BEFORE looking ahead and endeavoring to find what the new year holds in store for us, perhaps it would be well to take a backward glance over the records of the past year, for perhaps they may help us in knowing what to expect during the coming one. Although 1915 was not exactly a record breaker, it is hardly deserving of last place when the totals of things accomplished are summed up. Come to think of it, 1915 was a pretty good year—just about the best year that any man in school has seen since his entrance into Rose, and it surely seems that with a great deal of the initial momentum overcome, 1916 should leave 1915 quite a distance behind.

Let’s see, starting at the first—our athletics during the spring term last year were not a great deal better than usual, but they were not poorer. We established no exceptional records, but our record was one that we can be proud of. So much for athletics, but last spring term brought forth a couple of other new ideas which should be thought of at this time.

Remember the Seventeenth of March? Perhaps with all the hitches and bobbles that usually accompany a first attempt, and particularly the escapade of the runaway elephant, this was not the extraordinary affair that it was expected to be, but in the founding of “The Order of The Elephant” a big step was taken in the direction of creating and fostering a better and stronger school spirit. Perhaps at some future time, those of us who were able to attend the “First Trumpet” will be able to look back upon that time with a great deal of satisfaction after seeing to what proportion this order will by that time have grown.

The Hemingway Club was opened last May. Its influence while only temporary, in that it will probable not exist after the new school is built, is worthy of mention for what it is doing and what it will do in bringing Rose men together and getting them better acquainted.

Taking a jump from last spring to the time when school opened last fall, the thing we think of first is the football season. It wasn’t
a record breaker and it wasn’t a disgrace. The team was a whole lot better than the team of the year before. If you get pessimistic about last football season, just thing of DePauw and then you’ll feel better. After the football season came the party of December 4th. That was one time when every loyal Rose student turned out and celebrated. Another new idea—here’s to many of them.

December also marked the inauguration of the first junior inspection trip, the most successful faculty dinner ever held, and the adoption of a new system of athletic managership. Who said 1915 was a slow year?

Now it is time to look forward to the coming year. Our athletics under the new system should be better than ever; the I. C. A. L. track meet will be held at Rose this year; this year will mark the beginning of the work on the new school.

Anything else? Certainly, but we’re not detail prophets, so be a little patient and you’ll see for yourself that 1916 is going to be A BIG YEAR for Old Rose.

Listen student, now’s the time for you to get your ticket for the festivities. It won’t cost much—only your willingness to do your part in stirring things up and keeping them humming. Your part isn’t much—only 1-180 of the whole. You can surely do that.

Now is the time to start. January has just kicked off and it’s time to travel. Let’s roll up the biggest score for things done that has been piled up since the school was founded! Hit ‘em hard, hit ‘em low. Yea Rose, let’s go!

Speaking of “mentioning The Technic,” Professor Wischmeyer did a little “mentioning” recently which helped our finances to the extent of over fifty dollars. In sending out notices to the members of the Alumni Association reminding them of their dues to the Association, Professor Wischmeyer mentioned to them that a year’s subscription to the Technic could still be obtained for one dollar and that the Business Manager was exceedingly anxious to have as large a number of Alumni on the mailing list as possible. The result was fifty-one subscriptions, which, of course, brings in fifty-one dollars, and, even if “Business is Booming,” fifty-one dollars is quite some sum.

We are indebted to Professor Wischmeyer and to the half hundred who so loyally responded—we thank them.

Through the courtesy of Mr. D. F. Roach, of the local traction company, we were able to secure for publication several interesting papers which were delivered before the seventh annual convention of the Indiana Electric Light Association, recently held in Terre Haute. The first article is a discussion of transmission line construction by E. J. Condon of the Indiana Utilities Company, describing particularly the construction work in the erection of a twenty-five mile line now operated by this company. We consider ourselves fortunate in being able to print this article.

This month’s alumni article by Robert N. Miller, ’01, on “The Legal Liability of Architects and Designers” is of particular interest and is most timely in that the seniors are now doing their last work on their Specifications and Contract and are more than usually interested in matters pertaining to engineering jurisprudence.

The notions of an average engineering student regarding engineering law, and no doubt this holds true for a great many graduates, are usually vague and like his notions regarding law in general, for unless a great deal of time is devoted to a study of this subject, a smattering is all that can be obtained. Papers on such a subject are not obtainable quite as often as articles dealing with subjects more closely related to the practical application of some of our “strictly engineering” studies. Mr. Miller’s article is “something a little different.”
IT is perhaps wise to correct the statement in regard to the salaries of Rose graduates made in one of the editorials of the December issue. The figures given were taken from an article in a local paper discussing a gathering of the heads of the various educational institutions of Terre Haute.

At this meeting Dr. Mees stated that "probably from 15 to 20 graduates have incomes of more than $10,000 and less than $25,000, a large part of which is salary. Considering only graduates who have been out of school more than ten years, which number comprises about forty per cent of the total number of graduates, 25 or 30 have salaries above $5,000, and forty per cent of these graduates may have salaries averaging $2,700."

These figures and facts became rather twisted, however, by the time they found place in the columns of the daily paper.

It was assumed that the figures thus issued by the paper were correct. Such was not the case. No doubt many an alumnus upon seeing these figures remarked to himself, "Incredible!"—or something worse. We ask them to remember that the chance to publish such remarkable figures does not come every month in the year.

At this particular time of year, with the rushing season so close at hand, it might be well to say something in regard to the relation of the college fraternity to the college student. It is unfortunate that at least a few people regard fraternities as organizations which are more detrimental than helpful. Evidently in answer to criticisms against the college fraternity there appeared in a recent number of the Rensselaer "Polytechnic" an article which brought out some of the things being accomplished by the fraternities. We do not know who the author is, but whoever he is, in his expression of what the fraternity has done for him, he has shown what fraternities have done and are doing for countless other college men. We would say something for ourselves in regard to the fraternity, but the expression of an undergraduate would hardly be received with much consideration, nor would it be worthy of a great deal, so that we are glad to let our ideas be expressed in far better fashion than we could express them by the alumnus of Rensselaer who wrote the article on "The College Fraternity" which appears herewith:

THE COLLEGE FRATERNITY

From The Rensselaer Polytechnic.

If I am an ardent champion of the college fraternity, it is because fraternity did so much for me. Perhaps it was my good fortune to see fraternity life at its best, or perhaps I saw it sometimes through rose-colored glasses. But this can hardly be charged to youthful enthusiasm or to lack of outside viewpoint, since I had been nine years out of high school, and for five years had been viewing college and fraternity life at close range from the nearer contact of boarding-house tables, when I finally matriculated.

I believe in the fraternity. That is, I believe in it when it does what my fraternity did—and why shouldn't they all and always do the same? It taught me implicit, unquestioning obedience, born of perfect confidence that the motives behind the commands were ever of the highest and most trustworthy, and that such submission was necessary to the welfare of all, self included. It taught me to pull
shoulder to shoulder with the other fellow, to accept criticism in a receptive spirit and to criticize constructively and impersonally without malice and without favor, to be loyal, and to be forgiving, to command justly and considerately when my turn to command came, to share responsibility and to come to time on every requirement. It taught me to meet with men, and with women too, and to be at ease with them by forgetting myself (somewhat)—for I had been one of the most painfully self-conscious lads that ever dodged around a corner to avoid the girl he adored. It taught me to study undisturbed in a roomful of more or less quiet other students—for I had not been one of a large family. But it taught me most of all a surprising lot about human character, and especially about the splendid idealism of young manhood and its longing for self-expression and united organization in our colleges here today in sordid America.

