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Rose Technic Staff
Rose-Hulman Institute of Technology

ROSE TECHNIC

Vol. XLII, Number 6 MARCH, 1933

Member Engineering College Magazines Associated

ROSE POLYTECHNIC INSTITUTE, TERRE HAUTE, INDIANA

Wooden soldiers
in the war *against decay*

To conquer the forces of decay which attack telephone poles, scientists of Bell Telephone Laboratories carry on a relentless campaign.

They study many kinds of wood, test many preservatives. They isolate wood destroying fungi and insects—study them in the laboratory—search for a practical means of combating their attack. They have set out armies of stub poles in Mississippi, Colorado and New Jersey where altitude, climate and soil vary widely. At regular intervals they inspect these poles to learn which woods and preservatives are best.

Such scientific thoroughness—found in all phases of telephone work—is one reason why Bell System plant becomes more efficient each year. And why telephone service is so dependable.

BELL SYSTEM

TAKE A TRIP HOME BY TELEPHONE
. . . TONIGHT AT HALF-PAST EIGHT!

Surveying This Issue

EFFECTIVE lighting has made the Hall of Science at the Century of Progress Exposition beautiful by night as well as by day. The cover cut shows the south entrance of this building.

ANOTHER illustration of the striking effect of lights and shadows in architecture is afforded by the frontispiece. These giant towers have almost become symbolic of American "big business" growing to immense proportions practically over night.

THREE "electricals" have collaborated to furnish us with a very interesting description of the Radio Club's new short-wave transmitter. The station embodies many unique features.

MR. F. J. Bogardus, who graduated with honors last June and is taking advanced work at Yale has written about a revolutionary new development in his field of mechanical engineering.

A HIGHLY important function of The Century of Progress Exposition is the testing of new methods and materials of building construction. Mr. McEowen, a sophomore, discusses the Exposition as a proving ground for experimenters in this field.

AS engineers are becoming more and more involved in the business and economic life of the nation, it is highly important that they should acquaint themselves with the current problems of business; therefore, every student is advised to read the contribution submitted this month by W. A. Layman, '92.

HARBOR development is an interesting but comparatively unknown field of engineering. We are fortunate to be able to present an article on this subject by a nationally known authority, Mr. G. F. Nicholson.

—J. G. B.

THE ROSE TECHNIC

Vol. XLII Number 6

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Mr. Robley Winfrey, Chairman, Engineering Hall, Ames, Iowa.

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New York Times

A Study of Light and Shadow

THE ROSE TECHNIC

THE TECHNICAL JOURNAL OF THE ROSE POLYTECHNIC INSTITUTE

Volume XLII | MARCH, 1933 | Number 6

Rose Radio Station

By Howard A. Stadermann, e., '34

Robert Barr, e., '33 « Photographs Russell Archer, e., '33 « Diagrams

DURING the last month the new amateur radio station at Rose Poly was completed and put into operation. As a result of the interest displayed on the part of the students and alumni of Rose, the Rose Tech Radio Club has compiled the following article in order to inform its interested friends of the operation and potential possibilities of the station.

For many years the Radio Club has felt the need of an amateur station as a means of carrying on experimental work as well as providing on interesting activity for its members. In past years, several low power transmitters have been constructed, but in each case they were temporary and no attempt was made to provide a permanent station installation.

First of all it might be well to state the location and type of this broadcasting station. It is located in the building formerly occupied by Station WBOW, near Deming lake on the campus of the Institute. The power is 150 watts, continuous wave, and is capable of sending a signal around the world on a frequency in the vicinity of 7100 kilocycles. This type of station operates in an amateur, or experimental, frequency band and it shares space in the ether with other university, college, and experimental stations. At present telegraph code is used as the means of communication, but it is planed to incorporate radio telephony in the near future.

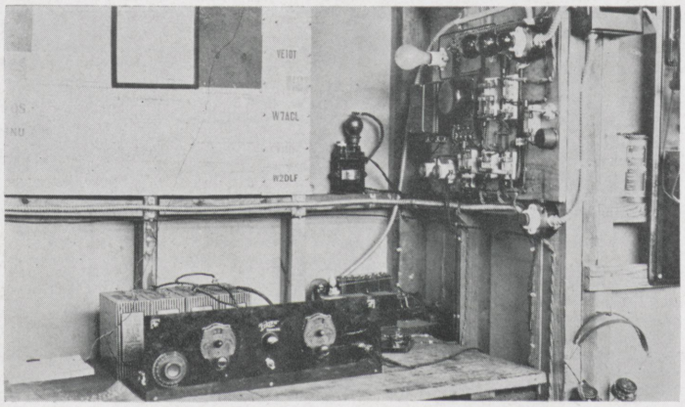
The station on the day of the formal opening.

During the first term, actual work was begun on the construction of the station. The building was acquired and prepared for the installation of new apparatus. The Club is extremely fortunate in securing this building with its aerial towers and electric power leads. After some discussion it was decided that the station should be remotely controlled from the main building of the Rose Polytechnic Institute. It was further decided to place wires in operation from the main building to the radio building which is about one-quarter of a mile away. Students acquired some real practice in pole climbing and also some

experience in setting telephone poles. This connection between the main building in the club room of the Electrical Engineering Laboratory with that of the transmitting building enables students to operate the transmitter remotely. There are several advantags of remote control from the main building. First, it allows the students to operate the transmitter during spare school hours without the necessity of going to the transmitting building thus saving time and avoiding the quarter-mile trip in all sorts of weather. Then again during winter months the transmitting room would have to be heated. The club room, located in the main building, offers ease in accessibility and the location of the transmitting apparatus in the building by the lake offers splendid radiation possibilities.

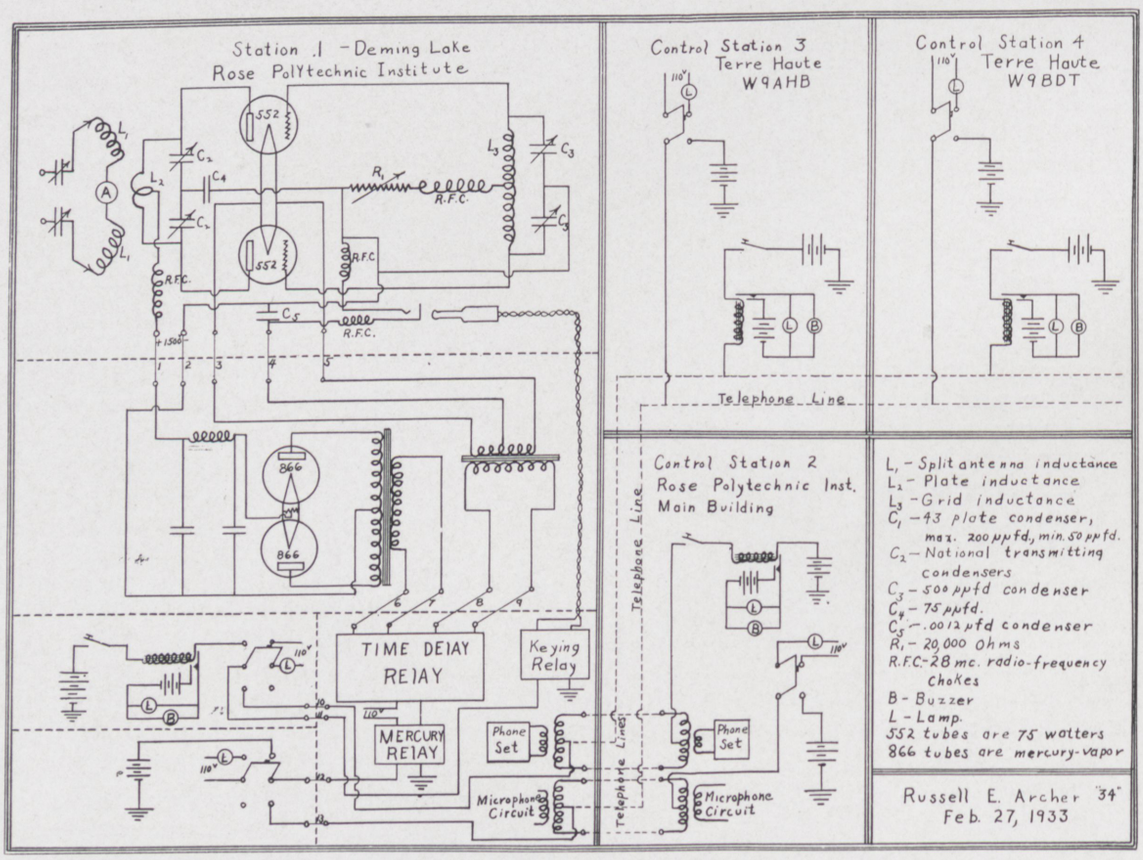
It was also decided that telephone communication should be obtained between the operating club room and transmitting location in order to facilitate the tuning and adjustment of the transmitter. It then appeared as if an additional pair of wires would be necessary between the two buildings but this was obviated by using a phantom circuit. The solution of this difficulty is an example of how some of the problems in practical engineering were met, and the Radio Club feels that its members derived much benefit from their application of theoretical knowledge to actual operating engineering. Each Saturday morning a group of interested members came out to school and worked in the transmitting building. Some worked on the electric light wiring, while others helped in the installation of the control apparatus and the erection of the aerial. While this work was progressing a new opportunity presented itself in the form of a generous offer of the local telephone company to provide an experimental line from the transmitting building to the city exchange. This line was extended to the amateur radio stations W9AHB and W9BDT, located in Terre Haute seven miles away. It was then realized that the station at the Institute could have at least five different operating positions and from these different locations many experiments could be carried out among the interconnected laboratories. This

(Continued on Page 23)



The central station in the main building.

Circuit diagrams.



The External Consumption Engine

By Frederick J. Bogardus, '32

Dedicated to Saint Patrick

READ this dizzy dissertation at your own risk. My reason having long since left will not be responsible for anything that may occur. With this word of warning, proceed if you dare.

(Editor's Note—The author has departed for parts unknown, as he auto, so it is useless to attempt any reprisals.)

The field of unapplied energy has received much attention during the past year. Chief among the many developments in this field was the construction of an improved type of external consumption engine by an unesteemed and unindustrious colleague, Professor C. Mishmeyer.

Much thought and labor have been wasted on this problem for the past hundred or so centuries. The noted Dr. Zilch, B.S., P.D.Q., devoted approximately 25 hours a day to the development of butterfly valves on a certain model. He once explained that moths were out of the question for this purpose as they ate holes in the castings. He also tried poppet and mama valves, but they made too much noise. His labors were brought to an untimely end when he suffered a compression stroke and choked to death.

Mr. Hick, C.U.P., I.O.U., introduced a model that incorporated many novel features. Perhaps his greatest contribution was the gyroscopically stabilized streamlined piston used in his engine. The stabilization did away with piston slap by removing the rocking. Another interesting feature was a vent in the head of each cylinder to relieve the pressure, thus allowing the cylinder walls to be made out of cellophane. Of course the many advantages of such an arrangement can be seen at once, such as lighter weight, clear view of the consumption chamber, and so on.

However, this great advance was irretrievably lost to science when the head blew off and he was given a fatal blow by the blow up.

Solution ? ? ?

It has remained for Professor C. Mishmeyer to provide a thoroughly useless and annoying solution to this problem. At the same time it must be remembered that he began on his engine with the greatest reluctance, and only at the request of Professors Mipmeyer, Mousley, and Mowlett.

Professor Mishmeyer's first act when he undertook the case that was to make him famous was to put on his water jacket, inject some fuel into his system, and compress his head into his hands. This ignited his train of thought and expanded his ideas until exhaustion took place. Many difficulties were encountered while working on this model.

His great absorption in this engine caused his timing to become quite irregular; in fact he became a regular crank.

