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Rose-Hulman Institute of Technology

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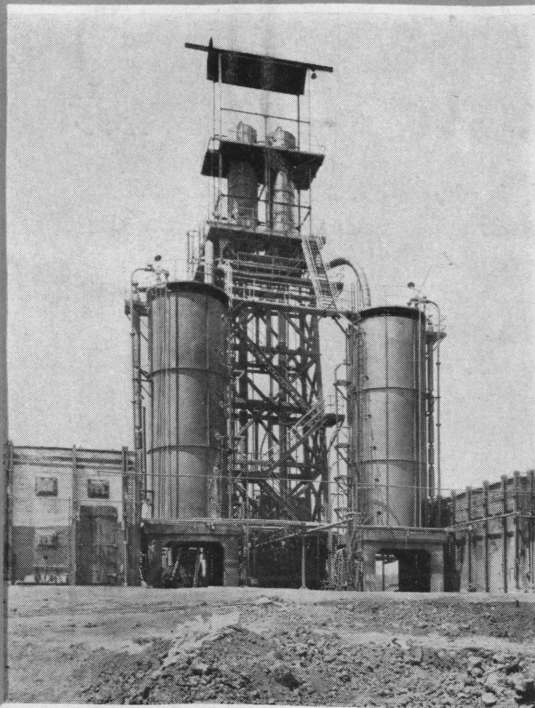
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The Rose **TECHNIC**

MONTHLY PUBLICATION OF THE STUDENTS
OF ROSE POLYTECHNIC INSTITUTE



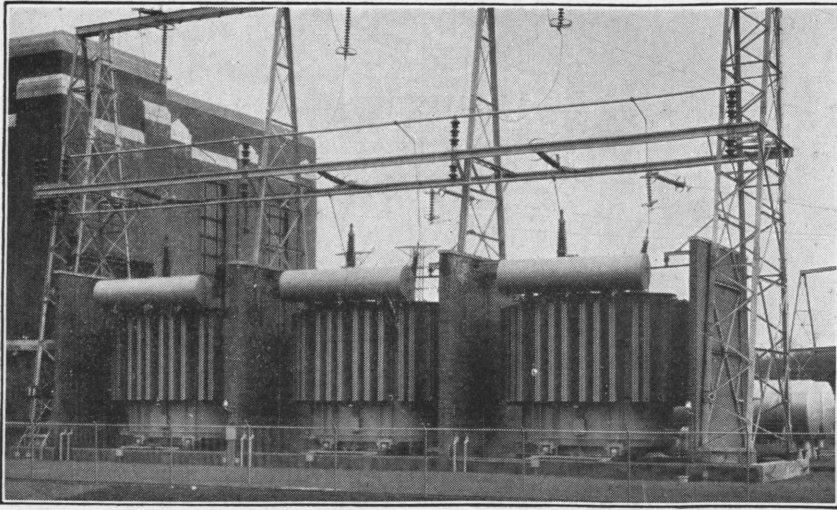
MARCH
1930

VOL. XXXIX

TERRE HAUTE, IND.

No. 6

Member of Engineering College Magazines Association



Special cars were needed . . . *railway tracks had to be lowered, to handle the transformers these men built*

AT CONOWINGO, Maryland, is the second largest hydro-electric development in the world. Power generated there at 220,000 volts will be fed into lower voltage transmission lines of the Public Service Electric and Gas Company at Roseland, near Newark, New Jersey.

The transformers that will perform this transfer of energy are physically the largest ever built, for their capacity is sufficient to serve the home lighting needs of a city of a million people. Four in number, each is larger than a house, weighs when empty as much as a large locomotive and holds three tank cars of

oil. Four specially built railway cars and fifty-two standard cars of various types were required to transport them from the factory to the job. At one point the railway tracks had to be lowered so the units would clear an overhead viaduct, so great was their size.

When spectacular jobs like this come up it is natural that they go to an institution like Westinghouse. Pioneers in electrical development, Westinghouse engineers often know the thrill of achieving the "impossible" in seeing their work through from design to erection.

Westinghouse



E. W. TIPTON
University of Kansas, '25
Development of Commercial
Design



R. L. BROWN
Ohio State University, '22
Tap Changer Development



EMIL STEINERT
University of Minnesota, '25
Electrical Designer



A. C. STAMBAUGH
University of Pittsburgh, '24
Engineer of Tests



H. H. WAGNER
University of Illinois, '27
Designing Engineer

THE ROSE ♦ TECHNIC

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



VOL. XXXIX.

MARCH, 1930.

Number 6

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Engineering College Magazines Associated

Mr. Williard V. Merrihue, Chairman, 1 River Road, Schenectady, N. Y.

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I believe in the joy of study, the delight of acquaintance with books, the discipline of diligent learning, and rediscovery of the world of nature and of men through an open mind.

I believe in character as essential to the highest type of scholarship; I hold that no intelligent achievement, however keen or clever, is worthy of deep respect unless it goes hand in hand with accuracy, reliability, honor, humility, tolerance and truth.

I believe in service, that it is the privilege and responsibility of the enlightened member of society to minister with kindness and understanding to the needs of the less fortunate in talent or in opportunity.

I believe in the burden of leadership, which scholarship, character and service lay upon me, for I believe my torch should light others to lives of greater beauty, richer joy, and fuller service.

—The Urn of Beta Sigma Omicron.

THE ROSE TECHNIC

The Official Publication of the Students of The Rose Polytechnic Institute

Volume XXXIX.

MARCH, 1930.

Number 6

Some Military Uses and Designs of Airplanes

Raymond Wells, m., '33

SINCE the historic flight of Colonel Lindbergh in the summer of 1927, the interest of the American people in aviation has increased by leaps and bounds with the result that we now head the list of all nations in miles flown, number of passengers, and pounds of mail carried. Although the people have not become air-minded to the extent that everyone is fully informed on the subject, a great future may be predicted for aviation in this country.

The military Air Services have contributed largely to this interest, because of the fact that they are more or less in the public eye and because they have been chosen to carry on the majority of the experimental work for both military and commercial purposes. In this experimental work the government has spent many millions of dollars, and many lives have been sacrificed. Much of this experimental work is done daily at Wright Field, Dayton, Ohio, the headquarters of the Engineering Division of the Army Air Corps, while the Navy maintains three fields, San Diego, California; Pensacola, Florida, and Anacosta, Maryland.

The work of these two services is largely of the same nature, but due to difference of flying conditions different types of ships are used. Because of the fact that almost all of the Army flights are made from large well-kept fields, a fast ship of small wing area which requires a long run before takeoff, can be used, and a high landing speed can be overlooked on account of these facilities. Conditions for Navy flights differ in that many of their flights are made either from the deck of a ship or from a catapult which allows no long run such as is required to get the fast Army ships into the air. Plans of different design with larger wing area are therefore necessary, as can be seen by a comparison of the Navy Corsair with any of the attack planes in use in the Army.

The work of the Army Air Corps comes under four different heads, namely, pursuit, attack, bombardment, and observation. In the group composing the pursuit squadrons the Boeing PW-9 and PW-12 are most commonly used. This type of plane is

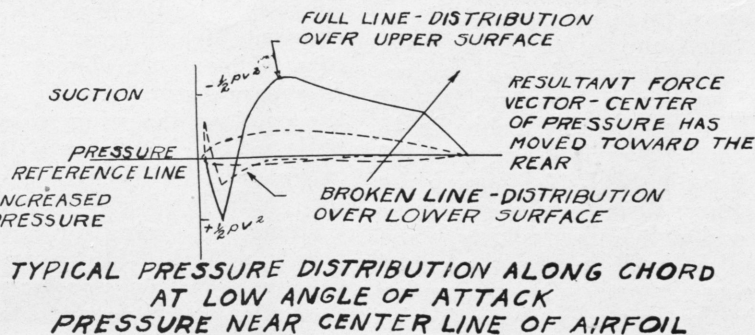
especially suited to aerial combat, possessing the characteristics of maneuverability to a marked degree and capability of attaining the high speed of 170 miles per hour when equipped with the Curtiss D-12 engine. It is a one-seated biplane with an overall span of 32 feet, an over-all length of 22 feet 7 inches, and with 224 square feet of supporting surface. Its landing speed is 65 miles per hour, its rate of climb 1,800 feet per minute, and it has a service ceiling of approximately 21,000 feet without supercharger. A thirty caliber machine gun is mounted in the cowl and synchronized to fire through the propeller. In addition to its use as a pursuit and combat plane five 25-pound bombs may be carried in the racks for use in exploding munition centers and routing troops on the march. A direct hit can also

paralyze ground transportation for an indefinite length of time, a thing of utmost importance in time of hostilities.

The type of work done by the attack group is much the same as pursuit. The planes used are of the two-seater type, capable of speeds as great as 150 miles per hour. The armament consists of one gun mounted in the cowl and another on a gun rack at the rear cockpit for

use of the observer. Their mission is largely one of guard duty for airdomes and other places of equal importance in time of war and of accompanying bombers into enemy territory.

For bombardment the type of ship and the mission is quite different, and for their uses a large ship capable of carrying much weight, with speed of no great importance, is best suited. They are always accompanied by pursuit or attack planes and are not required to participate in aerial combat, the idea being to carry large loads of bombs to their objective and return with as little fighting as possible. There are a number of different types of airplanes in use in the various bombing squadrons, the latest addition being the Keystone. This ship has a span of approximately 60 feet, a total supporting area of about 620 square feet, and is capable of a speed of 110 miles per hour when powered with two L-12-A



The Center of Pressure on an Air Foil Varies With the Angle of Attack.

Give yourself and 8,000 others a chance to be proud of you.

engines. The useful load is about 2,500 pounds with which it will climb at the rate of 800 feet per minute to a service ceiling of 15,000 feet. The armament consists of two machine guns, one forward and one aft, (the forward gun sometimes being a 50 caliber) and racks for one 2,000 pound bomb or 21 100-pound bombs. The fuel supply is sufficient for a flight of 600 miles at cruising speed fully loaded. They are called upon to destroy enemy munition works and railroad centers.

The group comprising the observation squadrons is quite frequently termed "the eyes of the service." They serve as many purposes as do the other three combined, and perhaps more. In addition to reconnaissance flights they are equipped with aerial cameras for photographic work, radio for the purpose of transmitting information from the air, two machine guns for aerial combat, racks for 25-pound bombs, and in friendly territory they are often used in the transportation of military supplies and personnel. In peace time they are called upon to do mapping and surveying, transport personnel and supplies, and any number of different missions which may come to their department. One of their missions is the spotting of shots for artillery units, and the towing of targets for anti-aircraft target practice.

The type of plane in most common use is the Douglas O2-H, manufactured by the Douglas company of Santa Monica, California. This is a two-seater, dual control, with a span of 39 feet 8 inches both top and bottom wings and an over-all length of 28 feet 10 inches. When equipped with an L-12-A engine, it will carry 1000 pounds at the rate of 140 miles per hour, climb 900 feet per minute to a ceiling of about 19,000 feet. Since there are several observation squadrons operating from points which make water the most feasible landing field, the government has purchased a number of Loening OA-1C planes for their use. The span of this ship is 45 feet, the length 55 feet, and the weight empty 3,400 pounds. When equipped with the L-12-I engine the speed is 125 miles per hour with a service ceiling of 10,000 feet. While an odd and bulky-looking plane due to fact that the hull is built in and a part of the fuselage, it handles easily and is very popular for flights over snow, ice, or water as shown by its use in the Arctic by Commander Byrd, in mapping the Canadian border in 1925 and in the South American flight of 1928.

