Fall 10-1909

Volume 19 - Issue 1 - October, 1909

Rose Technic Staff
Rose-Hulman Institute of Technology

VOL. XIX TERRE HAUTE, IND., OCTOBER, 1909 NO. 1

THE TECHNIC

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.

MISS HEMINWAY.

On Friday, June 25th, at 3 p. m., Miss Susan K. Frances died. Miss Frances was a distant relation of Chauncey Rose, and was the last of his relations. Her mother, Mrs. Heminway, had made a home for Chauncey Rose in his last years and received a large benefaction from him at his death. This property naturally fell to her daughter by her first marriage, and has now been largely willed by her (Miss Frances) to the Institute. Miss Heminway—as Miss Frances was quite generally called—has been a friend of the Institute for many years. She was always interested in everything that concerned it; was personally acquainted with many of the professors, and in former years, when her health was better, used to take delight in having the Faculty members and even students call upon her. She has always kept the memory of Chauncey Rose alive at Commencements by having his portrait wreathed with flowers. This tribute she never forgot, even long after she ceased to live in Terre Haute, showing her ever-friendly interest by sending roses at Commencement to be distributed among the members of the Board and Faculty.

While freely spending the income from her large property, she was always careful not to lessen the original capital; indeed, she has probably increased it by reason of her dividends, and kept it intact with the intention of finally supplementing Mr. Rose's endowment. She was very exact in the matter of her will, having it carefully thought out to the minutest detail, even making changes in it shortly before her death.

* * * *

PROVISIONS OF THE WILL.

In Article 8 of the will it is provided that the sum of $20,000 be set aside for the creation of a fund, to be known as the Firman Nippert Memorial Fund, for the Rose Polytechnic Institute, the income from which shall be used to aid

worthy students of limited means who attend the Institute.

It is later provided that the old homestead shall be preserved as a memorial to Sarah A. Heminway, to be used for some purpose or department of the Institute forever.

In the eleventh section the Institute is made residuary legatee of all the remainder of the estate, this also to constitute a fund, known as the Heminway Memorial Fund, to be used for the benefit of the Institute.

The Terre Haute Trust Company is made trustee of the estate, and it is estimated that the residuary bequest will ultimately amount to from $350,000 to $400,000. The Institute will not receive any considerable return from this benefaction for some time, but in anticipation of the benefits that will accrue from it, it is planned to at once increase and improve the equipment and laboratory facilities.

As to the disposition of the homestead, plans have not been definitely formed, but it is probable that it will be used for museum and assembly purposes, especially for the convenience of the various Polytechnic organizations, who will thus be provided with a down-town meeting place.

The Heminway bequest will probably mark the beginning of extensive changes and improvements of the entire plan and organization of the Institute. There is no prospect of radical change immediately, nor have plans been adopted as yet for future extension.

* * * *

For a long term of years no October issue has appeared without an item in this department wherein the new editorial staff made their initial bow; and lest some may deem its absence a neglect, we explain. This year a new plan has been followed, and the new staff undertook to edit a June issue in time for Commencement. In that issue can be found an outline of new policies and a general statement of the plans of the staff for 1909-10.

To those whose acquaintance with THE TECHNIC begins with this issue we extend greetings, wish you a long and pleasant acquaintance, pledge you the very best we can offer, and request your hearty support.

* * * *

This month the leading article comes from a '99 classman located in Schenectady, and is a reprint from *The General Electric Review*. It is not our custom to reprint, but the present instance is exceptional, and we are glad of the permission to use this paper, believing that the subject will be of interest and value to all Rose men.

* * * *

We wish to call the attention of Alumni of classes '90, '91, '92 and '93 to the notice appearing elsewhere in this issue regarding the proposed Mendenhall memorial tablet. Certain members of the committee have put forth earnest effort to bring this matter to your attention, and as yet only a minority have responded. The plan is surely most commendable, and we trust that those whose names are not already listed will give this matter their attention at once.

* * * *

THE TECHNIC wishes to extend greeting to the three new members of the Faculty: Mr. Albert A. Faurot, librarian and instructor in German; Mr. Claude H. Cary, instructor in Chemistry, and Mr. Philip Heimlich, instructor in Drawing.

Mr. Faurot is a graduate of the University of Nebraska, receiving the degree of M.A., and has done graduate work in Germany. He served as librarian at Rose from 1896 to 1901, and has since been instructor in German at Morgan Park Academy.

Mr. Heimlich graduated from a Technical High School in New York City, and completed the architectural course in the University of New York, receiving the B.S. degree.

Mr. Cary comes from Middlesboro College, Connecticut, where he received the degree of B.A. in the scientific course in '09.

TESTING OUTFITS FOR COLLEGE LABORATORIES*

By E. P. Edwards, '99.

Few of us possess more than a vague realization of the magnitude and importance of our educational system and its far-reaching influence on the growth and progress of the country.

A better appreciation of the subject will be gained by a glance at the following table of statistics:

UNIVERSITIES, COLLEGES AND TECHNICAL SCHOOLS IN THE UNITED STATES.

Number of institutions	500
Value of grounds and buildings	$240,000,000
Income (1905-1906)	40,705,120
Value of scientific apparatus	28,000,000
Number of students enrolled	250,000
Number of instructors	22,000

With these figures before us it does not require a vivid imagination to picture the mutual advantage to be gained by close coöperation between these institutions and the representative manufacturing concerns of the country. Only by such coöperation can the educational institution keep abreast of the times and advance the best interests of its students. From the manufacturer's standpoint this is a "consummation devoutly to be wished"; for his recruits must be drawn largely from the graduates of these institutions.

With this in mind, the General Electric Company has cultivated a close relationship with leading technical institutions, and each year takes into its Testing Department from two hundred to two hundred and seventy-five graduate students.

In normal years the testing force consists of between five hundred and six hundred men, representing from seventy-five to one hundred educational institutions. These men are trained to have an intimate familiarity with every class of electrical apparatus, and from their ranks the most capable are selected to fill positions in the engineering and commercial departments of the company.

This practice has met with such marked success that the company has extended its policy in an endeavor to reach, indirectly, the whole student-body. The means adopted for accomplishing this end may be enumerated as follows:

First—Laboratory sets have been developed with particular reference to the varied requirements met with in the educational field. These sets embody in the one piece of apparatus the salient characteristics of several commercial machines. The low price at which they are offered places them within the reach of every technical school.

Second—Every consideration is given to requests for quotations on apparatus intended for use in the laboratory or for purposes of instruction, and in quoting prices on such apparatus the General Electric Company freely sacrifices material profit as its contribution to the cause of advanced science.

Third—The company and its personnel is always ready to assist with advice and such technical data as may be properly given out.

Fourth—The factory is always open for inspection, and graduating classes with their in-

* See editorial column.

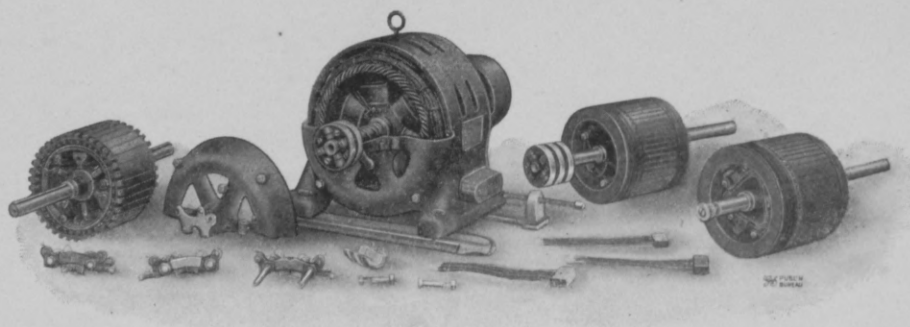


Fig. 1. Polyphase Generator A H B 6-7.5 Kw. 1200-220 Volts.

structors are given every facility to thoroughly inspect the works.

Fifth—Display boards showing standard products of manufacture are available for exhibition purposes, and will be supplied at consistently low prices. One such board is shown in Fig. 8.

A detailed description of the laboratory sets above referred to may be of interest and is appended.

POLYPHASE GENERATOR.

This is a 6 pole, 7.5 kw., 1200 r.p.m., 220 volt, 60 cycle machine, and is designed to operate either as a polyphase alternating current generator, a synchronous motor, an induction motor, or a frequency changer (Fig. 1). The following parts are supplied with the set to make possible its operation as any of the above-named machines:

One stator, for use either as an armature of an alternating current generator or as an induction motor field.

One revolving field.

One squirrel cage, form "K," induction motor rotor, with starting compensator having self-contained switches.

One form "L" induction motor rotor, with self-contained starting resistance.

One form "M" induction motor rotor, with three-phase collector rings, external resistance, and controller.

Special Features of Adaptability.

The stationary armature is provided with a twelve-terminal connection board, to which each section of the armature winding is brought out. This will permit of the following combinations when the machine is operating as an alternating current generator:

7.5 kw., 12-phase diametrical, 110 volts.
7.5 kw., 6-phase diametrical, 220 volts.
7.5 kw., 3-phase "Y," 380 volts.
7.5 kw., 3-phase delta, 220 volts.
7.5 kw., 2-phase, 310 volts.
5.0 kw., single-phase delta or "Y," 380 volts, 220 or 310 volts.

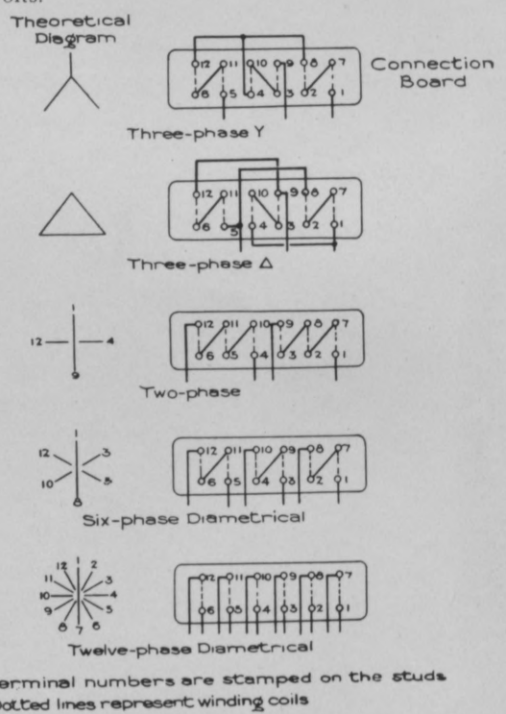


Fig. 2. Diagram of 12-Terminal Connection Board, Showing Various Voltage Combinations.

Fig. 2 indicates how these voltage combinations may be obtained from the connection board.

When these voltages are impressed on the armature from an outside source, the machine may be operated as a synchronous motor.

The three types of induction motor rotors represent different commercial forms, and can be used to investigate the characteristics of the following machines:

7.5 h.p., 3-phase "Y,"	220	volts.
7.5 h.p., 3-phase delta,	127	volts.
7.5 h.p., 2-phase,	190	volts.
7.5 h.p., 6-phase diametrical,	127	volts per phase.
5.0 h.p., single-phase "Y,"	285	volts.
5.0 h.p., single-phase delta,	165	volts.

