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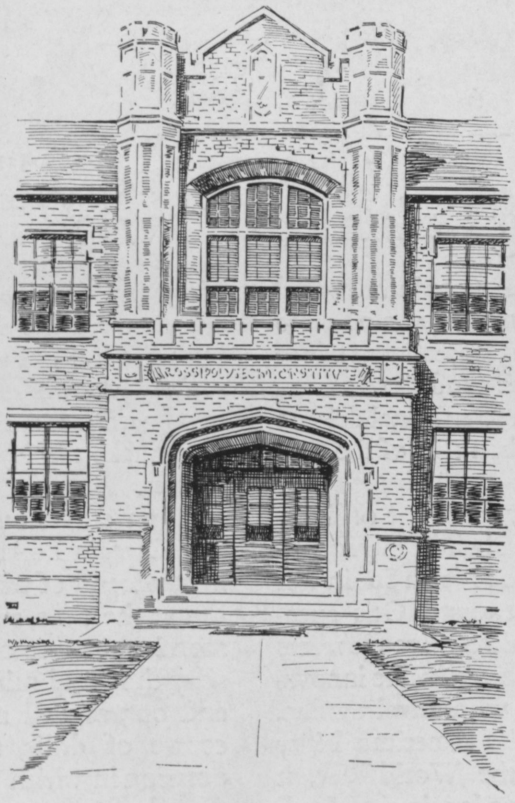

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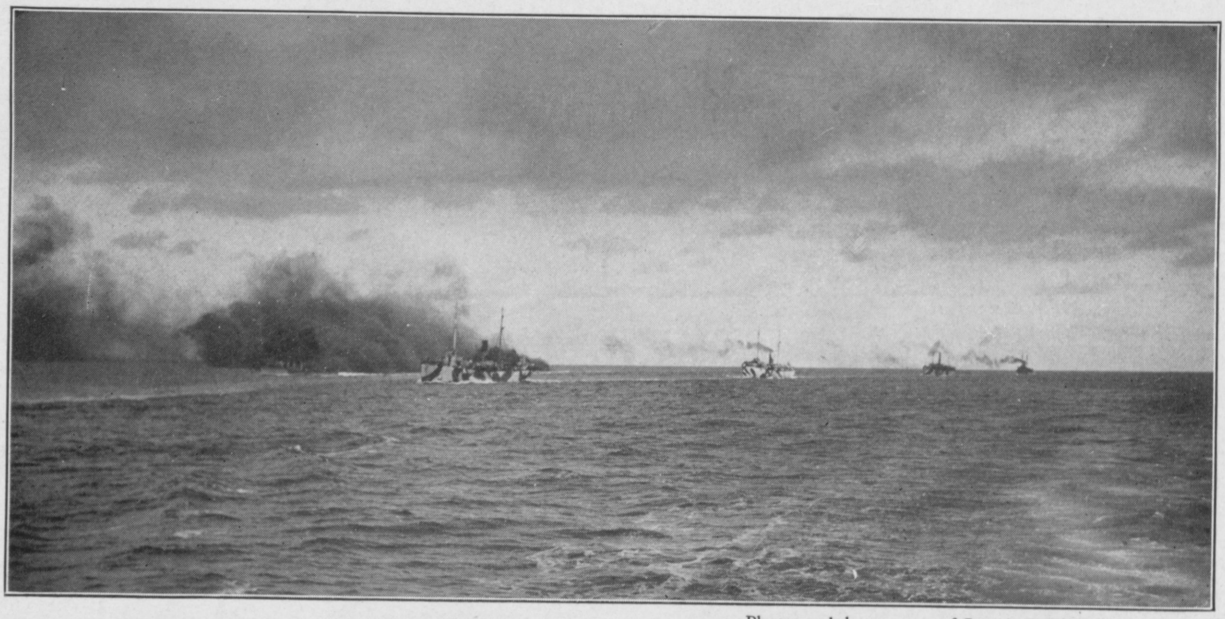

Photograph by courtesy of Captain R. R. Belknap, U. S. N.

Fighting Submarines with Elevators

When the American people answered "War" in 1917, no matter was of more importance than the readjustment of the great industries to the conditions of war, and no contribution to national defense was more exacting than that of the Otis Elevator Company.

It was a long way from the ordinary operations of business buildings throughout the country to the North Sea in war time, yet strangely enough Otis automatic leveling or micro-drive elevators proved one of the most valuable innovations in connection with naval warfare.

Up to the time the American Navy became a factor in the World War, it had been impossible to lay, in the North Sea, the contemplated mine barrage, which it was hoped could be used to prevent submarines from skirting the north end of the British Isles. This had been impossible, because the time required to get the mines overboard prevented successful results. The Otis Elevator Company cooperated with the American Navy and provided automatic leveling elevators for the delivery of the mines from the hold of the mine layers to the main deck, where they could be put overboard at such frequent intervals as to make the laying of the barrage a success.

In an article published several years ago, Captain Belknap, U.S.N., who was in command of the mine laying squadron at the time, stated that in the nine months or more of operation, in which sixty thousand mines were handled in and out, as well as many more in the course of drills, there was only one occasion in which any one of the thirty-two elevators was shut down. This was the fault of the operator, not the elevator, in that it was run too far up and jammed there for a few hours, but without causing any delay in the mine laying operation.

In war as in peace, the Otis Elevator has become one of the indispensable parts of our civilization.

Otis Micro-Drive Elevators, as developed for the mine laying ships and for the great Army and Navy Bases at New York and Boston, are now in constant use throughout all parts of the country in office buildings, hotels, department stores, warehouses, terminals and factories. The automatic leveling feature eliminates "inching" at the floors, obviates the stumbling hazard in passenger elevators, as well as saving time in operation, and increasing the life of the apparatus. On freight elevators it also provides an exactly level landing to facilitate the handling of freight.

OTIS ELEVATOR COMPANY

Offices in all Principal Cities of the World

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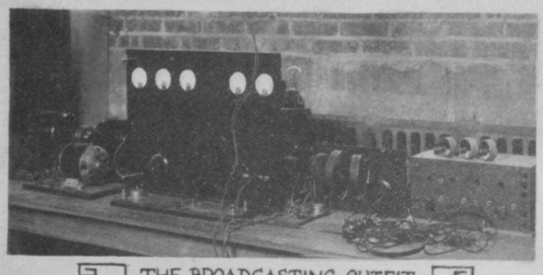

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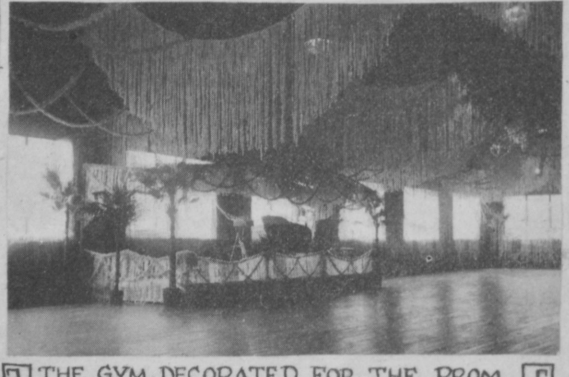


THE GYM, DECORATED FOR THE PROM.

The Engineers Contribution to Social Problems*

Does Engineering Contribute Something Unique to Education

By Frank C. Wagner, A. M., D. Sc.
President of Rose Polytechnic Institute

THE purpose of education may be said to be to prepare people to live under modern conditions. Are modern conditions different from conditions of a generation ago, so that a different education is needed?

Fundamentally, human nature has not changed. The conditions of living have, however, removed restraints in certain directions. We have overcome some of the limitations of time and space. We send messages for thousands of miles in a few moments. We travel sixty miles an hour by train or automobile, or 200 miles an hour by aeroplane. We send pictures by electricity across the country. We listen to the voices of men who have been dead for years, or we see events years after they have happened as if they were occuring before our eyes.

Do these wonderful accomplishments give to our young people a new sense of power over material things? What is the feeling of a youth who sits at the wheel of a high powered automobile and finds it respond to his every touch? Does it somehow enter his consciousness that he is freed from moral restraints also? Have not men in the past been tempted to throw off moral restraint as they have become powerful?

The engineer has produced the marvelous mechanisms that have wrought these changes. Has the engineer anything to offer in the way of a solution of the problems which he has helped to create?

I believe that he has. The engineer takes the discoveries of science and applies them to the use of mankind. He is obliged to think straight. He deals with the laws of physics and chemistry. While he makes them do his bidding, he does it by working in conformity with them.

If he fails to take account of all the factors in his problem or if he makes a mistake in his calculations, it is pretty certain to be found out. There is no arguing with the laws of physics. Facts are very stubborn things. The engineer of necessity, forms the habit of thinking logically.

A proper engineering education should cultivate in students the habit of close reasoning and of accurate calculation. Are these qualities of value to the community at large and if so has not the community the right to look to engineers to furnish these qualities toward the formation of public sentiment?

One of the dangers of the present day is the habit of loose and inaccurate thinking. Too many people reason backwards. They are like the pupil who looks at the answer to his problem and then tries all sorts of operations to obtain the answer. I tried coaching my daughter in arithmetic one summer. I asked her how she went about to work a problem. She replied that first she added and if that did not give the answer then she subtracted. If this did no better, then she multiplied. If multiplying did not do it then she divided. Anything to get the answer.

Too often people start out with an answer and the answer is usually what they wish it to be. Anything to get the answer. If you argue them down along one line of reasoning they immediately shift their ground, start out with new premises and try to reach the desired conclusion in a different way.

In these days when public opinion is so powerful, it is more than ever necessary that the public think straight.

Another aspect in which the engineering training may help is in the habit of taking account of all the factors entering into a problem. Social theories very often leave out some important factors. Human nature is not so simple as some would have us believe. If men were perfect it would be easy to devise a system of government that would work to perfection. Some social theories assume that men will do what is reasonable and will act unselfishly. Other theories assume that men act only from selfish motives. Sometimes ardent advocates of a new social scheme argue first that men now act solely from selfish motives and then immediately put forth a scheme that assumes that men will act unselfishly.

Like the Irish couple who were up before the magistrate for quarreling. After lecturing them upon their fault, the judge asked Pat if he and his wife could not get along without quarreling and live happily. "Yes," says Pat, "but not happily." Human nature is one of the facts that must be taken into account in any social scheme if it is to succeed.

There are other factors to be reckoned with besides human nature. Living conditions have changed. A new standard of living is being formed. Men will not be content to live as they did fifty years ago. This is one of the factors to be taken account of in the solution of our social problems. Here again men's desires are likely to warp their reasoning. It is easy to picture the impossible, and men will be ready to follow a plan that promises what they desire, even when it can be shown that it is impossible. come to the rescue. The engineer can figure in large numbers with confidence. If he knows how many bushels of wheat there are in the country and also how many people, he immediately figures out in his mind that each person can have so many bushels of wheat on the average and no more. Promises of unlimited wheat for everybody, if only somebody's social scheme is adopted, will not affect his judgment based upon known facts.

The engineer has not made his full contribution to public thinking unless he has brought his methods of close and quantitative reasoning to the attention of the general public.

The public recognizes what he has done with material things by using known laws and exact calculations. If he brings to bear the same methods in dealing with social and economic questions, adhering to known laws and facts, and reasoning quantitatively as well as qualitatively, I believe that he can contribute something very valuable toward the solution of the new problems, both social and economic, that are pressing for solutions.

* Address broadcast from Station WGY. March 26, 1926, on the occasion of the Schenectady Rose Tech Club meeting.

The Oil Electric Enters Manhattan*

By C. B. Keys '99
New York Office General Electric Co.

When interviewed regarding railroad transportation of the present, E. H. Outerbridge, former Chairman of the Port Authority of New York replied:

"There is perhaps no field in the use of power as important to the life and progress of humanity as the power employed in transportation, and of all forms of transportation the one of most vital importance in the United States, because of the extent of territory and its industrial development, is railroad transportation. There is, therefore, no field in the use of power where economy in its production is of such vital importance to the whole nation as economy in railroad power.

"Within only the past few years, invention has made it possible to build the oil-burning engine of much lighter weight per horsepower and therefore of less cost than formerly. Through the skill, energy, invention and courage of three associated companies this principle has been successfully applied in the development of what is known as the OIL-ELECTRIC LOCOMOTIVE."

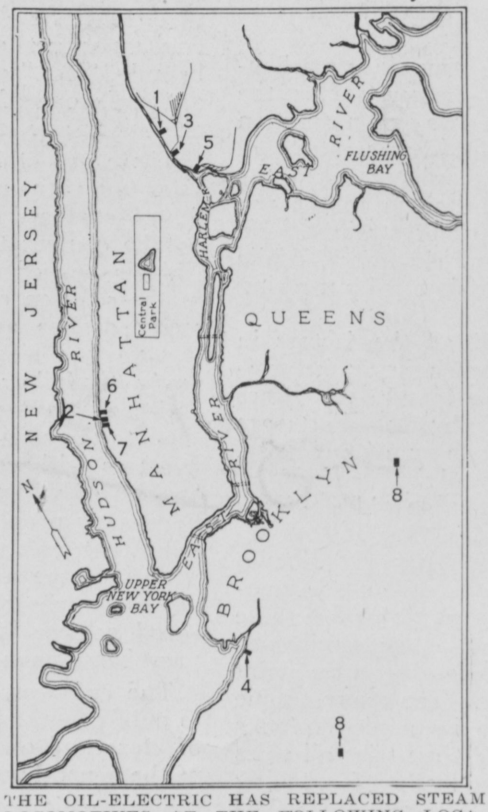
A GREAT deal of interest has been shown in the oil-electric locomotive of late, and considerable space has been devoted to this subject in both the press and technical papers. While there is a very broad field for this type of motive power, initial purchases have been largely confined to New York City and the immediate vicinity. A brief explanation of the activity in this locality may be of interest.

For a number of years engineers have foreseen the desirability of this type of motive power and some nine or ten years ago a locomotive using an oil engine of our own design and manufacture was built. This locomotive was placed in service on the Jay Street Terminal Railroad in New York City in 1917. This was during the war period when conditions were such that they reacted against the success of this particular installation. In fact, very little interest was shown in the locomotive at the time. It was a start, however. Later, a locomotive was built in co-operation with the Ingersoll-Rand Company and equipped with a 300-h.p. oil engine of that company's manufacture. In 1923, when this locomotive was placed in service on the West Side tracks of the New York Central operating between the 30th Street yards and St. John's Park in Manhattan, it created a great deal of interest among the railroads.

Representatives of some roads traveled half way across the continent to witness this locomotive in operation. In fact, the time for demonstrating such a type of motive power could not have been better, inasmuch as the railroads had just about recovered from the effects of government operation and had succeeded in restoring their motive power to such a condition that they had time for the consideration of new developments, looking toward lower cost of operation.

Later in the year, this demonstration locomotive was given a tryout in the yards of most of the railroads operating in and around New York City. These operations demonstrated the reliability as well as the efficiency of the locomotive, which received most favorable consideration from not only operating officials but engine men and train crews. The economies exceeded all expectations.

Meanwhile, the State of New York, in 1923, enacted what is known as the Kaufman Act. This law, as amended in 1924, provides that no railroad or part thereof operating within the limits of the City of New York or within the limits of an adjoining city, shall on or after the first day of January, 1926, use any motive power in its operation within these cities, except electricity, to be generated, transmitted and used in said operation in a manner to be approved by the Public Service Commission. This act was very far-reaching and affected a number of the railroads, some with major operations and others with only minor operations within the territory involved.



THE OIL-ELECTRIC HAS REPLACED STEAM LOCOMOTIVES AT THE FOLLOWING LOCATIONS:
1—LEHIGH VALLEY—EAST 149TH STREET, BRONX; 2—LEHIGH VALLEY—27TH STREET, MANHATTAN; 3—DELAWARE, LACKAWANNA AND WESTERN—HARLEM TRANSFER; 4—DELAWARE, LACKAWANNA AND WESTERN—25TH STREET, BROOKLYN TERMINAL; 5—CENTRAL RAILROAD OF NEW JERSEY—BRONX TERMINAL; 6—ERIE RAILROAD—28TH STREET TERMINAL, MANHATTAN; 7—BALTIMORE AND OHIO RAILROAD—26TH STREET, MANHATTAN; 8—LONG ISLAND RAILROAD—MANHATTAN BEACH AND EVERGREEN BRANCHES

To one not familiar with the handling of freight in New York, it will undoubtedly be surprising to learn the number of small freight yards and terminals scattered about the city. Some of these yards cover an area of only a block or two, each yard as a rule being served by a single locomotive. The majority of the yards are on the water front, and cars are brought to the yards on floats, the function of the locomotive being to take the cars to and from the floats and to spot them in the yards.

