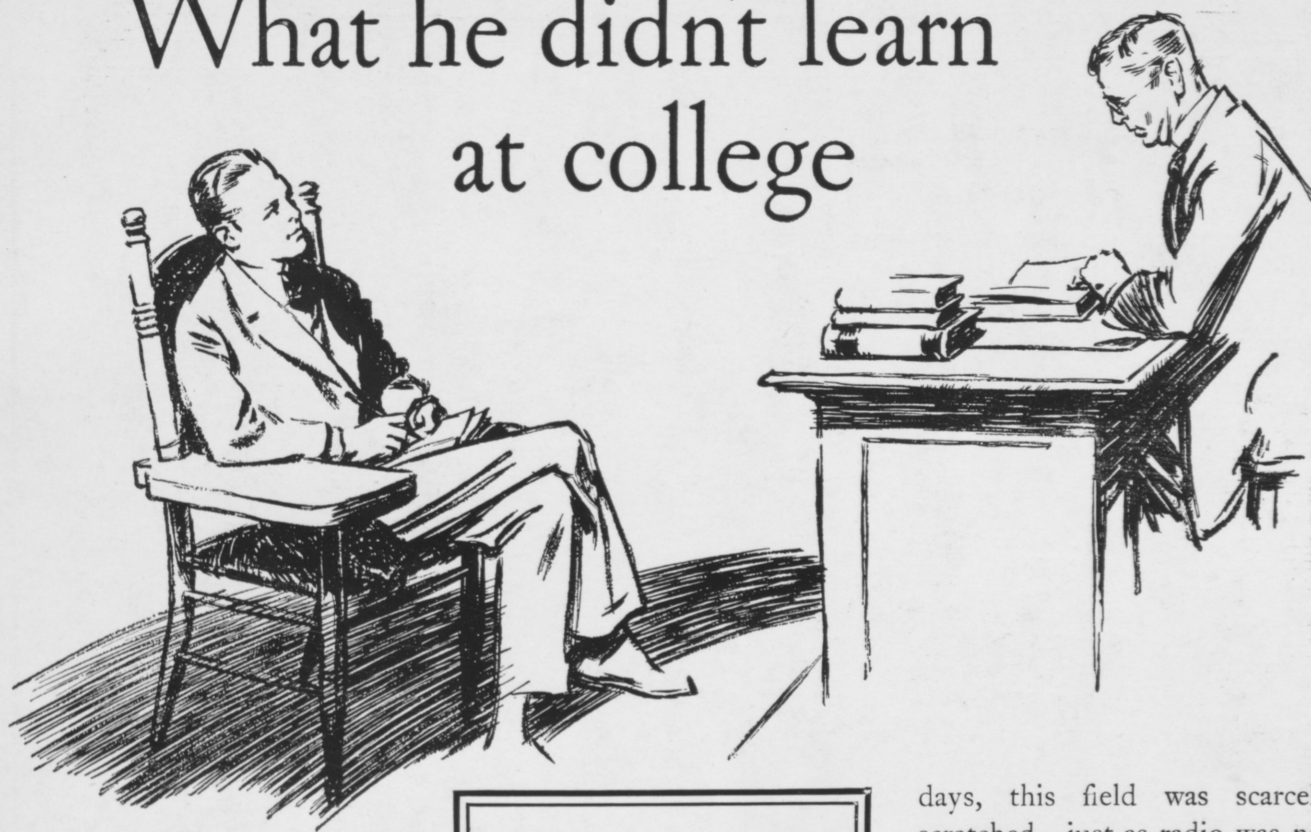
"A COLLEGE OF ENGINEERING"

**COURSES IN ARCHITECTURAL, CIVIL,
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MECHANICAL ENGINEERING**

**HIGH STANDARDS OF SCHOLARSHIP
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IN COLLEGE ATHLETICS**

TERRE HAUTE, INDIANA

What he didn't learn at college



LAWRENCE DAY
HOWELL

In his class work, Lawrence Day Howell, Princeton, Litt. B. '13, E. E. '19, never heard of marine applications for electrical equip-

ment. In fact, they were practically unknown. Yet he now is in charge of the Marine Section, Transportation Division, of the Westinghouse Sales Department, located at New York.

When Howell came from college to the Westinghouse Graduate Students' Course, he had twelve months of thorough-going work in the shops at East Pittsburgh. Then he decided he wanted to enter the field which seemed most undeveloped

“What’s the future with a large organization?” That is what college men want to know, first of all. The question is best answered by the accomplishments of others with similar training and like opportunities. This is one of a series of advertisements portraying the progress at Westinghouse of college graduates, off the campus some five—eight—ten years.

and perhaps most promising of broad expansion. This was marine engineering.

Not five per cent of the present opportunities on the water have been opened for electrification. Yet there is more horsepower, in prime movers, on the ocean than there is on the land.