If I have forgotten any of these hard-earned, much-needed lessons, or if my ideals have grown shabby—both of which I fear are true—it is not the fault of the fraternity, but of long separation from it. I look back with wonder and with longing to the old chapter-meetings. We were different men—yes, men in every sense and action—when we formed that hallowed circle; glorified and spiritualized in every thought and purpose, self laid aside, the ideals of our order supreme in every mind. Who will say that the college curriculum or the college faculty can do a like thing for any student?

We were men, too, in the handling of any misguided brother, in the maintenance of the house discipline, in the larger issues affecting the college, in the building up of scholarship. Our fun we had, hearty and refreshing, and vital, too. But we know better than to cheapen ourselves to the neophyte or before the world by indulging in foolish horse-play on the streets with those whom we were initiating into our sacred family. It was not left to the caprice of the sophomores or to the hysteria of the moment to prepare the candidates, to make sure of their unflinching readiness, or to furnish the proper counter for that solemn ceremony which, speaking for myself at least, burned such a lasting impression for good indelibly into one's character. Suddenly there seemed to rise behind my feeble courage a wall of united determination, a majesty of high ideal, a vast company of helping hands held out. In that moment I was fairly born again. A fraternity may be measured by its initiation. Consciously or unconsciously, it is so measured on the instant by every initiate.

It is unfortunate that the world can learn so little of the real and best work that the fraternity (that is, the good fraternity) carries on, because that is a part of its inviolable secret. Vaguely the world knows that the germinal idea of every substantial Greek-letter society is literary. The college librarian sees a taciturn response to some mysterious stimulus; the country finds itself swayed in after years by the trenchant pen or clarion tongue of an alumnus. But it never knows the tremendous debt it owes to the fraternity for these men who can express the ideal that is in them. It sees in the fraternity only too often merely a group of snobs around a gaming table, with a bumper and a pipe apiece. And it judges all by these occasional conspicuous exceptions.

The best national fraternities now strictly bar intoxicants from the chapter-houses, and the rules are seldom evaded without unpleasant returns. Alcohol is too inflammable stuff for the intense fire of the chapter meeting. As to morality, college men are not usually prudes and unsophisticated brothers generally get their eyes opened, but not often to their harm or by ways of shame, I think. Anything of the latter kind met with ill-concealed disgust, as I remember. On the contrary I knew of some very manly risking of good name to protect a woman's honor (her soul, not her reputation).

But these are not the important phases of the chapter life. They are but symptoms of the deep underlying foundation of human brotherhood and of the solidity of judgment.
that responsibility evokes, often most unexpectedly. The important thing about the chapter is that it is so certain every man is hitching his wagon to a star. Under such circumstances how can he do otherwise? And in fact he seldom fails. This it is that justifies the fraternity.

And now, you who read, you are your fraternity. What you do, the fraternity does. Are you making of your fraternity all that it might be? Are you giving to it your best, placing it above petty self and petty strife, making it demand of you all that you ought to be? A handful of men, united, can move the world. Are you maintaining martial law in the house, including study-hours? Are you searching every man's weakness to overcome it, and furnishing right outlets for his strength? Are you checking his harmful excesses—late hours at books or at "movies," insidious cigarette or mere idle chatter? Are you focusing his attention on the real workaday wide world, preparing him to be a power for good, for progress, for the triumph of right? Are you remembering that you are your brother's keeper?

**TECHNICAL NOTES**

The United States is soon to have new type submarines, if the battery which Mr. Edison is now working on is a success. The new battery is smaller, lighter but stronger than those at present employed and will permit the craft to dive at an angle of sixty degrees, while at present a fifteen degree dive is attended with danger. The new battery also eliminates the danger from chlorine and other dangerous gases. The battery has an increased discharge rate which makes higher speed possible.

A new aerial bomb dropping device has just been patented. The device consists of a balloon patented and steered by compressed air and capable of carrying six bombs. The bombs are placed on a chain operated by the propeller in such a way that the bombs may be dropped one at a time for a considerable distance or all dropped at one time.

A new perfected magnetic gear shift control has been patented and placed on one of the popular priced cars. The magnetic shift does away with the old style lever control and is especially designed for women drivers.

Edison says: "The soldier of the future will be a sabre bearing, blood-thirsty savage. He will be a machinist. The war of the future, that is if the United States engages in it, will be a war in which machines, not soldiers, fight. For that reason we can gamble safely on a volunteer army, provided we have a great number of officers trained and ready for service in forty-eight hours, to lead and drill these new men."

Thomas Edison is interested in the manufacture of a new light delivery truck. The truck weighs complete, with battery and all, only 750 pounds, and will run about thirty-five miles on a charge. The battery can be recharged for very little, and in order to bring the car within the reach of the smaller merchant it will be sold on the installment plan, and extra batteries for it can be rented for a small amount.

A large transformer capable of handling a current of 1,000,000 volts has just been constructed at San Francisco. The transformer will be used in experiments in dissipating fog by powerful electrical discharges.

A pocket sized blasting machine has been introduced, which, while capable of supplying current for firing from three to five blasting caps by a sharp twist of its handle measures only 4 1/2 by 3 3/4 by 2 1/8 inches and weighs 4 1/2 pounds. The handle is removable, rendering the machine fool proof.

A non-corrosive alloy consisting of iron, copper, boron and carbon has been patented. It possesses hardness and strength and unusually easy working qualities.
The primary consideration in the erection of a high tension transmission line, is, of course, the ultimate requirement at the receiving end. This, in turn, determines the type and quality of construction. It has been in the past, practically an impossibility to accurately forecast, the ultimate requirements of the lines we are building today.

So many mergers are being consummated and so many construction developments to be considered, that only a very close and careful study of the condition to be met and the strictest adherence to standard engineering practice will procure for us an eventual satisfaction.

The vast amount of progress in the field of transmission line construction in the past few years, naturally, has increased the demand for high tension lines. It has brought out one fact, very important to many of us, namely: that the small town electric service supply can be put on a paying basis. Consequently we have a more or less mushroom growth of lines springing up in all parts of the country. In a great many cases, these lines have been built thoughtlessly and with a decided leaning toward the commercial side of the problem at a consequent cost to the engineering phase. As a result, long before a depreciation fund has begun to assume adequate proportions, these Wild-Cat lines are going to render the venture unprofitable.

In the interest of transmission lines to come in this State, this paper has been written; and with the express purpose of starting a co-operative movement, such as will insure a higher standard of construction and enable us to better understand and be prepared for more extensive transmission systems, which are surely coming to claim us for their own. It might be of interest to embody a certain amount of information regarding our own experience in the field: that is that we have nearly outgrown our 25-mile line after an operation of less than three years. The line in question is a 300 K. V. A., 13,200 volt, 60 cycle system covering about 40 miles of territory. In this territory we furnish light and power for five towns, ranging in population from 600 to 4,000 inhabitants. We have also a very small amount of rural business.