This set is also capable of operating as a frequency changer when using the form "M" rotor, the frequency depending upon the speed and the direction of rotation. If the form "M" rotor is driven at normal speed in the opposite direction to that in which it would revolve as a motor, a frequency of 120 cycles and a voltage between collector rings of approximately 145 volts may be obtained, when normal three-phase voltage at 60 cycles is impressed on the stationary armature.

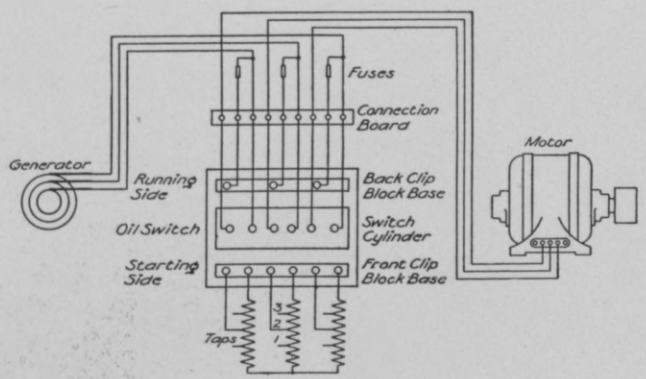


Fig. 3. Compensator Connections for Three-Phase Motor.

When run with the form "K" rotor, the machine typifies the motor which is ordinarily used when a large starting current is not especially objectionable. By means of a starting compensator the initial rush of current is cut down to reasonable magnitude. The compensator connections for a three-phase motor are shown in Fig. 3.

In using the form "L" rotor set a self-contained starting resistance is gradually cut out of the rotor circuit, as the machine comes up to speed, by means of a small handle at the end of the shaft.

With the form "M" rotor the use of the three-phase controller and external resistance allows resistance to be cut into or out of the armature—thereby decreasing or increasing the slip—and permits operation as a variable speed motor. The connections and development of a controller for use with this rotor are shown in Fig. 4, and an outline view with approximate dimensions is given in Fig. 5.

Construction of Machine.

Much thought has been spent in deciding upon a convenient arrangement for this machine. It

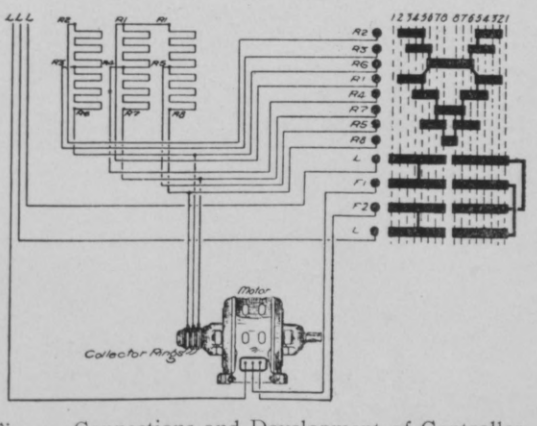


Fig. 4. Connections and Development of Controller for Use with Form M Induction Motor.

possesses a wide range of voltage and outputs ordinarily not obtainable except with several different units. It occupies the least possible space,

and its weight is such that the revolving parts can be shifted by hand. The conductors on the stator and on the induction motor rotors are imbedded in slots, the coils being form-wound, separately insulated and tested, and interchangeable. The revolving field is equipped with short-circuiting collars under the pole tips, to insure successful operation as a synchronous motor. The stator and rotors are built up of laminated steel. The bearings are contained in end shields, are self-aligning, and are lubricated by means of oil rings. One of the end shields is so designed that the revolving field and form "M" rotor can be removed without taking off the collector rings.

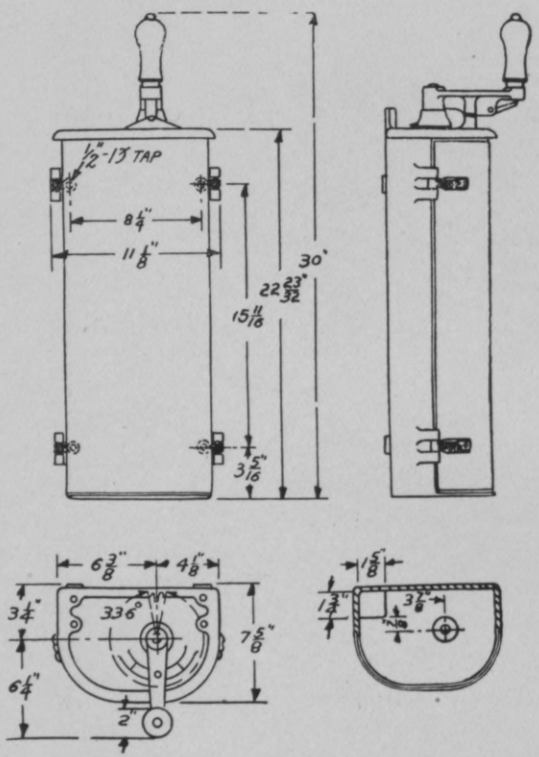


Fig. 5. Outline of Controller for Use with Form M Induction Motor.

The spring plug terminals for changing the terminal connections constitute another practical feature, and render it possible to make rapid and positive connections without the use of a wrench or screw driver. The electrical design is such that the e.m.f. wave of the generator is practically a sine wave. The field excitation is approximately 1 kw., at 125 volts.

Floor Space and Weights.

The approximate floor space of this set over all, including wooden base, is 42 in. by 19 in. The approximate net weights are as follows:

Stator	450 lbs.
Revolving field	255 lbs.
Form "K" rotor	160 lbs.
Form "L" rotor	200 lbs.
Form "M" rotor	200 lbs.
Pulley and rails	70 lbs.

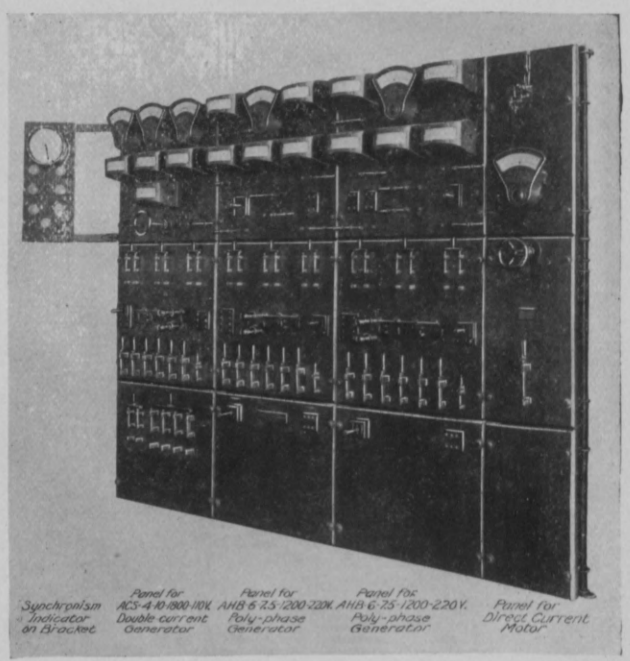


Fig. 6. Switchboard Panel for Double Current Generator.

DOUBLE CURRENT GENERATOR SET.

This is a shunt wound machine, and is rated, in the nomenclature of the General Electric Company, ACS 4-pole, 10 kw., 1800 r.p.m., 110 volts. The rotating element consists essentially of a direct current armature, with leads connected to slip rings located at the opposite end of the armature from the commutator. It is furnished, when desired, with speed-limiting and end-play devices, and with rheostats for field control and for starting from the D.C. end.

Construction of Machine.

The machine has the usual desirable features of General Electric apparatus, being representative of their standard rotary converter construction. The armature conductors are imbedded in slots, the coils being machine made, separately insulated and tested, and interchangeable. The commutator and brushes operate well under all conditions of load, and ample ventilation of the rotating part is insured by the presence of ventilating ducts. The brushes are provided with flexible conductors for connection to brush holders and allow free movement of the brush in the holder, at the same time maintaining good contact. The pole pieces are of laminated steel and are separate from the magnet frame; they are furnished with copper bridges and collars to insure stable operation when the machine is run as a synchronous motor or rotary converter. The bearings are self-aligning and the frame is divided horizontally; the assembly of this machine is, therefore, a simple process. A driving pulley is mounted on an extended shaft, as shown.

Special Features and Adaptability.

The double current generator is provided with six collector rings, an arrangement that permits of single, two and three-phase operation.

The generator can be operated as a 60-cycle machine with voltage variation of from 110 to 160 volts on the D.C. side, under any of the following conditions:

(1) *As a Rotary Converter.*

Machine will give approximately the following voltages:

Direct current, 110 to 160 volts.

Three-phase, 70 to 102 volts, with leads taken from rings 1, 3 and 5.

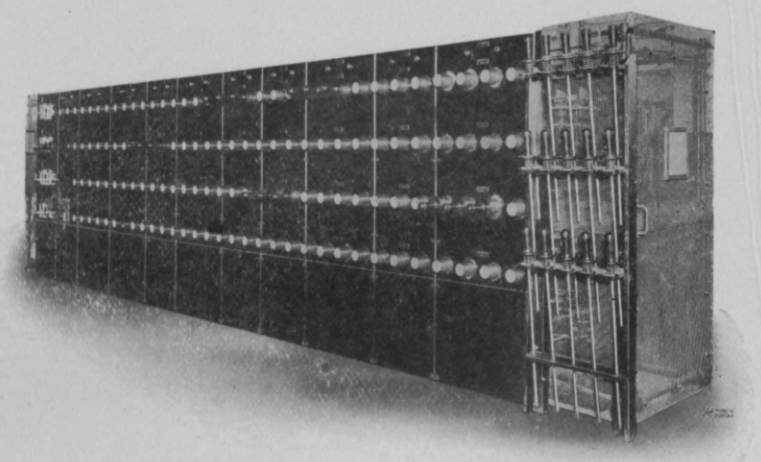


Fig. 7. Plug Switchboard in Use in Testing Department of General Electric Company.

Two-phase, 81 to 115 volts, with leads taken from rings 1 and 4, 2 and 6.

The above voltages are the minimum and the maximum, respectively, of the range for which the machine is designed. When run as a rotary converter there will be but slight change in voltage ratio (A.C. to D.C.) with change in the load.

(2) *As a Double Current Generator.*

The machine can be operated at all the voltages mentioned under heading (1) with the following additions:

Single-phase, 81 to 115 volts, with leads taken from 1 and 4 or 2 and 6.

Additional single-phase voltage of 70 to 102 may be obtained from rings 1 and 5, 3 and 5, or 1 and 3; these voltages being secured by varying the shunt field excitation with the field rheostat.

(3) *As a Direct Current Generator.*

The machine has a range of from 110 to 160 volts.

(4) *As an Alternating Current Generator.*

The machine is designed for operation at voltages mentioned under headings (1) and (2).

(5) *As a Direct Current Motor.*

The machine will operate on 110 to 160 volt circuits.

(6) *As a Synchronous Motor.*

The machine is designed for operation on circuits of approximately the voltages mentioned under heading (1).

(7) *As an Inverted Rotary Converter.*

The machine will operate with the same voltages as mentioned under headings (1) and (2).

