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Rose Technic Staff

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IN running down a list of characteristics which one large company employing college graduates sets forth as necessary for qualification we find industry, reliability, tact, personality, and the rest of them all there, but listed with these qualities which every near-graduate job hunter has come to know so well is another not usually set forth in bold type. That is *courage*.

Quite surprising! Off hand one would hardly consider courage as absolutely essential for the holding down of a plain job such as the graduate usually steps into. However, when one considers the situation, it is seen that lack

of this quality is even more than a serious handicap.

Kipling with his underlying affection for the engineer has idealized this quality and others which are always closely associated with it in "The Bridge Builders" and has termed Engineering the profession which accepts no excuses. Of course he has idealized, but considering this, surely the profession of engineering does require courage, self-reliance, and fortitude. A man high up in a company known in all parts of the United States brusquely gives expression, "Our company is no place for a man with a yellow streak."

There is probably no better time for the development of these stronger qualities than the first few years after a man leaves college. There are several facts which every graduate must face. He realizes that he is entering into direct competition with men of much more experience. He realizes that he is just making his start, and that getting a start in the profession of engineering requires not one whit less of endeavor or grim determination than getting a start in the professions of law and medicine. Hard work—and no small amount of it—is the important factor in the equation of success in any worthwhile undertaking; and hard work in the face of discouragement and opposition requires much which is not distantly related to courage. Determination and grit are essentials to real success. Many a man has won because, like the bull dog, "when once he took his hold all heaven and earth couldn't make him let go!"

WE print below a letter recently sent to the president of the Senior class by W. A. Layman, '92. The letter, in itself, is sufficient. Nothing more need be said.

March 2, 1917.

To the President of the Senior Class,
Rose Polytechnic Institute,
Terre Haute, Indiana.

Dear Sir:

Allow me to extend sincerest congratulations on the magnificent way in which your class of 1917 is coming forward to the support of the Alumni Building Fund. You cannot imagine the enthusiasm with which this action on the part of your class has been received by the Alumni generally. It is a splendid expression of devotion and sets a pace which is going to help get results all the way down the Alumni line.

As Chairman of the Ways and Means Committee of the Alumni, I have great pleasure in expressing general appreciation of your class action.

Very cordially yours,

W. A. LAYMAN.

THE *Technic* has for the most part printed but little in regard to the Alumni campaign which is now being carried on. Being a monthly publication, we cannot hope to supply the Alumni with up-to-date information when weekly news bulletins are being sent broadcast. What is printed may increase the "safety factor" of "information spreading," however, and if we are able to inform but a few Alumni of what is going on at the present time, and if by some chance they are so situated that this information reaches them thru no other channels—we are sure there are but few Alumni so situated—the space in our magazine so used is well used, even tho the news value of this matter is, to the vast majority of our readers, absolute zero.

IT looks as if Rose is again headed for the dark and dangerous paths of rabid Militarism.

Let us give thanks!

Time has been when it seemed as if the hulabaloo in this regard which had been stirred

up last April would result in nothing more definite than intentions. National affairs, however, have done much to hasten matters.

We again give voice to our opinion that military training, compulsory if necessary, is a thing to be heartily supported. The many benefits arising from bettered physical condition and altered mental attitude which are sure to follow this innovation should be, in themselves, enough cause for the adoption of this training. But dropping these reasons entirely, national conditions should prompt immediate action towards taking up this work. Let us hope there will be no delay.

THE accurate measurement of water flowing in a pipe line is often a matter of extreme importance. For example, in making efficiency tests of hydraulic plants where a bonus on the apparatus is paid according to the percent efficiency, an error of even one percent involves a substantial sum of money. The Pitot Tube method of measurement is very convenient for work of this kind and would no doubt be commonly used were it not for the fact that the turbulency of the water effects the reading of the tube, and oftentimes an error amounting to four percent or more may be hereby introduced. In order to overcome this effect, Professor H. A. Thomas has evolved a piece of apparatus to which he has given the name "Hydraulic Shunt Flow Tube." Apparently the effect of turbulency in the water is here eliminated.

The idea of the shunt flow tube was conceived a few years ago, but until recently no actual tests had ever been conducted to prove or disprove the correctness of its theory. For that reason "The Test and Study of the Hydraulic Shunt Flow Tube" presented by W. R. Spencer and A. d'Amorim, both of last year's class, is an interesting bit of work insofar as the results indicate that the principle of the Shunt Flow Tube is fundamentally correct, and that this piece of apparatus is prac-

tical and very possibly far superior to the Pitot Tube as regards accuracy of measurement. The Shunt Flow Tube is probably not so convenient for use as the Pitot Tube, and for this reason it cannot be expected to supersede this common form of meter except in cases where extreme accuracy is necessary, but in the case mentioned above the use of the Shunt Flow Tube would perhaps prove more simple than other methods in common practice.

Due to the handicap of limited equipment the experiments carried out were not so complete as desirable. It is hoped that a similar series of experiments may be carried out on a much larger scale in the near future.

Lack of space prevents including more detailed tables of data, but the single table given is sufficient to summarily indicate the results obtained.

We are indebted to Professor Thomas for the footnote explaining the theory of the Shunt Flow Tube.

IN this number we are fortunately able to print a short article on the subject of "The Engineering Graduate." Short it is, but to the point. It is the expression of a man who has had experience in teaching college men, who has for years been kept in close touch with the college graduate, and who knows whereof he speaks. It is worth thinking over.

The article being on the general subject of "The Engineering Graduate" also serves admirably to prepare the way for a short series of articles on the training courses offered by

some of the larger companies of the country for the benefit of the Engineering Graduate. *The Technic* has arranged for this series of articles, not so much with the idea of benefiting the members of the graduating class as that of giving to the underclassmen a notion of what these courses consist. Too often the engineering student does not consider the work he is to take up after he leaves college until it is almost time for him to receive his diploma. Then, oftentimes, his decision is a matter of "snap judgment."

Student courses are in many ways very good. Their scope is widening each year. It would be well for the underclassman to give the student course some thought before he reaches the standing of a Senior.

The next article, dealing with the course offered by a large company engaged in the manufacture of electrical apparatus and equipment, will appear in the April number.

AGAIN we are favored with a contribution from A. G. Butler, '10. This article consisting of a brief explanation of the work of ferrying the locomotives in use during the recent work of widening the Louisville and Portland Canal across the canal after the completion of the work describes an interesting bit of work made necessary by the fact that the bridges over the canal were incapable of carrying the weight of the locomotives.

The article rather fittingly brings to mind the statement of that authority who said that, after all, engineering is 90% common sense applied in the right way.

The Engineering Graduate

By E. C. HIGGINS, Educational Department, Western Electric Company.

NOW is the time for the engineering graduate to get in line for the part he expects to play in the world's great game. The day of big projects and therefore big opportunities is upon us and competition for positions of responsibility is keen.

Much is expected of the engineering graduate of today; very much more than the mere technical knowledge indicated by his diploma. He must be equipped with a considerable amount of general business intelligence, even though he may expect to follow very closely engineering practices. Many engineering graduates fail to reach their goals simply because they do not use all the gray-matter stored away in their domes, all the time. The brain is not a delicate organ and hard thinking will not hurt it; on the contrary, neglect of use is more likely to be harmful. I mean by this that even though you are studying to be a technical engineer in the completest sense of the word, you must not fail to develop your commercial instincts.

The men who now occupy responsible engineering positions and are paid big salaries are men who have developed their business sense to a point where they are said to possess that important quality "good judgment." This power cannot be inherited, nor purchased, it is acquired only by men who have learned to think and think straight; men who have by consistent training and development of mind become capable of seeing things in their true light and at their true value. They have, moreover, learned to market this training and knowledge in the world's commercial field.

I doubt whether the average engineering student, upon entrance to college, definitely analyzed his motive. He, perhaps unconsciously, felt the call of a broader world and resolved to enlist in a course of training that would help prepare him for a more or less active part in it. We may say then, that his

original motive was to become actively engaged in the world's business of development.

Our ancestors plowed with crooked sticks, traveled in ox-carts and signalled their neighbors with fire and smoke. Our successors will farm with mechanically driven automatic machinery, travel through the air at high rates of speed with motive power unknown to us, and signal distant lands by lightning flashes. This will come through individual effort and originality, persistent concentration of mind, and general business sense.

For the average engineering graduate, the future has not been charted. He must decide for himself the sort of business he should engage in, upon completion of his college training. The importance of this selection cannot be over-estimated and he will be abundantly repaid for the efforts spent in examining the business world which he is about to enter; looking carefully into the future of each proposition before deciding finally to accept any one of them.

The ambitious man should look forward to a position where he will have room to grow. He does not know his own possibilities; his latent ability has not had a chance to express itself and is therefore an unknown quantity. He must study his own likes and dislikes and play fair with himself by locating where study and training may continue, and where he will have room to round out his college trained mind to his complete satisfaction.

Many of our present day successful, industrial and commercial concerns have established the practice of systematically training engineering graduates for responsible positions in their organizations. They want men with engineering training and with commercial instinct, men who are capable of growth and development, men who are willing to continue study after graduation and to become masters in the world of business.

NEWS OF OTHER COLLEGES

A gift of \$1500 annually for five years was recently announced by the University of Chicago. This fund, to be used for an annual series of public lectures, is the gift of a young Alumnus who does not want his identity revealed.

Nearly all of one thousand grammar schools, fifty-three high schools, and thirteen colleges in Turkey have been closed since the outbreak of the war.

New instruments costing \$4,000 have been obtained for the University of Illinois band. The new instruments are said to make the equipment of this band better than that of any other military band in the country.

By a vote of 1,100 to 300 the students of Yale favored some form of universal military training. A vote of this question was affirmative at Harvard also.

The University of California is giving benefit dances to aid in raising a fund to send France an ambulance corps of university men. Already \$2,500 has been raised. All the resources of this university have been offered for government service in case of war.

An investigation carried on among the Alumni of Ohio State University shows that the majority of women graduates marry university men.

Stanford University advises students to marry for the reason that they will then have more time for study. Marriage keeps them from fussing, pool playing and political discussions, it is said. Joke?

Professors of Kansas and Iowa state that the western student is more interested in his work than the student of the eastern college.

Seniors of the University of Chicago have organized a four weeks' beard-growing contest which is now under way. Senior women will pick the winner to whom will be given a loving cup, mustache style, in commemoration of his hirsute excellence.

More stringent rules are in force for the co-eds at Ohio State. Dates must be concluded at ten thirty and girls will be allowed out only three nights a week. Street proctors have been appointed to assist the girls' council in enforcing the new rules.

The University of Illinois is to have a new dormitory, costing about \$500,000 and having two hundred and eighty-two rooms.

The University of California contemplates offering a course in golf, and for this purpose has purchased indoor golf equipment. The course is to be open to all and may be substituted by underclassmen for gymnasium.

A writer in the Harvard Alumni Bulletin says that famous college "snake dance" originated quite by accident, about 20 years ago, at the celebration of the golden anniversary of Cambridge as a chartered city. Crowding and jostling in the ranks of the student body in the parade caused a swaying movement, and instinctively the marchers struck up the "snake dance." That happy accident in '98, the contributor avers, was the origin of the zig-zag march that is now so picturesque a feature of college celebration.