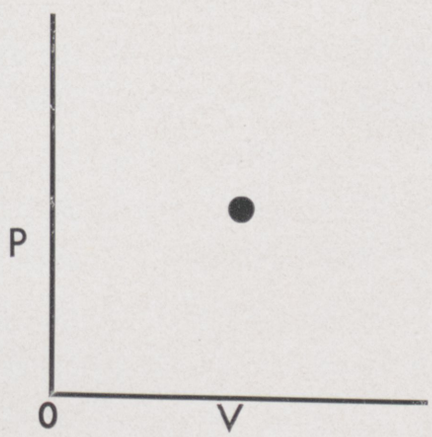


Figure 1.

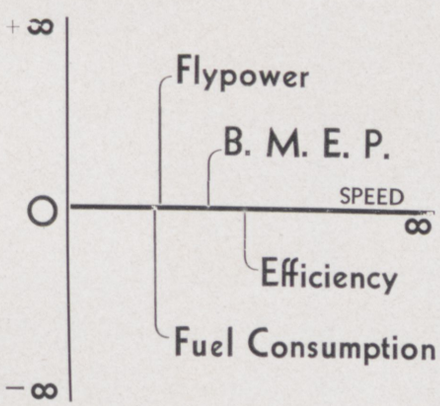


Figure 2.

Operation - Not Surgical

This engine operates on the no-work cycle; that is, no work is required to operate it. Fig. 1 is a graph of this cycle. Dr. D. B. Brentice has declared that it is the most efficient engine yet developed, since no work can be lost. Mr. H. C. Dray has announced that all future ocean liners will be equipped with this ultra-modern device.

When the operator's aunt comes into the room and says "didn't you hear anti-knock?", he waves at her and knocks a few sparks off the old plug with the connecting rod. These sparks ignite two pecks of entropy, which has a heating value of 0.3 o.h.g.* per gallon. Immediately adjacent is a battery of wheels with four flies hitched to each one, and connected with a worm drive. Care must be taken to use only first quality tomato worms, and the room must also be worm. The specific heat from the entropy worms up the flies, who begin to fan the air by adiabatic expansion and contraction of their wings, in place of a better cooling system. These flywheels develop up to n flypower, n being the number of flies pulling in the same direc-

*One hot girl.

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The World Fair

is a Proving Ground

By Albert V. McEowen, a., '35

THE World's Fair, soon to open in Chicago, will serve many purposes other than a common display of interesting exhibits. It can be thought of as a great proving ground where manufacturers and others put their products to the test and await the verdict of the masses. One branch that will be under fire will probably escape the notice of most spectators, but their actions will all be part of the trial that is going on. The subject being considered is the design and construction of the buildings which will house the varied exhibits. These buildings will embody new and modern principles of design, structure, and materials; and the results will have an important effect on the building of the ensuing years. Many new ideas will be tested and from the data gathered the modern builders will have gathered arguments in favor of their theories.

Conditions Favorable for Tests

The Century of Progress Exposition offers a wonderful field for experimentation, since the conditions will be quite severe enough for most critics. Although the life of the buildings will be relatively short, the abuse they will undergo from the passage of the thousands of sightseers will be comparable to much longer life elsewhere. The location of the buildings on the shore of Lake Michigan is also convenient, since the wind and weather common thereabouts will contribute its part to the investigation. The site being used is on some of the "made land" which has been built up out of the lake by filling with all sorts of junk, rubbish, and waste materials. This fill was made on the silty lake bottom so that it is from forty-five to sixty feet down to a solid formation. The character of the fill is such that no two spots have the same bearing qualities. A pile foundation system was necessary, and this type of construction was used in practically all of the buildings. A two story building was considered the most economical and will be the standard followed. One other general problem was that of fire resistance, and by order of the Board of Directors, all buildings must provide one hour resistance but this is the only characteristic they have in common. All the buildings differ in some respects. All the materials discussed in this article will receive their share of use.

Most of the units have steel frames with a fairly light construction which is usually field bolted to facilitate demolition at the end of the exposition. The steel trussed joints used are secured to the beams with a simple bolted clip and light bridging is also clipped to the joists. This construction is economical and the open type allows the use of the space between floor and ceiling as a ventilating duct. Most of the buildings will be windowless and will need a ventilating system.

Structure is Decorative

Another step toward economy brings more novel ideas to the front in the use of the structural members as part of the decorative scheme. In one case indirect lighting is used to cast the shadow of the roof framing onto the roof deck above. Other buildings use the columns as the main feature of their wall decoration, and economize on the wall construction by eliminating the boxing in, or furring of the columns. Problems of this sort are being studied today by modern designers and the buildings of the future will in all probability show the results of this line of thought.

Metal and Plywood Used

The floor materials on trial are a metal decking and plywood deck. Each has its good and bad points, some of which have been observed already. The metal decking is of 20 gauge steel with reinforcing ribs and comes in interlocking units 6 inches thick by 16 inches wide. It is naturally incombustible, and has a presentable appearance, so that the under side is often used decoratively, allowing the omission of ceilings. However, the sound insulating effects are bad and a mastic fill is necessary to overcome this difficulty. Both the corridors and exhibition spaces require a finish floor over a mastic fill, so that the construction becomes quite expensive. The plywood deck has its advantages and disadvantages also. The material used is a 5 ply $\frac{5}{8}$" laminated fir panel coming in 3'x8' blocks. It is laid with tongue and groove joints and gives a floor which can be used for exhibits without additional cover. It is more economical, both in initial and application costs. Since this type will burn, there is generally required a non-combustible ceiling underneath, which will allow it to meet the fire requirements. The wood surface is much more convenient where finish floors must be applied, but only time will reveal the relative merits of the two materials.

The exhibit space in most cases

will be artificially lighted so that windows are unnecessary. This leaves large wall spaces which are ideal for over-all decorative schemes, but which introduce some complications in the construction. Most of the walls are of wooden stud construction with the covering applied directly. The dead air space provides ample insulation and a very economical effect is produced. The surfaces require some allowance for expansion with temperature changes and must take paint satisfactorily. A light material is desirable, but resistance toward wind and rain is necessary.

Other Materials Employed

An asbestos cement board will be tried, coming in 1/8" to 3/4" thickness and in sheets 4'x8'. Because of its expansion it must be laid with 1/2" joints, which can vary under the battens. The horizontal joints must be flashed with metal to prevent damage by water. It is a relatively expensive material, and the application cost is also high, but the product is extremely durable and has a good natural color. It is heavy and brittle, however, and takes paint rather poorly.

A ribbed metal siding is also being used, which comes 6" units any length up to 80' and is easily attached with clips to horizontal girts. The narrow strips make it easily adaptable to curved surfaces although these same strips are one objection to the sightliness of the finished wall. It is easily erected but the cost of the material is high.

A plywood wall board comes in 4'x8' sheets of 1/2" thickness. By using ship-lap horizontal joints the flashing necessary with asbestos cement board is eliminated and tongue and groove joints will make battens unnecessary. The initial and erection cost is lower than asbestos cement board, the panel is easily applied to plane or curved surfaces, and the paint surface is naturally good. The panels are primed with hot linseed oil at the mill and waterproof glue is used, making a lasting job.

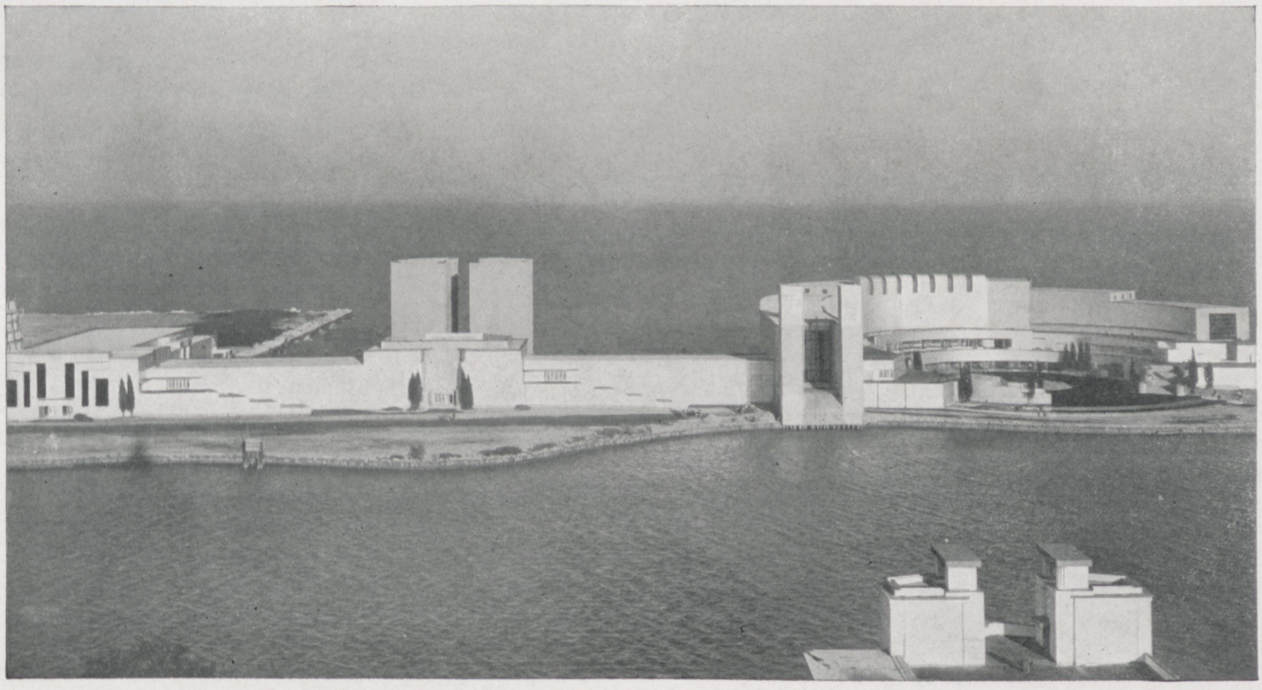
The last type in question is a gypsum wall board, consisting of a cement and gypsum core, covered with a heavy paper, and dipped in aluminum paint at the mill. It can be steamed and formed to curved surfaces, so its use meets most requirements. The initial cost is low and erection is comparable to plywood while the paint surface offered is the best that has yet been found.

Aside from the materials under inspection, the designs of many of the buildings are revolutionary to the extreme. Almost every unit has new and modern treatment, much of which will be visible in the newer construction work. The use of structural members as a base for the decorative treatment is both economical and artistic and this type of design is growing in favor. Much stress is being laid on the exhibition in hopes that the modern influence will win an increase in popularity among the masses of the American public.

Modern Movement Will Profit

The observations and conclusions which have been made up to date cannot be taken as final or complete, for the work has just been started, but as the research continues many new uses for common materials can be expected to be forthcoming. The modern movement will undoubtedly receive a great stimulation and the results of the above mentioned tests should be of interest to all designers and builders who wish to keep abreast of the times.

The Lagoon at the Exposition



Courtesy General Electric Co

What Would You Do?

By W. A. Layman, '92

EDITOR'S NOTE:—

Since the writing of this article, which was intended for publication in February but failed to arrive in time, several of Mr. Layman's suggested remedies for economic evils have been adopted.

THE engineer-industrialist is charged with responsibility for a considerable part of the present economic disorder, and it is asserted in some quarters that he should do something about it. Whether the charge be true or false, and whether or not an obligation rests upon him to carry a considerable part of the burden of correction, it is certain that every engineer-industrialist of constructive temperament is thinking seriously about what he would do if in a position to influence constructive action. The speculation is a most interesting one, and as all present students of Rose will plunge into active professional life in time to participate, in some measure, in the country's reconstruction, I venture to put the above question to you. As a basis for discussion, I advance the following views:

1st. Readjustment should proceed with relative little consideration of export trade as an early avenue of relief.