At the time of the adoption of the Kaufman Act and for a considerable time thereafter, the general impression seemed to be that it was not intended that it should apply to the small yards just men-

(Continued on page 24)

* Courtesy G. E. Monogram

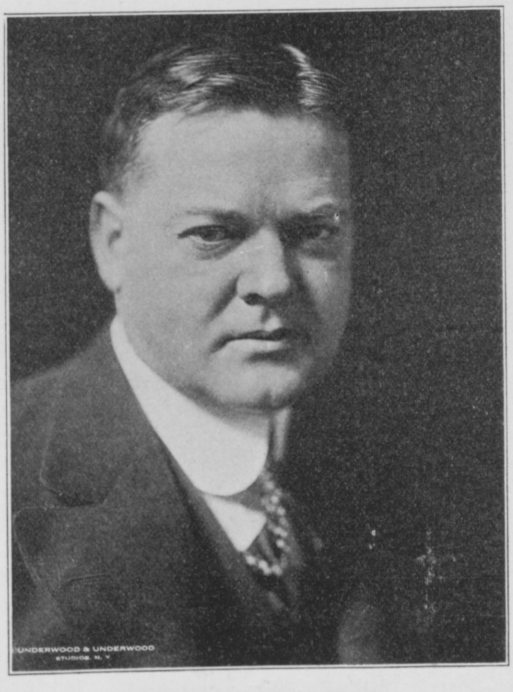
The Vital Need for Greater Financial Support to Pure Science Research

By Hon. Herbert Hoover
Secretary of Commerce

I WISH on this occasion to say something upon our great national need of a much more vigorous support to pure science research in our country.

There is no body of men more interested in the advancement of pure science than our engineers, for the engineering profession is built upon the application of scientific discovery. And of larger vision, if we would command the advance of our material, and to a considerable degree, of our spiritual life, we must maintain the earnest and organized search for truth. We could well put such an appeal wholly upon moral and spiritual grounds; the unfolding of beauty, the aspiration to knowledge, the ever-widening penetration into the unknown, the discovery of truth, and finally, as Huxley says, "the inculcation of veracity of thought." All are ample justification for our finding dollars to keep these searchers alive. But as I am proposing to support an appeal for dollars, I propose to discuss the dollars' results as well.

Research in the biological and physical sciences takes two forms; industrial research (which is the application of science) and research in pure science. Obviously, there must first be a pure science before there can be an application. I am aware that there is a twilight zone between them, but no scientist has difficulty in finding the borders.



HON. HERBERT HOOVER

While we have in recent years developed our industrial research upon a scale hitherto unparalleled in history, we have by no means kept pace in the development of research in pure science. We have an increase in some 10 years from 100 to over 500 laboratories engaged upon search for applications of known scientific fact and law. These results have been magnificent. But all these applied science laboratories are dependent upon the raw material which flows from the laboratories and men engaged in pure science. And the industrial investigators are the first to demand more support to pure science.

Not only is our Nation to-day greatly deficient in the number of men and equipment for this patient groping for the sources of fundamental truth and natural law, but the sudden growth of industrial laboratories has in itself endangered pure science research by drafting the personnel of pure science into their ranks—depleting at the same time not only our fundamental research staff, but also our university faculties, and thus to some degree drying the stream of creative men at the source. Thus applied science itself will dry up unless we maintain the sources of pure science. This is no complaint against our great industries and their fine vision of the application of science. It simply means we must strengthen the first line of our offensive. The day is gone by when we can depend very much upon consequential discovery or invention being made by the genius in the garret. A host of men, great equipment, long patient scientific experiment to build up the structure of knowledge, not stone by stone but grain by grain, is to-day the fundamental source of invention and discovery.

Compared with other expenditures of far less importance to human welfare, the amount of money annually devoted in the United States to the aid of investigators and investigation in pure science is absurdly small. It is less than one-tenth what we spend on cosmetics. We have, indeed, some fine foundations for pure scientific research—the Carnegie Institute, the Smithsonian Institution, the Rockefeller Institution and the many other research activities of much more limited but special endowments. The work of our universities, together with the work of the National Research Council and our Government agencies, have shown fine accomplishment in this field. But the whole of the income available from these sources for research in pure science certainly does not exceed $10,000,000 a year—whereas in the professional schools of our universities, in technical and agricultural colleges and experiment stations, in industrial laboratories, and in our Government bureaus we probably expend today $200,000,000 a year upon applied science research.

The wealth of the country has multiplied far faster than the funds we have given for these pure science purposes. And the funds administered in the Nation to-day for it are but a triviality compared to the vast resources that a single discovery places in

* An address delivered before the American Society of Mechanical Engineers, New York, Dec. 1, 1925.

our hands. Men of science know, from their own experience, how seriously scientific work has been impeded by lack of resources, and they will appreciate how great, in the aggregate, must be the resulting loss to the Nation and to the world.

The progress of civilization, as all clear-thinking historians recognize, depends in large degree upon "the increase and diffusion of knowledge among men." It is not merely a question of applying present-day science to the development of our industries, the reduction to the cost of living, the eradication of disease and the multiplication of our harvests, or even the diffusion of knowledge. We must add to knowledge, both for the intellectual and spiritual satisfaction that comes from widening the range of human understanding, and for the direct practical utilization of these fundamental discoveries. A special study in an industrial laboratory, resulting in the improvement of some machine or process, is of great value to the world. But the discovery of a law of nature, applicable in thousands of instances and forming a permanent and ever available addition to knowledge, is a far greater advance.

Radio communication would have remained not merely impossible but wholly inconceivable except for the fundamental experiments of Faraday, the mathematical formulation of the wave theory by Maxwell, and the experimental realization of Maxwell's predictions by Hertz; successive advances in knowledge made without thought of immediate application or financial return.

No newspaper headlines noticed Becquerel's discovery of radio activity from which long after sprung the whole train of discoveries leading to radium and its vast human service. No one reads in the popular journals of the theory of the hydrogen ion. We do hear sometimes of the effect in economy and production that its understanding is having upon scores of industrial processes, but how many know the name of the scientist who has added billions in money value to the world? And I am not sure he had even a stenographer to save his time in his race in search of other laws. The rise of the Einstein theory, which has revolutionized physical science and fundamentally affected modern thought, was rendered possible by the most abstruse developments of mathematics over long terms of years, and who may say that some day it may not become the raw material of our industrial laboratories with a fine outpouring of benefits in added human comfort and convenience?

If we were to survey the Nation, we should find that the technically trained men engaged in pure science research fall into two main groups; on one hand, those supported in the great pure science research institutions, and on the other, those in our universities or engaged in individual investigation. The number supported by our pure science research institutions, such as the Carnegie, Rockefeller, Smithsonian, and others probably does not exceed 500 technically trained men. Those engaged in pure science research in our universities or upon their own resources probably do not exceed 5,000, and most of these devote only part of their time to this work. And there are some men in our industrial laboratories who are engaged in pure science work. It is an interesting contrast that the scientifically trained personnel in applied science investigation today probably exceeds 30,000.

The problem as I see it is to secure much larger support—

First. To our university men, in order that they may be able to give a large proportion of their time to research, and that our universities may increase the number of men.

Second. To coordinated research for certain definite purposes.

Third. To the pure science research institutions.

It is on the men in independent research and in our educational institutions that the great burden of scientific advancement must always rest, and from them that the inspiration of the younger generation of oncoming scientific workers is derived. What we need above all things is the better support of these men. They should not, by the necessities of living and the cost of equipment, be forced into our industrial laboratories. Those men who show an aptitude for research should be less engulfed in teaching. Often their productivity can be greatly aided by being released from teaching and administrative demands and endowed in research positions. Much can also be done by providing them with instruments, skilled assistants, measurers, computers, and stenographers, and all the aids that the nature of their researches and the most economical use of their time may demand. To attempt to herd them into great laboratories, even for pure research, is often their least useful service. To alter their mode of life and thought would merely result in the exhaustion at the source of the vital essence of their success. Moreover, the very researches which they prosecute and the discoveries they achieve demand just such concentration of attention and originality of perception as their freedom tends to foster.

There is no price that the world could not afford to pay to these men who have the originality of mind to carry scientific thought great strides—and they wish no price. They need opportunity to live and work. No one can estimate the value to the world of an investigator like Faraday. Our whole banking community does not do the public service in a year that Faraday's discoveries do us daily. As national asset, men of his type, even when much less gifted than Faraday in the past and Millikan to-day, are beyond valuation, and no effort should be spared to facilitate their work. Only thus can they be reasonably expected to make the best use of their willingness to advance knowledge and therefore civilization, without thought of personal gain.

The universities in which most of them are employed are not to be blamed for this, because they do maintain vital interest in research and they would be glad to devote much larger sums to its support if the pressure of other demands would permit. In seeking assistance elsewhere the investigator encounters ample good will but sadly inadequate means. We may make these academic posts so attractive to the student of science that he will seek and occupy them permanently because of the opportunities they afford him to advance knowledge by original research without anxiety for bread and family and equipment. It is true that money can not buy genius but many a genius in science has defaulted because he has had to eat.

Aside from direct support to these men there is another method of organization of research among them that is no less in need of support. That is,

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Determination and Control of Distribution Transformer Loading*

By O. G. Whitecotton, '07
Supt. Adirondack Power & Light Co., Schenectady, N. Y.

THE determination and control of distribution transformer loading offers to the Central Station Engineer a problem, which, if properly planned, makes it possible to effect large economies. It has been estimated that a large Central Station Company having 6,000 transformers or more, would save approximately $60,000 per year by operating their transformers at 150 per cent rating instead of 100 per cent.

Transformers are designed on the basis of a rise of 55° centigrade above an ambient temperature of 40° centigrade under continuous load. The load a transformer may carry, however, is determined by the coil temperature and should not exceed 105° centigrade, which is the A. I. E. E. specifications for A-2 insulations. If the coil is allowed to exceed 105° hot spot temperature, the insulation may be damaged or at least the life considerably decreased. Residential lighting transformers are required to carry maximum loads for only a few hours each day and these maximum loads and maximum duration of loads are usually in the winter when the ambient temperature is low, which makes it possible to utilize their overload capacity. It has been found on distribution transformers under service conditions to carry in excess of 150 per cent and in some cases as high as 200 per cent load, depending upon how liberally the transformer is designed, without exceeding 105° hot spot temperature and therefore without damage and without decreasing the life of the transformer. It is, of course, necessary to compensate for these transformer loads in order not to interfere with voltage regulation.

Determination of transformer loading at frequent intervals during the peak load period should practically eliminate burn-outs from overloads. A number of methods have been and are now in use for determining the load on transformers. Principal among them are by loading according to number of customers, by graphic wattmeters and ammeters, by split core current transformers with ammeters, and by loading on temperature basis by use of thermo couple or by the use of thermal instruments.

The first method mentioned above is unsatisfactory on account of the varying amount of use by different types of customers and on account of the varying demand even in the same types, resulting in a wide range of ideas regarding the average load per customer. Another disadvantage of this method is the difficulty of keeping a record of the increase in load.

Graphic instruments are very cumbersome and expensive, and the instruments required must necessarily cover a large range, making a large and expensive stock necessary and are, therefore, rarely used. The results obtained by this method are, however, fairly satisfactory.

Current readings by means of a split core current transformer, taken as near as possible to maximum load periods, prove more satisfactory than either of the above methods. The expense is not large and the equipment required is small. The results obtained, however, are only indicated results and here again, due to lack of complete information, the opinion varies greatly as to the allowable load without damage or decreased life, the general opinion being that it is not advisable to carry in excess of 125 per cent normal current rating.

Inasmuch as transformers are designed on a temperature basis, the loading on heat basis is generally considered to be the most satisfactory. There are two principal methods for determining transformer heating,—one by the use of electrical instruments, but on account of the difficulty and expense involved, this method is impractical for distribution transformers and is only used for large transformers. Thermal instruments are simple and inexpensive and if used with proper knowledge as to the heat distribution of the transformer, afford a very satisfactory method for determining the safe loading of distribution transformers.

Manufacturers have been for some time investigating and experimenting with transformer temperature indicators. There are at present several on the market, all of which are so designed as to give indicated temperature as well as maximum temperatures reached. Following, I believe, is a complete list of indicators now in use.

General Electric Company's Thermotel

The Westinghouse Transformer Thermal Indicator (Manufactured by the Boyce Motometer Company)

The Standard Semifore, manufactured by the Condit Electric Manufacturing Company

The Baker Transformer Temperature Signal, manufactured by W. D. Crumpton and Company, New York City.

These indicators are made up in various designs, some to indicate by means of a drop signal when dangerous temperatures are reached, while others indicate on a scale the maximum temperature attained and also temperature at time of reading. The thermal indicators mentioned above with one exception are purely temperature indicators and do not take into account the effect of the varying ambient temperature upon the oil temperature and therefore do not give a true indication of the coil temperature. It is evident that with varying load and varying ambient temperature it is possible to get a wide range of coil temperature with constant oil temperature. For this reason, there is danger of overheating resulting in burnouts or damage if transformers are loaded on the basis of oil temperature alone. Even if thermometers are placed against the coil surface, the desired information will not be obtained. It is, therefore, necessary to provide a means of correcting for this varying ambient and indicate oil temperatures which must not be exceeded with different ambient temperatures. This may be accomplished by the use of a second element that is exposed to th air, which rotates in the opposite direction from

(Continued on page 26)

* Read at the Empire State Gas and Electric convention, New York, December 5, 1925.

Common Pitfalls of Patent Ownership*

By H. A. Toulman, Jr.

Of Toulman & Toulman, Dayton, Ohio

Who owns the patent?—Inventions made by employees—All business relations should be the subjects of written contracts—Decisions by the Supreme Court.

PATENT contracts, or the lack of them, often cause the most expensive leaks and losses incident to manufacturing. The actual loss of inventions and the time and money spent in litigation, constitute the most obvious and serious losses. A knowledge of the legal rules and of the reactions of human nature to situations developing from patent contracts, would enable a workable document to be drawn that would prevent disputes and litigation.

Failure to draw up such an agreement between manufacturers and their employees, is responsible for a large part of the disputes that have to be settled by the Patent Office and the Courts. Yet the law is quite clean cut and well determined on the subject. Carefulness would eliminate most of the losses and litigation costs.

That no business relation is so simple that it can safely be left unwritten is shown in the following case: An inventor of machinery who had not been brilliantly successful, sought additional capital. The man who finally furnished the money, naturally thought he was to be a partner. It turned out, however, that the verbal agreement was not a partnership according to the Patent Office's point of view, but, instead, was an arrangement by which the new man loaned money to the inventor and went to work for him as an employee to carry out certain special work for the inventor in his shop.

During this association, the man who thought he was a partner, actually first thought of a very important improvement which made the invention successful. After leaving his employer, he filed application for a patent on his improvement. His former employer had also filed an application for a patent on the same improvement.

The Patent Office finally decided that even though the man who thought he was a partner, had made the invention first, yet the fact that he was working under the direction of the inventor-employer would carry the presumption that the employer really made the invention.

This is a technical rule that is often unjust. Many people think it ought to be changed. But it is the law as applied in the Patent Office, and is one of those rules that must be specially known if it is to be guarded against since there is little logic behind it. This rule is characteristic of a good many rules of the law that are based upon broad matters of public policy, rather than individual justice.

There are, however, several sides to the employer-employee relation which are worthy of note, since the rules, logical or not, are well established. Take the case of a workman who develops a valuable invention in his employer's time, using his employer's tools and materials. This is an indirect contract relationship of employment, which pledges the inventor to give the manufacturer the right to use the invention in his shop. The manufacturer, however, has no right to use the invention anywhere except in his own shop. In fact, the manufacturer's right is so limited, that if he moves away or sells that shop, he cannot take the right to use the patent with him.

Let me cite a number of cases to show how many variations may arise under this employment relation: An inventor was employed at a stated salary to devote his time to the development of a process in a machine for the production of a front spring, used by the Ford Motor Car Co. He made the inventions and then endeavored to claim that they were his and that the company for which he was working had only a license to use these improvements. The Supreme Court of the United States held that the improvements belonged to the employer absolutely. This is a typical case of an employee endeavoring to secure compensation for the same job twice, by being paid for making inventions and then trying to own the inventions also.