Harvard leads all universities in the number of graduates listed in "Who's Who," having 155 graduates so honored. Yale is second with 83, and Columbia third with 52.

Excavations near Matthews Hall at Harvard University revealed the skeleton of a domestic pig, a large iron kettle, and a rusty cannon ball. Connections have been established between the pig and the kettle but the part played by the cannon ball in the animals untimely end has not yet been determined.

One hundred Leland Stanford men enlisted recently for work with the American ambulance service on the French front.

All Sophomore men at the University of Utah delinquent in paying their class dues are to receive a thoro ducking upon their first appearance on the campus.



Test and Study of the Hydraulic Shunt Flow Tube

By W. R. SPENCER, '16 and A. D'AMORIM, '16

THE Pitot Tube has long been used as a device for measuring the flow of liquids and gases but only when used with the utmost care have the results proven uniform.

The idea of the Pitot tube was first conceived by a French Engineer, Pitot by name, about the year 1732. The original tube was described by him in the "Memoirs of the Royal Academy of Science" under the date of November 12, 1732. It consisted of two tubes mounted side by side on a piece of hardwood, one straight and the other bent at right angles at one end and also a sliding gauging scale, on one edge of which was engraved the division lines for measuring the head proper and on the other edge was engraved division lines for reading the velocity corresponding to that head.

Pitot considered the mathematical principle back of his invention to be most simple and almost axiomatic and he arrives at his conclusion by saying, that since a head of water produces a certain velocity, therefore conversely, a given velocity should produce the head indicated by theory. Hence he says, "Water should ascend in the tube of my machine through the force of the current, precisely to the height from which it should have dropped to form that current," or mathematically $v^2=2gh$, h being the "Pitot head."

Pitot also conceived the idea of measuring the speed of vessels with this instrument as well as the velocity of flows of streams and

lamented the fact that all former methods had been of very doubtful results.

However since Pitot announced his invention a great number of experiments by different investigators have led to very different results and consequently to a large number of different opinions and theories underlying the principles of the Pitot tube.

In 1856 Darcy published a description of a modified form of a gauge which he used with the Pitot tube. By means of this ingenious device he was able not only to place his reading at any convenient place on a scale but also to magnify or reduce the Pitot head in a given ratio by using liquids having a specific gravity less than water, or vice versa.

All modified forms and improvements however, have not led to uniform results, some experimenters finding that the equation $v=\sqrt{2gh}$ under all conditions and others finding it to give values correct to within one per cent. Still others found a variation of as much as fifty per cent.

Pitot himself, by using a funnel shaped tip, found that $v=\sqrt{2gh}\div 1.5$; Weisbach found $v=\sqrt{gh}$ for very fine tubes; Basin and Darcy experimenting in the latter part of the eighteenth century found $v=\sqrt{2gh}$ within one per cent; Airey in the "Engineering News" of April 17, 1913, gives results found by him in experimenting with six tubes from one half inch to two inches in diameter and with different tips and using different velocity of flow to vary from $v=\sqrt{2gh}$ by less than one per cent and he interprets his results to show that this slight varia-

tion is due to turbulence and change of velocity.

A few years ago Williams, Hubbel and Fenkel conducted a series of experiments on measuring the flow of water in city mains by means of the Pitot tube. They found a variation of the velocity given by a particular tube when calibrated in still water, and when calibrated in flowing water in pipes to vary from three to twelve per cent.

Therefore, it is evident that the results obtained by the Pitot tube are not only variable in the hands of different experimenters but the same tube may have different coefficients varying according to the conditions under which it is used.

It is in order to correct this latter defect that Professor H. A. Thomas has devised what may be termed the "Hydraulic Shunt Flow Tube."

A great many principles of elementary electricity are made clear by comparison to hydrostatics and in this case a very close analogy may be made to the shunt method of measuring large electrical currents.

The idea of the "Hydraulic Shunt Flow Tube" is a tube so arranged that it may be introduced into the stream of water to be measured with the tip directly against the direction of flow and yet maintain a pressure at this tip the same as existed at that point before the introduction of the tube. With this condition existing, the water will flow into the tube with the velocity undisturbed from the normal and may be shunted into a small retainer and weighed or measured. The velocity of flow, expressed in unit time, at the tip of the tube will be equal to the quantity of water collect-

Theory of the "Hydraulic Shunt" Modification of the Pitot Tube.

The hydraulic shunt modification of the Pitot tube was devised to obtain greater accuracy in measurements of the velocity of eddying or turbulently flowing water than can be obtained with an ordinary Pitot tube.

In the common Pitot tube, shown in Fig. 1, the velocity of the water impinging on the tip is computed by the formula $V = c\sqrt{2gH}$, where H is the difference in height of the water columns in the pressure and impact tubes, and c is the Pitot tube coefficient. The Pitot tube coefficient has been found in many cases to vary considerably from unity.

To show that its value depends not only upon the degree of turbulence of the water, let V be the mean velocity of the water impinging on the tip, and let $V \pm v$ be the value of this velocity at any particular instant, or instantaneous velocity.

The instantaneous head corresponding to this instantaneous velocity is $\frac{(V \pm v)^2}{2g}$ or $\frac{V^2 \pm 2Vv + v^2}{2g}$. The instantaneous values of the head will not be followed in detail by the water columns on the pressure and impact tubes on account of the inertia and friction, but the head recorded by these columns will be the average of the instantaneous values. If the instantaneous heads be averaged for n successive instants, then the average head $= H = \frac{\sum(V^2 \pm 2Vv + v^2)}{2gn} = \frac{\sum V^2 + \sum v^2}{2gn} = \frac{V^2 + \sum v^2}{2gn}$.

Therefore $H > \frac{V^2}{2g}$ or $V > \sqrt{2gH}$

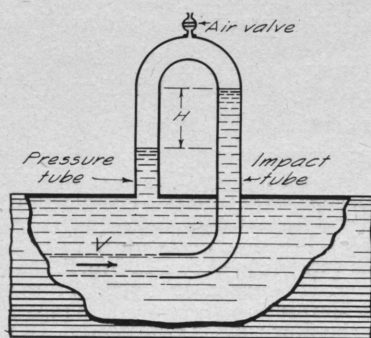


FIGURE 1.
Common Pitot Tube.

FORMULA:

$$V = c\sqrt{2gH}$$

- H = Pitot head
- c = Pitot coefficient
- g = acceleration of gravity

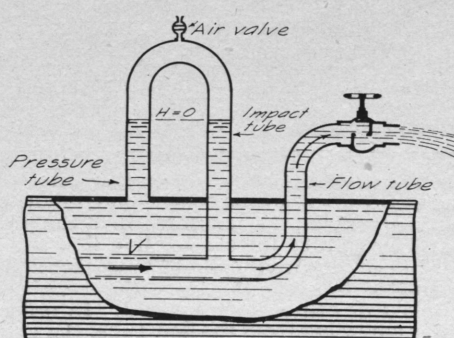


FIGURE 2.
"Hydraulic Shunt" Modification of the Pitot Tube.

FORMULA:

$$V = \frac{Q}{cA}$$

- Q = flow from tube
- A = area of tip opening
- c = tip coefficient

ed in a unit time in cubic feet divided by the area of the tip in square feet.

A mathematical proof that the turbulent flow should not effect the coefficient of the tip will be found in the foot note.

Theoretically the tip coefficient should be unity under all conditions, for as previously explained the water at the instant of entering the tip is supposed to be undisturbed. However, as ideal conditions are practically impossible to reach, we may expect a tip coefficient differing slightly from unity.

A series of experiments were conducted to investigate the behavior of the coefficient of the flow tube under different conditions and to compare it to the coefficient of the Pitot tube under identical conditions.

The flow tube which was prepared consisted of two copper tubes, three sixteenths and one fourth inches in diameter. The larger tube was bent at right angles about two and one half inches from one end, and a hole the size of the small tube drilled out thru the side of the larger tube at the bend. Two pairs of holes, one sixty-fourth of an inch in diameter

were drilled at right angles near the end of the smaller tube. This end of the small tube was then inserted thru the hole in the side of the larger one until the two ends were flush, and these tips were soldered together and also the tubes were soldered together where the smaller one entered the larger. The small tube was then bent at right angles and in the same plane as the larger one. The tip was dressed off to a sharp edged circular orifice, and to aid in traversing a brass scale was soldered to the sides of the two tubes.

The picture shows the arrangement of the apparatus. The nozzle shown was made of brass, polished and tapering on the inside from three inches to two inches and it was connected to a four foot length of three inch pipe. The pressure gauge and Pitot head gauge were graduated in feet, tenths and hundredths. Immediately below the nozzle were arranged two sheet iron pipes, fastened together and mounted on a single pivot so that the water could be deflected into the measuring tank or cistern almost instantly.

The measuring tank was a galvanized iron

These results show a common Pitot tube gives too high values of the velocity in cases of turbulent flow, and that the Pitot tube coefficient c might be well separated into two coefficients: First a "tip coefficient" depending only on the construction of the pressure and impact tips, and second, a "turbulence coefficient" having a value of unity for stream line flow and values of less than unity for flows of varying degrees of turbulence.

In the "Hydraulic Shunt" modification of the Pitot tube shown in Fig. 2, the water impinging on the tip is permitted to enter the tip without resistance and is shunted or diverted into the outer air where it may be weighed or otherwise measured. In order that the static pressure in the pipe may not effect the quantity of water emerging from the flow tube, the valve on the flow tube is regulated until the tops of the water columns in the pressure and impact tubes stand at the same elevation. The mean velocity of the water impinging on

the tip is computed from the equation $V = \frac{Q}{cA}$, where Q is the quantity of water emerging in the unit time from the flow tube, A is the cross section area of the entire entrance to the tip, and c is the tube coefficient. To show that the values of the velocity obtained by the "hydraulic shunt" tube are independent of the turbulence of the water, let $V \pm v$ be the instantaneous velocity of the water impinging on the tip, and let $h = \frac{V^2 \pm 2Vv + v^2}{2g}$ be the instantaneous head. The instantaneous quantity of water tending to enter the tube per unit time, considering the tip as an orifice which the water enters under a head h , is $q = cA\sqrt{2gh} = ca(V \pm v)$. The average flow, obtained by averaging the instantaneous flow for n instants is $Q = \frac{\sum cA(V \pm v)}{n} = cAV$.

The resulting value of the velocity, $V = \frac{Q}{cA}$ is thus independent of terms depending on turbulence, and the coefficient c depends simply on details of construction.

While both common Pitot tubes and "hydraulic shunt" tubes may have unit coefficients if ideally constructed, nevertheless in practice it will be necessary to calibrate them if the most accurate results are desired. Some of the details which may cause a variation of the coefficient of a hydraulic tube from unity are, changes in arrangement or location of the pressure opening, friction between the tip and the impact tube opening, and uncertainty in the exact area of the tip opening.

To obtain accurate results with a common Pitot tube it must be calibrated in water of the same degree of turbulence as that in which it is used. With the "hydraulic shunt" a single calibration in still water, or in water of any degree of turbulence, should give accurate results under all other conditions.

tank of a thousand pounds capacity, which rested on two pairs of scales. The tank was emptied by means of a pipe attached near the bottom.