The subject of aerodynamics, though not of interest to everyone, might well be given a little attention at this time. Since even the untrained eye will notice that on almost every type of aeroplane the wings differ in size and shape, it is quite obvious that for each size or power the question of airfoils is of the first to be considered. These airfoils determine the stability of the plane; the stabilizer, and elevators govern longitudinal stability; the ailerons and dihedral the lateral stability; and directional stability is maintained by use of the rudder and vertical fin. In addition the wings provide the lift, and the speed of the plane is largely due to their design. Unfortunately the reaction of the air on the wings is not all a useful force, the forward 33 percent of the wing causing only drag while the remaining 67 percent does all the work of lifting. This is best explained by considering the action of the air on an airfoil

rapidly moving through it. The force of the air in this case is directed back as well as upward, the backward force being what is called drag and the upward force lift. The efficiency of an airfoil is increased in almost direct ratio to the streamline of the airfoil or its ability to move rapidly through the air and at the same time creating the minimum amount of disturbance. To facilitate this the wing is built in a graceful curve, thick near the leading or entering edge and tapering to a minimum at the trailing edge. The top curve of the airfoil is known as upper camber and the lower curve the lower camber. The upper curve reaches its height about one fourth of the distance back of the leading edge and its function is to deflect the air upward thus creating a vacuum over the remainder of the wing. The lower camber is so constructed as to cause as small amount of downward flow as possible. No lift is registered on the leading one-third, but the downward curve of the remaining two-thirds attacks the air at an angle of about 5 degrees in normal flight. The vacuum on the upper surface accounts for about 70 percent of the lift and the pressure on the lower surface for the remaining 30 percent. The manner in which the lift of an airfoil varies with the angle of attack is quite evident. The lift is 0 percent at an angle of about 5 degrees and increases uniformly with the angle of attack until an angle of 12 degrees is reached. The increase is then less rapid to 14 degrees, while beyond this point the drag is so great on account of burble that the lift decreases rapidly and results in flying to what is commonly termed "stalling" of the aeroplane. The drag is at a minimum at 3 degrees. The forces of lift and drag are proportional to the square of the air speed. A formula for lift would be $L = K \rho A V^2$ where L is the lift, K is a constant depending on the shape of the foil the angle of attack and the density of the air, A is the area in square feet of the foil, and V is the velocity of the wind on the wing in miles per hour. This formula may be used for all the airfoil surfaces of an aeroplane, regardless of their function in flight. From the above it is easy to deduce the reasons for the thickness of a wing for carrying heavy loads at slow speeds and the thin wing for speedy ships. This thickness of a wing on large ships sometimes is more than four or five feet and has a very decided camber. The light fast ships have a thin wing of very small camber because speed is of primary importance; and since lift is proportional to the square of the air speed, they are fast enough to stay in the air with a wing of only sufficient thickness to permit structural strength. To overcome drag due to frictional resistances, these wing surfaces are treated with pigmented "rope" which gives them a hard glossy finish and thus reduces turbulence to a minimum. The greatest amount of frictional resistances is caused by the small uneven surfaces which create little eddies in the air surrounding the plane. To overcome this "fairing" is used to streamline boltheads and all small projections. Also the ends of wires such as those used for safetying are always projected toward the rear.

It is for the purpose of studying these and thousands of other problems that the Engineering division of the Air Corps daily experiments and co-operates with all the departments of aviation of the country.

You are only as good a Showman as you try to be.

A Day at Camp Custer

Milo Dean, c., '30

A FEW faint notes from a bugle, faint to embryo officers, the members of the Engineer R. O. T. C. at Camp Custer, who at 5:40 A. M. were closing an ear to the notes of first call so that they might be able to gain a few more precious moments of sleep. Everything was quiet about the camp except for the stir of cooks, who were preparing morning mess, and the guards, who were sleepily walking post. Suddenly a large field piece booms immediately behind the row of tents along the company street and then a blare of bugles and beating of drums break upon the ears of the young officers. March is now being played and the drum and bugle corps march up and down and wake even the most sleepy of the men. The camp is very much astir now because March is played at 5:50 A. M. and at 6:00 A. M. the bugles sound for reveille, at which time every man must be in formation. Faces are washed, sometimes, teeth

are brushed, and hair is combed, in a most hurried manner, and the manner in which puttees are wrapped is almost indescribable. At 5:57 A. M. the top sergeant, the most abused man for the day, sounds his whistle and gives the company fall-in amid the grumbings and pleadings of his fellow stu-officers who aren't quiet ready to fall-in. At 6:00 A. M. the company is moved out to the parade grounds at double-time and is sent through twenty minutes of calisthenics with the rifle, at the end of which they come back to the company street at the double-time and are dismissed

by the top sergeant to prepare for morning mess.

The bare seven minutes are taken up in making bunks and in policing the tents. At 6:28 A. M. the top sergeant again gives the company fall-in and after duly reporting the company to the company commander, he takes his post and the company commander marches the men into the mess hall. At the command "take seats," the fight is on and those who are of faint heart win a small amount of food. Seventy-five college men can eat more food than one hundred wheat threshers. As each man finishes, he leaves the mess hall to take advantage of the few minutes of leisure left him before 7:00 A. M., when the company again falls in, this time to spend twenty minutes in policing the company area and the regular army officers' tents. At 7:20 A. M. they are dismissed and instructed to change to fatigue clothes.

Then at 7:30 A. M. the company falls in again and is given instruction in duties of the soldier. This particular day, the company receives instruction in the use of the rifle and, under the supervision of the officers, drill in the various positions of the rifleman and in bolt manipulation. At 9 o'clock they are again dismissed and instructed to change to the O. D. uniform.

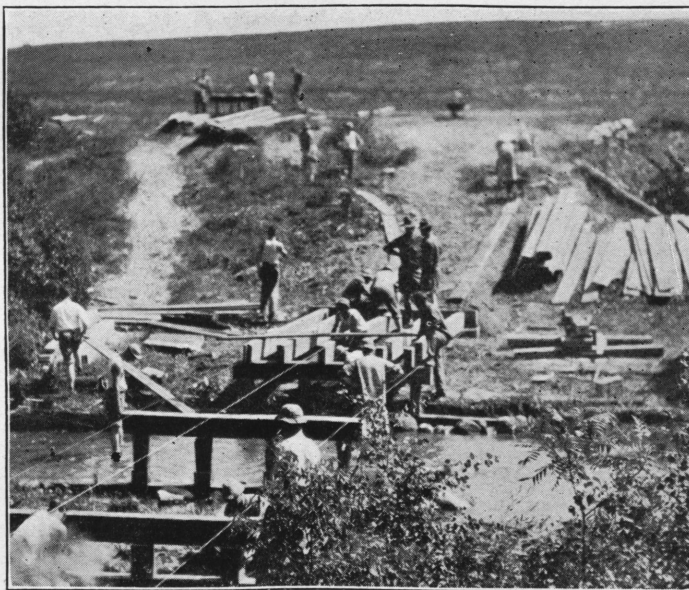
There is a bustle and stir in each tent as each man changes from fatigue clothes to drill uniform, wrapped puttees and all, and at the same time attempts to clean the dust and sand from his rifle. While some man is giving his rifle an extra wipe with a cleaning rag and one of his tent mates is in the midst of wrapping a puttee, the top sergeant blows the whistle that is loved so well by all, and the company rushes out to another formation. Roll is taken as usual and after the completion of duties by the non-

commissioned officers, the company is marched out to the parade grounds, where it goes through a concentrated drill in the manual of arms and the school of the soldier in squad, platoon, and company drill. Much energy and perspiration are required to whip the company of young officers into a well drilled unit. Near the close of this period the company is marched back to the company street and dismissed at 11:30. The men are at ease and move around at will preparing for and awaiting mess call. At 11:57 they are given fall-in and at 12:00 M. they march in-

to the mess hall. After mess the men enter their tents and soon the company street is vacated and not much sign of life is about the camp. The men are all in their bunks, resting and sleeping from a drowsiness caused by an over-indulgence of food and a sun that beats down unmercifully at noon day on the Michigan sand.

At 1:28 P. M., the top sergeant arouses the camp and again receives the rebukes of the men for his trouble. The company is turned over to the officers and is marched out to some place on the reservation suitable for a mimic battle. Here the company is instructed in the duties and actions of a soldier in the field. A mimic battle with an imaginary enemy is held and a drill with gas-masks where non-poisonous gases are used is held and generally the college

(Continued on page 166)



At Camp Custer the Embryo Engineers Receive Valuable Experience in the Construction of Military Bridges.

Our Student Loan Funds

Professor Albert A. Faurot

TWO general plans for giving financial assistance to worthy students are followed in colleges. The first consists of an outright gift of the money, based either upon scholarship regardless of the need of the student or upon the need of the student without requiring high scholarship. The other plan is to help the student by a loan which he is expected to repay within a reasonable time after graduation. Each of these plans has its good features but neither is in actual practice ideal since students are human and, being human, vary greatly in the basic attributes of character, such as appreciation, honesty, including proper sense of moral obligation, reliability, and other qualities that are essential to real success in life.

SCHOLARSHIPS

At Rose we have been using both plans for many years. The McGregor and Rea bequeaths provide at present twenty-nine scholarships which are awarded annually by the Faculty primarily upon the scholastic records of the students, although a man's character and material needs are taken into consideration. In these outright gifts the Institute distributes each year nearly \$4,000.00.

NIPPERT LOAN FUND

Two student loan funds also are at the disposal of the Institute. "The Firmin Nippert Memorial Fund," as it is legally designated, was created by the will of Susan K. Francis, who in Terre Haute was known as Sue Heminway after the name of her stepfather. Her widowed mother, Mrs. Sarah A. Heminway, came to Terre Haute about 1840 to make a home for her bachelor cousin, Chauncey Rose, the founder of Rose Polytechnic Institute. It was but natural that Sue Heminway should take a keen interest in the affairs of the Institute from its beginning. By many generous acts she manifested her love for it. The writer recalls that at every commencement up to the year of her death she sent beautiful red roses for the members of the faculty to wear upon the lapels of their coats. She died in Buffalo in 1909 and in her will named the Institute her residuary legatee, providing specifically that the sum of \$20,000.00 be set aside as a permanent endowment, the proceeds of which were to be used to assist worthy students of limited means. It was to be a memorial to Firmin Nippert, a lifelong friend of the family and one of the organizers of Rose Polytechnic and a member of our Board of Managers until his death in 1889. The interest upon this bequest became available first in 1911.

McGREGOR LOAN FUND

The James McGregor Student Endowment Fund is of more recent origin. James McGregor was for more than half a century a prominent business man of Terre Haute during which time he accumulated a fortune. By his will he left in trust the sum of \$100,000.00, the income from which was to be used to assist worthy students. A certain part of this money was set aside by the trustees as a loan fund for Rose students and became available in 1920.

HOW THE LOAN FUNDS ARE HANDLED

The administration of both our loan funds is in the hands of the trustees, the Terre Haute Trust Company acting for the Nippert fund and the Terre Haute National Bank and Trust Company for the McGregor fund. These banks loan the money only upon the recommendation of the Faculty Committee on Scholarships and Student Loans, duly certified by the President of the Institute. For many years the terms upon which the loans were made were left entirely to the banks. Some notes were made payable on demand, some ran for six months, while others were for much longer periods. Some drew interest from date, others bore no interest. These variations led to criticism and complaint, therefore

During the last twenty years nearly \$60,000.00 has been loaned by the Institute to 268 different students. These loans amount at present to over \$6,000.00 per annum. Herein is discussed briefly the origin, the administration and the present status of our student loan funds.

in 1924 the banks in conference with the faculty committee agreed upon uniform terms for all subsequent loans. Below is the substance of the note which each borrower now signs:

"On or before two years from date of my graduation or withdrawal from Rose Polytechnic Institute, I promise to pay to the order of the Firman Nippert Memorial Fund (or McGregor Student Loan Fund) the sum of.....dollars, for value received, with interest at six per cent per annum. It is agreed and understood that, if this obligation is paid on or before maturity hereof, no interest will be charged or collected."

It has been the aim and purpose of the Institute and the Trustees to make these loans on as favorable terms as possible, while at the same time assuring their repayment for the benefit of future generations of students. Two years after graduation is thought a reasonable time for the man to repay and if he does repay within this time no interest whatever is charged. If he does not pay off the debt he obligates himself to pay interest from date of graduation, which means

Do your Show jobs and help the other fellow with his.

Our Contemporaries—Donald E. Henderson

IT is only fitting and proper that this series should start with the president of that body representing the entire student body, the Student Council. And so we present Donald E. Henderson, president of the Student Council. Don entered the Institute in the fall of 1926 from Wiley High School. He soon made many friends among his new acquaintances at Rose and in the years following since that time has continued to earn the friendship and good will of his fellow students by the whole-hearted way he has thrown himself into the classwork and extra curricular activities.

Early in his college career Henderson became affiliated with the Y. M. C. A., a connection that he has maintained since that time. He has risen from one position to another in this organization until now he holds the presidency and has had much to do with shaping the policy of the local branch of the "Y." In conjunction with his "Y" work, he is responsible, as chairman of the committee in charge, for the publication of the handbook. The business of being at the head of student activities seems to be right in Don's line so it is only natural that he should be general chairman of this year's St. Pat's celebration.