2d. Our tariff should be adjustceed with relatively little consideration of export trade as an early avenue of relief.

3d Our anti-trust laws should be amended or supplemented to substitute constructive for destructive competition.

4th. The financial system of the nation should be so modified as to give security to both depositor and banker.

5th. A considerable number of unsound practices in commercial and industrial life must be corrected.

6th. Labor should be protected, in greater degree than at present, against unemployment and improved mechanization.

7th. Assuming the above consideration to take precedence, thereafter the international aspect of our economic sickness should have consideration.

Proceeding to a condensed discussion of these several propositions, permit me to sweep aside in one broad statement the most obvious of all domestic ills—top-heavy expense of government, excessive taxation, and the intolerable confusion and delay of Congressional action. Every school boy knows we must balance the budget; cut down taxes both national and local; stop pensioning military masqueraders; simplify the government all the way down; keep our currency sound, and stop loading the banks down with government short-time paper.

Imports and Exports

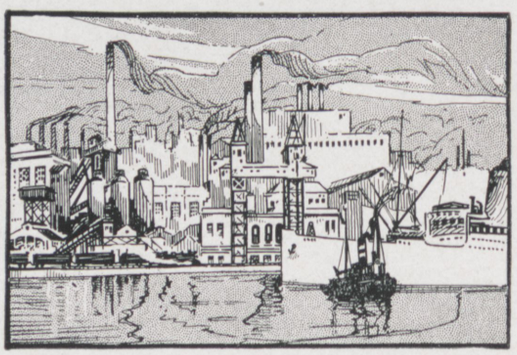
One fundamental aspect of this topic seems clear—we should not open our home market to competitive products nor expect foreign nations to open theirs. I therefore see no opportunity for "reciprocal trade agreements" or "debt adjustments in exchange for exports," as promised in the recent campaign, insofar as this involves competitive products. As to non-competitive products, industrial or farm, let us by all means exchange on a mutually advantageous basis. It is vital to our home recovery to keep our tariff on home-made production high enough to preserve the plane of living heretofore developed. Accordingly, we must have a multiplying factor, without delay, to adjust present tariff schedules to foreign off-gold currencies. It cannot be doubted that our export trade will recover slowly, and will give but little help toward the recovery of our economic balance with encouraging promptness.

Anti-Trust Laws

Only by a change in the fundamental principle of these laws can we hope for stability in business. They were designed to prevent undue concentration of production, shield the small business from competitive destruction, and protect labor in its employment. They have worked negatively in all three directions and all because they foster merciless competition, and gradually take the profit out of business. Every aspect of free opportunity for diversified employment of both capital and labor is impaired. The remedy is modification of these laws to make constructive competition the rule of our business life. This means balancing of production against demand, permitting a fair profit in trade,—in essence so modifying Federal regulation as to permit and maintain fair balance as between all parties to business: producer, consumer and labor. Other nations do this; why not the United States?

Financial Reform

Who can doubt that bank failures have constituted the chief cause of the extreme severity of



the depression. The engineer will not be expected nor invited to participate in banking reform moves, but he may be permitted to offer his observations. It seems obvious that both banker and depositor must be protected against depositor panic. A solvent bank should not be forced to close its doors against a panic demand for sight withdrawal of 100% of deposit balances. Deposits are made with full knowledge that the banker acts as the depositor's agent in loaning out the major portion of the depositor's balance. The banker faces an impossibility of meeting panic withdrawal demands. Furthermore, it is gross inequity for him to permit the frightened depositors to draw not only their share of the bank's liquid funds but also the share of the frightened depositor as well. Why not empower the Comptroller or the Currency to suspend 100% withdrawal privilege and ration withdrawals when depositor panic conditions arise?

Next in importance is wiping out the dual bank system and placing all banks under Federal supervision. State banks have been notoriously vulnerable in this panic, their audits inadequate if not politically collusive, and their management frequently incompetent and dishonest. All bank inspections should be strengthened toward prevention of accumulation of unbalanced and vulnerable portfolios. Bank statements, particularly of the small banks, should disclose the character of their portfolios, in which laudable move one large New York bank has recently set the example by making public, in detail, all its investments.

The security-distributing affiliate of the bank has been a contributing weakness, and should be completely divorced. It constitutes a continuing temptation to unwise diversion of bank deposits through loans to affiliates. It also tends to promote overcapitalization of the bank's best commercial customers for a handsome immediate profit, thus destroying the customer as such and sometimes creating an actual competitor through the customer's loaning of its excess cash resources.

Other bank weaknesses such as inadequate capitalization, excess number of banks, etc., and also purely fiscal reforms that may be necessary, are subjects the engineer may trust wholly to fiscal experts.

Unsound Business Practices

The individual business must be more honest with its stockholders. Its reports must be more frequent and more accurately reflect its condition and trend. Directors should be substantial holders of shares, and their holdings should be disclosed periodically to all stockholders. The rivalry of the states in domiciling corporations is an evil to be corrected. This may require, ultimately, the national chartering of all corporations and partnerships doing an interstate business. Business charters should confine the activities of the individual business to its logical purposes, and particularly prohibit banking practices by commercial organizations. Trade practices should be modified to avoid plant expansion to meet maximum sales needs, and peaks of demand either supplied from balanced reserve stocks or sublet to plants having reserve capacity. More emphasis must be placed on profits and less on sales volume. The trade association should be vitalized to displace the big trade unit as the directing force behind trade practices in the individual industry. Business must finance a more uniform rate of production irrespective of trade fluctuations. It must clear its balance sheet of obsolete plant investment and slow moving product. It must liquidate its excess capital rather than conserve it for excursions into "investment" fields. There must be a considerably higher plane of competitive ethics, which will inevitably follow when the Federal Trade Commission is empowered to regulate business constructively for wholesome competition in the general interest. There will inevitably follow a considerable change in attitude of capital to labor.

Business Reforms for Labor Benefit

The depression has borne very heavily on labor, for which fact capital is in part to blame. Therein lies the opportunity for reforms which will improve labor's general status. Concentration of production in the large centers has gone too far, and redistribution geographically will help labor by lessening the cost of living; greatly enhance the relative social position, dignity and fireside solidarity of the worker's family; temper depressions through home gardening, etc.; in short vastly contribute to stabilizing the worker's welfare. Such a program will also have substantial advantages for the employer. Then business must create reasonable reserves against unemployment, preferably voluntary reserves rather than state-controlled reserves which are sure to be politically mismanaged. These reserves may wisely take the form both of cash invested in government or equivalent liquid securities, and of a healthy floating battery of finished products adjusted to maintain greater uniformity of production. But it should be recognized that such reserves must be supplemented by labor conserving its own resources against a duration of depression beyond any ability of business to prefinance possible prolonged unemployment. Capital must also modify its practices relative to the distribution of the advantages of improved mechanization. Up to date, practically all of the time savings of remechanization have been retained by the employer. If this policy is not modified, labor may be expected to unite in re-

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The Development of

The Port of Los Angeles

By George F. Nicholson, '06

CONSTRUCTION of a large modern passenger and general cargo marine terminal was recently completed at the Port of Los Angeles for the Los Angeles Board of Harbor Commissioners, and was inaugurated on December 12, 1932, with the berthing at the new Terminal of the palatial new liner "Santa Rosa," of the Grace Line, on its maiden voyage. The new marine terminal, situated at Berths 145 and 146 in the West Basin of the Inner Harbor, will accommodate two of the largest around-the-world vessels or three ships of average size simultaneously. The designs for the Terminal incorporated unique features for the handling of passenger traffic between terminal and ship apart from cargo-handling operations on the main floor and the danger incident thereto. The transit shed proper is finished outside in a pleasing two-tone Spanish effect, expressive of the atmosphere of Southern California; while the passenger corridor and commodious waiting rooms, designed for the convenience and comfort of passengers, have been finished with old Spanish and travertine effects, providing beauty and simplicity. While the passenger arrangements are outstanding features of the new Terminal, the arrangements for general cargo handling are unexcelled.

General Description of Terminal

The new Terminal consists essentially of a combination reinforced concrete and timber wharf, 1470 feet in length; a double transit shed constructed of steel and concrete, 120 feet wide by 1008 feet long, served on the water side by two highline or wharf tracks and on the land side by three lowline loading tracks. In the rear of the transit shed there are large open storage areas for pipe and other heavy cargo, and a system of roadways serving the terminal.

Following the standard practice at the Port of Los Angeles, that portion of the wharf under the transit shed—36 feet in width—was constructed of a reinforced concrete deck, supported on asphalt impregnated concrete piling for the purpose of assuring great permanence to that portion of the wharf structure which would be difficult and expensive for replacement. (A previous article describing the impregnation of reinforced concrete piles with asphalt at Los Angeles Harbor appeared in the July 18, 1929, issue of the Engineering News-Record.) The under side of the reinforced concrete wharf slab was sprayed with a protective coating of emulsified asphalt.

A bulkhead, 15x24 inches in size, of similarly impregnated reinforced concrete sheet piling, stayed by substantial concrete anchors, retains the earth fill at the rear of the concrete wharf. A 31 foot apron wharf fronting the concrete section was constructed of creosoted timber and piling to lend resiliency to the structure and assist the fender system in absorbing the impact of berthing vessels. This wharf was paved with sheet asphalt, flush with tops of rails. The transit shed floor over the earth fill consists of a 6 inch concrete slab resting directly upon the fill and is surfaced with an especially proportioned asphaltic concrete, metallic in effect, which has been found to be resistant to wear under abrasive action of heavily loaded and fast moving steel truck wheels, and which is also non-plastic under heavy static loads in the storage zones.

Loading Facilities

A loading platform 10 feet in width was provided at floor level along the landside of the transit shed. Three lines of lowline railroad loading tracks served by a running track, all fully paved with asphaltic concrete, were constructed at the rear of the loading platform, and 3′ 10″ below to facilitate cargo movements between shed and trucks and freight cars. The platform and tracks have been laid out on a saw-tooth arrangement, following a plan used several years ago by the Port of Los Angeles, which makes possible the movement of railroad cars without interference with loading operations of trucks or railroad cars at the adjacent shed. A wide concrete roadway has been provided back of the lowline tracks to permit rapid trucking.

The transit shed walls are constructed of reinforced concrete, which readily lends itself to the inexpensive modernistic architectural treatment. The exterior walls of the transit shed have been gunited and finished in old Spanish effect. Interior walls of offices and passenger accommodations are finished in plaster with a modified Spanish effect above a travertine wainscoting, with floors in dull red tile marked off by ground joints in an attractive design.

The cargo floor is unobstructed except for a single row of structural steel columns at 42 foot intervals along the center line of the transit shed which support roof trusses of steel. The roof consists of five ply felt and gravel over wooden sheathing on timber

purlins, a type of construction comparable in fire resisting qualities with other types of greater cost recognized in the establishment of insurance rates.

The shed is well lighted by continuous steel sash in the roof monitor running the entire length of the structure, and by steel sash lights in every alternate panel of the shed wall on both land and ship sides. Manually operated rolling steel doors, 17 feet wide by 14 feet high on the water side and the same width but only 10 feet high on the land side have been installed in the shed walls, alternating with the side wall steel sash. Main traffic doors at the ends of sheds, and at the central entrances on the land side are 16 feet and 22 feet in width respectively.

Excellent artificial illumination for operation of the wharf at night has been provided by standard lighting units distributed so as to provide uniform intensity of approximately 2 foot candles throughout the shed. The shed is power wired throughout for the convenience of operators and stevedoring firms who may require electrically operated equipment. In addition to overhead angle reflectors outside the shed walls, outlet plugs have been provided at each rear door for the use of cargo checkers at night, and along the rear loading platform to permit the use of extension cords and lights for use in loading cars.

