Rose-Hulman Institute of Technology
Rose-Hulman Scholar

Technic | Student Newspaper

Winter 3-1911

Volume 20 - Issue 6 - March, 1911

Rose Technic Staff
Rose-Hulman Institute of Technology

Follow this and additional works at: https://scholar.rose-hulman.edu/technic

Recommended Citation
Staff, Rose Technic, "Volume 20 - Issue 6 - March, 1911" (1911). *Technic*. 306.
https://scholar.rose-hulman.edu/technic/306

Disclaimer: Archived issues of the Rose-Hulman yearbook, which were compiled by students, may contain stereotyped, insensitive or inappropriate content, such as images, that reflected prejudicial attitudes of their day--attitudes that should not have been acceptable then, and which would be widely condemned by today's standards. Rose-Hulman is presenting the yearbooks as originally published because they are an archival record of a point in time. To remove offensive material now would, in essence, sanitize history by erasing the stereotypes and prejudices from historical record as if they never existed.

This Book is brought to you for free and open access by the Student Newspaper at Rose-Hulman Scholar. It has been accepted for inclusion in Technic by an authorized administrator of Rose-Hulman Scholar. For more information, please contact weir1@rose-hulman.edu.

Vol. XX MARCH :: 1911 No. 6

THE ROSE TECHNIC

LET US
BE A MOTHER
TO YOU

BUTTONS REPLACED, SOCKS DARNED, UNDERWEAR REPAIRED; in fact, a mother's care of your garments Free of Charge.

Hunter Laundering & Dyeing Company

Phones 257 **BEN L. HEER, Agent**

Rose Pharmacy

Seventh and Cherry

The Drug Store Different Than the Rest.

The Store of Pure Drugs.

We charge you no more.

Agents for Belle Mead Sweet Candies.

Van Houten's Cocoa used at our fountain.

Give us a call.

FREE DELIVERY. BOTH PHONES.

Engravings

FOR COLLEGE AND SCHOOL PUBLICATIONS

WE MAKE A SPECIALTY OF

HALFTONES :: COLOR PLATES ZINC ETCHINGS, DESIGNING, ETC

For College and High School Annuals and Periodicals. Also fine copper plate and steel die embossed stationery, such as Commencement Invitations, Visiting Cards, Fraternity Stationery, Etc.

Stafford Engraving Company

Artists :: Engravers :: Electrotypers :: Engravings for College and School Publications a Specialty

CENTURY BUILDING INDIANAPOLIS, IND.

ALWAYS MENTION THE TECHNIC WHEN WRITING TO OUR ADVERTISERS. IT MAY HELP US.

The
Swope-Nehf
Jewelry Co.

524 WABASH AVE.
(Established 1867)

HEADQUARTERS FOR

CLASS PINS
SEALS
AND
FOBS

Souvenir
Spoons and Plates

MR. ARTHUR NEHF
of the Freshman Class will attend to Special Orders

Men's Wear
Reminder

Say, fellows, why not let us make your Spring Suit. We sure have the dandiest selection of Woolens you ever looked at, and the models are the smartest ever. Just come in and look them over—no obligations to buy. We have ready for you all the Spring Haberdashery and we respectfully solicit your business. Come and see us.

GAREN & BARRETT
MEN'S WEAR SHOP
PHONE 582. 715 WABASH AVE.

Young Men's
Low Cuts

Styles that give the finishing touch of elegance to the well dressed man

Nettleton's $6.00
"Scion" $3.50, $4.00 and $5.00

The SUTHERLAND-MARTIN SHOE CO.
505 WABASH AVE.

We are ready, when you are, to show the most Beautiful and Complete Line of SPRING WOOLENS ever shown, Fit, Fabric and Fashion Guaranteed.

$18.75 to $60.00

ED. SPARKS
HATTER Haberdasher TAILOR
"THE CLOTHES SHOP OF SATISFACTION."
813 WABASH AVENUE

John G. Heinl & Son
Florists

129 SOUTH SEVENTH STREET
TERRE HAUTE, INDIANA

J. M. BIGWOOD & SON

(Established 1877)

Jewelers and Opticians

607 Wabash Avenue TERRE HAUTE, INDIANA

UP-TO-DATE—Latest Designs in **Artistic Jewelry, Mesh and Leather Bags, Cut Glass, Silverware, Chaffing Dishes and Brass Goods.** Special attention given to **Fine Watch and Jewelry Repairing. Eyes Tested Free** and satisfaction guaranteed by Registered Optician.

J. M. Bigwood & Son

CHESTER BRADFORD **BRADFORD & HOOD** ARTHUR M. HOOD, Rose '93

805 Pythian Building **PATENT ATTORNEYS** INDIANAPOLIS INDIANA

UNITED STATES AND FOREIGN PATENTS, DESIGNS, TRADE-MARKS & LABELS

NEW SPRING STYLES

CAPS, HATS, SUITS, TOP-COATS, SLIP-ON COATS, ETC. Also Spring Woolen Piece Goods for Tailored Suits. Shipments arriving daily. We invite inspection.

THORMAN & SCHLOSS

FINE TAILORS :: CLOTHIERS

668-670 WABASH AVENUE **PHONES 137**

SUITS PRESSED 25c. CLEANING AND DYEING.

GREAT NORTHERN BARBER SHOP

OPPOSITE BIG 4 STATION **J. VERNON BREWER, Proprietor**

SCIENTIFIC HAND MASSAGE
TOILET ARTICLES AND CIGARS

PRACTICAL HAIR CUTTING
LAUNDRY AGENCY

When You are Ready

For Your Spring Suit come in and let us show you the best line obtainable of Ready-to-Wear Clothing. **Suits $15 to $35**

Emerson and Stetson Shoes $3.50 to $6

FINE NECKWEAR, UNDERWEAR, SHIRTS AND MEN'S HATS

TUNE BROS.

CASH CLOTHIERS, HATS & GENTS' FURNISHINGS
FIFTH STREET AND WABASH AVENUE

VOL. XX TERRE HAUTE, IND., MARCH, 1911 NO. 6

THE TECHNIC

BOARD OF EDITORS

Editor in-Chief

ERICH A. MEES

Associate Editors,

CARL G. KRIEGER ..... Assistant Editor
DAVID J. JOHNSON ..... Reviews
E. E. GARST ..... Alumni
R. FISHBACK ..... Athletics
E. L. FERRELL, W. R. BELL, R. D. MADISON, WALKER HENRY ..... Locals
R. D. MADISON ..... Artist

Business Department,

O. E. REAGAN ..... Business Manager
C. E. REESE ..... Asst. Business Manager

TERMS

One Year, $1.00 Single Copy, 15 cents

Issued Monthly at the Rose Polytechnic Institute.

Entered at the Post-Office, Terre Haute, Indiana, as second class mail matter.

IN this month's issue of the *Technic* we desire to especially call the attention of our readers to the group of Graphical Solutions of Equations, presented by Prof. Peddle. Aside from the intrinsic value of the charts here given, the reader should be lead to recognize the importance of this comparatively recent science, whereby a great amount of numerical computation may be accomplished in a minimum length of time and at a saving of much mental wear and tear. Prof. Peddle has made a very thorough study of the subject, and anyone desirous of becoming familiar with the basic principles underlying the construction of charts, will find an exceedingly useful and readable guide in his treatise, "The Construction of Graphical Charts," published by the McGraw-Hill Book Company, New York.

There are innumerable formulas in constant, daily use by engineers, who would find it a saving of time and money to construct accurate and comprehensive charts to accomplish the numerical labor involved, so to say, at sight.

The charts herewith presented are typical examples of the so-called alinement diagram. In many instances this type of construction is preferable to the more common custom of employing rectangular axes of reference.

The proper graduation of the scales is most readily arrived at by writing the equation in its determinant form. As this method of procedure is probably not known to many of our readers, we will try to prevail upon Prof. Peddle to give a minute description of the application of this method in the construction of a chart in a later issue of the *Technic*.

———ooo———

FOR some strange reason—we are at a loss to account for such an apparently unwarranted oversight—up to the present time no regular financial statements from the Students Council, custodians of the Students Fund, have appeared in the columns of the *Technic*.

It is true that the official minutes of all Council meetings have regularly been posted on the bulletin board, but now that the Council has voted to publish all it's proceedings and especially its financial statements, the student

body will no doubt feel that it has a vital interest in Council affairs and in particular in the disbursement of the Fund's resources. Interesting facts will be disclosed, and every student will have free and constant access to these. A complete knowledge of all the facts in any particular case will arouse the interest of each student and exert a wholesome influence on the student body at large.

At the monthly meeting of the Council held on Monday, March 6th, the committee appointed to suggest ways and means towards improving the present system of accounting, filed a preliminary report. The committee favored the appointment of *one man*, who should keep the accounts of all the various organizations, said person to receive a compensation for his work and possibly furnish a bond as a guarantee of good faith. The entire Council favored this suggestion and the committee will proceed to work out a detailed scheme along this line, reporting at the next regular session. The Committee detailed to suggest methods of altering the annual class rush of the lower classmen failed to arrive at any definite conclusions. The final report of this committee will also be filed at the next regular session of the Council.

The treasurer submitted the following report, complete up to and including March 6th, 1911:

Amount credited to—		
Y. M. C. A.	$ 39.60	
Camera Club	7.70	
General Fund	314.00	
Rose Technic	2.00	
Scientific Society	7.60	
		$370.90
Accounts Overdrawn—		
Athletic Association	$249.91	
Symphony Club	75.19	325.10
		$ 45.80
Balance in Bank		$ 45.80

W. R. BELL, Treasurer.

Anent this report it will be interesting to note the following items which are approximately correct:

Student Fund Assessment for 2nd Term at $7.50	$1350.00	
Percentage which goes to Athletic Association (50 per cent.)	675.00	
		$ 675.00
Unpaid Bills of Ath. Assoc.	$ 515.00	
Deficit from Basket Ball Season	151.00	666.00
Entire Funds of Ath. Ass'n.		9.00

Independent of all other treasuries, this balance of $9.00 would have to suffice to pay all the expenses of athletics from March until June!! The necessity of practicing economy need not be emphasized.

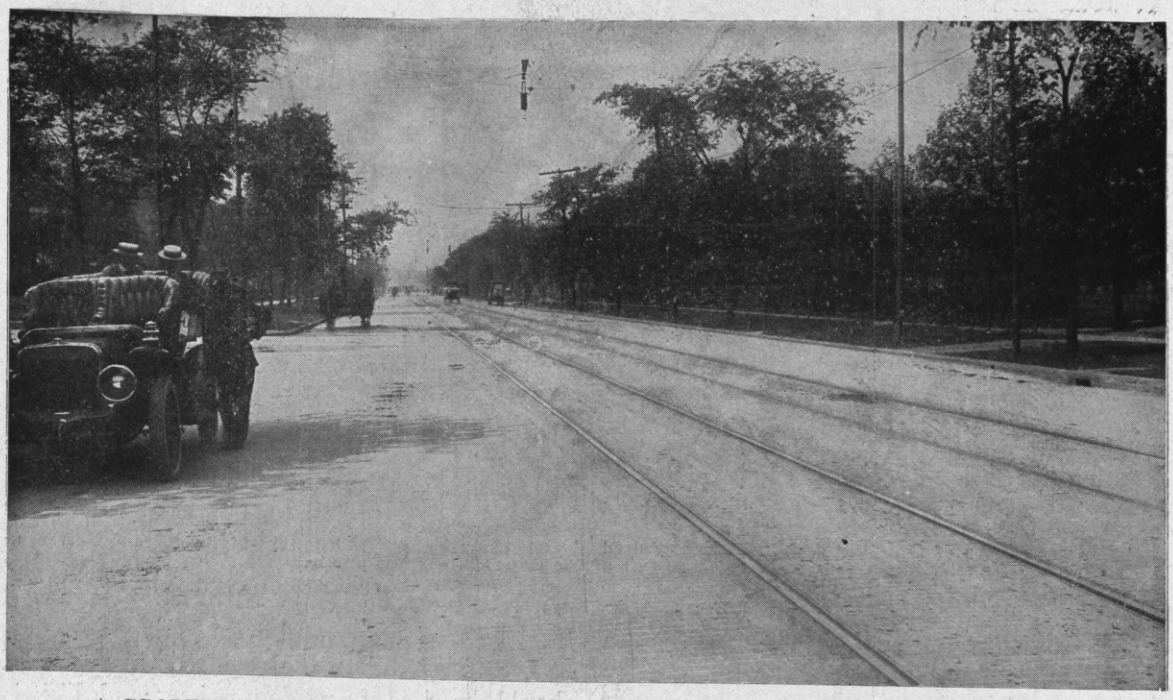
Providing all of the other student organizations can remain within the limits of their apportionment during the remainder of the year, the present balance of the Fund, as well as the 21 per cent. which reverts to the General Fund, may be used to defray the expenses of the Athletic Association. This would place about $340.00 at the command of the above mentioned body.

Let everyone, who is in a position to do so, guard against any unnecessary expenditure that we may not be overwhelmed by the burden of a large indebtedness.

IMPORTANT POINTS IN BRICK STREET CONSTRUCTION.

M. W. Blair, '03.

IT is perhaps because familiarity breeds contempt that the general public knows so little of the manufacture and use of clay products. So varied is the application of clay ware to our modern civilization and so close is its relation to our daily life that the wonders of art and utility in this line, as in many others, receive but passing notice.



A PROPERLY CONSTRUCTED VITRIFIED BRICK PAVEMENT, CLEVELAND, OHIO.
Five years old. Photographed June 15, 1909. Growing more perfect as it grows older.