Specifications.

In the construction of the first five miles of this line, 35-foot western cedar poles were used, spaced at a distance of approximately 120 feet, thus using 44 to the mile—the poles being brushed with Carbolineum. Three No. 4 hard-drawn copper conductors were carried on two cross arms—one 6' 4" pin arm and one 4' 2" pin arm, thereby giving an equilateral spacing of wires and providing for an additional circuit. Insulators designed for an operating voltage of 16,600 were used. For lightning protection a No. 9 galvanized iron wire was strung on wooden pins set into pole tops, tied in on small porcelain insulators and grounded at every fifth pole.

The specifications for the following 20 miles of line were changed slightly. Span lengths were increased to 140 feet, thus enabling the use of 38 poles to the mile. The 4-foot cross arms were eliminated and all three conductors carried on one 6-foot arm in a horizontal plane. The number of guys were increased to conform to the specifications of the American Telephone and Telegraph Company, covering 40-wire lines. A heavier insulator designed for an operating voltage of 22,000 was adopted, thus immediately increasing the insulating factor of safety from 1 1/2 to 2. A 1/4-inch galvanized
steel strand was strung on 4-foot angle iron bayonets for lightning protection, and grounded every fifth pole.

There are many different ways in which a line of this kind can be built. It is unnecessary to enumerate the many possible types of supporting structures, arms, insulators and other items which might be used with more or less satisfaction. It is not the purpose of this paper to deal with specifications for lines, but simply to offer a few suggestions in connection with our own experience.

We believe that 13,200 volts is not a practical transmission pressure, except in a few cases where companies have territory similar to our own. In such communities, the first ten or fifteen miles of line would be more or less of an experiment and when further expansion is necessary, it is already then time for a higher voltage. The practical limit of transmission with a voltage of 13,200 is 15 miles. The exception to the rule is in the case of scattered installations such as rural business would require, and where the increased cost of higher voltage transformers, etc., would prove the most serious obstacle. It is therefore our belief that the first step in transmission line construction should provide for a jump from a distributing voltage of anywhere between 2,300 and 6,600, to a transmitting pressure of at least 33,000 volts.

SUPPORTING STRUCTURES.

Wooden Poles

The first construction item to be decided upon is the type of supporting structure. A few years ago many companies were concerned as to the possible future shortage in wooden poles. Many varied statistics have shown that the enormous demands have materially decreased the available supply. These are incontrovertible facts, but other statistics will show that up to the present time a majority of the medium capacity lines are built with wooden poles. Within a limited capacity, wooden pole construction presents a greater flexibility. The approximate commercial limit, judged from the experience of the writer, for wooden poles are single circuit lines of approximately 3,000 K. V. A., at a pressure of 34,000 to 66,000 volts.

The greatest economy and best engineering practice of the day points to long spans and consequently fewer supporting structures. This is possible to a limited extent, even with wooden poles. With conductors of sufficient high tensile strength and within a reasonable weight, it would be possible to use increased span lengths of approximately 200 to 250 feet. These specifications would call for an increased number of guys, probably requiring a storm or 4 way guy every quarter of a mile. However, this would have certain advantages. Wires could be strung between these storm guyed poles and dead-ended each way, bringing splices in the lines at these points and leaving them with no mechanical strain. This would prevent a possible breaking of conductors, due to faulty splices and promote a higher factor of efficiency in operation.

STEEL STRUCTURES.

There are so many types of steel towers and poles on the market at the present time, that it would be useless to attempt a discussion of them. Nearly every individual installation requires its own type and manufacturers are always glad to furnish complete data.

There are many advantages incident to this type of construction. The greatest one is economy, due first to the practicability of long spans with fewer supporting units, and second to permanency of construction.

The main disadvantage is the difficulty of installation, which requires only a perfected and efficient system in the field to be overcome.

CROSS ARMS AND INSULATORS.

There are several types of steel triangular arms on the market which are giving excellent satisfaction all over the country. These are for use on wooden poles.

The arms for steel poles or towers will suggest themselves for the individual installation.
It is the writer's opinion that wooden cross arms should be confined to lower voltage systems, although in a great many cases they have afforded a complete operating satisfaction, in connection with higher voltages.

The high voltage insulators should be selected with great care and be designed for a minimum pressure at least twice that of the operating voltage of the line for which they are intended.

**Overhead Ground Wires.**

Overhead ground wires have proven their desirability. It is understood that their function is not to protect station apparatus, but only line equipment. It is simply a question whether one can run a chance of losing poles, arms and insulators occasionally, as well as putting up with other line disturbance due to lightning. These overhead grounded lines alone do not eliminate all troubles. In case they are used in connection with efficient lightning arresters at the points where equipment is installed, these troubles will be reduced to the minimum. Overhead ground wires should never be of a lower tensile strength than the conductors on the same line and should be repeatedly and well grounded.

**Transpositions.**

For the first five miles, where the equilateral triangular spacing of conductors held good, there were no transpositions of the power wires on our lines. In the following 20 miles, however, where the lines were not spaced equally, the following system of transposing was carried out. From the point where we started to use the one cross arm, to the junction of lines which feed the three other towns, a distance of four miles, one complete cycle of transpositions was effected. That is, each wire was transposed once and occupies each different one of the three pins on the arm for one-third of the total distance. Between the junction and sub-station No. 3, which feeds two towns, at the end of the branch line, a distance of seven miles, and between the junction and sub-station No. 4, which feeds the town at the end of the main line, a distance of nine miles, the same plan was carried out. These transpositions were made for two reasons, namely: To compensate for inductive interference with paralleling telephone lines and for the purpose of neutralizing the unequal reactive effects, due to the unequal spacing between wires. Losses through reaction vary directly with the spacing of lines. For about half the total length of our line we paralleled and for approximately six miles were directly above two fairly heavy telephone leads, the greater portion of one of which consisted of grounded lines. The mutual induction set-up, of course, interfered seriously with the proper operation of these lines. This was overcome by a compromise between our company and the telephone companies, who entered into a contract to rebuild their lines on a joint pole construction basis, on the opposite side of the road. All grounded circuits were changed to metallic, and an increased number of transpositions effected. This entirely eliminated the trouble. Our company bore a small percentage of the expense of this reconstruction.

We lack definite theoretical information on the subject of overcoming inductive interference by the transposition of lines. This is a problem which, up to the present time, can be solved only locally and through actual practical experience with the particular installation. It is considered by leading authorities the better practice to do all swinging or transposing of lines outside of the power wires. In the event that this is not done, it often calls for specially designed arms and structures, as well as greatly increasing the possibility of trouble.

**Construction.**

In the actual construction of the first five miles of line, the going was bad. The weather was very unfavorable to outdoor work. We hauled our poles out on the ground, using two men to go ahead and frame and treat them. These men were followed up by a digging gang, consisting of eight men, who would dig for two days and then go back and set poles.
countered all sorts of trouble, such as poleholes filling up with snow, water, etc., and averaged only about one-half mile of poles set per day. The stringing of wire by the line gang was not started until after the completion of the pole setting to the first town, a distance of five miles.