The entire structure has been equipped with an automatic sprinkler system conforming to the Underwriters' requirements, utilizing the Los Angeles Municipal Water service as the main source of supply, with an auxiliary pressure supply of 100,000 gallons in a steel gravity tank supported on a 100 foot steel tower.

A heavy duty cargo mast has been constructed the full length of the transit shed for use in conjunction with ship's whips in handling cargo, such as long lengths of pipe and steel, from ship's holds to railroad cars located on shipside wharf tracks.

Passenger Facilities

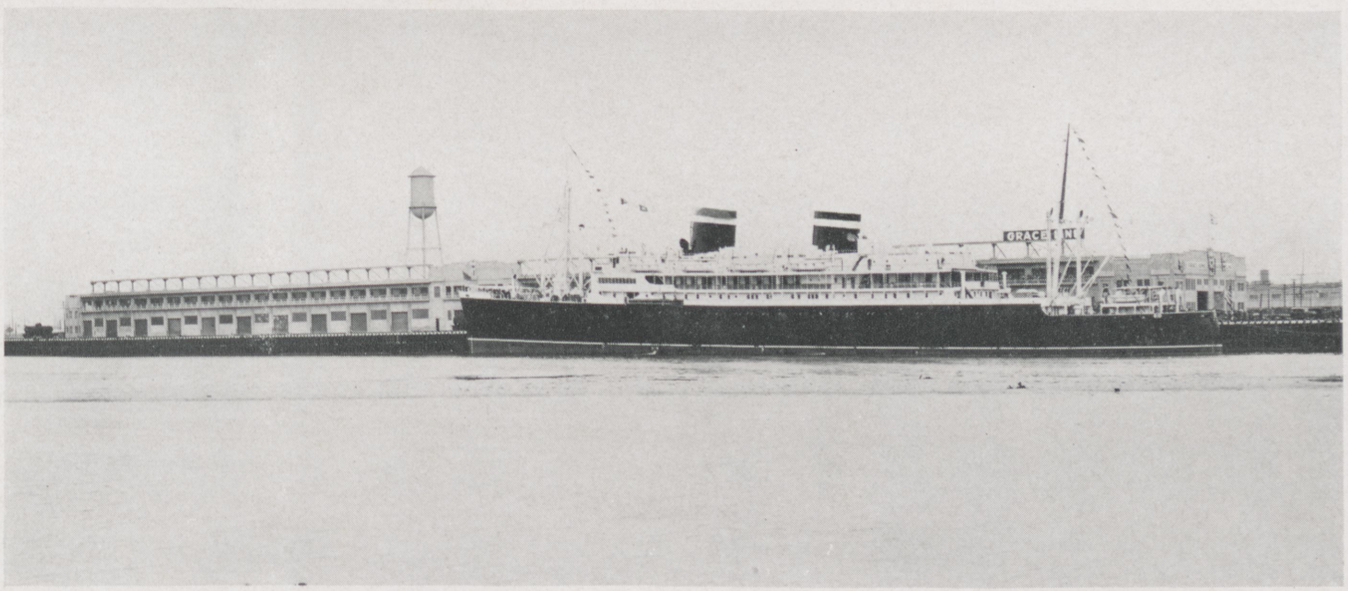
The usual exposure of passengers to risks encountered in passing through the more or less dangerous and noisy areas utilized for trucking, storage and handling of cargo, has been completely avoided at this terminal by the construction of an overhead passenger corridor, 18 feet in width, situated along the shipside of the wharf, for handling passengers, and the use of a specially designed motor-operated passenger landing stage and gang plank. Due to the equable climate in Southern California throughout the year, the waterside of the corridor has been left open between columns, and is provided with a continuous balcony outside the corridor proper, protected by a substantial wrought iron pipe railing with woven wire panel inserts, overlooking the wharf deck below. From this corridor visitors can exchange greetings with passengers upon arrival and departure of ships, and observe cargo handling operations on the deck below. The hand railing is made in removable sections so as to permit of making gang plank connections between the passenger port of different vessels and the passenger corridor.

Access to the corridor is provided by wide, easy ramps of fireproof construction, leading from attractively finished waiting rooms on the land side of shed at either end of the terminal, where passengers and visitors, arriving by automobile or train, will find every modern convenience, with ample parking facilities in the immediate vicinity. Ample baggage inspection accommodations are provided in the shed adjacent to the waiting rooms.

Offices for use of shed assignees have been constructed on the second floor above the waiting rooms, and additional two-story office accommodations have been provided on the waterside at either end of shed for use of wharf operators. The second floor offices are connected by a concrete bal-

(Continued on Page 26)

The pier, seen from the water.



Published Monthly by the Students of Rose Polytechnic Institute

THE ROSE TECHNIC

A Magazine Pertaining to Engineering and Allied Sciences

Member of Engineering College Magazines Associated

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ALUMNI ADVISER

ALLEN G. STIMSON

GRAPHS and charts have come to be symbols of our age. Everything conceivable is expressed in a form easy for visual comprehension. Many trends and phenomena are thus made apparent that are overlooked completely in mere figures.

One especially valuable sort is of one's scholastic progress during his four years in college. It is best plotted relative to the grade made during the first semester. This grade is used as a base, and is plotted as zero. Then the successive changes, plus or minus, are plotted as ordinates against semesters as abscissae. The resulting curve is a better indication of one's accomplishments than any sort of a numerical average.

There are several factors included in such a chart. It is a well known fact that the extent and quality of preparatory high school work vary widely among schools even in the same state. Some college freshmen enter with credit in almost half of their first semester subjects. Of course they make much better showings than their less fortunate classmates. By the second year, even by the second half of the first, the significance begins to appear. Many freshman meteors begin a precipitous decline which continues until graduation. Other students not quite so high the first semester stay almost level or manage to rise. These are the ones to whom credit is due.

The effect of extra-curricular activity is usually evident. The semesters in which outside work is being done suffer noticeably, and this sacrifice must be made. If the activity is worth while it is a good bargain. If its value is doubtful, one should think well before engaging in it.

If it were possible for the registrar to prepare graphs of every student's record, these would be valuable, but the time and labor involved make this impossible. Therefore the Technic wishes to suggest that each student obtain his grades from the office and plot his own graph. Study of it will doubtless prove a revelation.

Tear Gas

Chemical warfare is a favorite subject for condemnation by humanitarian and pacifist groups. Its horrors and devastating effects are graphically described while its humane characteristics are overlooked.

Originally developed for war service, there is one gas that is proving a boon to law and order in peace time. That is tear gas. It plays a part in the affairs of the world almost daily.

There is still much prejudice and ignorance concerning its use. If a mob becomes unmanageable, it must be dispelled quietly and without violence for some respectable and innocent citizens are probably in it. Shooting is out of the question. Tear gas effectively takes all the fight out of anyone without doing him any harm. The milder forms, such as chloropicrin and chloracetophenone, cause sneezing, crying and general discomfort; if more persuasion is needed, diphenylaminechlorarsine grenades may be used, which cause nausea, vomiting, headache, and a sense of suffocation. These effects last about a day, but have no permanently harmful effects.

In banks, stores, offices, and homes, a few tear gas guns give a security equal to real guns with none of the accompanying risk. The growing use by police forces show their effectiveness.

The ease of handling the "guns", which shoot gas shells, the simplicity of automatic pro-

tective devices employing tear gas, the effective yet harmless subjugation of criminals make it a most valuable weapon.

Requirements for Success

The February issue of "Chemical and Metallurgical Engineering" contains an article entitled "What Becomes of College Graduates?" that is well worth reading. It contains the results of a careful survey of the progress of a selected group of graduates. The results are too numerous to mention, but three general observations are worthy of notice. They concern the background which the most successful men had, aside from honesty, character and other ordinary virtues.

First, a scholastic average in all subjects well above normal, but particularly in thesis work and business and economic courses is generally noted.

Second, successful participation in extra-curricular activities, especially those requiring and developing managerial and organizing ability is evidenced.

Third in the list is a natural and deserved popularity, as evidenced by election to honorary and social fraternities.

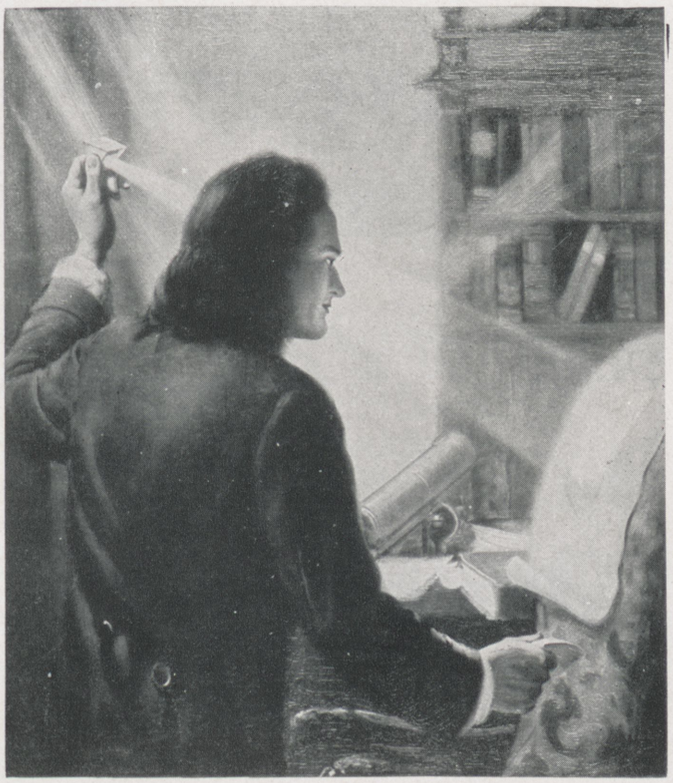
These points are not startling; in a general way they are common knowledge, but it is interesting to know that they are borne out by actual statistics.

Another interesting fact is that the most successful men came from the middle west, Wisconsin being first, Indiana second, then in order Ohio, Pennsylvania, and Maryland, with Massachusetts, Rhode Island, and Connecticut at the bottom of the list.

Technocracy

It is becoming increasingly difficult to use the word, let alone discuss safely, technocracy. It has become to many people a farce, the huge joke of the depression; to others it is still significant despite its many fallacies. Opinion is still changing rapidly, so any statement made concerning it is apt to be contested a few weeks hence.

Despite all derision, technocracy has dramatized and emphasized certain things which are important. True, almost none of its statements were original, but the country has become familiar with them, whereas, previously, only a small minority knew anything about them.



Bausch & Lomb

Isaac Newton (1642-1727) whose painstaking research and brilliant thinking laid the foundations of engineering science.

The staggering debts and obligations which we are piling up for future generations deserve consideration. Our increasing productivity does endanger employment, and is giving more and more leisure to the laboring classes. They must be taught to use this leisure. Unlimited competition does not seem wise, but Socialism is not the only answer. Unlimited production, too, must probably be curbed.

All these things have been crystallized into definite questions by technocracy. Then, too, it has done something else inadvertently. A man may shiver in a cold room. If he goes out doors where it is much colder and then returns the room seems much more comfortable, by contrast. Technocracy alarmed the nations with its warnings of immediate disaster. No hopes for recovery were held out. Now that the balloon has burst, and most people are amused instead of worried, we feel much better off than before. It has actually fostered an optimistic feeling with its extremely pessimistic claims.

Technocracy cannot be unconditionally condemned.

Courses or Subjects

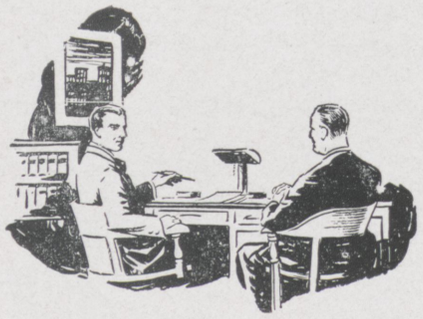
Among the most deplorable faults of our educational system is the practise of giving "courses" instead of "subjects".

