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Rose Technic Staff

Rose-Hulman Institute of Technology

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THE ROSE TECHNIC

VOLUME XXVII

ROSE POLYTECHNIC INSTITUTE
TERRE HAUTE, INDIANA

THE MOORE-LANGEN PRINTING CO.
TERRE HAUTE, IND.
1918

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THE ROSE TECHNIC

OCTOBER, 1917

THE NEW ROSE BUILDINGS

John V. Van Pelt

BY-PRODUCT COKE OVENS

James Farrington, '96

ROSE MEN IN THE SERVICE

THE CLASS SCRAPS

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MENTION THE ROSE TECHNIC WHEN SPEAKING WITH ADVERTISERS



VOL. XXVII

TERRE HAUTE, IND., OCTOBER, 1917

No. 1

THE TECHNIC

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TERMS.

One Year	\$1.00
Single Copy15

Issued Monthly at the Rose Polytechnic Institute.

Entered at the Postoffice, Terre Haute Ind., as Second Class Mail Matter.

AGAIN the *Modulus* question has come up for discussion, though a very short one, on this occasion. When an effort was made by representatives of THE TECHNIC to obtain control of the *Modulus* Dance Fund, it was learned that the general impression among the members of the Class of 1919 was that the year book would be published next spring, although no staff had been elected to assume the responsibilities of its publication.

On Tuesday, October 9th, a meeting of the Class of 1919 was called, and the question of publishing the *Modulus* was brought before the class by President Barnes and a representative of THE TECHNIC. When the members of the class were brought to a realization of

the magnitude of such an undertaking, it was voted to give it up, and to contribute the sum realized from the series of dances given during the past year towards putting out a special number of THE TECHNIC, somewhat similar to the May issue of 1916. A committee selected from the Junior Class will assist in the publication of this number, which is intended for January, 1918, when the present Senior Class graduates.

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To publish an edition of THE TECHNIC such as the one proposed for January is no small task, and one which the regular staff cannot be expected to perform alone. The committee selected from the Junior Class will be expected to undertake practically all the additional work required to make up this edition, with the staff proper acting in only their usual capacities.

LESS than five months ago, the condition of college athletics in this country was regarded as hopeless. With the entrance of the nation into the European conflict, by far the great majority of colleges, particularly those throughout the East, cancelled their

schedules in every branch of sport; and most of the institutions which attempted to continue athletic relations with other schools found it impossible to schedule enough contests to justify the services of paid coaches, assistants and trainers.

In some instances, where practically the entire 'Varsity squads left to enter the service or the Reserve Officers' Training Camps, or where nearly every game scheduled had been cancelled, the school authorities were probably justified in abolishing intercollegiate athletics entirely, at least for the time being. But there were numerous instances, especially among the nearby colleges with which we have scheduled contests annually, where such an action appeared to have been taken solely as a matter of patriotic sentiment, rather than of necessity.

On the whole, the effects were far from beneficial. Where intercollegiate athletics had been abolished, students were discontented; and at most institutions where efforts were made to keep 'Varsity teams in the field, heavy financial losses resulted from lack of games to play.

With the football season now at its height, it is interesting to note that practically every college and university in the country is again indulging in intercollegiate athletics activities, excepting the "Big Three" of the East, Harvard, Yale and Princeton. At each of these institutions, the Freshman team is permitted to play its customary schedule of games, while an "informal 'Varsity," composed of material from the three upper classes, practices daily, evidently with the hope that the authorities will eventually decide to resume athletic relations with other schools. Harvard's "informal 'Varsity" is said to appear almost as strong in practice as the Crimson team of 1916, and it has been suggested that a game between this squad and that of Princeton be played for the benefit of the Red Cross Society. Undoubtedly the game would be played, if the students had their way.

While perhaps the opinions and decisions of the conservative authorities of our three foremost universities, if not followed, should be respected by us, nevertheless we certainly fail to see where any benefit is to be derived from abolishing athletics in war time, when in fact they become more of a necessity than ever. In our opinion, Rose has acted wisely in keeping her teams in intercollegiate com-

petition in spite of the war, and we hope that she will continue to do so as long as conditions will permit.

ONE contribution to the Rose Building and Equipment Fund, received some time after the Campaign had closed, deserves more notice from the students and alumni than it has probably received, that of Mr. Jeremiah Mugivan, a former Terre Haute citizen. During the week of the "big drive" last spring, Mr. Mugivan pledged ten per cent. of the receipts of the two Terre Haute performances of the John Robinson Circus, which was billed for July 23rd. On the day following his exhibitions here, Mr. Mugivan more than made good his pledge with a check for five hundred dollars, an amount in excess of the percentage he had promised. In behalf of the Alumni, Faculty, and Student Body, we extend our acknowledgment of thanks and appreciation to Mr. Mugivan.

OUR leading article for this month, on the new Rose buildings, is by Mr. J. V. Van Pelt, of New York City, the architect in charge of design and construction. It was written by him for the purpose of conveying to our Alumni and Student Body a general conception of the character and arrangement of buildings finally decided upon by the Faculty and the Board of Managers.

While descriptions and illustrations of proposed designs and arrangements of the new plant have appeared in THE TECHNIC on several different occasions in the past, none of those published heretofore have been adopted by the school authorities. The article on the accepted designs, by Mr. Van Pelt himself, should be of more than ordinary interest to all connected with the Institute.

FOR our alumni article this month, Mr. James Farrington, '96, has prepared for publication a paper which he delivered before the June meeting of the Association of Iron and Steel Electrical Engineers, of which he is Treasurer. The article gives general information regarding the by-products of coal, and some of the advantages of recent coke oven construction.

Mr. Farrington also gives a detailed description of the plant with which he is connected, the La Belle Iron Works, of Steubenville, Ohio.



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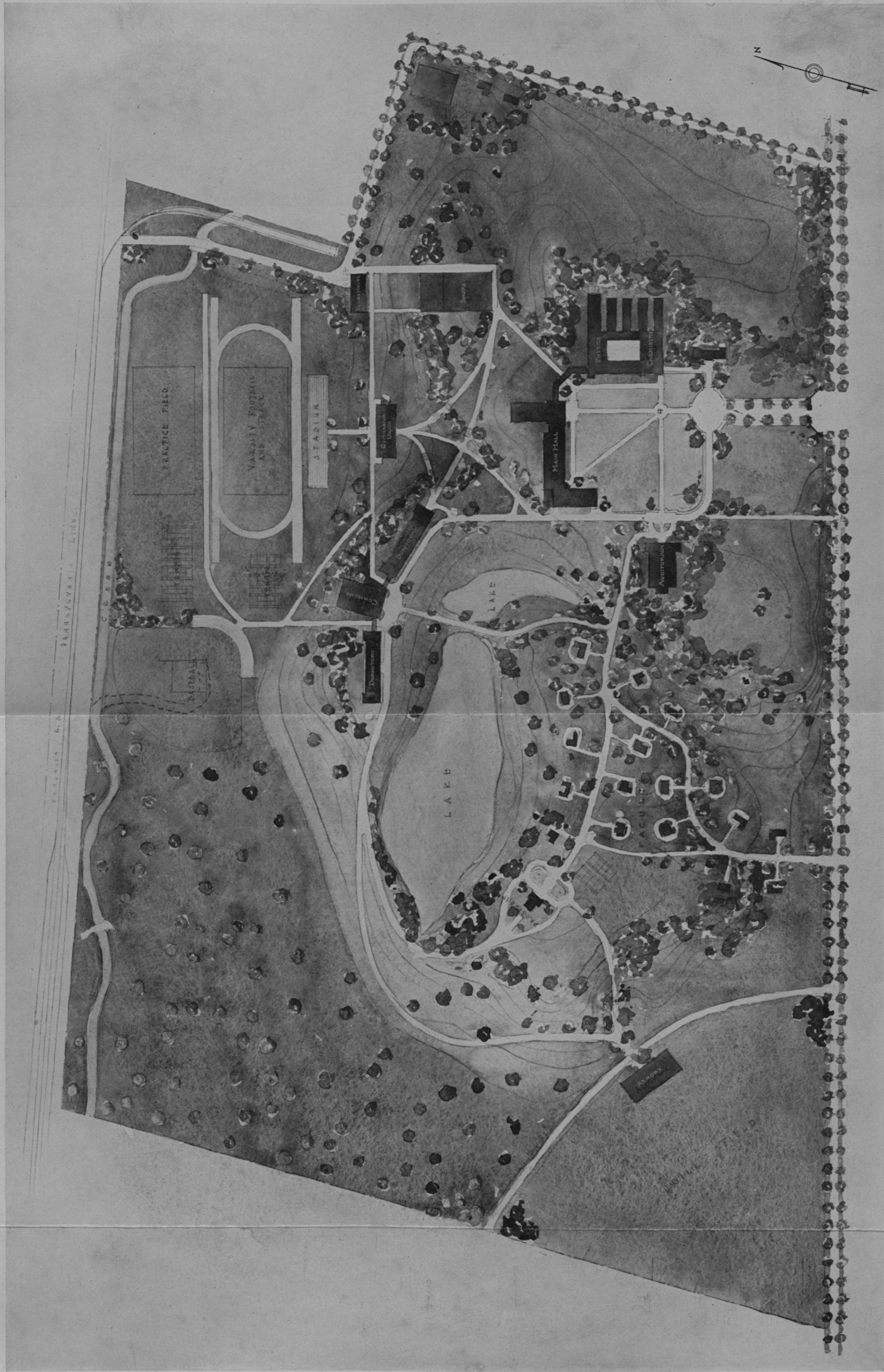
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GENERAL PLAN
OF THE
PROPOSED ARRANGEMENT OF BUILDINGS
ROSE POLYTECHNIC INSTITUTE
TERRE HAUTE, INDIANA
J. V. VAN PELT, ARCHITECT, NEW YORK CITY

The New Rose Buildings

By

JOHN V. VAN PELT

Architect, New York City.

WHEN Mr. Waters, Vice President of the General Electric Company, and Mr. Putnam of the firm of L. B. Stillwell and H. S. Putnam, first took up with me the matter of new buildings for the Rose Polytechnic Institute, they laid down the condition that the design and construction must be as nearly perfect as can be achieved by the most modern methods. If lack of funds, they said, curtails what we can do at the present time, let that curtailment be the extent of the work and not its quality.

In the matter of architectural design, nothing must mar the beauty of the conception or beauty of the style adopted in order to attain cheapness through imitation. The past tendency in America has been to develop engineers who are so specialized that they become narrow. In some centers they have been trained in factories and are only fit to build factories. A new order is at hand, and the engineer of the future will be trained in a broad way. Other modern engineering schools are reflecting this in their new buildings, and Rose is not to be behind them.

In adaptability to the work of the Institute, there must be found the very best means of fostering study through a most modern equipment, maintaining health through the best ventilation, light, both natural and artificial, convenience and surroundings conducive to good work, while in the matter of construction, while there must be no waste, the most appropriate materials must be used irrespective of whether they are cheap or expensive, and durability must not be sacrificed to mediocre cheapness. My mentors expressed the view that what is cheapest in the beginning is often most expensive in the end.