Don is pursuing his studies on the electrical engineering course. He is chairman of the local branch

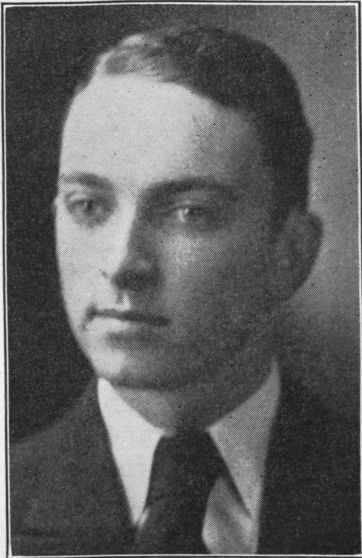
of the American Institute of Electrical Engineers and last December represented the branch at the district meeting held in Chicago. Don has always maintained an interest in his work and stands well up in his class in scholarship. In recognition of his scholastic attainments he was elected to membership in Tau Beta Pi.

The Theta Kappa Nu fraternity can justly be proud to have Henderson among its members, and that they have faith and confidence in him is shown by the fact that he has been president of his fraternity for the past year.

For his thesis he is making an investigation at the local telephone company to determine a means of finding the total number of calls at a given time by measuring the current flowing at that instant.

A brief resume of Don's more outstanding activities includes president of the Student Council, president of the Y. M. C. A., chairman of the Rose branch of the A. I. E. E., and general chairman of the 1930 St. Pat's celebration.

As has already been stated Henderson's scholarship has been of high quality and his extra-curricular activities have been numerous. Such a record is an accurate index of the man's ability and Rose will be justly proud of him in the future.



a penalty of 12 percent. A fair percentage have been repaying within the two years.

TO WHOM LOANS ARE MADE

The conditions which a student has to meet in order to be recommended for a loan cannot be reduced to rules. However, in practice the Committee has consistently followed certain principles. In the first place no loans are made to freshmen. The freshman year is a "tryout" year in which the man determines whether or not he is suited for an engineer and demonstrates his ability to do the work. Besides, it is felt that no one ought to enter upon a four year college course unless he has resources to carry him through the first year at least. Secondly, the scholarship and character of the applicant is considered. Does his work in school presage successful completion of the course? Is he earnest and faithful in his work? Is his character what it ought to be? In short, is he the type of man who will succeed both in school and out in the world? Finally, the need of the student is examined. No man ought to borrow money unless the lack of it makes it difficult for him to remain in school and do his work. Even then, his own relatives should ordinarily be called upon first for help. The average person does not realize that a debt, even though it be small, is a burden. Money comes easily on a loan but repayment is not so easy in the months immediately following graduation. Rarely does a graduate step directly into a good paying position. He must serve his apprenticeship in the busy world where competition is keen.

For the reasons expressed and implied above, ef-

fort is made to keep the loan down to the minimum necessary to meet the student's needs without serious embarrassment. During the scholastic year 1928-29 loans were made to 41 individuals averaging \$137.00. The maximum loan was \$250.00.

The following table shows by calendar years the amount loaned, the number of borrowers, and the average loan to an individual:

Year	No. of Loans	Total Loans	Aver. Loan
1911	4	\$ 222.50	\$ 55.60
1912	12	1272.50	106.00
1913	13	1272.50	79.75
1914	11	1147.50	104.77
1915	16	1229.50	76.81
1916	11	1415.00	128.63
1917	19	1742.50	91.88
1918	3	325.00	108.33
1919	11	1475.00	225.00
1920	16	2470.00	154.37
1921	24	3030.00	126.25
1922	39	4090.00	105.00
1923	29	2755.00	95.00
1924	27	3442.00	127.45
1925	39	5221.00	217.54
1926	53	6910.00	130.27
1927	51	5960.00	116.86
1928	44	5798.00	131.77
1929	51	6440.00	126.07

Summary for 1911 to 1929 inclusive—

(Continued on page 167)

Ten jobs for each Showman. Have you your ten?

"WE"

With Apologies to Col. Lindbergh

Robert Mees, m., '31

FOR many, many years it has been the custom of thousands of American people to journey to Florida to escape the cold and seemingly frigid atmosphere of the Yankee settlement. Four years ago their reason for going south was more than the thought of personal comfort. In fact, to many it proved quite the reverse, for you will recall that at that time the speculative, spectacular Florida boom was in full swing.

During the summer of that year it fell to my good fortune to accept a job in Florida. For three months I was to become the companion in the strife of my good cousin, whom I will refer to as Reno, hailing from New York City, but at that time attending college in my home town.

The trip was to be my first essay from under the protective wing of my mother and I was quite enthusiastic about the whole trip and so was Reno. We received from our promoters a draft for two hundred dollars which was to insure our passage to that far off blooming country. Now to us that was a lot of money, and we could see that it was nothing but foolishness to put all of it into two tickets to Florida and have nothing but ourselves and a suitcase to show when we arrived, and here our first engineering problem presented itself.

We bargained for a 1921 model Ford phaeton and bought it for seventy dollars. It had a new coat of shiny black paint and we took stock in the phrase that a coat of paint may fool the public but we soon found out that her lines told her age.

I thought it well to equip the car with a water pump and a special timer and outside oil line. We discovered that our initials were the same and to put on a touch of individualism we painted them in blazing red on each side of the body on the panel between the two doors.

After we had outfitted ourselves completely with all the clothes and paraphernalia for our work in the south and with tools and spare tires we shoved off in high spirits with the sun half way up, beating down on our bare heads, and about eighty dollars in our pockets.

Everything but one tire and our oil-line went well that first day, as we took our course down through Cincinnati and into the wilds of rolling Kentucky. We inspected a beautiful, ticket-strewn race track at Latonia and were refused entrance to a most enticing eating establishment or road-house. It was enticing only because we were hungry and craved good food and we were barred because our garb was not exactly appropriate and we did not care to change into evening attire just for one man.

We travelled on into Kentucky and the night, and, fearing for our safety among those traditional mountaineers, we decided to put up for the night in the best hotel in the next town. The name of the hostelry and settlement I have long since forgotten, purposefully. However one thing happened that night which I have not forgotten.

Our room was on the top or second story and our bed headed the window. I was not accustomed to Reno's night-mares or dreamings and about three in the morning he decided to have one. He woke me by his yelling and restlessness and by the time I could see him he was half-way through the head of the old-fashioned bed and going through the window, still yelling as though someone was after him. I braced myself against the head of the bed and pulled him back by the legs. Then he woke up and I had to explain his actions to him as well as to the small audience which had assembled.

The next day we headed for the Cumberland gap but decided to take a shorter but rougher route over the foothills of the Cumberland mountains. It was then that we realized what a good and reliable car we had, for we made all grades in high gear. Toward evening we struck a beautiful pavement and sped through a new long tunnel into Chattanooga, the first large city in which we stopped on our trip.

The cleanest-looking one of us went to the desk of a good but not high class hotel and finally got signed up. When I came in trailed by an overloaded porter, it appeared that the management might change its mind. But we quickly dived into an elevator and were whisked to the top or twelfth floor.

After a much needed shower bath and shave we dressed in our Sunday clothes and descended to the main floor. We were straightway approached as to our identity, for apparently we were not recognized after the transformation.

"But surely you're not those two fellows who came in here a while ago?" was the question. Most graciously we were conducted to the dining rooms where we enjoyed a well-cooked and appetizing dinner.

In spite of the fact that we were very tired we decided to go out and do the town. There was not much to do, we found out, so after a show we went up to our rooms, packed our grips once more, and got some sleep.

The next morning we had not even started on the right road out of Chattanooga before it began to drizzle. Well, the top had to go up, and it did, after a little urging on our part, and the isinglass curtains had to be hanged. Our wind shield wiper was hand powered but by means of a stick and some string it could be operated from the right side of the front seat. That is, while I was driving Reno had the honors.

We sped and spun as we travelled on hard roads and mud. Tire trouble pursued us and we lost. About noon we pulled up out of the mud, under the protection of a shed sticking out from the front of a big store building. It was one of those centralized general merchandise stores found in the most god-forsaken yet appropriate places in the south.

A tire and tube separated us from twelve dollars and we were quick to realize that our good times were over, and had been over for half a day. From

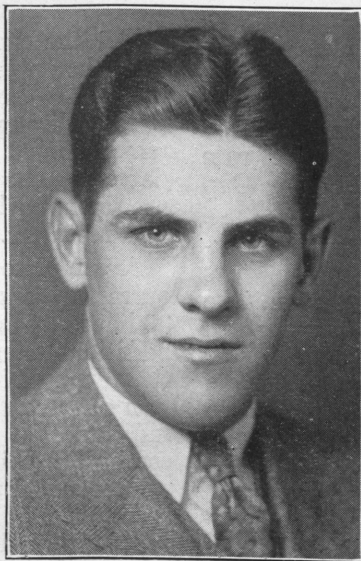
Our Contemporaries—Andrew H. Davy

ANDY DAVY in his quiet unassuming way has gone about acquiring a college education in a most thorough way. He hasn't been content to stop after perusing the books a little but has proceeded to enter many of the activities of the college.

Davy was prepared at Garfield High School and entered the Institute in 1926. His first honor came when he was elected vice-president of the freshman class. During his sophomore year he was secretary of the Athletic Board.

Being a letter man in high school, athletics naturally attracted Andy from the start and the ink had scarcely dried on his registration card before he had drawn his football suit. He was out for football for the '26, '27, and '29 seasons, but it was in the last year that he proved to be one of the mainstays of the team, holding down the position of fullback in a highly commendable manner. Track, too, came in for its share and Andy was awarded an "R" in this field of sports, running both the high and low hurdles. And rounding out his general participation in athletics he was on the basketball squad during the '27 and '28 seasons.

Photography being a pet hobby of Andy's, he became a member of the Camera Club and last spring was elected president of that organization. The



Club has prospered under his direction and is now one of the most active organizations in the Institute. by virtue of this position he is also a member of the Student Council. Governing athletics at Rose is an Athletic Board of Control composed of two alumni, two members of the faculty, and two undergraduates, one senior and one junior. Considered to have good knowledge of athletic conditions at the school, Davy was elected by the student body to be senior representative on the Board of Control.

The Rose Show this year will require some very good executive as well as engineering ability and who could better fit in than Andy Davy and thus again have the students shown their confidence in him. He has been working hard as chairman of the St. Pat's dance to get all arrangements made for the biggest dance in honor of the patron saint yet held.

Andy is a member of the Theta Xi fraternity and has always been one of its strongest backers. For his thesis he will run a power survey on

the plant of the Columbian Enameling and Stamping Company.

Although Andy has not been on the staff he has always been a loyal booster of the Technic. The staff wishes him success in whatever he may undertake.

then on, we had to speed and save all money for gas and oil. Toward evening we struck pavement and for fifteen miles into the city of Atlanta, Georgia, the home of Bobby Jones, the Coca-Cola industry, and WSB, we were in paradise. Even in the mist and fog the lights seemed to blind our dimmed eyes. However, since it was the best or nothing at all for us, and we could not get closer than the door of the Atlanta Biltmore hotel, and the traffic officers were very harsh in their compliments to our driving and appearance, we decided to move on. At least we could say we had been in Atlanta, Georgia once upon a time.

We stocked up with gas, oil and chile, tempered by a pint of milk, between tears and swallows, and rode on into the night, tired, sleepy, dirty and grimy, but singing and full of hopes for the dawn.

It was 5:15 by my baby Ben, it was chilly by every bone in my body, and I was paralyzed in every muscle, when some human instinct woke me out of my deep slumbers. I lit up a Camel, and proceeded to straighten out my body from its torturing configuration, for I had been sleeping on a mattress laid on top of our duffel in the back seat of the Ford, with side curtains in front of me and side curtains in back of me, holding and binding.

I tried to look through the curtains but the dew and dirt kept me prisoner. On the outside my cousin

lay, wet to the skin by the morning dew, for by a flip of a penny he had won the honor of sleeping beneath the stars on our only cot. But his restlessness during the night proved disastrous to his comfort. His feet were on the ground and his head about a foot higher, for the canvas part of the cot had ripped half the length. He was a miserable sight and his disposition was anything but congenial. Our choice for a camping place was picked blindly, at night, and if we had been one month later in these parts our breakfast would have consisted of those luscious Georgian peaches, now green on the trees.