The regulation of the head was bad, usually varying as much as two tenths of a foot during one traverse; and during the first part of the test it was necessary to use formula to reduce all the readings to the same head. Later a valve was placed on the upper end of the three inch pipe as shown in the picture. The head was thus regulated very accurately.

In order to investigate as many conditions as possible, traverses both with the Pitot tube and flow tube under several different conditions, namely, what may be termed stream line flow, and turbulent flow, were run several times.

In order to secure stream line conditions a strainer made up of several fine screens was placed at the top of the four foot pipe. While this ironed out the turbulence a great deal, there was possibly still considerable eddying in the stream and this no doubt accounts in part for the small change in the Pitot tip coefficient from stream line to turbulent flow conditions.

To produce turbulence different irregular obstructions were placed in the pipe above the nozzle. Three turbulent devices numbered 1, 1a, and 2 were used.

The manner of conducting the experiment was as follows:—To determine the amount of

water discharged by the two inch nozzle compared with the water column in the flow gauge connected to the three inch pipe, or in other words to calibrate the flow tube, readings were taken at different heads by weighing the amount of water discharged during a given time and after reducing the weight of water to cubic feet per second these were plotted against the head read in the flow gauge. Such calibration was made every time conditions of the flow were changed.

Traverses were taken with the Pitot tube, which was moved across the two inch nozzle at the rate of one sixteenth inch each time for the first curves and being changed to one eighth inch and one fourth inch at the center of the traverses for the last curves. Likewise, traverses were taken with the shunt or flow tube, and as before the tip was moved across the two inch nozzle one sixteenth inch at a time for the first curves and later on the space moved thru was increased to

one eighth inch and one fourth inch, beginning and ending always with the one sixteenth inch readings in order to get the velocity at the edge more accurately.

The first sets of traverses taken were devoted to stream line flow, run with two foot head. After several traverses had been taken with stream line flow the turbulent flow devices were put into use.

In order to reduce the error due to the fluc-



tuation of the head, readings of the water column were taken every ten seconds when running the flow tube traverse and these readings were reduced to constant head. After placing the valve on the three inch pipe so that the water column could be controlled at will a great deal of calculation was eliminated. Being thus able to control the head, a new set of readings at two foot head was taken for the Pitot tube as well as for the shunt flow tube, using stream line and turbulent flow as before. A head of seventy-five hundredths foot was used for taking another complete set of readings for stream line flow and turbulent flow and these compared with those obtained for two foot head.

In running the flow tube test one minute was taken as the unit of time. The water shunted off was run into a large bottle and weighed on scales which were sensitive to one one hundredth of a pound.

After securing the data the Pitot reading taken was reduced to velocity by the equation $v = \sqrt{2gh}$, (h being the Pitot head) and the flow tube reading to velocity by the equation $v = q \div a$, (q) is the quantity flowing through the flow tube in unit time and (a) is the area of the tip. The velocity curves were then plotted on cross section paper, and dividing the area of the nozzle into ten equal parts, we found

from the velocity curves the velocity in each ring, these we summed and used for the tip coefficient.

A summary of the results is as follows:

Stream line flow.

Two foot head, Pitot tip coefficient	—1.005
“ “ “ flow tube tip coefficient	—1.085
.75 “ “ Pitot tip coefficient	— .984
.75 “ “ flow tube tip coefficient	—1.080

Turbulent flow device 1a.

Two foot head, Pitot tip coefficient	— .9987
“ “ “ flow tube tip coefficient	—1.097

Turbulent flow device No. 1.

Two foot head, Pitot tip coefficient	— .9860
“ “ “ flow tube tip coefficient	—1.080
.75 “ “ Pitot tip coefficient	— .9646
“ “ “ flow tube tip coefficient	—1.078

Turbulent flow device No. 2.

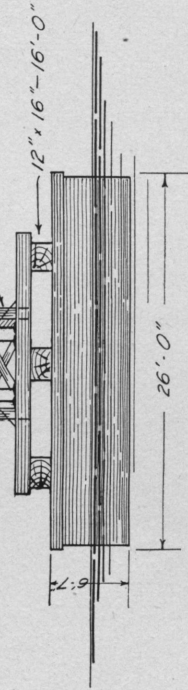
Two foot head, Pitot tip coefficient	— .9987
“ “ “ flow tube tip coefficient	—1.078
.75 “ “ Pitot tip coefficient	— .977
.75 “ “ flow tube tip coefficient	—1.086

From these results it was found that the Pitot coefficient varies slightly over four per cent, while the flow tube coefficient varies less than one percent. This variation was considered to be within the accuracy of our experiments.

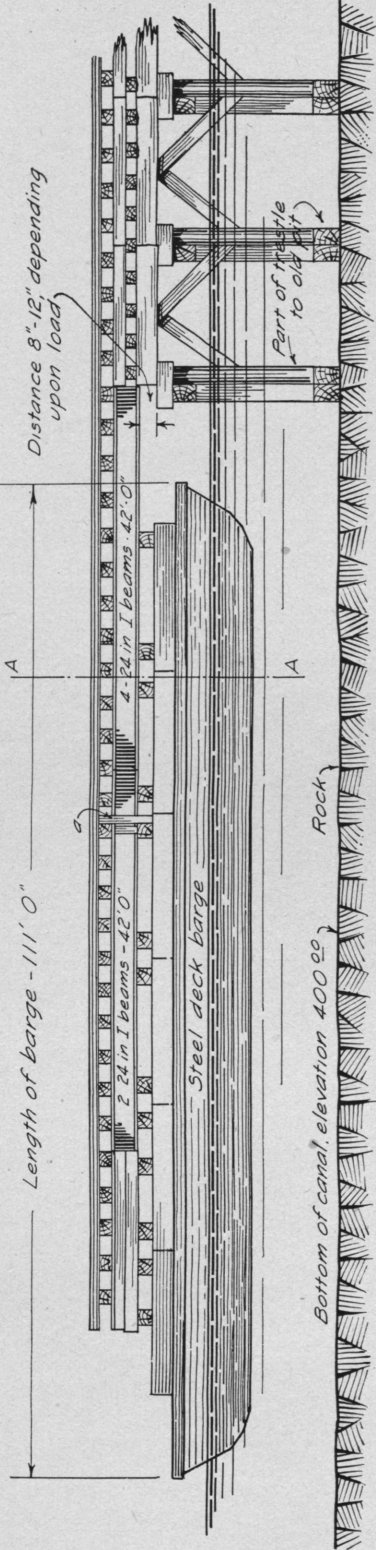
These results indicate that the principle of the flow tube is fundamentally correct.



8" x 8" placed every 5', as at A, Figure 1
Tied with 1" rods, top and bottom



SECTION A-A
Figure 2



THE ROSE TECHNIC

Figure 1

(Figures not drawn to scale)

HENRY BICKEL CO.

JOB 704

SKETCH OF FERRY DECKING

LOUISVILLE & PORTLAND CANAL

Scale 1" = 20'

Jan., 1917

1" = 10'

A. J. B.

Ferrying Equipment Across the Louisville & Portland Canal, Louisville, Ky.

By A. G. BUTLER, '10

In heavy construction work, the selection, care, and transportation of plant is no small item.

On the contract for widening the Louisville & Portland Canal, described in a previous issue of *The Technic*, it was necessary to transport all equipment across the canal by ferry. Neither of the two bridges were heavy enough for the loads.

Practically all of this equipment was bought new for this work, overhauled on the job, and sold at the close of the work. The plant could not all be taken over at one time as there was no storage yard available, and it was out of the question to hold a barge decked for this service over the two or three months required to dispose of this equipment. This made it necessary to rig for this work several times.

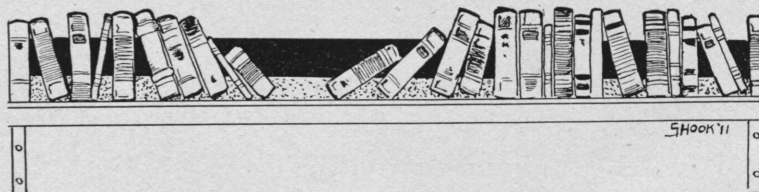
The deck used was 12" by 16" by 16'-0" timbers which had been used as stringers in trestles, and six 24" I beams previously used in a temporary highway bridge. The barge used was of steel construction thruout and very rigid. The deck was all from material on hand and could be quickly and cheaply handled by a locomotive crane that was available for

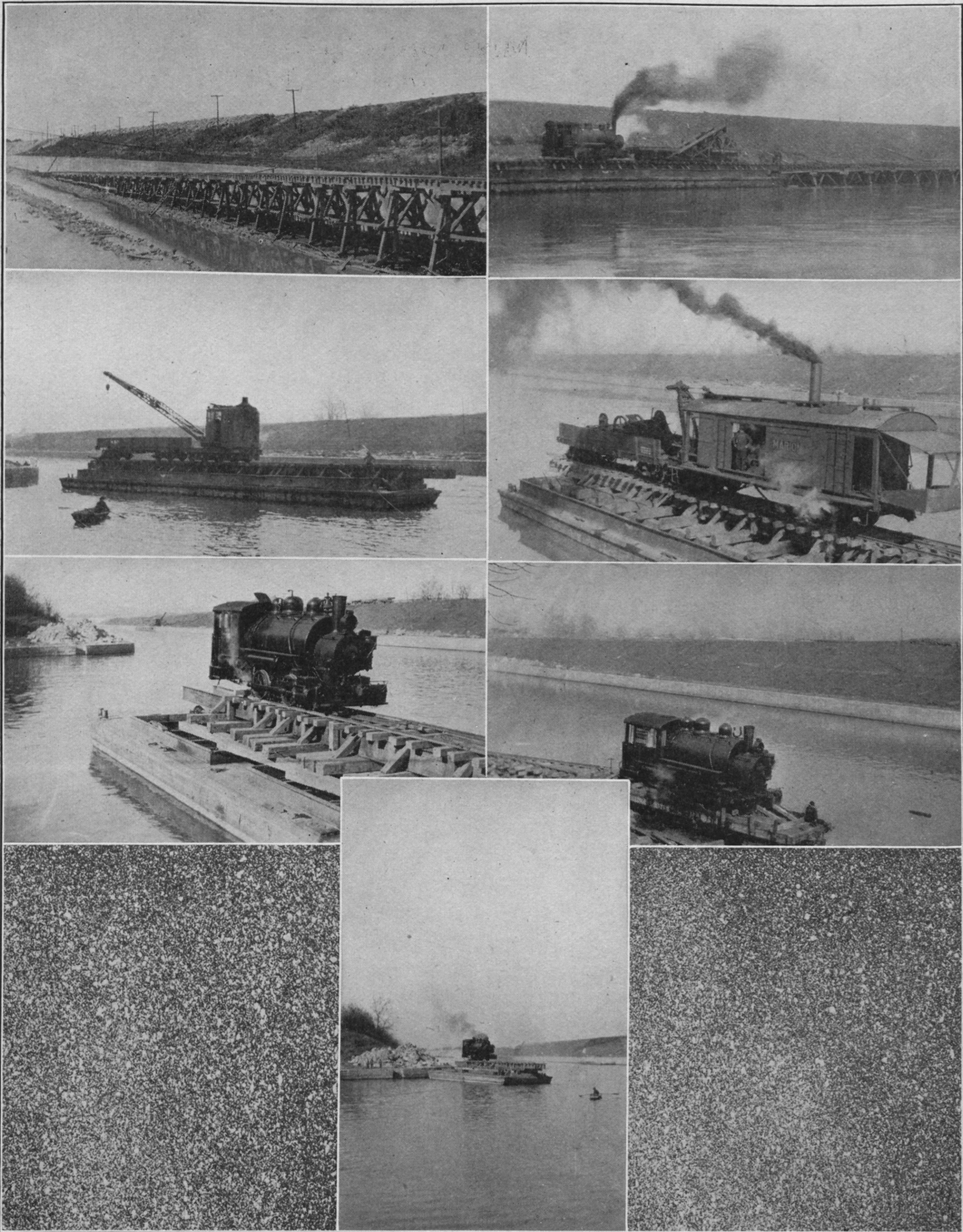
this work. The best time made was eleven hours to deck the barge, ferry a 37 ton locomotive, and strip the barge.