We reorganized our forces at this point, and upon resumption of work the following plan was carried out. All poles were treated, framed and ready for setting before leaving the yard. Two men went ahead of the digging gang, blasting and spading out holes to a depth of two feet, or as far as a short-handled shovel would permit. We had to dynamite the holes for twenty miles. These two men were followed by a digging gang of eight men. Behind them came the pole-raising gang of six men, who raised the poles and filled in just enough dirt to hold the poles in line. They were followed in turn by three tampers and one shovel man, who filled and tamped the holes to within six inches of the ground. Then came the banker, who filled up all the dirt around the poles and left everything in a normal condition.

The line men followed these ground men right up in the following order: Two men guy-ing, four men and a team stringing wire and one man tying in. In this manner the work went along thoroughly satisfactory, and we averaged a completed mile of line a day. A few days we completed the line over a stretch covered by 55 poles. The record day was 59. Two motor trucks were used for hauling the men back and forth from the work. A bonus system was used in paying the men—for example: A fair day’s work for a digger was six holes, where we found the ground so hard. A man received his $2.50 per day if he finished the specified amount of holes. For every additional hole that was finished, he received 20 cents over and above his $2.50. This same plan was followed all through the gangs in a like proportion, and helped greatly to incite efficiency.

An efficient field force and system is, in my opinion, the most important factor in constructing a line. A very well-designed line may be completed and left in an indifferent condition simply through poor workmanship. The ef-ficiency of the constructing force is usually the determining factor as to whether the cost of the installation is excessive or low. Great emphasis must be placed also on the absolute necessity of ability on the part of field executives.

Our sub-stations consist of three out-door steel towers and one brick in-door sub-station. These are all equipped with S. & C. Carbon-Tetrachloride fuses, choke coils and horn-gap arresters, for lightning protection. The three steel tower stations and in-door high tension station equipment was furnished by the Delta-Star Electric Company.

Station No. 1 consists of a steel tower and equipment of 300 K. V. A. capacity, and at present contains 2-100 K. V. A., General Electric transformers. These are connected in open delta and are used to step up the generating voltage of 2,300, to the transmission voltage of 13,200. This tower is located at the edge of the town in which the power station is located.

Station No. 2 consists of a steel tower and equipment of K. V. A. capacity, and at present contains 2-30 K. V. A. General Electric transformers. These are connected in open delta and are used to lower the transmission voltage to a distributing voltage of 2,300. This station is located on the main street and nearly in the center of a town of only 600 people. It is interesting to know that in a town of the population, we have a peak load of 60 K. V. A. and an average daily load factor of approximately 50 per cent.

Station No. 3 consists of a steel tower and equipment of 120 K. V. A. capacity. At present it contains 2-40 K. V. A. Fort Wayne transformers, which lower the transmission voltage to a distributing voltage of 2,300. This station is located on leased ground at the edge of a town, having a population of approximately 1,000. It also serves another town of about the same size, within less than a mile’s distance. This tower is also provided with a steel secondary housing at the base of the tower, sheltering a 6 K. W. Fort Wayne regulator, a time clock and other equipment necessary for an automatic series of street lighting system.
Indoor Station No. 4 is of 120 K. V. A. capacity at present containing 2-40 K. V. A. Fort Wayne transformers, furnishing a secondary distributing voltage of 2,300. This station is located in, and serves a town of about 1,500 people. It was formerly a power station, later shut down and converted into a sub-station, when our line was completed. At the present time it is partly used as a pumping station, containing a 15-horse power electric motor, direct-connected to a centrifugal pump, a stand pipe pressure regulator and other equipment incident and necessary to an automatically controlled water system.

Our high tension switching equipment consists of a 3-Type M. B. Delta-Star 300 Ampere air-brake switches, and one set of indoor disconnecting switches, installed so as to section-alize the line and provide for safety during inspection and repair.

**Inspection of Equipment.**

All sub-stations, switching equipment and lines are subject to a regular two week inspection trip.

**Conclusion.**

The next few years will undoubtedly witness a rapid development in high tension service and an interchange of experience will at this time be of value to all. It is the writer’s desire that a full discussion be given this subject and above all actual results cited.

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**MORE SENSE THAN POETRY.**

My friend, have you heard of the town of Yawn
On the banks of the river Slow,
Where blossoms the Waitawhile flower fair,
Where the Sometimeorother scents the air
And the Goeasy grow?

It lies in the valley of Whatstheuse,
In the province of Letherslide;
The tired feeling is native there—
It's the home of the listless I don't care,
Where the Puittoffs abide.

The Puittoffs never make up their minds,
Intending to do it tomorrow;
And so they delay from day to day
Till business dwindles and profits decay
And their days are full of sorrow.

—*The Yellow Jacket.*
The Legal Liability of Architects and Designers

By ROBERT N. MILLER, ’01,
Louisville, Ky.

An architect or engineer charged with designing a structure commits an error, we will suppose, which results in its complete or partial failure. What is his situation in a suit brought against him by his client or by others who have suffered damage? This question is a practical as well as a moral one. If a designer says, “I don’t care what the law is; if I make a mistake and cause loss to somebody, I will, of course, make it good to the extent of my means,” it covers the situation as far as it goes, but it leaves untouched a case in which the designer denies that any damage was suffered by a mistake of his. In such a case the designer is confronted, when the client makes claim against him, with a new question. He may say to himself, “I know this is not my fault,” but he must go further and ask himself, “What evidence have I to oppose the claims of the plaintiff, and persuade a judge and jury not to give judgment against me?” The wider a man’s experience with courts, the more firmly he is convinced that human beings have less talent for arriving at justice than for anything else, and that the best policy is to think far enough in advance so that if possible, matters are in so clear a state that no one will hope for success in court. The best law suit is one that has never been started. Therefore, it is worth while to consider what rules of law exist defining the duty of a designer and what precaution can be taken to provide for the unwelcome but never impossible event of a law suit. In this regard, whether they like their company or not, the designer, the lawyer and the doctor are in the same boat, or at least in sister-ships. Each is responsible for loss resulting to a client or patient from a failure by the professional man to exercise the care ordinarily exercised by reasonably prudent members of his profession in the locality in question.

Thus an architect who relies on hearsay as to the size of a lot to be improved, when he ought to have measured it, or one who improperly designs a foundation, because he negligently fails to advise himself as to the character of the soil, or one who carelessly designs a member of less cross-section than prudence and skill would call for, or who care-

1 The Columbus Co. v. Clowes, L. R. 1 K. B. (1908) 244.
lessly provides boiler flues in excess of the capacity of the chimneys which are to carry off the gases, must suffer the resulting loss. On the other hand a designer who carefully follows the accepted standards of his profession at the time his work is done, and in spite of care reaches a faulty result, will not be liable for resulting damage.