To live up to such a program is difficult. No waste at any point and yet the very best. I am going to tell you what we have done so far to try to meet these conditions. In the first place, the Building Committee and Trustees whom I have found are absolutely at one with Messrs. Waters and Putnam in the views

just expressed, have selected a style that holds the patent royal from tradition as that best adapted to College life. And they hold the view that Rose is and they want it to be a College in the sense that she will be the Alma Mater and will surround with her home life the student she is later to send forth to conquer in the world of engineering. Rose of the past has proved that she is well able to do this, and the loyalty of her Alumni who one and all hark back with affection and love to her halls and to the memories therein walled, are a sufficient evidence of this. The present strength of an Institution of learning is dependent upon the excellence of its teaching; but its future strength and prosperity is dependent upon the love of the children it brings forth. As the world grows, it must grow, and it cannot grow without continued support.

But Rose is more than a mere College. It is a Technical Institution, and so the Tudor style that has been adopted has been adapted to this more subtle quality both by restraint and by the more evident traits of character that such elements as large drafting room windows, class rooms, the library, the laboratories, the shops and a host of other elements unequivocally define.

Even the dominant feature of the tower, with which you are already familiar, which gives its stamp to the Collegiate atmosphere as the rallying point of the Community life, is modified to conform to the practical, and while it proclaims and houses the main offices of the Institution, it supports the enormous water storage tank that will give sustenance to the activities of the Institute and safety through fire protection, not only to the inmates but to the buildings themselves.

The constructions divide themselves:

FIRST: Into a Main building where will be the offices before mentioned, the main Assembly hall, the class rooms of general studies, the drafting rooms, the library, the general laboratories, and the principal group of locker rooms, lunch room, etc.

SECOND: A Technical Building where will be the special laboratories, lecture halls and special class rooms of the more technical studies such as Physics, Chemistry, Electrical Engineering, Chemical Engineering, etc.

THIRD: The Shops containing the large machine and wood-working shops with an absolutely modern forge and foundry, with such adjuncts as pattern, shop, storage, sheds and tool rooms.

FOURTH: The Power House which will not only furnish power, light, heat and electrical force to the Institution, but will be a model of its kind and permit the student to have continually before his eyes a practical illustration of what he may be called upon to design in the later practice of his profession.

FIFTH: The Dormitories with their common rooms for the daily life of the students.

SIXTH: The Gymnasium and Union for the recreation and development of the requirements of hygiene and physical up-building, with an athletic field to give zest to this development.

SEVENTH: An Armory or military drill field, a unit that is now become an integral part of the life of every American.

EIGHTH: A Residential Community for the Faculty which will foster concentration in the policies of the Institute and permit a freer interchange of ideas and a reasonable return in the shape of a more agreeable home environment to those who are giving their energies and sacrificing their lives to the welfare of Rose and her children.

NINTH: The Service Buildings which will more and more become a necessity as the Institution grows.

TENTH: A fitting frame to the whole Institution in what will eventually be a landscape development of unusual beauty made possible by the natural qualities whose selection is but another proof of the far-seeing ability of an unusually prescient Board of Trustees.

The Main Building: Entering the main building by the tower, we find ourselves in an octagonal gallery crossed by two main halls and connected by an arcaded passageway to the Technical Building. On the left will be the President's and Registrar's office. On the right an office for the Superintendent of Grounds, and a Visitors' waiting room. The

Registrar's vault is encased in one of the buttresses of the tower. Opposite the entrance, a wide corridor leads first to a staircase, and to four classrooms, this corridor terminating in the library and stack rooms. The two floors of stacks will supply about twice as much shelf room as the Institute now has, and the reading room extending beyond the building has the form of a half octagon lighted to the east, north and west. From the tower, the corridor extending to the west passes the Faculty room, special libraries, and model room placed on the south side of the building, and large drafting rooms on the north side of the building. Toward the end of this corridor is another large staircase giving access from the basement to a third floor drafting room, and at the extreme end of the corridor where will be the main students' entrance, is a large assembly room extending toward the south and having light on the east and west.

This assembly room will hold about one thousand persons and is treated like the halls of Oxford and Cambridge, or of the Graduate School at Princeton. The assembly hall and tower, the two points to which the public will come, are those in which the principal architectural effect has been sought.

The drafting and class rooms are necessarily entirely work-a-day. They will be model of their kind, the drafting rooms having in glass area considerably more than the usual 25% of floor area (indeed this amplitude of light is, to a certain extent, true of the class rooms) and both having a ventilating system with somewhat larger vent areas than are actually required by the Board of Health of the State of Indiana.

In the basement are very large and well lighted laboratories of Mechanical Engineering, bridges and arches, cement and concrete and testing materials, the testing material laboratory having a portion that is two stories high with exterior entrance extending throughout the total height so that columns can be brought in on a trolley crane.

Under the assembly room are lockers and well lighted and ventilated toilets for five hundred students. These last are immediately accessible from the students' entrance.

On the second story are other class rooms for languages, etc., drafting rooms arranged over those of the first story, and a large free hand drawing studio with cast room, the hall completed by the necessary offices and special

libraries. The spaces in the roof are lighted by a skylight to the north with small windows on the level of the floor to give a view and ventilation and will make admirable additional drafting rooms.

Technical Building: The Technical Building contains a large Chemical lecture hall with preparation room, and a large Physics and Electrical Engineering hall, also with preparation room. In close conjunction with these lecture halls are the Chemical Department on the one hand, and the Physics and Electrical Departments on the other, housed in the most modern laboratories with north and top light, and in the case of Physics and Electrical Engineering, with south light. This building is made complete with special class rooms, special libraries, and in the case of Chemistry, with balance rooms, gas and water laboratory, assay laboratory, industrial and research rooms, a large industrial laboratory or laboratory for Chemical Engineering, a special drafting room for Chemical Engineering Design, and in the case of Physics and Electrical Engineering, with dark rooms, photometer room, testing room, a pendulum tower, oscillograph room, magnetic testing, and a drafting room for electrical design in immediate connection with the electrical engineering laboratory. The Electrical Engineering laboratory will be equipped with a traveling crane, and there will also be a small traveling crane for unloading in the Mechanical Engineering laboratory of the main building.

Shops: The Shops will probably be "U" shaped, the two ends of the "U" extending to the south, between them a yard with shed for storage of material, while the connecting wing of the "U" at the northern part of the building will contain the forge, foundry, etc. Central stores are located, accessible to all of these departments, with ample lockers, tool rooms and small drafting rooms. It seems probable, although this has not been definitely determined, that a switch can be brought in from the Vandalia Line connecting directly to the Shops and Power House, so that materials and manufactured products, as well as coal and ashes, can be readily brought and removed.

The Power House: As has already been implied, the Power House will have the most modern equipment and will supply light, heat and electricity for the whole Institution.

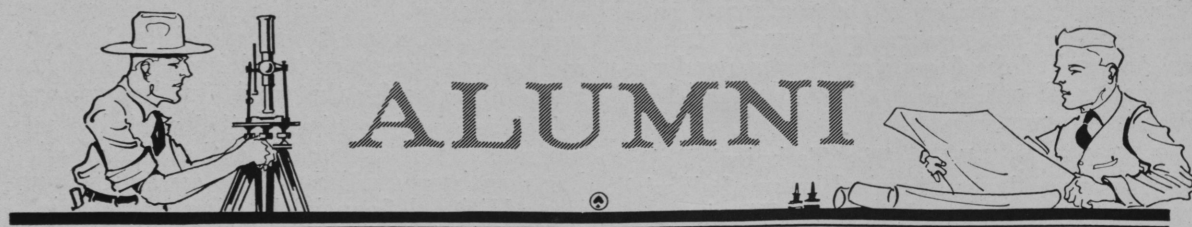
This is as far as the detailed work has progressed. It is not possible that all of what has now been studied can be constructed, unless additional financial backing is immediately forthcoming; but the main grading will be done at the present time, and the principal entrance gateway to the establishment is assured through the gift of Mr. Arnold W. Layman, who is presenting this as a memorial to his mother and father, formerly residents of Terre Haute.

The construction of the buildings has been worked out in reinforced concrete so as to eliminate steel framing as much as possible, and not only keep down useless expense, but assure fireproof qualities and the freedom from the necessity of painting and repairs promised by a practically indestructible material.

The Tudor style selected for the architectural expression of the buildings, lends itself admirably to this type of construction, for the interior of the piers and buttresses are most adaptable to a concrete core with finish of brick and stone. The floor panels will be combination reinforced concrete either with terra cotta or Pyrobar floor tile. The stone will be Bedford limestone, and the brick from one of the yards in close proximity to Terre Haute.

Our expectation is to have the work out bidding during the latter part of the winter or early spring, and to start construction in the spring as soon as the weather permits. The full size studies of the Main Buildings are now completed, and it is possible to forecast the complete realization of the plans of the President, Trustees and Building Committee.

Doubtless the founder of Rose did not dream that a monument so complete in all its details would one day continue the fame of his name; but the name is famous throughout the engineering world because of the quality of the work done by the students of the Institution, and the buildings now about to take form will be only the oil in the lamp to give greater brilliance to that fame.



By-Product Coke Ovens*

By

JAMES FARRINGTON, '96.

Superintendent of Electrical Department, La Belle
Iron Works, Steubenville, Ohio.

BY products from coal constitute today one of the pillars of chemical industry. It is generally considered that to burn bituminous coal, raw, without preliminary carbonization and recovery of by-products, should and probably will be some day prohibited by law.

Coke and gas, made by carbonization of coal, are excellent fuels, clean and highly efficient. Their use as fuels in place of coal has already reached large proportions, and is rapidly increasing. Their by-products, ammonia, tar, benzols and cyanide have immense value in the chemical industries, and make coal carbonization commercially an important and profitable procedure.

Carbonization is applied principally to the production of metallurgical coke and illuminating or fuel gas; coke for domestic and industrial heating has, however, become an exceedingly important factor in the industry. The recovery of by-products brings to a coking plant fully one-third of its revenue.

America is coming into her own in the coal by-products chemical industries, and there is no question that the recovery of the chemical base materials, benzol, toluol, ammonia, cyanides, naphthalene, tar and other valuable products of coal carbonization will have a rapid development during the next few years.

HISTORY.

The modern by-product coke oven has been evolved from the development of both coke

and gas manufacture; in this development the growth of modern chemical industries has played an important role. When coke alone was required the inexpensive beehive oven, located where coal was cheap, served the purpose. When public lighting gas alone was required, the very simple and inefficient gas retort sufficed. But now, in this day of efficiency and conservation, a coking or gas making process, in order to survive, must recover in largest measure and highest quality all of the products which are useful in modern industries, and must do this with low costs.

The illuminating gas industry had its beginning in 1792 when William Murdoch, a Scotch engineer, discovered that by distilling coal he could produce gas for illuminating purposes. His discovery was soon placed on a commercial basis and led quickly to an extensive growth of coal gas manufacture.

In the year 1851 Coppee built his so-called "Belgian oven," a horizontal coking chamber with vertical heating flues along each side in which the gas from the coal itself was burned. This was the prototype of most of the retort coke ovens of today. Knab's oven, built in France in 1856, was probably the first to accomplish by-product recovery from the oven gases, and the Knab-Carves oven, developed about 1862, greatly improved this feature. It was not until 1881, however, that the recovery of tar and ammonia from coke oven gases was practiced in any important degree commercially.