The K. & I. Terminal R. R. Co. have a track along the south canal wall, the end of which is at a basin in the canal. This gave a straight alignment on to the barge on this side. On the north side the canal wall is practically straight for its entire length and the beam is only 25 feet. This would not permit of good alignment, so that the upper end of the trestle from the pit was left in place when the pit was watered. This gave good alignment and good abutments on both sides.

On the span from the barge to the shore four of the I beams were used as stringers, for when the load was on this span the head of the barge went down, making this practically a clear span. The end of the beams were allowed to clear the bearing from 8" to 12" depending on the load. This was figured so that with the barge loaded the beams would swing clear.

The accompanying sketch shows the decking used and the kodak pictures show a locomotive being ferried across.





Trestle into Pit, Upper Section of Which Was Left in Place for this Work.
 Locomotive Crane and Gondola Car. Load 75 tons.
 Deck in Detail with Trestle and Crane Shown in Background.

Locomotive Being Pulled into the Basin.

Locomotive and Spreader Just After Being Run on Barge. Men Disconnecting Track. Load 50 tons.
 70 ton Steam Shovel and Car Upon Which Boom and Dipper are Loaded. Load 85 tons.
 Locomotive Loaded and Flat Car Ready for Shipment.

THE ALUMNI CAMPAIGN

The Alumni fund raising campaign, now in its second week gives promise of big things. With \$150,000.00 as the goal and \$52,000.00 already subscribed, there seems but little doubt that even more than the required amount will be pledged before the campaign closes in April. Mr. George Ketchum, representative of the Frederick Courtenay Barber Associates, in charge of the campaign, states that the various Tech Clubs have without exception evidenced the greatest enthusiasm and that every indication points to a highly successful conclusion of the campaign.

The ten clubs have organized campaign teams which will take active part in the soliciting of pledges. Class secretaries will also assist by getting in touch with classmates. Weekly news bulletins are being sent out to all Alumni, and no effort is being spared in the effort to put the Rose Polytechnic Institute upon a firm financial basis and to assure the success of the New School.

An indication of the spirit evinced by Rose men is shown by the action of men still attending school. Mention of this fact has already been made in these columns, but it may be well to again mention it. The feeling this action has created among the Alumni is shown very well in the letter sent to E. W. Richard, president of the Senior Class, by W. A. Layman, '92. This letter is printed in the editorial columns of this issue.

Previous to the opening of the campaign on February 27 over \$37,000.00 had been pledged. Since the campaign has opened this total has grown to an amount over \$50,000.00, one third of the required amount. It may be said that this amount represents the pledges of only 59 Alumni.

The various Tech Clubs have at this time perfected their organization of campaign teams, and from now on will devote their entire time to the real object, the obtaining of pledges. With campaign teams working in

practically all the states where Rose Alumni are found, these teams will probably play the leading part in the raising of the fund. The Louisville Club will have charge of all southern territory, the Cincinnati Club will be active thruout Ohio and adjoining states, the California Club will be able to reach those Alumni who are located in the western states, and the New York Club will work in the territory in and about New York. The St. Louis Club has organized the Missouri Valley Team.

The membership of the different teams is given below.

CHICAGO ALUMNI TEAM.

Alonzo J. Hammond, Captain, '89; William G. Arn, '97; Oscar Baur, '87; John E. Bernhardt, '08; Theo. L. Condron, '90; Claude A. Lyon, '14; Austin V. H. Mory, '94; Harry H. Orr, '07; Chester L. Post, '03; Shelby S. Roberts, '98; Donald B. Rush, '10; Walter B. Wiley, '89; Harold O. Wimsett, '11; George W. Brooks, '16; Herbert J. Harries, Jr., '11; John G. D. Mack, '87; Walter H. Martin, '97; Edwin C. Thurston, '90; Thomas D. Witherpoon, '00; J. R. Wisely, '15; Clinton B. Kidder, '88; Gustav Willius, Jr., '97; Frederick H. Cash, Jr., '07; Ivan L. Kauffman, '14.

CINCINNATI ALUMNI TEAM.

Luther S. Rose, Captain, '92; Clifford E. Albert, '93; Fred C. Brachman, '98; Davis Levi, '13; Jesse D. Lyon, ex-'92; Alfred A. Piper, Jr., '10; Walter E. Bock, '09; Harold McComb, '06; Walter D. Crebs, '99; Harvey G. Kittredge, '99; P. Wert Klinger, '96; Watson J. Klinger, '96; John W. Dale, ex-'94; Walter R. Gibbons, '01; William J. Fogarty, '92.

MISSOURI VALLEY ALUMNI TEAM.

John J. Kessler, Jr., Captain, '97; Victor K. Hendricks, '89; Waldo Arnold Layman, '92; Milton L. Oglesby, '92; George E. Wells, '96; Nathaniel Burt, '99; Otto B. Heppner, '11; Frank J. Jumper, '99; Albert C. Lyon, '01; James J. McLellan, '99; Harry D. Mosby, '09; J. Herbert Nichols, '07.

PITTSBURGH ALUMNI TEAM.

Harrison W. Craver, Captain, '95; Orville M. Bercaw, '10; Samuel Finkelstein, '15; Edward D. Frohman, '94; Ozni P. Hood, '85; Maurice C. Rypinski, '97; Brent Wiley, '98; Donald H. Atherton, '05; Harry S. Braman, '03; Herman S. Heichert, '97.

SCHENECTADY ALUMNI TEAM.

Edmund P. Edwards, Captain, '99; J. Earl Ham, '15; Edward H. McFarland, '04; George H. Pfeif, '05; Harold E. Smock, '16; Harry C. Uhl, '12; Edward G. Waters, '88; Svend E. Johannesen, '93; Thomas L. Lee, '09; Howard C. Taylor, '07.

CLEVELAND ALUMNI TEAM.

Jay H. Hall, Captain, '97; J. Simms Brosius, '03; Harry R. Canfield, '06; C. B. Cook, '05; James M. Darst, '09; James G. Dornbirer, ex-'99; Fred R. Fishback, '02; Claiborne Pirtle, '98; Harry S. Richardson, '00; Paul F. Stokes, '10; Walton L. Woody, '14; Frederick

J. Buckley, '91; Claude E. Cox, '02; Frank A. Whitten, '98.

INDIANAPOLIS ALUMNI TEAM.

William H. Insley, Captain, '00; Albert F. Brennan, '13; Herbert Foltz, '86; Arthur M. Hood, '93; Orange E. McMeans, '96; Barclay G. Mering, '87; Harry A. Schwartz, '01; Wilbur B. Shook, '11; Lewis A. Snider, '05; Frederick J. Reiss, '08; John M. Rotz, '06; Edward P. Wallner, '15.

SOUTHERN ALUMNI TEAM.

Francis H. Miller, Captain, '95; E. B. Allen, ex-'17; Warwick M. Anderson, '94; John O. Bland, '05; Arthur G. Butler, '10; William R. Heick, '05; Carl A. Klem, ex-'97; Walter B. Kuersteiner, '10; Addison W. Lee, '06; Robert N. Miller, '01; William S. Speed, '95; Robert A. Strecker, '07; C. M. Struck, '10; Henry W. Wischmeyer, '06; Harry D. Baylor, '07; William C. Knopf, '08; David Meriwether, Jr., '00; Robert York, '00.

SUBSCRIPTION FUND

Oscar Baur, '87	\$5,000	Omar C. Wewhinney, '91	\$500
W. A. Layman, '92	5,000	A. V. H. Mory, '94	500
Claiborne Pirtle, '98	5,000	Shelby S. Roberts, '98	500
H. S. Putnam, '86	5,000	Luther S. Rose, '92	500
John T. Wilkin, '86	5,000	Maurice C. Rypinsky, '97	500
Edward D. Frohman, '94	3,000	Henry R. Voelker, '11	500
Charles C. Rose, '93	2,500	Brent Wiley, '98	500
John D. Galloway, '89	1,500	Robert L. Wilson, '92	500
Arthur M. Hood, '93	1,000	Francis H. Miller, '95	450
William H. Insley, '00	1,000	Robert N. Miller, '01	300
Arthur Rice, '93	1,000	Harold O. Wimsett, '11	300
Edward G. Waters, '88	1,000	Warwick M. Anderson, '94	250
James S. Royse, '94	600	H. C. Gilbert, Jr., '03	250
William G. Arn, '97	500	Herman S. Heichert, '97	250
Theodore L. Condron, '90	500	James C. C. Holding, '94	250
Harrison W. Craxer, '95	500	W. M. O'Laughlin, '07	250
Herbert Foltz, '86	500	Harry H. Orr, '07	250
W. F. Freudenreich, '98	500	Chester L. Post, '03	250
Alonzo J. Hammond, '89	500	Richard Aitken, '17	200
George Lindenberger, '03	500	John E. Bernhardt, '08	200

THE ROSE TECHNIC.

Thomas M. Evans, '17	\$200	E. B. Allen, ex-'17	\$100
Edgar N. Goldstine, '17	200	Alfred N. Austin, '03	100
Arthur F. Gordon, '97	200	George W. Brooks, '16	100
Henry C. Gray, '17	200	Samuel Finkelstein, '15	100
Frederick W. Hild, '17	200	Harry S. Goldman, '14	100
W. Edward Richard, '17	200	Claude A. Lyon, '14	100
M. Harold Smith, '17	200	J. Harold Overpeck, '16	100
Milton Tilley, '17	200	E. Lindley Jones, '02	100
Harry A. Toelle, '17	200	J. Luther Pirtle, '16	100
Walter C. Wentz, '17	200	Donald B. Rush, '10	100
Vern J. Whelan, '17	200	Roscoe R. Stoltz, '16	100
Chester A. Williams, '17	200	Sam P. Stone, '16	100
Henry W. Wischmeyer, '06	200	Rolla S. Wilson, '09	100
Carl A. Klem, ex-'97	175	H. L. Weatherbee, '92	100
Harry D. Baylor, '07	150	Alfred A. Piper, '10	75
Lucien D. Gilbert, '12	125		

Jesse E. Holliger, '99, examiner in the Patent Office, died in Washington, February 15, after a short illness.