A well known case, often quoted in encyclopedias and text books, thus defines the duties of the architect:

"The responsibility resting on an architect is essentially the same as that which rests upon the lawyer to his client, or upon the physician to his patient, or which rests upon any one to another, where such person pretends to possess some skill or ability in some special employment, and offers his service to the public on account of his fitness to act in the line of business for which he may be employed. The undertaking of an architect implies that he possesses skill and ability, including taste, sufficient to enable him to perform the required services at least reasonably well, and that he will exercise and apply to the given case his skill and ability, his judgment and taste, reasonably and without neglect. The undertaking does not imply or warrant a satisfactory result. It will be enough that any failure shall not be by the fault of the architect. There is no implied promise that miscalculations may not occur. An error of judgment is not necessarily evidence of a want of skill or care and miscalculations are incident to all the business of life."

As regards liability, a marked difference appears between architects and persons who manufacture and sell machines for a particular purpose. The manufacturer and seller of a turbine generator, for instance, is held under the law to warrant that it will perform the work ordinarily done by such machines and the manufacturer is liable for a breach of this warranty, whether he was negligent in designing it or not, while an architect does not warrant the suitability of the design but if it fails, is only liable if his carelessness in designing it resulted in its being unsuitable.

Within the brief limits of this paper, it is not possible to cover more than a few of the obligations opposed by the law on the architect and designer. A frequent source of controversy arises out of the architect's obligation, undertaken in the contract, to supervise the construction of the work. To this duty the same principles apply as those which govern his duty as a designer; that is, his duty is one of care rather than one of absolute responsibility for the result. His duty is well expressed in a Kentucky case decided in 1914.

"If he be employed to superintend the building, he is not liable at all hazards for every defect in its construction, but is only required to use reasonable care and diligence in seeing that the work is properly done. The mere fact, therefore, that some of the construction work is not done in a workmanlike manner, is not sufficient to establish as a matter of law that he has not fully performed his contract. Under such circumstances, the question whether or not he used reasonable care and diligence in superintending the work is a question for the jury."

Under this rule, for example, it has been held that where pegs or spikes ought to have been used in a certain part of work by the builder, and the architect failed to discover that they had not been used, it is a question for the jury whether reasonable care on the part of the architect would have detected that they were not being used, the court saying that his duty did not require him to be on duty all the time.

Probably the most frequent defense interposed to the claim by the architect or designer for his fee is based on the alleged failure of the

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3 Hubert, et al. v. Aitken, 15 Daly (N. Y.) 237; 2 N. Y. Sup. 711.
4 Coombs vs. Beede, 89 Maine 187.
5 Kortz v. Kimberlin, 158 Ky. 566; 165 S. W. 654.
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design to come within the limit of expenditures fixed by the client. If a customer orders a building designed at a cost of $90,000.00, for example, and the plans which are furnished him cannot be carried out for less than $125,000.00, the architect is not entitled to his fee, and this is just, because he has failed to furnish what he was asked for. A small difference is immaterial, but unless the cost "reasonably approximates" the specified amount, the architect will lose his labor. Of course, if the customer, after finding out the increased cost, decides to use the plans, he must pay for them. Sometimes the question as to what is a "reasonable approximation" is a difficult one, but there are a number of decided cases which furnish assistance on this point. The safest course for the designer is to bring his design within the limits of his allowance.

Indeed, a failure on the part of the architect to come within his allowance will not only operate as a defense when he sues for his fee, but may be the basis of a suit of damages against him. This is well illustrated by a California case decided in 1912, in which it appeared from the complaint that plans for an office building costing $300,000 were desired to replace structures destroyed by the San Francisco fire in 1906. A written contract was entered into with the architect, but it did not mention the limit of $300,000. The architect furnished the plans, stating that they could be carried out for this sum, and construction was commenced. Later, by agreement, changes were made, which the architect stated would increase the cost not more than $100,000.00. When $460,000 had been paid out on the building and commissions, the architect informed the owner that the cost of the building would exceed the estimate and would reach $510,000. The owner stopped work on the building, and experts employed by him advised that the total cost would reach $700,000. As above set out, the court held that the owner might recover from the architect all that had been paid him as fees or commission and recover as well such damages as he has suffered by reason of the increased cost of the building. In answer to the contention that the owner had been careless in allowing the matter to drift so far before discovering the facts as alleged the court said:

"But we think the complete answer to all this is found in the fact that the situation of the parties was changed immediately and in most essential particulars from the moment their contract was entered into. From that instant they ceased to be dealing at arm's length, and from that moment the defendants became, as architects, contractors, and superintendents of construction under the pay of plaintiff, its trusted agents. Dealing with such trusted agents, plaintiff, as we have said, had the right to rely upon the representations antecedently made and, subsequent to the contract, oft repeated. It had, therefore, the right to rely upon the professed ability and skill of defendants, and upon their statement of fact that, whatever should be finally agreed upon as the plans and specifications, the upset cost of the building would not exceed $300,000, or, with the accepted modifications, $400,000. Still further, by virtue of this agency and relationship of trust and confidence, it became the high duty of defendants to make full disclosure of all the knowledge which they possessed and which it was desirable or important that their principal should have."

The architect may even be held liable for death or personal injuries suffered because of his carelessness in making plans or directing work, so that his responsibility is not limited to claims by the one who employed him.

From the brief outline attempted here it will be apparent that, groundless or not, malpractice suits are to be reckoned with as among the

8 See 42 L. R. A. (N. S.) 125.
9 Edward Barron Estate Co. v. Woodruff Co. 163 Cal. 561: 126 Pac. 361.
10 Lottman vs. Barnett, 62 Mo. 159.
possible contingencies of business; that an opportunity is created for unconscionable claims, and that in such complicated matters a jury might have great difficulty in distinguishing the true from the false. To be prepared to bring out all the facts bearing on the question whether he used care, and to refresh his own memory after time has dimmed it, it is important that all of the preliminary and final figuring and all other papers or drawings, rough or finished, which have been used, be made a part of the permanent file. The prudent architect or designer will of course do his work well; but he will also be careful that neither his oral nor written statements may be taken as representations regarding the probable cost of the building; that as far as possible such a representation is directly negatived by the contracts; and that every detail of the work which is done is so preserved for future use that if its sufficiency should be brought into question, the documentary evidence will be available to support the evidence derived from the memory of witnesses.

A very interesting letter was received recently by Doctor Mees from R. F. Tyler, '09, who is with the signal department of the C. M. & St. P. Ry. His letter is one that may prove interesting to a number of men in school. The letter, especially those who are contemplating taking up signal work after graduation, is printed below:


Dr. C. L. Mees, President Rose Polytechnic Institute, Terre Haute, Ind.

Dear Sir: Your very welcome letter of greeting received this morning, and I in turn want to wish you personally, as well as Old Rose, a most happy and prosperous new year.

I am now sitting in my box car office, set out on a little blind siding which hasn't even a name. It is located, though, in one of the most scenic stretches of road on the Milwaukee Railway. It is what we call the Sixteen Mile Canyon.

I am not here for the scenery, though, for every foot of it is as familiar to me now as the corner of Seventh and Main used to be. We are taking out our old automatic signals and installing a new system which is applicable to the new conditions created by the electrification of this section of the Milwaukee Railway. The work is extremely interesting and makes me constantly wish I could remember more of the things I learned at Rose, and is making me daily learn some new application of my slight engineering knowledge. We are up against conditions just a little different than have ever come up in signal engineering before. In the first place it is all single track work which is always more complicated than multiple track work, second the 3,000 volt D. C. propulsion current is higher than has ever before been attempted with direct current and the electric locomotives are the most powerful ever built, and in the 450 miles now being electrified we cross three mountain ranges where two or three locomotives will be used on a train. This means, of course, a very heavy negative return current in the rails and this brings in a number of complications in connection with our signal track circuit. All our signal circuits are alternating current. Instead of using the ordinary semaphore type of signal we are installing a color light signal for both day and night indication; the lights to be strong enough to be seen at least four thousand feet in the sunlight.