We travel over streets of burned clay by day and sleep within walls of brick by night. We eat from earthen dishes, scarcely recognizable, it is true, in the waferlike translucence of modern china. The electric current for power and domestic use is carried safely because of high tension insulators of burned clay. The sky scraper is made possible because of the strength and lightness of the fire proofing which forms its walls. Its adornment is of terra cotta without, and a variety of color and design in floors, walls, ceilings and decoration done in tile and pottery of burned clay within.

But this paper has nothing to do with the fine points of architecture or interior decoration, rather with the crudest product of them all, and yet one in which the public is perhaps the most vitally interested—the paving brick.

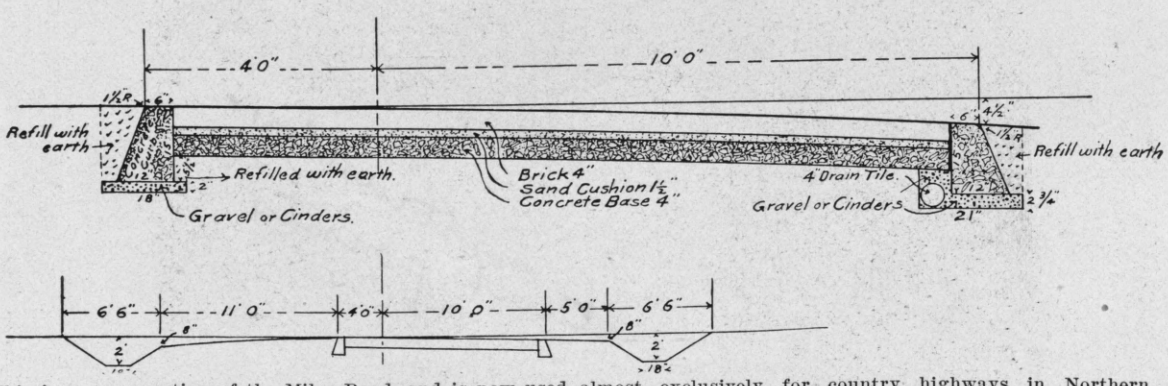
The public interest comes from the fact that its money is being spent in that direction, and badly spent for the most part. The question why an engineer will be painstaking in every possible particular in the design and construction of a bridge or other upright structure, to see that it rests on a secure foundation and is well put together so that if need be it will stand and serve for a century, and then take the same material, involving more money perhaps, and lay it out flat in such a miserable manner that if it were possible to get under it one would be crushed by a shower of material insecurely put together, is answered by only two words—either IGNORANCE or CARELESSNESS.

It would be impossible to go into the detail of manufacture in a paper of this character, involving as it does questions of chemical composition of raw material, no two clays being alike in this regard, and a description of complex mechanical devices and economical handling of a large tonnage of material. Problems of fuel consumption and many others enter into the production of a satisfactory paver at a reasonable price. It is perhaps enough to say to you that these problems exist and in calling your attention to them add that when the other industries have absorbed technical graduates until they can absorb no more, the clay industry will still be crying for more.

Your interest as future engineers lies in the proper use of a material which comes to your hand ready made. It is especially those little details in the construction of a brick pavement so often thought of little importance, yet which make or ruin the work as they are properly executed or neglected, to which attention is directed.

The sub-grade must be carefully prepared. It must be thoroughly drained to avoid heaving by frost and must be rolled until evenly and thoroughly compacted. It must be free from depressions and irregularities of grade and soft spots. If a concrete foundation is used, the concrete must be composed of clean materials, must be thoroughly and evenly mixed and must be evenly spread to the required thickness. It should be free from depressions and likewise must be free from loose stone which would interfere with the even spread of the sand cushion, which is placed on the foundation to receive the brick.

The proper preparation of this cushion is one of the vital spots in building a street. It must be evenly spread, of uniform thickness. Experience has demonstrated the proper depth to

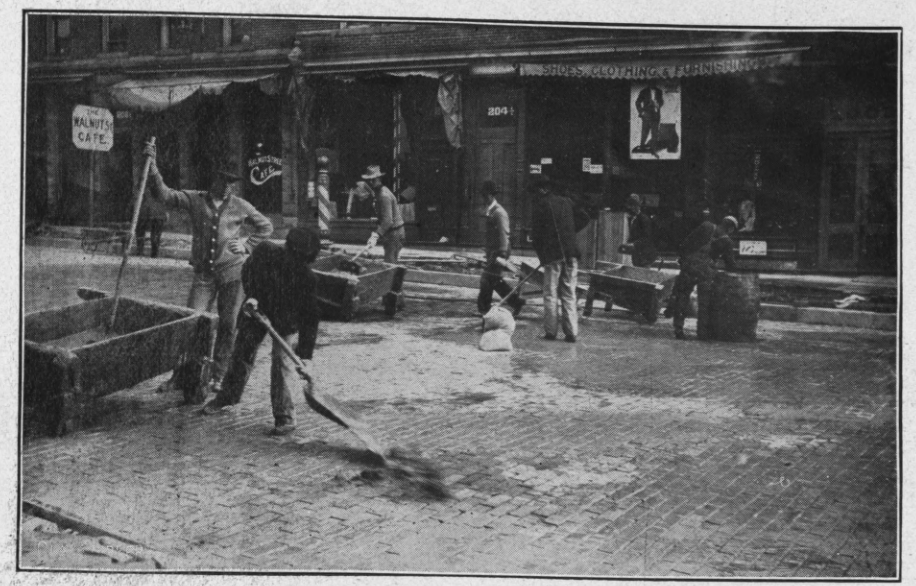


This is a cross section of the Miles Road, and is now used almost exclusively for country highways in Northern Ohio. It meets, in every respect, the approval of the general traveling public.

be two inches, no more and no less. It must be rolled with a light hand roller so that all the brick will have an even support at all points, otherwise the traffic will break the bond between the brick where the support of one brick is less than that of its neighbor. Loose, unconfined sand will flow under pressure and care must be taken to prevent the sand from flowing up between the brick and thus occupying space intended to be filled with cement. Many pavements are ruined because the interstices are merely bridged, instead of filled with grout.

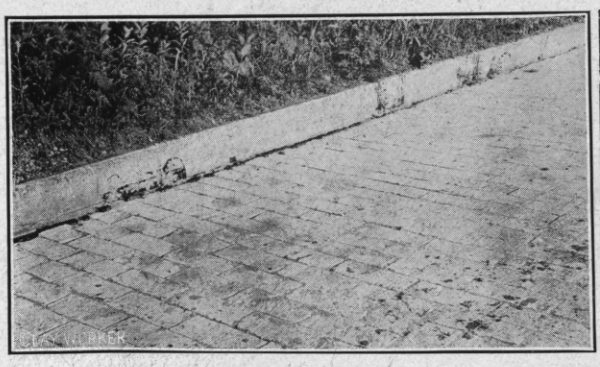
The brick are placed upon this sand cushion with best edges up and are then bedded in the sand by rolling. Inspection should be made before and after rolling and all objectionable brick removed. The pavement should be in the condition in which it is to be left before the cement filler is applied, so that the cement is in no way disturbed after it begins to set. The joints must be filled flush with the top and a rubber straight edge or "squeegee" passing over the joints at 45 degrees best accomplishes this result. Room for expansion joints must be provided. Transverse expansion joints are, however, unnecessary. The weak spot at a cross expansion joint often becomes an unsightly rut of chipped and broken brick. A longitudinal expansion joint or cushion is provided along the curb by placing a board next to the curb which is withdrawn after the cement is applied and the space filled with pitch or asphalt. Care must be taken to pour the pitch last, otherwise it will occupy space intended for cement and cement will later flow into the space intended for pitch.

The interstices between the brick are filled with a cement grout, one part fine, clean, sharp sand to one part Portland cement, mixed very thin in small quantities in a special box and dipped from it in a scoop shovel. This method insures constant agitation until the mixture reaches the pavement, which is essential to maintain the proportion. A box must never be dumped. It is the one sure way to bring about a separation of the sand and cement. To allow the filler to set, the pavement must be kept free from all traffic for at least ten days. Weather conditions largely determine the time, and common sense must be used to avoid breaking the bond. In hot, dry weather, damp sand should



Application of Cement Filler by Most Approved Methods.

Concrete Foundation, Sand Cushion and Brick Surface of Pavement.



An Expansion Joint in Working Order.

Curb Ruined Because Expansion was Not Provided For.

be spread over the completed pavement to prevent too rapid setting of the cement.

A careful execution of the suggestions offered will result in a pavement which improves with time, is smooth, sanitary and durable. The arching and consequent rumble is avoided and the depreciation and consequent maintenance charge is reduced to a minimum.

The use of brick on country highways has not been mentioned, but they are coming into use in this connection and their advantages of long life and satisfaction point to an increased use for this purpose. The pavement construction requires the same care in the country as in the city, and an equal amount of engineering skill and common sense.

A CLUB FOR ENGINEERING GRADUATES

J. E. Sweeney.

(Reprinted from The Electric Journal by courtesy of Westinghouse Manufacturing Company)

MODERN industry is recognizing more and more its dependence upon scientific methods and upon scientifically trained men. Graduates of technical schools are welcomed into industrial companies where facilities for their special training and advancement are provided. Probably in no branch of industry has the importance of technically trained men been more appreciated than in the electrical field. In the engineer's preliminary years, experience in factory and testing room are matters of first importance. Supplementing these, other means for advancement are sometimes provided.

The following account of the development of a club, formed primarily for the advantage of the young college men in a large electric works, is not merely typical of the attitude of the modern industrial corporation towards college men, but it shows in a concrete, definite way just how this work is carried on.

The Electric Club with which so many readers of the *Journal* were familiar was organized March 19th, 1902, with an initial membership of one hundred and fifty, consisting principally of engineering apprentices and the engineers of the Electric Company. The club has grown steadily and has fulfilled its object so admirably that it has naturally paved the way for a broader and greater organization, and on May 9th, 1910, it was reorganized as The Westinghouse Club. The Club now, as the name implies, embraces in its membership men from various Westinghouse interests in the Pittsburg District, and as a result the activities of the Club have greatly expanded.

GENERAL VIEW OF ONE OF THE CLUB ROOMS.

For new quarters the Club was fortunate in

securing the Royal Building, in Wilkinsburg, a residential suburb of Pittsburg, where commodious club rooms and an excellent gymnasium have been fitted up to meet the requirements, and here may be found one of the most unique clubs in this country.

With a membership of whom the majority are university graduates from all parts of the world and to which each year is added about three hundred new graduates, it is easy to see how the activities of such a club are maintained. The personnel of the Club is continually changing as the members leave to take up duties elsewhere. More than twelve hundred engineering apprentices have been members of the Club since its organization, and a great number of these are now scattered here and there all over the world in responsible positions. It would be difficult to imagine a better opportunity than is afforded by such a club for one to become acquainted with other young men whom he should know in his future engineering career, as well as older and experienced men in his field of work.

The Club provides for educational, social and athletic activity among its members. It is governed by a board of thirteen directors, chosen, for the most part, from the younger men, who are thus responsible for the direction and success of the Club. Incidentally, an important advantage of Club membership to these young men is this experience gained in conducting such an organization.

The various activities are in charge of general committees. The following is a list of the present standing committees and their chairmen, the club manager and physical directors:—

Athletic Committee.....A. G. Ahrens
Entertainment Committee.....C. R. Jones
Excursion Committee.....C. E. Stoltz
House Committee.....G. Blocksidge

VIEW IN CLUB ROOMS LOOKING DOWN CORRIDOR FROM RECEPTION ROOM.

Lecture Committee.....K. C. Randall
Library Committee.....G. H. Lewis
Membership Committee.....T. E. Simpers
Music Committee.....F. S. Balyeat
Publication Committee.....C. F. Scott
Publicity Committee.....R. A. Duke
Club Manager.....S. M. Anson
Technical Section Committee.....C. R. Dooley
Physical Director.....H. H. Provin

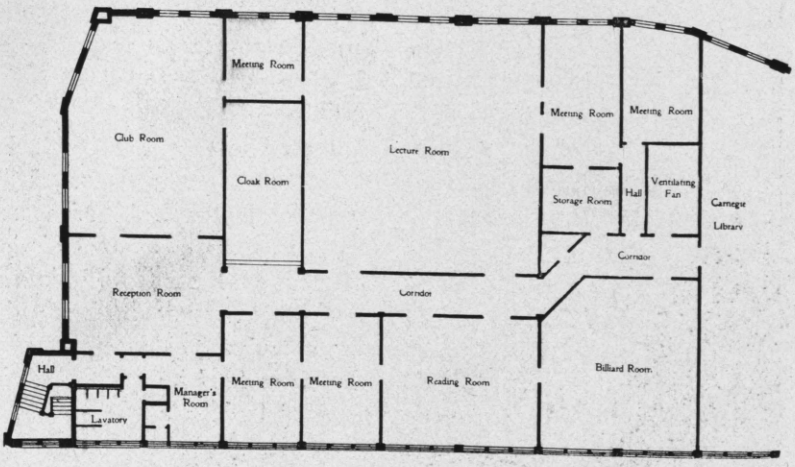
The field of activity as covered by these committees has been laid out on broad lines in order to interest all types of men and to give each man all that he is willing to do in the line that is most interesting to him. While the name of

each committee implies the general character of its activities, a few words regarding the scope of the work will probably be of interest.

The Athletic Committee, in addition to having charge of such sports as baseball, basketball, tennis, etc., has general charge of the gymnasium. The gymnasium has a floor space of 65 by 140 feet and is equipped for basketball, handball, and indoor baseball, as well as volley ball. A physical director has general supervision and conducts regular classes in which systematic exercises are given. Special classes are also formed in boxing, fencing, wrestling, etc.

The Entertainment Committee arranges for dances, smokers and various other forms of amusement.