Vernor J. Gillett, '91, engineer with the Detroit Brass Forging Co., of Trenton, Mich., died suddenly March 6, after a brief attack of pneumonia at his home in Trenton. Mr. Gillett was married in 1892 to Miss Irene Logan, daughter of Mr. and Mrs. Garrett W. Logan.

Mr. Logan is foreman of the R. P. I. shops. Mr. Gillett is survived by his wife and four daughters.



The MINSTRELS

You're right! Rose had a minstrel show—and it was a bear! Quoting from the *Terre Haute Star*, "When it comes to putting on a home talent minstrel show, the Engineers of the Rose Polytechnic Institute demonstrated beyond any lingering doubt that they are to be counted in the first rank. Before an audience which packed the Grand Opera House, the first annual minstrel show was given, and to say that it was successful to the fullest degree is not doing full justice to the new black-face entertainers."

The production, and we believe the performance may be correctly termed such, owed its entire success to Director Gilbert's hard work. It was Gilbert who conceived the possibilities of a Rose minstrel, and it was Gilbert who pushed the thing thru after the idea had been accepted by the Rose students. This should detract but little, however, from the credit justly due those who actively participated in the show. It was only by hard work and a big sacrifice of time on the part of all that the success was attained. It is to be hoped that the minstrel show will open the eyes of Rose men as to what can be accomplished by co-operation and working together. Here's to next year's show!

To get back to our story, however, when the curtain rose at the beginning of the first part, the audience beheld fifty of our own embryonic engineers dressed within an inch of their lives. "Pritch" had them togged out in the conventional black dress suits with a rose ribbon across each dress shirt. The effect was good.

Arthur Nehf, ably acting as interlocutor, introduced "Chick" Springer as the first end out

after the opening number, and the performance was off with a snap. Chick pulled some stuff about a supposedly historical football trip, (must have been the trip the Buzzards took) and finished his part with "Pray for the Lights to Go Out."

The balladists and remaining ends then came in for their proper bit of the performance, the first part of the show closing with Woodruff and the entire company in "Mammy's Little Coal Black Rose," without a single hitch.

Connelly and Grafe pleased the audience as end men, Grafe's story about his Southern Uncle proving to be the biggest mirth producer of the first part. Bob Tilley, the last end out, sprung a few on Professor Hathaway which, altho well known to all Rose students, had not been heard by the remainder of the audience and went well.

The ballad singers, Robin Woodruff, Milton Steffin, John Crowe and Dick Gillum played as prominent a part in the entertainment as the ends. Woodruff was featured, and being well known in local musical circles, received a royal welcome.

The blackface boys with the tamborines worked together wonderfully, and went thru their steps like old timers. The chorus should also be given due credit for the support which they gave the principals.

The first half closed with a feeling of delight not unmixed with surprise on the part of the audience, and put them in a mood to appreciate the olio which followed.

Bob Long and Frank David opened the second part with impersonations of Frank Tinney and his porter. Bob attempted to portray the famous blackface entertainer, and succeed-

ed, much to the delight of his audience. David backed him up well, and assisted nobly in their closing number, "She Sleeps in the Valley—by request."

Rudolph Wiedemann then introduced his mandolin club in an act billed in the program as "Melody on Strings." One of the numbers rather humorously degenerated into a race for the finish, but after the ice had been broken the fellows came back strong, and were called back for several encores.

The Harmony Four came on next with a number which was true to the name. The quartet probably registered the biggest success of the second part.

The show closed with a murder on the part of the famous Rose Band. Under the esthetic leadership of Ralph Waggoner "My Little Girl" and "A Rambling Wreck" were painfully executed. The audience exhibited Roman-like appreciation of the slaughter. Walter Charman performed excellently on the xylophone between tragedies.

An idea of the financial success of the show may be obtained from the fact that the entire house was sold out, and standing room was at a premium.

The program follows:

FIRST PART.

Interlocutor—Art Nehf.

End Men—"Chick" Springer, Paul Grafe, "Chuck" Connelly, Bob Tilley.

Ballads—Milton Steffin, John Crowe, Dick Gillum, Robin Woodruff.

Tambos—Joe Englehard, Paul Stoner, Fred Pence, Willys Wagner, Carl Froeb, Rudolph Wiedemann.

Chorus—J. F. Reinking, C. W. Young, N. A. Ruston, J. S. King, A. Brophy, D. Cromwell, F. F. Peker, C. E. Stoll, H. G. Schlamman, J. Mikels, A. W. Norton, H. P. Kremer, A. P. King, F. M. Stone, H. J. Lauterbach, V. J. Whelan, W. C. Bryan, H. E. Bierbaum,

G. K. Woodling, A. E. Altekruise, J. C. Zimmerman, D. W. Phillips, R. M. Wagonner, D. Howard, F. Rolshausen, W. C. Woodling, H. Briggs, F. B. Ray, W. R. McKeen.

MUSICAL NUMBERS IN FIRST PART.

Opening Chorus:

"Just One Day"Entire Company
Introducing "Chick" Springer

"Pray for the Lights to Go Out" ...Springer

"Somewhere a Voice is Calling"Steffin
Introducing "Chuck" Connelly

"At the Darktown Strutter's Ball" ..Connelly

"The Sunshine of Your Smile"Gillum
Introducing Paul Grafe

"Down Where the Swanee River Flows"..
.....Grafe

"Poor Butterfly"Crowe
Introducing Bob Tilley

"Those Homesickness Blues"Tilley

"Love, Here is My Heart"
.....Closing With Woodruff

"Mammy's Little Coal Black Rose"
.....Woodruff and Entire Company

OLIO.

Impersonation of Frank Tinney and His Porter.

Bob Long, Frank David.

Melody on Strings

W. C. Woodling, R. F. E. Wiedemann, N. A. Ruston, F. M. Stone, G. Robinson, H. G. Schlamman, D. B. Weaver

The Harmony Four

Our Own Band. Sixty Pieces
(Count 'em)

Col. Stone and Genl. Rolshausen.

Wm. Rose,	Carl Poly,	Darn Institute,
Red Rose,	Dick Poly,	Al Institute,
Jim Rose,	Jake Poly,	Dr. Institute,
Harry Rose,	Paul Poly,	Tom Institute,
Tim Rose,	Pretty Poly,	Bert Institute,
Fred Rose,	Dan Poly,	Ira Institute,
"Ek" Rose,	Andy Poly,	Less Institute,
Jap Rose,	Rose Poly,	Art Institute.

MILITARY TRAINING AT ROSE.

That Rose is to have some form of military training as a part of the regular course in the very near future seems almost certain. The feeling aroused late last year probably did much to start the movement, but present conditions have hastened matters materially. Last year it was deemed advisable by those in charge of Institute matters to defer action along these lines until after the school had moved to the new quarters east of the city. At a faculty meeting held on Saturday, February 24th, however, the matter was again brought up, and it was practically decided at this time to take immediate steps toward the establishment of military training as a part of the regular curriculum providing such action was approved by the students. There need have been very little doubt as to the stand of the students. The straw vote taken by *The Technic* last year showed that the students were practically unanimous in their support of this movement, and the same feeling has been evidenced again this year. Subsequent to the action of the faculty, petitions asking that military training be installed at Rose were drawn up and presented to Dr. White by the two lower classes. The fact that the upper classes have, as this issue goes to press, not yet taken action does not signify that they too are not heartily in favor of the idea. The two lower classes being those affected most by this change should probably have the greatest voice in the matter. That the other classes will lend their support, however, is not to be doubted for an instant.

A committee of investigation has been appointed by Dr. White. The committee consists of Professors Coles, Wischmeyer and Ranel. This committee was to determine the attitude of the student body on the subject of military training, and if then advisable, to investigate the various ways in which a training course might be installed. The committee having determined to its own satisfaction that

the Rose student body is in favor of the training, is now investigating what may be the best plan for adoption at Rose.

The adoption of military training here may mean one of a good many different things. The first thing to be decided is how much credit shall be allowed for this training and what part this training shall play in obtaining credits for graduation. For instance, the present course of work may be somewhat modified and the adoption of this training may mean that an additional number of credits will be required for graduation. This will mean that additional time at the Institute will be required. It is barely possible that this will be done. With the present schedule running up a goodly number of hours the faculty can hardly consider it just to add additional work. The feasible thing seems to allow time from other subjects. This is what will probably be done. The question will then arise as to what subjects may best be cut down or dispensed with entirely, and likewise whether this training will take the place of required credits or elective credits. It is hardly possible that military training for four years will be adopted. If two year's work is put in, the question as to the most advantageous place in the course for this work arises. Altogether it seems as if the job of mapping out a revised schedule to include training is not so simple as first appears. The report of the investigation committee will be anxiously awaited.

The first problem arising before the introduction of military training is the training of officers to drill the men. Professor Coles, having had a great deal of experience along these lines has kindly offered to hold an officer's school for all those interested. About thirty men have so far signified their willingness to attend. All others interested should turn in their names immediately. Drill may be installed this year, but no definite statement in that regard can be made. In case drill is taken

up this year Captain C. A. Kesseling of the local recruiting office has offered his services and has stated that he may be able to detail a drill sergeant to assist in this work. A course of lectures in camp sanitation and fundamental military tactics will in all probabilities begin the movement. Things should be well under way before another month has passed.

Right along this line may be mentioned the action taken by the faculty in extending an offer of their services and the entire equipment of the school in case of need. The following letter gives sufficient explanation.

February 26, 1917.

The President of the United States of America,
Executive Mansion, Washington, D. C.

Your Excellency:

In consideration of the grave crisis now confronting our country, and in support of the wise judgment of its executive in guiding its destinies, the Faculty of the Rose Polytechnic Institute at a meeting held on Saturday, February 24th, voted to extend to the President and the government of these United States an offer of their individual and collective support and services in case of demand, same to be used in such ways as may seem best to the authorities; and, further, to place at your disposal the resources and equipment of this Institute and its departments and its shops.

It has been suggested that as an engineering institution we might especially serve the government by establishing here a bureau for testing, calibrating and giving instruction in the proper use of gauges for machine purposes and otherwise; for the preparation of nomographic charts for the plotting of formulae; and for the carrying on of other scientific and engineering tests which may be suggested.

The following members of the Faculty participate in this action:

John White, Acting President and Professor of Chemistry.

James A. Wickersham, Professor of Languages.

Arthur S. Hathaway, Professor of Mathematics.

John B. Peddle, Professor of Machine Design.

Frank C. Wagner, Professor of Mechanical and Electrical Engineering.

Edwin S. Johannott, Professor of Physics.

Robert L. McCormick, Professor of Mechanics and Associate in Civil Engineering.

Clarence C. Knipmeyer, Associate Professor of Electrical Engineering.

Albert A. Faurot, Associate Professor of Languages.

Harold A. Thomas, Associate Professor of Civil Engineering.

Carl Wischmeyer, Associate Professor in Drawing and Machine Design.

William G. Ranels, Assistant Professor of Shop Management and Practice.

Orion L. Stock, Assistant Professor in Drawing and Architectural Design.

Henry L. Coles, Assistant Professor of Chemistry.