The average student never considers reading other authors opinions on the subject under consideration. A text-book has been designated for his use, a superficial mastery of it will enable him to pass the examination, so why read further?

Now very few subjects are established firmly enough that there is not some dissenting opinion. Each text-book author states his opinion. A student using only that book remains ignorant of any controversy.

Undue stress is often laid on certain formulae and methods, because of the arrangement or emphasis in the text-book.

Aside from specific objections such as these, "course" taking kills reasoning. Every problem, given in the text, and serving as a model for examination problems, is solved or a solution indicated in the text. No originality or initiative is required.



ALUMNI

Edited by Richard K. Toner, ch. e., '34

WITH this issue your editor completes his year's work. It is hoped that the department has proved of interest to those for whom it was written—the alumni. Just what the policy of the succeeding editor will be is of course unknown, but each of you can be of great assistance if you will only keep the editor informed of what you are doing. In presenting to you for the last time the alumni columns, the editor wished to express his appreciation to those who have assisted him and especially to his assistant, Jay Hall, without whose help this department would not have achieved whatever success may be accredited to it.

Cleveland Rose Tech Club

The Cleveland Rose Tech Club and their wives met as the guests of the Club's president, H. A. Schwartz, at a Sunday afternoon tea, February 19th.

After a period of general conversation, followed by refreshments, Mr. Earle E. Martin, Editor of the Cleveland News, talked informally telling stories illustrative of the gathering of newspaper material. Mr. Martin is a native Hoosier, a graduate of Moore's Hill and has been at various times editor of the Cincinnati Post, the Indianapolis News, the Indianapolis Star, the Cleveland Press and was in charge of the N. E. A. and for a time editor-in-chief of the Scripps-Howard papers. From this long experience he told stories of crime, adventure and politics beginning with the solution of the Pearl Bryan murder in 1896 and ending with the circulation of pictures of the attempted shooting of Franklin Roosevelt.

The Club is particularly gratified by the interest shown by the ladies. Mr. and Mrs. Jay Hall assisted in receiving the guests and Mesdames Fred Fishback and Walton Woody presided over the coffee and tea service. Those present were the Messrs. and Mesdames Baptist, Cook, Eastwood, Fishbac, Hall, Holloway, Kessler, Leisey, McCormick, H. S. Richardson, Spalding, Schwartz, Sliger, Stone, Tilley, and Woody and Messrs. Johnson and John Richardson.

Here and There with the Grads

'90 We are in receipt of a letter informing us of the death of Harvey L. Lefler who graduated from Rose in 1890. Mr. Lefler was formerly a construction engineer in New York.

'00 William H. Insley, business and civic leader, was named the 1933 honorary member of the Indianapolis Community Fund at its thirteenth annual meeting. The board of directors and the campaign executive committee recommended Mr. Insley as the honorary member in recognition of "outstanding and unselfish service to the public welfare." Announcement of the selection was made by J. W. Fesler, member of the fund directorate who referred to Mr. Insley as "one who for more than a quarter of a century has given himself unsparingly, unselfishly and with common broad-mindedness and fairness to the civic and social welfare of this city."

'12 Oliver Reagan who is a member of the American Institute of Architects announces the opening on February 1 of offices for the practice of architecture at 101 Park Avenue, New York City.

'23 Robert Hendrich, who is with the Titanium Alloy Manufacturing Company, has been made manager of the Clevleand office.

'24 E. J. Hauer, a graduate of Rose and a member of Theta Xi fraternity, was recently married to Miss Milwida Mooney of Terre Haute.

'28 Announcement has been made of the forthcoming marriage of John Mendenhall to Miss Martha G. Hill of Wilmington, Del. Mr. Mendenhall is a graduate of Rose Polytechnic Institute and is with the E. I. Dupont de Nemours company in the dye works at Deep Water, N. J.

Thomas Reed who is with the Ohio Public Service Company has been transferred to Cleveland. He was formerly at Mansfield, Ohio.

'29 John Cooley has announced the arrival of John, Jr. Is he going to be an engineer, John?

'31 Lowell Ray has been released from G. E. on indefinite furlough. He has a job with the Municipal Light and Power Company at Anderson, Ind.

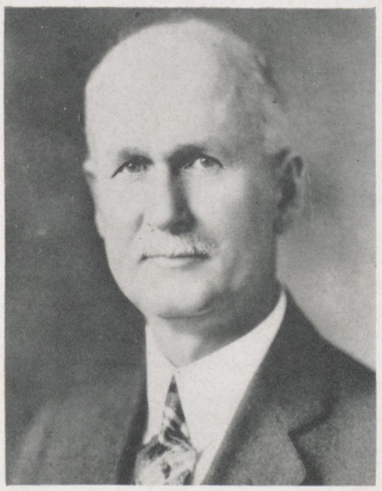
'32 O. G. Howson, who has a half-time job with the Lexington (Ky.) Ice Company is taking some courses at Kentucky University in his extra time.

Myron Clark was married during the Christmas holidays.

We add to our Roll of Honor

Alonzo J. Hammond

We reprint with permission of "Civil Engineering" a short biography of Alonzo J. Hammond as it appeared in the February 1933 issue.



Born in the little community of Thorntown, near the center of Indiana, on April 23, 1869, Mr. Hammond received his early education in the public schools of Frankfort, a few miles distant. Entering Rose Polytechnic Institute in the class of 1889, he graduated with honors, and a number of years later received the professional degree of Civil Engineer. He has found time to return frequently and to give of his time to direct the affairs of his alma mater as a member of its Board of Managers.

As a young man just out of college, and after a year of postgraduate work at the Massachusetts Institute of Technology, he returned to his home town of Frankfort and opened an engineering office, engaging in architectural and municipal work, at the same time acting as City Engineer. Here he continued practice until 1898, when he was offered an opening in the office of the Chief Engineer of the Vandalia Railway in Terre Haute. South Bend, Ind., was in need of a City Engineer in 1901, and this thirty-two-year-old assistant engineer from the Vandalia Lines was induced to accept the position.

He remained in South Bend until 1910, when the City of Chicago engaged him as consulting engineer to the Commission on City Expenditures for the purpose of reporting on the capacity of the 14-foot water tunnel at 73rd Street, extending out into Lake Michigan to the "4-mile crib." This work completed, he became Chief Engineer of Chicago's Bureau of Public Efficiency. One of his important accomplishments while holding this position was a complete electrolysis survey of the water mains of the city. In 1912 he became Engineer of Bridges and Harbor in the Department of Public Works and during the following two years designed, among other important bridges, the Lake Street and the Michigan Avenue double-deck bascule bridges over the Chicago River, and built three fixed bridges by day labor.

From 1914 to 1922 he was engaged on the design and construction of the Chicago Union Station, that $75,000,000 development which gathered into one great passenger terminal the transcontinental railroad facilities of the Pennsylvania, the Chicago, Burlington and Quincy, and the Chicago, Milwaukee, and St. Paul railroads. Mr. Hammond was successively Consulting Engineer, Principal Assistant Engineer, and Assistant Chief Engineer. The work involved the solution of numerous vexing problems, such as a complete redesign of all the sewers west of the Chicago River between Kinzie Avenue and 12th Street, and the redesign of all underground utilities, including tunnels and galleries affected by the terminal tracks. Retaining walls and dock walls, track depression and construction, viaducts, and a steel and reinforced concrete bascule bridge over the river at Monroe Street were all adjuncts to the terminal itself.

Following the termination of his work on this huge project he was appointed Chief Engineer of James O. Heyworth, Inc., and for three years was busy on the construction of a 27,000 horsepower hydroelectric plant on the Chippewa River in Wisconsin, of another on the Fox River in Illinois, and on the design and construction of another plant on the Mississippi River in Minnesota.

In 1926 he became Chief Engineer of the Mellon-Stuart Company of Chicago and represented that organization in its negotiations with the Cuban Government for a $130,000,000 public improvement program for Cuba.

Since 1928 he has maintained consulting offices in Chicago for the general practice of civil engineering. He has been retained by Cedar Rapids, Iowa, on a railroad grade separation program in that city; by Sioux City, Iowa, to study and report on a railroad and river freight and passenger terminal; and by Des Moines, Iowa, to prepare preliminary sketches for a Union Passenger Terminal to be a part of the city Civic Center. He has been employed by the City of Chicago to examine and report on bids for river straightening, for dock walls, bridges, and viaducts. In Chicago he also supervises the construction of an industrial building. Throughout this active career, Mr. Hammond has found time to devote to professional societies: he is a member of the American Institute of Consulting Engineers, the Western Society of Engineers, the American Railway Engineering City of South Bend, Ind., as interest in the business of the Association, and the Chicago Engineers' Club. In 1905 he was president of the Indiana Engineering Society and in 1921 was president of the Illinois Section of the Society. His devotion to the work of the Society has already been recounted. (The detailed account of his interests in and contributions to this society is too long to be gone into here. However, it should be noted that the society rewarded him by electing him to its presidency for 1933. This in itself bespeaks the admiration his fellow engineers have for him.) He also continues as Director of the Union Trust Company, of the First National Bank,

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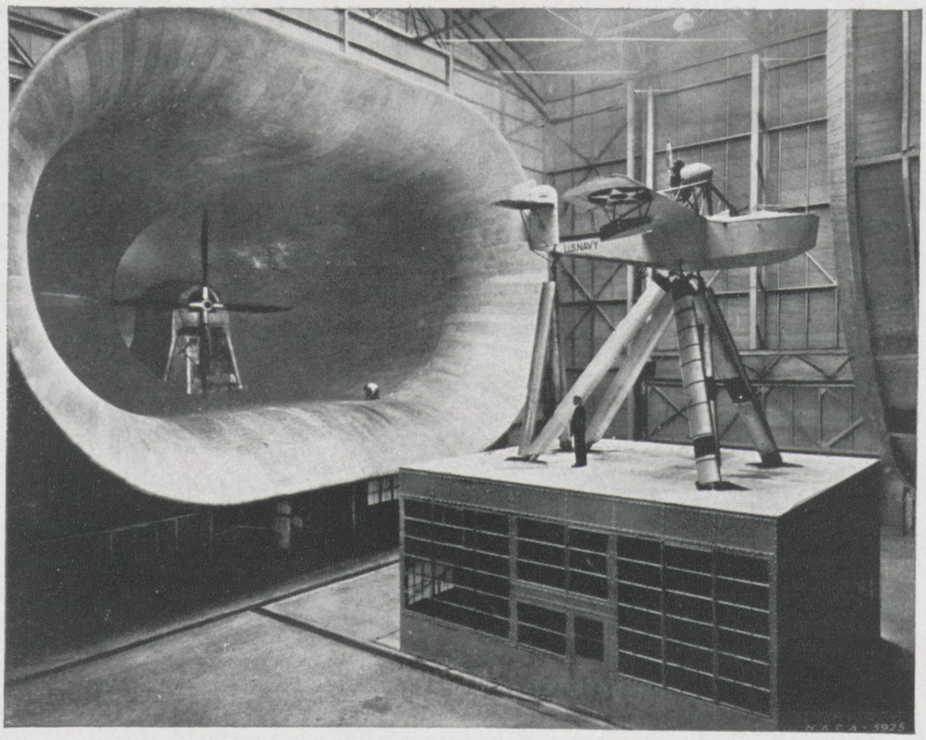
Research and Progress

Edited by
Robert H. Swoboda,
ch. e., '33



General Electric Co.

This giant wind-tunnel tests full-sized planes.