The Excursion Committee arranges for the systematic inspection of notable industrial features and other points of interest in and around the famous Pittsburg District. This affords an apportunity of observing first-hand and thereby gaining a comprehensive knowledge of rolling mills, tube mills, blast furnaces, coal mines, cement mills, glass works, locomotive works, oil wells, machine shops and other plants which are of interest to engineers.



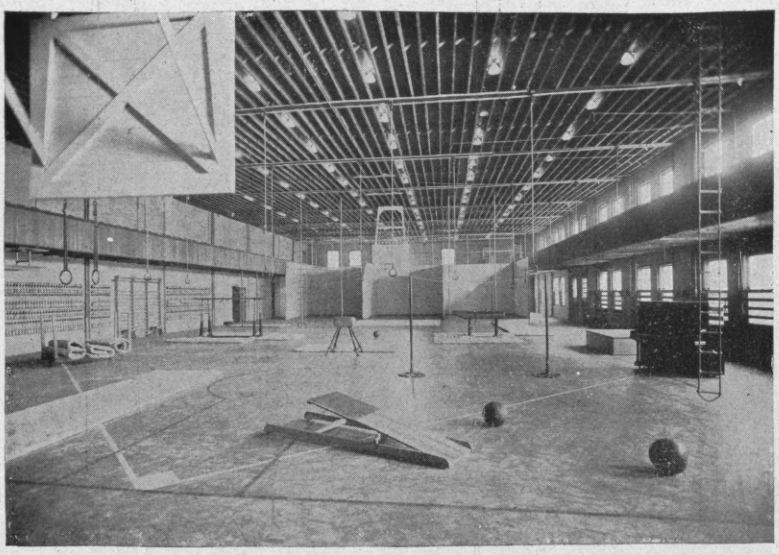
FLOOR PLAN OF CLUB ROOMS, SECOND FLOOR.

The duty of the Publicity Committee is to see that due notice is given regarding all Club activities.

THE CLUB BASE BALL FIELD.

The duties of the House and Membership Committees are the same as usually pertain to such committees.

The Lecture Committee arranges for weekly lectures, which cover a wide range of subjects, dealing particularly with general engineering, social, economic and national problems. The speakers are the foremost specialists in their line, including men of national importance.



VIEW OF CLUB GYMNASIUM.

The Library Committee has general supervision of the Club library. In addition to the collection of technical books, a complete file of current magazines on engineering subjects, as well as popular magazines and newspapers, is kept.

The Music Committee fosters glee and mandolin clubs and an orchestra and the Club makes use of the talent of these organizations at various entertainments.

The Publication Committee has general supervision of the technical publications of the Club, which includes *The Electric Journal*.

ONE OF THE CLUB TENNIS COURTS.

The Technical Section Committee has in hand the predominating feature of the Club, the education work. These sections are technical or engineering classes organized to deal with the

construction and application of various types of apparatus, or to consider other matters of importance in industrial organization and management. They supplement the daily work of the engineering apprentice in the factory. During the term ending December 21st, 1910, the work was divided into the following sections, each section having its own leader:—

APPARATUS SECTIONS

Brake Equipment Section.....B. F. Key
Detail and Switchboard Section....F. W. Harris
Gas Equipment Section.....L. A. Quayle
Illumination Section.....C. E. Clewell
Industrial Motor Applications Section.....
.....C. W. Drake
Industrial Motors and Controllers Section
.....C. G. Tarkington
Power House Equipment Section.....
..... J. Bache-Wiig
Railway Equipment Section.....L. G. Riley
Railway Project Section.....E. W. P. Smith
Signaling Equipment Section.....E. R. Coe
Steam Equipment Section.....H. F. Schmidt
Transformer Section.....E. C. Stone

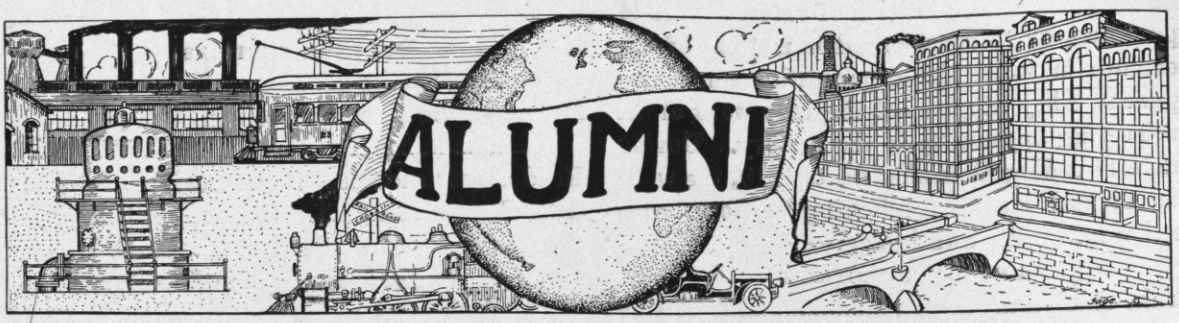
GENERAL SECTIONS

Accounting Section.....W. J. Patterson
Materials and Factory Testing Section.....
.....L. W. Chubb
Road Experience Section.....J. L. Yardley
Sales Section .....F. S. Balyeat
Works Management Section.....A. S. Duncan

J. H. Mustard, Section Director.

The apparatus sections are limited to about thirty men, but the general sections are unlimited as to number. Each section has a leader who is especially qualified to handle his particular subject. A definite plan of work is outlined for each section and meetings are held every two weeks.

Beside the direct personal gain that the various Club activities offer to the men as individuals, it develops between the members as a whole the spirit and temperament which are so essential to the success of men who are to work with others in any great undertaking.



THREE EQUATIONS SOLVED BY GRAPHICAL METHODS

By Prof. John B. Peddle, M. E.

UPON the suggestion of the Alumni Editor that a few charts for the solution of engineering equations would be interesting to the readers of the *Technic* I have constructed the three which are reproduced on adjacent pages.

The number of chart forms which have been proposed in the past by various writers is quite large, and nearly all of them have distinctive features which render them well suited to certain special types of equation.

Of all of these typical forms, however, there are but two which seem to have generally commended themselves as best suited for all around purposes.

In the first, three groups of lines are used, each group belonging to one variable, and the solution depends upon finding the point of intersection of three lines, one from each group.

In the second, three graduated axes replace the three groups of lines, and the solution depends upon finding three points, one on each axis, which lie upon the same straight line.

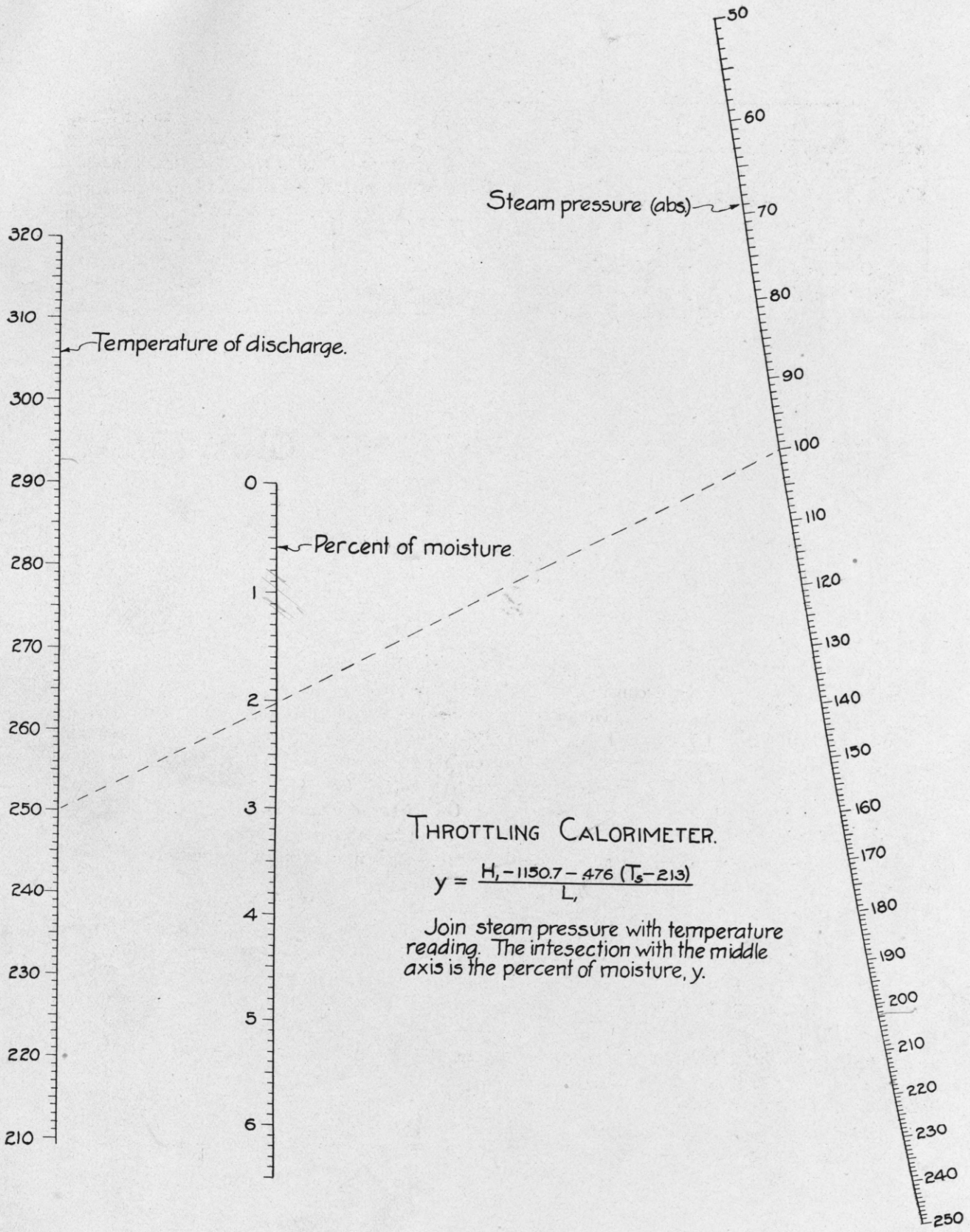
The former type is entirely self contained, but has the disadvantage that if the lines are closely spaced to secure accurate readings the confusion is great. Also the difficulties of constructing these lines, especially if they are curved, is serious.

The alinement chart, while requiring a straight edge for reading, is of an open and clear construction, and interpolations for accurate readings are easily made.

On these accounts I have a decided preference for the alinement type, and I have accordingly used it in charting the equations presented herewith.

The chart for the throt'ling calorimeter is the simplest in appearance, as it contains but three variables. Knowing two of them, the steam pressure and the temperature of the discharged steam, we connect these points on the chart by a straight line whose intersection with the middle axis gives the percentage of moisture present in the steam.

In plotting this chart the new steam tables of Marks and Davis, as given in the 1910 edition of Kent, were employed, and the pressure of the discharged steam was assumed as 15 lbs. abs. in



THROTTLING CALORIMETER.

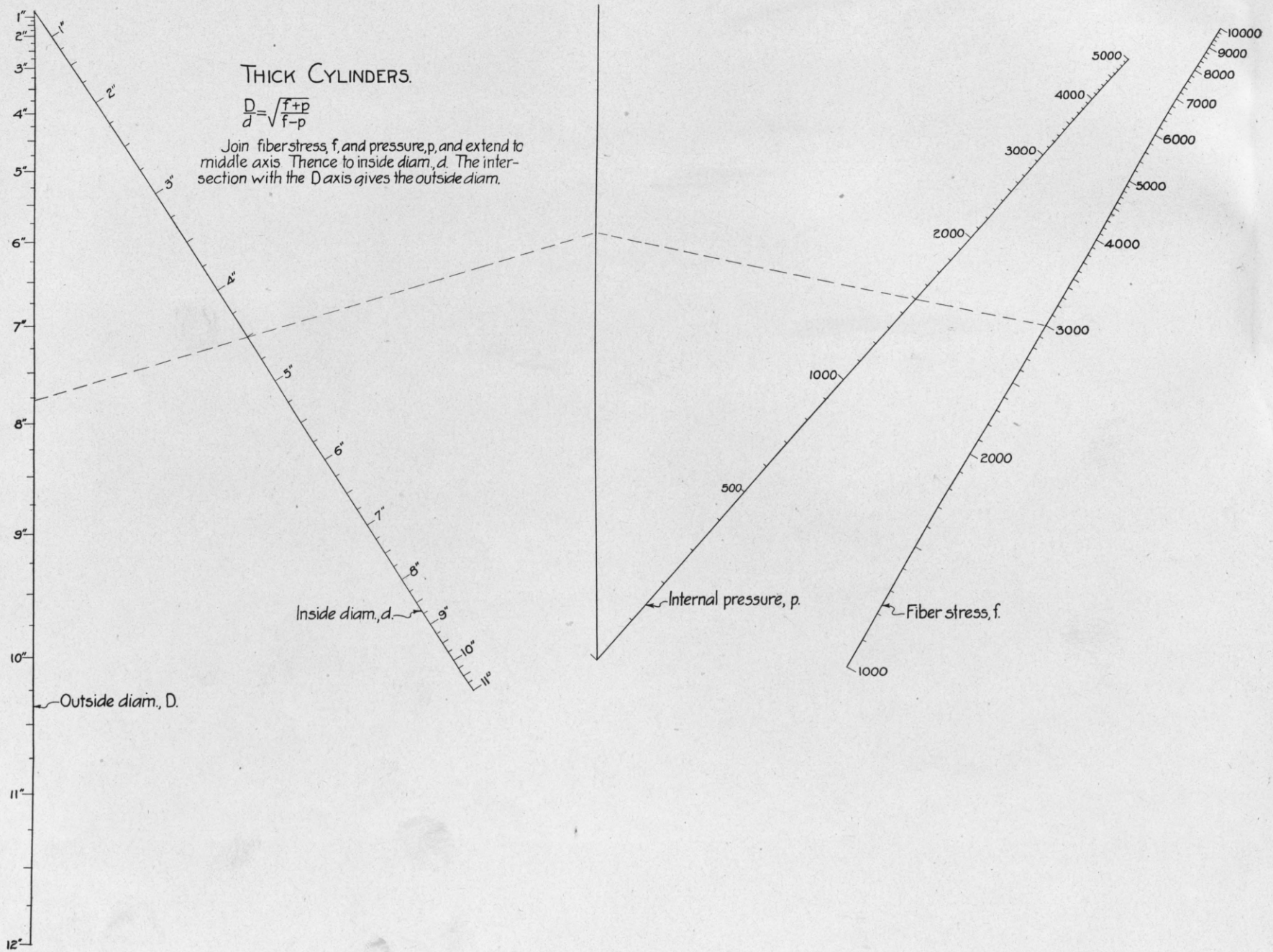
$$y = \frac{H_1 - 1150.7 - .476\,(T_s - 213)}{L_1}$$

Join steam pressure with temperature reading. The intesection with the middle axis is the percent of moisture, y.