With these voltages the machine is capable of successful operation as a rotary or as a generator,

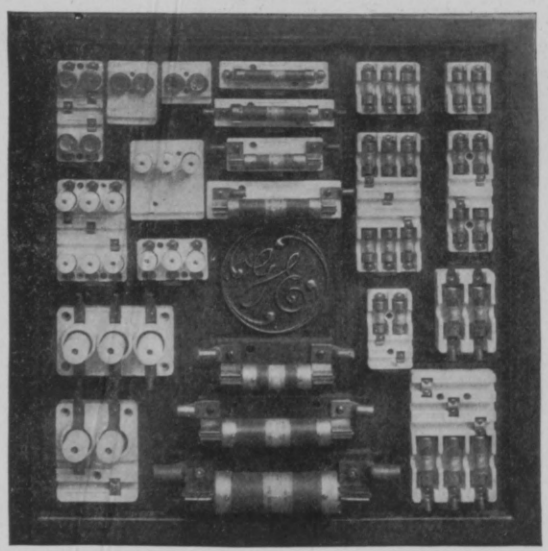


Fig. 8. Display Board of Standard Fuses.

with an output of 10 kw., except when operated single-phase. When this is the case its capacity is 7.5 kw. When used as a synchronous motor its capacity is 10 h.p., and 7.5 h.p. when run from polyphase and single-phase mains respectively.

Floor Spaces and Net Weights.

The approximate over-all dimensions are: Length along shaft, 4 ft. 5 in.; width, 4 ft. 6 in.; height, 3 ft.

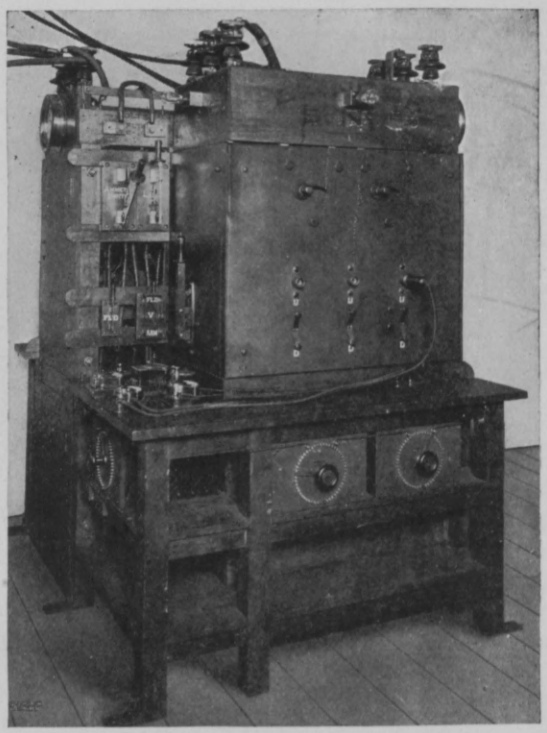


Fig. 9. Testing Table Used in Testing Department of General Electric Company. Front View.

The approximate net weights are as follows:

Armature and commutator	200 lbs.
Machine complete with pulley (without rails)	1500 lbs.
Rails	70 lbs.

This machine can also be furnished shunt wound for 230 volts, in which case it is rated ACS 4 pole, 10 kw., 1800 r.p.m., 230 volts. It is not designed for such wide range of voltage as the first machine, although it is capable of full kilowatt output at 220 volts. It may be operated in exactly the same manner as the 110-160 volt double current generator, but the A.C. voltages will be as follows:

Three-phase, 146 volts, with leads taken from rings 1, 3 and 5.

Two-phase, 167 volts, with leads taken from rings 1 and 4, and 2 and 6.

Single-phase, 167 volts, with leads taken from rings 1 and 4, or 2 and 6.

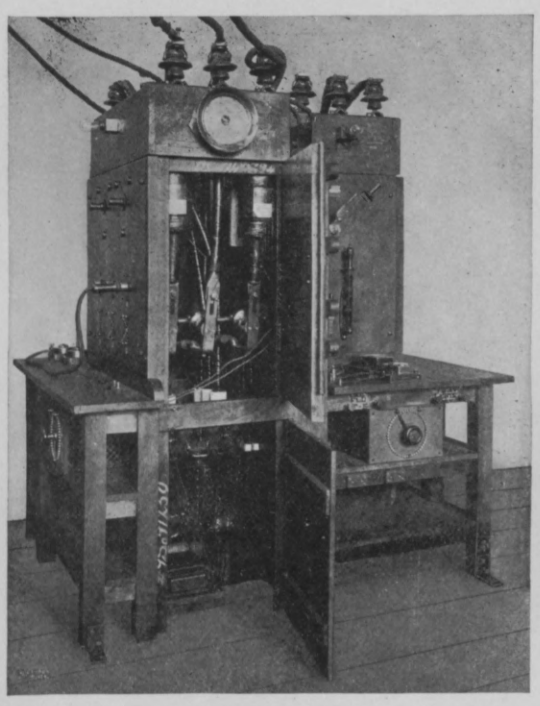


Fig. 10. Testing Table, Showing Interior.

Additional single-phase currents of 146 volts may be obtained from rings 1 and 5, 3 and 5, or 1 and 3.

SWITCHBOARD.

For the purpose of properly controlling the sets above described, switchboard panels have been designed (Fig. 6). The advantages of these switchboards can not be overestimated; the student becomes acquainted with the methods employed in modern switchboard manufacture and operation, gaining at the same time an insight into the wiring and arrangement of meters, switches, etc.

Another method of control, which, however, is not so well adapted to small installations, is that used by the General Electric Company in its Testing Department. This system involves the use of a plug connection board, shown in Fig. 7, and the testing tables, views of which are shown in Figs. 9 and 10.

The machines to be tested are temporarily located at various points in the different buildings used for testing purposes, and in the immediate vicinity of a testing table. These testing tables are connected to the plug board by cables laid in ducts. The leads from the generators furnishing current for testing are also run in ducts to this plug board, and any testing table may be connected to any generator, irrespective of its location, by using the proper combination of plugs.

The plug board and the tables are constructed of slate, and inclose the oil switches, transformers, and such other apparatus as is subjected to high potential.

Portable instruments are used, and all cables are run under the floor. With this system, danger is reduced to a minimum and the greatest flexibility is secured.

A similar scheme may be used in the college laboratory, but it is usually found that the standard switchboard best meets laboratory requirements.

THE CHEMICAL LABORATORY IN CONNECTION WITH AN IRON MINE

By Frank W. Armstrong, '09.

You may wonder what connection chemistry has with iron mining, and not knowing what value it is really given, be surprised with some of the facts which I shall set forth. The laboratory in connection with the mine of the Oliver Iron Mining Company at Virginia, Minn., costs, in round numbers, $1,500 per month for running expenses, and the up-keep of every other laboratory on the Mesaba Range is in proportion. This seems, at first glance, a very unnecessary sum to spend for this purpose, but really its value is far greater than that. If it were not, no such successful company as the Steel Trust would expend that much more monthly without getting good returns. The ore is all shipped on analysis, and also the testing and exploiting of new fields depend entirely for their future value upon the analysis of the ore.

Most of the companies on the range have their own well-equipped laboratories in connection with each mine, but some of the smaller concerns still depend upon public laboratories for their analyses. Most of them only have a determination run on the iron content, and for each of these they pay fifty cents. This is so much money for an operation which costs the chemist less than five minutes' work. Is it any wonder, then, that the larger companies, making large shipments of ore daily, have gone to the expense of fitting out so many laboratories?

In all of these places there is rush and bustle all day and all night, for the shovels are working all of the time, and the ore must be analyzed continually, to see if it is always fit for shipment. In most cases four determinations are run on each sample. To explain this process I will take, for example, the Oliver laboratory, where I am employed. The mine here ships on an average of fifteen thousand tons of ore daily, pulling it out in drags of from three hundred to five hundred tons each. Every drag is sampled, and the sample analyzed for iron, manganese, phosphorous, and silica. This analysis must be made before a train, which consists of five drags, and therefore contains five samples, reaches the docks at Duluth, which gives two hours for the sampling, grinding, drying, and analyzing. The drag comes up out of the mine, usually being ten steel ore cars,

and is sampled in the yards. This sample is then carried to the grinding house, where the moisture is determined after it has been ground to powder. It then goes to the laboratory, where it is weighed up by boys into beakers and given to the chemists. The iron is determined first, as the drag can not leave the yards until this is done, as no ore running under 50 per cent. iron is shipped. As a rule, it is less than a half hour from the time that the steam shovel finishes loading the cars that the iron content is known to within one hundredth of 1 per cent. The other constituents tested for do not have to be ready this soon, but always in less than two hours after the departure of the train for the docks the analysis is complete and the result telephoned into the graders, who mix the trains in the boats, so as to get a uniform standard of ore.

This would make thirty or forty car samples, as the foregoing are called, in a day. Besides these, there are many more for determination. Always exploitation is being carried on in the pit, and a large number of drill samples are brought in daily. Then, when the result of mixing the ore in a boat at Duluth is known, an average of the car samples is made up, and the analysis of this is made, which must check with the figured average. Also each morning an average sample is made up of the ore which has gone out on the previous day, and the analysis of this must tally with the figured average results. In this way a constant check is kept on all results, so not only the greatest speed, but also the greatest accuracy is necessary.

Bearing all these facts in mind, you will probably see that the chemical side of the mining is a big one, and the chief chemist is practically lord of the mine, for he can stop the shipment of any train of ore, and he can also stop the digging in any spot if the ore does not come up to standard. The entire mine is run and regulated by the different analyses as given out by the laboratory, so it is certainly a necessary adjunct, as without it the company working the mine would have no idea whether they were making money on their investment or not. Therefore, do you still think that $1,500 per month is an exorbitant price to pay for such a department?

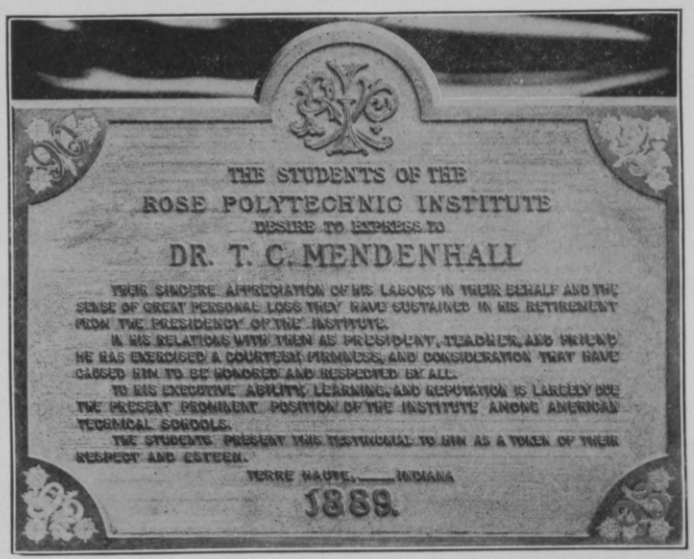
Now as to the methods and interpretation of results used in the Oliver laboratory here. Each laboraory uses methods devised by the chief chemist, although they are essentially the same. The main thing is to combine accuracy with speed, and all the different methods accomplish this. For the iron determination the ore is dissolved in hydrochloric acid, and then reduced with a solution of stannous chloride. The amount is then titrated with a standard permanganate solution, and from tables provided for the purpose the percentage read directly. For manganese the ore is dissolved in hydrochloric acid and evaporated to dryness, taken up with nitric acid, and the manganese precipitated with potassium perchlorate as manganese dioxide. The amount of this is determined by dissolving it in a known amount of standard hydrogen peroxide solution, and the excess of this titrated with permanganate. The manganese in the mine here runs all the way from five-tenths to eight per cent. This element is not objectionable in the ore, as it has a value in the making of steel. The silica is determined gravimetrically by dissolving out everything but the silica, and after weighing, this residue evaporating it off with hydrofluoric acid, and weighing the crucible again. The average per cent. of silica is between two and fourteen, and as its presence is objectionable, no ore is shipped which runs much above the higher figure. Phosphorous is determined by precipitating it as ammonium phospho-molybdate, dissolving this in a known amount of standard sodium hydrate solution, and titrating the excess with standard nitric acid. Alumina is also determined on a few samples.