Simon, an English engineer, about 1884, added to the Carves oven the recuperator,

*From a paper presented at the June Meeting of the Association of Iron and Steel Electrical Engineers, Pittsburg, Pa.

which made possible the recovery of some of the waste heat of the flue gases, by preheating the air for combustion. By this means it became possible to save a part of the coke oven gas as surplus, over what was required to heat the ovens. About this time also Dr. C. Otto in Germany successfully applied the Sismens regenerative principle to coke oven heating and the yield of surplus gas was thus greatly increased.

In America, about 1899, Dr. F. Schniewind developed the method of separating into two parts the gas produced by distillation, so that the richer part could be diverted for industrial and domestic purposes and the leaner part could be used for heating the ovens.

Heinrich Koppers, of Essen-Ruhr, Germany, perfected in 1899 a by-product coke oven and system of by-product recovery which had many distinctive features.

Prior to 1906, the by-product ovens in this country were for various reasons not generally successful in making good metallurgical coke; consequently by-product coke was not then popular with American blast furnace managers and it constituted less than 10 per cent of the coke used.

During 1906, the United States Steel Corporation appointed a committee of well-known engineers and works managers to investigate the manufacture of coke for blast furnace use. This committee, after many months of most thorough investigation including visits to the principal by-product coke plants of the United States and Europe, finally recommended the building of 280 Koppers ovens. These were built at Joliet, Illinois, and put into operation in 1908, recovering tar, ammonia and gas.

The effect of this committee's thorough work has been far reaching. It has revolutionized the by-product coke industry in the United States and accomplished the saving of many millions of dollars' worth of our most valuable natural resources. The furnace results secured with the coke from these first ovens in this country were excellent. They caused blast furnace managers quite generally to reverse their former position on by-product coke and it is now universally conceded that better furnace practice and lower coke consumption can be secured by the use of by-product coke than by coke made in any other type of oven.

The ovens as they are now being built in the United States represent the most advanced

European practice thoroughly and carefully adapted to American conditions. Ten years ago the United States lagged behind all other large coke consuming nations in by-product coke practice. Today American practice leads the world.

The type of the coke plant to be used is of vital importance to the manufacturer of pig iron. The quality and quantity of iron produced is greatly influenced by the quality of coke used. Although the first cost of a by-product coke plant is large, it is no greater than the value of the output of the plant in one year and it is hardly one-third the value of the pig iron made from its coke in one year. The first cost of the plant is so large and the continuous successful operation of the plant is so important to those interests using the coke, gas and by-products, that only the best and most substantial coke plant should be considered. A plant that insures continuous supply of the best coke, highest yields of uniform and excellent by-products and lowest possible cost of production is in the long run the cheapest, regardless of first cost.

A by-product coke plant is a highly technical and costly manufacturing establishment. Its proper design and construction requires the best efforts of practically all classes of engineering talent.

The first by-product oven installation in the United States was in 1893 by Semet-Solvey, 12 ovens, Syracuse, N. Y.; the second installation, 1895, Otto Hoffman, Cambria Steel Co., Johnstown, Penna.; third installation, 1897, Otto Hoffman, Pittsburgh, Penna., Coke and Gas, (now Allegheny By-Product Coke Co.), Glassport.

The following is a list of By-Product Coke Plants built and under construction in America, September 1, 1916:

Owner or Operator. Location	Year	Number of Ovens
Illinois Steel Co., Joliet, Ill.....	1908	280
Illinois Steel Co., Gary, Ind.....	1911	560
Woodward Iron Co., Woodward, Ala.....	1911	170
Coal Products Mfg. Co., Joliet, Ills....	1912	35
Tenn. Coal, Iron & R. R. Co., Fairfield, Ala	1912	280
Algoma Steel Corporation, Ltd., Sault Ste. Marie	1910	110
Inland Steel Co., Indiana Harbor, Ind.....	1913	130
Minnesota Steel Co., Duluth, Minn....	1913	90
Republic I. & S. Co., Youngstown, O.....	1914	143
Maryland Steel Co., Sparrows Pt., Md.....	1914	120
Lehigh Coke Co., S. Bethlehem, Pa....	1915	424
Laclede Gas Light Co., St. Louis, Mo....	1915	56

Owner or Operator. Location	Year	Number of Ovens
Cambria Steel Co., Johnstown, Pa.	1915	92
Toledo Furnace Co., Toledo, O.	1916	94
Youngstown Sheet & Tube Co., Youngs- town, Ohio	1916	204
La Belle Iron Wks., Follansbee, W. Va.	1916	94
United Furnace Co., Canton, O.	1916	47
River Furnace Co., Cleveland, O.	1916	204
Brier Hill Steel Co., Youngstown, O.	1916	84
Gulf States Steel Co., Gadsden, Ala.	1917	37
Seaboard By-Product Coke Co., Jersey City, N. J.	1917	110
Minnesota By-Product Coke Co., St. Paul, Minn.	1917	65
Carnegie Steel Co., Clairton, Pa.	1916	640
American Steel & Wire Co., Cleveland, Ohio	1916	180
Colorado Fuel & Iron Co., Pueblo, Colo.	1916	120
National Tube Co., Lorain, O.	1916	208
Bethlehem Steel Co., Sparrows Pt. Md.	1916	240

The advantages of by-product coke ovens over the old beehive type are many, the most important of which are: better coke, because of better heat control; ease with which coke can be taken out of oven; the saving of the gas from which are derived the many by-products; increasing the coke yield from 60% in bee hive to 70% in by-product, due to heat conditions in a by-product coke oven one charge is coked in 18 hours against 48 to 72 hours in a bee hive oven; the ability to coke certain kinds of coal that cannot be coked in the bee hive oven; and the saving of the fuel supply of the world.

COAL.

The general scheme of the by-product coke oven consists in conveying the different kinds of coal to a breaker in the top of a building; which breaks the coal into pieces the size of eggs; from there it passes down through chutes to hammer mills which hammer the coal into pieces, 85% of which would pass through $\frac{1}{8}$ -inch mesh screen. The coal is then conveyed to a storage bin over the ovens, from which it is distributed to the ovens by larry cars, which drop the crushed coke through four holes in the top of the ovens. After the coal has stayed in the ovens for the requisite length of time, varying from 16 to 30 hours, the doors of the oven are lifted by door machines, and the coke pushed out by a pushing machine into a quenching car. This car is then pushed by a steam or an electric engine to a quenching station, which sprays water on the coke for 45 seconds. The coke is then hauled to the coke wharf and dumped upon it.

From the wharf it is conveyed to the coke screens by belt conveyors and passed through the screens to standard railroad cars below, the smaller parties, or coke breeze, as it is called, passing into another car. There is a market for coke breeze, as it is burned under boilers.

GAS.

The gas is taken from each oven to a main gas line, which conducts the hot gas to primary coolers, where the tar and water vapors are condensed, and run into a settling tank, from which they are pumped to the by-product building for further reinforcement. The gas is then pumped through saturators, where it bubbles through a weak solution of sulphuric acid, and the ammonia in the gas is recovered as a white salt called ammonium sulphate, an excellent fertilizer. From the saturators the gas goes through another set of final coolers, where it is cooled down to about 20° C. and then through tower scrubbers, where the benzols are recovered, by scrubbing the gas with wash oil. About one-half of the gas is then sent back to the ovens to carry on the coking process, the other half, commonly spoken of as surplus gas, is used throughout the mills for heating water and steel.

The wash oil containing the benzols is then distilled, and the benzols recovered from it in a crude state. In this state they are called light oil. The light oil is then distilled and in this distillation is divided into four fractions, crude benzol, crude toluol, crude light solvent, and crude heavy solvent. Each of the crude fractions is then washed with 66% sulphuric acid to take out the hydrocarbon impurities. They are then washed with caustic soda to neutralize the acid, and each fraction is again distilled to bring the range of the pure product within the required specifications. The specification of benzol requires that all the product shall distill within the range of 20° C, and in this range shall be included the true boiling point of benzol, which is 80.2° C. The specification of toluol requires that all the product shall distill within the range of 2°, and in this range shall be included the true boiling point of toluol, which is 110.3°. The light solvent specification requires that not more than 10% shall distill at 140°, and that 90% shall distill at 160° C; the heavy solvent specification, that not more than 10% shall distill at 160°, and 90% shall distill at 200° C.

Benzol, chemical formula C_6H_6 , is used as a motor fuel; it has about 15% greater power than gasoline. It is also used to make picric acid, which is used in making explosives. Toluol is used in the making of Tri Nitro Toluol. The light solvent is used as a solvent, as its name implies, as a paint center, and in mixing varnish. The crude heavy solvent is not extensively used at present. When tar is distilled creosote oil and pitch are recovered. Creosote oil is used to preserve lumber and to impregnate blocks for paving; pitch is used in roof coverings.

The La Belle by-product coke oven consists of two batteries of forty-seven ovens each, of H. Kopper's cross regenerative ovens, consisting of a narrow brick chamber approximately 38 feet long, 10 feet high and 18 inches wide. This chamber or oven has a capacity of about 16 tons of coal, giving a 70% yield of coke of about $12\frac{1}{4}$ tons in 18 hours. It will thus require about 2,000 tons of coal every 24 hours. To supply this amount of coal, we have three sources, one from barges at the river dock and one from a storage stock pile. When coal is used directly from the railroad cars, the car is placed over a large bin or track hopper and the coal is allowed to drop into the hopper. When the coal is taken from barges, it is hoisted by a 5-ton clam shell bucket with a hoisting speed of 600 feet per minute, driven by a 350 H. P. 3 Phase 60 Cycle 440 Volt slip ring motor on a traveling coal tower or unloader. The hoist has dynamic braking in two phases for lowering. The coal is hoisted approximately 80 feet, and the trolley with the bucket is brought over stationary bins at the coal dock by a 75 H. P. slip ring motor. The bucket is opened and the coal is dropped into bins, from which it is conveyed by rubber belt conveyors to the track hopper or bins. The main conveyor of about 150 feet is driven by a 50 H. P. 220 volt induction motor, controlled by the operator at the track hopper. This coal unloader has a capacity of 2,000 tons in 10 hours.

When coal is not available from the railroad cars or barges, it is taken from the stock pile by the No. 2 Coal Tower and loaded into standard railroad cars, which are then pulled over the track hopper, as in the first case, by a 50 H. P. D. C. car spotter. The coal is put into stock by the No. 2 Coal Unloader, which takes the coal from six bins along a 950 foot stocking

pit. The coal is dropped from standard railroad cars into these bins. The unloaders have a 360-degree swing, which allows them to completely fill the pits. The current is delivered to the coal unloaders by three sixty-pound A. S. S. T. rails, supported in a triangle by third rail insulators; the average center of the rails is 17 inches. The rails are tapped every 50 feet to three 60 cycle, 440 volt, 3 phase feeders, paralleling the collector rails. The rails are supported on 8 inch by 8 inch posts, 7 feet 6 inches from the ground. The feeders are supplied from an outdoor transformer station consisting of three 250 k.v.a. 22000-460 volt single phase, oil cooled transformers. The coal is carried from the track hopped by a conveyor, A, driven by two 10 H. P. motors, which delivers it to conveyor B, driven by two 75 H. P. motors, which in turn carries the coal to a breaker in the top of the building, approximately 90 feet high. The breaker is driven by a 50 H. P. slip ring belt-connected motor. From the breaker the coal passes over a mixing conveyor to a conveyor C, driven by two 5 H. P. motors, to the hammer mill bins. From these bins it passes to the hammer mills, which are driven by a 350 H. P. slip ring motor. The coal passes from the hammer mills to a belt conveyor, driven by a 50 H. P. motor, which lifts it up to Conveyor E, driven by a 25 H. P. induction motor. The conveyor delivers the coal to top of the storage bin, over the ovens. All the coal and coke conveyors, feeders, hammer mills and breaker controllers and magnets are placed in a brick building, and so interlocked that if any conveyor or feeder stops from any cause, all the conveyors back of it stop and all ahead of it keep on running, thus preventing the coal from piling upon a dead conveyor. In order to get protection for underload, due to a pinion coming off, a watt meter type relay was installed, dropping out the switches if the load falls below a predetermined value. All motor windings were impregnated to prevent acid and coke dust from destroying the insulation. The motors in the coke screen house were enclosed in a metal cabinet, which in turn was placed in a concrete room. So far we have experienced no trouble.