Our last day was before us and we lost no time nor spared gas nor tires. We ate nothing 'til noon, and then changed our minds and satisfied our stomachs with a cup of hot coffee. Early in the afternoon we crossed the Florida line and shortly arrived in the great metropolitan city of the south, Tallahassee, the capital of Florida and the answer to our prayers.

It took two sandwiches and two cups of coffee to increase our poverty to nothing. But we were in high spirits and the crust of dirt was soaked off under cold water at the city camp ground. And so after four days of journeying, with our faces shiny and our stomachs empty, we reported for work, our engineering ability having carried us through to the bitter end.

Research and Progress

Conducted by Lee C. Kelsey.

Astronomy

ACCORDING to a report to the American Association for the Advancement of Science, some scientists have long held this belief. One of the latest discoveries in astronomy indicates that the world is traveling in a vast whirl including the sun and all the stars that are visible to the eye, at a rate more than 2,000 times as fast as the Schneider Cup record.

The motion has been shown to be a complete rotation around a massive center of not only the stars but of everything millions of miles beyond them. The rotation is the formation of stars in the shape of an immense flattened ball, whirling after their center in the direction of the constellation Sagittarius, a center so distant that its light has been estimated to take approximately 47,000 years to reach the earth. The investigations included speed measurements and verification of the whirl.

These findings are the result of six years of study and research by Dr. J. S. Plaskett, Director of the Dominion Astrophysical Observatory at Victoria, B. C., Canada.

According to Dr. Plaskett there are four separate and simultaneous motions of the earth resulting from the whirl. There is the daily revolution on its axis which is approximately 28,000 miles every 24 hours; the yearly trip around the sun as a center at a speed of $18\frac{1}{2}$ miles a second or roughly 12,000 times the speed of an express train. There is a "random" motion in which the earth is moving along with the sun in a journey not seemingly in the direct path of the whirl, and lastly, the high speed spin of the entire adjacent section of the universe.

Dr. Plaskett estimates that 300,000,000 years are required for one rotation about the center. In his own words, "The first point quite distinctly shown by this work is the rotation of a whole galactic system at a speed of about 300 kilometers, or about 200 miles a second, which would be more than 2,000 times the speed of the present Schneider cup record of 355.8 miles an hour."

first time in the history of industry that X-Ray equipment powerful enough to examine steel three inches thick has been used as a portable unit.

For the examination, the tube is placed in a lead lined box within a sheet-iron case directly over the casting to be photographed. The rays are thus passed through the case and make a shadow picture which shows the location and nature of any serious defects. The 200,000 volt direct current required for the examination is profused by special transformers and rectifiers.

A complete examination of a three-inch fitting requires approximately 125 pictures, consuming about 30 hours of actual exposure time and at least 10 hours additional for arranging the castings and placing the films. X-Ray tests confirmed by cutting a section of the casting and by other means of examination indicate that the undesirable internal conditions in castings fall into relatively few classes, all of which are traceable to definite and simple causes. Most of these causes, if not all of them, can be eliminated by proper foundry practice. Experience shows that when defects repeatedly show up in the castings and have been corrected by making the required changes in foundry methods, they tend to stay corrected. It is thus possible, by the aid of X-Ray examinations and the conclusions drawn from them, to eliminate from 75 to 90 percent of the more important defects in castings as produced by a given foundry.

The principal undesirable conditions in steel castings revealed by an examination are as follows: (1) gas slag and sand pockets due to loose dirt in molds; (2) gas cavities due to imperfectly deoxidized metal; (3) sand inclusions due to the cutting of the mold or the runners; (4) pipe or primary shrinkage caused by failure of the risers to function as indicated; (5) secondary pipes caused by flow of viscous metal through restricted channels in the casting during the final stages of solidification; (6) shrinkage cracks starting from a sinus-like cavity developed during cooling; and (7) rupture developed during hydrostatic tests.—*Abstract, Machinery.*

X-Ray Inspection of Heavy Castings

IN order to be sure of having sound steel castings for a 1,200 pound pressure steam power plant now under construction in the East, the owners of the plant and their engineers decided to have the castings inspected by means of the X-Ray before placing them in service. As several of the fittings weighed more than three tons each, it was more convenient to inspect them at the plant than to have them sent to the laboratory for inspection. Accordingly, a high potential power plant was temporarily equipped at a suitable location near the steam plant. This is the

Caterpillar Towboats

CATERPILLAR towboats without propellers or paddle wheels are now being put into operation on the shallow rivers and streams of the middle-west. These boats are of unique design and have a three foot draft. The boats are equipped with a caterpillar drive on each side, the caterpillars consisting of chains with blades attached at regular intervals. The suggestion of the idea for this new type of water propulsion undoubtedly came as a result of the use of tanks in the World War.—*Abstract, Machine Design.*

(Continued on page 168)

How do you measure up? The Show will show.

*Published Monthly
by the Students of the
Rose Polytechnic
Institute*

The Rose TECHNIC

Member of Engineering College Magazines Associated

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Our Contemporaries

A GAIN the Technic is publishing a series of personal notes concerning certain members of the senior class. In selecting the men about whom to write, certain standards were set for the senior to meet. These standards as we see them are not superficial ones but are a true measure of the man's worth to himself, the Institute, and to his fellow men.

The primary requisite is: Has he the true Rose spirit? Is he a true "Fighting Engineer" who although he goes down under great odds comes up fighting for a worthy cause? Does he show that strength of moral fiber so necessary in a professional man? Next we ask if the man has displayed the proper application during his college life as shown by his scholastic achievements. This does not mean that an "A" rating is essential but that the man has been consistently good in his class and has shown a sincere effort to obtain a knowledge of engineering. And lastly, has he taken an active part in student undertakings? Is he a leader or does he have to be led?

With these three qualities—character, scholarship and leadership—in mind we have tried to choose those seniors in whom these qualities are best exemplified. In a class of many good men it has been no easy task to select a few for special mention and perhaps the Technic may even be accused of unjust discrimination. But whether the reader agrees or disagrees he will have to admit that they are good men.

And with the above explanatory remarks the series, "Our Contemporaries," is left for the approval of the reader.

The Rose Show

THERE remains only one more month to prepare for one of the biggest events on the school calendar, the 1930 Rose Show. The show has been one of the main topics of conversation around the Institute for some time, but what has been done other than a

lot of talk? Action must be taken and taken immediately!

The reasons for haste should be obvious to the seniors and juniors who helped in the first show, if not to the uninitiated sophomores and freshmen.

After the exhibits have been lined up and each student is acquainted with the types of exhibits to be developed under his direction there follows a period of experimentation, series of attempts, failures, more attempts, and at last success. And it is this period that requires time and effort. A student may be filled with ideas that work beautifully in his mind, but it is only after he tries to construct his exhibit that he realizes the difficulties to be overcome.

Further experimentation will show that certain exhibits are impractical or cannot be carried out with the equipment available. Wholehearted work on one exhibit will certainly result in the growth of new ideas or more elaborate work along the same lines. There is nothing to limit the enthusiasm of the student who once starts to work and attains the real show spirit.

STUDENTS! get to work! You know now what you are going to do, do it! Seniors and juniors, set an example for the freshmen and sophomores. They look up to you for leadership and will follow you if you will only lead. Sophomores and freshmen, go to the upper classmen to whom you have been assigned and keep after them until they give you a definite job to start on. And then with everyone working a show even better than the one of two years ago will be produced.

Tau Beta Pi has made an exceedingly interesting announcement that should meet with widespread favor among the student body. That organization has taken the initiative as it rightly should in an attempt to make students more alive to the possibilities of the show. Tau Beta Pi has offered a prize of \$10 to the student or group of students having the most novel or original exhibit in the show. This should furnish increased incentive for good work to be done.

Fellows, this is **YOUR** show and it is up to **YOU** to make it worth the time that is being spent on it.

Are you loafing on the Show job?

CAMPUS NOTES

Chester C. Stock, ch., '32

THERE have been made several small improvements around school. An electric clock is installed on the wall of the front hall which should eliminate some tardiness. In the rifle range a concrete floor has been constructed. A very beautiful piece of woodwork has made its appearance in the assembly room in the form of a speaker's rostrum. To further brighten appearances, one of the old sets of bulletin boards was replaced by a new set. Thus we see that the tendency is for constant improvement for both utility and appearance.

R. O. T. C.

PERMANENT appointments and assignments of Cadet Officers and Cadet Noncommissioned Officers in the Engineer R. O. T. C. Unit were published at drill on February 7th as follows:

CADET MAJOR—Milo Dean.

CADET CAPTAIN AND ADJUTANT—Clyde S. Marsh.

CADET CAPTAINS AND COMPANY COMMANDERS—James H. Dicks, Company A; John R. Gibbens, Company B; Gilbert L. Shew, Company C.

CADET FIRST LIEUTENANTS—John W. Chinn, 1st Plat. Co. C; James H. Corp, 1st Plat. Co. A.

CADET MASTER SERGEANTS (Acting Second Lieutenants)—H. L. Witt, 2nd Plat. Co. A; R. S. Roach, 1st Plat. Co. B; B. C. Wells, 2nd Plat. Co. B; J. C. Weddle, 2nd Plat. Co. C.

CADET FIRST SERGEANTS—R. F. Mathews, Company A; A. C. Ogan, Company B; L. L. Ray, Company C.

CADET SERGEANT MAJOR—J. A. Wells (Staff Sergeant).

CADET STAFF SERGEANTS—J. A. Barrett, Company A; J. L. Bruce, Company A; S. B. Dibble, Jr., Company A; H. J. Loving, Company B; M. C. Wilson, Company B; H. S. Powell, Company C; B. Wassel, Company C.

CADET CORPORALS

Company A—Stock, C., Pfizenmeyer, H., Shofner, W. O., Butler, F., Pratt, C. A., Adams, G.

Company B—Kelsey, L. C., Sawyers, P., Bertschinger, G., Broadhurst, R. W., Clark, M. J., Froeb, P. J.

Company C—Smith, A., Jones, J. T., Goodman, A. H., Fischer, H. M., Rockwood, W. G., Niemi, I.

The Military Department feels that it has a very fine staff of Cadet assistants and is looking forward to a successful year—one in which the morale of the students will be high and interest in the work keen. It believes that this phase of student activities at Rose is important and that what is being done should be done with the backing and entire good will of the student body, not to the end of making invincible soldiers but rather invincible citizens.

A Cadet Officers' Club has been formed with membership including all members of the Senior and Junior Classes in Advanced Military. The purpose

of the Club is to have a social meeting ground where policies helpful to the school and to the R. O. T. C. Unit may be informally discussed and planned. Milo Dean was elected president, James H. Dicks, vice president, and John R. Gibbens, secretary-treasurer. The desire for a Club or some kind of a Military Student organization has been manifest for some time and the possibility of applying for membership in "Scabbard and Blade" has been considered. For the time being, however, this does not seem to be feasible and it is believed that the Cadet Officers' Club is the logical solution.

Assemblies

February 6, 1930.

THE first assembly period of the new term was devoted to separate class meetings. The main purpose was to vote on the question of the St. Pat's parade. The classes decided not to hold the parade this year. The great amount of time required by the ROSE SHOW was one of the deciding factors. There will quite likely be a theatre party. Although the parade is dropped for this year, the St. Pat's dance will be held.

February 13, 1930.

THE new rector of the St. Stephen's Episcopal Church, Rev. Charles N. Tyndell, spoke on The Engineering of the Soul. In the course of his talk Rev. Tyndell emphasized the fact that a minister must be a man and that he must understand man. In the engineering of our soul there are four dimensions: length, width, depth, and height. Rev. Tyndell explained what each dimension signified. The length of our being is measured by the impression our soul makes upon other men through our help to mankind. Breadth is our social conduct. We must make an impression rather than be impressed. The depth in our existence is love. Through love we know life's true worth and should try to increase its value. The fourth side of life is vital, no matter how great the degree of perfection of the others. The height of life is measured solely by the language of God. By bringing his thoughts clothed in an engineer's terms, Rev. Tyndell made his ideas clearly understood.