These methods are all very short, and six men, working in two shifts of ten hours each, can turn out a hundred samples in the twenty hours. One man runs the iron and manganese, another the phosphorous, and another silica, and on some amples alumina. Needless to say, with this work there is very little chance for loafing on the job.

The ore mined at the Oliver mine nearly all

finds its way to the furnaces of the Illinois Steel Company at South Chicago by boat from Duluth. At the South Chicago docks it is again analyzed, and the results found there should tally with those obtained here. The mine here is an open pit, with six big steam shovels working most of the time. However, a large number of the mines on the range are underground works, and the ore is brought to the surface in hoists. A very large number of college men are employed as engineers and chemists by the different companies, the most of them from the Michigan College of Mines.

ALUMNI NOTES.



CHICAGO, May 6, 1909.

TO MEMBERS OF THE CLASSES OF '90, '91, '92 AND '93 OF ROSE POLYTECHNIC INSTITUTE.

Gentlemen: You will doubtless remember that in December, 1889, we presented to Dr. T. C. Mendenhall a bronze tablet, a cut of which is shown herewith. It is proposed that we join in having a replica made in bronze of this tablet, properly mounted, and placed in the main building at the Institute. Such a mural tablet would be a fitting testimonial to Dr. Mendenhall and a happy reminder of our four classes in the Institute.

This replica should be about 14″x18″, and properly mounted as a mural tablet, with a brass plate stating that the replica was erected in 1909 by the Alumni of our four classes.

The cost of this tablet in place should not exceed $150. There are seventy-four living Alumni of our classes listed in the latest catalogue, six of whose addresses are uncertain. If practically all join in this, the expense will not be over $2.50 each.

If you approve of the scheme, send us your check, or a money order for $2.50 made in favor of any one of the signers of this letter. If the scheme falls through your money will be returned to you, or if more is raised than needed, a rebate will be made pro rata.

Yours very truly,

T. L. CONDRON, '90. B. R. SHOVER, '90.
J. S. COX, '91. R. L. MCCORMICK, '91.
W. A. LAYMAN, '92. A. W. WICKS, '92.
H. S. HART, '93. A. M. HOOD, '93.

CHICAGO, October 1, 1909.

TO THE ALUMNI OF CLASSES '90, '91, '92 AND '93 OF ROSE POLYTECHNIC INSTITUTE.

Gentlemen: Regarding the Mendenhall tablet matter, I have received subscriptions of $2.50 each from thirty-nine of the seventy-four members of the classes of '90, '91, '92 and '93. This gives us hardly enough money to carry out the project as originally outlined.

I believe, however, we can get a few more subscriptions, probably enough to bring the total up to $100, and my proposition is, to raise as much more as we can within the next thirty days, and then place our order for the tablet, to include, also, a plate under the tablet on which to engrave the names of those subscribing to the fund. The engraving of these names will be a very small expense, and certainly only those who contribute should receive credit for the tablet.

Will you kindly send your check for $2.50 if you approve the proposition?

Awaiting your advice, I remain,

Yours truly,

COMMITTEE.

* * *

B. R. Shover, of the Class of '90, who is the engineer in charge of the Indiana Steel Company at Gary, Ind., while experimentally operating a machine had the misfortune to have a flying piece strike his eyeglass, the glass entering the eye and cutting it so badly as to require its removal. He has sufficiently recovered to take charge of his work.

* * *

W. J. Davis, '92, is now located at San Francisco, Cal., care of the Union Trust Building. He is in the employ of the General Electric Company.

* * *

D. D. Wright, '05, who has been connected with the Sales Department of the Westinghouse Electric and Manufacturing Company at Pittsburg, was recently transferred to the Industrial and Power Department of the same company at Columbus, Ohio.

A. W. Lee, '06, is teaching the classes in Electricity at the Louisville Y. M. C. A. Night School this winter. He is connected with the Power Department of the Louisville Lighting Company. Mr. Lee recently visited in Terre Haute.

* * *

Mr. George Kelsall, '06, is teaching at East Lansing, Mich.

* * *

J. C. Johnson, '09, who is in the employ of the Indiana Steel Company at Gary, Ind., visited in Terre Haute recently.

* * *

O. L. Stock, '08, is connected with the Maintenance of Way Department of the Chicago & Eastern Railroad, with headquarters at Chicago.

* * *

Martin E. Heim, of the Class of '09, is with the Western Motor Company, of Marion, Ind.

* * *

E. T. Buckley, '09, and Mr. L. C. Kerrick, '08, are at present located at Wilkinsburg, Pa.

* * *

R. L. Smith and Mr. C. W. Piper, both of the Class of '09, are with the Westinghouse Electric and Manufacturing Company, Wilkinsburg, Pa.

* * *

F. H. Cash, '07, is employed as Engineer for the Republic Iron and Steel Company, with headquarters at Virginia, Minn.

* * *

The Pittsburg Rose Tech Club was organized at the German Club in Pittsburg on June 1, 1909. The following officers were elected:

President—Brent Wiley, '98.

Vice-President—J. Simms Brosius, '03.

Secretary and Treasurer—Edward D. Frohman, '94.

S. S. Wales, '91, was elected representative

to the twenty-fifth Commencement and Alumni meeting, held at that time.

During the summer months the Pittsburg Club has kept up interest in Poly affairs by meeting once a month at lunch, where such matters as came up could be discussed under proper conditions. These meetings were very much enjoyed by those attending, the average attendance being about ten. A business meeting and smoker is planned for the middle of October, when a time and place will likely be fixed for regular business meetings.

* * *

The Alumni editor would like very much to have reports of the meetings of the various Rose Tech Clubs in the country. We have some post cards printed specially for Alumni notes, and will be glad to send them out to any one who will take the time to write us a few notes. Can't you use a few?

* * *

The Alumni article in this number of THE TECHNIC was written by Frank W. Armstrong, of the Class of '09. "Army" is employed as a chemist by the Oliver Ore and Mining Company, of Virginia, Minn. He expects to do some writing along Athletic lines for the Duluth (Minn.) papers this winter.

* * *

Amos D. Pritchard, '09, one of the mainstays of the 1908 football team, is with the General Electric Company at Schenectady, N. Y.

* * *

E. W. Klatte, '09, is employed at the Toledo plant of The American Bridge Company.

* * *

Roy Stephens, '09, is with the Vandalia Railroad, with headquarters at Effingham, Ill.

* * *

H. B. Hammond, '09, is located at the Cincinnati works of the Allis-Chalmers Company, Norwood, Ohio.

I. R. Ralston, '09, is at present in the employ of The Riter-Conley Company, Pittsburg, Pa.

* * *

Claude L. Douthett, '09, has recently accepted a position in the Maintenance of Way Department of The Frisco, with headquarters at Monnett, Mo.

* * *

W. E. L. Bock, '09, is with the Jefferies Manufacturing Company, Columbus, Ohio.

* * *

James N. Johnson, '09, is with the Allis-Chalmers Company at Milwaukee, Wis. Jimmy was married soon after the Commencement to Miss Ruth L. Gaylord, of Pasadena, Cal.

* * *

Claude E. Cox, '02, and W. H. Brannon, Jr., '09, have established a branch of the Wilcox Auto Truck Company in Minneapolis, Minn., where a part of the product of this company will be manufactured.

* * *

J. B. Schickel, who has been in the employ of the General Electric Company at Schenectady, N. Y., was a spectator at the Eastern Illinois game Saturday, October 2d.

* * *

V. S. Calvin, ex-'10, has accepted a position with the Vandalia Railroad, with headquarters at St. Louis. He expects to be back in school next year.

* * *

Notice of the weddings of the following alumni have been handed us: Mullet, '04; Hahn, '04; Lindaman, '08; Knopf, '08; Sievers, '08; McCormick, '08; J. N. Johnson, '09.

* * *

William Hadley, '01, who is connected with the Electrical and Mechanical Departments of the Panama Canal, and has been spending his vacation in the States, sailed from New York October 8th.

H. E. Schmidt, '08, is now Chief Chemist for the La Rue Ore and Mining Company, Nashwauk, Minn.

* * *

The Alumni editor has received a miniature envelope containing a tiny card tied with white ribbon and engraved with the following:

ROBERT FRANKLIN GARRETSON, JR.
SEPTEMBER 13, 1909.
MR. AND MRS. ROBERT FRANKLIN GARRETSON.

* * *

Miss Lydia Grossenbach, daughter of Mr. and Mrs. G. W. Grossenbach, of Milwaukee, was married to Howard A. Mullett, '04, of Kansas City, in Milwaukee, on September 8th. It was a home wedding and one of the prettiest of the season. Miss Grossenbach was popular in society.

Miss Olga Kossuba, of Milwaukee, was maid of honor, and Robert D. Heine, of New York, best man. W. D. Ingle, '03, of Evansville, Ind., was among the guests.

Mr. Mullet was one of the most popular and prominent men of his class. He won both the Heminway medals. After graduation Mr. Mullet served an apprenticeship with the Westinghouse people, later accepting a position with the Milwaukee Street Railroad Company. He is now Electrical Engineer of the company and temporarily Assistant Superintendent of the rolling stock.

THE DEVELOPMENT OF THE CANNING INDUSTRY

By Earl D. Hay, '10.

The preservation of foods by sterilization in hermetically-sealed containers is a comparatively new industry, yet it has been developed so rapidly that it is now one of the leading industries in many parts of the world. About 115 years ago the French Government made an effort to find out some means of preserving foods in a wholesome manner and to keep them in as nearly fresh condition as possible; for, by pickling and drying, which were the only means used before that time in preserving perishable foods, the quality and flavor of the goods were greatly impaired.

About the year 1795, at which time the Reign of Terror was at its height, the French Government offered a prize of 12,000 francs for the best method of preserving fruits, vegetables, and other elementary articles without pickling or dessication. The French Minister of the Interior, M. Montilivet, acting on the report of the Board of Arts and Manufactures, granted to M. Nicholas Appert the award of 12,000 francs. This award was made in 1810. The recipient was required to furnish in book form a true copy of his process and methods for the benefit of the world in general, and M. Appert complied with this requirement before receiving the money. Even though he was the originator and founder of this industry, it appears that he mastered his art so well and practiced it with such care that he accomplished results which have been possible with modern methods. M. Appert spent his prize money and his savings as well through further investigation and research for the benefit of the new industry, and he died a poor man. But the French Chambers, after his death, recognizing the utility of his discovery to mankind in general, virtually placed his name among famous men by creating his son a Chevalier in the Legion of Honor. The French Government also ordered a life-size bust to be made of him, which is said now holds an honorable place in the office of the Secretary of the Interior.