The coal is taken from the storage bin in a larry or coal charging car, driven by a 30 H. P. D. C. mill motor, the current being supplied by collector rails mounted on asbestos blocks to stand the heat of the oven. The car travels

over the tops of the ovens, and drops the coal into them through four openings. When the coal is coked and ready to be pushed, the door on the back of the oven is removed by an electrically driven door machine, and the door on the front is removed by a coke pushing machine. The ram of the machine is started through the oven, pushing the coke ahead of it into a quenching car on the other side of the oven. The ram is driven by a 50 H. P. D. C. mill motor. The bridge motion and ram motion are so interlocked that the bridge cannot be moved while the ram is in motion.

The quenching locomotive has two 85 H. P. D. C. 200 volt motors arranged for series parallel operation, and is equipped with air compressors for operating brakes and opening and closing the doors on the quenching cars. The quenching station is equipped with a 35 H. P. induction motor for pumping water into a spray tank, and is automatically operated by a float in the tank. The coke wharf feeders, feeding coke from the wharf onto the conveyors, are driven by a 5 H. P. induction motor.

The Coke conveyor to the screens is driven by 25 H. P. induction motor. The two screens are each driven by a 15 H. P. induction motor. The empty cars are spotted and the loaded ones removed by a coke car spotter, driven by a D. C. 50 H. P. mill motor with magnetic control, having dynamic breaking on the first point. The spotter consists of a drum and gear which pull a steel cable attached to the cars.

In order that the gas may be reversed in the ovens at regular intervals and in proper cycle, an automatic controller operated by a clock has been installed. The motors opening the valves can be operated either by the clock, electrically, or by hand, electrically or mechanically. The ovens being on one side of the Ohio River and the blast furnaces on the other, a cantilever type railroad bridge was built connecting the two plants. The gas from the ovens is sent under the river by a 250 H. P.

D. C. variable speed motor driven booster, to the heating furnaces.

The water for the coke works is from eight driven wells, 185 feet deep, and is forced out by compressed air, driven by a 200 H. P. A. C. motor. The water flows by gravity to a storage well from which is pumped by centrifugal pumps of 6,000,000 gallons capacity. The pumps are driven by 150 H. P. motors, with a speed of 1170 r. p. m. The two high pressure fire pumps are automatically started by push buttons, from different parts of the plant. A switch located in the low pressure tank automatically starts the pumps by the flowing of water from a stand pipe into the pumps, should a hydrant be turned on. When the fire pumps get up to speed, raising the water pressure, the check valve between the two systems closes.

The power for the coke works is supplied from a substation containing two 500 k.w. 250 D. C. 2200 A. C. 900 r.p.m. motor generator sets, four 400 k.w. 2200-240 volt single phase 60 cycle, oil cooled transformers. The fourth transformer is connected to the high and low sides by switches which can be closed in case any one of the other three break down.

All circuits were run with 3 Conductor 400,000 C. M. lead covered cables, underground, with pot heads at the substation. The power is purchased from a power company having two 22000 volt lines at our substation, reducing the voltage to 2200, from the outdoor transformer station. The substation at the coke works is connected to the power house at Steubenville by a submarine cable and an overhead line over the railroad bridge at 22000 volts stepped down to 2200 at each station. The Steubenville Power House will operate in parallel with the purchased power.

I am indebted to Mr. E. H. Collester, superintendent of the By-Product Coke Works, for the information on by-products. I have endeavored to outline the general scheme of by-product practice and equipment, and I hope this paper will be the means of bringing out a lively discussion.

ROSE MEN IN THE SERVICE.

An earnest effort is being made by the Institute to preserve a record of alumni and others connected with Rose who have entered government service. Any information which might aid in keeping this record should be reported to the President's Office.

Following is a list of those who have received commissions:

John D. Galloway, '89, Major, E. O. R. C., San Francisco.

S. M. Rock, '92, First Lieutenant, Coast Guard.

Wm. G. Arn, '97, Captain, Detroit Regiment of Engineers.

Leon Goodman, '05, Captain.

Earle S. Butler, '06*.

C. B. Andrews, '08, Captain, E. O. R. C.

B. L. Kelso, '08, Captain.

E. M. Brennan, '09, First Lieutenant.

H. M. Shaw, '10*.

R. A. Strecker, '12, Captain.

J. M. Lawler, '12, First Lieutenant.

M. R. Denny, '13, Ordnance Dept.

A. C. Hansen, '14, First Lieutenant.

H. S. Goldman, '14, Second Lieutenant, E. O. R. C.

J. T. Scott, '14, Second Lieutenant.

F. W. Bringman, '14, First Lieutenant.

R. J. Templeton, '14, First Lieutenant.

J. M. Schoonover, '14, First Lieutenant, Signal Corps.

C. A. Lyon, '14, Second Lieutenant, E. O. R. C.

M. W. Stoms, '14, First Sergeant, Quartermaster Department.

H. E. Mayrose, '15*.

S. Finkelstein, '15, Second Lieutenant, E. O. R. C.

J. S. Gillum, '15, Second Lieutenant.

R. E. Finley, '16, Second Lieutenant.

Edward Abbett, Captain, Artillery.

H. C. Thomas, Ex-'17, First Lieutenant.

Stanley Adams,* Coast Artillery.

Ivan C. Miller, Ex-'18, Second Lieutenant, Aviation Corps.

J. M. Snead, Captain.

Edward Ewens, Ex-'19, Second Lieutenant, Coast Artillery.

E. J. Ducey, '11, First Lieutenant, Engineering Corps.

H. B. Hammond, '09*.

F. N. Hatch, '06, Captain.

J. H. Service, '12*, Aviation Corps.

Among those who are at present in the R. O. T. C., or in some other branch of the service, are:

S. S. Roberts, '98

Clifton Brannon, '04

O. F. Reynolds, '05

J. E. Bernhardt, '08

S. B. Hamilton, '08

F. H. Reiss, '08

G. M. Curry, '09

L. E. Grammer, '09

T. L. Lee, '09

B. O'Brien, '09

Richard L. Smith, '09

A. H. Albrecht, '12

W. W. Reddie, '12

R. C. Rehm, '12

A. F. Brennan, '13

Chesleigh Gray, '13

E. E. Hughes, '13

F. T. Loehninger, '13

Warren R. Cox, '14, Red Cross Ambulance Service, France.

W. H. Henry, '14

R. E. Lammers, Ex-'14

K. E. Lancet, '14

G. B. Meyers, '14

Frank A. Rogers, '14

H. A. Smith, '14

A. T. Arnold, '15

E. A. Brauns, '15, Aviation Corps

R. F. Burns, '15, Aviation Corps

H. C. Charman, Ex-'15.

C. S. Duddleston, '15, Aviation Corps

Homer A. Howe, '15, Ordnance Department

J. E. Sheldon, '15

R. M. Smith, '15

H. R. Woodward, '15

G. M. Anderson, '16.

C. F. Carlisle, '16

H. E. Smock, Engineering Corps, N. Y. N. G.

R. R. Stoltz, '16

R. A. Weinhardt, '16, Aviation Corps

J. C. Rector, Ex-'17

Milton Tilley, '17, Aviation Corps

W. C. Wente, '17

Chester A. Williams, '17

B. L. Combs, '18

C. E. Geiger, Jr., '18

R. E. Price, '18

Richard Scott, Ex-'18

William H. Bruning, Ex-'19

H. H. Heck, Ex-'20, Aviation Corps

*—Rank Unknown.

Among those who are working as citizens in connection with the Government are:

Dr. C. E. Mendenhall, Scientific Committee of National Council of Defense

W. A. Layman, '92, National Council of Defense

E. P. Edwards, '99, National Council of Defense

A. A. Bareuther, '10, Chief Inspector, Panama Canal

W. O. Hensgen, '06, Radio Expert

O. P. Hood, Bureau of Mines

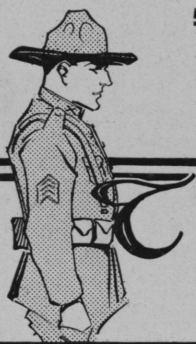
G. R. Putnam, '90, Bureau of Lighthouses
F. J. Frisz, '09, U. S. Navy Department, Washington, D. C.

R. M. Hickman, '11, Paymaster, U. S. Navy
R. D. Madison, '13, Ordnance Department, Washington, D. C.

L. W. Lewis, '13, Bureau of Yards and Docks, Navy Dept., Washington, D. C.

G. W. Holding, '17, Ordnance Department, Washington, D. C.

S. P. Stone, '16, Bureau of Mines, Washington, D. C.



THE COLLEGES and THE WAR



THE war has made big inroads on the colleges of the country, and the registrars' records show decreased figures where increases would be invariable under normal conditions. Registration is not yet complete even in those colleges which have opened—and several are not yet open—but the figures already show an average decrease in enrollment of fully 30 per cent in the big universities.

The decrease at Yale is reported at 39 per cent; at Harvard and Princeton, 40 per cent; at Dartmouth, 35; at Cornell, 30; Williams, 30; Brown, 30; Ames, 30; Purdue, 25; Kansas and Indiana, 20; Wisconsin, 19; Iowa, 12½.

Not only in the registration but in the curriculum is the effect of the war made manifest. Military courses are compulsory, credits for them are in many cases increased, and several universities have added courses on military topics and national service.

Most of the Yale undergraduates have been enrolled as "students of artillery" in the reserve officers' training camps or as students for ensign examinations in the naval training unit. A retired West Pointer, Capt. Overton, and Capt. Bland and Massey, two University of Toronto men, who have seen active service at the front, will look after the artillery instruction, and the credits for the work going toward a degree will be about one-fifth of the total college work of the year. The French government has supplied the university with a battery of 75 millimeter guns, and Capt. Dupont of the French military mission is at Yale helping to inaugurate the instruction at the new artillery armory.

Thirty members of the Faculty of Yale University have either resigned or have been given leaves of absence to enter the war service.

The medical school was the only department in Harvard university to show an increase, according to official registration figures.



THE SCRAPS

"Ha, 'ere's
de meat!"