In this case, the employee was hired for the specific purpose of making a certain invention. In the following one, the invention was made as a side issue, by a man whose duties did not include inventing. He thought of a new type of electric sadiron, together with a process and apparatus for making it. He developed the invention in the company's time and with its tools, and with the assistance of other of its employees. He permitted the company to use these inventions without any claim for compensation as an inventor. The court held that the company clearly had the right to use the inventions throughout the life of the patents, and to an extent commensurate with the extent and growth of its business.

Based, perhaps, on such rulings as this, one company sought to ignore the provisions of an agreement it had made with an employee, by which the employee was to receive royalties on any inventions he made, in addition to his salary.

The employee sued for royalties under this agreement, and the court held that even though the inventor was in the company's employ when he made the invention, there was no reason why such an agreement was not valid. The fact that the materials and facilities for making the invention or perfecting it, were furnished by the employer, did not alter the case, and the court said that this was not an inconsistent relationship, and that it was perfectly possible for the inventor to sue for such royalties and secure them, when there was agreement to that effect, and that he should have the royalties in addition to his salary.

The Legal Distinction

The courts have drawn a distinction between what belongs to a mere employee who makes an invention while working for a company, and what belongs to an executive who may be working for the same company. In a recent case, an executive, hired to make the business successful, and to make improvements in articles made by the company, made an invention

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* By Courtesy of the American Machinist

These Big Corporations*

By Charles Loomis Funnell

IS it such a bad idea to work for a big company? Do they promote more slowly, pay less and offer fewer opportunities to recent college graduates than the smaller organizations?

Those are interesting questions. You hear quite a few young college men asking them. I asked them myself just the other day.

The man I asked is a vice president of a big corporation. Because he is the kind of man young chaps like to talk with, he spends about 10 per cent of his time helping them to straighten up their ideas of what they want to do in business, and how they want to go about doing it.

"The fairest way to answer you," said the V. P., "is to look at these big corporations through the young man's eyes. Here are things that eight out of every ten uncertain young men tell me are their objections to the large company as an employer:

"First, the big company deliberately makes a very low salary bid for the young graduate's services.

"Second, it promotes slowly, with small raises for the first few years.

"Third, it is too impersonal; the young graduate doesn't meet the president very often—perhaps not once in five years.

"Fourth, the job of the company is so big that any job a young man may do is too small to be interesting.

"Fifth, the big company is a big company, and by association of ideas that means that it must be intangibly heartless and soulless.

"Now to answer these grave charges, let me tell you about Tommy Burton. He left us in October two years ago. He had been with us a year and a half. He told me he was leaving to join a one-man business. He cited the five big company indictments I have just listed for you, and said that he knew the president of his prospective employing firm very well. Mr. Small wanted Tommy to bring his young ideas to the Small publishing business and work through the office, eventually becoming a member of the firm.

"What happened? Tommy went with the Small Company, of course. He got his contact with the president—daily. Mr. Small opened the mail himself, a sacred rite which he felt enabled him to keep his finger on the business. He even opened mail addressed personally to Tommy. Each day after the opening ceremony, Mr. Small called Tommy in and gave him that part of the postal offering which he wanted Tommy to handle.

"One morning Mr. Small handed Tommy an inquiry asking the cost of twelve pages of advertising in the Small periodical, and requesting a suggestion for text and layout. Mr. Small told Tommy to answer the letter and do the copy and layout suggestions.

"Here was what Tommy had been waiting for. He found out where the advertiser's product is sold, who buys it and wherein the product differs from competitive goods. He found a basic idea and split it up into twelve closely related advertisements. He lined material for the eleven others. Then he wrote wrote the copy for the first of the series and out his letter of transmittal and quoted standard advertising rates.

"When he showed his work to Mr. Small, that gentleman very deliberately tore up the letter, the layout and the copy. He told Tommy that because the inquiry came from a personal friend a special discount was to be quoted, that the layout was too wasteful of white space and the copy too flippant.

"Tommy protested that to quote rates less than those paid by other advertisers was bad publishing ethics, and he backed up his copy and layout by saying that it was the result of the same kind of thinking which had built him a fairly good reputation with his previous employer.

"Mr. Small replied that he had been in business some thirty years and no boy two years out of college could tell him how to run it. However, Mr. Small accepted Tommy's next piece of copy as he wrote it, for it was his resignation.

"Tommy is with a big corporation now. At luncheon yesterday he told me how much he enjoys his associates. As he puts it, 'Every one of them knows a lot more than I do about some one part of the business. I can go to lunch with anybody there and learn something.'

"He has passed the stage where they stop to think how long he has been out of school when they are deciding raises. He has erased the objection of impersonality, for like his associates, he now knows more than they do about certain parts of the business.

"Having learned to give out, he can take in. He has ceased to worry about the bigness of his outfit, too, for that bigness brings advantages of itself.

"There is, for example, the matter of geography. With a small organization, having a single office and an area of business activity of only a few hundred square miles, a young man comes to think of business in terms of a few cities, a few counties, or, at best, a few states.

"But with the large organizations where offices are maintained in half a hundred cities, the chap who is coming along in that company gets a viewpoint of business which is not local but national. His trips take him to more and more remote sections. He finds that things are done differently in Maine, Georgia and Ohio. As he gets to know people in each of his company's territories, his thinking becomes broader not only on business subjects but on government, politics, sociology and culture."

By way of countering that charge of slow promotion, the V. P. again compared the Small Company with a sizable outfit. In the Small Company, there are four jobs that pay well, There are three sons of the president in the business. With the larger organization, on the other hand, the very size of the business makes it necessary to find many dozens of men to fill good jobs every year. And since it requires at least two years to get a thorough grounding in the company's operation, most of those jobs are filled from the ranks.

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* Editorial in the Saturday Evening Post.

Research and Progress

THE REFRACTORY METHOD OF CASTING CASTING IRON PIPE

Cast iron pipe is no new thing. Neither is centrifugally casted pipe the latest step in the process. But centrifugal cast iron pipe, made in a refractory mold is the last and newest achievement. "Monocast" is the name or rather trade-mark given to pipe made after this method.

The mold for this process is not an altogether new one. It is made in a metal flask lined with molding sand. As soon as it has been rammed with sand, the mold is placed in a centrifugal casting machine and the molten metal run into the pipe mold. When the bottom is covered with the iron from one end to the other, the casting is tilted to varying angles. At the point of proper distribution, the metal and consequently the mold is subjected to a sudden and greatly increased angular velocity. The development of centrifugal force is practically instantaneous; the molten metal is cast onto the walls of the sand lined molds so that every part of the pipe is formed at the same moment.

This method of manufacturing cast iron pipe, according to authorities, eliminates all casting strain so often present in older methods of centrifugal casting, as the refactory mold prevents the casting from being chilled. In addition to the above mentioned improvement, this new method gives a true gray iron structure of a very fine grain and is free of all slag and other foreign materials. Among the direct advantages, these are especially to be noted. The pipe shows 40 per cent better resistance to hydrostatic pressure than the ordinary pipe, 20 per cent greater value in cross bending, and 25 per cent greater value in withstanding shock.

The pipe machines are able to produce this article in sizes ranging from 4 to 12 in. inclusive, and all equipment connected with them are adjustable and interchangeable so far as pipe size are concerned, so that any machine can be adjusted to handle any size pipe of the range listed above. A new method, advantageous and economical as is this one, will quickly find its place in the pipe industry.

—C. R. Ploch.

PNEUMATIC CLEANERS FOR THE INDUSTRIAL PLANT

Dust, from the earliest stages of manufacturing has been a nuisance both to employer and employee of the large industrial plant. For the latter it has meant unpleasant working conditions; to the former it has resulted in injury to his product, and perhaps other offensive troubles. Yet, to adequately cope with this demon was more or less an unsolved problem.

Recently, however, there has been introduced a system that not only removes the dust particles, but collects and conveys them to a safe place all in one action. The operating mechanism is simple, its action being based on the principle applied to the household vacuum cleaner. The only big difference is that of capacity. Electrically operated centrifugal blowers and exhausters of the multi-stage type are used to accumulate the dust and to convey it to bin or other places of safety. The equipment is made in a wide range of sizes and capacities, varying from ½ to 50 hp.

Void of mechanical complexities, little more needs to be said of this apparatus from a structural viewpoint. On the other hand, its wide variety of uses merits no little attention.

While in operation, this machine raises no dust whatever. This feat is so remarkable that it has been regarded as the outstanding feature of the system. This fact gives it an advantageous use in the textile industry, where dust often clogs up the machinery. In the manufacture of lead it is used to eliminate the poisonous dusts. In the wall-paper industry and in the silk mills, where dust tends to injure the products; in grain elevators, coal pulverizing plants, starch factories, and hard-rubber plants, where dust accumulation are the cause of serious explosions, these pneumatic cleaners have been graciously received. Another use is in the power plant, where it easily and quickly removes dust for the tops and exteriors of boilers piping, and other structure; lifts it to an overhead collector, and then conveys the combustible material into hoppers to be burned. Dust explosive hazards in this way have reached a new low level. A benefit to all, this machine is the welcome addition to the industrial plant.

—C. R. Ploch.

SMOKE DETECTORS AND FIRE EXTINGUISHERS

Enclosed electrical and similar equipment often get too hot, at times so hot, in fact, that smoke and consequently fire is the result. To cope successfully with this hindrance has brought on the market an apparatus for indicating and detecting this smoke, and for the purpose of extinguishing such fires. The manner in which smoke is detected is based on the principle of the Rich system. A lamp, so as to have a beam of light, and a mirror are all that need be placed in the enclosed generating equipment. So long as the machine is running all right the air in the compartment remains clear, and the beam of light from the lamp remains invisible to the operator as he looks into the mirror. But, just as soon as too high a temperature, the general result of undue friction, is reached, a strong beam of light is observed through the smoke particles. At this point the operator releases pure, dry carbon dioxide which is stored in steel cylinders under pressure and ready for instantaneous use for smothering the fire. This gas can be released electrically, by hand, or by a combination of both methods. The first named method makes the entire operation automatic. To make things still better, the gas can be directed to any spot.

This combination system is applied to machines that are subject to overheating sufficient to cause smoke; and especially to enclosed apparatus with ventilating systems. Reports seem to verify the statement that this smoke detector and fire extinguisher equipment is adaptable to the transformer and oil switch rooms; for electrical fires may be put out in "live" equipment without damage and without turning off the power, by this system. It is likewise used to protect paint rooms, paint spray baths and

other places where highly inflammable liquids are used or stored.

In summing up, this apparatus may be classed as a combination of older known methods and systems, into an entirely new and effective apparatus.

—C. R. Ploch.

DISCOVERY OF ELEMENT NO. 61

Many people are aware of the fact that a new element is said to have been discovered. Further than this, however, they know nothing of it. And it is true that little is really known about this recent addition to the chemical family. On the other hand, the way in which it was discovered has been related, and is indeed of interest.

The discovery had its foundation several years ago, when the University of Illinois and the Bureau of Standards co-operated in an endeavor to map the arc spectra of the pure rare earths. Upon examining pure neodymium and samarium materials, 130 lines were observed that corresponded to the spectra of both of these elements, but which in no way checked with any of the known elements.

This encouraged any faint suggestion that these lines might be due to the presence of element No. 61. So with such an incentive, and under the leadership of Prof. B. L. Hopkins, work began in an effort to isolate this element. Materials were prepared by the fractional crystallization of magnesium nitrates by the X-ray method. This gave no conclusive proof of the presence of the sought-for element. But, when the arc spectrum was examined an additional five new lines were produced in the ultra violet ray. Though very faint in the pure neodymium and samarium, they were more pronounced in the intermediate fractions.

Dr. Leonard F. Yntema, as a result of his experiments believed that if element No. 61 was present in the material being used, it was in very small amounts, presumably less than one part per thousand. Later it was decided to concentrate materials of magnesium nitrates and bromates, and subject them to fractional distillation. The theory of this process was to separate the unknown from the more plentiful neodymium. A new line of absorption spectrum was immediately noted, and by using this for a guide, fractions were obtained showing heavy absorptions bands that could be the result of none other than the new element. Having later been subjected to the X-ray for examination, the lines for element No. 61 have been obtained.

The discovery of the new element is therefore based upon the proof obtained by the arc spectra, absorption spectra, and the X-ray spectra. The element as yet has not been named. Various names have been proposed but among the most prominent is illinium with symbol Il.

—C. R. Ploch.

BUREAU OF STANDARDS MONOGRAPH BY WEBER

One of the most complete service monographs just issued by the Institute for Government Research deals with the history, activities and organization of the United States Bureau of Standards at Washington. This monograph which contains three hundred pages of the most detailed description of what the Bureau has done and is doing was prepared by Gustavus A. Weber.

In the foreword to his book Mr. Weber makes the following explanations:

"Under present conditions services frequently engage in activities in ignorance of the fact that the work projected has already been done, or is in process of execution by other services. Many cases exist where one service could make effective use of other services had they knowledge that such facilities were in existence. With the constant shifting of directing personnel that takes place in the administrative branch of the national Government, the existence of means by which incoming officials may thus readily secure information regarding their own and other services is a matter of great importance."

"To the public these monographs will give that knowledge of the organization and operations of their Government which must be had if an enlighted public opinion is to be brought to bear upon the conduct of governmental affairs."

The monographs will undoubtedly furnish an essential school for better legislation, administration and popular control and will be the basis for constructive work on the part of those in the responsible positions.

—Bulletin Am. Eng. Council.

THE MODULUS

The yearbook of Old Rose, The Modulus, is nearing completion. For completeness of detail, artistic arrangement, and a book which truly preserves college days, it will far surpass anything heretofore published by the student body. The Modulus will contain photographs of the faculty and all members of the student body. Special attention will be given to various school activities such as the Y. M. C. A., Rifle Club, Radio Club, Rose Technic, Camera Club, and Junior Prom.

Of course athletics will share a goodly portion of the book. The successful season of athletics that Rose has enjoyed for the past year will be given a prominent place with photos of football, basketball, baseball, and track men. The Rose Engineer Unit of the R. O. T. C. will retain a considerable section of the annual.

A special feature will be the description and plans of the Deming Memorial Dormitory which is now under construction. Fraternities and snapshots will convey more intimate glances of student life and activity on the campus. These, together with a joke section, only begin to set forth why the book will represent 1926 potentialities of the Institute.

Loyal Rose students and supporters will be the owners of the 1926 issue of the Modulus.

To alumni—The Modulus will show through the medium of the present Rose the recollections of those school days of yore. Send your reservation for one of these yearbooks at once.

TECH LETTER BOX

This section is exclusively devoted to news from Rose Tech clubs and items of personal interest to alumni. We might call it an open forum. The principal excuse for its being is that it has started itself. Alumni like to hear about one another—what they are doing—whether they are playing golf or baseball. Your letter, if it is of general interest, will be published in these columns. Address all communications to Letter Box Editor, c|o The Rose Technic.

DOINGS IN AND AROUND CHICAGO

Some time ago the Chicago Tech Club held a dinner meeting of a type that all the Rose Tech Clubs will do well to remember when planning future social affairs. They conceived the idea of inviting not only the alumni, but also their better halves; and provided features on the program which proved quite entertaining to all. The dinner was held at the Chicago Engineers' Club with Dr. Wagner, President of the Institute, and C. F. Loweth, guests. Mr. Loweth, who is Chief Engineer of the C. M. & St. P. Ry., will be remembered as having been selected to deliver this year's Commencement Address. As regards the program of the evening, the following paragraphs of a letter from President Walter Mills of the Chicago Club will bear repeating.

"I feel that everyone enjoyed our last meeting at the Engineers Club when our Club gave a dinner for Dr. Wagner and Mr. Loweth—including the ladies. It was good to get a little intimate and first hand information from Dr. Wagner regarding the activities and plans of old Rose. Those of us who passed through Rose before Dr. Wagner, and had never had the pleasure of meeting him before, were delighted to have this bit of personal contact with the man who has had the advancement of Rose so near his heart for these many years.

"Mr. Loweth gave a most delightful account of the overcoming of some of his engineering problems—such as anchoring sliding bridge piers, "stretching" a bridge that was built a foot too short, etc. His talk was so entertainingly given, that the ladies completely forgot they were attending an engineering party.