THICK CYLINDERS.

$$\frac{D}{d}=\sqrt{\frac{f+p}{f-p}}$$

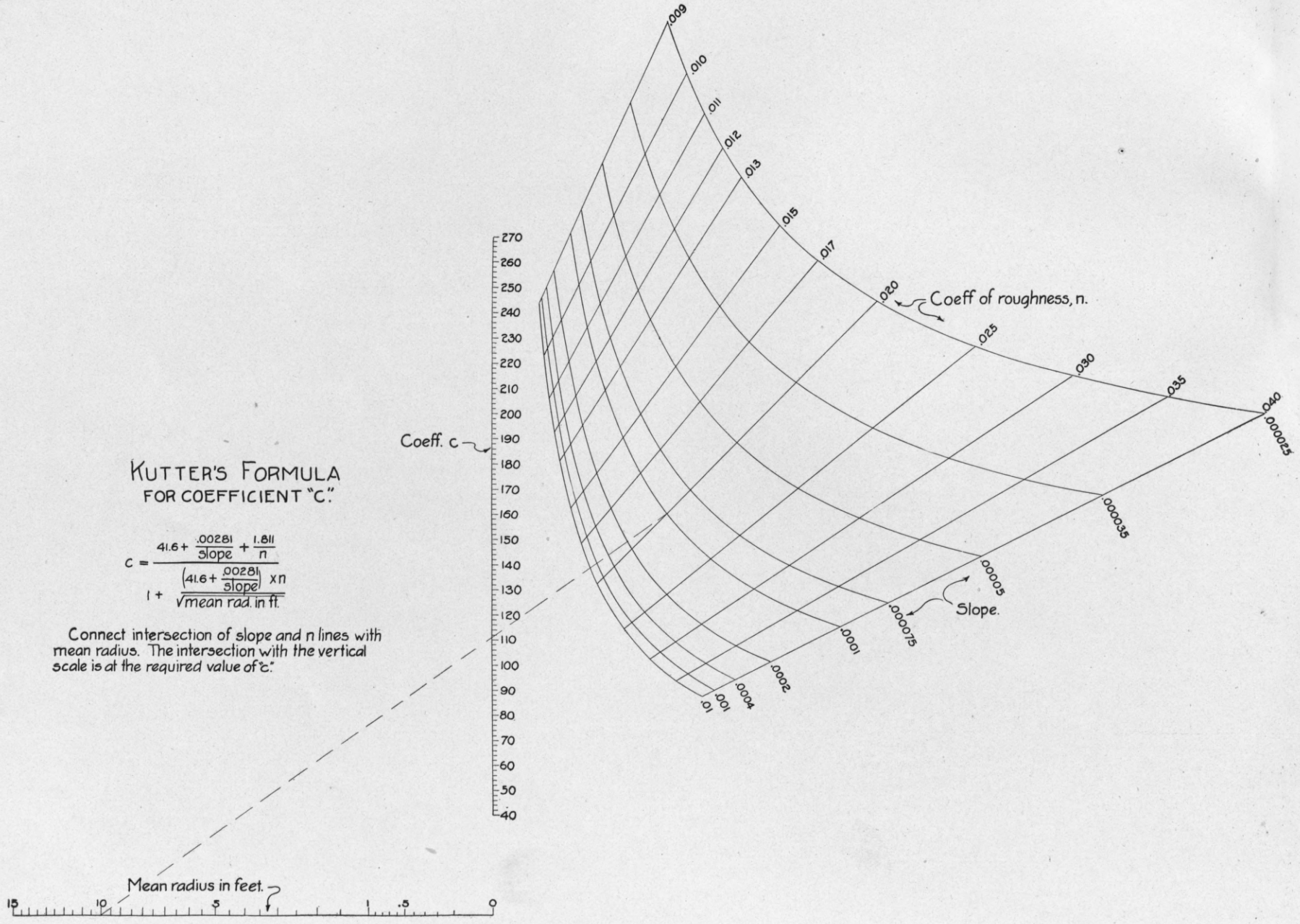
Join fiber stress, f, and pressure, p, and extend to middle axis Thence to inside diam., d. The intersection with the D axis gives the outside diam.



KUTTER'S FORMULA
FOR COEFFICIENT "C."

$$C = \frac{41.6 + \frac{.00281}{slope} + \frac{1.811}{n}}{1 + \frac{\left(41.6 + \frac{.00281}{slope}\right) \times n}{\sqrt{mean\ rad.\ in\ ft.}}}$$

Connect intersection of slope and n lines with mean radius. The intersection with the vertical scale is at the required value of "C."



order to allow for a slight increase in pressure above atmosphere in the expansion chamber.

In the second chart, that for thick cylinders, we have four variables, and the chart is read by what is known as "concurrent double alinement." The desired "f" and "p" values are joined by a straight line which is prolonged to its intersection with the dummy middle axis. This point is on a straight line joining the other two variables, the two index lines "concurring" on the middle axis.

In the chart for Kutter's formula we again have four variables, but only need to line up once, since one of the points is determined by the intersection of two curves in the net at the right, each curve representing a variable. By this plan it is clearly possible, in some cases, to operate on as many as six variables by a single alinement if each of the points on the straight line can be located at the intersection of two curves.

By way of explanation it should be said that when I had nearly completed this chart I discovered that the construction of a remarkably similar one for this formula is described in Trautwine. It was then too late to work up something else, and as the Editor thought that its usefulness would not be greatly impaired by its lack of novelty it was decided to print it with the others.

———ooo———

ALUMNI NOTES.

Mr. A. V. H. Mory, '94, Chief U. S. Drug and Food Inspection Laboratory at Kansas City, Mo., has accepted a position with Sears, Roebuck & Co., of Chicago, as General Chemical Advisor, and will leave Kansas City about March 9th to take up the duties of his position, which is a new one in the organization of this firm.

Mr. A. E. Michel, '03, of New York City, has resigned from the Advisory Committee of the Alumni Association, on account of pressure of business, and the President of the Association has appointed Mr. Samuel D. Collett, '90, of New York City, to succeed him on the Committee.

The present personnel of the Committee is as follows:

H. A. Schwartz, '01, Chairman, Indianapolis, Ind.
W. F. Freudenreich, '98, Chicago, Ill.
R. N. Miller, 01, Louisville, Ky.
J. J. Kessler, Jr., '01, St. Louis, Mo.
Jay H. Hall, '97, Cleveland, Ohio.
S. S. Wales, '91, Pittsburgh, Pa.
S. D. Collett, '90, New York City.

Mr. Ray Greene Jenckes, Jr., '05, was married to Miss Sarah Pratt, of Syracuse, N. Y., on Feb. 14th, 1911. The couple will be at home after March 1st, at 2010 North Illinois St., Indianapolis, Indiana.

On Tuesday evening, Feb. 28th, 1911, Mr. Harry R. Canfield, '06, of Cleveland, O., was married to Miss Hilda Charlotte Leibing, at the home of the bride, No. 432 N. Center St., Terre Haute, Ind. The couple will make their home in Cleveland, O.

W. H. Brannon, Jr., '09, has abandoned engineering, and has entered the merchandise brokerage business, at No. 213 Terre Haute Trust Bldg., Terre Haute, Ind.

Mr. Harry McDargh, '96, is now assistant engineer in the Department of Public Efficiency of Chicago, Ill. Mr. A. J. Hammond, '89, is chief of the department.

Mr. Brent C. Jacob, '03, has changed from the Westinghouse Co., at Pittsburgh, to the Brown Hoisting Machinery Co., of Cleveland, O.

Carson G. French, '04, is now assistant engineer for the Corrugated Bar Co., of Chicago, Ill.

Agustin Zambrano, '08, is now draftsman for the Mazas Valley Ry., at Monterey, N. L., Mexico.

H. E. Shryer, '05, has quit engineering and is acting as reporter for the Detroit News, at Detroit, Mich.

J. S. Jackson, '0C, has taken a position with the Commonwealth Edison Co., of Chicago, Ill.

H. S. Austin, '07, is now chemist for the Hubbard Steel Foundry Co., at East Chicago, Indiana.

Schuler Hall, '07, is now in the employ of the National Electric Works, at Whittier, Cal.

Paul R. Wickliff, '07, has become engineer for the Greenville Coal Co., at Greenville, Ky.

Arthur J. Paige, '02, has taken a position with an automobile concern, at Muncie, Ind.

C. N. Lammers, '08, is now with the Griffin Car Wheel Co., of Chicago, Ill.

Stafford Hathaway has accepted a position with the Bartlett & Romney Co., Civil Engineers, of San Antonio, Texas.

The Arthur A. Little Co. Inc., Chemists and Engineers, Boston, Mass., have recently closed a contract with the General Motor Co. of Detroit, Mich., to do all the latter's chemical and physical testing of materials, etc. Mr. Charles H. Jumper, '02, has been appointed to take charge of the new laboratory work.

Frederick H. Cash, Jr., '07, and Harry L. Smith, '10, visited the Institute during the week of March 12th.

J. Simms Brosius, '03, formerly with the Westinghouse Electric Mfg. Co., has accepted a position with the Electric Controller and Mfg. Co., Cleveland, Ohio.

John C. Johnson, '09, formerly with the Bullock Electric Company, Norwood, Ohio, has at least temporarily forsaken the engineering profession and accepted a position with the Indiana Inspection Bureau, with headquarters at Indianapolis, Ind. During the past few weeks Mr. Johnson has been in Terre Haute.

Rolla S. Wilson has resigned his position as chemist with the Great Western Cereal Company, Akron, Ohio, to accept the responsible position of chemical engineer for the Diamond Match Company, of Akron, the largest match manufacturing company in the world.

Harry L. Smith, '10, formerly with Condron & Sinks, Civil Engineers, Chicago, is now in the Engineering Department of the Illinois Glass Co., at Alton, Ill. He furthermore holds the position of Asst. Engineer, Illinois Terminal R. R. Co., in the same city.

THE JUNIOR RECEPTION.

ON Friday, the 17th of February, the Junior Class fulfilled the duties of guests at one of those delightful "reception-parties" that have been instigated and carried out by the "Ladies of the Faculty" this year, as an innovation in the social life of the Rose Poly undergraduate. Whether or not the Seniors and Freshmen enjoyed themselves upon the occasion of their respective parties, we cannot say—but we can certainly state, very positively, that every member of the class of 1912 who was present at the Junior function—and there were very few of the class who were not present—had to have a good time, whether he wanted to or not; the good time was thrust upon him, and all he had to do was accept it.

In accordance with the prevailing season—the party was given before the valentine spirit had disappeared—the entire Heminway homestead was draped and festooned with all sorts of emblems symbolic of St. Valentine; little clusters of hearts, arrows, cupids, and similar figures hung from every conceivable place. Whether or not their presence had an inspiring effect upon the young men and ladies present, we would rather not state; but it is rumored that several Juniors have been holding standing Sunday night engagements since the 17th of February.

And then there was the achery contest, which was the occasion of much hilarity. The idea consisted in sending an arrow (propelled by conventional bow) into a big red heart, mounted on a sort of pillow. Everybody took a chance at it—not only the boys and girls, but also the hosts and hostesses, made strenuous efforts at sharpshooting. Some shots hit the ceiling; some landed on the floor; some flew aimlessly through perfectly good window shades; one came very near entering the smiling countenance of Mr. Pete Heimlich; some, strange to say, actually hit the target. Mr. C. Owen Dodson, by virtue of his clear eye and steady hand, was the sole Junior to have the honor of sending his arrow directly into the center of the heart, and received a box of candy as a tribute to his unerring markmanship. Some one made a remark to the effect that "it was a shame Owen couldn't hit key-holes as well as he hits hearts," but we refuse to make further comment on the subject.

Then, everybody was presented with a hat—not a Stetson, nor a Panama, nor any of your impossible Easter creations—but paper hats, made in all sorts of fantastic shapes and designs. Some were appropriate, and some were not—for example, "Swede" Rasmussen was adorned with a green hat worn by sons of the "Old Sod," while Reilly's Irish head was covered by a Highlander's bonnet!

And then there were "eats"—oh, those "eats!"

It would be folly to attempt to describe the joys and pleasures of them, so we will let them silently linger in the recesses of blissful memories.

As for the rest of the program, it consisted in dancing by some, conversation by others, and so on, until finally the gathering disbanded, with each Junior bearing a grateful feeling toward the faculty and ladies of the faculty for furnishing them with a good old enjoyable evening.

———ooo———

THE JUNIOR MEMORIAL.