But the development of a century has virtually changed the utensils and broadened the methods of Appert under the pressure of American business, so that a view of his simple utensils and process room, so to speak, would provoke a smile to-day.

Until about the year 1809 the only containers in use in the industry were of earthenware, when at this date an English tinplate worker took out a patent for a vessel of tinplate for use in the preservation of hermetically-sealed goods. With this invention the canning industry, so called from the container used, took on a new life and became a prominent industry by reason of the possibilities which were now opened up for it. And throughout the last century, which has marked the growth of the industry, the development of the machinery used in the manufacture of the cans and the can itself has kept an equal pace with the industry itself. At first the containers were soldered on the inside of the seams. This resulted in many cases of lead poisoning when the contents were of a strong acid nature, or when fermentation took place on account of insufficient sterilization of the contents. The cans were next soldered only on the outside, as is now required by law, and for some classes of goods inside-enameled cans are used. At the present time the can which is growing into popular favor is what is known as the "sanitary" can, which is not soldered at all, but is made and sealed by crimping the edges together in a special die press.

In the beginning of the industry we find the packers using methods which put one in mind of the ancient alchemists, as it seems there was a great deal of ignorance displayed regarding the processes employed, yet each packer jealously guarded his processes and kept his formulas secret lest some one else should use them and destroy his trade. At first all of the work was done by hand, and, as the exact conditions for complete sterilization were unknown, a large amount of goods were lost by fermentation, which made the cost of manufacture very high. In recent years, however, we find the feeling of distrust rapidly dying out among the packers, and, as the men in other enterprises have done, they have joined themselves together in national organizations for the mutual benefit of all. In this manner they materially help one another, and there results a lowering in cost of manufacture.

In the United States the articles packed most extensively are tomatoes, corn, and peas; but, since the packing of these articles occupies but a small portion of the year, the equipments of most factories are so arranged that any number of side lines may be run the rest of the year so as to reduce the per cent. of the fixed annual charges on the few weeks' operation of the plant which would otherwise result.

THE PACKING OF TOMATOES.

It has not been a great many years since the time when the tomato, or love apple, as called by the Germans, was considered only as an ornamental plant and unfit for food, but now it is the most important of any single thing packed, and has been termed "the poor man's meat" from the amount consumed by the working classes. The yearly pack of the United States now lies between ten to twenty million cases of twenty-four cans each. Tomatoes are the most important article packed in Indiana, and Indiana tomatoes rank high on the markets, owing to their fine quality. The entire operation of packing tomatoes except the peeling and processing, in plants with up-to-date installations, is carried on with automatic machinery. The tomatoes are first placed in a washing and scalding machine, where they are washed and scalded, and then they are carried by conveyors to the peelers. After they are peeled the tomatoes are graded and fed into the can-filling machine. This machine fills the cans and delivers the full cans to an exhausting machine, where they are heated up to about 170 degrees F. on the outside. Next the cans are wiped off, the cap, or lid, is placed on the can, and the soldering flux is applied by automatic machines in order and then delivered to the capping machine. The capping machine solders the lids on the cans and an automatic tipper closes the vent in the cap. The cans are next inspected and then delivered to the processing room. After the tomatoes are cooked the required length of time the cans are cooled down in a cold-water bath to prevent further cooking. The cans are then placed in the

warehouse to season, after which they are labeled and boxed by automatic machines.

There are three methods of processing or sterilizing the goods in the can in common use. The first is called the open-bath process, in which the cans are placed in large vats or kettles filled with water and boiled with steam at atmospheric pressure, or 212 degrees F. This is the slowest method, but it does very well for tomatoes which are sufficiently sterilized at a temperature of 170 degrees F. The next method is by cooking with steam under pressure of 10 to 15 pounds gauge, which gives a temperature of 240 to 250 degrees F. The cans are placed in what is called a closed retort, which is a vertical boiler with the top head held by clamps, and subjected to the steam pressure. By this means the length of time of sterilization is greatly reduced, and the contents of the can are not cooked down so much as in the first case. A third system which has given very good results is called the automatic calcium process. A calcium chloride solution of sufficient density to boil at a temperature of 240 degrees to 250 degrees F. is placed in a long tank and heated by steam coils. The crates of cans are carried by conveyors through this tank at such a velocity that the cans will be heated to the right temperature before emerging from the tank. There have been methods of sterilizing by means of electricity attempted, but as yet they have no practical importance.

The packing of corn and peas requires a much larger equipment and a greater amount of room than a tomato factory. The processes are somewhat similar, only far more complicated, especially in the grading and processing. Corn and peas to be successfully packed must be processed at a temperature of 250 degrees F. Great care must be exercised in the cooking of the corn and in the cooling of the cans, or the corn will be darkened. This is due, some say, to the liberation of hydrogen sulphide, which acts upon the tin of the can, forming stannous sulphide, which gives the corn about the sides of the can a dark color. The packing of these articles has advanced materially in the last decade by reason of the invention of new machinery and the improvement of the older types. In going over the recent improvements in this line of machinery one can not help but notice the great ingenuity of the inventors and designers in meeting certain conditions which have confronted them. And the end has not as yet been reached. There is a great field of opportunity open to the ambitious designer who finds such problems suits his fancy.

Along with the improvement of the machinery there has been a marked advance in the construction of the packing houses themselves, and a consequent improvement in sanitary packing. This advance was hastened in a way by the recent pure-food agitation, which, though extreme in a few cases, has had a good effect nevertheless. A few years ago the typical packing house was of wood construction almost entirely, and the amount of sunlight which reached the interior was very limited. The floors were generally sloppy, and it was a hard job to make the place have an odor which would improve one's appetite. Now things are changed. The new buildings are of concrete and metal construction, and have good sewage systems, with drains conveniently located in the floors. This facilitates the cleaning of the building, which must be done twice daily. The new buildings, as a rule, have an extra large amount of glass surface, which makes the factory light and also aids the sanitary conditions with the large amount of sunlight which reaches the interior. The packers are beginning to understand that if they keep their places in a sanitary condition and use sanitary methods the presence of visitors does not decrease, but increases, the demand for their products. The writer had the opportunity, while making a visiting tour of some of the canning plants of the State, to examine an up-to-date plant for packing tomatoes, corn, peas, etc., at Greenwood, Ind. This plant is, in a way, the results of the efforts of one of the sons of Rose, Mr. O. E. McMeans, '96, who gave an account of its erection in THE TECHNIC of March, 1908.

THE CIVIL CAMP

By E. L. Ferrell, '11.

The civils of the Class of '11 first realized that they were Juniors when, on September 1st, they boarded a train with all the necessary equipment and soon found themselves at Marshall, Ill.

We had read of civil camps, and were going out to see what one really looked like. There were twenty-five in our party, including three reckless Sophomores, prompted by the spirit of adventure.

One-half the party was sent out to find board and lodging, while the others were trying to find just where they were "at."

The purposes of an expedition like this are manifold. Besides running tangent lines and staking out curves, one is expected to train himself to walk at least ten miles to and from work, to say nothing of the walk while at work.

It seems that the Vandalia Railroad was built through this section long before Rose Poly had graduated any civils, consequently it was full of short curves and heavy grades. Recently the Pennsylvania Railroad Company has decided to decrease its curves to a maximum of one degree and its grades to one per cent., and, of course, they could not afford to attack this job until the Rose civils said it could be done.

The work was divided into two sections, the east end and the west end. The proposed route led through woods, across valleys and creeks and through cornfields. These cornfields were a source of much trouble, especially in leveling and transiting. The transiting was obviated by an extremely ingenious contrivance made by Professor McCormick. It was a high tripod which elevated the transit above the corn.

After all lines were run and properly tied in, the topography was taken, "and the evening and the morning were the fourteenth day."

The most of our party found lodging at a little "'Wayside Inn," while the professors and some of the more aristocratic lodged at the village "Waldorf-Astoria."

Besides the many practical engineering truths we learned, we made a few discoveries and received a few forcible impressions. For example, we found by actual experiment that a human being can live two whole weeks on dry sandwiches. Perhaps the profoundest impression received by any of us was that received by Offutt when he attended the "Girl Question."

Few geniuses were revealed in the camp. Ker drew a prize for having the neatest notebook.

Being in camp also gives us a chance to become better acquainted with each other and to learn each other's peculiarities and inclinations. For instance, we would never have known that the timid Corbin and the pious Werst were the pugilists they are if it had not been for the civil camp.

Taking it all in all, the camp was a great success, and we enjoyed it very much. We will all have pleasant memories of these two weeks. Who could forget being chased off his premises by one of the irate natives? How could the

memories of Room No. 17 ever fade? Who can ever forget the earnest conversation Hoffner had with the mosquitoes in the woods by Big Creek?

The entire party is very much indebted to Mr. Pritchard for his courteous and hospitable treatment. Through his kindness we had an opportunity to meet the ladies of the town. This came very near being "Little Doc's" undoing. None of us wondered why he volunteered so quickly to go back to Marshall to take additional data.

Notwithstanding the fact that we enjoyed ourselves very much, no expressions of regret were heard when we boarded the train homeward bound, each bringing a souvenir of poison ivy.

It has been customary, heretofore, to have camp in June immediately after the close of school, but, on account of the rainy weather, it was decided to begin this year just two weeks before the opening of the fall term. We hope, for the benefit of those that come after us, that the change will be made permanent, as the weather and the students' mental condition seem much better suited to requirements of camp work.

THE FRESHMAN RECEPTION.

Owing to the fact that the orchestra was unable to organize and be prepared to furnish the music, the Freshman reception was postponed until Friday evening, October 1st, instead of being held on September 24th, as had been announced.

The gymnasium was very artistically decorated with old rose and white, pennants of numerous colleges, palms, and potted plants. Then, with this background, the Freshmen did their first social stunt at Rose.

The music was furnished by the Rose Orchestra, and refreshments consisting of punch, ice cream and cake were served by the young ladies who attended.

Many of the Faculty members were present with their wives, and helped the new students to feel that they were welcome to Rose.

THE FRESHMAN CLASS.

Columbus C. Adams, Dayton, O.
Wesley A. Archibald, Terre Haute.
Inscoe R. Bailey, Terre Haute.
Camille C. Bains, Terre Haute.
J. Mercer Beauchamp, Sullivan.
Edgar A. Bovell, Paris, Ill.
Albert F. Brennan, Indianapolis.
Warren H. Brewer, Terre Haute.
Fred W. Bringman, Pine Bluff, Ark.
Clarence A. Brown, Indianapolis.
Raymond Buck, Indianapolis.
Matthew R. Byers, Seelyville.
Joe C. Cooke, Ridgefarm, Ill.
Smith N. Crowe, Richmond, Ind.
Harry L. Deck, Girard, Ill.
Maurice R. Denny, Terre Haute.
George M. Derr, Williamsport, Pa.
Edwin J. Duggan, Grandview, Idaho.
Hanna K. Farah, El-Monsif, Syria.
Charles Garrard, West Union, Ind.
Harry H. Hardesty, Brazil.
Richard O. Headly, Palestine, Ill.
Leslie C. Helmes, St. Paul, Minn.
Earl E. Hughes, Terre Haute.
David B. Isenberg, Shelbyville, Ill.
Harold O. Kelley, Terre Haute.
Karl G. Kornmiller, Fort Wayne.
Russell E. Lawrence, Terre Haute.
Davis Levi, Portsmouth, O.
L. Wallace Lewis, Rosedale, Ind.
Ferdinand T. Loehninger, Dayton, O.
Richard D. Madison, Terre Haute.
Harry B. Messick, Terre Haute.
William Milne, Barre, Vermont.
Leo L. Newlin, Hutsonville, Ill.
Frank B. Newland, Terre Haute.
T. Arthur Novotney, Terre Haute.
Joseph E. O'Connell, Chicago.
Frank M. O'Loughlin, Terre Haute.
Wilbur M. O'Loughlin, Terre Haute.
Raymond M. Ostrander, Terre Haute.
George G. Overpeck, Rockville.
George M. Parker, Jr., Terre Haute.