"However, that our ladies might feel that we gave just a little thought to their pleasure and entertainment, I had my sister give her very informal talk, "Intimate Glimpses of the Highways of Rural England" illustrated with slides made from her pictures and colored by her.

"Altogether it was a delightful evening and we hope to have more of them; we want to have an evening picnic in one of our parks soon as the weather gets warm when even the kiddies can come also, as we want a better acquaintance all the way through in our Chicago Rose Tech Club."

Regarding the activities of the Rose boys in Chicago, W. Mills says, "The only things that I know of which are out of the ordinary are the completion last year of a viaduct over the Illinois Central Railway at 23rd Street which was designed by Mr. Theodore L. Condron—it being quite an engineering masterpiece—and the activities of Major Wm. C. Arn in connection with the electrification of the Terminals of the Illinois Central Railway of which Company he is the First Assistant Chief Engineer. The first big electric engine to run over the suburban rails in this project was pictured in our papers recently. The elevation and electrification of the Illinois Central tracks in Chicago and suburbs is a feat that all Chicago is proud of and a feat in which the Chicago Rose Tech Club has especial pride because of Major Arn's activities in it."

ACTIVITIES OF CLEVELAND ROSE TECH CLUB

A Meeting of the Rose Tech Club of Cleveland was held at the University Club, April 24, 1925, at 6:30 P. M. Members in attendance were, G. McCormick '08, F. Fishback '02, J. Hall '97, E. Taggert '22, H. Fitzsimmons '22, H. Richardson '00, R. Wright '23, B. Jacob '03, H. Shaw '10, J. Darst '09, C. French '04, H. Petit '03, S. Brosius '03, D. Griffith '22, W. Woody '14, M. Tilley '17, H. Johnson '23, and H. Schwartz '01.

Dr. Mees was the guest of honor. After the banquet he gave an interesting talk on conditions at Rose and the future outlook of the school. He very interestingly told of the Professors, both active and retired. He also recalled some reminiscences of the student days of some of the members present.

Mr. Schwartz, president, asked the club members to express opinion relative to asking local men of prominence to address the meetings at times when Rose men were not available. The expression of opinion indicated that the members desired Rose faculty members when ever possible.

The meeting adjourned at 10:40 P. M.

A meeting of the Rose Tech Club of Cleveland was held on Dec. 11, 1925 at 6:30 P. M. at the University Club. Members present were, H. Schwartz '01, F. Fishback '02, G. McCormick '08, M. Tilley '17, H. Fitzsimmons '22 H. Shaw '10, W. Woody '14, J. Dombirer, and D. Griffith '22.

Dr. Howlett, professor of physics at Rose, was the guest of the club. He discussed the impressions which Rose had made upon him, the work of the department, some special research work which he is engaged in, and the athletic situation at Rose.

Fred Fishback had some interesting information concerning the athletic situation and the school in general.

Our own vaudeville team of McCormick and Dombirer furnished amusements of quality for all.

Meeting adjourned about 11 P. M.

The Rose Tech Club of Cleveland met at Fenway Hall for an informal a la carte luncheon at 1 P. M. Saturday, March 27, 1926. Members present were, H. Schwartz '01, M. Tilley '17, H. Johnson '23, E. Taggert '22, R. Wright '23, D. Griffith '22, H. Eastwood '06, H. Shaw '10, C. Cook '05, J. Hall '97, and H. Richardson '00.

The officers for 1925 were reelected to serve for the year 1926.

They are:

President—H. A. Schwartz.
Vice President—Jay Hall.
Secretary—D. L. Griffith.
Treasurer—H. Richardson.

Dr. Wagner was the club's guest. He spoke informally of Rose affairs and answered all questions asked by the club members.

Capt. Shaw furnished light for a motion picture taken by Schwartz. The picture failed to develop—which is perhaps all for the best.

The meeting adjourned at 5 P. M.

ST. LOUIS CLUB MEETS

An enthusiastic meeting of the St. Louis Rose Tech Club was held at the Forest Park Hotel upon the evening of April 24th. There were present E. C. Bradford '11; F. N. Hatch '06; J. A. Hepp '12; George W. Holding '17; W. Arnold Layman '92;

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EDITORIAL

WE NEED MORE ENGINEERS

Earl D. Hay, who was graduated in the class of '10 is now Dean of the College of Engineering at the University of Wyoming. In a recent issue of The Branding Iron, the weekly campus newspaper of that institution, he pays the following tribute to the engineer and his accomplishments.

"Engineering is one of the greatest **professions** of modern times. This has rightly been called the Engineering Age because some aspect of engineering touches every phase of life. Practically everything which we eat, wear, or use comes in contact with some phase of engineering. Engineering enters vitally into the economic life of today. It is the engineer who makes possible improved machinery and methods of manufacture which produce our food, clothing, and automobiles, so cheaply. It is the engineer who has so improved the methods of transportation that we may now have the fruits, and spices of the far corners of the earth placed upon our tables at a very nominal cost. It is the engineer who has so improved our methods of communication that we may now enjoy the musical programs and entertainments of the largest cities right in our homes.

"The first engineers to pioneer in an undeveloped country are the civil engineers. They make land surveys, lay out and build highways, bridges, railroads, irrigation systems, etc. If there are materials in the land, the mining engineers soon follow to prospect for ore, to open mines and establish mills and smelters. As cities spring up, mechanical engineers are needed to operate shops, mills, power plants, and factories of all kinds. Electrical engineers are needed to operate electrical power plants, telephone systems, transmission lines, to do electrical contracting, etc. Structural engineers and architects are needed to design and build buildings of all kinds."

In closing his enumeration of the engineer's tasks Dean Hay's final words ring true and may well be the message of Rose to future students:

"The faculty extends a welcome to all earnest young men who desire to prepare themselves for the profession of engineering. Its ideals are high; the training is rigorous, but its rewards are generous for those who are in earnest and who have a genuine love for the work."

THE ARM-CHAIR JUDGE

"To be educated," said some great and wise man, whose name we have unfortunately forgotten, "is to be possesed of enthusiasms." Enthusiasms: not just enthusiasm, that great allerhoechst Gott of the American college, commonly known as "pep" or more pedantically as "college spirit." But enthusiasms, an eager interest, an ardent zeal and a desire to work for those particular things which we believe to be fine.

The so-called "liberal" or "thinking" student who takes his education seriously, at least between lectures, is apt to be very suspicious of enthusiasms. He has no illusions. If you pass him a doughnut, he eats it and sighs about "the poor wage slave who cooked it in an underground kitchen." If you ask him what he is doing, he will show you a vast pile of books and manuscript, and mutter vaguely that he is "acquiring a point of view." His ideal of a liberal and intelligent thinker is one who will listen conscientiously to all sides, one who will maintain a calm "point of view" while the vulgar herd throws its propaganda and partisan lies back and forth below him.

Having got rid of his prejudices with infinite pain, he has no intention of espousing new causes. Henceforth he will look at everything "as a student," he will divide everything into past, present and future, mind, body and spirit, cause and effect, heredity and environment; he will outline the whole neatly in black and white and consider his work as an intelligent man does.

This is the danger of education. It makes a man think he's intelligent if he can point out where other people are foolish. It persuades him that he does enough if he bravely but politely says, "I'm sorry but you see you are a fool because—thus and thus." But this is only half. He must be affirmative. He must be willing to throw his personality into the scales in behalf of those causes he believes to be fine. And he must have enthusiasms. Whether they are for better congressmen or better babies, for fewer words or fewer wars, for more interesting movies or more interesting men, he must support them with all his force.

The open mind which education is supposed to produce! It may indeed open the windows, let in the sun and air, and show things in their true proportion. It must do more. It must open the door and let in the man who shall master the mind and rule it and put it to fine uses.

—The New Student.

IN THESIS TIME

As time for graduation approaches, we must 'grin and bear' the sounds emitted by the howling motors on dynamometer test in the mechanical laboratory. The electricals are also running enough speedy apparatus, but they are not perturbed about internal combustion at the present ime. Then too, heir well-lubricated brake tests could never produce the disquietude that supercharging does on a gasoline engine. With some of the seniors in school, and others far afield in search of the elusive data we find thesis work progressing at the regular time-pinch rate.

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Schenectady Tech Club Shows Its Colors

Broadcast Program Made Event

The Schenectady Rose Tech Club held a meeting and dinner in honor of Dr. Wagner, March 26, 1926 at the Mohawk Club in Schenectady. Every minute was made to count from the time when Dr. Wagner arrived. Seven o'clock sharp, we sat down to a perfectly served dinner, 18 Rose men strong. Time flew during that first hour, and according to schedule, Dr. Wagner was introduced in the WGY studio at 8:15. His talk on the subject of "The Engineer's Contribution to Social Problems" was well received at the dining room of the Mohawk Club.

Following the speaker's return to the Club an additional radio program, purported to be from WGY, ran as follows:

"This is **Station WGY** of the **General Electric Company** at Schenectady, N. Y., Wm. Crook announcing, from the **auxiliary studio.**

"We are experiencing a little difficulty in securing proper wire connections with WJZ of New York City, but we expect to clear this trouble in a few minutes, and continue our program in conjunction with that station.

"In this interval of a few minutes we will broadcast a few remarks of special interest to our friends, the Alumni of Rose Polytechnic Institute, who are listening in at Rose Tech Club dinners being held this evening in various cities.

"The Schenectady Rose Tech Club is giving a dinner this evening at the Mohawk Club. The guest of honor is Dr. Wagner, President of the Institute, who a few minutes ago addressed you from this station on the subject. "The Engineer's Contribution to Social Problems."

"You will be interested, we are sure, to know those who are attending the Schenectady dinner.

"The class of '88 is represented by Waters;

"From '99 there is Edwards; he tore himself away from business and family cares, and he's there;

"We wish at this time to acknowledge the following telegram from the Cincinnati Club to the Schenectady Club:

UNDERSTAND WATERS AND EDWARDS ATTENDING DINNER GET THEM IN STUDIO AND HAVE THEM SING OLD ROSE SONG SWEET ROSIE O'GRADY

We regret that we will be unable to comply with this request of our friends in Cincinnati—because of the length of time it would take these gentlemen to get to the studio.

"The class of '05 is represented by Pfeif. We understand that Pfeif had an altercation with a traffic officer while driving down to the dinner, and was advised that "if he wanted to go fast, he should go down to the power house and ride around on the fly-wheel."

"For '07 there is Whitecotton. It is hoped that the Adirondack Power will not turn off the lights tonight, as Whitecotton's presence is desired.

"The Schenectady Club members are glad to have with them again "Seed" Henry of class '18. President Weir '21 of the Club has been unable to get any information concerning Seed's recent whereabouts, but suspects he has either been studying for an M. S. degree, or playing professional football.

"Conover, of '22, the newly-wed, was permitted to come out to the dinner tonight, but he is due back at his fireside at 9:45 sharp.

"The class of '23 is ably represented by "Bin-nett," correction—Bennett, Shiek Wilson, Brown, and Albright.

"Class of '24 has "Soapstone" Jean, the man who got Japan on his Radiola 20; and Waltman, the celebrated walking champion.

"Dunning and Sato, the G. E. night force, speak for the class of '25.

"We have just been advised that Dr. Wagner omitted two important paragraphs from his address and wishes that they be read at this time. They are as follows:

Who is the man who designs our pumps with judgment, skill and care;
Who is the man who builds them and keeps them in repair;
Who has to shut them down because the valve seats disappear?
The bearing-wearing, gearing-tearing, mechanical engineer.

Who buys his juice for half a cent, and want to charge a dime;
Who, when we've signed the contract, can't deliver half the time;
Who thinks the loss of twenty-six per cent is nothing queer?
The volt reducing, load reducing, electrical engineer.

"Station WGY of the General Electric Company at Schenectady, N. Y. We are now transferring control back to our main studio."

The program was thoroughly enjoyed, and many a puzzled look appeared on the faces during the fake broadcasting program arranged by C. W. Fall, class of '18. Waltman and Albright were the Radio Engineers on this job.

In the latter part of the evening Dr. Wagner gave a very interesting talk on the activities at school; about the new Dormitory, and campus activities. Nearly every man present had some questions to ask concerning the school or school life.

Several very good views of the new school were shown. These proved of considerable interest to the older men who had not seen the new building.

The Schenectady Rose Tech Club is composed of the following members:

A. H. Moore, '88
E. G. Waters, '88
E. E. Gilbert, '89
W. J. Davis, Jr., '92
H. E. McDermott, '93
S. E. Johannesen, '93
E. P. Edwards, '99
G. H. Pfeif, '05
W. O. Hensgen, '06
R. S. Sage, '07
O. G. Whitecotton, '07
H. J. Madison, '10
P. F. Stokes, '10
H. C. Uhl, '12
G. W. Evans, '16
C. W. Falls, '18
G. B. Henry, '18
J. A. Wildermuth, '18
I. R. Weir, '21
O. E. Conover, '22
C. B. Wilson '22
R. B. Bennett, 23
E. Brown, '23
J. E. Albright, '23
Wm. Waltman, '24
G. Y. Jean, '24
J. T. Stone, '24
O. M. Dunning, '25
N. Whitecotton, '25
M. Sato, '25
E. A. Rickleman, '25

ALUMNI

'08

H. H. Boyd has moved to 270 Glover Building, Kansas City, Mo.

'11

Henry R. Vocker has taken a position in the Pneumatic Sales Division of the Ingersoll-Rand Company, at Athens, Pa.

Milford G. Welsh has gone to Wilmington, North Carolina to take a position with the Tide Water Power Company.

'13

Claude E. Reese is sales engineer with the American Brown Boveri Electric Corporation of Chicago.

'14

We are very sorry to report the death of Frank A. Rogers, who died in Chicago on April 24th.

Walton Woody has been promoted from acting manager of the Cleveland National Malleable and Steel Casting Co. to manager of the Chicago works of the same Company. He is to reorganize and modernize the Chicago plant.

'15

Ernest Hess is now with the Lufkin Foundry and Machine Co., at Lufkin, Texas.

'16

F. C. Wagner, Jr., is with the Central Texas Power Company of San Antonio, Texas.

'16

J. P. Brown is teaching in the schools of San Bernardino, Calif., and working for his Masters Degree at the University of Southern California.

'17

Milton Tilley has succeeded W. Woody as Metallurgist at the Cleveland Works of The National Malleable and Steel Casting Co.

David W. Holloway is with the Big Four railroad at Cleveland.

'19

Paul L. Fuqua is with McGuire and Shook, Indianapolis, Ind.

'21

Claude M. Gray has moved to 309 Kenmore Road, Indianapolis, Ind.

'21

Allan S. Bixby has been transferred to Chicago by the National Malleable Steel Castings Company.

Lloyd Greenbaum is Factory manager of the Reed Air Filter Company at Louisville, Ky. He writes that he hopes to visit the Institute in June.

'22

E. O. Hunt has been transferred to Denver, Colorado. Address 2941 Walnut Street.

James W. Landrum died Tuesday, April 27, at St. Anthony's Hospital.

'25

J. H. Reifenberg writes from Mansfield, Ohio, where he is temporarily located with Bolin '25, St. Clair '23 and Lehner '25.

E. F. Rickelman, with General Electric, has been transferred from Pittsfield, Mass. to Schenectady.

G. H. Pfeiffer, who is to receive his M. S. Degree in June from Carnegie Tech, has accepted a position with the Hercules Powder Co. at Kenvil, New Jersey. Henderson '22, and Suttie '22 are in the same plant.

O. M. Dunning has been promoted to Test Engineer of the Radiola 20 production at the Schenectady plant of General Electric.

'27

Bill Kintz is working for the Dresser Power Co.

'28

Dick Cole ex '28 is working for the Illinois Pipe Line Co. at Shelby Wyoming.

project and those opposing it were carefully develop-

Lakes to Hudson Route Not Favored by Engineer Board

Plan Said to be Unfeasible as a Rate Reducer and Cost is too High

The special engineer board which was appointed to report on the All-American Route for the proposed Great Lakes-to-Sea Waterway has reported that the project is not feasible as a rate saver and recommends that full information on both this and the St. Lawerence route be assembled before making a decision on a case which involves such large expenditures and far reaching possibilities.