RECENTLY at a large technical institute it was announced that living bacteria were found in the center of a meteor which had once been white hot due to its plunge into the atmosphere of the earth. From Canada's great University of Toronto comes the exact contrast to this statement. Extremely low temperatures, approaching those believed to exist in interstellar space, failed to kill bacteria.

Germs frozen for weeks in liquid helium, at a temperature of about 450 degrees below zero Fahrenheit, proved to be alive and able to multiply as though nothing had happened to them, as soon as they were thawed out.

These results are taken as indicating at least the possibility of the lower forms of life migrating through space, perhaps attached to bits of dust. They are of more immediate practical value as demonstrations of the fact that though cold will preserve foodstuffs it will not kill the germs of decay that lurk in them.

New Broken Atoms

Doctors L. R. Hafstad and M. A. Tuve have achieved the breaking of the aluminum atom nucleus at the Carnegie Institute in Washington. By allowing the heart of a helium atom to "tune in" on the heart of the aluminum atom, creating in it a sympathetic vibration the atomic disintegration was accomplished more easily than before.

The first experiments on the resonance smashing or disintegration of atoms were performed by Dr. M. Pose in Germany and the Carnegie scientists have now confirmed and carried this work further. It is found that when an attacking alpha particle or wave, which is the helium heart, has the proper energy it penetrates the other atom's nucleus. In this case, the alpha particles of mass four from radium joined with aluminum of mass 27 and formed silicon of mass 30 and released hydrogen of mass one in the form of a proton or wave-particle of positive electricity.

Doctors Tuve and Hafstad also repeated the experiments of Cockcroft and Walton at Cambridge, England using high voltage apparatus generating 600,000 volts. Hydrogen hearts or protons were flung at lithium and boron and helium were obtained from this disintegration.

Shooting Airplanes

Shooting down airplanes is a necessity at nearly every airport in the country—as well as shooting them up.

The "gun", with which this shooting is done, is a small extremely powerful searchlight and the projectile is a beam of white, red or green light. Until this beam of light hits its airplane target, whether in the air or on the ground, no flier may land or ascend. Signaling of this kind is required at every airport which is not equipped to radio directly to pilots, by regulations of the Department of Commerce.

Engineers of Westinghouse Company have just developed a new "gun" for this work which is 8.5 inches in diameter, 16 inches long, weighs only seven pounds but has a maximum beam candle power of 350,000. Its small size and light weight permit ease of operation and minimum fatigue for an extended period of traffic operation.

The unit is equipped with two pistol-grip handles, as carefully balanced as the finest rifle, to speed the operator in aiming at his target accurately and steadily. Like a gun, the projector must be aimed carefully since it "shoots" a beam of light a mere 12 inches wide. The beam, however, is so powerful that it is normally visible 10 miles in the daytime and 15 miles at night.

The directing beam may be made white, red, or green, by pulling the front trigger of the searchlight. As the pilot of a plane is circling the airport, the traffic manager "shoots" him with the beam. If red, he stays up. If green, he comes in. The same signals are used for the take-off. The white beam is used by the traffic director to "spot" objects on the ground for the pilots landing at night.

In "shooting" airplanes, the operator aims at them by means of a sighting tube mounted on top of the projector. This sighting tube is equipped with a peep sight at the rear and cross hairs at the front. The field of view is such that the operator can readily aim the unit and at the same time can see that no aircraft other than the one which he is signalling is in the limits of his signal.

Sterilizing with Corona Discharge

A manufacturer of cereals in Omaha, Nebraska, now has a slip enclosed in each of his packages stating that every particle of insect life has been killed and that the package will remain fresh, pure and insect free as long as its seal is unbroken. This guarantee is made possible only by an electric chair for insects and their forms of life.

The electric sterilizer is interposed in the existing package line and the treatment effected by passing the sealed packages through the zone of high-frequency high-voltage corona, applied between two groups of rotating electrodes and a corona concentrator below the package conveyor.

Packaging materials and adhesives must be relatively poor electrical conductors, otherwise the material or shape of the package is immaterial as the separation of the electrodes and the intensity of the corona is readily adjustable.

For operation commercial power is converted by a motor-generator and resonant circuit to a low voltage high-frequency, single-phase current and then transformed to the required voltage for the corona discharge. The high-voltage transformer is insulated and cooled by nitrogen instead of oil and all electrical apparatus is fully inclosed and dustproof.

X-Ray of 4-inch Welded Steel Plates

The application of fusion welding to continually increasing thickness of materials had outstripped the scientific examination of these junctions until the recent development of a new X-ray tube capable of continuous operation at 300,000 volts made for the examination of welded steel plates up to 4 inches thick.

The first of these tubes was made by General Electric for the Babcock Wilcox Company. The tube is 4 feet long with a bulb 8 inches in diameter and is constructed of pyrex glass ¼ inch thick as compared to 1/16 inch for the old 200,000 volt tube. The target is a tungsten disk held in a copper block. The entire block is water-cooled. The cooling unit is a closed system with a motor driven pump that maintains a line pressure of 50 pounds per square inch and a radiator in which a thermostat is so connected as to operate a circuit breaker in case the cooling water becomes too warm. The tube is rated for operation at 300,000 volts and 10 milliamperes.

The power unit of the installed apparatus consists of a Kenotron tube arrangement connected in a voltage "doubling circuit". Power supply for all equipment is 220-volt 60-cycle single-phase current. When operating at full load between 25 and 30 amperes in the power line is used.

The equipment of the Babcock Wilcox Company is housed in a room 10x16x10 feet, the control booth 4x4½ feet, and the tube box 9 feet by 44 by 48 inches. For protection from X-rays the tube box is lined with 7/16 inch lead, and the control box is additionally protected by ⅛ inch lead. The only opening for X-rays is an aluminum window in front of which is placed the welded object to be examined.

Apparatus similar to this will be used for the examination of the penstock pipes at Hoover Dam.

External Consumption Engine

(Continued from Page 7)

tion. Pre-ignition in the original model was prevented by the flies themselves. In line with the general reduction of prices lately, reduction gears have been installed, which make it oil right for everybody.

To give you an idea of what this remarkable inventor had to overcome, one of the simpler formulae will be quoted:

$$6\tfrac{7}{8}\ H_2S \pm (\text{U and Me}) \gtrless \int_{\infty}^{\infty} \sqrt{99.9\ HCN}\ \text{lb}/\square\ \text{mile} \pm \begin{matrix}\text{heat} \\ \text{cold}\end{matrix} \cdots \pm J$$

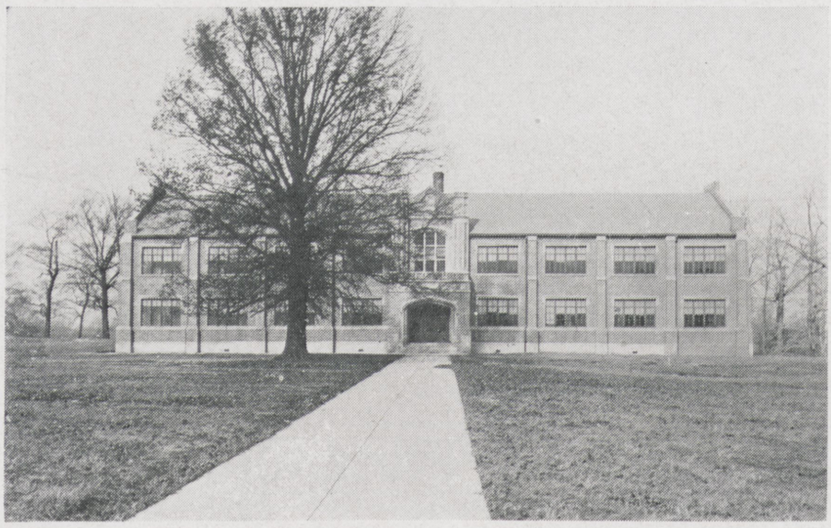
He also had trouble with gasoline it would not ignite.

A few graphs of the characteristics of this ingenious mechanism will perhaps give an idea of its performance. To simplify matters all curves are shown on one graph, in fact on one line. (Fig. 2.) Curve 1 represents the flypower attained at various speeds, curve 2 the b.m.e.p., curve 3 the fuel consumption, and curve 4 the efficiency. As can be seen by a careful study of these results, absolutely uniform performance is attained over the whole speed range.

Advantages - If Any

Some of the advantages claimed by Professor Mishmeyer are low steam consumption, royalties received from sale of oil film to Metro-Goldwyn-Mayer, and use in the international debt situation. In connection with the last, any country can eliminate the detonation by using one of Mishmeyer's contrivances. Additional income can be obtained from the sale of the by-products of combustion. A working model has been installed in a chassis and thoroughly detested. This was a stock chassis in every respect, except for the high tension transmission.

Destructive criticisms of this presentation are invited and will be cordially thrown in the wastebasket.



Campus Activities

Edited by J. A. Ritter, m., '34

AT the February meeting, of the Dormitory Ass'n. officers for the last semester of school were elected. The following are the results: Mr. Hayden Richardson, president; Mr. Farrington, vice-president; Mr. Overholser, secretary and treasurer; Mr. Ketchum, sergeant-at-arms. This meeting was held primarily for the election and no special business was brought up. Later in February a meeting was called by Mr. Richardson, president, and Dr. Prentice gave a short talk on a timely subject which was not only interesting but also instructive as well. Dr. Prentice stated that hereafter he expected to make it a point to talk to the freshmen in the dormitory soon after they enter school.

Glee Club

On Sunday afternoon, February 19th, the Rose Poly Glee Club broadcast a half-hour program over station WBOW. The Glee Club itself presented five numbers while two other students of Mr. Bennett, the instructor of the club, filled in for the rest of the program. Probably the Glee Club will have several other chances to show its ability in the future.

St. Pats Day

Every engineer knows that St. Patrick is the patron saint of engineering. Ever since Rose Poly was an Institute this day has been one of celebration. In the old days a parade, show, and a dance were items of the celebration. Now however the students must be satisfied with a dance. Probably there will be a show for some at the dance but every good and true engineer will be there to have a good time. Two years ago the celebration became roisterous and since then the dance, although sponsored by the Student Council, has been given at the Trianon. It will be given there again this year. Let every engineer be there to have a good time.

Radio Club

Since the Radio Club has become interested in short wave transmission and reception the radios at the dormitory have been crackling and sputtering with the efforts of the amateur. Due to the publicity which this has been given by the Radio Club, many students have been constructing sets, stringing up antennae, and listening in. Good results have been the rewards of the labor of some, while others are still struggling to perfect their apparatus.

For those interested the Radio Club has been sponsoring a class in Morse code. So far the results have been such that it can be judged a success.

Debating

Three hundred and fifteen debate students and coaches from thirty-two colleges in Michigan, Ohio, Indiana, Illinois and Iowa competed in simultaneous debates at Manchester college on the days of February 24th and 25th when the third annual invitational tournament was held.

Rose Poly was represented by twelve men in four teams made up as follows: Negative A, Messrs. Skinner, Rosenak, McGurk; Affirmative A, Messrs. Ketchum, Toner, Sentman; Negative B, Messrs. Batman, Mansur, Staderman; Affirmative B, Messrs. Morrison, Hall, Tucker. One match was won by the Negative A when they defeated Valparaiso; all other debates were lost. The two B teams participated in no-decision debates.

Mr. Bloxsome, coach of Rose Poly's debate teams, accompanied the teams to Manchester college.

A. I. E. E.

At the meeting February 9th, thirty students and one Institute member were present to participate in the work. After the regular business had been attended to, two papers were presented to the club. In the first by Mr. A. J. Massa entitled "Rotary Voltmeter," a thorough description of the voltmeter was presented and explained by diagrams.