ON Thursday, March 16th, the Juniors, the class of 1912, presented its very attractive memorial to the Institute. The gift is a handsome bronze tablet, extremely heavy and large, measuring about 8 feet in length and 1 1-2 feet in width. The raised letters are six inches high. The inscription on the plate is as follows:

ROSE POLYTECHNIC
18 INSTITUTE 83
'12 '12

The tablet was designed by the firm of Foltz & Parker, architects, Indianapolis, Ind. Mr. Foltz is an '86 graduate of Rose. The work was carried out by the firm of Noekle-Richards Co., Indianapolis, Ind.

The huge bronze tablet was placed in position between the middle stone columns of the vestibule, a score of Juniors assisting in the feat.

The class of 1912 may justly feel proud of their testimonial, and—feeling in a mood to do some celebrating—can hardly be held responsible for cutting classes on St. Pat's day.

———ooo———

PRESS CLUB DOINGS

ABOUT this time last year, due greatly to the work of Nathan A. Bowers, at that time Editor-in-Chief of the Technic, the Rose Press Club was organized for the purpose of improving the publications which are gotten out by Rose students. The Club was comprised of the staffs of these two publications and had enthusiastic meetings each month.

In May, the Indiana Inter-Collegiate Press Association, while in session at Purdue University, admitted the Rose Press Club into its membership, thus giving the Club added prestige.

However, when school began last fall, due to the change of the Technic staff and the fact that many other things had to be done, the Rose Press Club seemed destined to fade away into obscurity.

Now, with the advent of our new Editor-in-Chief, E. A. Mees, the Club has received new life and promises to be one of the livest organizations in school.

The first meeting was called early in February at which time nothing much was done except to arouse considerable enthusiasm. The second meeting was held March 3rd, at the Heminway home. E. A. Mees was elected President, C. J. Krieger Vice-President, and W. R. Bell retained the office of Secretary and Treasurer. It was decided to send delegates to the Annual Meeting of the Indiana Inter-Collegiate Press Association, which is to be held at Crawfordsville, Ind., May 19th and 20th. The delegates are to be selected at the next Club meeting. It was further decided that at each meeting one or two members should present papers upon subjects of interest, the Club acting as censor. Proceeding along this line, H. W. Ker and E. R. Ferrell are each to present a review of a new book, "Graphic Statics" by Carthart and Chaffee, at the April meeting.

This idea of having the members present papers, if carried out with the proper enthusiasm, will afford an opportunity for development along literary lines. Engineers frequently have to write articles, or present reports, and a training along these lines will certainly not be be a waste of time.

Recognizing these needs the Press Club has "come back" and has decided to do all in its power to promote the interests of its members and incidentally those of the Technic and Modulus.

It would seem proper for us to make some sort of a statement regarding the introduction of this new department to the pages of the Technic. The prime object we had in view was to stimulate the *personal* interest—if such we may call it—which students ought to display, as they daily come in contact with one another.

As students of engineering we all have a common goal after which we are striving, hence, aside from all other humanitarian reasons, we ought to take an interest in one another. The person who is a good *mixer*, who does not isolate himself from all other persons and who takes a whole-souled interest in his fellow-man, will find the world a pretty cheerful spot to live in.

The editors will appreciate it, if students will deposit any news items which they may gather together in the Technic mail-box.—Ed.

Rev. L. O. Richmond, of the Central Presbyterian church, gave a lecture before the Y. M. C. A. at the Heminway Home on Friday evening, March 17th. The subject of his lecture was, "The Great Commandment." At the conclusion of the lecture a first-class lunch was served. The remainder of the evening was spent in conversation and other social diversions.

Grand Holiday! St. Patrick was an engineer.

The regular mid-term exams will begin on Wednesday, March 29th, and close on April 1st. The time allotted for these examinations is exceptionally short, the usual custom being to devote an entire week to the work. To effect a general saving in time this change has been instituted. All laboratory and practice exams will be given during the last practice period of the half-term. This will give ample time to complete all exams in regular recitation subjects between the dates given above.

The date on which the Seniors will discontinue all regular scheduled work has been set for Monday, April 10th. From that time on the upper classmen will devote their entire time to the preparation of their graduating theses.

The new school catalog will be ready for distribution within a very short time. It has been found by the school authorities that students do not acquaint themselves, as they should, with the contents of the catalog. Time and again students will come to the office with queries concerning different rules with regard to condition examinations, etc., when exact information might be obtained by a careful perusal of the catalog.

In the present catalog this general information is scattered throughout the book. In order to make the new catalog more efficient all

these rules, which specifically concern the student, are gathered under one head, hence, in the future there will be little or no excuse for the student to plead ignorance on this or that point, or to unnecessarily take up the time of the president or registrar.

On March 14th the Senior civils, under the direction of Prof. Thomas, made an inspection trip to the rolling mills.

Mr. Voss, president of the Glee Club, reports that the organization is thriving after it's enforced disbandment more than a year ago. In conjunction with the Mandolin Club and Orchestra a program is being prepared and an announcement of a Symphony concert may be looked for within a very few days.

Encouraged by repeated successes the Sophomore class has decided to give at least one more Modulus Dance, same to take place shortly after Easter.

Rankin, '12, was out of school two days during the first week in March on account of illness.

E. E. Garst went to Marion, Ind., on the 18th ult. to confer with the Board of Control of the Indiana High School Athletic Association relative to the conditions of contract of the 8th Annual Track and Field Meet to be held on Rose Field, on May 20, 1911.

Owen, Christopher and Kornfeld have been appointed a Committee on Commencement Invitations by the Class of '11.

The following Senior Civils took Civil Service exams on the 8th and 9th inst.: Evans, McKee, Buckner, Owen and Wimsett for the Phillipine Service, Ducey, the Engineering student exam. on Roads, and the Garst Bros., the Junior Architects exam. They report an interesting session!

C. E. Bell, '11, visited home folks at Paducah, Ky., on the 15th ult.

E. A. Mees, '11, was summoned to his home at Columbus, Ohio, on the 6th inst., on account of the death of his younger sister.

E. L. Ferrell, '11, visited friends at Linton, Ind., on the 25th ult.

Clinton Worsham, ex-'11, who is stationed in the mining district of Minnesota, was recently seen in Terre Haute, being summoned home on account of the death of his mother.

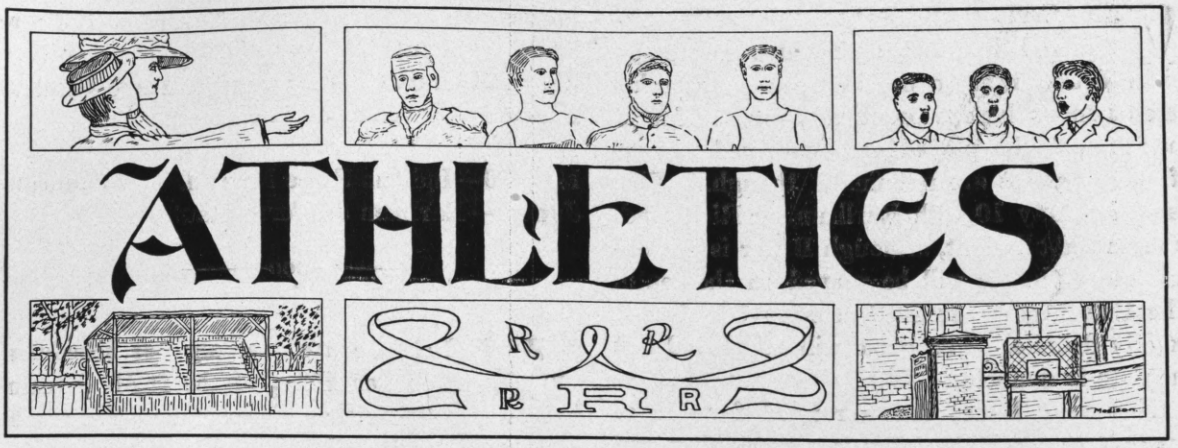
Paul E. Strouse, ex-'11, has a position with the Vandalia R. R. officiating at the ticket window, Union Station, Terre Haute, Ind.

The Senior Civils will gauge the stream flow of the Wabash in the near future under the direction of Prof. H. Thomas.

Archibald, '13, has fully recovered from an operation for appendicitis and has resumed his school duties.

Dr. C. L. Mees gave a second talk on "First Aid to the Injured" before the Scientific Society, on Saturday, March 10th.

E. A. Mees, '11, gave a talk on "The Principle of Least Work Applied in the Determination of Statically Indeterminate Stresses," before the Scientific Society, on March 4th.



ANOTHER season of baseball is started. The first real practice of the year was held Saturday, March 4, and from the large squad that turned out Capt. Shook picked two teams. A practice seven inning game was played, no attempt being made to count the score, and a good idea of the ability of the new men could be had, although no one showed any sensational playing. The men have been practicing in the gym for a couple of weeks and it was only on the Thursday before the day of the game mentioned that any outside work was attempted. It is still pretty cool for baseball and no one will limber up yet a while, if they do there will be some sore arms to be heard from. Some of the Freshmen look mighty good although you never can tell. They have lots of ambition now but it may wear off some in the next few weeks and their playing will show it. Kelly, Stoms, Lammers, Lyons, Nehf, Schopmeyer, Scott, Dutton, Moore, Pruett, Black and LaForge are some of the Freshmen who have been out so far and of the bunch the first five look the most promising. Nehf is a good pitcher and according to Capt. Shook will do the bulk of the work this year, "Shookie" going back to his old position, short stop, but always ready to take his turn in the box. Stoms is a catcher who has had some experience as can be told from his playing. He will have his hands full trying to beat John Lawler out of his job. Stoms will also be a contender for the first sack position. Lammers is good nearly anywhere on the diamond, and it is said he is a pitcher, too. Lyons is an outfielder and pitcher, who has had some high school experience. Schopmeyer is a South-paw pitcher and may develop some class before the season starts.

Of the older men who have turned out so far there are Lawler, Wyeth, Barrett, Shook, Bradford, Fishback, Floyd, Spindle, all of whom are members of last year's team except Spindle. More of the upper classmen will come out as soon as the weather gets better and instills some baseball fever in their veins. Nicholson, Buckner, Watts, Newlin and Hoffner are to be heard from yet although the report is that Hoffner will stay out of baseball. The following is the way the teams lined-up for the first practice game of the season:

Lawler, c; Nehf, Schopmeyer, p; Spindle, 1b; Moore, 2b; Kelley, ss; Floyd, 3b; Schopmeyer, Nehf, l.f.; Pruett, c.f.; Dutton, r.f.; versus Stoms, c; Barrett, Shook, p; Clegg, 1b; Fishback, 2b; Shook, Hansen, ss; Lammers, 3b; Hansen, l.f.; Wyeth, c.f.; Scott, r.f.

Clegg, who played first base on one of the teams, is a "prep" and we hope he will be with us again next year when he can play on the team. Judging from his playing so far he would show some class in college baseball.

MANAGER BAKER has practically completed the baseball schedule, only a few minor details need to be arranged. The schedule as shown here is practically final as far as the teams to be played are concerned. Some of the dates set are not final, though. The game for May 10 with Earlham, at Richmond, is arranged all right, although Baker is not exactly sure that it will be played on the tenth. The Culver game, marked as May 5th, is not exactly definite. The game will be played but the date is doubtful.

This year Baker has arranged for three games with Normal. This is a new thing and should work out nicely. These Normal fellows have gotten in the habit of beating us one of the two games scheduled for each year. With the three games, there will be no more ties. If the two teams should break even on the first two games the third one should draw a big crowd as the rivalry between the two schools is well known in the town. Really though, every Poly man will expect three victories this year. The dates have been arranged for these games, but the place of playing has not been decided.

Two games will be played with the Terre Haute Central League, one on April 3, and one April 8. Baker has also arranged for games with the Wiley Independents and other amateur teams in town to be played the last two weeks in March.

The Schedule is as follows:

April 15—Indiana University at Bloomington.
April 19—Indiana State Normal at Terre Haute.
April 21—Purdue at Lafayette.
April 22—Wabash at Terre Haute.
April 25—DePauw at Greencastle.
April 27—Hanover at Terre Haute.
April 29—Eastern Illinois Normal at Charleston.
May 4—Wabash at Crawfordsville.
May 5—Culver at Culver.
May 6—Indiana State Normal.
May 12—Moores Hill at Terre Haute.
May 17—Eastern Illinois Normal at Terre Haute.
May 19—Indiana University at Terre Haute.
May 24—Earlham at Richmond.
May 27—DePauw at Terre Haute.
May 30—Indiana State Normal.
June 3—Earlham at Terre Haute.

———ooo———

WHILE we are talking of schedules, Manager Heer, of the football team, has practically finished his schedule. Six games are already arranged and for the two open dates marked below he has games in view and within a couple of weeks these dates will be filled. It is only natural that the first two games be as they are. For the last three years it has been the same, and will probably stay that way for some years to come. Earlham is a rather new one on the schedule, the last game with them being played at Terre Haute in 1908, Rose winning at the time, 22 to 3. Central University of Danville, Kentucky, is a new one. The game with them is to be played in Louisville. It is said that they usually have a good team. Wabash will play in Terre Haute making up for the game they didn't get to play here last year. Manager Heer is trying to close a contract with Butler College for the Thanksgiving Day game, however the matter is still unsettled. In 1908 we played Butler on Thanksgiving day and the game was a tie 6 to 6, and the next year we won 12 to 6. Last year Butler wasn't on the schedule. The following are the dates:

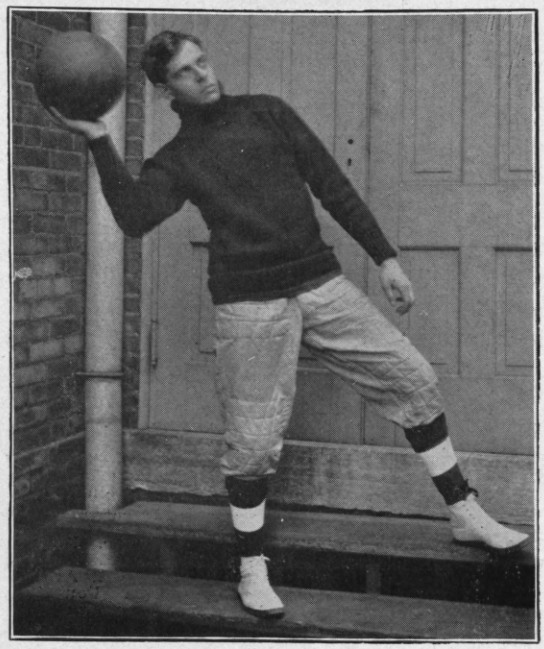
Oct. 7—Eastern Illinois Normal at Terre Haute.
Oct. 14—Vanderbilt at Nashville.
Oct. 21—Earlham at Terre Haute.
Oct. 28—Central University at Louisville.
Nov. 4—Open.
Nov. 11—Wabash at Terre Haute.
Nov. 18—Open.
Nov. 30—Open.

