

FEB. 7,
1883.
Vol. II. No. 9.

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The Tech.

VOL. II.

BOSTON, FEBRUARY 7, 1883.

No. 9.

THE TECH.

Published on alternate Wednesdays, during the school year, by the students of the Massachusetts Institute of Technology.

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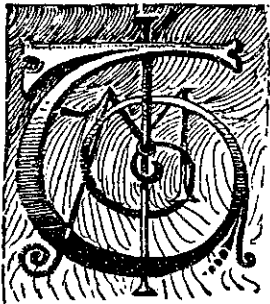
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HE second term is well under way. '83 has past her last quarter pole and is now on the home-stretch. The exertion to be first under the wire does not, however, appear to take a very severe hold on the members of the class. Each modestly prefers to let his classmate win the purse, while he contents himself with a moderate gait, and, perhaps, manages to throw a glance or two about him and see what is going on outside the course. The probability is that moderately good time will be made by each courser, although no astonishing speed will be developed.

IF the class of '84 desires to make the class supper an annual affair, we think that now is the most convenient time for our second meeting, as at present we are not so pressed in our studies as we shall be later. Moreover it is a generally recognized fact that money is a little more plenty among the students at the beginning of a term than at the end.

Those present at the last supper will certainly favor the idea of having one this year when they bring to mind the enjoyment had on that occasion. Who does not recall with pleasure the speech made by our last class president, and the one delivered upon the Chinese question; also the feats performed by our "boneless wonder"?

During our course of four years at the Institute, should we not meet together at least once a year for the purpose of enjoying ourselves as a class, and of becoming better acquainted with each other? What we need here is to be together occasionally and have some of those enjoyments usually had by students, instead of making our long course a continual grind.

Especially should those who do not belong to any society in the Institute favor the meeting, if they would know what a good time students are capable of having together. They will not then look back in after years and wish they had had more intercourse with their classmates outside the class-room.

THE department of mechanical engineering is to be congratulated on the recent accession to its instructors. The department has become the largest in the school, and has for some time past been considerably hampered in its work by the lack of a complete corps of instructors. Mr. Stevens, the new instructor, has been engaged in mill and machinery drawing at Lowell since 1870, and for two years past has been draughtsman of the Boston and Albany Railroad Company's repair shops, at Boston. Mr. Stevens brings with him a thorough knowledge of the requirements and methods in practical draughting and general machine work which will prove greatly to the benefit of the students under his charge.

THE first winter meeting of the Athletic Club will be held in the gymnasium Saturday afternoon, Feb. 17. On account of the lack of a suitable place for exercise during the greater part of last term, it can hardly be expected that the records of last year will be exceeded, but with a good amount of work in the time remaining, there is no doubt but that a creditable appearance may be made and a successful meeting carried through. As a large audience adds no little to the success and enjoyment of the occasion, it is to be hoped that every man will interest himself to attend and bring friends. It is intended, if possible, to introduce exhibitions of sparring and wrestling, which will give additional interest to the games.

ON account of the mid-winter vacation, the publishing of the present issue has been deferred for one week. The paper will be published fortnightly, as usual, hereafter.

Factory Mutual Insurance Companies and Fire Protection.

AN ABSTRACT OF AN ADDRESS, BY MR. EDWARD ATKINSON, BEFORE THE S. M. E. SOCIETY, DEC. 29, 1882.*

IN order to answer the question, Why is it better to insure in a factory mutual insurance company than in an ordinary stock insurance company? attention must be given to what constitutes the contract of an insurance company. It is a mutual contract, under any circumstances, whether it be made through a stock company or through what is technically known as a mutual company, the difference being merely this: that in the case of a stock company there is a capital invested by certain persons, which capital serves as a guaranty, but which it is not expected to draw from for the purpose of paying losses. You will see from this that unless the premiums paid by those persons who insure in the stock insurance company amount to more than the losses and expenses, the company is on its way to bankruptcy. In the factory mutual company there is no capital. The members pay premiums annually in the measure that is necessary to meet the losses and expenses, and in lieu of a capital stock the power of assessment is reserved in case the premiums do not suffice. In point of fact, during the history of factory