THE annual Sophomore-Freshman pink tea encounters are now recorded in the annals, with honors about fifty-fifty. The first engagement of the rival forces occurred just six hours after school had been opened. Both classes had been favorably impressed by the green lawn at Wiley, so there were two class meetings at that institution that were not on the day's schedule. The Sophs chose an earlier hour, so they had a young multitude on hand when the Frosh were just beginning to collect. Then, with a dash of bravery that will always be a credit of the Class of '20, they proceeded to "pick off"—in the words of the poet—the unsuspecting Freshmen, one by one. It was a grand burst of daring, undoubtedly of the same sort that wins iron crosses, the Legion of Honor, Carnegie Medals, and so on. Though these manouvers continued but a short time, they served a purpose—'21 was unable to assemble, and when the clash did come, the Soph numbers defeated the Frosh nerve.

On the next evening at seven o'clock, '21 swarmed to Seventh Street and Third Avenue, and, in spite of the threatening weather and the Soph "bear stories," eighty-five percent of the class showed up. Scrap Cap Gale was injured on the eve before, and although unable to fight, he told the yearlings how it's done in the best circles. At exactly 7:45 the procession started.

At the south end of the foot ball field stood a tall gloomy looking telephone pole that had long since received an honorable discharge. This pole, by the way, has had *some* history—and a ringside seat at all the scraps in the days of scraps that were. From its top in the glare of four huge lights floated the challenge in the cool night breeze. Huddled about its base were the hosts of the evening—defendants of the amateur lock and chain title—fifty strong, listening to the last words of Cap Gray. Scores of proud little brothers, anxious sisters, nervous mothers and curious dads lined the enclosure.

Such was the scene when '21, led by acting Captain Steffen, came rushing and roaring into the slaughter. The fight was all that could be expected. The classes were about equal in numbers and the scrap resolved itself into so many individual encounters. As is always the case, the fence gave way and the spectators crowded into "the squared circle" with the gladiators.

"Twenty, Help! He's killin' me!"

"Chain here, Twenty!"

"Lay still or I keel you!"

"Aw, I say, don't shove my face in this mud!"

"I'll git you for that, Freshman!"

"Getoffamyneck, will you "

"Oh, my poor son, my darling! Where is he?"

"Water, Water!"

"Get that Junior, Twenty!"

"Stand back here, please! Give 'em air!"

"Where's Gil? Couple knocked cold in the gym—"

"I don't care; I think this whole affair is perfectly outrageous. The police should interfere—"

"Not so tight, they're cuttin' me now!"

"Better have a little of this. You'll be glad of it later on!"

— — —and so on. This we heard above the snapping of locks, the clicking of chains and thunderous thuds as masses of legs and arms would hit the cold ground.

It took just one hour and a half of this gentle form of debating 'til it was decided that '20 was the master. Soon two trucks arrived on the scene, and the luckless Frosh were given a ride into the wilds of the surrounding country, where they were left chained, to entertain our wild animals.

The pipe rushes were equally good. The Frosh grabbed the verdict when the count showed that they had eighteen hands to sixteen of the Sophs', on Hath's 3-B. The count-

ers are not enjoying great popularity among the losers, though.

It is true that several spectators remarked that such events are outrageous and barbarous, and that no possible good comes from them. In defense we are forced to say that to call a man "yellow" is about the worst thing we

could say about him. And there is no doubt but what class scraps are the best "yellow-cides" ever put on the market. Draw your own conclusions. And then, too, "ain't it a grand an' glorious feelin'" when you're telling your dear one about it, and she just looks and says "Oh-h, George!"

MILITARY TRAINING AT ROSE.

With an extensive reorganization of the Student Battalion at Rose, compulsory military training for all members of the Freshman, Sophomore and Junior Classes has been adopted by the school authorities as a permanent part of the Institute.

It is the aim of the school to give a complete course in military engineering. The work will consist of infantry tactics, map-making and map reading, combat work, trench work, signalling (flag signalling and portable telegraphy), all phases and field engineering, and camp construction and management.

The Freshmen will be given close order work during the first part of the school year, and extended order work during the second term. The Sophomores will receive extended order work, combat work and trench work. The Juniors and Seniors are to receive instruction in map work, flag signaling and portable telegraphy, and guard duty.

Professor R. L. McCormick will give lectures on all phases of field work, accompanied by the actual field work. Professor H. A. Thomas will give instruction in map making and reading. Professor H. L. Coles will give lectures, and probably an elective course, in explosives.

From fifteen minutes to one hour of each three-hour drill period is devoted to setting up exercises, under the directions of Coach Gilbert, while the remainder of the period is spent in instruction.

The officers' training company under the direction of Professor Coles is open to any one wishing to take the course.

A system of demerits will be rigidly enforced. Officers will report all cases of violation of orders or the regulations to the Sergeant, who will report to the Sergeant Major. The distribution of demerits will be at the discretion of Professor Coles. The system of demerits is as follows:

Absence during prize drill, or inspection, without excuse	80
Absence during drill, without excuse.....	20
Tardiness, up to fifteen minutes after fall in....	5
Tardiness, up to thirty minutes after fall in.....	10
Tardiness, up to one hour after fall in.....	15
Excuse for absence must be given to the Adjutant on the proper blanks.	
Wrong report on absence	80
Failure to obey order of officer, or non-commissioned officer	40
Talking back to officer, or non-commissioned officer	40
Spitting in ranks	10
Talking in ranks	10
Laughing in ranks	10
Failure to salute officer while at drill.....	10
Dropping guns to ground unnecessarily hard, bumping against steps, and snapping trigger without orders, while in ranks, each.....	20
Not obeying order of Quartermaster Dept. regarding guns	20
Leaving post or gun while on guard duty.....	40
Failure to challenge or stop designated persons, while on guard duty	40
Talking while on guard duty, excepting as ordered	20
Inspection will be held each drill period by First Sergeant, immediately following roll call. A general inspection by the Major will take place at least once a month.	
Shoes not shined	10
Trousers not pressed	10
Coat not buttoned	10
Hat not brushed	10
Not clean shaven	10

80 demerits will fail the student in the one credit of military training required for graduation.

THE MODULUS DANCE.

The first Modulus Dance of the year was held on Saturday evening, September 29th, at the Phoenix Club. Over sixty were in attendance, the affair proving a decided success.

The hall was beautifully decorated in rose and white, with a large American flag draped over the west wall. Doctor and Mrs. Johnston, and Professor and Mrs. Coles acted as chaperons.

The Clifford Lowe Orchestra furnished the music.

ORGANIZATIONS

Up to Friday, October 12th, the following elections or appointments had taken place among the various student organizations:

Student Council

President and Financial Secretary..R. P. Long, '18
Vice-PresidentR. F. Bergmann, '18
Recording SecretaryGoldsborough Robinson, '18

Athletic Association

(No election of officers).

Senior Class

PresidentGoldsborough Robinson
Vice-PresidentChester W. Falls
Secretary-TreasurerAndrew Yatsko
Athletic RepresentativesL. S. Bake
James E. Orr

Junior Class

PresidentAlvin H. Barnes
Vice PresidentJohn R. Cain
Secretary-TreasurerJ. Walter Hauck
Athletic RepresentativesAdolph E. Reinhard
Herschel A. Hearn

Sophomore Class

PresidentClaude M. Gray
Vice PresidentJoe A. Engelhard
Secretary-TreasurerJames S. King
Athletic RepresentativesRex J. Self
Fred M. Pence

Freshman Class

PresidentW. Carr Skinner
Vice PresidentEarl Douthitt
Secretary-TreasurerRobert C. Walker
Athletic Representatives.....John G. Burns
Clark Foulkes

Camera Club

PresidentRudolph F. E. Wiedemann, '19
Vice PresidentDeWitt P. Cromwell, '19
Secretary-TreasurerRobert C. Walker, '21
Faculty AdvisorProf. John B. Peddle

Military**Battalion Staff—**

Major, Leslie J. Heedwohl, '18
Sergeant Major, Kenneth M. Huston, '20
Captain Adjutant, Norman A. Ruston, '20
Second Lieutenant, R. J. Owen, '19
Quartermaster, John W. Bolton, '18

Company A—

Captain, J. C. Zimmerman, '19
First Lieutenant, R. M. Waggoner, '20
Second Lieutenant, J. A. Engelhard, '20
First Sergeant, Claude M. Gray, '20
Second Sergeant, H. J. Lauterbach, '20
Third Sergeant, G. L. Brown, '20
Fourth Sergeant, Robert O. Cash, '20
Fifth Sergeant, R. C. Manson, '20
Corporals, R. E. O'Neil, '20; F. L. Reinmann, '20;
J. S. King, '20.

Company B—

Captain, C. K. Failing, '18
First Lieutenant, D. P. Cromwell, '19
Second Lieutenant, H. G. Schlaman, '19
First Sergeant, J. C. Wallace, '21
Second Sergeant, W. C. Bryan, '20
Third Sergeant, Clark Foulkes, '21
Fourth Sergeant, F. G. Klatte, '18
Fifth Sergeant, C. W. Young, '20
Corporals, J. F. Reinking, '20; G. K. Woodling, '20; G. N. Maxwell, '20; M. H. Steffen, '21; F. B. Ray, '20; J. H. Crowe, '20; R. C. Walker, '21.

Company C—**(Signal and Engineering)**

Captain, C. Ray Decker, '18
First Lieutenant, R. F. E. Wiedemann, '19
Second Lieutenant, F. M. Stone, '20
First Sergeant, Simon Werbner, '19
Second Sergeant, L. S. Stinson, '19
Third Sergeant, R. E. Woodruff, '19
Fourth Sergeant, D. M. Howard, '18
Corporals, A. H. Barnes, '19; W. L. Osmer, '20;
G. M. Owens, '19; I. C. Mendenhall, '19.

THE PEP FEAST.

Friday evening, October Fifth, marked the first "Pep Feast" of the school year, given by the Freshman Class in the gymnasium. And who'll not say that the Frosh are right there when it comes to throwing a party? And we guess some of 'em aren't "shifty wid de mitts," too—talk about your white hopes!

Two-round boxing matches, which proved nothing short of whirlwind exhibitions, occupied the earlier part of the evening. The process of elimination was used in determining the champ of each class—sort of a survival of the fittest, as it were. And Bruno Salles showed the fistic fans some stuff that the Marquis of Queensbury never saw!

J. Rufus Gilbert was on hand to promote his English betting game. Gil's game was the "Hound and Badger Fight," for which he had

procured a vicious looking yellow bull dog and a badger (?). The fighting qualities of the latter quadruped are to be highly respected, judging from the way Gil had boxed him in a flour barrel. "Fessor," expressing his opinion that the game was too inhuman, declined to officiate as timekeeper (later, however, he refused to admit it). After the selection of another less competent official, the decks were cleared for action.

Owing to the pugnacious instincts of badgers, as Gil explained, the job as jailkeeper for Mr. Badger was a particularly dangerous one; and it necessitated extremely coaxing terms to engage some volunteer who would pull the rope that liberated the badger for the main bout of the evening. Gil's efforts were at last rewarded, however, when none other than

Robert L. Tilley, Esq., stepped forth to assume office on the business end of the string.

Several moments later, with all the spectators, judges, and so on, up on the chairs (the scene resembled that of the mouse in the millinery shop), as Gil had spoken of the badger's occasional wild antics, the signal was given, and—*!***! Well, if you missed this scrap, ask Tilley, *he* knows.