THE Indiana High School Athletic Association will hold the State High School Track Meet in Terre Haute May 20, under the auspices of Rose Poly. The Rose Poly Athletic Association in arranging the meet does it through courtesy only and from the way things look now we are going to get the short end of the deal. According to the contract, which, by the way, has not yet been signed, Rose Poly only has the honor of taking care of, and paying the expenses of the visiting athletes while they are in town. The High School Association gets all of the gate receipts and pays all the expenses of getting the athletes here, but once they are here it is up to Rose Poly. Incidentally we have to have all of the printing, etc., done. Of course there is one advantage to be seen. If we treat them right, it will mean the coming of new and promising material to Rose next year and probably the year after. If everybody will lend a helping hand the expense should not be much. When the meets are held in other college towns, the fraternities take care of a large number of the boys and there is no reason why this could not be done in Terre Haute. It would mean a big saving in expenses. The Athletic Association of Rose has picked a competent committee of three to arrange for the meet. The men named were E. E. Garst, E. A. Mees and O. E. Reagan. With these fellows to run things the meet ought to be a success.

———ooo———

CAPTAIN COFFEY has called the first track work out and on March 3, twelve men turned out in suits. Moore, 1914, Ransford, 1914, Coltrin, 1914, Heer, 1912, and Uhl 1912, braved the cold outside air and ran a few laps on the track. They didn't stay out long but completed their work out in the gym. Black, Bowe and Klingman, all of 1914, distance runners, worked out in the gym as did Rasmussen, 1912, hurdles, and Kelley, 1913, and Deming, 1914, practised the jumps and vaulting. Gray, of 1913, is depended on to take care of the weights.

WHEN Hoffner resigned the captaincy of the basketball team in the middle of the season on account of an accident, Rose Poly lost a good man in basketball and probably in baseball. Hoffner has taken a big part in athletics ever since entering school. In his freshman year he got into some games in basketball and foot ball but it was in his second year that he started in to athletics proper. He acted as substitute full back, when Backman was playing that position, and for the last two years he has played regular full back and his playing has featured many games, especially the one on Thanksgiving day, 1909, when Rose scored 47 points in the second half against Franklin. For two years he played center on the basketball



C. E. HOFFNER.

team and this year he started as forward. An injury to his knee and ankle in foot ball nearly kept him out of basketball this year, and then after a few weeks on the team he had the misfortune to break a rib in a practice game. From then on the team had to be practically reorganized, Offut being elected captain. Hoffner says

he will not play baseball this year. Last year was his first year on the baseball team and he developed into one of the best hitters on the team. His absence will mean a big loss to the team, but one can hardly blame a man with a broken rib, a weak knee, and two bad ankles from dropping out of athletics.

———ooo———

THE basketball team finished the season with five games won and six lost. Wabash, Earlham, Notre Dame and Indiana have won from Rose since the time of the last Technic and DePauw and Normal have lost to us. The DePauw game settled all doubts as to our superiority, but mixes up the standing with Earlham. Earlham beat Rose 39 to 17, but lost to DePauw on a neutral floor, then Rose defeated DePauw by a big score. The players say that Earlham was quite a bit better than DePauw and probably better than Rose.

———ooo———

WABASH 38; ROSE 11.

Wabash had no trouble winning this game, it can nearly be said that Wabash would win from any team on their home floor. The first half ended 24 to 4. Leffel was the star for Wabash scoring five goals, while Gray excelled for Rose. The game was exceedingly rough, fouls being called often. Wabash used practically a sub team in the second half. The line-up:

Wabash (38)	Position	Rose (11)
Herron, Yount	F.	Offut (Capt.)
Leffel	F.	Kelley, Deming
Ebert, Arnold	C.	Gray
Lambert, Bishop Gangwisch	G.	Crowe, Poggensee
Stump (Capt)	G.	Wyeth

Summary—Field Goals: Leffel 5, Herron 4, Arnold 4, Ebert 3, Yount 1, Gray 2, Offut 2, Deming. Foul Goals: Lambert 4, Kelley. Referee—McKenna.

———ooo———

EARLHAM 39; ROSE 17.

There was never any doubt of the result of this game after the first few minutes of play. Rose wasn't in it and in the second half was completely outclassed. Conrad was an individual star, coming from his guard position eight times and scoring. Captain Reagan, of Earlham, was also a star. Kelley and Deming worked best for Rose. Earlham played a rough game and made twelve fouls but Rose could only score on three of them. The line-up:

Earlham (39)	Position	Rose (17)
Reagan (Capt)	F.	Kelley
Rowe, Stanley	F.	Deming
Golbert	C.	Gray
Conrad	G.	Offut (Capt)
Furnas, Jones	G.	Crowe

Summary—Field Goals: Conrad 8, Rowe 6, Reagan 2, Golbert 2, Kelley 3, Gray 2, Offut 2. Foul Goals: Conrad 3, Offut 2, Kelley. Referee—Cork, of Indiana.

———ooo———

NOTRE DAME 31; ROSE 23.

After Notre Dame had defeated Wabash on the latter's floor by a good margin, things didn't look very pleasant for Rose. But the hard game at Crawfordsville told on the Catholics and by some exceptionally good playing Poly held them 31 to 23. Maloney, the forward who starred in last year's contest here, did not get into the game until the second half on account of injuries, but while he did play he made things hum. Gray got more field goals than any man on the floor although covered a great part of the time by two Notre Dame men. It would not do justice to the rest of the team to call him an individual star as the players worked well together, everyone putting up his best game. The line-up:

Notre Dame (31)	Position	Rose (23)
McNichols, Maloney	F.	Deming
Fish (Capt)	F.	Kelley
Granfield	C.	Gray
Feeney, Walsh	G.	Offut (Capt)
Ulatowski	G.	Crowe

Summary—Field Goals: Gray 6, Offut 2, Kelley 2, Fish 5, Granfield 5, Maloney 2, McNichols 2, Ulatowski. Foul Goals: Kelley 3, Maloney. Time of halves—20 minutes. Referee—Reiman, of Purdue.

———ooo———

ROSE 14; NORMAL 10.

The cry of the Rose rooters and players at the end of the first half seemed to be for help. The score stood 7 to 3 in Normal's favor at the end of the first half and it was up to Poly to do something in the second half or have the disgrace of a defeat at basketball by Normal, an unheard of thing. The Normal rooters were hilarious the first half. Normal usually roots only before a basketball game, they don't get a chance afterwards, but it did look as if the tables would be turned this night. A little over-confidence was responsible for the trouble and it took some mighty good playing in the second half to over-

come this. Let it be said for Normal that they put up a great game. Moore and Knox played especially well, in fact, the whole team over-did themselves. The score stood 9 to 8 in favor of Normal for a long time in the second period, at least, it seemed a long time, when two field goals by Gray and a foul and a field by Kelley decided the fray. Westover, of Purdue, who was to referee, failed to show up and Coach Hadley refereed, Nugent, of Normal, helping him at the umpire job. The line-up:

Rose (14)	Position	Normal (10)
Kelley	F.	Knox
Deming	F.	Asbury, Moore
Gray	C.	Ellingwood
Offut (Capt), Poggensee	G.	McCullough
Crowe	G.	Bowles (Capt.)

Summary—Field Goals: Gray 4, Kelley 2, Knox, Moore 2, Ellingwood. Foul Goals: Kelley 2, Bowles 2. Time of halves—20 minutes. Referee—Hadley, of Rose Poly. Umpire—Nugent, of Normal.

———ooo———

INDIANA 37; ROSE 24.

Football would be a better name than basketball for this game. It was strictly rough house, Poly getting slightly the best of the rough house, while Indiana managed to slip in the most goals. As far as excitement was concerned the rooters were treated to plenty of it but they were somewhat disappointed in the showing made by Indiana, who was supposed to be one of the best teams in the West. Barnhart and Graves did most of the scoring for Indiana, while the home team's points were pretty well divided. The line-up:

Indiana (37)	Position	Rose (24)
Freeland	F.	Kelley
Barnhart	F.	Deming
Graves	C.	Gray
Hipskind	G.	Crowe
Berndt	G.	Poggensee, Offut

Summary—Field Goals: Bernhart 6, Graves 6, Freeland 2, Hipskind 2, Berndt 2, Gray 3, Kelley 2, Poggensee, Offut 2. Foul Goals: Kelley 8, Barnhart 3. Referee—Westover, of Purdue. Time of halves—20 minutes.

———ooo———

ROSE 40; DePAUW 22.

The last game of the season was an easy one, that is, after the first period which ended a tie, 13 to 13. Interest picked up in the second half and DePauw was left far behind. Kelley got his eye and threw nine field goals in the half, and six foul goals. If the team could have kept on feeding them to him he would still be throwing them as his eye was perfect. DePauw started off with a rush and had a lead of 10 to 4 in a few minutes, Gant, Leazenby and Walker taking part in the spurt, but it did not last long. Two men were disqualified by the four foul rule, Walker, of DePauw, and Crowe, of Rose, being the guilty ones. The line-up:

Rose (40)	Position	DePauw (22)
Kelley	F.	Grant
Deming	F.	Leazenby
Gray	C.	Dewey
Crowe, Offut (Capt)	G.	Walker, Schmalzried
Poggensee	G.	Hawthorn

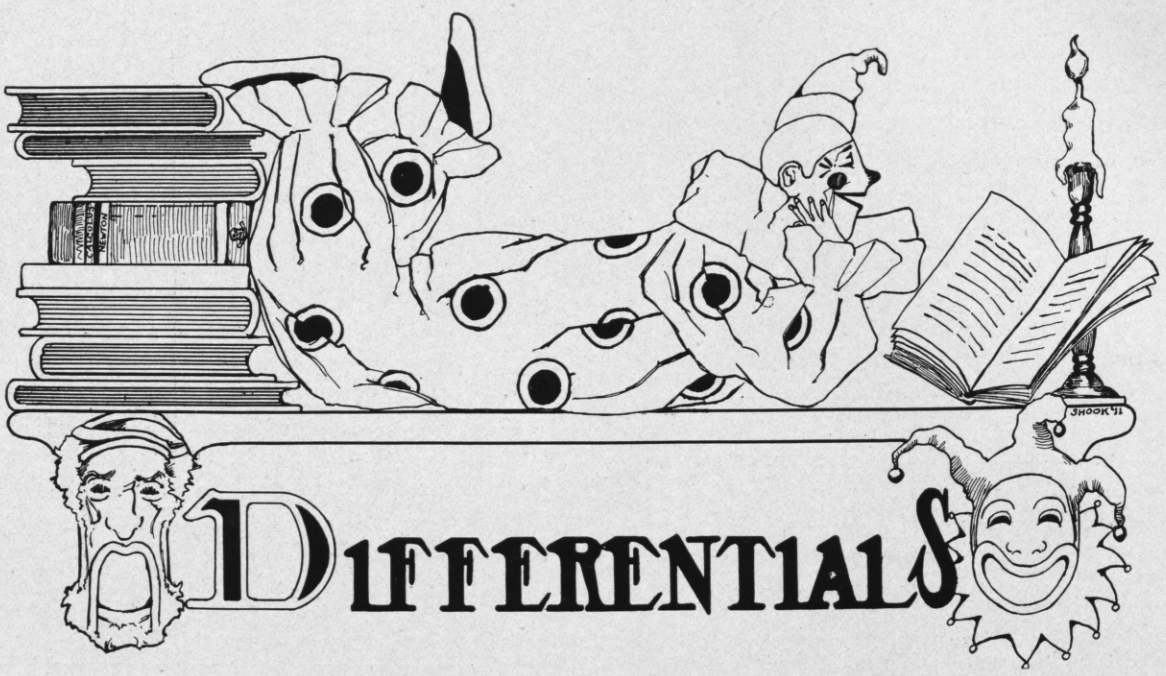
Summary—Field Goals: Kelley 11, Gray 3, Poggensee 2, Deming, Grant 2, Leazenby, Dewey 2, Walker, Schmalzried, Hawthorn. Foul Goals: Kelley 6, Leazenby 6. Time of halves—20 minutes. Referee—Reiman, of Purdue.

———ooo———

INDIVIDUAL RECORDS.

	Field Goals.	Foul Goals.	Total Points.
Gray	41	....	82
Hoffner	9	18	36
Kelley	31	22	84
Offut (Capt.)	12	6	30
Poggensee	5	....	10
Crowe	....	....	....
Deming	4	....	8
Totals	102	46	520

Rose 250—Opponents 309.



Poggy, to Doc White—"Can I have one of those tin crucibles?"

* * * *

Hath draws a wedge on the board.