* Mr. Atkinson's paper was illustrated by a number of sketches of various methods of construction in buildings, and a number of automatic sprinklers was exhibited and their efficiency considered in the discussion which followed the address.

mutual insurance companies, or since the very first beginning of the system, there has been no assessment in any principal company. The premiums have sufficed for all losses and expenses, and they have more than sufficed to the extent of sixty-seven per cent of the amount paid in, — that is, we have averaged a return of sixty-seven per cent of the premiums during the whole history of the company, and they are now averaging more than that. At the same time, there have been two cases in the history of the company of which I am president, where the annual premium for the year was exhausted and no return was made, and there have been two cases where the whole premium for the year has been returned. In these latter cases the profit on charge of investment and the income from the year's investment of the premiums more than covered the amount of losses and expenses.

Now, having obtained the fundamental idea of insurance as a system of co operation, you will observe a difference between the terms stock company and mutual company. The members of a mutual company band together to save themselves from loss, and there is no divided interest; whereas, in a stock company, there is a divided interest. The shareholders have a different object in view, which is to make money for themselves. Their main object, as owners, directors, and managers, is to make money, and not to save the assured from losses. This is a subtle distinction, and you would be surprised to see how far-reaching it is. It extends to this measure, that the business of a stock insurance company is to bet on chances, and the greater the chance of fire the higher the premium and the larger the possible share of the premiums, and perhaps the larger the profit. These profits are divided annually; hence when a great disaster comes, a considerable portion of the stock insurance companies becomes bankrupt, and the assured fail to get the promised indemnity in the time of utmost need.

I may astonish you by stating that in what are called "cheap" insurance companies, in which a fallacious promise of indemnity against loss by fire may be obtained at an extremely low rate, lies the foundation of combustible architecture. Owners will trust to a policy of insurance and will encourage the "combustible architect" in bad methods of construction. Another reason for this is that the business of stock insurance is practically in the hands of agents and brokers, and not under the control of the managers, so that of the amount of premiums which constitute the fund of indemnity forty per cent is spent in the mere expense of conducting the companies. If you or your fathers pay a certain amount of money into a stock insurance company, four dollars out of every ten go to pay the expenses, and your real fund of indemnity is reduced to six tenths of the whole amount. The results of cheap insurance, and buildings constructed by combustible architects, are a loss by fire of eighty to ninety millions in ordinary

years, — sometimes brought up to one hundred millions. The cost of fire departments is about twenty-five millions a year, and the mere cost of conducting the system of underwriting is about thirty million dollars a year; so that the annual fire expenses of the United States are greater than the cost of the largest standing army maintained in Europe; and yet we call ourselves an instructed, well-educated people. We brag too much and do too little; that is the case.

When you approach this subject your first question is, how to build a fire-proof building, but you cannot do it. There is no such thing as a fire-proof building. A smelting furnace may be consumed by fire, and many of the so-called incombustible substances are the most dangerous to use in buildings. Granite, which is apparently incombustible, is one of the most dangerous things. Iron, you know, is one of the most treacherous of all materials when heated: it yields either by bending or breaking; and iron doors, when subjected to the heat of a fire, begin warping almost instantly, and are about the worst things that can be put in a building.

A grain elevator in Philadelphia, capable of holding six hundred thousand bushels of wheat, was composed almost entirely of iron and brick. The wheat took fire, and the six hundred tons of iron were so warped and twisted by the heat that the building was torn to pieces, and the owners had to pay money to get rid of the wreck, even of the iron. In London, the Pantech-nicon, one of the most fire-proof buildings ever constructed, was entirely consumed by the heat of its contents, with enormous loss of valuable goods, furniture, plate, pictures etc., stored in it for safety.

The object of the mutual system of insurance upon factory buildings is twofold. I place first the prevention of loss by fire, and second the payment of the indemnity in case the fire occurs. If a fire occurs it is generally somebody's *fault*, and usually, though not always, the fault of either the owner or the underwriter.