Warren R. Spencer, Instructor in Mathematics and Civil Engineering.

Respectfully,

(Signed)

JOHN WHITE,
Acting President.

DINNER FOR BASKET BALL MEN.

On the evening of March 3, a delightful dinner and theatre party was given by Mr. and Mrs. Rufus W. Gilbert in honor of the basket ball men. The guests included the basket ball men, Messrs. Reinhard, Davis, Floyd, Heedwohl, Allen, Howard and Wentz, and also three football representatives, Messrs. Grafe, Woodling and Wagner. Ever since the event happened, each one of the guests has been trying to out do all the rest in giving glowing accounts of the party, and the consensus of opinion seems to be that the food was "scrumptious." The dinner passed with a great deal of jollity and festivity, and afterward a general discussion was held in regard to prospects for baseball, football and track. After this the party adjourned to the Hippo-

drome, in time for the nine o'clock performance. The end of the show marked the close of a most enjoyable evening, and the hospitality of Mr. and Mrs. Gilbert has caused their guests to be envied by the whole school. Would that we all might be basketball men!

JUNIOR CLASS MEETING.

Members of the Junior Class got together in Fessor's room on the afternoon of March 5 to formulate plans for the St. Patrick's celebration, with Vice-president Furry in the chair. Since it was thought wise to dispose of disagreeable matters first, the meeting was opened with the announcement that the total assessment for this year's hilarity is to be seventy-five cents, instead of fifty cents as in foregoing years. Attention was called to the fact that the celebration of 1916 had left the school twenty dollars in the hole. This year fifty cents will be required of every man for the general activities on the afternoon of the 17th, and twenty-five cents additional for the dance to be held that night. The saving of this extra quarter will afford some consolation to those who do not dance.

Mr. Furry then called for suggestions in regard to the regalia to be worn by the Juniors in the parade. But most of those present had just completed a session in Phys. Lab., and in consequence were not overflowing with brilliant ideas. However, after much deliberation and wrangling, several suggestions were adopted, and the school may rest assured that the Juniors will be "gotten up regardless" on the night of the 17th.

MR. COTTINGHAM'S LECTURE.

At a general assembly held at three p. m. on Thursday, February 15, a lecture, illustrated by moving pictures was given by Mr. Charles Cottingham. Four films were shown, two of which gave views of the Panama Canal, the third and fourth being entitled, "The Making of a Big Gun at Krupps'" and "The Production of a Modern Newspaper." While the

films were instructive and valuable from an educational standpoint, it must be confessed that they did not inspire the intense interest and enthusiasm that the same audience would have evidenced during a reel of the incomparable Chaplin in spite of the fact that Mr. Cottingham's pictures combined features which were both weird and startling.

FRATERNITY NOTES.

On the evening of February 10th, the members of the P. I. E. S. fraternity held an informal at the fraternity house for their newly pledged Freshmen. The evening was spent in dancing and in carrying out a number of original stunts. Punch was served thru-out the evening. Later the guests were treated to dainty refreshments. The fraternity members present were Chester Williams, Thomas Evans, Harry Toelle, Harry Knox, Wayne Self, Robert Long, Harry Harbulak, Earl Minnick, Earl Wessel, George Owens and Ralph Buck. The pledges present were Arthur Wildermuth, Frank Reinman, James Byers, Walter Osmer, Harry Bierbaum and Russel Stockmaster.

The party was chaperoned by Professor and Mrs. O. L. Stock.

A unique entertainment was given at the Alpha Tau Omega House on the evening of March 7. The freshman pledges of the fraternity gave a dance, to which one freshman pledge of every other fraternity was invited. The representatives of the other fraternities were R. C. Manson, Beta Phi; H. H. Heck, Alpha Chi Sigma; N. A. Ruston, Theta Xi, W. L. Osmer, P. I. E. S.; W. P. Wagner, Sigma Nu; and R. P. Jones, V. Q. V. The dance was chaperoned by Mr. and Mrs. C. Owen Dodson.

The affair was a complete success and the first year men of the A. T. O. Fraternity are to be congratulated. A greater number of inter-fraternity entertainments should be encouraged.

MINUTES OF STUDENT COUNCIL
MEETING.—FEB. 23, 1917.

Meeting called to order at 7:30 by Pres. Hild.

Wente, Carpenter, Howard and Kessler absent.

Voucher committee reports that vouchers have been printed.

Stationery committee reports stationery received.

Report of Financial Secretary, for period Jan. 19, 1917 to Feb. 23, 1917 inclusive.

Athletic Assoc	\$111.81	\$806.05	\$917.86	\$905.40	\$12.46
Y. M. C. A. . . .	102.78		102.78	5.00	97.78
Technic	53.38	84.50	137.80	135.29	2.51
Symphony Club	131.65		131.65	*131.65	
Scientific Soc. . .	9.65		9.65		9.65
Camera Club. . .	11.07		11.07		11.07
General Fund. . .	50.63	131.65	182.28	130.00	52.28
Financial Secretary—Balance in bank, Feb. 23, 1917					\$185.75

*Reverted to General Fund.

Moved by Long, seconded by Streeter that report on last month's budget and on Minstrel be deferred until next meeting. Motion carried.

After discussion on motion to make paying of Student Fund compulsory; Smith and Long were appointed on committee to interview Dr. White.

After a general discussion it was decided that the Modulus might be published by the Sophomore and Junior classes together if such arrangement met with the approval of the Sophomore class.

Motion for adjournment by Long, seconded by Smith. Motion carried.

Meeting adjourned.

E. W. RICHARD,

Rec. Sec. Pro Tem.

GOVERNMENT CONTROL OF WIRELESS.

"American progress in radio-communication has been particularly rapid; because the art has not been a government monopoly here, but has been open to free competition from all parts of the country. In Europe, also, the progress has come from those individuals and organizations unhampered by governmental restrictions, and in those places where intellectual liberty and initiative have had sway.

"The London International Radio Convention, having been subscribed to by the United States, has already hampered industrial radio-development here. It has laid severe and unnecessary restrictions on the use of a large range of wave-lengths. The air we breathe is no longer free, in the sense that all electric waves in it may be utilized for the transmission of intelligence by those who undertake to serve the public by sending their radio-messages. Only a relatively small range is permitted to civilian use, the greater share being reserved to military service, where it is but little needed in time of peace. Moreover, the military authorities of the United States

are given arbitrary powers in time of peace for the suppression of all use by civilian telegraphists of the preempted range.

"Because all good citizens should loyally aid and support the military forces in time of war is no reason for sacrificing the interests of radio-communication in times of peace. The military profession is so exacting in its duties and requirements that military men can not properly attend to the invention and designing necessary for keeping American radio-communication in the front rank of preparedness. If war does come, it is just as likely to come very suddenly, and much will then depend upon the state of development of the art of radio-communication in this country. The right way to be prepared is to leave the development of the art of radio-engineers and inventors, and then to commandeer their services for military use. The wrong way, and the one which legislation is designed to bring about, is to leave it exclusively to the military departments of the Government."—*Electrical World.*

CAMPUS CELEBRITIES

VI

G. ROBINSON



victim, Mr. Goldsborough Robinson. (Loud applause.)

The ranks of our celebrities have so far been filled with financiers, executives, and athletes. Robby doesn't stand as an athlete, however,—that is if you don't consider his ability as a mandolin wrestler—and neither does he care a rap about his abilities as an executive—this is because he has his heart set on becoming a research engineer. We cannot pass judgment on whether or not he has the makings of a financier. He would probably make a world beater as an accountant, for it is rumored that in keeping with his general methods of efficiency he has an elaborate system of cost keeping by which he regulates his personal expenditures, and that he keeps a regular set of books for the same purpose, and balances them up in fifteen minutes

THREE years ago a mild mannered chap came up out of the South, paid his registration fee, purchased a student lamp, and settled down to get an education. Today he has covered three-fourth of the ground and is still going strong. Next year there will be none to deny that he "got it." You, of course, know by this time to whom we refer and with that brief introduction we present as this month's

at the end of each month. As for high finance, however, he has too much love of the Pure Science to have any ambition to get out and dynamite Wall Street.

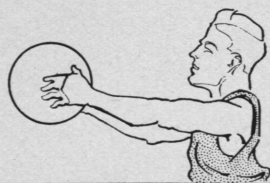
Robby is a man after Jojo's own heart. Not a salesman—a scientist! He doesn't talk a great deal, and he doesn't make much fuss. He just delivers.

The criticism usually offered him is that, "he doesn't have any sense about quitting anything. When he starts after anything he just naturally sticks to it until he gets it." We all know that's a bad habit—same thing wrong with Edison, Henry Ford, Graham Bell, and the rest of those bums. Promising boy, too!

You can spot Robby just about three blocks away when he comes gum shoeing over to one of his many eight o'clock classes; coat collar around his ears, hands in his overcoat pockets, and using that peculiar feet-foremost style of navigation that no one else has ever been able to successfully duplicate. When he gets within hailing distance the procedure is always the same. First he grins, then takes his right hand out of his overcoat pocket, raises it vertically and says, "Howdy Gents," if you are alone or in company with fifty classmates.

He is a real character. He lovingly cherishes a picture of Robert E. Lee which hangs just over his bed, and does not recognize Lincoln pennies as legitimate specie.

He is one of those fellows whose memory remains in the school long after they are gone, and when the talk of old times goes around and the name comes up the Freshmen always say, "Oh yes, I've heard of him."



BASKETBALL

ROSE-BUTLER.

This was a repetition of the Illinois Wesleyan game. With a ten point lead, Rose went in the second half and scored two field goals to Butler's seven, the final score being 26 to 21. In the first half, Tech played the best basket ball of the year. Ick, Doc, Jap and Silvers bombarding the basket, while Les held the visitors down. But such good work failed to last more than 20 minutes and thus the result. Slivers Floyd was unable to finish the last half and Reinking took his place, followed by Allen, but the visitor's rush could not be checked.

Score:

Rose 21.		Butler 26.
Floyd.....F.....	Markland	
Orr.....F.....	Race	
Davis.....C.....	Cornelius	
Reinhard.....G.....	Susseman	
Heedwohl.....G.....	Frankford	

Field goals—Race, 7; Susseman, 4; Floyd, 3; Orr, 3; Reinhard, 2; Davis, 2. Foul goals—Reinhard, Race, 3; Susseman. Referee—Smith, Indianapolis. Timekeeper—Hathaway, Rose. Scorer—Wente, Rose. Substitutes—Rose, Reinking for Floyd and Allen for Reinking.

ROSE-BUTLER

This was the first game of a week-end visit to the capitol City. The Indianapolis News comments upon the affair as follows:

If hand grenades, poisonous gases and Lewis machine guns could have been smuggled into the Marion Club gymnasium yesterday afternoon they would probably have been used. For two contending parties gathered there, one wearing the belligerent blue of Butler and the other the ruthless rose of Rose Poly, and

staged a basketball game alongside of which an ordinary battle royal would have looked like a tea fight. Had these ten athletes been mobilized in a prize ring and not on a basketball floor Rose Poly would have been awarded the decision. But as it was a basketball game, and the Butler five spent just a wee bit more time than did the Rose crew pursuing the game's primary object of tossing the ball through the circular hoop and a trifle less in tossing their opponents on the hardwood floor, the home team won, 35 to 26."