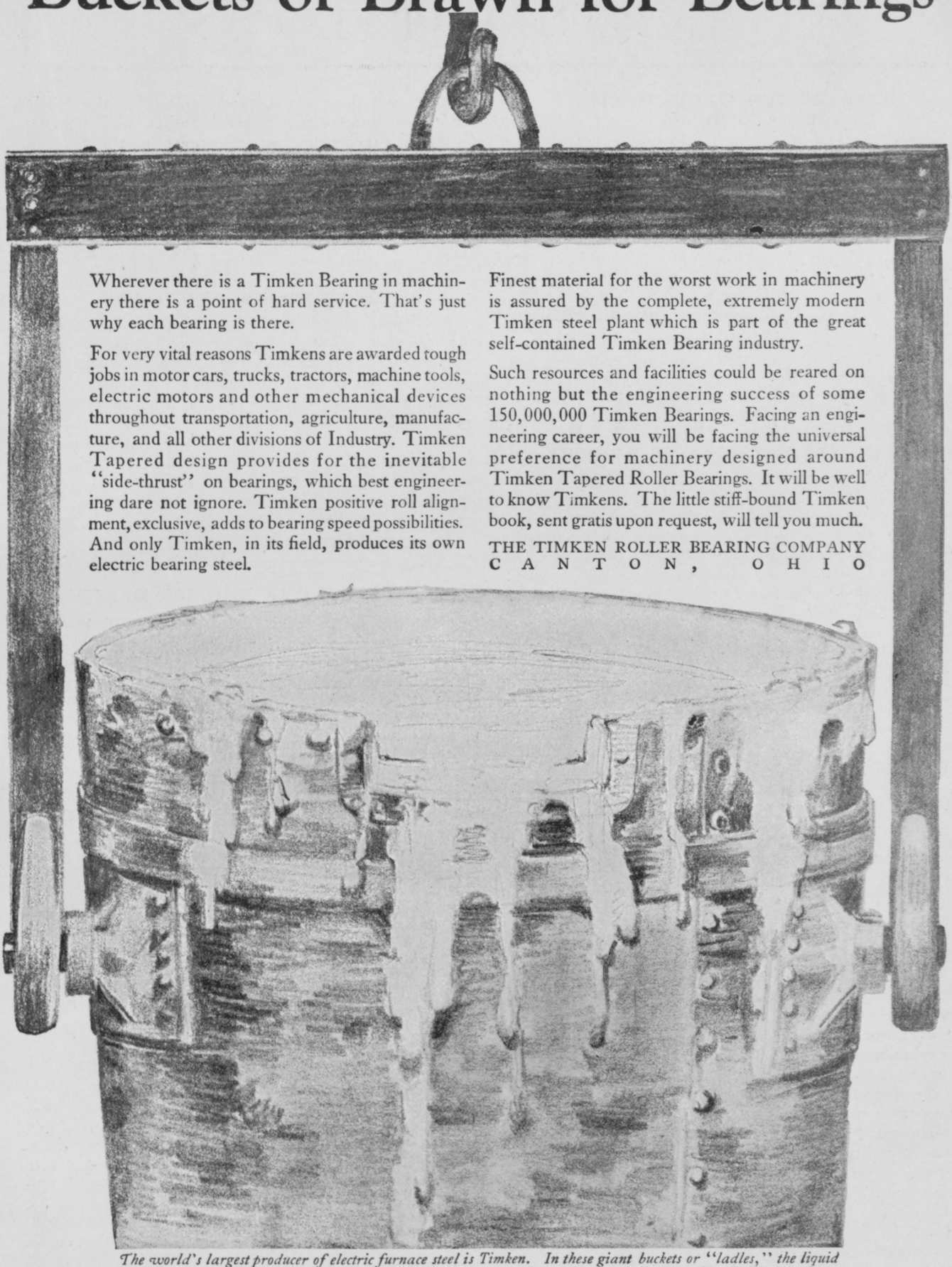
The river and harbor engineer board report held that more time was needed for exports to determine which of the two routes was to be preferred. In this connection it was pointed out that additional data on the St. Lawrence project would soon be available.

Congress had limited the time in which this report was to be submitted although it had been contemplated that ample time had been gained in which to make a thorough report. Both views in favor of the ed before the engineer board as a result of which it was recognized that there was a demand for a deep waterway connection from the Lakes to the Atlantic for the purpose of reducing transportation charges on commerce that could be sent over the route. Those interested in such commerce also want a canal between Lake Erie and Lake Ontario, east of the Niagara River, which would also give a route entirely in American territory. Advocates felt that such a route would be a national asset from the standpoint of defense. The interests which opposed the project claimed that national defense was of little significance in this connection.

If a 20-foot waterway is provided the board estimated that a traffic of 13,450,000 tons would move over it annually with a saving in freight costs of $11,235,000. A 25-foot waterway, it was estimated, would carry 15,500,000 tons annually at a saving of $22,500,000. The route favored was estimated to cost $449,000,000 at first for a 20-foot waterway and $506,000,000 for a 25-foot waterway.

—Bulletin Am. Eng. Council.

Buckets of Brawn for Bearings



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ATHLETICS

ROSE SWAMPS OAKLAND CITY IN BALL OPENER

Rose Poly's baseball team opened the 1926 season, April 19, with a very impressive victory over Oakland City College by a score of 11-4.

The game was of the early season type with both teams making numerous errors. The Engineers started the game off with a bang showing six tallies across the rubber before the "Oaks" could get the necessary three outs to retire the Fighting Engineers.

Babillis started on the slab for Rose and allowed only four hits in five innings he worked. Wells, who relieved him, finished the game in nice shape.

Rose has some wonderful baseball material this year and under the coaching of Coach Settles is looking forward to a successful season.

Rose Poly	6	1	0	2	2	0	0	0	*	—11
Oakland City	1	0	0	0	0	3	0	0	0	— 4

ENGINEERS WIN SECOND VICTORY

Rose Poly defeated Indiana Central on April 10 to a score of 7-5 in a game featured by the fine hurling of Babillis, Rose twirler, who struck out 14 men.

Herrin, Indiana Central flinger, pitched good ball, but was not consistent. Rose scored three runs in the fifth and eighth innings, and one in the seventh. Indiana Central got under Wells' arm for three hits and two runs in the early stage of the game and Babillis took the mound for Rose. Then the game developed into a matter of how many men Babillis could fan.

Taggart went on a batting rampage and got five blows out of five times at bat. His hitting was directly responsible for most of the Engineers' runs.

Rose Poly	0	0	0	0	3	0	1	3	0	—7	10	4
Ind. Central	2	0	2	0	0	0	0	1	0	—5	7	4

Batteries—Rose Poly, Wells, Babillis and Thompson; Indiana Central, Herrin and Hoffman.

E. I. S. N. IS THIRD VICTIM FOR ROSE

Rose Poly's Fighting Engineers continued their winning streak when they defeated E. I. S. N. on April 14 by a score of 7-4.

"Red" Sweeny was on the mound for Rose and pitched creditable baseball, while his team mates gave him good support. The Engineers scored in the first, sixth, seventh and ninth innings.

The sixth was the big inning for Rose. Witty flied out to Gilmour, but Taggart singled and stole second. McIntosh was wild and walked Thompson. Sweeny got a walk, to load the bases. At this point Kehoe placed a nice bunt and beat it to first, Taggart scoring. On a squeeze play Dowen bunted, with Thompson scoring, and Dowen going out at first, Sweeney come home on a passed ball, but Nicoson struck out. Rose was never headed after this inning and pushed over three more runs.

Score by innings:

E. I. S. N.	0	2	1	0	0	0	0	1	0	—4
Rose Poly	1	0	0	0	0	3	1	0	2	—7

LITTLE GIANTS DOWN ENGINEERS 16-4

On April 16 the Wabash College baseball team defeated Rose Poly in a slugfest 16-4. Babillis the Engineers' twirler started on the mound but was relieved in the seventh inning by Wells. Ineffective pitching and poor support accounted for the Little Giant's sixteen runs. Several rallies were started by the Engineers but were stopped by the fielding of the scarlet players.

Rush was the hitting star for the Wabash team with four hits, while Cripe connected for three. Taggart, Sawyers and Capt. Mayrose each got a pair of blows for the Engineers.

Wabash	1	0	2	7	1	0	0	5	0	—16
Rose Poly	0	0	1	0	0	1	2	0	0	— 4

ROSE WINS RAGGED GAME

The Engineers defeated Oakland City's baseball team on April 21 in a loosely played game. Eleven errors were made during the game. Seven were against our team and four against the "Oaks". The "Oaks" made a big rally in the seventh, but could not overcome Rose Poly's big lead.

It was the ability of Rose Poly batters to hit Cleveland's delivery and to take advantage of Oakland City's misplays that gave our team its victory.

Rose easily outhit Oakland City, collecting seventeen in all, but their seven errors were very costly.

The score follows:

Rose Poly	4	0	0	2	1	0	5	0	0	—12
Oakland City	0	0	0	2	1	0	7	1	0	—11

ROSE SECOND IN HOOSIER RELAYS

Rose Poly's evenly balanced track team made a very successful showing in the Hoosier Relays, held at Danville, Indiana on May 8. Ten college teams from all parts of the state were entered in the meet, but it soon became a contest between Earlham and Rose, with the Quakers winning through the fine all-around work of Huntsman, who is one of the country's best track men.

Huntsman was high point man of the meet, winning first in the 120 yard high hurdles, 16 lb. shot put, discus throw, javelin throw, and running broad jump, for a total of 25 points.

McNaught was the most outstanding man for Rose, winning first in the 100 and 220 yard dashes. Rose also won the 440 yard relay in the fast time of 44 4-10 sec., defeating the other competitors by a large margin. The Rose relay team was composed of Reinking, Wade, McNaught, and Captain Dunning. The results are summarized as follows:

100-yard dash—McNaught, Rose Poly, first; Staley, N. A. G. U., second; Kincaid, Central Normal, third; Stokesberry, Muncie Normal, fourth. Time, 10 8-10 seconds.

120-yard high hurdles——Huntsman, Earlman, first; Anderson, Indiana State Normal, second; Derry, Rose Poly, third; Moore, Earlham, fourth. Time 16 seconds.

Mile run—McKand, Hanover, first; Conley, Indiana State Normal, second; Henwood, Earlham, third; Olderman, Manchester, fourth. Time, 4 minutes, 34 5-10 seconds.

440-yard run—Parker, Earlham, first; Perrigo, Muncie Normal, second; Hednigton, Hanover, third; Smith, Earlham, fourth. Time, 48 6-10 seconds.

220-yard dash—McNaught, Rose Poly, first; Staley, N. A. G. U., second; Dunning, Rose Poly, third; Kincaid, Central Normal, fourth. Time, 23 2-10 seconds.

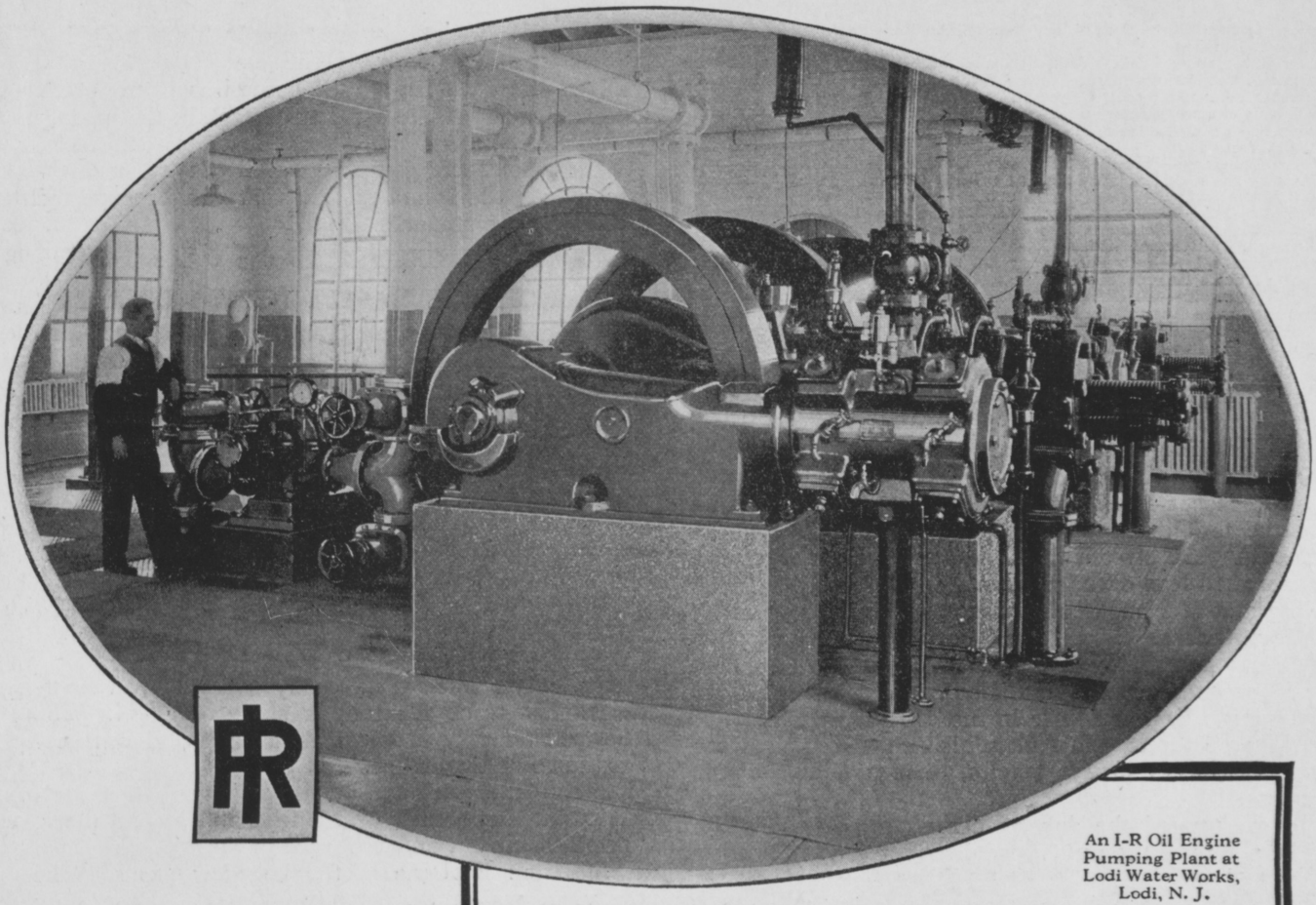
220-yard low hurdles—Parker, Earlham, first; Derry, Rose Poly, second; Lahti, Rose Poly, third; Stokesberry, Muncie Normal, fourth. Time, 26 4-10 seconds.

880-yard run—Perrigo, Munice Normal, first; Peacock, Earlham, second; Kenley, Earlham, third; Porter, Indiana State Normal, fourth. Time, 2 minutes, 3 8-10 seconds.

Two-mile run—Bankowsky, Earlham, first; Lake, Rose Poly, second; York, Central Normal, third; Moser, Indiana State Normal, fourth. Time, 10 minutes, 34 seconds.

16-pound shot put—Huntsman, Earlham, first; Layman, Central Normal, second; Gant, Hanover, third; Garland, Central Normal, fourth. Distance, 39.38 feet.

Pole vault—Lyons, Franklin, first; Bard, Earlham, second; Bolting-



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house, Indiana State Normal, and Max White, Rose Poly, third. Height, 11 feet, 5 inches.

High jump—Lyons, Franklin, and Boltinghouse, Indiana State Normal, tied for first; Piper, Rose Poly, and Harris, Central Normal, tied for second. Height, 5 feet, 9¼ inches.

Discus throw—Huntsman, Earlham, first; Garland, Central Normal, second; Catlin, Earlham, third; Aitken, Rose Poly, fourth. Distance, 122.73 feet.

Javelin throw—Huntsman, Earlham, first; Piper, Rose Poly, second; Freuck, N. A. G. U., third; King, Central Normal, fourth. Distance, 168 feet, 4 inches.

Broad jump—Huntsman, Earlham, first; Derry, Rose Poly, second; Kincaid, Central Normal, third; Max White, Rose Poly, and Anderson, Indiana State Normal, tied for fourth. Distance, 22 feet.

440-yard relay—Rose Poly, first; Earlham, second; Central Normal, third; Muncie Normal, fourth. Time, 44 4-10 seconds.