The beginning of the mutual system was in this wise. Mr. Zachariah Allen of Providence, having constructed and fitted his factory in the best manner, according to the general knowledge existing in 1835, applied to one of the stock insurance companies for a lower rate of premium, and they made the same reply that they do now: "We can't make any different rate for a cotton factory; we insure it at two and a half per cent, and you can take the policy or not." Mr. Allen concluded that he could associate himself with other mill-owners and insure each other; and so the first factory mutual company was formed. This company still continues, now insuring a cotton factory for nine tenths of one per cent; and of this premium two thirds have been returned to the members. The actual cost of factory insurance has been brought down from two and a half to one quarter of one per cent.

In the seventeen mutual companies there are three

hundred million dollars combined, and the saving to factories is about two million dollars a year. The expense of doing business, instead of being forty per cent, is about four per cent on the premium.

I think I will do well to give you some of the principles which guide the "combustible architect" in the constructions so common in our larger buildings, even of to-day. [Mr. Atkinson exhibited diagrams of each variety of combustible architecture described hereafter.] We will first consider the combustible stone church. The average combustion of churches is one a week, — one for every Sunday. It is a very simple art; it consists in building a stone sham on the outside with a timber structure inside, and a good large space well protected from water over the nave. Then place a furnace in the cellar, with an air-box, the first three or four feet of metal, the rest of wood, carried along under the hollow floor above. Now, when it comes a cold Wednesday, Thursday, and Friday, with the temperature in the church down to forty-five degrees, and then a warm Saturday, the sexton lights the fire in the furnace, and all is well prepared for a conflagration. The air-current is reversed, the air inside the church, being the colder, passes out through the air-chamber, carrying the heat with it; the air-box takes fire and spreads straight up through the open spaces between the walls, and the first appearance of the flame is away up on the ridge of the roof, and the whole thing is under way.

The next example is a dwelling-house, in which the fire caught in the basement, got in behind the furring on the party-wall, and spread all over the building; damage, \$10,000.

Not long ago I was called upon to inspect a hospital. One or two hospitals or asylums are burned each month, usually with loss of life. This particular one contained a thousand inmates, and was admirably planned for quick combustion. The steam-boilers, engine, pumps, ventilating fans, and the like were on the first floor of a small, detached building, and on the second was a paint and carpenter's shop, being about one of the most dangerous things possible to place there. The fire apparatus, cooking apparatus, and heating apparatus all depended on the safety of this building; and while a large sum of money had been spent on an expensive but poor fire apparatus, its use depended on the safety of this paint and carpenter's shop, in which were no appliances for extinguishing fire.

The average destruction of hotels is one a day throughout the year. The cooking apparatus and boilers are often in the basement; every possible means of helping the spread of a fire is provided in the construction, and we usually allow thirty minutes for burning.

The largest losses come from the destruction of warehouses. Here is a very common form of warehouse,

stripped of all architectural shams, of which you may find plenty of examples in the city of Boston: here is a granite post, supporting a cast-iron girder; and then comes a pile of granite and brick four or five stories high. I think I may say I know of cases where there is a hundred tons' weight depending on the cast-iron, and cast-iron is utterly unfit for use where there is any transverse strain. Let the fire take place in the basement, the granite begins to crumble and the iron to cripple, and the whole thing comes down by the run. The necessity for this kind of building comes from the need of great show windows; and here comes the electric light, which will in great part do away with this necessity of mounting a great building upon stilts. [Mr. Atkinson then gave a number of other instances of dangerous, and even criminal, constructions of buildings.]

You have heard Mr. Woodbury speak about the construction of mill floors, and you have been told what floor is best for cheapness of construction, etc. Now this [*pointing*] is the common joisted floor. The fire gets in between the vertical pieces, and is completely protected from water; whereas, with the open timber floor, the water can play anywhere between the timbers, and the fire is swept out at once.

Now for the different kinds of roof coverings. The usual covering is, first, boards, not set very close; then felt is put on, and then the slates. The latter crack at the first exposure to heat; they let the cold in and the heat out; and the upper story, which ought to be the pleasantest in the building, is used for rubbish, and becomes dangerous. This is what made the great conflagration in Boston, the flames spreading from roof to roof.