In Howell’s undergraduate

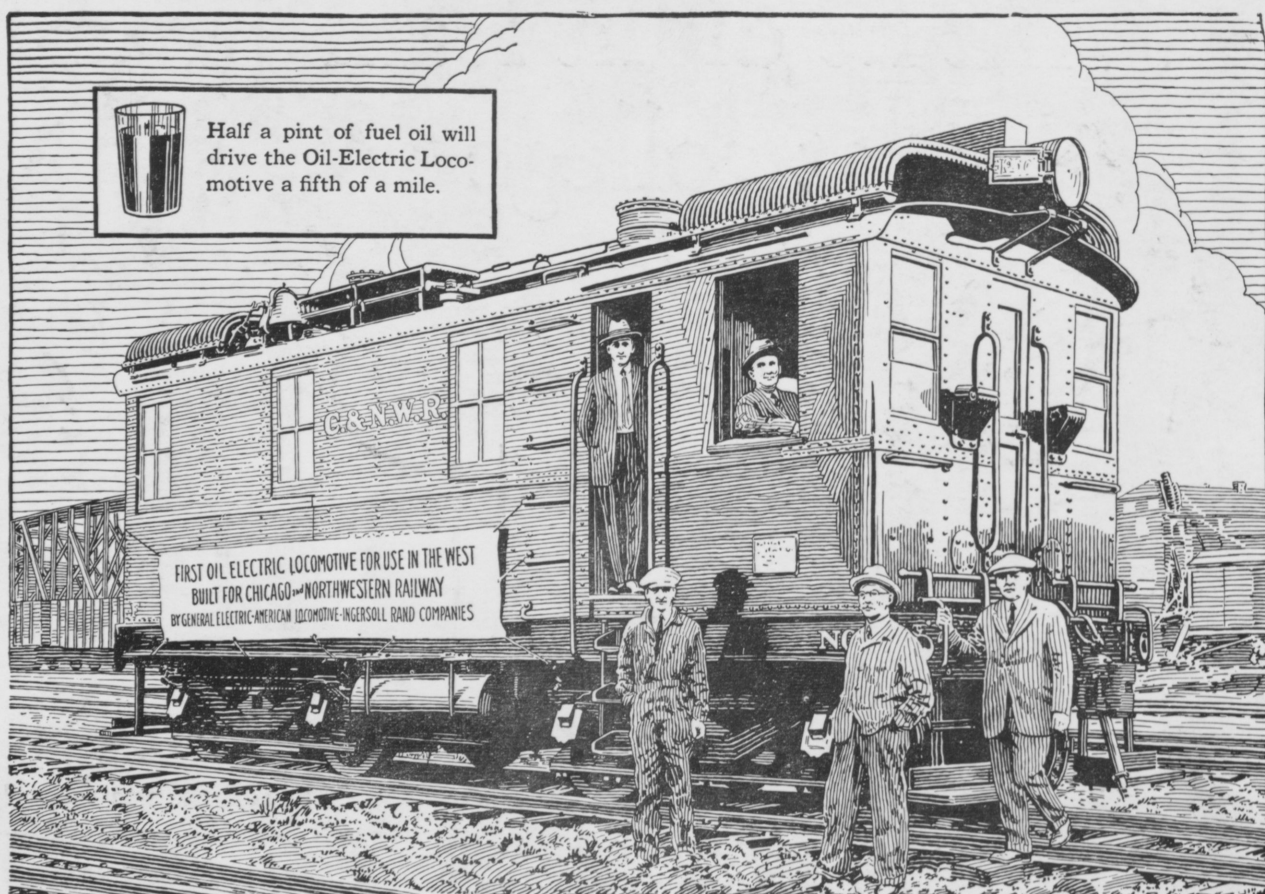
days, this field was scarcely scratched—just as radio was not known to many young engineers when they were in college. A college man’s opportunities are not limited to the electrical developments now in existence.

In marine applications an order may assume large proportions. A single installation, negotiated by Howell recently, of the newly-developed Diesel-electric drive for a yacht, totaled \$175,000. Such sales are not made overnight. They result from understanding fully a customer’s needs.

To men with the knack of taking the other fellow’s point of view, a career as Sales Engineer at Westinghouse brings returns in personal satisfaction as well as in worldly reward.

Westinghouse





832 miles for \$11.90

On its initial trip from Schenectady to Chicago this Oil-Electric Locomotive, running light, traveled at a cost for fuel of less than 1½ cents a mile—832 miles for \$11.90.



Five big railroads are already using this new type of locomotive. Developed jointly by the American Locomotive Company, the Ingersoll-Rand Company, and the General Electric Company, it is a significant example of what co-ordinated effort can produce.

A series of G-E advertisements showing what electricity is doing in many fields will be sent on request. Ask for booklet GEK-18.

One operating official estimates that this locomotive will save the Chicago & Northwestern Railway more than \$10,000 a year. Every year electricity finds new ways to help the industries and homes of the nation.

The college graduate is the leader in these discoveries, whether it be in science or in applying known equipment to new uses. Think of electricity as a tool to help you along the paths of progress, no matter what your life's work may be.

391-10DH

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, NEW YORK