Curtis Pendergast, Terre Haute.
Claude E. Reese, Terre Haute.
Arthur Rohm, Rockville.
Jospeh C. Roll, Terre Haute.
Reid Ross, Sullivan.
William C. Royse, Terre Haute.
Edward A. Scheffel, Louisville, Ky.
August F. Schweers, Louisville, Ky.
Jerry H. Service, Mishawaka, Ind.
W. Albert Shearer, Indianapolis.
William L. Sibley, Columbus, Ind.
Burt R. Simmons, Paris, Ill.
Arthur E. Staff, Terre Haute.
Herbert A. Smith, Terre Haute.
S. Irwin Stocking, Rockport, Ind.
Charles F. Ware, Dayton, O.
Kenneth V. Wood, Emporia, Kan.

DIRECTORY.

Senior Class:
President, James A. Shepard.
Vice-President, Seth T. Hadley.
Secretary, Herman J. Madison.
Treasurer, A. A. Piper.
Athletic Directors: S. T. Hadley, George F. Standau.

Junior Class:
President, E. E. Garst.
Vice-President, H. M. Kauffman.
Secretary, L. T. McKee.
Treasurer, C. E. Bell.
Athletic Directors: W. B. Shook, C. E. Hoffner.

Sophomore Class:
President, C. O. Fairchild.
Vice-President, J. C. Newell.
Secretary, W. R. Bell.
Treasurer, R. C. Rehm.
Athletic Director: H. O. Root, J. M. Lawler.

Freshman Class:
President, J. C. Roll.
Vice-President, W. A. Shearer.
Secretary, L. W. Lewis.
Treasurer, C. C. Baines.
Athletic Directors:

Student Council:
President, J. A. Shepard, '10.
Vice-President, N. A. Bowers, '10.
Treasurer, E. E. Garst, '11.
Secretary and Clerk, C. O. Fairchild, '12.

Athletic Association:
President, S. T. Hadley, '10.
Treasurer, W. B. Shook, '11.
Secretary, J. M. Lawler, '12.

Orchestra:
President, H. W. Henry, '10.
Vice-President, E. D. Hay, '10.
Secretary and Treasurer, W. B. Kuersteiner, '10.
Representatives to Symphony Club: C. O. Fairchild, '12; D. P. Savant, '12.
Instructor, Mr. Hugh McGibney.

Mandolin Club:
President, J. C. Newell, '12.
Secretary and Treasurer, D. M. Hubbard, '12.
Representatives to Symphony Club: W. L. Edwards, '10; H. O. Kelley, '13.

Glee Club:
President, C. G. Planck, '10.
Vice-President, Walter Voss, '11.
Secretary and Treasurer, W. H. Webster, '10.
Representatives to Symphony Club: E. R. Lawrence, W. H. Webster.

Symphony Club:
President, W. H. Webster, '10.
Secretary and Treasurer, J. C. Newell, '12.

Y. M. C. A.:
President, H. J. Madison, '10.
Vice-President, Seth T. Hadley, '10.
Secretary, A. L. Hyde, '12.
Treasurer, E. E. Garst.

Camera Club:

President, A. C. Rasmussen, '12.
Vice-President, H. O. Wimsett, '11.
Secretary and Treasurer, H. C. Uhl, '12.
Instructor, Prof. J. P. Peddle.

Scientific Society:

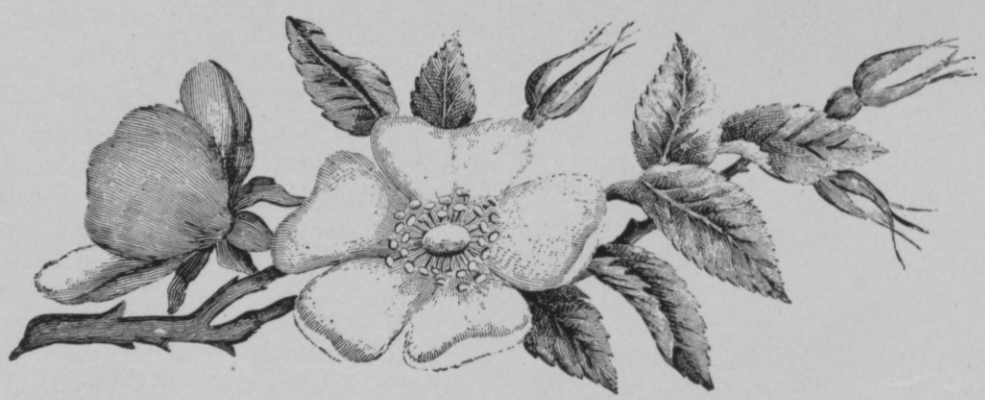
President, J. V. Davidson, '10.
Secretary-Treasurer, H. M. Kauffman, '11.
Senior Counsellor, W. L. Edwards, '10.
Junior Counsellor, T. E. Maddox, '11.
Faculty Advisors, Professors Howe and White.

Location of Fraternity Houses:

Alpha Tau Omega, 530 North Seventh Street; New 'Phone 2250.
Sigma Nu, 520 North Center; New 'Phone 1530.
Theta Si, 425 North Center; New 'Phone 1409.
Alpha Chi Sigma, 1107 North Eighth Street; New 'Phone 2437.
P. I. E. S., 802 North Seventh Street; New 'Phone 2596.
M. E. P., New 'Phone 1958.
V. Q. V., S. E. Corner Seventh and Locust, New 'Phone 608 C.

RAYMOND B. LANDRUM
Class of 1912
Died August 2, 1909

HARRY E. DRAKE
Class of 1911
Died August, 1909



...ATHLETICS...

Athletics at Rose this year seem to be very promising. The Freshman Class no doubt can be relied upon to furnish new men in all departments of athletics. At present nothing very definite can be predicted, but, judging from the way they *cleaned* the Sophomores, they surely are a capable set of *freshies.*

When the news that Backman, '10, had been engaged to pitch for the St. Louis Cardinals spread among Rose men, the second thought, following that of pride, seems to have been of the loss Rose would suffer. "Back" had been elected to the captaincy of both football and baseball teams for the season of '09-'10, and, of course, would be disqualified for further participation in amateur sports. However, it is a genuine pleasure to see Backman in school again, and, while we shall miss his broad figure in the thick of our athletic contests, we shall surely feel his influence in the organization and training of the teams.

Since so many college men are going into professional baseball, it seems likely that the Faculty Conference Rules will be revised so as to allow these men to play on college teams so long as they keep up their class work and do not violate the four-year rule. We realize the time is not quite ripe for such revision, but it is inevitable nevertheless.

The reason for college athletes forsaking their athletic standing in college for professionalism may be best expressed in the language of Mark Antony: "Not that they love the athletics of their Alma Mater less, but because they love the big league salaries more." So, "Back," here is good luck to you. We all hope that Mordecai Brown or the great Mathewson will look like a dirty deuce in a new deck when you get to going along right.

The writer wishes to impress on all athletic men the importance of the *flunk* rule in all departments of athletics at Rose. This rule is forced impartially on all men not coming up to the requirements. The Freshmen who take part in athletics are urgently requested to get familiar with this rule. Now, do not wait until too late. See Dr. John White for necessary information.

Now that a new season in athletics has opened at Rose, let every man do his duty toward supporting the teams, both financially and morally. Remember, a team can not be run on free admissions, enthusiasm or wind, but on the cold, hard cash taken in at the gate. This means that Polys are expected to bring two or three girls with them to each game and pay their admission, thus helping the managers to meet the expenses. Do not be like *Old Man Grump,* with his hammer out all the time, but bring that dear little girl and enjoy yourself.

FOOTBALL.

Rose, 75; E. I. S. N., 0.

At last Rose has gotten sweet revenge by beating her old rival and hoodoo, the Eastern Illinois State Normal School, on the campus October 2d.

Rose was master of the game from start to finish, and at no time was her goal in danger. All Normal could do was punt, and sometimes she made a mess out of that.

Every man on the team had a chance to show his skill, and did it with the greatest of success.

Captain George Standau made some excellent tackles, and after the game expressed himself with being well pleased with the game.

Coach Heze Clark had no occasion to throw any "fits" on the side lines like he came near doing last year. His open formations and forward passes netted him an average of 25 yards.

To make a long story short, Rose beat her rival with her terrific speed.

The line-up:

Rose Poly (75).	Position.	Normal (0).
Struck, Rohm	L. E.	Welsh
Wente	L. T.	Carney
Black	L. T.	Hill
Offutt	C.	Weimers
Davidson, Larson	R. G.	Conrad
Standau (Captain)	R. T.	Kibler (Captain)
Roll, Wyeth, Riehm	R. E.	Frazier, Rich
Bradford, Shook	Q. B.	Butler
Strouse, Root	L. H.	Bigler
Hoffner	F. B.	Wilson
Baker	R. H.	Givens

Touchdowns—Roll, Hoffner (2), Strouse (3), Baker, Standau, Rohm (3), Bradford, Shook.

Goals—Bradford (8), Rohm (2). Failure to kick goal—Bradford (3).

Time of halves—Thirty minutes.

Officials—Scott, Princeton, referee; Thomas, Illinois, umpire; Baker, timekeeper; Frisz, head lineman.

The football squad certainly looks good at the beginning of the term, despite the loss of several of the best men of last year's team, who were expected to return, but so far have failed to put in an appearance. However, since the beginning of the training season the team has suffered more losses. Seth Hadley has been compelled by his physician to quit the game. This will leave a hole somewhat difficult to fill. It looks now as if the team will lose the services of Strouse, who has been taken off the team by Dr. White on account of his class standing. However, we think he can *"plug"* up a little and be back in the game soon. Strouse was trying out for left halfback, while Hadley was considered a fixture at left tackle. But with all these misfortunes, Coach Heze Clark keeps hammering away, plugging up all the holes and instilling more speed into the bunch. Coach Heze Clark surely deserves lots of credit for the way he keeps at his work, in spite of whatever happens to mar his success.