These seven or eight story buildings should be avoided, especially for industrial purposes, for not only is the vitality of the operatives wasted in climbing stairs, but the buildings themselves are dangerous, and the chances of escape from them are insufficient. The long, flat buildings, as near one story as they can be brought, are the best. They have greater stability and little vibration. Dr. Edward C. Clarke gave as his expert opinion that the economic value of buildings — with reference to the health of women — that are free from vibration is five per cent more than the economy of the building where the floor is vibrating like that [*illustrating*] . . .

Nothing is so offensive to me, or to any man of right taste, as a pretty picture of a structure in brick, stone, and iron, with nothing but sham behind it. I have of late years lost all interest in the streets of Boston because I know that in many a building two or three hundred people are every day exposed to needless danger in an infamous way. . . .

There is another thing that I will say a few words about. In the open country it is better in many respects to build a storehouse in what we should consider the most combustible way than to build it "fire-proof." If, for instance, it is stored with cotton, wool,

or goods which may be greasy, they may take fire by spontaneous combustion, and, if the building is fire-proof, it serves to keep the heat in and the firemen out; therefore, where there is room and space, we recommend the construction of a one-story building, with thick plank roof, heavy posts, and the lightest possible wooden sides, so that the firemen can tear down the sides and withdraw the goods rapidly, and reach the fire in the quickest way.

Alumni Meeting.

THE Alumni Association of the Massachusetts Institute of Technology held its annual meeting at Young's on Thursday, Jan. 18.

The business meeting was called to order at six o'clock. The election resulted in the choice of the following officers: —

Trustee of Alumni Fund. — Howard A. Carson, '69.

Member of Alumni Committee on the School. — Theodore F. Tillinghast, '70.

Member of Executive Committee. — Harry H. Cutler, '81.

At the close of the dinner, the president of the Association, Mr. James P. Tolman, '68, introduced President Walker, who spoke of the present condition of the Institute, its future, its finances, the new buildings, etc. Plans of the new building, now being erected upon the site of the old gymnasium, were presented and explained by Dr. Francis H. Williams, '73.

Attention was then drawn to matters directly concerning the present student. Mr. Geo. A. Mower, '81, explained the organization, purposes, and results of the Σ . M. E. Society. At the request of the president, Mr. Walter B. Snow, '82, made a few remarks upon THE TECH, and read a communication from Mr. Geo. J. Foran, secretary of the present board of directors, with regard to the interest taken in the paper by the alumni. The number of graduates whose names appear upon the subscription list was found to be surprisingly small.

Then followed brief remarks by Mr. Howard A. Carson, '69, upon the Corporation, Mr. Silas W. Holman, '76, upon the Society of Arts, and Mrs. Robert H. Richards, '73, upon the Woman's Laboratory.

The Excursion.

THE excursion of the *S. M. E.* Society, of which mention was made in the last issue, and which promised to be a very enjoyable trip, was a complete success, according to the testimony of the excursionists, and entirely fulfilled expectations.

The excursionists, seventeen in number, left Boston at 6 P. M., on Monday evening, January 22, via the Fall River line, for New York. The boat was considerably delayed, and Jersey City was reached on the following day only in time to take the 11.15 A. M. train, by the Bound Brook route, for Philadelphia.

PORTER-ALLEN ENGINE WORKS.

After reaching that city, and disposing of a very acceptable dinner at the Girard, the first visit was made to the Southwark Foundry. Here the party was very kindly received and escorted through the works by Mr. Joseph S. Farrell, general manager, and Mr. Charles B. Richards, chief engineer.

The majority of the students were already familiar with the details of the Porter-Allen engine, which is here manufactured, and most of the afternoon was spent in examining the various machine tools of the company, and in following out the various processes by which the different parts were shaped and finished and finally put together in the engine.

The size of some of the engines in process of construction excited considerable comment. The largest cylinder then in the erecting shop was 44 x 66 inches, with a 44 780-pound bed and an immense disk crank. This engine, an employee stated, was designed for the Lackawanna Rolling Mills, and would run at about ninety revolutions per minute. Another 44 x 48 cylinder was intended to run at one hundred and twenty revolutions.