Our working conditions at present are anything, but favorable. For instance, yesterday
we were putting in concrete foundations with the thermometer ten degrees below zero.

If you have some good stout, husky fellows graduating this year who are not afraid of lots of hard work and a rough place to live, and men whom you would thoroughly recommend, I think I could perhaps find a job for them this summer if all the work comes up that we are expecting. They would perhaps have to handle a pick and shovel some on the start, but I feel that the field of signaling is a good one at this time. The chance of being in such close contact with this big electrification job is also worth something. The lowest we pay is $3.00 per day, and pay about a dollar for board.

With best wishes for Old Rose and to the individual members of the faculty, I remain,

Yours sincerely,

ROY F. TYLER.

Notes

Guy W. Woody, '09, and Miss Helen Blackburn, of Rudley Park, Pa., a suburb of Philadelphia, were married in Chicago several weeks ago. Mr. Woody met Miss Blackburn several years ago while on a business trip. Mr. Woody is now employed in Milwaukee, where the young people will make their home. They spent the Christmas holidays with Mr. Woody's parents on North Seventh street.

J. N. Compton, '15, who has been at home sick for some months, is now able to be up. He expects to be back at his work in Indianapolis soon.

R. M. Smith, '15, recently accepted a position with the Atlas Powder Co., and is now serving as chemist in the plant located at Webb City, Mo. Mr. Smith spent several days in Terre Haute during the Christmas holidays before leaving for Missouri.

F. E. Sullivan, '15, is now serving as a munition inspector with the Allis-Chalmers Co. Sullivan spent most of his Christmas vacation in Terre Haute.

R. J. Wisely, '15, spent the holidays with his parents in Terre Haute. He is now with the American Bridge Co., at Gary, Indiana.

Word was received a few days ago that F. T. Loehninger, '13, was to be married in Indianapolis soon.

H. R. Woodward, '15, spent a few days during the holidays with Terre Haute friends. He has just received a promotion in his work, and will be transferred from Bridgeport, Illinois, to Oklahoma, where he will continue his work with the Standard Oil Co.

C. B. Kidder, '88, A. D. Kidder, '99, and S. J. Kidder, '00, spent a short time in Terre Haute during the Christmas holidays while visiting their father, Willard Kidder. C. B. Kidder is engaged with various electrical interests, A. D. Kidder is supervisor of surveys, with the Government Land Office, and S. J. Kidder holds the position of manager of the Ernestine Mining Co., of Magallon, Mex.
THE FIRST INSPECTION TRIP.

The first inspection trip ever given for the benefit of Rose Juniors lasted two days, December 17th and 18th.

Ten Juniors made the trip, leaving Terre Haute on the early morning Vandalia train for Indianapolis.

The Beach Grove shops of the Big Four Railroad was the first place visited. These are the largest and probably most up-to-date railroad shops in this section of the country. Locomotives as well as coaches, are built and repaired here. The power plant was an interesting feature of these shops, as well as the engineering laboratories and drafting rooms. This company conducts an apprentice course for the benefit of its employees, each employee who so desires being given the privilege of several hours of instruction in this course each week; each employee is paid at his regular rate for the time he spends at such work. Several rooms adjoining the laboratories and the drafting rooms in the office building have been turned over to the use of those taking this apprentice course.

The Hyde Leather & Belting Co. was supposed to be the next concern visited, but on account of lack of time this company had to be omitted from the list.

The Langsenkamp & Wheeler Brass Works, where the well known Schebler carbureter is made, was visited in the afternoon. This factory is pronounced by the State Board of Factory Inspectors to be the best of its kind in the state. It is here that modern efficiency methods reign supreme. This company has its own gas plant, and is able to obtain heat and power at a very low cost. The furnaces are gas furnaces whose cost of operation is only about two-thirds that of the old style coke furnaces. Gas engines are used for power; only 1 1/4 lbs. of coal are required per horse power hour.

After leaving this plant, the Nordyke-Maron Company was next called upon. Flour mill machinery, as well as automobiles, is manufactured by this company, but the part devoted to the construction of automobiles proved to be of greater interest. One of the interesting things was the testing department where, among other the various automobile parts are tested for the correct degree of hardness. Several of the new cars which were to appear in the New York Automobile Show were seen in the assembling room in the last stages of construction. Stiltz, '15, and Wallner, '15, are at present serving with the Nordyke-Marmon Company, and were on hand when the party went through the plant. This completed the first day's program. The party made the Hotel Severin their headquarters, and after a dinner party in the Inn that evening, several theatre parties were organized.

That it was a late hour before such a thing as sleep was thought of was evidenced by the fact that in spite of an announcement by Mr. Ranels that the next morning's start would be made at 7:30, it was almost 9:00 before the last straggler stumbled out of the elevator rubbing the sleep from his eyes.

Most of Saturday morning was devoted to a visit to the National Malleable Castings Company. An old Rose man, Harry A. Schwartz, '01, is in the service of this company, and the party made the trip through the different departments of this plant under his guidance.
The novel style of overhead carriers and the electric trucks used were among the most interesting things seen here. The laboratory with its various machines for testing the castings was not without interest.

Speedway City, where the Electric Steel Company of Indiana is located, was next visited. The large 800 K. W. furnace used at this plant was a novel sight, to say the least. A much better grade of steel casting is obtained by the use of this type of furnace, and many automobile parts and pieces requiring extra strength are made by this company.

A trip to the International Machine Tool Company completed the program. It is here that the Libby turret lathes are manufactured. This is another up to the minute place where a high degree of efficiency prevails. The high-speed, highly efficient machines used here were as much of a revelation of the modern methods of shop practice as was the methodical manner in which the work was carried on.

Those making the trip were: Rector, Whelan, Wente, Hild, Goldstine, Richard, Toelle, Carpenter, Gray and Offutt.

It is understood that Mr. Ranels is already laying plans for a senior trip next year. It is certain that he will be supported by those who made this trip and it is to be hoped that next year either St. Louis or Chicago will be visited.

THE INTER-FRATERNITY BOARD MEETING.

Friday, Jan. 8, marked another session of the Inter-Fraternity Board, at which a few new suggestions were brought forth and adopted, but only after much argument, wrangling and debate by all present. For the development of really first-class lawyers, the Inter-Fraternity Board has Professor Howe with all his specifications and contracts, consideration, and liability backed clear off the boards.

The primary object in calling the meeting was the adoption of the blank form of invitation to be issued to the Freshmen. The form suggested by the board of last year was found satisfactory and was adopted for use at the end of the coming rushing season. A committee was then appointed by Doctor White to take care of the printing of the blanks. It was suggested that a statement explaining the method of filling out the acceptance blanks be printed on this same card.