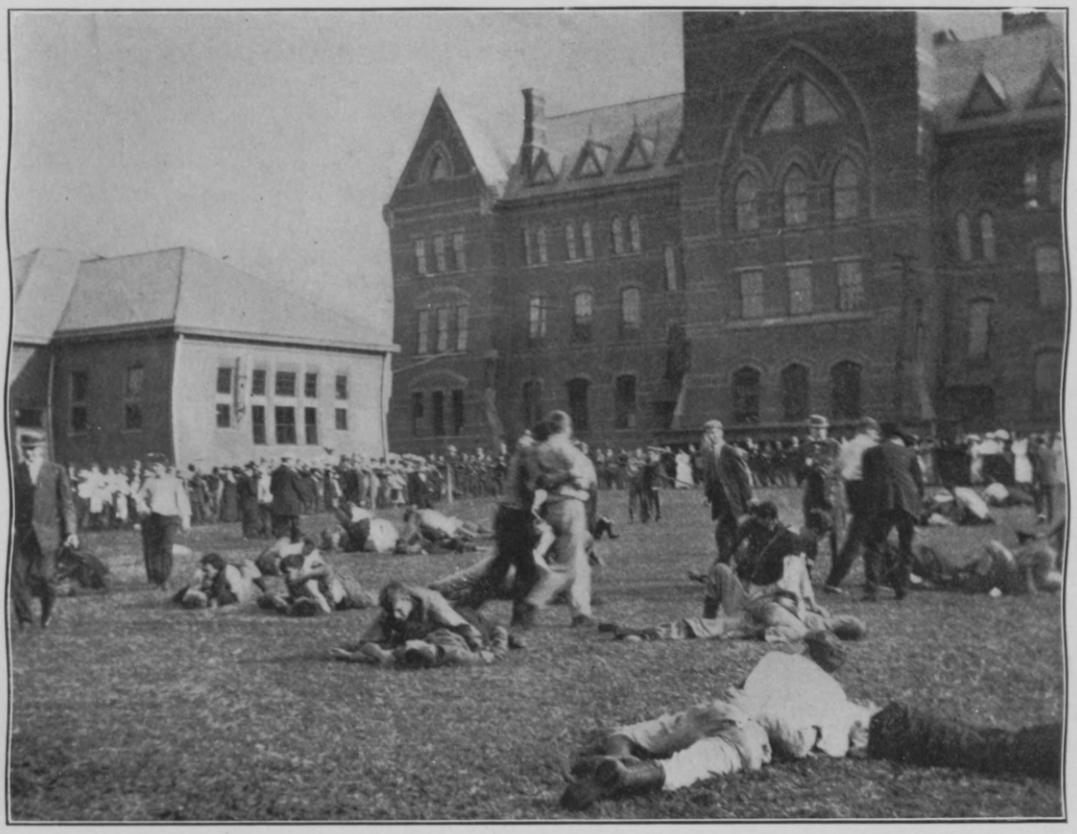
The following table will be published in each issue during the season, with each man's standing tabulated to date:

	Touch downs.	Goals.	Field goals.	Failure to kick goal.
Struck				
Rohm	3	2		
Wente				
Black				
Offutt				
Davidson				
Larson				
Standau, Capt	1			
Roll	1			
Weyth				
Riehm				
Bradford	1	8		3
Shook	1			
Strause	3			
Root				
Hoffner	2			
Baker	1			

Total points scored by Rose, 75; by opponents, 0.

PIPE RUSH.

The '13s had no trouble in administering what is commonly referred to as a good walloping to the Sophomores in the annual pipe rush. They are certainly without a doubt the best organized class ever seen at Rose for a good while. Out of a total of fifty-two men, fifty showed up with their fighting clothes on ready for the fray. The two absent members were accounted for on the sick list. The only part of the whole performance that the Sophs had a look in was the



ball game, which they won by a score of 17 to 0 in five innings. Captain Roll, of the Freshmen, was elected leader, and did his part nobly.

The challenge fight was won easily by the Freshmen, who almost wrecked the gym in their eagerness to get at the Sophomores, who had locked several of the Freshmen and themselves in. However, the damage is very slight and will be paid for by the Freshmen.

Roll assembled his men at Collett Park, and from there marched them in good order to the campus. Here he used a little forethought and made allowances for emergencies. He split his squad into two parts, and sent about fifteen men to the shops to await further orders. But these men were never needed, although they came up and helped out just for the fun of it.

The score of the pipe rush was 22 to 16 hands, in favor of '13.

Well, *"Freshies,"* since you have started in on your college career like a *"lion,"* see to it that you do not get kicked out by the *"Profs"* on account of flunks. Here's good luck to you and lots of it.

BASKETBALL.

Captain Hadley seems to think Rose will be well represented in basketball this year. He thinks by the time the season opens he will be strong and well enough to lead the team through another very successful season. Most of the old team from last year are back in school, so, with the prospect of a coach being engaged, Rose ought to be among the leaders this year.

TENNIS.

Professor Hathaway with his squad of tennis enthusiasts have been busily engaged in improving the courts on the campus. So far not enough practice has been indulged in to show what sort of material is at hand for the coming season. However, we know Hath's old eagle eye will be sure to find some candidates worthy to successfully represent Rose in the tennis tournaments next spring.

ATHLETIC BRIEFS.

Rohm, our new man from DePauw University, looks good, but the coach says he must get into the Rose way of playing.

Roll, our scrappy Freshman, will make a valuable man after he learns a few more inside points.

Guess *"Spoon"* Butler isn't a hustling manager? Take a peep at those new bleachers.

How long has it been since *"Doc"* ever saw a Rose team in action on the campus? Search me; I don't know.

Girls say George Standau is the best looking captain Rose ever had. How about Backman's pretty white teeth, girls?

Now, how are the girls going to keep warm on those bleachers? Don't worry; Polys will take care of that all right, old kid.

Why is Heze Clark so small? Because good goods are done up in small parcels.

Doc White must be using a high-power magnifier on those records. Somebody ought to *"swipe"* the glass.

Baseball men had better not *"cut"* any bases next year, for Mac is on the baseball committee.

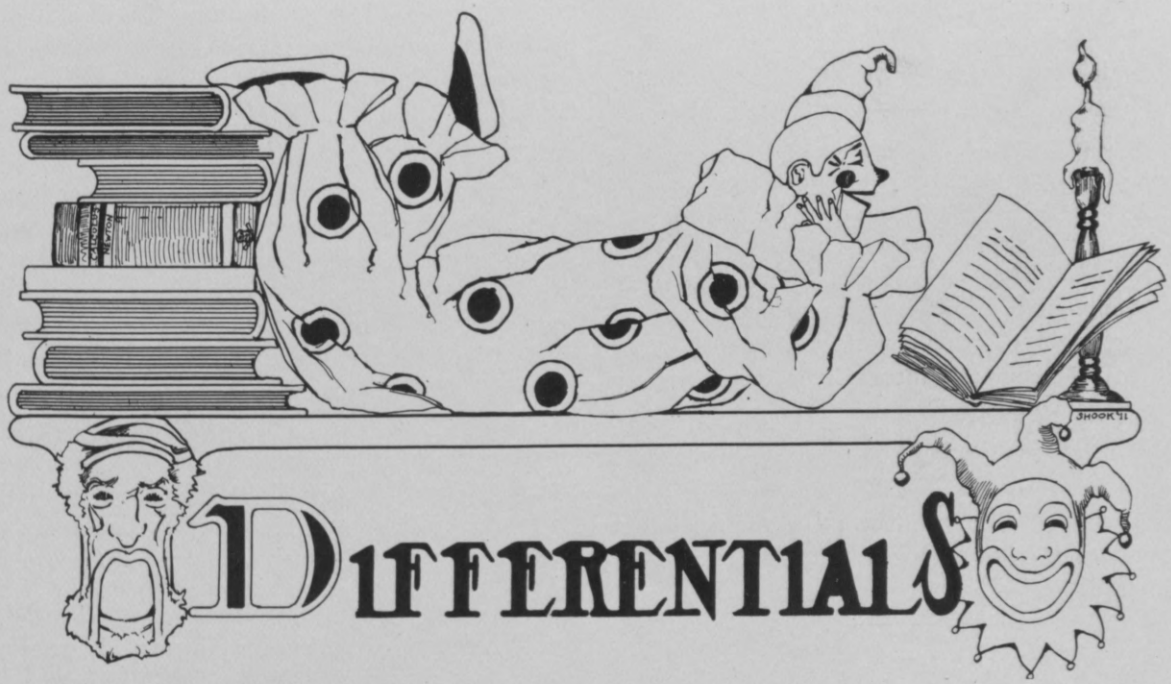
Doc White is surely seeing to it that everybody is getting what's coming to him.

Manager *"Spoon"* Butler announces the possibility of a football game for Thanksgiving Day on the campus. Franklin College will very likely be our opponent.

The Athletic Association, together with the student-body, wish to thank Dr. Mees, Professor House and Mr. Wilmarth for their kind assistance in erecting the new bleachers. The bleachers will surely be appreciated by those loyal supporters of athletics who bring their lady friends.

"Chalk" Waldon is one of the most faithful trainers Rose has ever had. Chalk surely is keeping the team in fine trim, and seems to possess an excellent knowledge of human endurance.

Has anybody noticed this new man on the team by the name of Black? Well, you had better keep an eye on him, for, according to the *wise ones*, he is slated to develop into one of the *"phenoms"* of the season.



Waggie in Thermo—There is something peculiar about Thermodynamics. You just have to jump into the middle of it, and then see what you are in afterward.

Elliott to Davy—Just like getting married, Dave.

Adams, '13 (reading a letter from her).

Newlin, '13 (reading over his shoulder)—My dearest husband.

Jojo (meeting Shaw in the hall)—Mr. Shaw, I wished that I had flunked you last year. I haven't any one to amuse me in class now.

"REVISED SPELLING" BY THE CLASS OF '11.

porus.	divition.
pourous.	possitive.
remidied.	exspose.
almalgamate.	emersed.
varius.	disposites.
sepparate.	gass.

The Class of 1913 has already done something of which they may justly feel proud. The microscopic bleachers which they erected will long stand a monument to their industry and ability.

Soph. (in lab.)—Mr. Carey, would you judge this to be a cobalt bead?

Mr. Carey—I couldn't say; I was out late last night, and would rather not attempt to judge any colors to-day.

Our old friend, "Doc" Bennett, is now teaching English to Senior classes (co-ed.) at the new Peoria High School. Oh, you Doc!

It is understood that the Rose Poly drawing instructors—*i. e.*, Messrs. Wischmeyer and Heimlich—have been elected members of the Ancient Order of Hibernians.

'Tis a wise athlete that knows his own football suit.

Pat (examining broken window)—Begorra, it's more sayrious than I thought; it's busted on both sides!

Freshman (in shop)—I've carried this same plank back and forth from the loft seventeen times, and Daddy thinks I'm working.

Soph.—I can't make anything out of this dividing engine; it won't work.

Jojo—I suppose those Civils have been up here again; every time they get up here they wreck something.

Riehm says the most beautiful section of our country lies between Nickerson, Kan., and Guthrie, Okla.

Soph.—Shall I read the French before translating?

Wicky—Yes; it'll help to kill time.

Judging from some recent events, it appears that some of our Juniors, to say nothing of the Freshmen, have ambitions to become barbers.

We are delighted to note that Professor Royse, of the Chair of Plumbing, is with us again this year.

Fresh.—Say, can we fellows smoke in the wood shop?

Soph.—Sure, only you must be careful not to drop any ashes on the carpet.

Ben Elliot—I say, Henry, do you like to ride backward?