After the K. O., the customary Pep Feast bread line formed, and Gil more than atoned for his misdoings when he cut the gang loose on the eats and drinks.

Some party, Freshmen!

STUDENT COUNCIL MEETING

October 4, 1917.

Called to order at 7:30 P. M. on October 4th by Acting President Long at Theta Xi house. Mr. Gilbert and Professor Coles present. Athletic Association, Scientific Society, and Symphony Club not represented.

The meeting was opened with an informal discussion of military uniforms by Prof. Coles, and the Council. The uniform decided upon was regulation uniform (except for rolled collar coat), campaign hats, gray shirts, and black military ties. Bergmann volunteered to design the necessary insignia. Prof. Coles excused.

Election of officers of Council: President, R. P. Long; Vice President, Richard Bergmann; Recording Secretary, Goldsborough Robinson.

Failing requested that an appropriation of \$155.00 be made from the general fund to the Y. M. C. A. Laid aside pending investigation by Failing and Long.

Moved by Bergmann that money from *Modulus* dances be turned over to the general fund, and thence to THE TECHNIC. Laid aside pending a meeting of the Junior Class to discuss the *Modulus* situation.

Moved by Bergmann, seconded by Wiedemann, that THE TECHNIC be allowed 25 per cent of the profits from minstrel show each year. Carried.

Barnes excused.

Mr. Gilbert explained the Athletic situation in detail. Reported budget of \$1,574.17 for September and October, and outlined plan for reducing the indebtedness of the Athletic Association.

Council voted Athletic Association \$600 from general fund.

Moved by Bergmann, seconded by Gray, that Mr. Gilbert be authorized to enter into a contract with the Grand Opera House for a minstrel show on December 13 and 14, the contract to be a duplicate of the one of last year. Carried.

Moved by Robinson, seconded by Wiedemann, that Council shall not purchase stationery. Carried.

Moved by Gray, seconded by Skinner, that the regular meeting of the Council be held on the third Friday of each month. Carried.

Adjourned.

GOLDSBOROUGH ROBINSON,
Recording Secretary.

THE FRESHMAN CLASS

Seymour N. Anderson, M., Terre Haute; Karl Arleth, Ch., Long Beach, Calif.; George R. Armstrong, Ch., Terre Haute; Albert G. Belden, Jr., E., Terre Haute; James R. Benham, C., Terre Haute; Ray L. Biller, E., Staunton; Raymon E. Binhack, C., Princeton; Donald W. Boaz, Ch., Terre Haute; Harry E. Bolt, E., East St. Louis, Ill.; John G. Burns, M., Terre Haute; Edwin H. Carnarius, Ch., Terre Haute; Homer A. Clark, Ch., Terre Haute; Henrique deM. Correa, C., Nichteroy, Brazil, S. A.; Delbert O. Cretcher, C., Terre Haute; Carl J. Dedert, Ch., Terre Haute; William R. Dedert, Ch., Terre Haute; Earl Douthitt, Ch., Terre Haute; Jesse E. Dowen, E., Carbon; G. R. Epps, M., Indianapolis; Max A. Faucett, E., Terre Haute; Clark Foulkes, C., Terre Haute; Lloyd E. Gale, M., Robinson, Ill.; Hubert T. Goodman, Ch., Terre Haute; Lloyd Greenebaum, M., Louisville, Ky.; Earl W. Haley, C., Terre Haute; Hugh F. Harvey, M., Terre Haute; Herbert P. Hanger, E., Terre Haute; Amador Heres, M., Clarksburg, W. Va.; Arthur D. Hill, C., West Terre Haute; Edward F. Jaenisch, M., Terre Haute; Fenelon M. Johnson, E., Seymour; William H. Junker, Ch., Terre Haute; Fred H. Klatte, M., Terre Haute; Herman J. Krausbek, M., Terre Haute; William H. Merry, Ch., Terre Haute; Samuel J. Minar, E., Terre Haute; John M. Moser, E., Terre Haute; Carl Moses, E., Terre Haute; I. Warren Newman, C., Louisville, Ky.; Frederick R. Owens, Ch., Terre Haute; Aubrey J. Pettus, Ch., Terre Haute; Linden Pigg, E., Terre Haute; Ronald

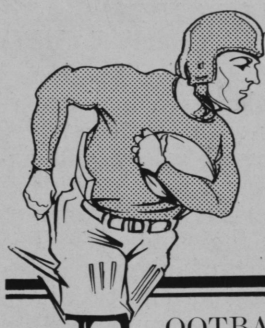
G. Rawlings, M., Marshall; Adrian Ray, E., Terre Haute; Sidney Reibel, M., Terre Haute; Edward R. Ronald, M., Louisville, Ky.; Arthur G. Rosenbaum, M., Louisville, Ky.; Bruno Salles, C., Campinas, Brazil, S. A.; Carl W. Schroeder, E., Terre Haute; Robert E. Sewell, Ch., Anchorage, Ky.; Robert L. Skidmore, C., Indianapolis; Winfield C. Skinner, M., Louisville, Ky.; Paul R. Smith, A., Terre Haute; Milton H. Steffen, Ch., Terre Haute; Donald M. Van Buren, Ch., Terre Haute; Milton F. Vianna, C., Rio de Janeiro, Brazil, S. A.; Charles R. Voges, Ch., Terre Haute; Robert C. Walker, Ch., Terre Haute; James C. Wallace, M., Terre Haute; Irvin Weir, E., Prairie Creek.

DRAMA LEAGUE WANTS MEN TO COACH PLAYS IN CAMPS.

The Drama League of America has issued a call for college men who have had experience in putting on plays with amateurs. Men are wanted who, for a small salary and expenses, are willing to go for a month or more, or indefinitely, into the various training camps and put on plays with the soldiers. The League is preparing a list of plays suitable for such use, and is making an effort to have the royalties dismissed for camp performances. Those interested should address the Camp Entertainment Committee, Drama League of America, 306 Riggs Building, Washington, D. C.

The Senior Summer Schoolers





FOOTBALL



FOOTBALL, in spite of the war, is still holding its own as the king of all college sports. Unlike the majority of colleges in the country, Rose has not been so hard hit by Uncle Sam. From last year's squad, the only losses besides the Freshmen wonders were Captain "Jap" Davis and Wagner. Coach Gilbert, Captain Grafe and warriors started their practice a week before the regular fall session opened. The first week was spent in mastering the arts of passing, catching and falling on the ball. The squad, which now numbers about an even two dozen, is composed mostly of veterans. "Butch" Barnes, "Sister" Bake, "Head" Gray, "Jim" King, "Seed" Henry, "Slivers" Floyd, and Captain Grafe ought to make up one of the classiest lines in the state, and with such men as Engelhard, Orr, Gale, Howard and Burns to work in the backfield, Rose should have a team like those of twenty years ago, when it was considered a disgrace not to score at least fifty points on Wabash. "Chick" Springer looms up as our best quarterback bet, and those who saw him perform at Greencastle were by no means disappointed.

Before the Alumni game, Gilbert was as-

sisted by Ed Grogan, former Holy Cross luminary, who gave special attention to the line. Grogan's work helped the team immensely, as did the efforts of Sprow, who helped Gil "cuss" the linemen into form the week before the DePauw pilgrimage.

With the Alumni, DePauw and Hanover games out of the way, Gilbert is pointing his men for the Wabash game—the most important one on the schedule. Poly's chances of downing the Little Giants are the best in four years, and it is conceded that a victory over the Scarlet means the I. C. A. L. championship for 1917.

The remainder of the 'Varsity's schedule is as follows:

October 27—Washington University, at St. Louis.
 November 3—Franklin College, at Terre Haute.
 November 10—DePaul University, at Chicago.
 November 17—St. Louis University, at Terre Haute.
 November 24—Butler College, at Indianapolis.
 November 29 (Thanksgiving)—Rolla School of Mines, at Terre Haute.

The scrubs have cast aside their old name—"The Buzzards"—and are venturing forth against the neighboring high schools as the Rose Tech Club.

ROSE—ALUMNI.

For the first encounter of the season, the following "old heads" returned to give battle to the 'Varsity: Trimble, '16, "Bill" Carter, '15, "Pos" Schmidt, '08, "Connie" Baxter, '15, "Goney" Goldsmith, '16, Bradford, '11, Shook, '11, Baker, '11, Standau, '10, and "Bill" Hoff (he skipped his last three years). Good as this all-star line-up may look, Rose looked better, and at the end of the argument the score stood 21 to 6, with the 'Varsity on top. For Rose, Howard put up a nice passing game, while "Doc" Orr and Burns gained ground consistently. The line held like an American trench. The game by quarters ran as follows:

First quarter:—Alumni won the toss, and kicked off to 'Varsity. Alumni held, and

"Scroob" Howard punted sixty yards. Rose held, and Bradford kicked. Line smashes netted Rose first down, and a pass, Howard to Floyd, gave the 'Varsity its first touchdown of the year. Howard kicked goal. Score: Rose 7, Alumni 0.

Second quarter:—Alumni kicked; Burns and Orr each got away for fifteen yard gains for the 'Varsity. Howard added twenty, and Springer went through center for the second marker. "Scroob" failed at goal. Score: Rose 13, Alumni 0.

Third quarter:—Floyd kicked off to Hoff, who returned the ball ten yards. Orr intercepted a pass, and Howard and Burns completed one for the 'Varsity that was good for twenty yards. Rose was caught off-side, and

finally held for downs. Another penalty cost the 'Varsity fifteen yards, but Bradford was forced to punt after line plunges and a forward pass had failed. Howard punted forty-five yards to Bradford, who attempted to kick on the first down. "Butch" Barnes broke through and blocked the punt, the ball rolling across the goal line. Barnes was first to corral the oval, thereby registering six more points for Poly. Howard missed goal. Score: Rose 19, Alumni 0.

Fourth quarter:—Trimble kicked to Howard, who returned the ball thirty yards. "Scroob" then hit the line for twenty more, and a pass took the ball to the Alumni five yard line. Alumni recovered a 'Varsity fumble, but Bradford was downed behind the line for a safety. Score: Rose 21, Alumni 0. A shutout victory appeared in sight for the 'Varsity until "Bill" Hoff grabbed two forward passes in succession, gaining fifty yards and a touchdown. Trimble missed goal.

Line-up and summary:

Rose (21)		Alumni (6)	
Grafe	L. E.	Trimble	
Byers	L. T.	King	
Gray	L. G.	Schmidt	
Henry	C.	Carter	
Boring	R. G.	Wiedemann	
Barnes	R. T.	Schultz	
Floyd	R. E.	Baxter	
Springer	Q. B.	Bradford	
Orr	L. H.	Hoff	
Burns	R. H.	Baker	
Howard	F. B.	Goldsmith	

Touchdowns—Floyd, Springer, Barnes, Hoff. Goal from touchdown—Howard. Safety—Bradford. Substitutes—Rose; Kremer for Springer; Alumni: Shook, Standau. Referee—Grogan. Umpire—Bigwood. Head linesman—Cook. Timer—Hathaway.

ROSE—DEPAUW.