Wood—"That looks like a cut of cheese."

Hath—"Well; it's the same thing."

* * * *

Beauchamp, after first day in blacksmith—"I haven't got as many blisters as I had this morning."

"How is that?"

Beauchamp—"They're all run together."

* * * *

Hath—"Now what is the pressure on this submerged dam?"

Brennan—"I don't like these dam problems, Professor."

Kelly—"This is no place for a minister's son."

* * * *

Newlin, translating 'merci monsieur'—Mercy, Mister!

* * * *

Heimlich informs us that in making out our grades, our individual personal equations shall be taken into consideration.

* * * *

Hath—"Give your attention this way, boys, it is only by working these examples over and over again that you can get them. In fact, it is only by long practice that you can accomplish anything. What makes an athlete?"

Novotney—"Egg-O-See."

* * * *

Overpeck, in blacksmith—"Shut off your wind, Slim, you'll blow your 'feuer' out!"

* * * *

Donaldson's "three sided triangle" and Wood's "round circle" remind us a little of Hath's "cylindrical slice."

* * * *

"Came pretty near speaking to a fellow on the street, Sunday. I thot it was Adams."

"Well, wasn't it?"

"Couldn't have been; he had on a Derby."

* * * *

Hath—"I believe Brewer came back because their was "Pi" in the problem,"

"I hear Wischy has become infatuated with a school teacher here."

"Riehle?"

* * * *

Knippy—"The ohm was named after Ohm, the unit of resistance."

* * * *

Hath, in Solid Analytics—"This is no social function." (We've known that for some time!)

* * * *

Hunter—"What is your favorite wild game?"

College Boy—"Football!"

* * * *

"Say, we will have to order some more absence blanks."

"Why, we just got some last week."

"I know, but Loehninger is absent again today."

* * * *

Dodson—"I'll bet you sleep late these days."

Gilbert—"How did you guess it?"

Dodson—"Oh, because you 'lie' so much."

* * * *

Parker—"Mr. Stevenson, what is furious acid?"

* * * *

Slocomb (During argument about fellows swiping towels from hotels)—"You might as well go down stairs and steal two dollars out of the cash drawer."

Bringman—"I'd lots rather."

* * * *

Krieger—"Funny, isn't it, but when a lady is in full dress, less of her body is covered than when she is not?"

Hepp—"That's nothing. It is the same way with poultry."

* * * *

Doc White (Lecturing to Chemists)—"The last time I gave you ether; today I give you chloroform."

* * * *

Ed Scheffel—"Aren't you going to see 'Camille,' Baines?"

Freshman—"Why am I marked zero?"

Prof.—"Why, that is the lowest mark we give."

* * * *

Wischmeyer (In Dynamics)—"A pure couple is never in equilibrium."

* * * *

AT JUNIOR RECEPTION.

She—"Why do you suppose they have telephone wires so high in the air?"

Hubbard—"I don't know, unless it is so they can keep the conversation up."

* * * *

Harry W. Watts attended his regular weekly recitation last Thursday in spite of the rain.

* * * *

Speaking of Ohm's Law, it seems that the Seniors aren't the only ones that occasionally forget that $E = I R$. A farmer out in Kansas sent to one of the large electric machinery manufacturing companies for a motor. The company sent the motor with diagrams for wiring, and about two weeks later received a letter from the man saying that the motor wouldn't run, although he had wired it up according to the diagram. They sent a man to investigate and he found that the motor was wired up O. K., but that the man lived twenty miles from the nearest source of electric driving power. Cheer up, Seniors!

* * * *

"When folks don't mind their business
The reason is easy to find;
They either have no business
Or else they have no mind."

* * * *

Freshman—"There is something preying on my mind."

Doc—"Never mind! It will soon starve."

* * * *

Beany—"Yes, she promised to be mine some day."

Krieger—"But when?"

Beany—"As soon as she can break off four or five other engagements."

LOCAL OPTION.

"Hush, little Blind Tiger,
Don't you cry;
You'll be an open saloon;
Bye and bye!"

* * * *

"Where are you going my pretty maid?"
"I'm going to Reno, sir," she said.
"May I go with you, my pretty maid?"
"When I get back," she kindly said.

* * * *

Freshman—"I love you!"

College Widow—"I've heard that before, Hoff used to say that."

Freshman—"I worship you madly!"

College Widow—"Loose talk, Krieger indulged in that."

Freshman—"I cannot live without you!"

College Widow—"Get some new stuff, Beany fed me that."

Freshman—"Will you marry me?"

College Widow—"Well, now, there is some class to that, kid!!"

* * * *

Owen—"Bud, our invitations will cost $24.00 for the first hundred."

Ferrell—"Gee! I don't want any of the first hundred."

* * * *

Tilley—"I am trying my best to get ahead."

Doc—"You need one badly enough!"

* * * *

Thomas (In Strength of Materials)—"Portland cement is stronger when it dries under water."

(Laughter)

Thomas (Blushing)—"I meant to say water was damper than air."

* * * *

Heimlich (Looking for room)—"Did you say a music teacher occupies the next apartment? I cannot stand that."

Landlady—"Oh, that's nothing. He has eleven children, and they make so much noise you can't hear the piano."

Breathes there a man, who has the price
Who's not soliloquized once or twice:
"It's eleven-thirty and I think
I'll just step in and have a drink."

* * * *

Hansen—"Did you ever see Sarah Bernhard?"

Clegg—"Sure!"

Hansen—"What in?"

Clegg—"A taxicab, going to the depot."

* * * *

Prof. Thomas (To Freshman Civils)—"When out surveying, ladies cause almost as many transit troubles as the country boy with his jack-knife."

Pfau—"How's that?"

Prof. Thomas—"Why, (blushing) the 'ribbon steel' which they carry 'about them' deflects the compass needle."

* * * *

Mrs. S.—"I hear your son is on the college football eleven."

Mrs. V.—"Yes indeed."

Mrs. S.—"Do you know what position he plays?"

Mrs. V.—"Ain't sure, but think he is one of the draw-backs."

* * * *

Conductor—"We ran over a cat a few hours ago."

Wimsett—"Was she on the track?"

Conductor—"Why no, we chased up an alley after her!"

* * * *

Prof. Faurot (In German)—"Nothing ever reaches perfection in this world."

Cook—"Some people do."

Prof. Faurot—"No, you only think she does!"

* * * *

Prof. Wickersham—"Mr. Le Forge, since you are so very sleepy, I guess I shall sing for you."

Thence followed a painful rendition of "Sleep, Daisy, Sleep."

EXPLOSIVE DON'TS.

THE United States Bureau of Mines has issued a collection of rules regarding the precautions to be taken to reduce the risks in storing, thawing, handling and using explosives. They were prepared by Mr. Clarence Hall for the guidance of coal miners, and some of them refer particularly to mining conditions, although most are applicable to blasting work generally. The rules are printed in full in the *Engineering Record*, February 25, 1911.

A few of the "Dont's" are given here:

Don't store detonators with explosives. Detonators should be kept by themselves.

Don't open packages of explosives with a nail puller, pick or chisel. Packages should be opened with a hard wood wedge and mallet, outside of the magazine and at a distance from it.

Don't store explosives containing nitroglycerine so that the cartridges stand on end. The nitroglycerine is more likely to leak from the cartridges when they stand on end than when they lie on their sides.

Don't repair a magazine until all explosives are removed from it.

Don't thaw frozen explosives before an open fire, nor on a stove, nor over a lamp, nor near a boiler, nor near steam pipes. Use thawers such as are provided by the manufacturers of the explosive.

Don't expose detonators or explosives to direct sunlight for any length of time. Such exposure may increase the danger in their use.

Don't economize by using a short length of fuse. Shot is liable to go off too soon.

Don't attempt to draw nor dig out the charge in case of misfire. Some authorities believe that the great disaster at Courrieres, France, in which 1,100 men lost their lives, was caused by a miner striking with his pick a cartridge he was digging out. Drill and charge another hole at least two feet away from the hole that misfired. After the coal has been brought down look carefully for any unexploded material.

In all there are 31 "Dont's."

———ooo———

QUALITIVE CHEMICAL ANALYSIS.

(A Laboratory Guide—By Wilfred Welday Scott, New York, D. Van Nostrand & Co., Octavo XI, 165 pp. Illustrated $1.50.)

A truly helpful manual of Qualitative Analysis will be found in Wilfred W. Scott's "Qualitative Chemical Analysis—A Laboratory Guide," published by the D. Van Nostrand Company. For a book of 165 pages it certainly contains the maximum of information. This is made possible by the extensive use of the tabular arrangement.

As the author states in his preface: "The text embodies only such methods of procedure in analysis as have been thoroughly tested and have proven themselves to be of practical value not only in the hands of a professional but also of the beginner." There should be no doubt of its usefulness to the beginner, as part one is devoted to the topics of theory and practice that are necessary to an understanding of the subject, these being presented in a manner to be readily grasped by one who is not thoroughly

grounded in Chemistry. For the professional analyst, however, the book seems to be but an outline of the subject and rather elementary.

Only two errors in topography were noted. On page 18, line 18, lead is written as an anion, Pb", instead of the cation, $Pb^{\cdot\cdot}$. On page 24, seven lines from the bottom of the page, HgS should read H_2S.

Among the good points to be noted are the following:

The descriptions of apparatus and operations will be valuable, especially to one following the subject alone.

A number of tests characteristic of the metals and given in many manuals but rarely used in ordinary work, are omitted.

Notes on the procedure and precautions are just the thing for students who won't believe a thing till they see it in print.

The author's description of metals and their more common compounds is a convenient thing to have at hand.

The comparison of Marsh's tests for arsenic and antimony is well put.

But few complete equations are given in the text and only a few of the more important ones are required of the student. Some teachers might object to this, but it seems that the student who can answer the fundamental questions given at the close of each group, will understand what he is doing.

The novel arrangement of Part V will be found very convenient for a comparison of the effect of the same reagent on various cations.

For the analysis of an unknown substance, the method and directions given in Part IV are very complete.

On the whole the author has put out a very *usable* book and one that will find a place, not only in the hands of the student, but also of the works chemist.

—J. Newell Stephenson.

ELECTRIC LOCOMOTIVES FOR THE B. & O.

DURING the present year the service on the Baltimore belt line of the Baltimore & Ohio R. R. has received the addition of two electric locomotives which are illustrated in the *Railway Master Mechanic for* February, 1911. The locomotives were designed and equipped by the General Electric Co., the mechanical portion being furnished by the American Locomotive Co. The cab resembles the type which has been widely used for switching locomotives on interurban electric railways, while the trucks and running gear are suitable for the severe duty demanded in trunk line service.

The running gear is articulated and consists of two four-wheel trucks connected through a massive hinge which allows the two trucks to support and guide one another without interfering with the lateral flexibility required in curving with a long wheel base. The framing is massive and the sections are heavier than actually required for mechanical strength on account of the necessity of obtaining ample weight for tractive effort. The wheels are steel tired, 50 inches in diameter, with the motor gears mounted directly on extensions of the wheel hubs.

The cab consists of a main operating cab located in the center of the platform and sloping auxiliary end cabs extending towards the ends of the platform. In the outer end of the end cab are located the main air reservoir, sand boxes and rheostats. All wiring in the main operating cab is in conduit. The central piece of apparatus in the main cab is the air compressor. This is a CP-26 compound compressor, motor driven, with a capacity of 100 cu. ft. piston displacement per minute when pumping against 130 lb. reservoir pressure. The center of the main cab is the most feasible point for locating the compressor, as it permits the various items which may require attention to be accessible from every side. In passing from the low pressure to the high pressure

cylinder, the air is carried by a 2-inch pipe to the roof of the cab through about 35 feet of pipe lying on the roof in order to provide the radiating surface necessary to reduce the temperature of the air before entering the high pressure cylinders. A similar length of radiating pipe is inserted between the high pressure cylinder and the main reservoir for the same purpose. The compressor is controlled by an electro-pneumatic governor and arranged for maintaining the reservoir pressure between the limits of 120 lbs. and 130 lbs.

A fan for forced ventilation of motors is placed beside the compressor.

The motor equipment consists of four GE-209 motors. Each motor is furnished with twin gearing, a pinion being mounted on each end of the armature shaft and a corresponding gear on each driving wheel. With absolute alignment of the armature shaft and axle insured, the strain on the gear teeth is reduced to a minimum. The motor is a 600 volt commutating type. The equipment of four motors can exert a tractive effort of 46,000 lbs. at 14 m. p. h. which is the theoretical slipping point of the wheel, assuming a coefficient of adhesion of 25 per cent.

To obtain some idea of the power of these locomotives, they may be compared with the heaviest types of steam passenger locomotives. The Baltimore & Ohio electric locomotives weigh 90 tons on drivers. The weight on the drivers of the Pacific type of steam locomotives which is the type used for heavy passenger service, very rarely exceeds 75 tons. A weight of 90 to 100 tons on drivers is obtained only on freight locomotives of the Consolidation and Mikado types. The weight on drivers, which determine the maximum pulling power of the electric locomotives, is therefore comparable with the heaviest types of steam locomotives.

In the steam locomotive, on account of boiler limitations, it is impossible to carry the maximum tractive effort at speeds higher than eight miles per hour or 10 miles per hour, while the electric locomotive will develop its maximum tractive effort at 14 miles per hour. This tractive effort of 46000 lbs. corresponds to an output of 1700 H. P. The electric locomotive is more flexible and has a greater power than indicated by these figures. Two of these 90 ton units can be coupled together and operated by one engineer in the forward cab. All the motors are controlled simultaneously by one operating handle, and one engineer has under his control a maximum capacity of 3400 H. P. or a maximum tractive effort of 90,000 lbs., developed from one 180 ton locomotive.