The second paper, by Mr. Bachelor, was entitled "The Use of Dry Batteries." In this description, which was explained by the aid of pictures, a brief resume of the perfection of the dry cell battery step by step was given. It is now a very useful supply of electrical energy.

Fraternities

Alpha Chi Sigma

Iota chapter was entertained at a professional meeting held Feb. 16 by Mr. Gantz of the English Department, who spoke on "The Motion Picture as an Art Form." On March 10, three men were welcomed into the fraternity, these three new brothers being Willis Biggs, Edward Ketchum, and Paul Smith.

It is a source of pride to the chapter that, with the exception of Tau Beta Pi, the fraternity has the highest scholastic average of any organized or unorganized group on the campus.

Alpha Tau Omega

On Tuesday, February 21, a Father's and Son's smoker was held at the fraternity house in honor of the new pledges. A pleasant evening was spent. After the smoker, a light lunch was served. Dr. Prentice and Professor Wischmeyer of the faculty were present.

A. T. O. takes pleasure in announcing the formal initiation of Lyle Maehling and Louis Lyon into the chapter on Sunday, Feb. 26.

Sigma Nu

The annual pledge dance was held at the chapter house on Tuesday evening, February 21. The chaperones were Professors Gantz and Hoel. The music was furnished by Ligget and his Orchestra. A very enjoyable evening was had by all present.

Beta Upsilon also held a formal pledging service on Monday night, February 20, for the formal pledging of H. F. Richardson, D. Colburn, J. W. Mann, and R. Spain.

Tau Beta Pi

Indiana Beta chapter of Tau Beta Pi is pleased to reward three men in the Junior Class for their scholastic work during the past three years. Those attaining the honor of being elected to Tau Beta Pi are: J. Robert Motz, Richard K. Toner, and Maurice Tucker.

We congratulate these men upon their honors attained, and hope they, as past members have, will do honor to the chapter.

Theta Kappa Nu

Indiana Gamma chapter of Theta Kappa Nu is very pleased to announce the pledging of the following men; Duane Ford of Sullivan, Paul Bennett of Farmersburg, Eugene Wilber of Pittsburgh, Pa., Jack Bacon, Charles ard Metz, John Sonnefield, Wil-Evinger, Raymond Harrod, Richliam Staley and John Whitesell, all of Terre Haute.

Formal pledge services were held at the chapter house, Sunday, February 5, followed by the annual pledge banquet.

Theta Xi

Kappa of Theta Xi wishes to announce the formal pledging of Hubert Lyon, Brazil, Ind., Donald Hehman, St. Bernice, Ind., Lyon Utter, Philip Cartwright, Fredrick Modesitt and Robert Libbert, all of Terre Haute.

On Friday evening, Feb. 10 the annual pledge banquet was held at the chapter house, in honor of the new pledges. After the pledge service, short talks were given by alumni and members. Ed. Weinbrecht acted as toastmaster.

SPORTS

Edited by Harry Richardson, m., '35

ROSE has almost reached the end of its intra-mural basketball season. The schedule having been completed, a tournament was started on Saturday, February 26, the purpose of which was to give the teams that brought up the tail end of the standings at the conclusion of the schedule another chance.

The results are as follows:

Team	W	L
Civil B	4	0
Mechanical A	4	1
Civil A	4	1
Mechanical B	3	2
Electrical A	2	3
Chemical A	0	4
Electrical B	1	3
Chemical B	0	4

In the first round the Electrical A team gave forth a surprise by licking the hitherto unbeaten Civil B team. The Chemical A, the Mechanical A, and the Civil A teams won their games by forfeit as their opponents had evidently given up hope of coming through with a victory and a chance at the school championship.

In the second round, the Civil A team played the Mechanical A team in the feature game, and the Chemical A team played the Electrical A.

Chemical A vs Electrical A

The final score was 27-16 and the Electricals were never headed after jumping into a large lead at the first of the game.

Lineup and Summaries:

Electrical A	F.G.	F.T.	P.F.
F. Dalrymple	0	1	0
F. Grogan	3	0	1
C. Brown	5	1	1
G. Presnell	3	0	4
G. Rennels	1	1	1
F. Montgomery	0	0	0
F. Withers	1	0	2

Chemical A	F.G.	F.T.	P.F.
F. Hager	0	1	0
F. Cavanaugh	0	0	4
C. Reid	0	0	0
G. Price	3	2	2
G. Tucker	0	2	1
F. Reintjes	2	1	0
C. James	0	0	1

Referee—Phil C. Brown.

Mechanical A vs Civil A

"Red" Richardson scored a neat field goal to start the scoring for the civils. DeWitt fouled Wilson, and he made good from the charity stripe. Gillette held Hess, who added the point. DeWitt again fouled Wilson, but Wilson missed. Butler went under the basket wide open to make the score 5-1 in favor of the civils. Fisher made a double decker on a fast cut. Several set-up shots were missed by the mechanicals, and then Hess scored a bucket for the civils on a smooth piece of passwork. Cushman went under the basket on a long pass to give the mechanicals their first field goal. Fisher made another basket. Several minutes were spent in running up and down the floor, with both teams missing several shots, and then Fisher scored again. At this time the civils took time out. Wilson intercepted a civil pass and dribbled under the basket for a goal. DeWitt fouled Wilson, and Wilson missed his try. Eyke took a pass from "Red" to score a neat basket. On a nice bit of passwork on an out-of-bounds play from Gillette to Richardson to Gillette, Gillette went under for a pretty bucket just as the half ended. Score 15-7 in favor of the civils.

The final score was 34-25.

Lineup and summaries:

Mechanical A—25	F.G.	F.T.	P.T.
F, Wilson	4	1	0
F, Hilgeman	0	0	3
C, Cushman	2	0	0
G, Gillette	3	0	1
G, Bull Richardson	2	2	1
	11	3	5

Civil A—34	F.G.	F.T.	P.F.
F, Fisher	6	2	0
F, Butler	1	1	1
C, Hess	3	2	1
G, Red Richardson	3	1	2
G, DeWitt	0	0	3
G, Eyke	1	0	2
	14	6	9

Civil A vs Electrical A

The Civils won 34-14.

Lineup and summaries:

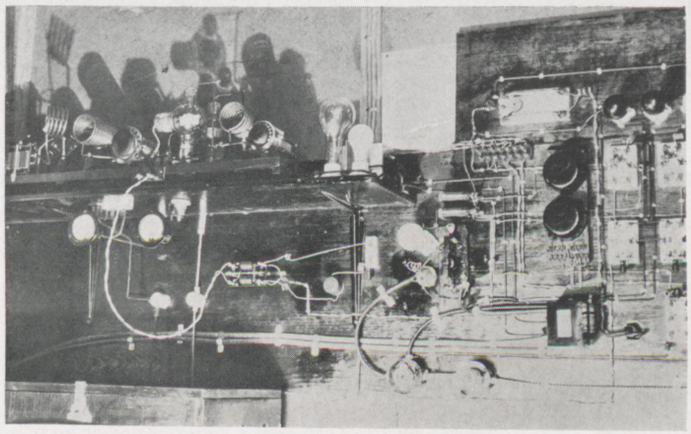
Civil A	F.G.	F.T.	P.F.
F, Fisher	3	0	0
F, Richardson	1	0	0
F, Butler	1	0	2
F, McEowen	0	0	0
C, Hess	3	1	0
C, Heck	0	0	2
G, Eyke	1	0	2
G, Brinkman	3	1	0
G. DeWitt	1	0	3
G, Bernd	0	0	0
G, Mayrose	2	0	0
Totals	15	2	9

Electrical A	F.G.	F.T.	P.F.
F, Grogan	1	1	1
F, Withers	0	0	0
F, Dalrymple	0	1	0
F, Liston	0	0	1
C, Brown	1	1	2
C, Straw	1	0	0
G, Presnell	1	0	0
G, Rennels	1	1	1
G, Montgomery	0	0	0
Totals	5	4	5

Rose Radio Station

(Continued from Page 6)

means that intensity measurement tests can be made by the operator who can turn the transmitter located at the Institute, either off or on from a distance of seven miles. By this means, twenty-four hour tests can be made without repeated trips to the Institute. The telephone line is also available to laboratory classes as a means of obtaining experimental data and thesis research work.



A view of transmitting equipment.

With five different operating positions, a problem of intercommunication presented itself. By means of a simple but ingenious circuit it was arranged that when any one of the positions is being used signal devices will operate in each of the other positions. This prevents any confusion in the operation of the station and allows each control point to know that the station is on the air. A tape recorder across the line serves as a useful monitor of all transmission. Precautions have been taken to insure that the station will be off of the air when the operators leave any control point by providing colored lights that remain burning while the station is in an operating position. Switches, locked in iron boxes, allow only federal licensed operators access to the operation of the station. The wiring diagram shown in this article has been greatly simplified in order not to confuse the readers with extra features which do not affect the fundamental circuit.

Time Delay Relay Installed

One other problem is worthy of mention. In placing a radio station on the air it is always necessary to turn the filament current on the various tubes of the transmitter a few seconds before the high voltage is applied on the plates of the tubes. Since the club had only two telephone wires at its disposal and three circuits were necessary, it was decided to employ a time delay relay on one circuit so that the third additional circuit would operate about fifteen seconds after the first, and thereby combine two circuits on one wire. With such a feature the station is relatively easy to operate and is foolproof. The operator closes the power switch in order to put the station on the air, and this immediately applies filament current to all tubes of the transmitter. Fifteen to twenty seconds later the high voltage, 2000 volts, is applied automatically to the tubes by means of the time delay relay. The operator then uses a telegraph key as a means of communication. By resorting to composite circuit it will later be possible to add also a microphone circuit.

Since the completion of the station the Radio Club has sponsored a code class in order to make it possible for more of the club's members to take advantage of the use of the radio station as a recreation as well as a scientific tool. The club has become affiliated with other university clubs throughout the country, and it is hoped that scientific data can be exchanged by this means. Throughout the construction of the transmitter, future growth of the station was kept in mind. The station is built in units so that if additions are to be made, no existing equipment will become obsolete. Up to the present writing, a few foreign countries have been in direct communication with the Rose Poly Station, among them stations in Mexico, Canada, Cuba, and New Zealand, 11500 miles away.

The name of Rose will be heard the world over.

Power Losses

Edited by
Joseph H. DeWitt, c., '35

St. Patrick said:

As long as gentlemen prefer blondes there will be plenty of blondes.

When young folks marry in June it's for love. But when they marry in December it may have been for love in June, too.

There was once a man who belonged to the suicide club, but didn't kill himself because he was behind in his dues.

The raw materials we import from France are books, post cards and plays.

The trouble with freshmen nowadays is that they get too many pats on the upper back and too few on the lower.

The absent-minded professor we would like to meet is the one who would lecture to his steak and cut his classes.

A soldier went to his colonel and asked for leave to go home to help his wife with the spring house cleaning.

"I don't like to refuse you," said the colonel, "But I've just received a letter from your wife saying that you are no use around the house."

The soldier saluted and turned to go.

At the door he stopped:

"Colonel, there are two persons in this regiment who handle the truth loosely, and I am one of them. I'm not married."

—*Neb. Awgwan*

Professor: "What is steam?"

Student: "Water going crazy with the heat."

A skunk sat on a stump. The skunk thunk the stump stunk and the stump thunk the skunk stunk.

—*Texas Longhorn*

"Papa are you growing taller all the time?"

"No, my child. Why do you ask?"

"'Cause the top of your head is poking up through your hair."

—*Utah Humbug*

The drunk was noisily trying to unlock the door to his flat late one night, when a window opened upstairs and an angry voice yelled, "Haven't you got your key?"

"Sure, I got lots of keys, but shay, would you jushashoon throw me down a couple o' keyholes?"

Him: "And why do you call me Pilgrim?"

Her: "Well every time you call, you make a little progress."