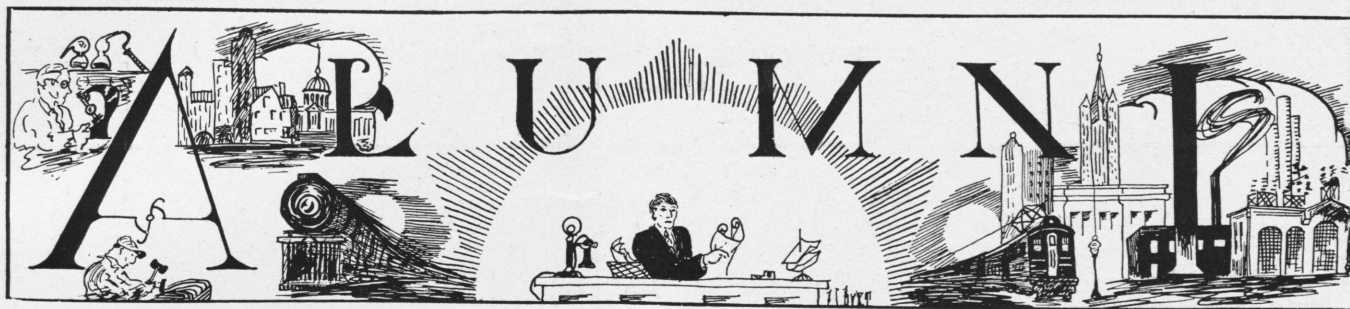
Rose Radio Club

Paul R. Froeb

THE Rose Radio Club has made plans for a very elaborate display of the latest types of radios and many other features concerning radio, as their part in the Rose Show. They have ready at the present time more exhibits than they had in the last show, and many more displays are nearing completion. The club this year has a larger membership than it has had for several years, and everyone is wanting to do

(Continued on page 162)

What a hit this show will make!



Bruce R. Walsh

SINCE graduation from Rose Polytechnic Institute in 1926, Bruce R. Walsh has been connected with the Westinghouse Electric and Manufacturing Company. He was elected to Tau Beta Pi and won the Heminway medal for the highest four-year scholastic standing at Rose. After completing the Westinghouse Graduate Student Course he entered the Engineering Department and engaged in problems of railway engineering.

Mr. Walsh has been identified with the development and application of electrical equipment for power transmission in rail cars. These cars, equipped with gas and diesel engine prime movers, have developed extensively during the past four years. They have involved the development of many new schemes of control; new traction motors for widely varying service, and generators to match many gasoline and diesel engines of various sizes. The design and application problems involved have been followed in all their phases by Mr. Walsh. He has conducted experimental tests on gas-electric cars of various types and has prepared economic reports for various railroad companies on oil-electric vs. steam operation.

'97

J. Henry Lendi, M. W. S. E., Electrical Engineer, Universal Atlas Cement Company, died at his home in Chicago, January 18, 1930. He has been in failing health for the last year and able to devote only a part of his time to his work.

Mr. Lendi was born in Dubuque, Iowa, June 25, 1874, and was graduated in 1897 from Rose Polytechnic Institute. On graduation he went to Chicago and spent two years with the Kellogg Switchboard and Supply Company, in charge of telephone laboratories, then three years in the experimental department of the Western Electric Company and then five and one-half years as electrical engineer with the Belden Manufacturing Company. In 1910 he was made electrical engineer of the Universal Atlas Cement Company and continued in that position until his death.

Maurice C. Rypinski, of the class of '97, is now manager of the radio department for the Westinghouse Electric and Manufacturing Company, with headquarters at New York City.

'05

Dudley D. Wright, with the Westinghouse Electric and Manufacturing Company, has been transferred from Ishpeming, Michigan, to St. Louis, Mo.

'15

Chester Cotten, formerly with the Horne Company,

Ltd., Osaka, Japan, is now Export Manager, Latin-American Division, Austin Manufacturing Company, in Chicago, Illinois.

J. Ernest Sheldon, formerly Resident Engineer, State Road Department, Olympia, Florida, is now with the State Highway Department at Saginaw, Michigan.

Charles N. Stevens is President and General Manager of the Milwaukee Boiler Manufacturing Company at Milwaukee, Wisconsin.

'20

Frank L. Reinmann, formerly with the Northern Indiana Public Service Company, is now Electrical Operating Engineer, Midland United Company, of Chicago, Illinois.

'23

Claude F. Leisey, with the American Telephone and Telegraph Company, has been transferred from Detroit, Michigan, to Cleveland, Ohio.

Sylvester J. St. Clair is Assistant Electric Engineer in the office of the constructing quartermaster, War Department, at Washington, D. C.

'25

Orville M. Dunning, formerly with the Acoustic Products Company at Stamford, Conn., has taken a position with Thomas A. Edison, Inc., West Orange, New Jersey. He is working in the Research Department, chiefly with Ediphone.

'28

Alexander Babillis has taken a position with the General Electric Company at Pittsfield, Mass.

Roy Reese was to have sailed Tuesday, February 18, from New York City for the Panama Canal Zone where he is to take a position as assistant electrical engineer in the government service. Since his graduation he has been with the Michigan Bell Telephone Company in Detroit. Interest in going to Panama was aroused in Roy through Bart Smith, also of the class of '28, who has been in Panama since his graduation.

Word has been received in Terre Haute of the marriage of John Crawford, ex-'28, to Miss Helen Albin of Terre Haute. John was connected with Terre Haute newspapers in the advertising departments, before going to Detroit, where he entered the Burroughs Adding Machine Company's school. He completed the course and was sent to Buffalo, New York.

'29

Galen Clark, ex-'29, with the Victor X-Ray Company has been transferred from Chicago, Ill., to Rochester, N. Y.

Kermit Glazner is Student Engineer with the International Motor Company at Allentown, Pennsylvania.

ATHLETICS

Claude R. Nicholson

DANVILLE 29 — ROSE 18

IN a return game played at Danville, Ind., the Central Normal cagers were forced to the limit to take a 29 to 18 victory from Rose, Feb. 11.

The Engineers battled on even terms with the Purple warriors for a large part of the first half but Central Normal put on steam in the latter part of the period and led at the intermission, 13 to 8.

Billy Reeves scored four field goals in the second session to help the Teachers maintain their advantage. Allen played a very creditable game at back guard. He also was the high point man of the Rose team.

Line-up and summary:

Central Normal (29)	F.G.	F.T.	T.P.
Gip Reeves, f.	3	2	8
B. Reeves, f.	4	1	9
Falkenberry, c.	1	0	2
Gin Reeves, g.	2	1	5
Bratton, g.	0	0	0
Smith, c.	1	1	3
Wood, g.	0	2	2

Totals 11 7 29

Rose Poly (18)	F.G.	F.T.	T.P.
Alexander, f.	0	0	0
Fisher, f.	1	1	3
Allen, c.	2	5	9
Gillette, g.	2	0	4
Sawyer, g.	1	0	2
Batman, f.	0	0	0

Totals 6 6 18

Referee—Bayh; umpire—Adams.

INDIANA CENTRAL 39 — ROSE 20

INDIANA CENTRAL'S Greyhound quintet decisively defeated the Rose Poly basketball team, 39 to 20, at Indianapolis, Feb. 18. The game was fairly close during the first ten minutes of play, but the Rose defense cracked, and allowed the Central cagers to gain a 21 to 9 advantage at the half.

Judd and Ewig, Greyhound forwards, led a concerted attack against the Engineers in the last half, accounting for 14 points between them. Fisher was the outstanding Rose player, although he was forced from the game in the first half.

Line-up and summary:

Indiana Central (39)	F.G.	F.T.	P.F.
Judd, f.	6	1	2
Otto, f.	2	0	0
Emig, f.	3	2	4
Stillebower, c.	2	3	2
Bailey, g.	1	1	1
Laudermilk, g.	0	0	1
Durham, g.	0	0	0
Swan, g.	0	0	1

Totals 16 7 11

Rose Poly (20)	F.G.	F.T.	P.F.
Alexander, f.	2	1	1
Fisher, f.	2	1	1
McEwen, f.	0	1	0
Allen, f.	0	1	1
Batman, c.	0	0	0
Sawyer, g.	3	1	2
Piker, g.	0	0	0
Gillette, g.	0	1	2
Totals	7	6	7

Referee—Goldsberry.

EVANSVILLE 33 — ROSE 27

AFTER leading until the last five minutes of play, Rose Poly was nosed out by Evansville College, at Evansville, Jan. 25. A well sustained rally launched by Hartke in the second half and given impetus by Vaughn, who contributed three consecutive field goals, enabled the Purple Aces to win their second game of the year.

Hartke and Vaughn played excellent ball and connected with the basket with regularity. Alexander and Sawyers were the high lights of the Rose attack.

Line-up and summary:

Evansville (33)	F.G.	F.T.	P.F.
Harper, f.	1	0	0
Fitzsimmons, f.	0	1	0
Hartke, f.	8	0	1
Vaughn, c.	5	3	2
Burrell, g.	0	0	3
McMurtv, g.	0	0	1
Mangold, g.	0	0	1
Bossee, g.	0	1	1
Thompson, g.	0	0	2

Totals 14 5 11

Rose Poly (27)	F.G.	F.T.	P.F.
Alexander, f.	3	1	1
Butters, f.	0	0	0
Sawyer, f.	3	2	3
Sanford, c.	1	0	0
Fisher, c.	0	2	1
Allen, g.	1	6	1
Spangenberg, g.	0	0	3
Broadhurst, g.	0	0	0

Totals 8 11 9

Officials—Referee, Rogers; umpire, DeGroote.

OAKLAND CITY 35 — ROSE 23

PLAYING a slow, deliberate game most of the time, but sweeping through for points when needed, Oakland City College's basketball team overcame the Rose Poly netters, 35 to 23, at Oakland City, Feb. 7.

Led by Dunn, Patberg, and Smith, who among

(Continued on page 158)

Be Show-minded! Exercise your talents!

FRATERNITIES

FRATERNITIES are as essential to a college education as a faculty of professors, especially in a democracy. That was demonstrated more than 2500 years ago by the academic brotherhoods of ancient Greece whence we derive our Eleusinian mysteries. . . . In other words, the education of our youth as social beings is as intrinsically necessary as their mental being.

The classroom and the fraternity house must work hand in hand to develop the well rounded American citizen, the scholar, and the gentleman. Fellow students have a far greater influence on the making of the manhood of an individual than the vast majority of college professors. The former, not the latter, determine the esprit de corps of a college community.

—Dr. Richard C. Schiedt, *Phi Kappa Sigma*, professor emeritus at Franklin and Marshall.

ALPHA TAU OMEGA

INDIANA Gamma Gamma of Alpha Tau Omega is pleased to announce the pledging of Paul Cooper, Struthers, Ohio; Logan A. Gillett, Logansport, Ind.; Jack Merrifield, Indianapolis, Ind.; Raymond McNeill, Gary, Ind.; Raymond W. Wells, New York, N. Y.; Orville R. Lowther, Robinson, Ill.; Hubert White, Birmingham, Ala.; Charles O. Kruzan, William

F. Nichols, John M. Phelps, Leon Sanford, and Arthur W. Tuemler, all of Terre Haute. Gamma Gamma also announces the repledging of Jacob Cushman of Terre Haute, and James Skinner of Indianapolis.

The annual state meeting of Gamma Gamma, Gamma Omicron, Delta Alpha, and Delta Rho chapters was held Saturday, March 1, in the beautiful Riley Room of the Claypool Hotel, in Indianapolis. After a delightful luncheon was served, addresses of vital interest to the fraternity were given followed by some clever entertainment. The dance was voted to be one of the best ever and that it ended all too soon was the verdict of everyone present. The local chapter was represented practically one hundred percent.

The dance given every year in honor of the pledges took place on March 8 at the Terre Haute House. Guests of the chapter in addition to the new pledge brothers included Prof. and Mrs. Carl Wischmeyer, Prof. and Mrs. Roland Hutchins, Mr. and Mrs. Phil Brown, Prof. John L. Bloxsome, Lieutenant and Mrs. Richardson Seele, and representatives from the other fraternities on the campus.

The chapter is gratified to learn that two of its members, Brothers Stimson and Witt, have attained that coveted honor, election to Tau Beta Pi.

ALPHA CHI SIGMA

ON the evening of January 24 the Iota chapter of Alpha Chi Sigma met at the Elks' club to give welcome to the new pledges at a banquet. A very



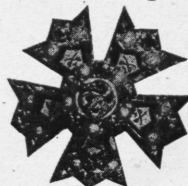
successful evening was enjoyed by everyone who came, and of course no one would miss a feed. Dr. White and Mr. Koch of the faculty were present as well as several members of the Alumni Association.