880-yard relay—Earlham, first; Rose Poly, second; Central Normal, third; Muncie Normal, fourth. Time, 1 minute, 32 7-10 seconds.

Mile relay—Earlham, first; Muncie Normal, second; Rose Poly, third. Time, 3 minutes, 32 seconds.

TRACKSTERS CRUSH OAKLAND CITY

The Fighting Engineers defeated Oakland City in a dual track and field meet April 10, to a score of 93-38. The Engineers had an easy time in defeating the "Oaks", winning twelve of the fourteen events.

The most noteworthy performance of the day came in the first event when Captain Dunning navigated the 100 yard stretch in 10 seconds. Dunning had a three yard lead over his team mate, McNaught. Dunning and McNaught also won first and second in the 220 yard dash.

Derry ran the high hurdles in the fast time of 16 5-10 seconds. Bob Wade also showed his speed by winning a first for Rose in the 440 yard dash.

Piper, Barrett, and Aitken also annexed points for the Engineers in the javelin, shot put, and discus events.

Rose topped the day by her victory in the relay. The points of the meet were distributed as follows:

100-yard dash—Dunning, Rose, first; McNaught, Rose, second; Patberg, Oakland City, third. Time, 10 seconds.

One mile run—Gavins, Oakland City, first; Swalls, Rose, second; Reeves, Rose, third. Time, 5 minutes 12 seconds.

220-yard dash—Dunning, Rose, first; McNaught, Rose, second; Patberg, Oakland City, third. Time, 25 2-10 seconds.

120-yard hurdles—Derry, Rose, first; Kell, Oakland City, second; (third man disqualified). Time, 16 5-10 seconds.

440-yard dash—Wade, Rose, first; Turner, Oakland City, second Drompp, Rose, third. Time, 58 7-10 seconds.

Two-mile run—Lake, Rose, first; Weber, Oakland City, second; Gammell, Rose, third. Time, 12 minutes 2 6-10 seconds.

220-yard hurdles—Lahti, Rose, first; Derry, Rose, second; Kell, Oakland City, third. Time, 30 1-0 seconds.

880-yard run—Swalls, Rose, first; Gavins, Oakland City, second; Shelton, Oakland City, third. Time, 2 minutes 20 2-10 seconds.

Pole vault—Trautman, Rose, and M. White, Rose, tied for first place; Smith, Oakland City, third. Height, 10 feet 6inches.

16-pound shot put—Barrett, Rose, first; Kelly, Oakland City, second; Shelton, Oakland City, third. Distance, 36 feet 1¼ inches.

High jump—Barrett, Rose, and Piper, Rose, tied for first; Wesley, Oakland City, third. Height, 5 feet 4 inches.

Discus throw—Aitken, Rose, first; Kell, Oakland City, second; Piper, Rose, third. Distance, 99 feet 10 inches.

Broad jump—Kell, Oakland City, first; Derry, Rose, second; Lahti, Rose, third. Distance, 20 feet 1 inch.

Javelin throw—Piper, Rose. first; Turner, Oakland City, second; Barrett, Rose, third. Distance, 156 feet 4 inches.

Half-mile relay race—Rose Poly (Burt, Davis, Porter, Wade), first; Oakland City (Turner, Wilsie, Smith, Patberg), second. Time, 1 minute 46 3-10 seconds.

ROSE REGISTERS BASEBALL VICTORY

Captain Harvey Mayrose and his Rose baseball team stepped on Eastern Illinois State Normal on April 24 winning by the score of 10-4. This was the fifth victory for the Engineers this season.

Eastern Illinois got away to a good start in the first two innings, but the Fighting Engineers came back strong in their half of the second inning and hammered Hoahn's curves for four hits and five runs. From this point on Eastern Illinois never had a chance.

Most of the 100 odd high school athletes from Indiana high schools gathered in Terre Haute for the Terre Haute Relays were guests of the Rose team for the game.

Alexander Babillis was in the box for the Fighting Engineers and he worked superbly. He kept the Eastern Illinois hits scattered and in his turn at bat tore off two hits both of the extra base variety. Thompson also played a good game behind the plate. Sawyer also showed to good advantage in the hitting, getting three blows.

On a whole, the game was well played, and the team played the brand of ball that can be expected of them by the students.

E. I. S. N.	2	1	0	0	0	0	1	0	0	—4
Rose Poly	0	5	1	0	2	2	0	0	x	—10

WABASH WIN EASILY BY 17-1 COUNT

The Wabash team went on a hitting rampage April 29, and hammered two Rose hurlers for a total of 22 hits. Rose was up "in the air" for the first three innings and the "Little Giants" scored 13 runs. The teams then settled down and played fairly good ball for the remaining part of the game.

Wells started for Rose but was relieved in the first inning by Babillis after a combination of walks and hits scored two runs. Sweeney was the only Engineer to get more than one hit.

Rose Poly	0	0	0	0	0	1	0	0	0	—1
Wabash	3	4	6	1	0	2	0	1	*	—17

ENGINEERS ALSO WIN IN TRACK

Rose Poly's track team easily overwhelmed Eastern Illinois' track team by a score of 87-44. The Rose athletes copped eight first places, eleven seconds, and five thirds.

Dunning and McNaught, two of the fastest dash men in the state, each won a first and second place. Wade also ran a wonderful race in the 440 yard dash to win from Riplogle in the last few yards. The pole vault was a tie between White of Rose Poly and Wilson, E. I. S. N. Piper, Aitken, and Barrett also added many points to our score in the field events, which totaled 24.

Rose Poly's five freshmen track men, White, Derry, Lahti, Reeves and Porter, all showed well and much can be expected from these men in the coming three years. Our half-mile relay team won first in one of the most thrilling events of the day and thereby keep a perfect record. The record of various events follows:

100-yard dash—Dunning, Rose Poly, first; McNaught, Rose Poly, second; Riplogle, Eastern Illinois, third. Time, 10 1-10 seconds.

120-yard high hurdles—Derry, Rose Poly, first; Lahti, Rose Poly, second; Curtserger, Eastern Illinois, third. Time, 18 2-10 seconds.

Mile run—Swalls, Rose Poly, first; Pfier, Eastern Illinois, second; Reeves, Rose Poly, third. Time, 5 minutes, 15 5-10 seconds.

440-yard dash—Wade, Rose Poly, first; Riplogle, Eastern Illinois, second; Adams, Rose Poly, third. Time, 55 1-10 seconds.

220-yard dash—McNaught, Rose Poly, first; Dunning, Rose Poly, second; Rutledge, Eastern Illinois, third. Time, 23 5-10 seconds.

220-yard low hurdles—Riplogle, Eastern Illinois, first; Derry, Rose Poly, second; Lahti, Rose Poly, third. Time, 27 seconds.

880-yard dash—Newland, Eastern Illinois, first; Muntz, Rose Poly, second; Swalls, Rose Poly, third. Time, 2 minutes, 16 3-10 seconds.

Two-mile run—Newland, Eastern Illinois, first; Lake, Rose Poly, second; Pence, Eastern Illinois, third. Time, 11 minutes, 50 1-5 seconds.

Pole vault— White, Rose Poly, and Wilson, Eastern Illinois Normal, tied for first; Worsham, Eastern Illinois, third. Height, 10 feet, 9 inches.

High jump—Piper, Rose Poly, and Barrett, Rose Poly, tied for first; Murlet, Eastern Illinois, third. Height, 5 feet, 5 inches.

Shotput—Barrett, Rose Poly, first; Piper, Rose Poly, second; Strader, Eastern Illinois, third. Distance, 35 feet, 4¼ inches.

Discus throw—Piper, Rose Poly, first; Aitken, Rose Poly, second; Strader, Eastern Illinois, third. Distance, 104 feet 6 inches.

Javelin throw—Baker, Eastern Illinois, first; Piper, Rose Poly, second; Riplogle, Eastern Illinois, third. Distance, 151 feet, 1 inch.

Broad jump—Riplogle, Eastern Illinois, first; Derry, Rose Poly, second; M. White, Rose Poly, third. Distance, 20 feet, 8 inches.

Half-mile relay race—Rose Poly, (Burt, Davis, Porter and Wade), first; Eastern Illinois (Newlin, Rutledge, Adams, Riplogle), second. Time, 1 minute, 41 6-10 seconds.

ROSE THINCLADS SWAMP CENTRAL NORMAL

In a dual track meet with Central Normal on Clark Field the Engineers swept to a 100-20 decision over

(Continued on page 32)

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FRATERNITIES

ALPHA TAU OMEGA

With the end of the school term rapidly approaching, Indiana Gamma Gamma begins to look back over the school year with much satisfaction. The banner season, so acclaimed by all, has been the one since the last issue of the Technic went to press.

During the past month, seven new names have been added to the chapter roll book, and thru no formality, we announce the formal initiation of pledges Cliff, Donovan, Koester, Ploch, Sawyers, Shatz, and White on Monday night, April 5.

Remembering other similar enjoyable occasions, open house was declared for Sunday night, April 11. Not a few of the brothers demonstrated their ability on the hardwood to the satisfaction and awe of the gentler sex. Bridge, however, was likewise a popular entertainment, and the several tables for that purpose were constantly occupied.

The climax of the season came on Saturday, April 17. On that date the State Dance and Banquet, an annual affair, was held at Hotel Claypool, Indianapolis. Much excitment was created before this occasion, and rightly so, for the active members of the chapter, the pledges, and the Alumni members who attended, acclaimed it as one of the greatest social functions of the year.

Exams were ushered in with a short-lived lull in chapter activities, but plans did not cease. On May 9, the chapter observed Mothers Day in a most fitting way. The Mothers were guests of the Fraternity that Sunday afternoon and each expressed her thanks of being able to become better acquainted with her sons best companions.

Naturally the Junior Prom, so rapidly approaching, merited much attention from the members, who after making it a social success for Rose, have planned that it shall be a success fraternally as well.

A farewell party for the seniors, sponsored by the new members and pledges, or in better understood terms, the freshmen, will be given in the near future.

During the past month Bros. Reed and Pole of Penn. Delta Pi. Brother McIntosh of Louisville, Ky., and Brother Neely of Ind. Delta Alpha have been among our visiters.

Stories of summer positions and vacations are now being circulated, but after these are lone memories, our new officers headed by Brother Booth assure us a first rate 1926-1927 year.

SIGMA NU

Beta Upsilon wishes to announce the initiation of pledges John Derry, Robert Dowen, Oliver White, Everett Shaw, Ralph Bailey, and Raymond Harris. The initiation was held at the chapter house on the afternoon of Sunday, April 18, 1926.

The annual fourth division convention in conjunction with the annual Hoosier Rally was held in Indianapolis on May 6, 7, and 8. On Thursday evening, May 6, the installation of a chapter of Sigma Nu at Butler College was held at the Lincoln Hotel. Through the courtesy of the assistant manager of the Lincoln Hotel, the entire fourteenth floor of the hotel was offered for the installation. The new chapter at Butler brings the number of chapters in this division to six. The other chapters are at Purdue, DePauw, Indiana, University of Kentucky, and Rose Poly.

On Friday night, May 7, the Hoosier Rally was held at the Lincoln Hotel. One of the founders of the Hoosier Rally was Brother Traff Talmadge, who attended Rose Poly, and every year Beta Upsilon has always had a large representation. In spite of the fact that school work has been a hindrance to some of the brothers in attending the convention, every active member was able to attend one of the three days.

The terminating affair of the convention came on Saturday night, May 8, when a formal ball was held at the Lincoln Hotel Ballroom. Several of the brothers who went to Danville with the track team, found it convenient to come down after the meet for the last affair of the convention.

The chapter social committee is making plans for the annual faculty and fathers' night to be held this month. The mothers' tea was held on the afternoon of Mother's Day. The chapter attended church in a body on the morning of Mother's Day in keeping with the annual custom. The church choosen was the Central Christian Church at Seventh and Mulberry. Mr. H. G. Connelly, the Pastor, is a Sigma Nu, having graduated from Bethany and Yale University.

Brother Ellis B. Hall, the inspector of the fourth division was a recent visitor to the chapter. He discussed the present condition of the chapter with the brothers.

Among the recent alumni visitors to the chapter are Brother "Len" Quinlan, Brother Elmer Dalhquist, Brother Fred Hoberg, and Brother John Moorhead. Brothers Dalhquist and Hoberg attended the initiation on Sunday afternoon, April 18.

ALPHA CHI SIGMA

Brother James W. Landrum, class of '22, who had been seriously ill for some time, died Tuesday, April 27, at St. Anthony's Hospital.

Jimmy, as he was known to his colleagues, was early in the work of his profession, accepting a position shortly after graduation with the Indiana Portland Cement Co. at Greencastle. He was employed as chemist at the Greencastle plant until a few months ago, when he resigned to accept a similar position with the Marquette interests in Ohio. About that time he became ill and was unable to take up his new work. The fatal illness did not become critical until about a month before his death.

Brother Landrum is better remembered by the older alumni of Iota chapter of Alpha Chi Sigma. He was a comrade and brother in the profession as well as in school. He has passed to that "undiscovered country from whose bourne no traveler returns." The chapter's deepest sympathies are with those who are left.

(Continued on page 28)

CITY GAS SUPPLANTS BIG PRODUCER UNITS

Scores of manufacturers, heretofore making their own producer gas for industrial heating, have scrapped their individual plants during the past year and will begin to feed from the mains of the regular manufactured gas utilities, according to engineers of the American Gas Association. Nineteen such individually operated plants have been shut down in one city alone, according to the report.

It is pointed out that the conversion to city gas calls for practically no additional investment either on the part of the customer or on the part of the gas company.

A recent survey showed that many manufacturers throughout the United States own their own gas making equipment. In most of these instances, however, it is possible to buy gas, particularly in the case of glass factories, which are frequently situated in locations where it is impossible to get gas. Besides the glass manufacturers there are others who have made their own gas for economic reasons. With the increase in main-laying activities and other extensions planned by the gas companies during 1926, it is confidently expected that many more factories will be able to shut down on their privately owned plants.

A single industrial account of this kind is frequently as profitable to the gas company as 2,000 ordinary domestic accounts, or 12,500 minimum domestic bills.

The Oil Electric Enters Manhattan

(Continued from page 4)

tioned; but as the railroads came to a realization of their real status under the new law, they began to consider plans for some type of motive power that would replace their steam locomotives and comply with the act. In view of the fact that within the year practically all these roads had witnessed the demonstration of an oil-electric locomotive which met all their requirements as far as operation was concerned, and which operated at a lower cost than the steam locomotive, it is not at all surprising that they should have considered using this new type of motive power. Therefore, plans were filed with the Public Service Commission on the basis of using this type of locomotive. When these plans were approved, orders were placed for locomotives and some of them are now in operation. The roads that are now using this type of motive power and those that are planning to do so, and the location of their yards, are as follows:

Baltimore & Ohio: One 60-ton locomotive, for 26th Street, Manhattan Freight Terminal.

Lehigh Valley: Two 60-ton locomotives, one for the 27th Street, Manhattan, and one for the 149th Street, Bronx, Terminal.

Delaware, Lackawanna & Western: Two 60-ton locomotives, one for the Harlem Transfer and one for the 25th Street, Brooklyn, Terminal.

Central Railroad of New Jersey: One 60-ton locomotive, for the Bronx Freight Terminal.

Erie Railroad: One 60-ton locomotive, for 28th Street, Manhattan.

Long Island Railroad: One 100-ton locomotive, for Manhattan Beach and Evergreen Branch.

The location of the terminals outlined above is shown on the map on the preceding page.

In addition to the above freight terminal installations, the New York Central Railroad has ordered one 800-h.p. (approximately 125-ton) passenger locomotive and one 750-h.p. (approximately 25-ton) freight locomotive, to try out on the Putnam Division, main line. If these trial locomotives meet expectations they will undoubtedly replace all the steam motive power on this branch.

Greater Support to Pure Science Research

(Continued from page 5)

coordinated research in specific directions by men in different localities—again, men mostly in our universities. Some of these are broad inquiries, demanding the joint consideration of specialists from various fields of science. Others are of narrowed scope but of such character or magnitude that the combined efforts of many workers are essential for their solution. The National Research Council has organized many cooperative investigations. Such organized campaigns against the unknown are few and far between in our country, for but few men have had the vision to give them financial support. Thus, we need to find great funds which wisely directed can be used to support and stimulate the work of the many indigent investigators, the many men in our universities, the great research institutions, and to organize definite campaigns of cooperative research among them.