In one of the most hotly contested games ever put up between the two schools, DePauw set back Rose in the secondary race, by one touchdown—6 to 0. The game was a thriller from whistle to whistle, the teams being about as evenly matched as possible. The feature of the game was the defensive work of the 'Varsity, the line holding like a stone wall on every play. Time and again, due to gains on exchanging punts, DePauw threatened to score; and on every occasion they were forced to kick on the fourth down. The deciding touchdown came when it was least expected, and on a play which the Rose line had apparently broken up. On an intended end run, Cook's interference was completely broken up, when he found a hole through the Rose defense and dodged his way for almost half the length of the field for the only touchdown of the game.

For the remainder of the game, DePauw resorted to punting as an effective means of gaining ground. With an advantage of almost ten yards on every exchange—which might have been more, but for Springer's great work in returning the ball—the Methodists forced Rose to play on the defensive throughout the second half of the game. The defensive work of the Varsity line, its effectiveness in breaking up forward passes, and the all-around playing of the secondary defense when the Rose goal line was threatened featured the last thirty minutes of play. "Chick" Springer put up a snappy game at quarter. Playing against his weight, the little fellow handled and returned punts in a magnificent style. Engel-



Moses		Coach Gilbert		
Barnes		Engelhard	Reinhard	Brophy
Henry		Howard		Burns
Floyd	Grafe			Boring
Gray				
Bake				
Springer			Orr	

hard hit the line with his old-time "pep," and Gale tore off a sensational run in the closing minutes of play that looked good for a touchdown, until the star full back was downed from behind. Every man on the 'Varsity line played a star game. Bake and Barnes, especially, "hit 'em hard and low." "Seed" Henry had a scrappy afternoon of it, until requested to resign, along with his opponent, late in the fourth quarter.

The game in detail:

First half—DePauw kicked off to Rose, Springer taking the kick and returning it ten yards. The 'Varsity failed to gain through the DePauw line, and punted. DePauw returned the ball twenty yards, and on the second down, Wheat fumbled, and Barnes recovered the oval near the Methodists' goal. This was the best chance the Engineers had to score, and it was lost when the 'Varsity failed to puncture the DePauw line on straight football. The ball was lost on downs, and Rose was penalized five yards for off-side play.

Cook skirted the Poly end for a good gain. When the first forward pass was attempted by DePauw, Captain Grafe intercepted the ball. Joe Engelhard then tore off a twenty-five yard run that put Rose in a position to score. A high pass from center was muffed by Gale, and DePauw recovered and kicked out of danger. Rose failed in an attempt to pass. On another pass, DePauw recovered the ball and again elected to kick. Rose was penalized fifteen yards for holding. DePauw blocked Gale's punt, and recovered the ball. An attempt to drop kick a goal failed. Another attempt by DePauw to go through the Rose line failed, and again a drop kick failed. After a series of plays near the end of the second period, Cook's touchdown followed his run through the entire Rose team. Bastian failed to kick goal. The half ended with the ball in the center of the field, in possession of Rose. Score: Rose 0, DePauw 6.

Between halves, DePauw's contingent flocked into the field several hundred strong, but not to be outdone, "Jake" Reinking and his cohorts flocked also. A snake dance was started, and the handful of "ye olden elephant followers" marched in and out of the DePauw line. In the closing number they fell in behind the Old Gold Drum Corps and struck up the familiar air of "Rambling Wreck"—with its twenty-odd verses.

To start the second half, DePauw kicked off

to Poly a second time. Springer returned the ball and was put out of the game on the tackle. Two DePauw men hit "Chick" at the same time, and the little quarter received a kick in the back of his neck that sent a cold chill up every Rose rooter's back. Burns went in at end, and Grafe went to quarter, when Springer was taken out.

DePauw tried forward passing, but failed, punting on the fourth down. Both teams resorted to a kicking game. Rose fumbled again, and DePauw recovered the ball. The advantage was lost, however, in attempting to buck the Rose line, and kicking was again taken up. At the beginning of the fourth quarter, Springer again went into the game, taking Burns' place at end.

Gale brought cheers from the Poly supporters late in this quarter when he reeled off a thirty-five yard run. It looked good for a touchdown until a faster DePauw man brought down "little Rosebud" with a flying tackle from behind. Rose worked hard for a touchdown, but without success. The final whistle blew with the ball in the Engineers' territory.

Line-up and summary:

Rose (0)

Floyd	R. E.	M. Guild
Barnes	R. G.	B. Guild
King	R. T.	Smith
Henry	C.	Ogden
Gray	L. G.	Tway
Bake	L. T.	Bondurant
Grafe	L. E.	Royse
Springer	Q. B.	Wheat
Engelhard	R. H.	Szold
Orr	L. H.	Cook
Gale	F. B.	Bastian

DePauw (6)

Touchdown—Cook. Referee—Robinson, Indiana. Umpire—Clark, Indiana. Substitutions—DePauw: Wolfe for Szold, Carlisle for Guild, Isenbarger for Cook, Miller for Isenbarger, Anderson for Tway; Rose: Burns for Springer, Springer for Burns, Borning for Henry, Byers for King.

Time of quarters—15 minutes.

Score:

DePauw	0	6	0	0	—Total 6
Rose	0	0	0	0	—Total 0

ROSE-HANOVER.

Saturday the Thirteenth was a Rose day—the 'Varsity smothering Hanover, 51 to 0, and Tech smearing Wiley, 24 to 0. Hanover was absolutely outclassed, looking more like a high school outfit than a college squad in comparison with Gil's gladiators. "Doc" Orr's open field running was the feature of the game; the young physician circled Hanover's ends at will,

scoring 18 of Rose's 51 points. "Scroob" Howard's technically educated toe was behaving in the "A" class, all his kicks going for fifty yards. As usual, the line held like a stone wall, and it was more than unusual when Hanover made their downs. The subs were all given a chance to perform, and perform they did.

The line-up and summary:

Hanover (0)		Rose (51)	
W. McNully	.....L.E.	Springer, Wiedemann	
Broadwell	.....L.T.	Bake	
Konklin	.....L.G.	Gray, Skinner	
Miles	.....C.	Floyd	
Horn	.....R.G.	Henry, Boring	
Kloeffler	.....R.T.	Barnes	
McNully	.....R.E.	Moses, Reinhard	
Hufford, Paulos	.....Q.B.	Grafe, Springer	
Homar	.....L.H.	Orr, Brophy	
Managh	.....R.H.	Engelhard, Grafe	
Huntley	.....F.B.	Howard, Burns	
Touchdowns—Orr (3), Engelhard, Grafe, Howard, and Reinhard. Goals from touchdown—Floyd (2).			

Rose Tech Club—Wiley H. S.

On Rose Campus, the Tech Club put up an article of football that might have been a credit to the 'Varsity. Playing the entire game without a slip, completing forward passes good for thirty and forty yards, hitting the line, and circling the ends "Chick" Harley-like, the ex-Buzzards had no trouble

in giving Wiley the short end of a 24 to 0 count. "Doc" Kremer ran the team with his usual pep. "Jake" Reinking and Clark Foulkes did some pretty backfield work, the former working the cut-in on end runs like a veteran. Our old friend "High Pockets" Rolshausen grabbed a fumble and grandstanded forty yards before being "spread out" from behind. Douthitt tackled sensationally during his short stay in the argument.

The Tech Club put up a good game, and should enjoy a successful season. We wonder if there's anything in a name. If the "Buzzards" were "rotten," the "Tech Club" good, what would that bunch do with an appellation like "Ye Ancient Order of Warmers of the Bench" clinging to them? It's a question.

The line-up and summary:

Rose Tech Club (24)		Wiley High (0)	
Jones	.....R.E.	Brown	
Stinson	.....R.T.	Greenwood	
Skidmore	.....R.G.	Joseph	
Briggs, Rolshausen	.....C.	Eickmeir	
Bolton	.....L.G.	Trueb	
Krausbeck	.....L.T.	Standau	
Self	.....L.E.	Reichard	
Kremer (Capt.)	.....Q.B.	McCombs	
Reinking	.....R.H.	Pfeifer	
Foulkes	.....L.H.	Calvert	
Falls	.....F.B.	Adamson	
Touchdowns—Rose Tech Club: Reinking (2), Foulkes, Kremer.			

NOTICE TO ALUMNI AND STUDENTS!

A copy of the October, 1909, issue of THE TECHNIC is wanted for the purpose of completing the editorial files. Fifty cents will be paid for a copy of this issue.



REVIEWS



Interesting Technical Articles of the Month

ELECTRICAL WORLD, Oct. 6, 1917.

Improved Method of Testing Current Transformers.

By Francis B. Silsbee. A method more sensitive than the absolute method.

ELECTRIC TRACTION, Sept., 1917.

Operation of Sub-stations Without Attendants.

Interesting features of a number of important installations of automatic railway sub-stations.

WIRELESS AGE, Aug., 1917.

Signal Officers Training Course.

By Maj. J. Andrew White. Third article.

CEMENT WORLD, Sept., 1917.

Recovery of Potash as a By-product in the Manufacture of Cement.

By John J. Porter.

SCIENTIFIC MONTHLY, Oct., 1917.

Application of Science to Warfare in France.

By Dr. Geo. K. Burgess.

POWER, Oct. 9, 1917.

Operation of Mechanical Stokers.

By H. E. Lawrence. Describing the practical operation of several types of Taylor stokers.

Brown and Sharpe Wire Gage.

An article of especial interest to Juniors.

Economical Generation and Use of Electric Power in the Steel Industry.

By Brent Wiley. The possibilities and tendencies of economical power generation in the steel industry are discussed.

AMERICAN MACHINIST, Oct. 4, 1917.

Drafting-room Etiquette.

AMERICAN MACHINIST, Oct. 11, 1917.

Mare Island Navy Yard.

A number of illustrations with a description of the work carried on at the navy yard.

RAILWAY MECHANICAL ENGINEER, Sept., 1917.

Fallacies Regarding Malleable Iron.

By A. H. Weston. The extent of its usefulness under modern methods of manufacture are generally underestimated.

Dodd's Cold Stored Light.

A short description of a new appliance.

MACHINERY, Oct., 1917.

Present Demand and Standardized Production.

By D. M. Perril.

The Use of Pulverized Fuel on Locomotives.

Abstract from a paper by John E. Muhlfeld.

JOURNAL AMERICAN CHEMICAL SOCIETY, Oct., 1917.

The Outlook in Chemistry in the United States.

By Stieglitz.

JOURNAL OF FRANKLIN INSTITUTE, Sept., 1917.

Radiation and the Electron.

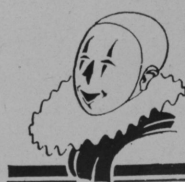
By Millikin.

JOURNAL OF THE SOCIETY OF AUTOMOTIVE ENGINEERS, Sept., 1917.

Final Tests of the United States Aviation Engine.

Value of Engine Performance.

By Otto M. Burkhardt.



DIFFERENTIALS

DRILL.

"Come stand at attention; aw turn out yer toes.

Look straight out before ye. Don't squint down yer nose.

Say, pull in that belly, and throw out yer chest;

And hold yer head up. Take yer chin off yer breast.

Now don't smash the butt of that piece thru the floor!

All right, 'Order—Arms'—One, Two, Three, Four!

"Say, ye mutt, that's a rifle, it isn't a hoe;

Bring it down like ye meant it, don't be so damn slow.