In another shop was found a number of Clerke gas engines, built in Great Britain, and here set up in order to be tested when running. These engines, it was stated, worked satisfactorily and economically. The governor was a peculiarity, the balls revolving in a vertical

plane and acting on a cut-off valve independent of the main valve. By this arrangement an explosion could be produced at every revolution of the crank or omitted for as many strokes as was necessary to regulate the speed. These engines, according to the statements made to the students, are used considerably in England to drive dynamos for electric lighting purposes.

The belting used in connection with these engines was that known as "link belting," composed of small pieces of leather an inch or so long and half as wide, set edgewise in log-house fashion, and fastened together by iron pins extending the entire width of the belt, and slightly rivet-headed at the ends. The belt was thus continuous, very strong, and sufficiently pliable to work satisfactorily. The gentleman in charge of the engines noted that it was considerably used in England, and that he preferred it to the common belt.

Among the many peculiar and interesting machine tools was a wa-her-grinder, consisting of two rather thick disks of metal, each cut away on the face, leaving half an inch at the circumference. These were placed facing each other on an arbor in a lathe and adjusted to the thickness of the washer. The latter, supplied with emery and water, was partially inserted, and the rotation of the disks caused a uniform and constant rotation of the washer, which bore against a freely revolving wheel outside. Both sides of the washer were thus ground true at one operation.

Another interesting operation was the scraping of surface plates. To obtain a true surface three plates are necessary. These are made as true as possible by using the straight-edge, and are then applied to each other and scraped in the usual manner. By these three plates all the shop face-plates were trued when it became necessary, and on the latter the surfacing of the regular shop work was done.

ENGINEERS' CLUB.

In the evening a number of the excursionists made a visit to the rooms of the Engineers' Club. A part of the evening was very pleasantly spent

here in examining the drawings, photographs, etc., on the walls and tables. The Shaw locomotive was conspicuous in photographs and a large painting. Nearly every scientific and technical periodical published was found on file at these rooms.

The students then proceeded to the station of the Brush Electric Lighting Company. Here were found eight Porter-Allen engines, of about forty-five horse-power each, running at two hundred and thirty revolutions per minute, and each belted to a single dynamo. A large double Corliss, of about five hundred horse-power, was running at seventy-five revolutions, driving eight dynamos, with more to be added. The boilers consisted of four Babcock & Wilcox and six return flue boilers, and were those on which a thorough comparative test has recently been made by Mr. J. C. Hoadly, and the results published in *Van Nostrand's Magazine* for January.

WILLIAM SELLERS & CO.

On the following morning the manufactory of William Sellers & Co. was visited, the party being received and conducted through the establishment by Mr. Coleman Sellers. Mr. Lewis, class of '75, M. I. T., who is employed by the company, also accompanied the party.

Mr. Sellers's descriptions of the machines, of the requirements for special work, of adjustment and construction, were exceedingly thorough, and the students were very earnest in their praise of his clear explanations and ready answers to all questions. One of the most noticeable devices in the machine shops was an attachment for lathe feeding. Instead of using gears to transmit the motion from the spindle shaft to the rotating rod running to the tool rest, this company uses a very ingenious device, the invention of Mr. Coleman Sellers. Two steel disks, about six inches in diameter, are fastened on the ends of the shafts, from one of which the motion is to be transmitted to the other. These disks are hollowed somewhat on both sides, leaving three eighths of an inch or so at the circumference. Between these two shafts runs another,

which may be moved in either direction, and on this are two brass disks of about the same diameter as those above, but convex on the surfaces toward each other. These can be clamped so as to enclose a portion of the rim of each steel disk, and, by varying the position of this free shaft, any desired speed of tool rest can be obtained. This method will of course not do for screw cutting, but for common lathe work it would appear invaluable. The device is patented.

Considerable time was devoted to the draughting room, and to an explanation of the company's methods of making and keeping drawings and tracings. Mr. Sellers pointed out the advantages of the "card catalogue" for reference, and strongly urged every young man, who had not already done so, to begin such a catalogue at once.