One hundred eighty tons represents approximately the weight of a single large steam locomotive and its tender, but in the steam locomotive only half of this weight is on drivers, while in the electric type the whole 180 tons is on drivers and is capable of being applied for developing tractive effort.

———ooo———

METHODS OF SECURING MAXIMUM EFFICIENCY IN MANUFACTURING AND CONSTRUCTION.

SCIENTIFIC management of industrial plants and in construction work is receiving considerable attention at the present time. Much is being written and said in regard to this phase of engineering, which has resulted in the standarization of not only machinery and methods, but also motions of workingmen performing different kinds of work, hence we have what may be called production engineers or efficiency engineers.

This subject forms the basis of an article found in *Applied Science*, published at the University of Toronto, by Wm. M. Towle, BS, Professor of Industrial Engineering, Clarkson Memorial School of Technology.

Reference is also made to an article in the *Engineering Magazine*, February, 1911, by Harrington Emerson, on Principles of Efficiency.

Quoting from Prof. Towles' paper, the cost of the manufactured product is made up of the

cost of the raw material, labor, supervision, interest and depreciation of plant, and expense of operation. In the ultimate analysis of the cost it will be found that labor represents nearly the whole amount, for the raw material before any labor is put upon it is but a small fraction of the whole cost of the article. Therefore, to reduce the cost of the finished product it is necessary to increase the efficiency of labor.

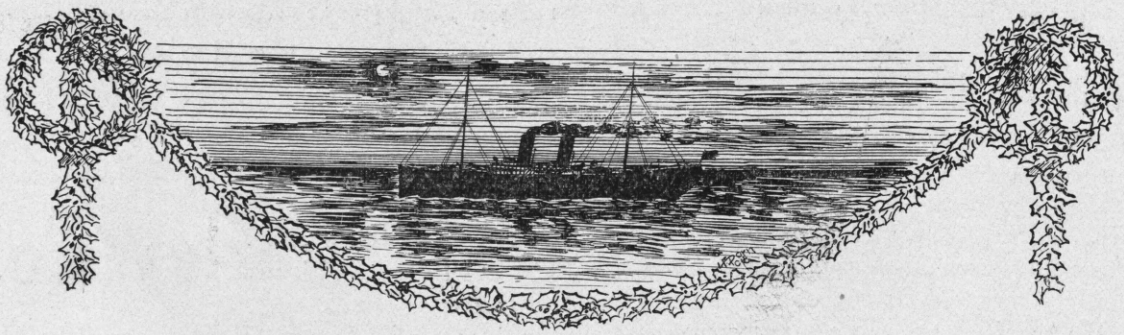
Many schemes have been thought out and tried to accomplish the desired result, the most efforts having been made on the wage side of the problem, but as a general thing have not been successful.

The greatest gain in securing maximum efficiency in manufacturing can be obtained by conserving the energy of the workmen. This can be done by investigating and studying all the operations performed by the workman, in designing and arranging the tools, machines, and appliances; and in planning the method of doing the work that the workman may produce the greatest amount of output with the least expenditure of effort. This can be secured only by the hearty co-operation of the employer in providing the best of everything wherewith to do the work and by the workman in using such to the best advantage.

Much has been done by several engineers who have made a systematic and analytical study of each and every motion and operation required to produce a given result and who have devised means and methods to produce the best and quickest results at the least cost.

A careful study is made of all operations which go to make up a series of motions on the part of the worker and all useless movements of both man and material is eliminated and, in short, giving a set of standard operations to be followed.

By the adoption of standard motions in Bricklaying, for instance, Mr. Frank B. Gilbreth shows in *Industrial Engineering* that the efficiency of the men is improved to such an extent that for men working under old methods there is hardly any comparison.



BOYS

At the BIG FOUR TAILORING CO.'S STORE, 629 N. SEVENTH STREET,

You get your clothes MADE TO SUIT YOU. New Store, New Goods, New Styles, Tailored by Mechanics who acquired their knowledge as you are now laboring to do. Come right in if you only turn right around and walk right out again. You'll get a pleasant look from **P. J. CLARK, Mgr.**

KODACKERS AND KODACKERSSES

DON'T FORGET WE DO DEVELOPING AND PRINTING

E. T. HULMAN, 422 Wabash Ave.

We are Here to Serve You

ROSE PENNANTS, SEALS AND POSTERS

CROSS SECTION NOTE BOOKS, FINE STATIONERY, FINE PRINTING

Orbiel Supply Co. ALWAYS WELCOME **112-114 N. 6th St.**

STARRETT'S MACHINIST AND CARPENTER TOOLS

PLUMBING AND HARDWARE

FREITAG, WEINHARDT & CO.

664 WABASH AVENUE. PHONES 140.

BANNERS
PENNANTS
CLASS PINS
MONOGRAMS
STATIONERY

COLLEGE POSTERS
PILLOW TOPS
COLLEGE PINS
WALL SQUARES
ROSE WATCH FOBS
CLASS PINS

PICTURE FRAMING A SPECIALTY

KODAKS, CAMERAS and PHOTO SUPPLIES FOR AMATEUR AND PROFESSIONAL.

Kadel's Art Shop

125 S. SEVENTH STREET. NEW PHONE 985

IN A CLASS BY THEMSELVES

WEINSTEIN BROS.

"The Quality Shop"

523 WABASH AVENUE

TERRE HAUTE'S LEADING HABERDASHERS TAILORS AND HATTERS

"Where the Pretty Shirts Come From"

WE SOLICIT YOUR PATRONAGE

Baur's Pharmacy

TERRE HAUTE TRUST BUILDING
SEVENTH AND WABASH AVENUE

Agency "HUYLERS"

CELEBRATED NEW YORK CANDIES

R. F. Marley Co.

647 WABASH AVE.

STATIONERY AND OFFICE SUPPLIES

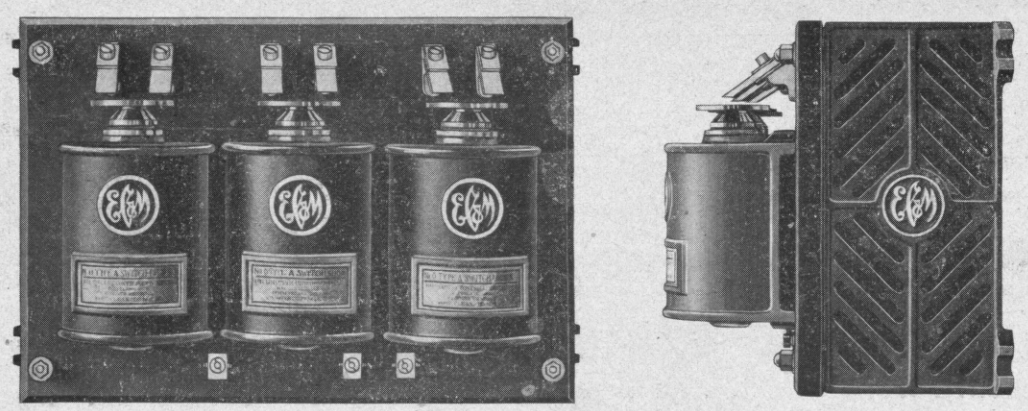
For cross-section note-books, drawing instruments and material, see KERR, '11, Poly Representative.

The Type E. C. & M. Automatic Motor Starter

Has All the Advantages Embodied in Any Magnetic Switch Starter Without Being Unduly Expensive.

Its Absolute Simplicity Places It far Above Any Other Starter in Use.

Relays, Dash Pots and Control Circuits are Positively Eliminated.



TYPE E. C. & M. AUTOMATIC MOTOR STARTER, FORM A.

For Detail Information Regarding the Starter Illustrated Above Send for Bulletin 1010

THE ELECTRIC CONTROLLER & MFG. CO.

:NEW YORK: 50 CHURCH ST.
:PITTSBURG: 515 FRICK BLDG.

CLEVELAND, OHIO, U. S. A.

:CHICAGO: 135 ADAMS ST.
:BIRMINGHAM: 827 BROWN-MARX BLDG.

The House of Foulkes Bros.

The E. & W. Redman Collars are Fit Perfection. 20 Styles, both Regular and Quarter Sizes; Two for..... **25c**

THE HOUSE *of* FOULKES BROS.
6½ AND WABASH AVE.

Polytechnic Pharmacy

J. F. BRUNNER, PROP.

Pipes, Cigars, Tobaccos and Cigarettes

SODA WATER, CANDIES
LOWNEY'S BOX CANDY
AND REX BOX CANDY

THIRTEENTH AND LOCUST STREETS

OUR SPECIALTY

HOME MADE CANDIES ONLY.
We make Candies every day.
Pure and wholesome
Our Candies guaranteed absolutely pure.

James Georgopoulos

SEVENTH AND WABASH AVE.

THE TECHNIC

Is printed by us; we can do just as satisfactory work for YOU
Why NOT let us try.

Terre Haute Printing Co.
25 S. FIFTH STREET Citizens Phone 415

WM. SCHONEFELD'S

Great Northern Pharmacy

Full Line Note Books, Tablets, Pencils, Etc.

Agent for Rex and Lowney's Candies.

SEVENTH ST. & BIG FOUR R. R.

BOYS

This is the Store to buy
CALABASH and
ALL KINDS OF PIPES
"Prices Right"

VALENTINE'S

QUALITY DRUG SHOP
EIGHTH AND WABASH.

LET US

BE A MOTHER

TO YOU

BUTTONS REPLACED, SOCKS DARNED, UNDERWEAR REPAIRED; in fact, a mother's care of your garments Free of Charge.

Hunter Laundering & Dyeing Company

Phones 257 BEN L. HEER, Agent

Rose Pharmacy

Seventh and Cherry

The Drug Store Different Than the Rest.

The Store of Pure Drugs.

We charge you no more.

Agents for Belle Mead Sweet Candies.

Van Houten's Cocoa used at our fountain.

Give us a call.

FREE DELIVERY. BOTH PHONES.

FOR YOU

and FOR US

Walk-Over Shoes are the best shoes for you to buy and for us to sell, because, "once a Walk-Over wearer always a WALK-OVER Wearer."

See the point? You will if you see the new spring WALK-OVERS in our window.

PRICES $3.50, $4.00, $4.50, $5.00, and $5.50

Walk-Over Boot Shop

651 Wabash Avenue

The
Swope-Nehf
Jewelry Co.

524 WABASH AVE.
(Established 1867)

HEADQUARTERS FOR

CLASS PINS
SEALS
AND
FOBS

Souvenir
Spoons and Plates

Field Day Medals
and Cups

MR. ARTHUR NEHF
of the Freshman Class will attend to Special Orders

Men's Wear
Reminder

Say, fellows, why not let us make your Spring Suit. We sure have the dandiest selection of Woolens you ever looked at, and the models are the smartest ever. Just come in and look them over—no obligations to buy. We have ready for you all the Spring Haberdashery and we respectfully solicit your business. Come and see us.

GAREN & BARRETT
MEN'S WEAR SHOP

PHONE 582. 715 WABASH AVE.

Young Men's
Low Cuts

Styles that give the finishing touch of elegance to the well dressed man

Nettleton's $6.00
"Scion" $3.50, $4.00 and $5.00

The SUTHERLAND-MARTIN SHOE CO.
505 WABASH AVE.

We are ready, when you are, to show the most Beautiful and Complete Line of SPRING WOOLENS ever shown. Fit, Fabric and Fashion Guaranteed.

$18.75 to $60.00

ED. SPARKS
HATTER Haberdasher TAILOR
"THE CLOTHES SHOP OF SATISFACTION."
813 WABASH AVENUE

John G. Heinl & Son
Florists

129 SOUTH SEVENTH STREET
TERRE HAUTE, INDIANA

J. M. BIGWOOD & SON

(Established 1877)

Jewelers and Opticians

607 Wabash Avenue **TERRE HAUTE, INDIANA**

UP-TO-DATE—Latest Designs in **Artistic Jewelry, Mesh and Leather Bags, Cut Glass, Silverware, Chaffing Dishes and Brass Goods.** Special attention given to **Fine Watch and Jewelry Repairing. Eyes Tested Free** and satisfaction guaranteed by Registered Optician.

J. M. Bigwood & Son

CHESTER BRADFORD **BRADFORD & HOOD** ARTHUR M. HOOD, ROSE '93

805 Pythian Building **PATENT ATTORNEYS** INDIANAPOLIS INDIANA

UNITED STATES AND FOREIGN PATENTS, DESIGNS, TRADE MARKS & LABELS

SPECIAL MODELS FOR COLLEGE MEN

In **Blue Serge Suits, $15.00 to $30.00.** **Gray and Tan Cheviott Suits, $12 to $30.**
to be seen in newest 1911 Styles in our Men's Suit Department now
A big showing of **Slip-on Coats, B. V. D.** and **Munsing Underwear. Faultless, Cluett** and **Monarch Dress Shirts, Howard, Berkley, Edgemere** and **Elmwood Hats.**

THORMAN & SCHLOSS

668-670 WABASH AVENUE **PHONES 137**

POLY BOYS

To appear to advantage you must have a practical Hair Cut. We do the work to please **you.**

Cleaning and Dyeing Done. Suits Hand Pressed 25c
Toilet Articles and Cigars Laundry Agency

GREAT NORTHERN BARBER SHOP

OPPOSITE BIG 4 STATION **J. VERNON BREWER, Proprietor**

When You are Ready

For Your Spring Suit come in and let us show you the best line obtainable of Ready-to-Wear Clothing. **Suits $15 to $35**

Emerson and Stetson Shoes $3.50 to $6

FINE NECKWEAR, UNDERWEAR, SHIRTS AND MEN'S HATS

TUNE BROS.

CASH CLOTHIERS, HATS & GENTS' FURNISHINGS

FIFTH STREET AND WABASH AVENUE