Summary:

Rose 26.		Butler 35.
Orr.....F.....	Race	
Floyd.....F.....	Markland	
Davis.....C.....	Cornelius	
Reinhard.....G.....	Woods, Agnew	
Heedwohl, Allen.....G.....	Frankford	

Field goals—B. C., Race, 2; Markland, 10; Cornelius, 2; Agnew, 1. R. P. I., Orr, 4; Floyd, 2; Davis, 2; Reinhard, 2. Foul goals—Race, 4; Reinhard, 2.

ROSE-INDIANA DENTALS.

Rose lost to the Dents 28 to 20 in the second half of a roughhouse contest at Indianapolis. The Tooth Pullers never had the game cinched but a spurt at the finish told the tale. The goal shooting of the Dental guards was a feature.

Summary:

Dentals 28.		Rose Poly 20.
McCormick.....F.....	Floyd	
Deakyn.....F.....	Orr	
Edman.....C.....	Davis	
Sibbitt.....G.....	Reinhard	
Ray.....G.....	Heedwohl	

Substitutions—Dentals, Roth for McCor-

mick, Filer for Sibbitt; Rose Poly—Allen for Orr, Howard for Floyd. Field goals—Sibbit, 4; Ray, 3; Deakyne, 2; Edwan, 2; Rose Poly, Reinhard, 3; Floyd, 2; Orr, Davis, Allen. Foul goals—Dentals, McCormick, 4; Deakyn, Roth; Poly, Reinhard, 4. Referee—Ross Smith, Indiana State Normal. Time of halves—20 minutes.

ROSE-NORMAL.

Rose met the Teachers on their home floor and received the short end of a 35 to 12 score. Our forwards could not locate the basket, tho they had many shots. The Normal guards displayed good defense and moreover each contributed five field goals to the score. Ick and Les held their men to a couple field goals apiece. Summary:

State Normal 35.	Rose Poly 12.
Bayh.....F.....	Floyd
Shriner, Grose.....F.....	Orr
Rhoads.....C.....	Davis
Curtis.....G...Heedwohl, Howard	
Williams.....G.....	Reinhard

Field goals—Curtis, 5; Williams, 5; Shriner, 2; Bayh, 2; Floyd, 3; Orr, 2. Foul goals—Shriner, 2; Bayh, 5; Reinhard, 2. Time of halves—20 minutes. Referee—Craigle.

ROSE-WABASH.

They came and they conquered—The Wabash Wonder Five. Rose, however, put up a

scrappy game and were only downed by a 35 to 16 count. The Poly defense was a feature of the game. The Wabash warriors were allowed only few "grape" shots. Jap Davis handled his man, Cauldwell, exceptionally well, in fact, it was too well to suit said Mr. Cauldwell and once or twice things grew quite interesting. As for offense, Reinhard led the assault. Ick had a special spot marked on the floor from where he couldn't miss the basket. He camped here during the second half. Result? Five field goals for Ick. The much-heralded Stonebreaker went in during the second half and gave an exhibition of brilliant basketball. Bacon, star guard, handled the whistle in absence of Referee Maloney. He blew it when he tossed up the ball and when some one caged a goal. That's good refereeing in these parts.

Score:

Wabash 35. Rose Poly 16.

Cunningham,	
Stonebreaker.....F.....	Floyd, Howard
Hunt.....F.....	Orr
Cauldwell.....C.....	Davis
Dietzer.....G...Heedwohl, Howard	
Neal.....G.....	Reinhard

Field goals—Cunningham, 6; Hunt, 6; Cauldwell, 2; Dietzer, 1; Stonebreaker, 1; Reinhard, 5; Floyd, 2; Orr, 1. Foul goal—Stonebreaker, 2; Dietzer, 1. Referee, Bacon. Timer—Prof. Hathaway.

INTER-FRAT BASKETBALL.

On Tuesday Feb. 20, the first games of the Inter-Fraternity Basketball Tournament were played. The Theta Xi five found no trouble in downing the Beta Phi's 26 to 4. The second game was closer, however, and after an exciting struggle, Alpha Tau Omega downed Alpha Chi Sigma, 20 to 13.

On the following afternoon, P. I. E. S., suffering from injuries, forfeited to Sigma Nu, 2 to 0; and the V. Q. V.'s barbed the barbs, two dozen to one.

In the semi-finals, the A. T. O. gang bested the Theta Xi's 20 to 13 and the V. Q. V.'s eliminated the Sigs 33 to 2.

The final on Saturday night was won by the V. Q. V.'s, 32 to 4. The game was exciting thruout in spite of the one sided score. Professor Hathaway presented the winners a beautiful silver cup, which they have the right to gaze upon 'til the next inter-frat competition. At that time, it will be again displayed and another battle will ensue.

PROSPECTS.

On Friday, March 2, a meeting of track, baseball and football candidates was held. Coach Gilbert made a long speech in which he said he would insist upon three things during the coming year. Regularity at practice, obedience and complete harmony, not only between players, but between player, captain, and coach. Football Captain Grafe gave his candidates a short talk. Football stock is above par. With a natural leader at the helm and an abundance of good material, the old name "Fighting Engineers" should indeed be revived.

In baseball, we are hard hit, retaining only two of our hard hitting nine of last year,

Catcher Bake and Captain Reinhard, but a young multitude of aspirants are out for jobs, so things are not so bad as they seem.

Track prospects are all that they were last spring plus the Freshman tracksters. Bill Wagner looks mighty good in the high jump and a number of other men of '20 have track ability.

As for tennis, all that need be said is that this is Walter Charles Wente's senior year and also another tennis championship for Rose. Last fall's tournament produced quite a number of stars and it is likely that Dutch will find a good running mate.

 SCHEDULE FOR 1917.

BASEBALL:—

- April 11—Purdue at Lafayette.
- April 21—DePauw here.
- April 25—Butler here.
- May 10—Wabash at Crawfordsville.
- May 12—Indiana State Normal here.
- May 18—DePauw here.
- May 19—Wabash here.
- May 23—I. S. Normal at Parsons Field.
- May 25—Central Normal at Danville.

TRACK:—

- April 28—Wabash and Normal here.
- May 5—Normal and DePauw at Greencastle.

May 12—Normal here.

May 25—I. C. A. L. Meet at Richmond.

FOOTBALL:—

- Sept. 29—Alumni here.
- Oct. 6—DePauw at Greencastle.
- Oct. 13—Hanover at Evansville.
- Oct. 20—Wabash here.
- Oct. 27—Washington U. at St. Louis.
- Nov. 3—Franklin here.
- Nov. 10—DePaul at Chicago.
- Nov. 17—St. Louis U. here.
- Nov. 24—Butler at Indianapolis.
- Nov. 29—Rolla School of Mines here.



REVIEWS



Interesting Technical Articles of the Month.

ENGINEERING AND MINING JOURNAL, March.

Common Sense of Gold Dredging.

By A. C. Ludlum. The essentials preliminary to a successful gold-dredging operation are concisely explained. Failures of the past were largely due to lack of prospecting or unsuitable equipment.

A Chilean Pocket Gold Mine.

By E. David Pope. In 1911 the discovery of a rich gold pocket at Putue created much excitement. The deposit was of limited extent and was soon worked out. The veins were cut off by numerous faults. This isolated patch of rich gold ore in a country full of barren quartz veins is of special interest.

ELECTRIC RAILWAY JOURNAL, March.

Buffalo-Niagara Falls High-Speed Line.

Quick acceleration, high running speed and frequent service are to be characteristics of new line on private right-of-way now under construction between these two cities.

ELECTRICAL MERCHANDISING, March.

The Bank as the Contractor's Ally.

The plan by which a trust company provides Cleveland electrical contractors with working capital.

GENERAL ELECTRIC REVIEW, March.

Structure of the Atom.

By Dr. Saul Dushman. Part One of a two-part discussion on this subject. The writer discusses the theories of the structure of the

atom in the light of the most recent discoveries in physics. This first part deals with the experimental observation upon which these theories are based.

The Tungar Rectifier.

By R. E. Russell. This article is a description of the hot cathode argon gas filled rectifiers as at present developed commercially. These convenient rectifying units are now available in three sizes, the smallest having a capacity of two amperes, and the largest a capacity of six amperes. Some of the less obvious applications of a rectifier of this kind are here discussed.

SCIENTIFIC AMERICAN, March 3.

The Destroyer and the Torpedo.

High speed and quick turning ability as the effective solution of torpedo evasion.

The Machinery of Ships.

By H. C. Dinger, U. S. N. The modern trend of methods and construction in the ship-building industry.

SCIENTIFIC AMERICAN SUPPLEMENT, March 3.

Electrical Treating of Wounded.

By W. J. Turrel and M. D. Oxon. Application of electrotherapy to rheumatism, paralysis, wounds, etc. Success of this method in the French army. Among the beneficial effects noted are the elimination of pain and the healing effect on wounds.

ELECTRICAL JOURNAL, March.

Magnetic Properties of Sheet Steel.

By T. Spooner. Losses by hysteresis, eddy currents. Permeability. Factors affecting magnetic properties.

ENGINEERING RECORD, March 3.

Test of Concrete Columns with Cast Iron Cores.

Emperger columns tested at U. S. Bureau of Standards. Reported by L. G. Mensh for American Concrete Institute.

BOOK REVIEW

Physical Laboratory Experiments for Engineering Students. by Sheldon & Hausman; pp. 134. D. Van Nostrand Company, New York. \$1.25 net.

This volume which is designed to cover a course in the Physical Laboratory of the Polytechnic Institute of Brooklyn, describes thirty experiments. These experiments, while purely physical, are chosen so as to touch as closely as possible on a wide range of topics, such as might be encountered by the student in his experience after graduation.

The choice of the material and the method of treatment appears to be appropriate for the student with the proper preparation. It could hardly be considered to be the best if the primary object is drill in the fundamental

principles of physics, rather than to present the methods to be employed in many of the important subjects that the student might meet in his practical experience, later. The treatment is not sufficiently didactic to recommend it as a general text, or manual, for the average course in the physical laboratory. To illustrate, is it not probable that the student would learn more of the methods of the oculist than he would of the principles of physical optics in Experiment 26, on the ophthalmometer?

The book is very well written, the treatment is thoro and still concise; and it will be welcomed as a valuable reference in the physical laboratory.

The Spray Engineering Co., of Boston, has just issued a new bulletin descriptive of their "Spraco" Equipment for washing and cooling the ventilating air for steam-driven generators. Apparently the pamphlet has been carefully prepared and sets forth a number of facts re-

garding air washing and cooling apparatus which should be of particular interest to engineers having charge of any generating machinery of considerable size. Interesting figures as to the real value of clean, cool air in this connection are clearly set forth.

McGRAW AND HILL PUBLISHING COMPANIES CONSOLIDATE.