Anything which is likely to be of use in the future can easily be jotted down on a small card, labelled and filed, and can be readily found when required. Newspaper clippings, etc., can be enclosed in envelopes of the same size as the cards and filed in the same manner. Mr. Sellers gave practical suggestions for using sulphur in fastening the bed bolts of a planer or other heavy machine, and pointed out the requirements for correctly designed drill sharpeners and gear cutters, of which examples were shown. A small steam hammer was seen running at three hundred and sixty strokes per minute.

The general shop measurements and scales were all in English measure, inches and fractions (sixteenths, etc.). In the injector department, however, all measurements were in the metric system, which the company have here given a very thorough trial. On inquiring about the success of this system in regular shop work, the excursionists were answered by being each presented with a pamphlet containing Mr. Sellers's address before the Society of Mechanical Engineers. In this address the gentleman takes the ground that the metric system is not fitted for shop uses, and gives the results of the

Sellers Company's trial in the department above mentioned. Of this address we hope to speak more fully in a later issue.

ROACH'S SHIP-YARD.

Wednesday afternoon the excursionists visited John Roach's ship-yard at Chester. Three large hulls, two hundred and eighty to three hundred feet long, were on the ways and in process of construction. The arrangements for punching, clipping, and bending iron were on the largest scale. The shops which contained these machines were entirely open in front, for convenience in handling the great quantities of plate and rolled iron, but thereby exposed the workmen to the severity of the winter cold. The boiler shops, machine shops, pattern shop, and engine-erecting shop were investigated, and considerable time spent in the draughting rooms, where many models and drawings for vessels were exhibited and explained.

Thursday morning was devoted to the Baldwin Locomotive Works, and of this visit an account will be given later. In the afternoon the establishment of I. P. Morris & Co. was visited. Some very heavy foundry work is here done, including a considerable part of the work for Leavitt and other pumping engines. A number of students spent the afternoon at the round-house of the Bound Brook Railroad, examining the Shaw locomotive and a number of Baldwin "Consolidated" eight-wheel freight engines, which were there housed.

Athletics.

THE first winter meeting of the Athletic Club will be held in the gymnasium on Saturday afternoon, Feb. 17, at 2 P. M. The events to be contested are as follows: Running high jump, running high kick, standing high jump, fence vault, pole vault, boxing, wrestling, tugs of war (heavy-weight, class teams, and light weight). The class teams are limited to six hundred pounds. Any of the above events will be withdrawn if not entered by a sufficient number immediately. Entries should be made as

soon as possible to the secretary of the club. Entries close Wednesday, Feb. 14.

U. A. C. GAMES.—The fourth annual winter games of the Union Athletic Club took place Monday evening, Feb. 5, in the Mechanics' Fair Building. About 1,500 spectators were present, including a good number of Institute men. A marked improvement was noticeable over the games given by the club in the same building a year ago. The track was better, the events followed each other more promptly, and, from past experience, the length of the programme was kept within reasonable limits.

The Massachusetts Institute of Technology Athletic Club, contrary to custom, was but poorly represented this year. A middle-weight tug-of-war team, consisting of Richards '83, Harriman '83, Haines '84 (capt.), and Windsor '85, anchor; a feather-weight tug-of-war team, consisting of Whitney, Douglass, Magoun (capt.), Deshon, anchor; and T. C. du Pont in the high kick, being the only entries from the club. The middle-weight team had had Windsor as an anchor only since Saturday, while Richards pulled with the team that night for the first time. The feather-weight team had but slightly more practice.

The record of the events in order of their succession was as follows: Indian clubs, first prize, Harold, second prize, Pearce. Light-weight (500 lbs.) tug of war, between Union gymnasium team and Lynn Athletic gymnasium team, won by the Lynn by four inches. Light-weight tug of war between Union Athletic Club team and Massachusetts Institute of Technology team. The Union team got the drop by about two inches; but, before they could gather themselves, a couple of heaves by quick little Deshon carried the ribbon across the line toward the Techs by about two inches. Several more good heaves by the Technology boys brought the rope six inches in their favor; and this advantage they easily kept until the end of the heat. Parallel bars: J. B. Farrell, Union Athletic Club, first prize; J. T. Williams, Union Athletic Club, second prize. Third