The third type of pure science research that requires much more liberal support is the special institution. The recent appeal of the Smithsonian for

additional endowment to enable it to support a larger staff, so that it may properly compass that fraction of the field of science which has been its province, should have the support of every citizen. The Smithsonian has been peculiarly the architect of scientific investigation in our country. Much of the work we have in progress to-day has been inspired from this great pioneer of all American research.

It is unfortunately true that we can claim no such rank in pure science research as that which we enjoy in the field of industrial research. Instead of leading all other countries in the advancement of fundamental scientific knowledge the United States occupies a position far in the rear of the majority of European nations. A list of the awards of the Nobel prizes to men of various nationalities reveals the small proportion of first minds that we support. Other tests lead to the same conclusion, namely, that the number of first-rank investigators developed in the United States is far below what our population, education, and wealth would lead one to expect.

The difficulty we experience in securing a place in science beside the nations of Europe can hardly be due to a lack of men of innate ability, judging from the leading part already played by the United States in finance, in architecture, and in applied science. It results partly from the fact that American civilization is only beginning to emerge from the pioneering stage, and partly from the financial and other inducements which so often lead talented men reluctantly to accept well-paid industrial positions instead of poorly-paid academic and research posts.

The far-sighted leaders of industry fully recognize the dependence of their progress upon advances in science, and emphasize their belief that fundamental research should be much more greatly aided.

Dr. J. J. Carty said in his presidential address to the Institute of Electrical Engineers ten years ago:

"By every means in our power, therefore, let us show our appreciation of pure science, and let us forward the work of the pure scientists, for they are the advance guard of civilization. They point the way which we must follow. Let us arouse the people of our country to the wonderful possibilities of scientific discovery and to the responsibility to support it which rests upon them, and I am sure they will respond generously and effectively."

But the response has not yet come.

After many years of experience in industrial research he echoes the words of Tyndall spoken in New York in 1873:

"It would be a great thing for this land of incalculable destinies to supplement its achievements in the industrial arts by those higher investigations from which our mastery over Nature and over industrial art itself has been derived."

We have prided ourselves on our practicality as a Nation. Would it not be a practical thing to do to give adequate organized financial support to pure science? And if by chance we develop a little contribution to abstract learning and knowledge, our Nation will be immensely greater for it.

That's That

Student X: Lend me a dollar.

Student Y: There is just one thing more impossible.

Student X: What's that?

Student Y: Me getting it back. —Selected.

Control of Distribution Transformer Loading

(Continued from page 7)

the element in the oil, with each exposed to increasing temperature, causing the pointer to indicate the difference of the two movements. Such an instrument, properly calibrated, should correctly indicate the maximum safe loading conditions. It, of course, should be borne in mind that the relation of the temperature of the oil to the windings will vary depending upon the amount of insulation blanketing the conductors. For example,—the heat is carried to the oil more readily through a small amount of insulation than through a large amount. For this reason, the design of the transformer should be taken into consideration in designing the indicator.

The element of the indicator may be located at any convenient point in the oil above the coil, as tests show that the entire volume of oil above the coil is within one or two degrees of the same temperature. This condition maintains even under varying load or varying air conditions.

In selecting temperature indicators, the principal things to be borne in mind are cost, accuracy, ease of reading and ease and cost of installation. In connection with the last mentioned feature, there are at present two methods used. One necessitates the drilling and tapping of case, thus entailing considerable expense and trouble; the other, which seems much simpler, requires only that the cover be removed and a supporting metal strip be slipped over the edge of the tank, which makes it possible to readily install in the field and easy to transfer from one transformer to another.

These Big Corporations

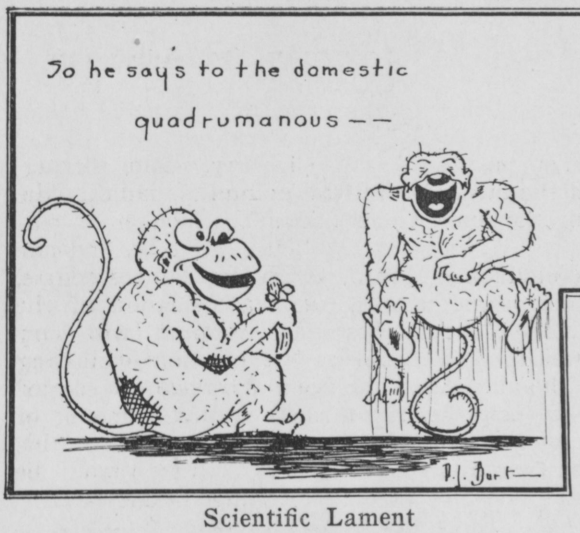
(Continued from page 9)

A dozen years from now a large percentage of the Tommy Burtons who have stayed along with the big companies will find their jobs highly pleasant. They will be transacting interdepartment business with men who have grown up, as they have, with their outfits. And, perhaps, if they check their incomes against those of their classmates who have put into practice their theories of small-company advantages, they will find themselves surprisingly well off by comparison.

It is true that the first few years with a large company are usually years of slow progress. But they are also years of investment in experience. Like any other investment, the company back of it should be chosen with care. Properly placed, those investment years should bring a splendid return in growth, in widened acquaintance and in income. It is not such a bad thing after all, to work for an outfit that is bigger than any one industry, any one community, or any one personality.

SAILS FOR JAPAN

Henry M. Shaw '10, who is Special Factory Representative for the Haroma Chemical and Manufacturing Company, has sailed for Japan on business. Shaw is a member of the Cleveland Rose Tech Club and has been actively engaged on some researches with ultra violet light.



HUMOR

Scientific Lament

"The alchemists in the good old days sure had it easy compared with us modern scientists. I was out with my girl the other night, and she merely said a little word and changed all of my gold to nothing."

Farmer Brown (on being asked if the tornado of the night before had damaged his barn)—"Derned if I know, I aint found the danged thing yet."—Blue Jay.

She—"Could you go over that dam without hurting yourself?"

He—"I d'no, why?"

She—"Fish do." —Sun Dial.

No Excuse For It

"What do you think of man who throws a girl a kiss?"

"I think he is the laziest man in the world."

Nervous Woman (to beggar): "If I give you a piece of cake you'll never return, will you?"

Beggar: "Well, lady, you know your cake better than I do."—Utelum.

The old gentleman was a trifle bewildered at the elaborate wedding.

"Are you the groom?" he asked a melancholy looking man.

"No, sir," the young man replied. "I was eliminated in the preliminary tryouts."

As a car lunged a lady fell backward into a man's lap.

Lady: "Oh, forevermore."

Man: "Oh, no. Just for a little while."

"Say, you can't smoke in this building."

"Who's smoking?"

"Well, you got your pipe in your mouth."

"Yes, and you got your pants on, but you ain't panting."

An Old Saw Retoothed

Prof.: Never calculate your juvenile poultry before the proper process of incubation has fully materialized.

Barber: "Say, haven't you been here before?"

Stude: "Yes, but I'm healed up now."

"Are you laughing at me?" demanded the irate professor of his class.

"No," came the answer in chorus.

"Well," insisted the Professor, "what else is there to laugh at?"—College of the Pacific Weekly.

The objector to prohibition spoke bitterly.

"Water has killed more people than liquor ever did."

"You are raving," declared the teetotaler. "How do you make that out?"

"Well, to begin with, there was the flood."—Epworth Herald.

Alumnus—"Professor, I have made some money and I want to do something for my old college. I don't remember what studies I excelled in, if any.

Professor—"In my class you slept most of the time."

Alumnus—"Uh! Well, I'll endow a dormitory.—Kansas City Journal.

If you can't laugh at the jokes of the age, laugh at the age of the jokes.

FRATERNITIES

(Continued from page 22)

Alumnus Garnet Phillips was unexpectedly called to Terre Haute early in the week of April 18 on account of the death of his mother. Iota chapter honored the memory of Brother Phillips' mother by attending the funeral in a body.

On Wednesday, May 5, following the second set of mid-term examinations, Iota chapter held a wiener roast on the Rose campus near Hulman's lake. The event was well attended and a genial social time was had by all. When the fire had burned low, songs of modern origin were matched against those of ye olden tyme. There was some difference in opinion as to the type of song that will remain popular.

THETA KAPPA NU

On Wednesday night, April 14, the fraternity house was the scene of a house party, given by the members for the entertainment of their girl friends. After everyone had grown tired of dancing and playing bridge, refreshments were served. Music for the evening was furnished by "Feature" Mayrose at the piano.

Upholding the precedent set up years ago, Indiana Gamma entertained the Mother's club of the chapter at the chapter house on Mother's Day, May 9th, with entertainments of varied natures. Iced tea, ice cream and wafers were served throughout the afternoon. The success of Theta Nu has been promoted greatly by the activities of the Mother's Club and the mothers were graciously thanked for their co-operation during the year. Each mother received a red rose as a favor.

Plans for the annual Conclave which will be held during Commencement week are under way. At Conclave, the alumni return to their fraternity and their Alma Mater to renew old acquaintances and to talk over old times. An all-day stag boat ride will be held on the river during the week.

Recent visitors at the house were Syd Freers and John McCormick, of Chicago, Lee Wilson of Marion, Indiana, and Orville Dunning of Schenectady, N. Y.

Brother Dick Johnson who has been operated on for appendicitis, and who later contracted pneumonia, is reported to be getting along nicely and it is hoped that he will be out again soon.

Indiana Gamma announces the pledging of Ted Barrett, class of '28.

TECH LETTER BOX

(Continued from page 12)

R. F. Leinberger '16; M. Harold Smith '17; H. E. Wiedeman '03; and H. E. Miller ex '04; Donald C. Walmsley ex '22; of St. Louis; Earl C. Metzger '03 of Granite City, Illinois and W. S. Henley '05 of Tyler, Texas.

Dr. Wagner was present and told of the plans for the new dormitory. A number of valuable suggestions were brought out in the discussion regarding the future of the Institute. President Emeritus Mees was invited to attend the dinner but was unable to be present on account of the serious illness of his sister. The success of the meeting was due to the efforts of H. E. Wiedeman president, and G. W. Holding, secretary.

IN THESIS TIME

(Continued from page 13)

The civils are engaged at designing and hydraulic problems; while the architects silently pour over a maze of drawing details of heating and ventilating systems. If you want a brake lining tested, you will be ceremoniously escorted to the mechanical laboratory. Near the "chem. lab" oil will be drained out of your car free of charge by the chemists who are making broad claims for their reclaimation process.

In the realm of minute detail there are searchers along purely electrical lines. A study of the oscillagraph is listed among these. Electric filters and magnetic testing are also being pursued. In all, the year's thesis work represents a broad selection of subjects. The ardent investigations are obtaining commendable results. It is too much to hope that the finished texts will even exceed the quality of their present work.

THESIS SUBJECTS

"Heating and Ventilating of the New Dormitory of Rose Polytechnic Institute"
Peter J. Burt

"The Effect of Supercharging on Gasoline Engines"
Robert H. Aitken
Paul E. Crane
Herbert E. Matson

"Tests on Brake Linings"
Harvey H. Mayrose
Earl M. Pierce

"Power Investigation of Dresser Plant"
Bruce R. Walsh
Edward F. Kelley
Clarence W. Ellis

"Small Municipal Plant versus Purchased Power"
John S. Wells

"Tests on Flynn-Weichsel Motor"
M. L. Witty
B. G. Witty
H. E. Lewis

"A Study of the Dynamometer"
G. Edison White
Harry L. Willson

"Power Survey at Terre Haute Paper Mill No. 2"
Carl Dreher
Theodore S. Moench
Ralph Tapy

"Measurement of Flow Thru Submerged Orifices Similiar to Openings as Designed for U. S. Dam No. 41 at Louisville, Ky."
John Leake
Lee Pickel

"The Study of the Reclaimation of Crank Case Oils"
Clarence L. Corban
Ernest P. Pifer
Frank Swearingen

"Oscillagraph Studies"
Joseph H. Utt
Everett Letsinger

"Design of Heating and Ventilation system for East Side Junior High School. Vacuum System."
M. L. Mitchell

"Design and Plans for Sewer System for Rosedale, Indiana"
C. Max Sherwood
E. Wayne Watkins

"Electric Filters"
D. R. Werner
A. E. Faust

"Magnetic Testing"
Victor E. Schlossberg

PITFALLS OF PATENT OWNERSHIP

(Continued from page 8)

in his own time. The court said that he was unlike an employee whose invention made on the outside would be his own. In this case, it was held that the executive held a position of trust with the company and should, in equity, turn over his improvements to the company.

If, however, the executive is the principal executive of the company, the case may be different. The head of a company making stokers took out a patent on furnace apparatus, which was in the line of the manufacture of the company. After a contest, the courts decided that he owned the patent and that the company was not entitled to use the invention. The same result was arrived at in another case, in which the inventor was the general manager, and an officer of the corporation, when the invention was made.

Before a company is entitled to take the inventions of an inventor-employee, it must be shown that the employment relates to the subject matter of the invention involved. The mere employment of a workman does not entitle the employer to claim the inventions made by him. In the absence of any express contract on the subject, the employee has a right to the inventions, and owns them subject to any shop right the company might have under certain conditions.

It is not necessary, however, that the contract be in writing, since the very circumstances of the employment, as for instance the employment of a man at the head of a designing room, may indicate that his employment was for the specific purpose of design and development. It is, however, unwise to rest upon any such assumption, for the facts may upset the plan.

Contracts of employment that are entered into without thought of invention may, it is apparent, result in a very serious loss to one or both parties, and give rise to a plausible but expensive controversy. It is customary in many concerns to have employment contracts carefully drawn, forming part of the employment card which every employee, no matter how humble, signs when he enters the employ of the company.

This is a very wise precaution, since the agreement can be thus secured that is fair to both parties at the initial stage of the employment, but which could not be secured without loss, or law suit, later. But suppose such a contract is entered into merely by way of employment, and the employee, conceiving a brilliant idea in the line of business of the employer, develops the invention in his own time and with his own materials at home.

Has the manufacturer any rights in this invention?

The courts have held that this situation gives the manufacturer no claim over the invention at all, since the employee has a right to his ideas, provided he uses his own time and materials to develop them. This holds, even though the invention may be in the line of work of the employer. Many employers feel that this is a great hardship, because the man really gets the ideas while working in the shop, and benefits by the education and advantage afforded in

BOOK REVIEW

THE USE OF SOLVENTS IN SYNTHETIC ORGANIC CHEMISTRY. By Donald W. MacArdle, S. B., D. Van Nostrand Co., New York, 1925. 224 pp., cloth, $3.50.

A reference book for the research chemist, working with solvents who does not have access to libraries of scientific journals. The sources from which the work is compiled are many and varied. Both American and foreign publications have been consulted.

The volume is planned as the first part of a treatise on the operative technique of synthetic organic chemistry. For the most part it compares similarly with the first sections of the well-known German works of Lassar-Cohen and of Wehl, but it is thoroughly modern, practical, and designed to fulfill the requirements of the American chemist for a text and reference book on this important subject. Theoretical discussions are wisely omitted, for it is assumed that the user is well enough acquainted with theoretical chemistry, its laws and reactions. The purpose in the main is to give a thoroughly workable presentation of methods and processes. A bibleography of more than 900 cross references and sources is appended.

Chapter Headings: General Considerations; Inorganic Solvents; Organic Solvents for Inorganic Salts; Alcohols as Solvents; The Preparation of Absolute Alcohols; Higher Alcohols and Ethers as Solvents; Organic Acids, Esters, Ketones, and Bases as Solvents; Hydrocarbons as Solvents; Inert Liquids as Solvents; Special Means of Inducing Crystallization; Salting Out.

ELEMENTS OF RADIO COMMUNICATION. By Ellery W. Stone, D. Van Nostrand Co., New York City. 1926. Full page plates, diagrams, photographs, tables and graphs. 5¾x7¾, 690 pp. $2.50.

This book was written for the engineer, the amateur and the student. It discusses the theory and practices of modern radio transmission and reception, and gives a complete and detailed description of the radio apparatus that has had any connection with the development of the science of radio communication from 1900 up to the present time.

The first part of the book explains the basic principles of radio communication and the behavior of alternation currents in radio circuits containing inductance, capacitance, and resistance. From these fundamentals of radio circuits the author shows the development of special radio apparatus and particularly the apparatus used in modern radio stations.