A discussion then followed as to the success of the present rushing season. Dr. White stated that the policy of leaving the Freshmen alone for one term has resulted in much better work by the school as a whole, and heartily endorsed the new system. P. I. E. S. voiced the opinion that the present rushing season of two weeks is going to prove entirely too short.

A discussion then came up as to the meaning of rule seven, which states that “there shall be no formal fraternity entertainments for unpledged Freshmen.” According to the wording of this rule no smokers, theater parties, dances, or any other kind of formal entertainments for Freshmen could be held by the fraternities during the rushing season. Doctor White stated that it was the intent of those making the ruling to have the rule mean that there should be no formal entertainment of Freshmen during the period previous to rushing season. The rule in itself seems rather useless in that rule five states clearly, “There shall be no rushing or pledging of Freshmen during the first term of the institute.” Doctor White said that rule seven was inserted in order to bring out the idea that in particular cases where a Freshman had friends in a certain fraternity, and was perhaps a stranger in Terre Haute, that it would not be necessary for his friends to avoid him entirely, but that they should not have any formal entertainments for his benefit. The majority of the fraternities, however, were working under the belief that all Freshmen should be avoided and that under no condition should a Freshman be invited to enter a fraternity house. While the present open season has passed off successfully inasmuch as no fraternities had complaints to offer, the idea of allowing friends of a Freshman to
entertain him, even informally under these special conditions, seems rather dangerous. No fraternity living up to the spirit of the agreement will think of using this loophole, but it seems as if more stringent ruling could be and should be enforced.

Another matter bringing forth much discussion was the rule that not more than one date with a Freshman could be made in advance. M. E. P. brought out the argument that with this rule in force, no fraternity would be able to hold a formal entertainment, since a date at any time for such an affair would prohibit other dates between the time of issuance of the invitation and the time of the affair.

It was finally decided that each fraternity would be given a certain date on which to hold an entertainment and that no other fraternity could issue any invitations for dates on that day until after 8:00 P. M. on the evening preceding that day. This was done to eliminate the necessity of a fraternity being compelled to issue invitations a few days previous to their entertainment and so being compelled to remain without dates during that time. Numbers were drawn for choice and the various dates then selected by the respective representatives.

The meeting adjourned at about ten o'clock.

A TALK given by Doctor F. C. Sharp, of the University of Wisconsin, on Dec. 15, proved to be very interesting. Doctor Sharp's subject was, "How to Study," and he brought out a number of points which are surely worth thinking over. Doctor Sharp is Professor of Philosophy at Wisconsin University.

STUDENT COUNCIL MEETING.
December 21, 1915.

JOINT meeting of Student Council and Athletic Association called to order by Dr. White, with O'Laughlin, O'Brien, Carlisle, Hild, Leibing, Gray and Tilley of Student Council.

Mr. Mefford submitted a proposition by which he said he could better athletic conditions at Rose.

Moved by Mr. Frisz that providing school authorities will aid in meeting financial end, a committee of two or three be appointed to draw up a contract to be submitted to Mr. Mefford. Second Stuart. Carried.

Moved by Weinhardt, second Wyman, that chairman appoint committee. Carried. Professor Hathaway, Dr. White and Weinhardt appointed.

Meeting adjourned.

P. J. Grafe, Recording Secretary.
In creating the position of Director of Athletics and in filling it with a man seemingly so well fitted for the place as is Mr. Hal. L. Mefford, Rose has taken a big step in the right direction. During the past few years our athletic teams, and the spirit behind our athletic activities in general have been deteriorating to some extent. No doubt the principal cause lay in the fact that there was no one force, or rather no one man to get behind, organize and enforce year after year any sort of continued athletic plan or policy. Athletic managership and responsibility for athletics at Rose has been battered about indifferently among the various faculty advisors and student managers, and as a matter of course, our athletics suffered from lack of expert and undivided attention. Our student managers have shouldered responsibilities as well as they could, but were, of course, not equipped either with the experience or the time, or possibly with the ability to do justice to their managership.

In Mr. Mefford we have a capable and enthusiastic director of sports. He comes to Rose well recommended, as an old Chicago University man, and one who has seen some service as coach and scout for Stagg. He is known locally as the man who put football on the map at Robinson, Ill., developing, not only a very good team, but a lot of enthusiasm and support for the team and the game in that locality. Although the citizens of Terre Haute are somewhat apathetic and give very indifferent support and often none at all to the athletic activities of their colleges, Mr. Mefford hopes to awaken their interest, to bid for their support (as other college towns support their institutions), and to put athletics at Rose upon a paying basis. Our new director is not dependent upon his job, but has taken it up as an enthusiast in amateur athletics. He has a wide acquaintance in college and athletic circles and should give us the better teams, the better sportsmanship, and the better athletic position among Indiana colleges which we all would be glad to see.

Mr. Mefford’s plans will probably be developed more in detail in some future number of the TECHNIC. They include the development of a track team first to represent us creditably in the State meet, which is to be held on our campus next spring; also the introduction of soccer football, regular winter football practice, and the organization of gymnasium classes among the students if a sufficient number desire it. There is a possibility that within a few years “gym” work among Freshmen and Sophomores will be made compulsory and credit allowed for the same, as for any other branch of school work.

Under the new organization the present board of control, that is our Athletic Association, with its faculty members, becomes an advisory committee to the director, and after things get started and a definite policy established this board will probably perform only such formal duties as the awarding of “R’s,” etc. The director’s position is upon the same
plane as that of an instructor—he is in effect a member of the faculty, and the head of his department, athletics. His office has been established in the gym, and correspondence files and card indexes of financial information concerning various games and teams have been inaugurated. With Mr. Mefford's assumption of the office January 1st, the management of our athletics upon a business basis was begun.

The schedule of inter-class games established by Coach Gilbert has been steadily followed out. Quite a lot of new and promising material has appeared and many of the games have been real "nip and tuck" affairs from start to finish. During the last week we have had as many as thirty and thirty-five basket ball candidates out each evening, which looks encouraging and promises a good team.

Senior A has the best standing to date with Sophomore B, Freshman B and Senior B following in the order named. Among the new men brought out by these games, Streeter, Rhinehardt, Piety and Allen have made perhaps the best showing.

Possibly more difficulties than usual were encountered in arranging basket ball games this season and the following schedule is perhaps not as strong as might have been desired. Our student manager was disappointed in being unable to schedule two games with State Normal again this year. An earnest effort was made to obtain these two games, but it could not be arranged. At present eleven games are under contract, and at least two, possibly three, will be added:

Jan. 8—Central Normal College at Terre Haute.
Jan. 12—University of Louisville, at Terre Haute.
Jan. 29—Franklin at Franklin.
Feb. 5—Butler at Terre Haute.
Feb. 8—University of Louisville, at Louisville.
Feb. 12—Indiana Dental, Earlham (tentative), at Terre Haute.
Feb. 15—DePauw, at Terre Haute.
Feb. 19—Butler, at Indianapolis.
Feb. 23—Central Normal College, at Danville.
Feb. 26—Hanover, at Terre Haute.
March 3—DePauw, at Greencastle.