Iota has moved and now may be found at 1811 Chestnut street. We are not completely settled yet, but even so our quarters are an improvement over our preceding house. More room as well as better appointment add to its advantages.

We decided to hold a professional meeting on Wednesday, February 19th, at our new location. Brother Piker was entrusted with responsibility for the program and "did it up brown" with local, but with excellent talent. Dr. White gave us some very good advice on the subject "How to Study." We trust the listeners will be able to apply successfully the ideas presented. Dr. Howlett, of the physics department, then gave us a talk on relativity and the work of Einstein in this field. Dr. Howlett said his treatment was very scanty, which gives us the desire to search further some day to see what lies below the surface of this all-encircling subject. The evening was tapered off in a lighter vein consisting of conversation with sandwiches, drinks, and cards. Everyone agreed that the evening was well worth while and we expect to have at least one more such event before school closes.

SIGMA NU

BETA UPSILON'S four-day rush season was a distinct success and the chapter is pleased to announce the pledging of the following men: William



Bachelor, Merrill Bradfield, Theron Detrick, Jack Faust, Arthur Reinking, Wayne Stark, and William Forrest Simpcoc, all of Terre Haute; James Byrne of Chicago; Mack Decker of Brazil; Homer Fisher of Sullivan; Lester Dowen of Carbon; Norman Gilbert of Cleveland; Bertram Menden of Chicago, and Carlton Sexson of Bloomfield.

On Friday evening, February 7, a pledge banquet was held at the chapter house and the neophytes became the proud wearers of the serpent. Formal pledge services took place the following Sunday afternoon and they officially began their life in the fraternity.

The active chapter entertained the new pledges with a dance in their honor on February 22. The affair was held at the chapter house with our old

How many hours per week are you giving to the Show?

favorites, Bud Cromwell and his Night Riders, furnishing the music. The chapter expresses its appreciation to Lieutenant O. G. Hoas and Professor Bloxsome who chaperoned the dance. Guests from the other fraternities were John Rockwood and Alfred Kasameyer, Alpha Tau Omega, and Harold Kehoe, Theta Kappa Nu. Four alumni brothers returned to meet the pledges and enjoy their dance with them. They were Robert Downen, Hugh Holmes, Valentine Mitch, and William Houck.

On Friday night, February 21, the Mothers' Club held a bridge party at the chapter house which was attended by the parents and the actives, pledges and their guests. The party was a big success and the Mothers have promised another in the near future.

The Sigma Nu State Formal held annually at Indianapolis, by the chapters in the Fourth division, comes on March 8 this year. The dance is sponsored by the Indianapolis alumni association in conjunction with the active chapters at Indiana, Purdue, DePauw, Butler, and Rose Poly. The Claypool Hotel will be the scene of the affair this year.

Visitors at the house during the past month include Brothers Sidney C. Leibing, Harry S. Richardson, Valentine Mitch, Robert Wade, Hugh Holmes, Benny Wilson, Robert Downen, Carl Downen, William Downen, William Houston, Richard Brown, Claude Sweeney, and Norman Traub.

TAU BETA PI

INDIANA BETA of Tau Beta Pi is glad to announce the pledging of Clarence W. Hoff, Allen G. Stimson, Benedict Wassel, James C. Weddle, Charles E. White, and L. Herndon Witt, Jr.

At a meeting held Thursday, February 20, 1930, it was decided to award a prize of ten dollars to the student or group of students having the most novel or original exhibit in the 1930 Rose Show. The judges will consist of three men with a practical and scientific knowledge enabling them to make a fair and impartial decision.

KAPPA OF THETA XI

KAPPA of Theta Xi after four days of intensive rushing, announces the pledging of twenty of the finest men of Rose. Those pledged are: Edwin Withers, Dan Ringo, Jack Dalrymple, Glen Lautenschlager, and Homer Phillips, all of Brazil, Ind.; Roger Peugnet of Frederick, Md.; Paul Carter of Riley, Ind.; Charles Sipple of Logansport, Ind.; Richard Richmond, Otto-



bert Axton, Don Gardner, Cloyd Risher, Warren Skeeters, Norris Engman, William Heidenreich, James Paton, Forrest Heilliger, Dave McEwan, Herbert Hylton, and Edward Weinbrecht all of Terre Haute, Ind.

Our Annual pledge banquet was held at the Tavern of the Deming Hotel. The principal speaker of the evening was Brother John B. Peddle who gave a fine talk on the value of a fraternity. Other speakers were Bros. Jack Joslin, Anthony Blake, and William Bayfield.

Brother Blake accompanied by Bros. Wells, Corp, Renfro, and pledge Bro. Axton, left for the sixty-fifth annual convention at St. Louis early Thursday morning, February 20. When they returned Sunday strange tales were heard about that one trip of the year. Tales of stag banquets, smokers, formal dances, aero shows, sightseeing trips, and other "business meetings" were floating around galore much to the enjoyment and entertainment of the other brothers. In fact, everyone is looking forward to the convention next year. Although a good time was had by all there was plenty of time to transact the business at hand. Headquarters were established in the Hotel Jefferson, which was reserved in its entirety for the occasion.

The pledge dance was held at the house where sixty couples danced to the music furnished by the orchestra. The house was beautifully decorated in the colors of the fraternity and when the dance was over everyone was lavish with his praise for the social committee.

Visitors to the house were, Hubert Swartz, Herbert Matson, John Shaw, Robert Taggart, Henry Nancrede, Jack Joslin, Sheldon Johonnott, A. H. Lyons, and Jerry Pellum.

THETA KAPPA NU

INDIANA Gamma is pleased to announce the pledging of the following men: William Lindeman, Russell Powell, Howard Alvey, Chester Crom-



well, Charles Schilling, Charles Germain, Harold Williams, Ernest Leitzman, Leon Champer, William Paton, Ted Bauer, and Philip Needham, all of Terre Haute; Frank Rider, Cleveland, Ohio; Harold Barrett, Hume, Illinois;

James Cantwell, Carbon, Indiana; Reagan Mallett, Seelyville, Indiana; James Guymon, Vermillion, Illinois, and James Gillian, Rockville, Indiana.

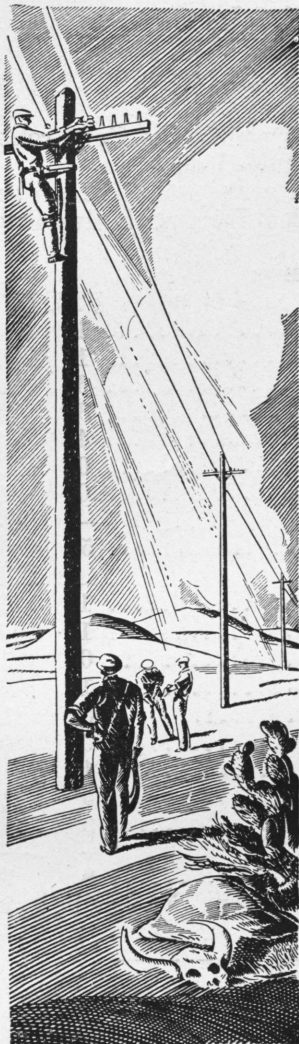
Formal pledge services were held Sunday, February 9. A pledge banquet was held in honor of the pledges on Sunday evening. Speeches were given by Brothers Stock, Osmer, and Johnson, each of whom extended a welcome into the chapter to the eighteen new pledges.

The pledge dance was held in the Vicenza ballroom of the Terre Haute House on February 21. Much credit is due Mick Kehoe, social chairman, and his assistants for the way the dance went over. The more than fifty actives, pledges, alumni, and guests showed a world of spirit and the dance was a real success. A large delegation from DePauw arrived just in time for the dance and made it all the merrier.

The alumni just can't seem to stay away. Lately, Lee Berry, Harold Carson, Harold York, Jim Procter, Walter Davidson, Marion Houston, Wendell Watkins, Allen Reeves, and Francis Tapy have all dropped in on us. We were surely glad to say hello to them again.

With the Military Ball now history, the Theta Nus are looking forward to St. Pats and the Junior Prom and assure the support of actives and alumni for both.

See you at ST. PATS!!!!



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FLORIST**

129 South Seventh

P. S.—I have attended every R. P. I.
commencement.**Athletics**

(Continued from page 154)

them accounted for 29 points, the Oaks rolled up a 20 to 5 advantage at half time.

Dunn, with six field goals, was the high scorer of the game. Sawyers led Rose with five field goals and one free throw.

Line-up and summary:

Oakland City (35)	F.G.	F.T.	P.F.
R. Kell, f.	1	0	2
Loge, f.	1	2	2
Dunn, f.	6	0	0
Patberg, c.	3	0	2
Smith, c.	4	3	2
Wilder, g.	0	0	3
Davis, g.	0	0	2

Totals 15 5 13

Rose Poly (23) F.G. F.T. P.F.

Alexander, f.	1	1	1
Fisher, f.	1	0	1
Rockwood, f.	0	1	1
Batman, f.	1	0	0
Allen, c.	0	1	1
Sanford, c.	0	0	0
Gillette, g.	1	1	1
Sawyers, g.	5	1	3
Spangenberg, g.	0	0	0

Totals 9 5 8

Officials—Referee, Weber, Evansville; umpire, Decker, Hazleton.

E. I. S. N. 35 — ROSE 22**R**OSE POLY suffered another hardwood setback Feb. 10, losing to Eastern Illinois State Normal, 35 to 22, in a contest staged at the Rose gym.

The "Suckers" snagged 14 baskets and pitched half as many foul goals. Wassen led the drive with a total of 15 points.

Fisher and Sawyers each scored three baskets for Rose with the latter adding two points from the foul line. In all, the Engineers tallied eight field and six foul goals.

Line-up and Summary:

E. I. S. N. (35)	F.G.	F.T.	P.F.
Fangolia, f.	3	3	2
Hall, f.	3	1	0
Wassem, c.	6	3	2
Haire, g.	0	0	3
Van Behren, g.	0	0	1

Totals 14 7 8

Rose Poly (22) F.G. F.T. P.F.

Fisher, f.	3	0	3
Rockwood, f.	0	0	0
Batman, f.	1	0	0
McEwan, f.	0	0	0
Allen, g.	1	0	2
Gillett, g.	0	3	1
Sawyers, g.	3	2	2
Piker, g.	0	1	0

Totals 8 6 8

Referee—Vaughn Russell.

(Continued on page 160)



TIME—THAT TOUGH OLD TESTER—FINDS A FOE THAT FIGHTS HIM OFF

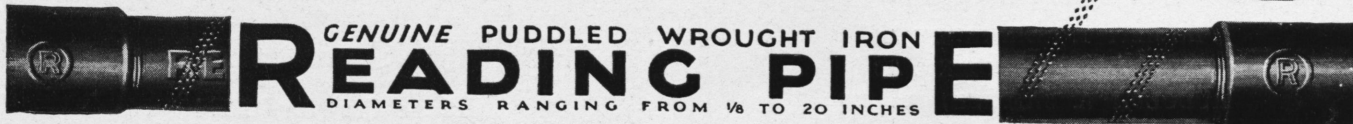
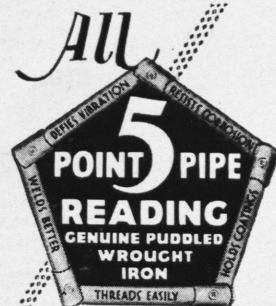
Many generations ago, Time—That Tough Old Tester—began his fight with genuine puddled wrought iron. Against that sturdy metal of which Reading 5-point pipe is made, Time first used his most potent weapon, corrosion.

Year after year after year, Time poured his corrosive mixtures over and through 5-point pipe trying to set in action the destruction which men call rust. But no loop-holes could Time find—filaments of silicious slag barred the way. Only pipe made of genuine puddled wrought iron has proved that it can thus fight off the test of Time—the only conclusive pipe test known.

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Athletics

(Continued from page 158)

DANVILLE 42—ROSE 6

DANVILLE Normal had little trouble defeating Rose Poly by the score of 42 to 6, at the Rose Gym, Jan. 23. The smaller Rose team held the big Normal five for the first few minutes of play, but they could not cope with the speedier and taller quintet from Danville.

Led by the two Reeves brothers the Teachers drove under the basket time and again and scored. Schultz played a bang-up game at center and constantly got the tip-off for the purple.