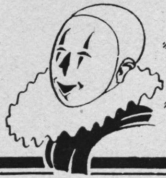
The McGraw Publishing Company, Inc., and the Hill Publishing Company, New York, have been consolidated as the McGraw-Hill Publishing Company, Inc. The new company acquires all the properties and interests of the two constituents, including the following technical journals:

Electrical World, Electrical Railway Journal, Electrical Merchandising, Engineering Record, Metallurgical and Chemical Engineering, The Contractor, American Machinist, Power, Engineering News, Engineering and

Mining Journal, and Coal Age.

Two of these papers, Engineering News and Engineering Record, will be consolidated under the name, Engineering News-Record, with Mr. Charles Whiting Baker, now editor of the Engineering News, as editor-in-chief.

Mr. James H. McGraw will be president of the new company, Mr. Arthur J. Baldwin (now president of the Hill Publishing Company) vice-president and treasurer, and Mr. E. J. Mehren, vice-president and general manager.



DIFFERENTIALS

'19 SEZ.

Hey fellers, have you seen it? Say it's a wonder, that piece of architecture put out by Zim and Co. '19's I mean that elephant. It's got two real head lights right in its head, one green and one blue, and a tail light where do you suppose? It's as strong as an elephant for it can ride Peker with ease and not even grunt. Talk about speed, why with a few Rose men behind it, it could beat anything

from a Wabash football team to Jo-Jo five minutes before the hour is up. Say those ivories are wonders! If you could only feed him some peanuts or snuff I bet he would walk right off the platform. Anyhow he will be out on the campus soon and all ye followers of the order can fall in line. I tell you it's the most wonderful elephant in existence; it's a Rose elephant.

FAMILIAR PHRASES.

"They will probably get married in June."
 "At the present time, however, we have nothing to offer but will place your application on file."
 "Do you think he will ever amount to anything?"
 "Sixty is not enough."

"I'd like to locate for life in a drafting room."
 "Do you think he'll get a diploma?"
 "That is just the same result we got Professor!"
 "Yes I know, but he always manages to get by somehow."

First Junior: "Pop Fury seems to be embarrassed by his baldness, I see he keeps his hat on all the time."

Second Junior: "It's not that; he's afraid a phrenologist might be around."

R. P. I.

"My dear that gown shows your figure almost as plainly as if you had nothing on."

"Well, there is nothing the matter with my figure, is there?"

R. P. I.

"Define deficit."

"Deficit is what you've got when you haven't as much as you had if you had just nothing."

—Puck.

R. P. I.

Mary had a little lamp;

It was well trained, no doubt,
 For every time a fellow called,
 The little lamp went out.

Fessor (requesting Sophs to give him the name of a chemical compound which may be used in giving an example of the use of calculus in chemistry): "Waal boys, what shall I use?"

Probst: "Take sodium chloride, Fessor."

Werbner: "Take copper sulphate, Fessor."

Bold Unknown: "Aw take Potassium Cyanide, Fessor."

R. P. I.

Collector: "Is your master at home?"

Servant: "Yes sir."

Coll.: "Thank goodness, I will see some money at last."

Servant: "No you won't sir. He wouldn't be at home if he had money."

R. P. I.

"Daddy, what is the plural of spouse?"

"Spice, my boy."

Jones: "Circumstances over which I had no control prevented me from coming."

Oldwed: "That's a long name to give your wife!"

R. P. I.

"Well," said the doctor, "you're cured at last. How do you feel?"

"I feel," said the patient, looking at his wallet sadly, "I feel as if I could start life all over again."

R. P. I.

The mule is patient, fond of work,
His virtues well bear sifting;
Besides, the business end of him
Is always so uplifting!—*Life*.

R. P. I.

Ed (in auto): "This controls the brake. It is put on very quickly in case of emergency."

Co-ed: "I see, something like a kimona."

—*Orange Peel*.

R. P. I.

He met her at the pasture gate,
She bore a pail of milk,
He gazed upon her rosy cheeks,
They were as smooth as silk.
"How is the sweet milk maid?" he asked.

She wrinkled up her brow,
"The milk ain't made, you boob," she said,
"We get it from the cow."—*DePaww Daily*.

R. P. I.

"Lillian," said mother severely, "there were two pieces of cake in the pantry this morning, and now there is only one. How does this happen?"

"I don't know," replied Lillian regretfully. "It musta been so dark I didn't see the other piece."

R. P. I.

Wife: "The paper says that nitrates are higher."

Hub: "What do we care? We never telegraph any."

R. P. I.

"Every time the baby looks into my face he smiles," said Mr. Meekins.

"Well," answered his wife, "it may not be exactly polite, but it shows he has a sense of humor."

A maiden entered the midnight car,

And firmly grasped the strap;

And every time they hit a curve,

She sat in a different lap.

The hill grew higher, the turns grew worse.

At last she gasped with a smile,

"Will some one kindly tell me, please,

How many laps to the mile?"

R. P. I.

"What is a falsehood?"

"A hair switch."

R. P. I.

Patient: "Doctor, what I need is something to stir me up—something to put me in fighting trim. Did you put anything like that in the prescription?"

Doctor: "No. You will find that in the bill."

R. P. I.

"I see you have your hand in a sling," said the inquisitive passenger. "Broken, isn't it?"

"Yes, sir," responded the other passenger.

"Meet with an accident?"

"No; broke it while trying to pat myself on the back."

"Great Scott; what for?"

"For minding my own business."

R. P. I.

Fond Papa: "Well, son, what did you learn in school today?"

Son—"Aw, not much, Dad. We hadda a couple of two reelers in history, a three reeler travelogue in geography and a split reel nature study. They usta give us a wild west pitcher once in a while but they don't do it no more."—*Widow*.

R. P. I.

Cornwell: "I was reading the other day where a scientist found over ten million germs on a single dollar bill."

Valle: "I wonder how many he could find on a hundred dollar bill?"—*Red and Black*.

R. P. I.

Spunk: "Jones told me today that he wasn't drinking any more."

Spank: "I don't see how he could."—*Life*.

MARCH TECHNIC ADVERTISERS

Ed Sparks.
St. Nicholas Barber Shop.
Wm. Schonefeld, Druggist.
Thorman & Schloss.
Dr. James McCall.
L. C. Smith & Bros., Typewriter Co.
Swope-Nehf-Bloomer Jewelry Co.
Stewart's Shave Shop.
Colonial Dairy Lunch.
American Lead Pencil Co.
M. Joseph's Sons.
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Max Frank.
Great Northern Barber Shop.
Grand Opera House.
Tune Bros.
Heinl's.
Greek Candy Kitchen.
Baur's Pharmacy.
Myers Bros.
Freitag, Weinhardt & Co.
Hood & Schley.
Moore-Langen Printing Co.
Charles M. Higgins & Co.

Engineering Magazine.
Electric Controller & Mfg. Co.
Walkover Boot Shop.
John Ford.
The House of Foulkes Bros.
Smith, the Real Cleaner.
Bill Cody's \$2 Hat Shop.
Hotel Deming.
The Root Dry Goods Co.
A. Herz

Smith got married and the evening of his pay day he gave his bride \$14 of his \$15 salary and kept only a dollar for himself.

But the second pay day Smith gave his wife \$1 and kept \$14 for himself.

"Why, John," she said passionately, "how on earth do you think I can manage for a whole week on a paltry dollar?"

"Darned if I know," he answered in calm tones. "I had a rotten time myself last week. It's your turn now."

Prof. A.: "That boy Smith has learned all my ways."

Prof. B.: "Don't worry. He may improve."
R. P. I.

She: "Oh, I wish the Lord had made me a man."

He: "He did. I am the man."—*Life*.

R. P. I.

Hubby: "The bottom fell out of the stock market today."

Wifie: "Oh horrors! Was anybody hurt?"
—*The Lamb*.

Members of Rose-Normal Business Men's Athletic Ass'n

Spencer F. Ball, Chamber of Commerce.
Carl Bauermeister, Wholesale Grocer.
L. D. Smith, Athletic Goods.
Ed Sparks, Gent's Furnisher.
Kleemans, Dry Goods (Dept.)
Roots, Dept. Store.
Silberman, Furniture.
Ben Blumberg, Lawyer.
Buntin Drug Co.
The Deming Hotel.
Stimson, Stimson, Hamill & Davis,
Law Firm.
H. A. Condit, Real Estate.
Woodburn Printing Co.
John Crawford, Banker.
Weinstein Bros., Gents' Furnishers.
R. F. Marley, Office Supplies.
Siegel's, Ladies' Clothes.
Viquesney, Printers.
Jas. Royse, Banker.
McCurdy's Lunch Room.
Myers Bros., Gents' Furnishers.
Petersdorf's, Ladies' Clothes.
Valentines, Drugs.
Citizens Gas and Fuel Co.
Wade Duncan's Cafe.
Levi Dry Goods Co.
T. H. Brewing Co.
Traction Co., Five Tickets.
George Standau.

Ermisch, Cleaners.
Smith-Alsoop, Paints.
Mewhinney's, Candies.
Harvey Furniture Co.
Manford Collins, Printer.
Temple Laundry.
Model Ice Cream Co.
Furnas Ice Cream Co.
Central Union Telephone Co.
F. Allen.
Lee Goodman Sons, Furnishers.
Stahl-Urban Factory.
Deep Vein Coal Co.
Webb Beggs.
T. H. Boiler Works.
Plaza Restaurant.
Great Northern Restaurant.
Great Northern Hotel.
J. Levering and Son.
Brunner's Pharmacy.
Jensen Bros. Billiard Parlors.
DeArmott Bros. Billiard Parlors.
Tribune Billiard Parlors.
The Hippodrome.
Mehegan, Tailor and Haberdasher.
Gwinn, Dow R.
Moore-Langen Printing Co.
J. M. Bigwood & Son.
F. F. Winslow.
A. Herz.

Wood Posey Shoe Co.
Oak Hall Pharmacy.
Fisher Cleaning Co.
Tune Bros., Clothiers.
Edward Reiss, N. Y. Dental Parlors.
H. T. Farwell, Citz. Indep. Tel. Co.
Swope, Nehf & Bloomer Co.
R. H. Rhyan.
W. L. McPeak.
Foulkes Bros., Clothiers.
Ed. F. Leever, Insurance.
M. Joseph's Sons, Clothiers.
D. M. Nixon, Saturday Spectator.
Freitag, Weinhardt & Co., Hardware.
Thorman & Schloss, Clothiers.
J. T. Powers, Powers Cleaning Co.
A. Baur, Drugs.
Walk-Over Boot Shop.
Cook, Black & Hoffman.
Foster Furniture Co.
Greek Candy Kitchen.
Craft's Book Store.
Austin Hardware Co.
Hornung Shoe Shop.
Columbian Laundry Co.

The "Poly" Elephants
are now at Herz's

39c and 50c each

CHOICE OF WHITE OR ROSE

Read The Technic Ads!

You are sure to find it worth your while, as each bears an important message from the advertiser to you.

Optimist: "Come in and have a drink."

Pessimist: "I'll bet it is a grape juice."

R. P. I.

"So you want to become my son-in-law, do you?"

"I suppose I'll have to if I marry your daughter."

R. P. I.

He: "Before I go I shall kiss you."

She: "What time is it."

Prof.: "Is there any questions anyone would like to ask before we begin the lesson?"

Junior: "Yes sir—Will you tell me where it commences?"—*Tiger*.

R. P. I.

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