H. W. Henry, '10—No; it always makes me dizzy, and I guess it always will.

Ben—Well, you better tell your folks to bury you face downward, then.

First Soph.—You say Beany will be back with us in February?

Second ditto—Yep; he's waiting for the rest of us to catch up.

Credulous Freshman—My, it must have been exciting to shoot a white elephant. How is it that you have no photo of it among these other views?

Bowers—Strange about that; you see, I always carry my kodak with me, slung from my shoulder. Well, the first day that I struck the Seattle "Expo." the film you ask for was still in the kodak, undeveloped. I chanced to stroll in to see an X-ray demonstration and stood near the machine. When I developed the films all were blank save one, which bore the faint outlines of the metal around the lens and of three of my ribs.

The following newspaper clipping, all the way from San Francisco, will amuse Civil students, at least:

BERKELEY, May 4.—Hundreds of college boys stopped their work on the University of California campus yesterday to enjoy a peep through surveying transits trained on a certain spot on the Berkeley hills above them, where a spooning couple basked in the sun and their own smiles, utterly unconscious of the consternation that they were creating in the throng of undergraduates.

A class of students in civil engineering had their instruments out in front of North Hall, measuring distances with transit and chain, when a survey of the hilly slopes revealed the romantic pair, who evidently supposed themselves beyond the ken of curious eyes. The magnifying powers of the surveying instruments brought the couple plainly to view, and the news of the interesting sight brought eager spectators from all parts of the campus, until civil engineering practice for the time was demoralized, while a line of laughing undergraduates waited their turn to gaze through the transits at the spectacle far up on the hillside.

The pair are well known in local circles and the next *Pelican* may give their names.

"Do you believe in dreams?"

"No, but I used to."

"What cured you?"

"I was engaged to one for six months."—*Ex.*

TECH. CLUB EXPANSION.

The TECHNIC chiefs were busily engaged in arranging copy. Much "dope" had to be sorted. Ben turned half around with "Hey, Nate, what department do undergraduate death notices go in?"

Nate—There's Stokesie, give 'em to him for the Alumni Department.

Stokesie (absently) — Have those fellows joined the Alumni Club?

"Bless me! That old hen is eating tacks."

"Yes; she's probably going to lay a carpet." —*Ex.*

Here is a literary gem which will be appreciated by all the members of the newly-organized Sophomore Anti-Spell-'Em-Correct Society: "If any man's or woman's cows get into these here otes, his or her tail will be cut off, as the case may be."

Proud mamma (showing infant to caller): "Now, what does Fido say?"

Precious Infant: "Bow-wow."

Mamma: "And Kitty?"

Precious: "Meow."

Mamma: "And Polly?"

Precious: "Go to h—ll."—*Ex.*

The track meet was at its height and the distance runs were just over when a terrific rainstorm put an end to the events. As Butler left the field a small boy, who had been driven from his place on the high fence, accosted him with the query, "Are they running in there yet?" Butler thought an instant and informed him that "They were, — running the water off."

The question (?) of supremacy at baseball between the two divisions of the Freshman class seems to be in doubt no longer. For further information see Fishback, '12.

Telephone Train Dispatching on the Santa Fe.

The Santa Fe is one of the first large railroad companies to put the telephone to any extensive use for train dispatching, as well as for the general transaction of their business.

The authority for the following is *The Railroad Age Gazette*. Mr. C. H. Gaunt, assistant general manager and superintendent of telegraph, upon request gave them all the information possible regarding the success of the telephone system:

"The initial use upon the Santa Fe lines of the telephone for train dispatching was in June, 1908, when 93.8 miles, newly-built branch line between Holly and Swink, with twelve offices, in the beet-sugar district of Colorado, was so equipped. At that time the calling selectors at present in use had not been perfected, and recourse was had to the then standard bridging bell and hand generator, offices being signaled by a combination of rings. The equipment has been in continuous successful use upon that branch for all purposes of wire communication since the above date, no telegraph line ever having been installed."

At present they have under construction 2,276.3 miles of telephone train dispatching, of which 1,090 miles is now in operation. All the circuits thus far constructed, with the exception of that from Holly to Swink, consist of two hand-drawn copper wires, weighing each 210 pounds per mile, equipped with the latest type bridging telephone apparatus and calling selectors, in about equal proportions of the two distinct types, operating upon the synchronized clock and the step-by-step principles. The telephonic transmission over the line of greatest length, Fresno to San Francisco and branches, 203.1 miles, with thirty-two stations bridged across the line, leaves practically nothing to be desired, either in volume of sound or clearness of articulation. The telephone dispatching has been in no way responsible for any accident in any territory so equipped. Further, in no case have they gone back to the telegraph dispatching after once starting the telephone circuit, except, of course, temporarily for very short periods of time during wire trouble on the telephone pair.

The Turbine-Engine Combination in Marine Service.

The use of the low-pressure turbine in connection with reciprocating engines is a comparatively new idea in steam practice, and any additional data which may be gathered on the subject is of considerable interest. As is well known, the Corliss engine is at its best as regards economy when working through the higher pressures and within a rather small range. The turbine's economy is independent of the pressure range, and while its average is better than the Corliss engine, yet it is not as great as the latter at the higher pressures. For this reason a Corliss engine working from about 200-pound gauge to about 10° gauge, in connection with a turbine

working from the latter pressure to about a 28-inch vacuum, is the most economical arrangement yet developed. The marine engine is not as economical, possibly, as some of the modern Corliss types, yet the following will give some idea of the saving resulting from the combination. It would be of still greater interest, perhaps, should the comparison of a similar vessel fitted with turbines alone be obtainable:

"Last month a paper was read before the Scottish shipbuilders' societies by Engineer-Commander W. McK. Wisnom, R.N., giving some instructive information regarding the trials and service performance of the 'Otoki,' a vessel of the New Zealand Shipping Company's line, delivered by Messrs. Denny last November. She is fitted with a combination of turbine and reciprocating machinery, and is practically a sister ship of the twin-screw 'Orosi' and 'Opawa,' which are fitted with reciprocating engines. In the paper to which reference has been made full information is given concerning the trial runs, which show that the boat was about 12 per cent. more powerful than the sister vessel Orosi. Service performance is more instructive, however, than trial runs, and the information given in the paper indicates that the combination power plant saves approximately 12 per cent. of the coal required by the vessel with the engines. This is about the same result, it is understood, that has been attained with the White Star 'Lamentic,' which has the combination of engines and turbines, in comparison with its sister ship, the 'Megantic,' fitted with reciprocating engines."—*The Engineering Record.*

Paint for Steel Cars.

A committee of the Master Car Builders' Association will report at the June convention upon the methods of protecting steel from corrosion especially as they are applicable to steel cars. It is needless to say that the variety of paints and coatings for this purpose are innumerable. But, despite this fact, authorities are unanimously agreed that there are certain fundamental principles involved that should be applied and embodied in all paints. In the first place, the film should be continuous; for if it is broken at any point, moisture and air will enter and attack the exposed surface of the metal, with the results that rust will be carried down over the outer surface of the paint and will become an important and powerful factor in its deterioration. The second point is that, in drying, the paint should not only become firm and remain closely adherent to the metal, but should maintain its elasticity, so that it may expand and contract with variations of temperature without developing cracks, which will be sure to hasten its destruction. Finally, it is desirable that the pigments used should be of such a character that they shall not only be unaffected by external conditions, such as moisture, acid, or other deteriorating or oxydizing effects, but may themselves serve to protect the vehicle that carries them from deterioration by these influences, that are so detrimental to the durability of oils. If such conditions as these can be obtained, the pigments will serve not only to protect the metal, but also to preserve the very paint itself from deterioration after the outer coating of the vehicle has been worn away. Among the materials that will meet this requirement, silica and graphite are probably the best known.

Both are inert and unaffected by acid or moisture, and silica has the added physical advantage of presenting what is known as a "tooth," which fits it exceedingly well for repainting. Silica is inert as an extender or filler in paint, and does not combine with any other pigment or vehicle.

The amount of silica which may be safely added to a mixed paint without detracting from its covering property, and which will increase its wearing quality, is one-third of the total pigment used, and if graphite is diluted with a heavier base, a good paint is formed, and many of the characteristics, chemical and physical defects of lead are largely reduced and frequently elimi-

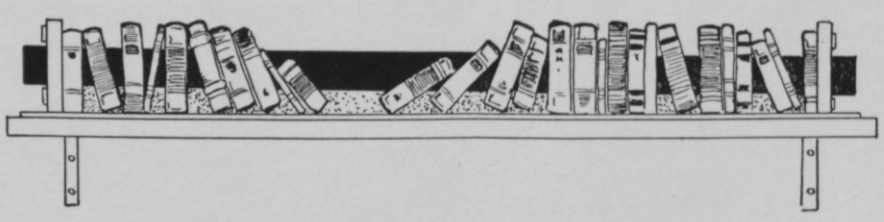
nated when it is mixed, in a proper proportion, with graphite; a high grade of graphite when finely ground with linseed oil acting as a lubricant and sliding under the brush. If, therefore, graphite is mixed with a heavier base, such as silica, good results will be produced.—*The Railway Master Mechanic.*

Cost of Concrete Buildings.

The use of reinforced concrete buildings for textile mills was discussed before the convention this week of the National Association of Cotton Manufacturers by Mr. J. P. H. Perry, of New York City, who made the following comments on the cost of factory buildings:

"Reinforced concrete will generally run from 5 to 15 per cent. higher in first cost than first-class mill construction, and will be from 10 to 20 per cent. lower than steel construction fireproofed. A large warehouse in Brooklyn was begun in May, 1908. At that time new construction work was scarce, and all contractors figured very closely. The successful reinforced concrete figure was $30,000 lower than the best bid on the same plans in fireproofed structural steel. A large factory in Philadelphia was designed in steel. The architects considered an alternative in reinforced concrete and saved $60,000. A large publishing house and loft building was recently completed in Springfield, Mass., of reinforced concrete throughout, thereby saving $40,000 over the probable cost in steel. These three instances represent respectively savings of 12, 25 and 10 per cent. In competition with mill construction the percentage depends almost entirely on the size of the building. For structures costing $40,000 and less; and of a height of four stories or less, the brick and wood construction will run about 15 per cent. less than concrete. On larger buildings, however, concrete gets closer to the cost of the mill construction. The designers of a very large hardware building in Minneapolis were surprised to find concrete figures slightly under those of mill construction. A similar case occurred in Toledo, O. Both of these propositions exceeded $150,000 in value.

"In considering the costs of different types of construction the initial cost should not be the only criterion. There are certain fixed charges which enter into the relative values of buildings. These may be briefly summarized as follows: Insurance, maintenance, depreciation, amount of light available, freedom from vibration, elimination of vermin, and the assurance that a fire can not destroy the building. It is difficult to put an exact monetary value on these different items. Each plant manager would have his own views, and local conditions would alter materially any assumptions. If, however, due consideration be given to the savings which can be obtained on each of these items by the use of reinforced concrete buildings, it will generally be found that, even though the concrete structure cost complete 10 per cent. more than mill construction, there will be a saving annually of from 1½ to 2 per cent."—*The Engineering Record.*



Vol. XIX NOVEMBER, 1909 No. 2

THE ROSE TECHNIC