light-weight tug of war, Union Lacrosse Club against South Boston Athletic Club, won by latter by three inches. One-mile handicap walk, eight entries: S. Grishaver first; W. F. Friese, Union Athletic Club, second, Friese starting from the scratch and allowing Grishaver 80 yards; time, 7 minutes 41 seconds, and 7 minutes 43 seconds, respectively. Middle-weight (600 lbs.) tug of war between Columbian Athletic Club team and Massachusetts Institute of Technology Club team. This, at least to the Technology boys, was to be the event of the evening, but, knowing the recent make-up of our team, it was with but little hopes of success that they saw their club opposed by the stocky Columbians. The Techs got the drop through the quickness of Windsor by about 4 inches, which they increased to 2 feet, and easily held to the end of the heat. Horizontal bar: C. A. Rabethge, first; R. Stroehr, second. One-mile handicap run: J. C. Little, Boston (scratch), first; Peter Riley, Boston (30 yards), second. Light-weight tug of war: second round, between the winners of the two former heats, viz.: South Boston Athletic Club and Lynn Athletic Gymnasium; though the latter got the drop, the South Boston boys won by 1 inch. Running high jump: A. H. Winch, Union Athletic Club, first, with 5.7½ feet; J. L. Behneke, second, with 5 feet 7 inches. Special half-mile run, by Mr. L. E. Myers, amateur champion of America, 2 minutes 9 seconds. Light-weight tug of war between Massachusetts Institute of Technology boys and the South Boston team deciding the first prize. Our boys got the drop, but the avoirdupois of the South Boston anchor was too much, and the ribbon gradually crept over to their side, the heat being called with the rope 2¼ to their credit. What made the defeat particularly chagrining was the fact that the South Bostons were thrown out of the lists, being over weight, and were only allowed to pull through the courtesy of Deshon, anchor of Massachusetts Institute of Technology. Running high kick: W. S. Phillips, first, with 8 feet 8 inches; J. K. Simpson, Union Ath-

letic Club, second, with 8 feet 7 inches; du Pont, third, with 8 feet 6 inches. Final pull of middle-weight tug-of-war teams between winners of former heats,—Lynn Athletic Gymnasium, Crescent team, and Massachusetts Institute of Technology Athletic Club team. The Techs, as usual, got the drop; but before Windsor could hold it a quick heave by the Crescent team brought back the ribbon to the line, and finally over. The Technology boys clearly outpulled their opponents, as far as a clear pull was concerned, and it would only have needed the skill of Hillyer to have turned defeat into easy victory; for, though Windsor anchored exceedingly well for a new man, he was not quite up to the requirements of the position, and was caught once or twice by the agility of the Lynn anchor. After a close and exciting bout, the Crescent team won by 5 inches, thus giving the first medals to the Lynn team, second medals to the Technology boys. Final light-weight tug of war between Lynn Athletic Gymnasium team and Technology for second prize was finally won by the Lynn team by an inch, after a desperate struggle. In the pole vault we missed the presence of Baxter and Sturgis. This was won by J. K. Simpson by 9 feet 2 inches, two inches less than the last record made by Sturgis in the Massachusetts Institute of Technology Gymnasium.

Department Notes.

THE Seniors have begun testing framing joints. From the two tests made it was found that headers, when framed with a double tenon and a joint bolt, were much weaker than if hung on a stirrup. It is hoped that there will be time enough to test a header with full-sized floor joists, instead of the small blocks which are inserted at present. This will present some difficulty in regard to the manner of applying the load; but that will doubtless be overcome by experiments.

Very little work has been done so far in the drawing-room, a few of the first-year specials

being still away on their vacation, and the second-year men either taking their customary exercise on Huntington Avenue or working for outside parties.

The electrical engineers are now receiving a course of lectures on the "Theory of Climbing Telegraph Poles." Field practice is to commence as soon as the weather will permit.