The greater part of the book gives complete data on the apparatus developed within the last few years such as radio frequency generators, the modern Poulsen arc, the radio compass, antenna ground circuits and aircraft radio; vacuum tubes, and radio broadcasting and reception are also given considerable space in this text.

The author presents the material without the involved use of mathematics and physics and more attention is paid to the physical standpoint; however, there is no sacrifice of technical accuracy in presenting matter so that it can be readily understood by the layman as well as the student and technician.

J. A. F.

MANUAL OF INDUSTRIAL CHEMISTRY. By Allen Rogers. D. Van Nostrand Co., New York, 1925, 2 vol., 1315 pp., illus., $10.00.

The fourth edition of a well-known text in Industrial chemical processes will no doubt meet with even greater favor than have the preceeding editions. Regarding them the Journal of Industrial and Engineering Chemistry and Chemical and Metallurgical Engineering have said "It is the best single volume treatment of Industrial Chemistry in the English language."

This new edition far surpasses the previous ones in arrangement of material, conciseness, yet completeness of description. Much new material has been added and practically every chapter has been revised and enlarged. The author has had thirty-four specialists associated with him in preparing the treatise. These specialists were individually responsible for certain of the forty-seven chapters and the result is a very authoritative treatment. There are several entirely new chapters notably ones on Carbon, Laundering, and City Gas. The work is divided into Organic and Inorganic volumes. It presents in tangible form facts and theories of Industrial Chemistry, so as to be readily accessible to the student, research man, and practicing chemist.

STATISTICS

The statistically inclined members of the student body may be interested in the following report. The statistician having recovered from the strain of making the report of the Rose-Normal basketball game has compiled the following figures relative to the annual cost of keeping the door between the library and the machine design room closed during the day. The figures are as accurate as may be expected from an electrical.

Average weight of each student	150 lbs.
Average number of trips (per day)	10 (ten)
Total number of students, faculty members etc.	250
Estimated height of stairs	10 ft.
Approximate number of days used per year	200
Total work done per year	150x10x10x250x200=750,000,000 ft. lbs.
Correction of 33 1/3% for Aitkin, Lahti, etc.	250,000,000 ft. lbs.
Actual work done	1,000,000,000 ft. lbs.
Ft. lbs. x 1. 356	1,356,000,000 joules
Joules ÷ 3,600,000	376.6 kw. hrs.

Source of energy—Snuggle Bars @5c per 2 oz. bar=$800.00 per ton
Compared with coal @$4.00 per ton makes power worth 200 (two hundred) times that from coal. Estimated cost of power from coal=$0.10 per kw hr. therefore the cost of power from such fuel as is available =$20.00 kw hr.

Total annual cost	$7,532.00
Cost of compiling this report	??????

the shop, to observe and get experience. He may then capitalize all this on the outside and sell his idea to a competitor.

The question often rises, "How is it possible to tie up the employee so that he will turn over his ideas and inventions to the company?" A special contract for this purpose is necessary. The employee must either be tied by special contract, or hired, by an unwritten contract, or a written one, for the purpose of inventing.

If he is hired for this purpose, of course, everything he does in the line of the company work belongs to the company. But even here, if he invents something that is not in the line of the company's manufacture, even though it might like to get into the line in which the inventor is working, yet it cannot hold the invention.

ATHLETICS—RAIN OR SHINE

Great raincoats for baseball and football fields, tennis courts and other playing places, made of a special rubberized fabric, which will keep the ground dry and thus permit games to be played in spite of rainy weather, have now been developed and it is expected will be features of coming seasons in athletic contests.

The new rubberized fabric, made on a special formula, has been developed by an Eastern corporation. This material is such that it is not only rainproof, but resistant to fungus growth, thus preventing it from becoming moldy or mildewed when rolled up and not in use. Tests of sections of the new fabric were made at the University of Illinois grounds under light frost conditions, and the rubberized material kept the ground from four to six degrees warmer than other fabrics, besides keeping out the water.

ROSE CAMERA CLUB REORGANIZES

After several years of inactivity owing to the moving of the Institute and other causes the Rose Camera Club has been reorganized for the purpose of teaching the students how to make good photographs and to develop and print the negatives. The taking of pictures may seem to some to be a mere pastime but when one considers the great use of photographs in engineering reports and catalogs, the need for the engineer to understand how to put his camera to the best use is apparant. The use of a single good photograph will save several pages of descriptive matter and hours of expensive drafting in many cases. For these reasons and the more obvious one of taking photographs for their artistic value, the Rose Camera Club has been reorganized. The officers for 1926 are Robert H. Aitken, president; Paul E. Crane, vice president; W. Robert Ferris, secretary-treasurer; and Professor John B. Peddle, faculty advisor. Professor Peddle is prepared to instruct the members in any phase of photography and his long experience in such work will be appreciated. The Institute has extended the privilege of permitting members to use the dark room so that the work of the club may be begun immediately.

—W. R. F.

ATHLETICS

(Continued from page 20)

their opponents, on May 2. Rose scored first in eleven of the fourteen events, carried off eleven seconds and seven thirds.

That the meet was fast is indicated in that two Rose records were broken, and another tied. Reeves broke the record in the two mile event, covering the distance in 11 minutes, 45 2/10 seconds. Barrett broke the high jump record with a jump of 5 ft. 9 in. Lahti showed wonderful form in topping the "sticks" to win in the low hurdles. His time was 27 8/10 sec., which tied with the Rose record.

Captain Dunning with a total of ten points won the high point medal of the meet. He finished first in the 100 and 200 yd. dashes, closely followed by McNaught.

The half mile was one of the best races of the day with Drompp taking the lead at the start and maintaining it until the second lap when Muntz stepped out to pass him. Muntz won the race in the sprint to the finish. Swalls, Rose's premier distance runner had things his own way in the mile run, and won in an easy manner.

Derry ran the high hurdles in good time to beat Lahti, besides winning a second in low hurdles and third in broad jump. His wins totaled nine points for the Engineers.

The event that every track fan waited for, and wanted to take in, was the half mile relay. Both schools had undefeated relay teams. Patterson, Garlan, Harvey, and Kincaid ran in the order named for Central Normal, while Porter, Davis, McNaught, and Wade formed the Rose aggregation. Patterson led Porter in the first 220 yards. Garlan kept the lead in the second, although Davis was close to him. In the third, McNaught stepped out and was leading Harvey by four yards, thus giving Rose a small edge. Wade took this lead and was in front of Kincaid when they rounded the last turn with 75 yards to go. In attempting to cut in between Wade and the pole Kincaid stepped on Wade's foot, throwing him to the track. Kincaid broke the tape first, and Wade, bleeding from cinder cuts staggered across the finish line. The referee ruled Kincaid had fouled and Rose was given first place. Rose placed in the events as follows:

Summaries:

100-yard dash—Dunning, Rose, first; McNaught, Rose, second; Patterson, Central Normal, third. Time, 10 3-10 seconds.

120-yard high hurdles—Derry, Rose, first; Lahti, Rose, second; Commons, Central Normal, third. Time, 17 7-10 seconds.

One mile run—Swalls, Rose, first; Reeves, Rose, second; Lee, Rose, third. Time, 5 minutes, 1 6-10 seconds.

440-yard run—Adams, Rose, first; Burt, Rose, second; Wade, Rose, third. Time, 1 minute, 1 6-10 seconds.

220-yard dash—Dunning, Rose, first; McNaught, Rose, second; Wade, Rose, third. Time, 23 5-10 seconds.

220-yard low hurdles—Lahti, Rose, first; Derry, Rose, second; Fulps, Central Normal, third. Time, 27 8-10 seconds.

880-yard run—Muntz, Rose, first; Drompp, Rose, second; Swalls, Rose, third. Time, 2 minutes, 13 5-10 seconds.

Two-mile run—Reeves, Rose, first; Gammill, Rose, second; no third place. Time, 11 minutes, 45 3-10 seconds.

Pole vault—Trautman and M. White, Rose, tied for first; Fulps, Central Normal, third. Height, 10 feet, 6 inches.

High jump—Harris, Central Normal, first; Barrett, Rose, second; Piper, Rose, third. Height, 5 feet, 10 inches.

16-pound shot put—Barrett, Rose, first; Layman, Central Normal, second; Garland, Central Normal, third. Distance, 37 feet, 8 inches.

Discus throw—Aitken, Rose, first; Garland, Central Normal, second; Piper, Rose, third. Distance, 109 feet, 6 inches.

Javelin throw—King, Central Normal, first; Piper, Rose, second; Garland, Central Normal, third. Distance, 142.85 feet.

Broad jump—Kincaid, Central Normal, first; Harris, Central Normal, second; Derry, Rose, third. Distance, 20 feet, 3½ inches.

ATHLETICS

ENGINEERS BEAT DEPAUW 9-8

The fighting Engineers beat De Pauw University in baseball on May 19 by score of 9-8. The game was very exciting from the start. Rose held the lead until the fifth inning when a De Pauw rally scored three runs to give the Preachers a one run lead. However the Engineers came right back in the eighth inning to score two runs the result of hits by Sweeny, Dowen and Sawyers.

Sawyers, Goddard and Taggert were the hitting stars for Rose. Babillis pitched good ball throughout the game. This was the seventh win of the season for the Engineers.

ROSE PLACES FIFTH IN LITTLE STATE

Rose Poly's track team placed fifth in the little State Track Meet by scoring fifteen points. The schools finished in the following order: De Pauw, Earlham, Wabash, Butler, Rose Poly, Franklin, State Normal, Hanover, Oakland City, Danville Normal, and Muncie Normal.

Max White was the leading scorer for Rose winning two seconds, one in the broad jump, with a distance of 20 ft. 11½ in., and the other in the pole vault with a height of 11 ft. 6 in. Capt. Dunning and McNaught, Rose Poly's stellar dashmen, finished second in the 100 and 220 yd. dashs respectively. Piper placed fourth in the javelin throw.

The Engineer's mile relay team showed class in winning a third place in the relay. The Engineers team was composed of Burt, Wade, Drompp and Muntz.

Rose has one more meet, the State Meet, in which all the colleges and universities of the state will participate. Rose is expecting her men to show well in this meet.

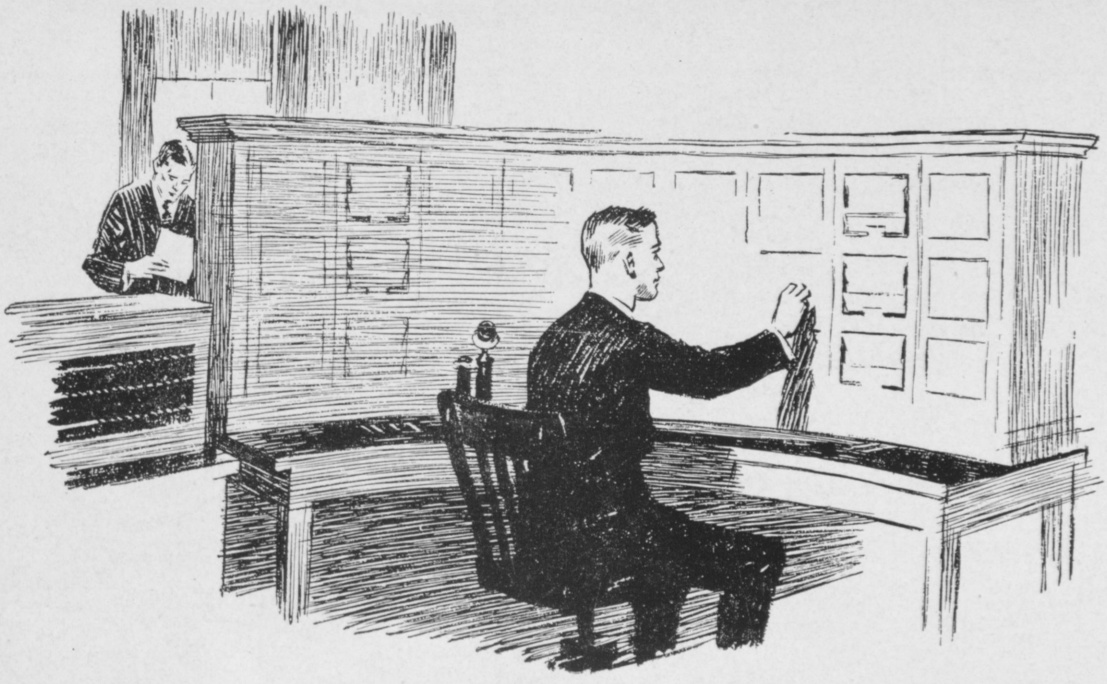
ROSE WINS CLOSE BATTLE

Rose poly's base ball team won its sixth victory of

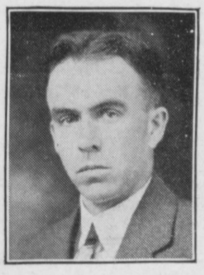
Rose Poly's base ball team won its sixth victory of the season on May 14th against Indiana Central. A ninth inning rally by Indiana Central fell short by one run. Both Herrin and Babillis pitched excellent ball in spite of the cold weather. Rose bunched their hits to better advantage than did the Indianapolis team, which only collected five hits off the offerings of the Rose hurler.

The Engineers played good ball and deserved to win. Kehoe, Witty, and Sawyers each got two hits for Rose while Sawyers stole four bases during the game.

Indiana Central	0	0	0	0	0	0	0	0	1	—1
Rose Poly	0	1	0	1	0	0	0	0	*	—2



They call it the "Pierce Type"



R. T. PIERCE

When the class of '15 at Maine was being graduated, the name "Pierce" meant no more in the field of metering than Sweeney or Jones. Today, however, if you'll talk to such companies as the Detroit Edison Company, The Southern California Edison Company, the Duquesne Light Company, or the United Verde Copper Company, you'll learn that "Pierce" means a type of remote metering, which enables a man in a central dispatcher's office to read the condition of a sub-station several miles away.

Superpower brought in the need for an improved method of remote metering, and R. T. Pierce, Maine '15, in the employ of Westinghouse, devised it. He designed a system that operates on a new and different principle, and that has met with general acceptance in the Central Station field. He also was active in the recent re-designing of the entire Westinghouse instrument line.

It was only a few months after Pierce had completed the graduate student course at Westinghouse that he was given an assignment in the instrument section of the engineering department. He took it merely as a "fill-in" job. Soon he saw that instruments play a vital part in every electrical operation. As an instrument engineer, Pierce spent several weeks on the U. S. S. Tennessee and the Colorado during their trial runs. He has ridden in the cabs of electric locomotives. He is in closer touch with radio than anyone not a radio engineer.

A design engineer comes continuously in contact with sales negotiations, and Pierce's contact with them proved so beneficial that he was lately made head of the Instrument Section of the Sales Department, which means that he really has charge of the sale of all instruments to Westinghouse customers.

The question is sometimes asked: Where do young men get when they enter a large industrial organization? Have they opportunity to exercise creative talents? Or are they forced into narrow grooves?

This series of advertisements throws light on these questions. Each advertisement takes up the record of a college man who came with the Westinghouse Company within the last ten years or so, after graduation.

Westinghouse

W
WESTINGHOUSE ELECTRIC

Crows

In a field in sunny Spain stands a stone mortar. Crows hover around it, picking up bits of grain and chaff—cawing.

Here Marcheta, in the fresh beauty of her youth, will come to pound maize. For years she will pound maize. The stone will stand up under the blows; not a dent has the muscle of three generations of women made upon it. But the crows will hurl their black gibes upon a woman aging early and bent with toil. *Old Marcheta*—still in her thirties.

The American woman does not pound maize. But she still beats carpet; she still pounds clothes; she still pumps water. She exhausts her strength in tasks which electricity can do better, and in half the time.

The high ideals of a community mean little where woman is still doomed to drudgery. But the miracles which electricity already has performed indicate but a fraction of the vast possibilities for better living and the tremendous opportunities which the future developments in electricity will hold for the college man and woman.

Electricity, which can release woman from her burdens, has already created a revolution in American industry. Wherever mankind labors, General Electric motors can be found carrying loads, driving machinery and saving time and labor. And there is no branch of electrical development today to which General Electric has not made important contributions.

A series of G-E advertisements showing what electricity is doing in many fields will be sent on request. Ask for booklet GEK-1.

7-72DH

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY. SCHENECTADY. NEW YORK