Put it back on yer shoulder. The left one, ye dub.

Some people ye sure have to teach with a club!

Well, come on, get busy, we'll try it once more.

Now then, 'Order—Arms'—One, Two, Three, Four.

"Why, ye camel-backed, mule-eared, sheep-headed baboon!

You'll do this thing right if you stay here 'till noon.

D'ye think that a feller has nothing to do But to waste his whole day on a jackass like you?

Put that piece on yer shoulder. The same as before.

Try again, 'Order—Arms'—One, Two, Three, Four.

"Well, I've drilled every kind of boneheaded ass,

But Bo, you sure are the head of your class.

The doctor who passed you sure had his gall.

Why, man, ain't ye got any savvy at all?

Ditch that scowl. 'Twon't do ye no good to get sore.

Now then, 'Order—Arms'—One, Two Three, Four.

"The limit. Doggon my young sister's black cat.

I've seen a trained poodle do better than that. Have you nothin' but thumbs on them slum-hooks, ye boob?

Say, honest, you are the worst kind of a rube! You're an out and out idiot, right to the core. Come again, 'Order—Arms'—One, Two, Three, Four.

"S no use wastin' time, so we might as well stop.

Go down in the basement and get ye a mop.

A pail of hot water, some government soap. I'll make ye do something ye sculpin' eyed dope!

Put that piece in the rack. Now face towards the door.

'Straight Ahead'—'Forward,' 'March'—One, Two, Three, Four."

—*Our Navy.*

R. P. I.

The automobilist of today divides pedestrians into two distinct classes—the quick and the dead.

—*Philadelphia Times.*

R. P. I.

He—"That will power expert is fine. He told me this morning that every day I should do something I shrink from."

She—"Then you can take me to the matinee today."

R. P. I.

Bake—"I don't think they ought to use this Rankine. It's too old."

Mac—"They're still using the Bible, aren't they?"

R. P. I.

J. Forrest Furry—"Don't you think I've got an aristocratic name?"

A. Wildermuth—"Rather 'backwoods,' I'd say."

R. P. I.

J. Reinking, after an hour in Hath's Calculus—"Another hour wasted! I could have been out standing on a corner."

THE SONS OF NEPTUNE.

During the past summer, a number of the Seniors enrolled in summer school expressed a desire to study the haunts and habits of the animals subsisting in the fresh waters of the middle west. Under the direction of Mr. Antonio Gouvea, noted Brazilian authority, and J. W. Bolton, famous connoisseur of pigeons, a short course was organized, and classes were held at the lake at Hulman's Farm. The course was elective, and no credit for the work was given towards graduation. Both Mr. Gouvea and Mr. Bolton gave several examples of the flying fish, striking the water with great force; the former also illustrated the art of swimming under water *with the eyes open*. Mr. Robinson gave exhibitions of the standing, sitting, standing double jack-knife dive that brought forth great applause—even from the instructors. As an added attraction, Mr. Gouvea, aided by Mr. Combs and Mr. Wagner, gave an illustration of the retreat of Villa. The retreat took place along a high ridge, and the cries and green apples that filled the atmosphere made the scene most realistic. The Seniors would recommend this course to the lower classes. However, without the services of so capable instructors, the success of the course is problematical.

R. P. I.

Vapid Verses.

A chemist was brewing a lotion,
An offensive, ill-smelling potion;
When lo! the flask burst,
And the chemist, he curst;
For his bosom was filled with
emotion.

There once was a soldier quite
thin,
Whose tongue hung away from
his chin,
When asked what was
wrong,
He gulped loud and long,
And said he was just mustard
in.

—Widow.

R. P. I.

A BIT HEADY.

Presiding Genius—"What is the charge against Private Jones?"

Sergeant—"If yer plase, 'e's been drunk, an' 'e's been breakin' things; an' he won't obey no orders. In fact, 'e's been behavin' gin'r'lly as though he wuz the bloomin' colonel 'imself!"

—*Sidney Bulletin.*

History Prof. (angrily)—"What do you know about the Age of Elizabeth?"

Stude (awakening)—"She'll be nineteen her next birthday."

R. P. I.

Family Cheer.

"Well, Maggie, I certainly am dead tired," said the laborer in the sewer when he got home.

"Tired, is it? You don't know when you're in luck. Here I have been at the washtub all this hot day and you've been working in a nice cool sewer."—*Awgwan.*

R. P. I.

"I was at a little stag party last night."

"Yes, I know it. I saw you staggering home."
—*Puck.*

R. P. I.

Sergeant, drilling awkward squad—"Company, attention! Company, lift up your left leg and hold it straight out in front of you."

One of the squad held up his right leg by mistake. This brought his right-hand companion's leg and his own right leg close together. The officer, seeing this, exclaimed angrily:

"And who's that blooming galoot over there holding up both legs?"

R. P. I.

Judge—"What's the charge officer?"

Officer—"Intoxication, your honor."

Prisoner—"It's not true, Judge. Last night I was as sober as you were."

Judge—"If that's the case, I'll send you up for six months."—*Lehigh Bun.*

R. P. I.

"Well," said the camel, as he galloped over the sand, "I've got to hump it some to get there."—*Widow.*

R. P. I.

"Is this beef too rare for you, Mr. Simpkins?"

"Well, since you ask me, Mrs. Skinner, I would like it a little oftener."—*Ex.*

R. P. I.

Up Men! And At 'em.

Sweet Thing—"Are you a Navy man?"

Mosquiter—"Oh, yes. I am thoroughly acquainted with nautical matters."

Sweet Thing—"Then tell me, do the officers aboard submarines carry water-pistols?"

—*Widow.*

Before leaving the good old United States with some Military Organization have a good

PHOTOGRAPH

Taken for that Mother, Wife or Sweetheart

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GEORGE GRAHAM HOLLOWAY STUDIO

Jo-Jo (after a lengthy explanation in Junior Heat):—"Now, what does this quantity represent?"

Barnes—"That's what I want to know, Professor."

R. P. I.

Rupert—"What did you do with the cuffs I left on the table last night?"

Roland—"They were so soiled that I sent them to the laundry."

Rupert—"Ye Gods! The entire history of England was on them."—*Widow.*

R. P. I.

Popping The Question.

He—"Come on—be a sport! We won't have to stay married if we don't want to."

She—"It would be just my luck to want to."—*Widow.*

R. P. I.

Grace—"I told him he musn't see me any more."

Her Brother—"Well, what did he do?"

Grace—"Turned out the lights!"

—*Jack-o'-Lantern.*

R. P. I.

"I've just returned from Turkey."

"Did you see the Fatima factory?"

—*Illinois Siren.*

She—"How wonderful! You never think of anything but me."

He—"Nothing else. Did you say your father was out?"—*Penn State Froth.*

R. P. I.

In The Trenches.

Jean—"Are ze Angleese sending over of amazons to fight for zem?"

Louis—"Non, non. Zey are ze Scotch."

J.—"But ze dresses, Louis?"

L.—"Mon Dieu! Zey are ze kilts des Highlands!"

J.—"Alons, I go see, moi."

After investigating, Jean returned.

J.—"We both have wrong, Louis. Zey are ze Middlesex Volunteers."—*The Brief.*

Of the effects of the war on engineering colleges, the *Electrical World* says reports show conclusively that the enrollment will be from 10 to 25 per cent diminished. That these figures are not larger is owing to what seems to be the largest freshman engineering class in history. The upper classes have been severely depleted in numbers. One university expects but a 10 per cent senior attendance; others expect as low as a 20 and 30 per cent attendance in the upper classes; few report a full senior enrollment. There is also a depletion in the ranks of the faculty.

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GRAVITATION.

In the daily papers of September 19th, it was stated that a new theory as to gravitation will be announced soon before the St. Louis Academy of Science by Prof. Francis E. Nipher, retired head of the department of physics of Washington University. In a written statement Professor Nipher said:

"It will be shown that gravitational attraction between masses of matter not only has been diminished to zero, but has been converted into a repulsion which is more than twice as great as normal attraction."

Professor Nipher is reported to have made experiments with bodies suspended horizontally toward each other. By introducing electricity into the atmosphere he converted normal attraction into repulsion.

"If electricity can alter the gravitational attraction of the bodies used in my experiments," he said, "the same force can alter the earth's attraction. If negative electricity could be drawn from the earth's surface, gravitational attraction suddenly would cease and the coherence of the earth's surface would be disastrously affected."—*Journal Am. Soc. M. E.*

INTENSIVE FISH BREEDING IN PONDS.

The Bureau of Agriculture in France has published a series of bulletins upon the use of ponds for intensive fish breeding. It is calculated that a pond 4 hectares in size in which 1,200 carp fry per year are put, will yield 6,000 francs (\$1,200) annually from the sale of carp and 1,500 francs (\$300) from eels. From these amounts must be deducted 1,000 francs (\$200) for initial cost and 1,500 francs for running expenses.

NEW STOKERS INCREASE ECONOMY AND CAPACITY OF PLANT.

The Metropolitan Edison Co. has nearly completed the installation of eight automatic coal stokers at its West Reading (Pa.) power plant. The installation of these new stokers, which replaces an old type of stoker, will about double the capacity of the boilers and effect important economics in the operation of the plant.

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The allowable working strain for a single belt with 180 degrees contact is, 40 pounds per inch width. This multiplied by the arc of contact found in the previous calculation and divided by 180 will give the effective pull allowable in pounds.—*The Power Plant.*

**NORWEGIAN CONCRETE SHIP
LAUNCHED.**

The Times' Christiania correspondent, says *The Engineer* (London), gives the following particulars of the launching at the Porsgrund Cement Works of the first Norwegian iron and concrete ship. The vessel, which is of 200 tons burden, was built bottom upward and, apparently, on a sort of underlying sledge or cradle which went down into the water with the vessel. The latter is reported first of all to have become detached from its cradle, then to have sunk up to a certain point, and then gradually to have righted itself. It is said that it took only three weeks to build the boat and that the next vessel will only require about half that time.—*Power.*

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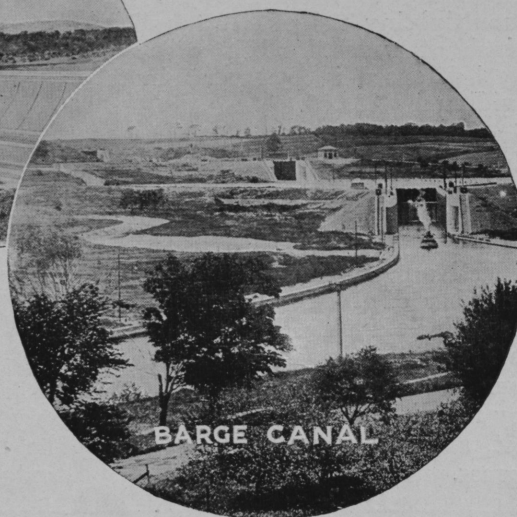
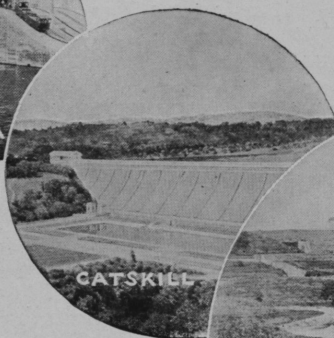
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