Rose opened the 1916 basket ball season by losing to the fast quintet from Danville, Jan. 8, by a score of 45 to 30. This should not discourage the Engineers, however, because they met an unexpectedly fast team in the Central Normal aggregation, also a team which has already played six games, and is in mid-season form while the Rose regulars are hardly organized as yet and as a consequence were weak on team work in the first contest.

Captain Davis and Larr started at forwards for Rose, Reinhardt at center and the old reliables Carter and Kingery at guards. After the first half frequent substitutions were made, and Orr, Barrett, Streeter and Allen were given a chance to show their mettle. The visitors led at the end of first period, 21-15, Carter and Reinhardt being responsible for all Rose points credited thus far. Reinhardt made 11 of them and showed a good eye for the elusive basket. The Engineers offered a good clean game and the individual playing was good, but there was a woeful lack of the team's work which results in goals.

Capt. Davis and Carter each added two field goals in the second half. In this period the jinx, which seems to be following Joe's trail of late, made its appearance. He smashed into the wall and injured the shoulder which was broken during the past football season. Sad to say, but we will lose his valuable services during the remainder of the season.

Every one of the visitors was fast and aggressive, Thomas playing an especially hard game. Their passing was fast and shooting both accurate and lucky.
THE ROSE TECHNIC.

THE HEIGHT OF AGGRAVATION.
Kline and True with the hay fever.

Doc. White—"What is H₂O?"
Freshman—"A colorless fluid which turns black when you wash your hands."

"The old man was certainly wild today," remarked the first pirate as the last captive plunged from the plank.
"What do you mean, wild?" inquired the second.
"Didn't he walk seven men?" laughed the first offender.—Buffalo Express.

Bix—"Do you still walk in your sleep?"
Dix—"No, I take carfare to bed with me now."—Ew.

First Mother—"Mrs. Clancy, your child is badly spoiled."
Second Mother—"Gwan wid yez."
First Mother—"Well, if you don't believe it, come and see what the steam roller did to it."—Lampoon.

Old Lady—"Do the Germans ever leave anything valuable behind them in the trenches?"
Veteran—"Never a drop, mum!"

Recruiting Officer—"One grandfather living? Is he on your father's or your mother's side?"
Recruit—"Oh, he varies, sir; he sticks up for both of 'em—a sort o' nootral."

In the wee hours of the morn, the suburbanite got off the train at the home station. Going to the telegraph office he sent this message: "Will not be at the office today. Am not home yesterday yet."—Jack o' Lantern.

"Quick, Watson, the needle," chuckled Sherlock Homes, and he slowly wound up the Victrola again.—Jack o' Lantern.

Indignant Professor—"Quit this quibbling, sir! Who was King Henry VIII? Answer, 'yes' or 'no.'"—Punch Bowl.
THE ROSE TECHNIC.

Twelve reasons for the downfall of man:
One woman and eleven bottles of beer.—*Siren.*

The Lady—“Don’t you think that Muscovite onslaught is awful?”
The Gent—“I’ve never tried it. Can you show me the steps”—*Chaparral.*

She—“Why is your studio so cold today?”
Artist—“I’ve just been painting a frieze.”

“Wake up Bill, there’s a fire on the row!”
“Fraternity or sorority?”
“Fraternity.”
“Let the damn thing burn.”—*Chaparral.*

IN MACHINE DESIGN.
Jackie—“What sort of shafts must be made hollow?”
Junior—“Elevator shafts.”

Tray—“Did you hear about the hypnotist who catches fish by just talking to them?”
Moutarde—“He must have a strong line.”—*Tiger.*

She waited at the church in vain,
Where could the bridegrom be?
“I fear this wedding will go off
Without a hitch,” said she.—*Jester.*

“That’s where I shine,” said the young man as he showed his blue serge suit to the tailor.—*Cornell Widow.*

Niff—“She wears too thin skirts don’t you think?”
Biff—“No, only one.”—*Chaparral.*

Smith—“Why are you in mourning?”
Jones—“For my wife’s first husband. I’m sorry he died.”

Tommy—I won’t prove that by integration, but by working backward and differentiating.
Lyons—“You can prove it to me any way you work it.”

Barrett, in Mech Des.—“What’s a wall crab, professor?”
Jackie—“Well, it isn’t an animal.”

Waggie—“What is meant by the specific heat of saturated steam?”
Leinberger—“Why, it’s the specific heat of steam that is saturated.”

Davison in Thermo is solving for \( X \) = quality of steam.
Kline—“What is \( X \)?”
Brown—“Distance to center of gravity.”

FAMOUS QUOTATIONS.
“Shoot if you must this old gray head, but do not shoot the bull,” she said.
“A stitch in time saves two in the bush.”

TO BE HEARD NEXT YEAR.
First Senior—“Why I thought you took Analytical Dynamics last year.”
Second Senior—“So I did, but Hath encored me.”

What do moths live on when they eat nothing but holes?

He—“What did your father say when you told him my love was like a broad and gushing river?”
She—“He said, ‘Dam it!’ ”

ARITHMETICAL EGGS.
“Waiter,” he suggested mildly, “I want three eggs, and boil them four minutes.”
But the cook, having only one in the place, boiled it twelve minutes.
Which proves the value of higher mathematics.—*Philadelphia Public Ledger.*

NEEDED ONE HERSELF.
“What’s that piece of cord tied around your finger for?”
“My wife put it there to remind me to post a letter.”
“And did you post it?”
“No; she forgot to give it to me.”
WELL—

One student says that he can not go to the dance, because he has to study his Latin. Another says that he can not study his Latin, because he has to go to the dance.

One student plans his work and lets pleasure break in occasionally; another plans his pleasure and lets work break in occasionally.

One student makes Phi Beta Kappa and is happy; another is happy and does not make Phi Beta Kappa.

Both of them live to a moderate old age and die in moderate circumstances.

Funny old world, isn’t it?—Daily Texan.

“Small time stuff,” said Ulysses, as he sailed calmly by the special performance of the siren’s cabaret. “You ought to see the new Winter Garden show.” And realizing themselves outclassed, the Sirens gave up in disgust.

A BRIEF ESSAY.

“Describe the manners and customs of the people of India,” was an instruction given in a school-examination paper. A small boy posed of the subject in this brief fashion: They ain’t got no manners and they don’t wear no customs.”—Ex.

Professor—“A fool can ask questions that a wise man can’t answer.”

Student—“Yes, that’s why I flunked in my last exam.”

THE QUESTION BOX.

Kline—Yes, Bismethylaminotetiaminoarsenobenzenehydrochloride contains 26.5 per cent of arsenic.—Ed.

Freshman—As well as I could determine by questioning some of the older professors, the Symphony Club was once upon a time a flourishing organization, but none of the present generation seem to have heard of it.—Ed.

C. S.—This department does not decide bets. Besides, we don’t feel qualified to judge of liquid capacities.—Ed.

Ignorant—No, the odor of onions could scarcely be called the Breath of a Nation.—Ed.

Much as we hate to give free advertising, we feel that it would be criminal not to seize upon the opportunity of remarking that Henry of flivver fame, threw up the sponge after one glimpse of the fjords of Norway.

“Anyway,” said Anthony, as Cleopatra nestled in his arms, breathed a tender assent, “there’ll be no coal bills to pay.”

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