Both teams missed many shots, but the Engineers had a hard time working the ball inside the defense set up by the Teachers. In the second half the Normal Mentor sent his second team in and the teams looked more evenly matched. The Brownmen put up a hard game but they were simply outclassed and could not keep up with the pace set by the Purple five.

Allen and Sawyers looked the best for Rose with Allen playing a fine defensive game and Sawyers carrying the burden of the offense.

Line-up and summary:

	F.G.	F.T.	P.F.
Danville Normal (42)			
B. Reeves, f.	4	0	0
Woods, f.	1	0	1
Smith, f.	3	0	0
Gip Reeves, f.	1	0	0
Schultz, c.	3	2	0
Steidel, c.	0	1	0
G. Reeves, g.	3	0	0
Falkenberg, g.	3	1	1
Johnson, g.	1	0	2
Bratton, g.	0	0	0

Totals 19 4 4

Rose Poly (6) F.G. F.T. P.F.

Alexander, f.	0	0	1
Fisher, f.	0	0	1
Sawyers, f.	1	0	0
Downen, f.	0	0	1
Sanford, c.	0	1	3
Batman, c.	0	0	0
Spangenberg, g.	0	0	0
Barrett, g.	0	0	0
Allen, g.	1	1	1

Totals 2 2 7

Officials—Referee, Jones; umpire, Adams.

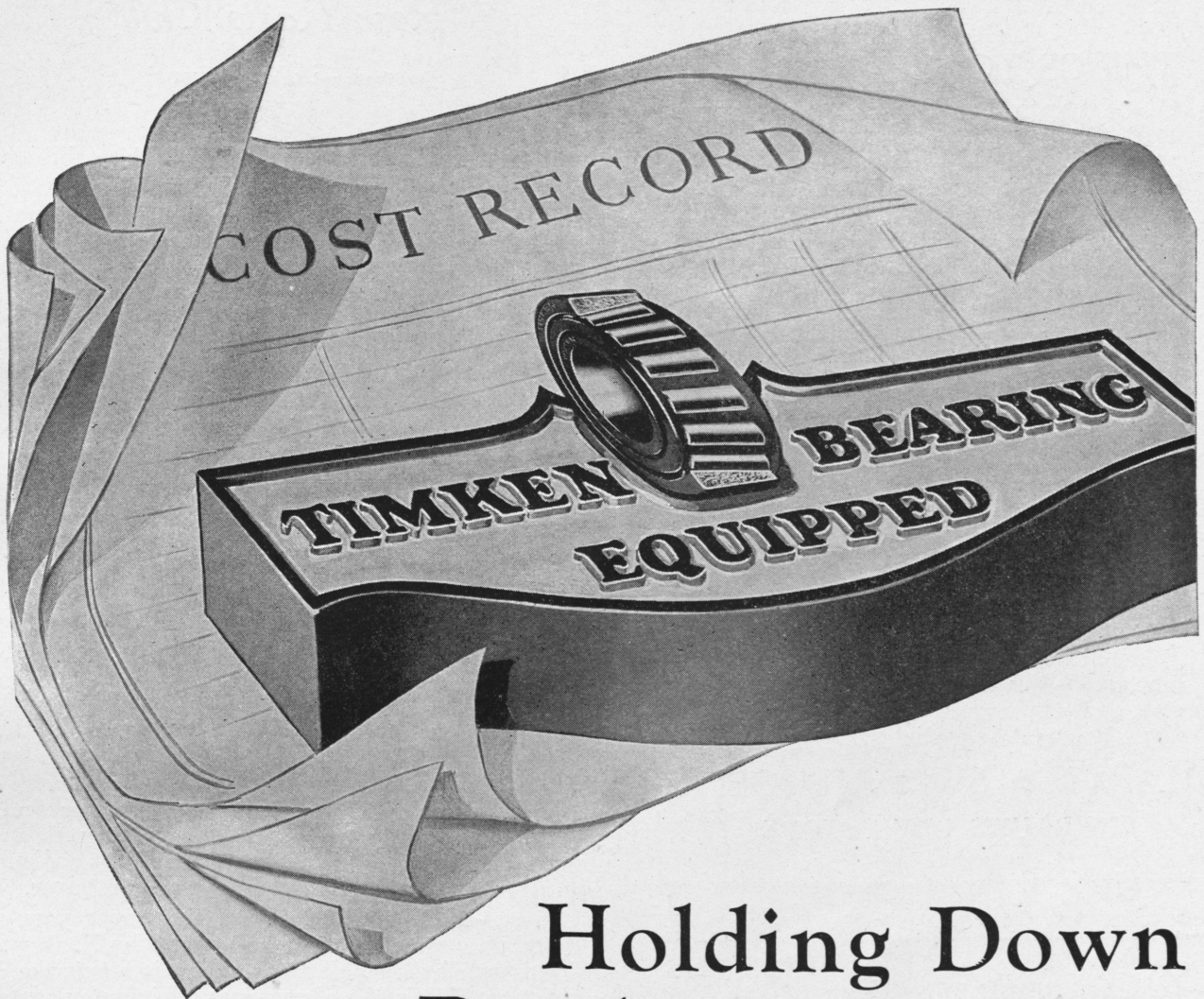
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Rose Radio Club

(Continued from page 152)

something to help make the Radio Club's exhibit the best in the show.

Perhaps the most interesting thing in the entire show will be a Television receiver which is being built by T. Cliff, president of the club, with the help of C. White. This receiver will be the first of its kind in Terre Haute and should create a great deal of interest in itself.

A. Ahler and E. Leitzman have charge of the theatre sound equipment and illustration. They plan to have miniature sound equipment on display and perhaps give an exhibition of how it works.

A heart-beat amplifier is being built by R. Blair, consisting of a sensitive microphone which, when placed over the heart, picks up the sound and amplifies it in the circuit until, when it issues from the speaker, it is as loud as a trip-hammer.

D. Williams and Schultz have collected all of the latest and oldest types of radio tubes and arranged them on a board for display.

A miniature receiver which has the volume of a large set, was built by P. Froeb. It uses only three tubes, but is very sensitive and covers a large wave band.

C. Lamb has built a short-wave receiver and a short-wave transmitter, which should interest amateur radio fans. Lamb is also working on a display showing the latest type of screen-grid receiver.

An automatic radio switch which turns your set off and on automatically is being built by N. Baptist. This is run by a small clock which is set at the desired time. When the alarm goes off it automatically controls the receiver.

There will be many other exhibits of interest, such as a portable broadcast receiver being built by Ber-caw and a speaking beam of light by Baptist and Blair. R. Blair is also experimenting on an electric eye, which should create a great deal of interest. An illustration of the process of recording radio programs has also been arranged by T. Cliff.

Besides these exhibits there are many more planned and at each meeting of the Radio Club new suggestions are constantly being brought up. In fact, the Radio Club will have an exhibit which, in itself, will be worth the price of admission to the show.

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sheepskins for machinists' tools, and gladly spent many months in the Worthington plants at Harrison, Holyoke, Buffalo and Cincinnati. They took a thorough post-graduate course in Worthington Engineering. When they finished, they were Worthington men in fact as well as in name. It is significant that 76 out of every hundred of these candidates become permanent Worthington representatives.

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While, step by step, this progress has taken place, the many men who have contributed to it could not know what far-reaching results it would have. Now the ultimate boons grow clear. Water power development becomes a national policy, steam bids fair to rival water power for cheapness, economically produced power brings more

plentiful goods, lights houses and hauls crowds in cities, is carried to rural sections to lift washday drudgery from farm women's shoulders.

Among the many industrial victories that are behind this revolution, none is more important than wider knowledge of piping materials and better materials. One of the highly prized chapters of our history is the contribution that Crane research and valve engineering has made to the general advance. The results of this research are embodied in a Crane book, *Pioneering in Science*. It is a fascinating story of engineering development and a valuable reference work for engineering students. A request will bring you a copy.

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A Day at Camp Custer

(Continued from page 145)

men win the battle with the imaginary enemy. The company is marched back and dismissed. At 3:10 the company falls in again without rifles and marches over to the stables where a drill is held, that for the average modern, city-bred youth, is both painful and embarrassing. Mounted drill, drill on army horses, horses that are stubborn and smart as only army horses can be, fills the next one and a half hours. This period is one of fun and pains for the men and one of playfulness for the horses, who take advantage of the poor unskilled riders and play the pranks that they cannot play while carrying a regular cavalryman. The company is dismissed at 4:30. The men are now busy in policing their uniforms and faces and giving their rifles a careful cleaning for the next formation.

At 4:57 the company falls in and stands retreat at 5:00, after which the company is inspected and the men who have been negligent in their toilet and in the cleaning of rifles and such are detailed for extra work for the next day. They are placed on the "skin" list, a list all men try to avoid because often-times the Saturday afternoon, which is supposed to be a holiday, is taken up by working off a "skin." After dismissal, the men prepare for evening mess. At 5:30 the company commander marches the company into mess where the men spend their happiest moments.

After mess, the men have various ways of spending the evening. Some go swimming, some talk with new friends of their college life at their different colleges, others may be seen to enter the hostess house, there to spend the evening reading or to write letters to friends, parents, and sweethearts, while those men of fickle heart may be seen polishing their boots and getting all fixed to make some fair young thing happy and give her a big moment. The evening passes and at 10:50 call-to-quarters is sounded and the men come back to their tents and at 11:00, when taps is blown, they go to bed and sleep a sleep that is sound and healthful in the Michigan night air. Then only the heavy breathing of the sleepers can be heard and everything is quiet except for a sudden call from a sentry that halts one of the late Romeos and causes him to spend his Saturday afternoon working off a "skin." So ends a day at Camp Custer, the Engineer R. O. T. C. camp of the Sixth Corps Area.

The days aren't all spent in such a manner as this one just described. The day may be spent on the rifle range or the pistol range, trestle or pontoon bridges may be built, trenches laid out and dug, barbed-wire entanglements constructed, bridges blown up with T. N. T., swimming meets or track meets held between platoons and sometimes a crew race in large pontoon boats is held on the lake. Each student officer must complete his routine as outlined by the company roster, which includes the duties from the company commander down to that of kitchen police.

The six weeks spent during the summer training period is a very concentrated and profitable period for the college men who will be the future officers of the engineer corps of the United States Army.



Our Student Loan Funds

(Continued from page 147)

Total number of individual borrowers, deducting repeated names, 268.

Total amount loaned, \$56,983.00.

Average loan to person in a year, \$121.72.

Total average loan to a person, \$212.60.

BORROWERS BY CLASSES

The following table shows the borrowers by the classes with which they were graduated. Students who did not graduate (28 in all) are listed with the classes to which they belonged while in school. The figures are corrected to Dec. 31, 1929.

Class of	Number of borrowers	Number unpaid
1912	2	0
1913	4	1
1914	6	1
1915	11	2
1916	3	1
1917	4	4
1918	16	4
1919	3	0
1920	10	7
1921	8	2
1922	12	4
1923	19	7
1924	17	11
1925	24	13
1926	17	11
1927	27	15
1928	27	23
1929	16	16

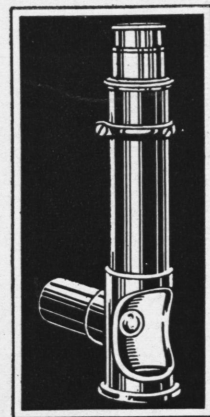
An inspection of this table will reveal that fifty-nine members of the classes of 1912 to 1920 inclusive were granted loans, twenty of whom have not yet paid. Of these twenty, however, two are dead and some others have paid in part. Members of the classes of 1921, 1922, 1923, 1924, and 1925 might also be reasonably expected to meet their obligations within the time elapsed since they left school. In this five year group there are eighty borrowers, of whom thirty-seven have not yet paid in full. One is dead and some have made partial payments. While there are some Rose men, we are sorry to say, who do not seem disposed to meet their obligations, it is gratifying to know that most of those who borrow are honest and loyal enough to repay the loan which helped them to get an education they might not have secured otherwise.

The Committee has placed in the President's office the record of all student loans since 1911, showing the amount loaned and the date of repayment. This data will henceforth form a part of the graduate's personal record. It will be of interest to a prospective employer to know how promptly a man repays his loan.

Simplicity is an exact medium between too little and too much.—Sir Joshua Reynolds.

A man is an animal that writes.—Homer.