Angry wife: "Now that I have a frigidaire—see what you can do about a mechanical stenographer."—*Ames Green Gander*

Son: "What is the meaning of college? Isn't is just the same as any other kind of bread?"

Father: "No, only a four year loaf."

NOWADAYS

A new clerk, dictating a letter to a modern stenog, was in doubt as to the use of a certain phrase, so he said to the young lady: "Do you retire a loan?" and the wistful-eyed one answered sleepily, "No, I sleep with mama."

Senior: "Gee, I wish school was over so I could get married."

Junior: "Boy, o boy, what a girl she was."

Soph.: "Whew, what a hangover."

Frosh: "I hope Mother didn't notice what time I got in."

The frog, poor fellow, seems to be adapted to all manner of queer descriptions. A correspondent writes "in behalf of the frog." He recites the description of the frog credited to a young Norwegian, not long in this country. Here it is:

What a wonderful bird the frog. When he sit down he stand almost. When he hop he fly, almost. He ain't got no sense, hardly. He ain't got no tail, hardly, either. When he sit, he sit on what he ain't got, almost.

—*Penn. Triangle*

NO KICK COMING

The other day a vacationing student walked up to the paying teller of a savings bank and pulled out two twenty-dollar bills. Thrusting the money through the window, he asked bluntly enough, "I want two cases."

The teller sized the well-groomed chap up and then sympathetically inquired, "Two cases of what, sir?"

"I don't know what you call it," replied our darkened student, "but the sign in the window says two and a half percent, and I'm willing to try anything."

—*Penn. Punch Bowl*

What Would You Do?

(Continued from Page 11)

tarding production improvements. If the reduction of labor hours through improved mechanization is equitably divided with labor, it will frequently be found that heretofore estimated cost savings have been decidedly over-estimated. The worker's day must be shortened and available employment rotated until all willing labor is employed at the best wages current production will permit, this being accomplished by the voluntary action of capital and not by legal compulsion. It may be expected, confidently, that as business revives there will be a natural redistribution to labor of opportunities for longer hours and better earnings until normal employment is restored. Labor leaders should abandon futile efforts to have heretofore over-manned industries continue to carry excess man power, and should cooperate with capital of those industries in diverting this excess into new channels of employment. These leaders should also not delay and impair business recovery by running ahead of conditions in demanding wage advances business cannot earn. Normal employment at old time wages must be nursed back.

The Farmers' Plight

The farmer, like all the rest of us, has made serious economic mistakes. He has speculated heavily on margins—in land rather than Wall Street stocks. For the time being, there is a very restricted market for his factory production. Like the manufacturer of the city who produces world-competitive products, if he produces more than the home market will absorb, he must export at the world price. He enjoys, similarly with the city producer, a protective tariff which will not protect if he insists on over-producing. What is his avenue of relief? It seems not to be not through economic readjustment, but through political bounty. Not being subject to anti-trust laws, he might cooperatively reduce production to approximate demand, but it is said this is impracticable because he won't cooperate en masse. He might also form a collective export sales company to handle exportable surpluses at world prices while he supplies the domestic market on the same plane of tariff protection as the city producer, but here again the idea is said to be impracticable because he has not and perhaps will not organize to this end. So his fate is in the hands of the politicians. Their idea seems to be to use his predicament for creating a national police force to regulate him while providing a new harvest of jobs for faithful followers. Also they seem to want to pay him a big bonus at national expense to shift his over-production from a few glutted markets to an over-glutting of those relatively profitable markets in which supply and demand are fairly well balanced. Suppose you answer this one?

International Relations

The writer believes the big end of fighting the depression is at home. International adjustments will come slowly, and we need not starve while waiting for them. Our international friends and adversaries, generally speaking, are of two classes—industrial competitors who owe us money which they will exhaust every effort to avoid paying, and non-industrial customers who are either too poor just now to buy heavily or are so involved temporarily in internal disorders that their minds are not on economic reconstruction. Of course we should not neglect endeavors to improve international trade conditions, but these should not divert our attention from the much more promising field of betterments at home. It must not be overlooked that our foreign friends believe in negotiating slowly, and also that they lay down their cards reluctantly. Bre'r Fox lives not alone in our Uncle Remus stories. The job of the engineer, in this situation, is certainly at home.

Question.

What would you do?

Port of Los Angeles

(Continued from Page 13)

cony across the shed at either end, and the waterside office opens directly into the passenger corridor, thereby providing direct access to the corridor from both offices.

Design of Piled Substructure

The design of the wharf substructure was based upon the results of a thorough exploration and study of the underlying material of the harbor bottom, and upon results obtaining by driving test piles at intervals over the area of the wharf site. A 2-inch core drill was used in making borings. The materials encountered varied considerably throughout the site, ranging from soils possessing reasonably good friction factors at the northerly end to thin layers of very soft clay underlaid by a soft silt of great depth at the southerly end—the latter requiring unusually long piling to obtain bearing.

Bents are spaced 10 feet 6 inches on centers, with sufficient piles in bents to support the superimposed loads—additional piling being used in the vicinity of heavy loaded shed columns. In general, concrete bearing piles were driven to support safely a load of 30 tons, and timber piles a load of 20 tons. A live load of 500 pounds per sq. ft. was assumed over all portions except tracks, where an E-40 locomotive loading was used, following the standard practice at this Port.

Open Storage Areas

With a view to providing ample temporary open storage areas for the extensive movements of steel and iron products arriving from the Atlantic and Gulf Ports, an area of approximately 12 acres has been laid out at the rear of the terminal in diagonal parallel zones, 400 feet in length by 80 feet in width, which are served by six concrete roadways. This width of storage areas was selected as best adapted for unloading steel products by truck mounted cranes from low trailers drawn by wharf tractors, and subsequently reloading upon trucks and trailers which transport practically all steel pipe, structural steel, etc., from the harbor district on hauls too short to warrant rail shipment.

Costs and Execution of work

The cost of the completed wharf, including tracks, roadways and the pipe storage areas, will be approximately $1,500,000.

The terminal was designed and constructed for the Los Angeles Board of Harbor Commissioners under the general supervision of the writer and the engineering staff.

The major portions of the work were constructed under contract by the Pan-Pacific Piling and Construction Company, the Merritt-Chapman & Scott Corporation, the McClintic-Marshall Corporation, and the Stanton-Reed Company, all of Los Angeles.

Alonzo J. Hammond

(Continued from Page 16)

and of the First Union Company.

It is typical of Mr. Hammond that whatever he finds to do he does with a will. He has the innate power to visualize a problem and carry it through to a logical conclusion. Furthermore — and what is even more important—he has the capacity of understanding the "other fellow's" point of view and to harmonize divergent tendencies. These valuable traits tend not only to accomplishment but to definite progress, based on rational and helpful deductions—surely a worth-while combination of faculties, which seems especially valuable considering the needs of the day.

Blessed with a ready smile and a genial spirit, difficulties seem to evaporate in the warmth of Mr. Hammond's contact. One look at him and he commands confidence. It goes without saying that he has a host of friends, in the Board of Direction, among the membership at large, particularly those who are favored with his neighborly company.

In 1893 Mr. Hammond married Miss Flora Troll. They have two children, Mary and John. Mr. and Mrs. Hammond make their home in Evanston, Ill.

INDUSTRIAL PROGRESS

Demands Technically Trained Men for Leaders

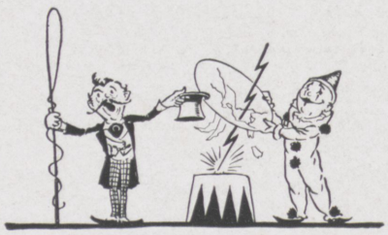
CUT COURTESY THE ROTARIAN

Rose Polytechnic Institute

"A College of Engineering"

Terre Haute » » » Indiana

G-E Campus News



TAMING LIGHTNING

A crackle, a deafening crash—and a gigantic streak of man-generated lightning leaped 30 feet. Thus, was 10,000,000 volts, the largest artificial flash ever produced by man, discharged at the G-E high-voltage laboratory.

To produce this enormous voltage, a 50,000,000-kw. lightning generator imitates nature. Hundreds of small capacitors take the place of nature's clouds. They are charged by transformers. When the voltage is built up, the capacitors are discharged in series to produce 10,000,000 volts. Sounds simple, doesn't it? However, the power output of the generator—during the infinitesimal period of the flash—is nearly twice that of all the generating stations in the United States.

F. W. Peek, Jr., a Stanford grad of '05, was chiefly responsible for this achievement—incidentally, he is now the chief engineer of the G-E Pittsfield Works. "Lightning tamer," his old classmates would probably call him. And rightly proud of him they should be, for in the field of transients and dielectric phenomena he is second to no one.

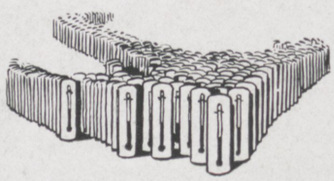
ATOM CHASER

On December 10th last, a mild-mannered scientist stood in the Great Hall in Stockholm and received the Nobel Award in Chemistry for 1932. Then he went skiing with his wife and daughter, seemingly unmoved by being the second American chemist in 31 years to be so honored.

In 1909 Dr. Irving Langmuir, a '03 graduate of Columbia University, came to Schenectady, to the G-E Research Laboratory, to ask questions about tungsten wire, its behavior in a vacuum. He stayed, just "looking around" and wondering why the bulbs of incandescent lamps blackened so easily. He found out, and thus developed the gas-filled lamp. It saves Americans a million dollars every night.

Then he wondered about atoms coöperating with electrons and produced the high-vacuum electronic tube, making possible radio broadcasting, which created an industry. Incidentally, he contributed a new type of welding—atomic-hydrogen.

They call him atom chaser, electron driver. The Swedish Academy of Science rewarded him — not for lamps, radio tubes, or welding methods, but for achievements in pure science. For just "wondering."

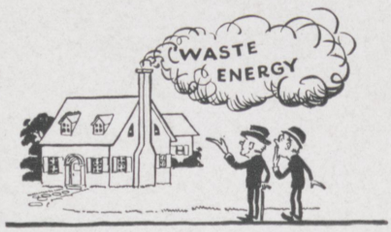


25 MILLION THERMOMETERS

You may have heard about our new power plant at Schenectady—the first of its kind ever built. In it there's a 20,000-kw. mercury-vapor turbine. The plant uses mercury vapor for power, the exhaust vapor producing superheated steam.

270,000 pounds of mercury will be needed for the boilers. That's enough for 25,000,000 thermometers. Perhaps you wonder why we don't use water. Well, the new process makes possible some thirty per cent more power from coal than heretofore. And we don't expect that those boilers will be refilled.

W. L. R. Emmet, an '81 graduate of the U. S. Naval Academy, is the inventor of this mercury-vapor process. That isn't all he's done, either. In his capacity as a consulting engineer at G. E., he developed the steam turbine from a small beginning to a place of dominating importance, and he first applied electric power to ship propulsion.



FLAME WITHOUT SMOKE

Smoke and soot mean wasted energy. That's what our engineers thought, too. They rolled up their sleeves and began to work. For five years they studied electric control of oil combustion. And they developed progressive impact combustion; they broke a single drop of furnace oil into a hundred million parts.

In this process, oil and air collide under pressure, and each drop of oil breaks up into millions of particles. Application of heat further breaks down the oil into gaseous hydrocarbons; and when the latter encounter air, the entire energy of the fuel is converted into hot flame without loss of carbon in smoke.

This is just one of the features of the radically different G-E oil furnace — another G-E achievement. And such men as E. D. Harrington, a '16 grad of Beloit College, helped to chuck tradition to the winds. He was closely associated with the entire development of the oil furnace. He's now Engineer of the new Air Conditioning Department.

95-954DH

GENERAL ELECTRIC