Why Modern Engineering Hinges on Optical Science



INDUSTRY today is a rapidly increasing variable with mass production to the nth power as its final limit.

To the engineer, increased precision in the control of raw materials, of processes and of finished products becomes the vital problem in improving present mass production methods.

The Brinell Ball Test Microscope illustrated above is only one of the countless special optical instruments developed by Bausch and Lomb to aid the engineer in obtaining greater accuracy.

Bausch and Lomb will gladly lend their wide industrial experience to the solving of your problems by means of special optical instruments.

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THE result of more than 75 years' experience, Tycos Thermometers have long been an accepted standard of rugged construction, ease of reading, and permanence.

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Good Engineers Are an Asset to Any Country

Industrial progress depends upon technically trained men for Leaders. The students of technical schools must assume this responsibility of leadership.

Rose Polytechnic Institute

"A College of Engineering"

Terre Haute, Indiana

Research and Progress

(Continued from page 150)

Diesel Engine

AN engine which has received considerable impetus of late, particularly in the aircraft field and also in machinery for road construction is the Diesel. Excessive weight always has been regarded as the handicap of the Diesel aircraft engine, since cylinder pressures may approach 12,000 pounds per square inch, yet the new Packard Diesel engine has shown that even this is not a serious handicap to light engine construction. The weight of this engine is less than 3 pounds per horse power developed.

Advantages claimed for the aircraft Diesel over the ordinary gasoline engine include: (1) greater reliability due to the elimination of the electric ignition system and the use of separate fuel injection applied to each cylinder; (b) decreased fire hazard; (c) engine operation is not affected by temperature and humidity conditions; (d) reduction in radio interference due to absence of electric ignition system; (e) fuel consumption reduced about 20 percent and fuel costs about 70 percent; (f) open exhaust ports, making possible the elimination of the weight and drag of exhaust manifolds.—*Extract, Machine Design.*

Library Notes

THE following books have been accessioned by the library:

Hays, Will H.—See and Hear, a discussion of the motion picture industry.

Morrow, L. C.—Plant Engineer's Manual, a book dealing with the problems which confront a plant engineer and their solutions.

Cameron, J. R.—Motion Pictures With Sound explains some of the now more common sound picture systems; e. g., Movietone, R. C. A., Photophone, Vitaphone, etc.

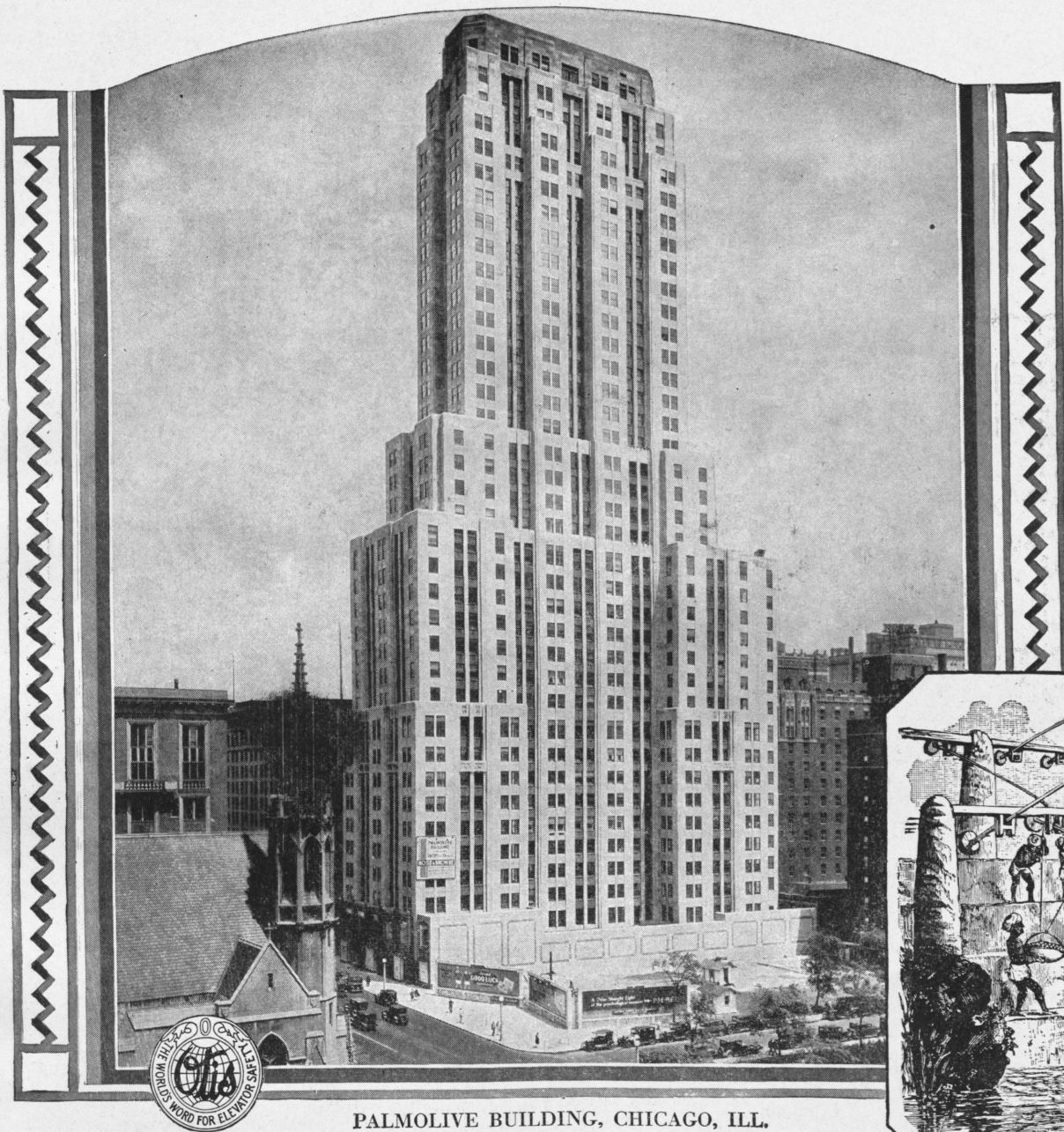
Crowther, Samuel—The romance and rise of the American Tropics. The coast of the Spanish main that crescent shore which bounds the western and Southern sides of the Caribbean, where the conquistadors conquered and everyone searched for gold, is the setting for Mr. Crowther's history of the reconquest and rebuilding of an ancient empire by American finance.

Interfraternity Conference—1929 Yearbook.

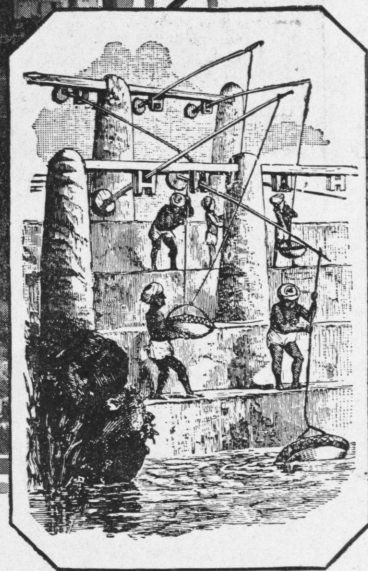
In addition there is now available in the library the Industrial Arts Index. This is an index of fifty magazines, which will prove to be a very valuable source of information. The set is complete from the beginning of 1926 to the present time.

The framed photographs of the classes of '87, '88, '89, '91, '93, '95, '96, '01, '19, '21, '22, '25, and '28 have been hung in the library reading room and the corridor leading to the library.

If you are unable to locate anything at any time in the library, do not hesitate to ask for help. Those in charge are always willing to help you.



PALMOLIVE BUILDING, CHICAGO, ILL.
Holabird & Root, Architects



One of the early
phases of Vertical
Transportation

A New Chicago Skyscraper

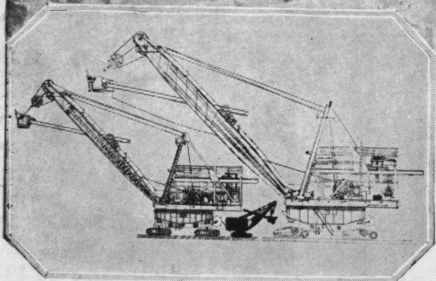
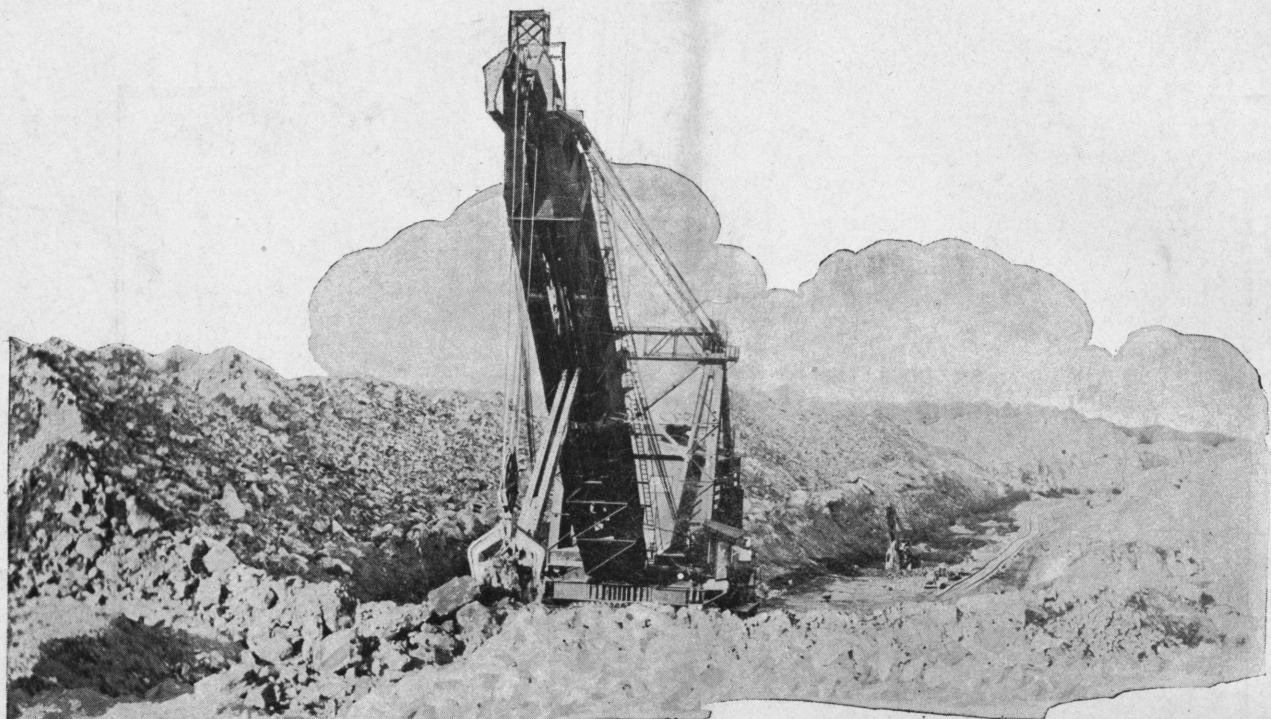
THE Palmolive Building, Chicago, although completed only a short time, is already a famous office building. It is served by 12 Otis Signal Control Elevators for passenger service.

In such an outstanding structure as this it is imperative that nothing but the finest equipment be used and Otis Elevators, with their world-wide reputation for safety and reliability, were the natural choice.

Over 75 years research and manufacturing experience are behind Otis Elevators, which are made by the same organization that has pioneered the way with every important development and major improvement in the entire field of Vertical Transportation.

OTIS ELEVATOR COMPANY

OFFICES IN ALL PRINCIPAL CITIES OF THE WORLD



A comparison: the big shovel; the previous record size; and, in solid black, the standard-size excavating shovel

A One-man shovel **9 Stories High**

ONE man easily controls the excavating operations of the world's largest shovel, now stripping coal at Duquoin, Illinois. Yet this shovel weighs as much as 20,000 men.

Its 15-cubic-yard dipper can pick up, at one bite, enough coal to heat a good-sized dwelling for a year (about 16 tons). The highest point on the shovel equals the height of a nine-story building.

General Electric, a leader in the application of electric power to industry, installed the electric equipment, aggregating 5500 horsepower.

The planning, testing, and distribution of electric equipment are largely the work of college men who are members of the General Electric organization.

GENERAL ELECTRIC



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