Our mechanical students frequently have occasion to compute the amount of steam used by a steam engine from the indicator diagrams. We think the following method will be found convenient, as the only data required are a diagram and its scale:—

Draw a horizontal line through the point of release, and mark the point where it cuts the compression curve, which may be prolonged beyond the limits of the diagram, if necessary, in order to get an intersection. Let

l' = the distance, measured on any convenient scale, from the point so found to the point of release;

l = the length of the diagram;

p = the mean effective pressure on the piston in pounds per square inch;

w = the weight of a cubic foot of saturated steam at the pressure corresponding to the point of release;

then the weight of dry steam per horse-power per hour accounted for by the indicator,

$$S = 13750 \frac{l' w}{l p}.$$

The above rule is accurate for any case where the steam in the cylinder is not superheated, and takes into account both the loss of steam due to clearance and the saving due to compression. The steam not accounted for by this method has either leaked through into the exhaust or has been condensed in the cylinder, and not re-evaporated before the end of the stroke. These sources of loss can seldom be detected by the indicator. The number 13,750 is obtained by combining several constants, which ordinarily appear in the calculation, into a single coefficient.

Locals.

Providence took away our beloved '86 director during vacation.

The Senior mechanicals rejoice in the prospect of ten weeks' "laboratory work"; not at the Institute though. Bless you, no! outside, of course.

The Cadets appeared in uniform last week, giving a much better appearance to the battalion. Some of them mourn some over the splendor of the officers' uniforms, gold lace, etc.; but they must remember that "all that glitters is not gold."

After this, those Civils who desire to pass with honor in hydraulics should hand in a pretty note-book. It would be well to get one with colored covers; and, if possible, the student should take a course in penmanship at some business college before taking the above-named course.

How many fellows there are who, after the semi's, have had tip-top positions offered them in business, you know, and it really would n't pay to come back another term. Besides, their physicians say that their health is becoming seriously impaired by too close application, etc., etc.

Various opinions of the discriminating public concerning the character of the excursionists: At Jersey Ferry, "Glee Club?" Fulton Market, (*with disgust*), "Collegians!" Ditto, further on: "They've let 'em all loose, to-day." Philadelphia horse car: "Is this a college concert company?" New York exclamations: "Emigrants," "Baggage smashers," "Germany let loose," "Female seminary in disguise." (Indicating the Prof.), "All his family, I presume."

An interesting series of lectures on "Dynamo-Electric Machinery," by Prof. Sylvanus Thompson, is appearing in the *Journal of the Society of Arts*, beginning Dec. 29, 1882, and also in the *Electrician* (London), beginning Jan. 6, 1883. C. R. C.

In *Van Nostrand's Magazine* for February, 1883, is an article by Wex, on "The Regulation of Rivers and Waterways, with a View to the Prevention of Floods." Interesting for the third-year Civils. G. F. S.



THE current volume of the *Atlantic Monthly* promises to be one of the most interesting which the publishers of that excellent periodical have issued. The volume is to contain Longfellow's dramatic poem, "Michael Angelo," — probably the last unpublished work of the dead poet; the sketches for a novel which were left by Nathaniel Hawthorne, and a series of papers by Dr. Oliver Wendell Holmes. The last are of peculiar interest in connection with the *Atlantic*, for, as The Autocrat of the Breakfast Table, Dr. Holmes made himself and the magazine famous. The various other features of the volume are of more than ordinary interest and value. The February number contains, in addition, an undoubtedly just criticism of Herbert Spencer's theory of education, and a timely article on civil-service reform.

The *Columbia Spectator* publishes the names of its eleven editors and denies that any outside influence is brought to bear upon the journalistic work of the paper.

The *Varsity* has a charming way of taking its property wherever it finds it. It rarely credits its clippings from the college journals; even the prolific *Ex.* is not recognized in its columns. As a result, several unsuspecting journals have credited to the *Varsity* notes and items which could claim a much higher parentage.

The Bowdoin *Bugle* and Amherst *Olio* are out. Both are complimented.

There is very little likelihood that Columbia will send a crew to Lake George. — *Acta*.

An old bachelor says we are safe from ever having a woman for President, because no one of the sex would ever confess to being over thirty-five years of age. — *Ex.*

Political Economy is studied by more men than any other one elective subject in college. — *Crimson*.

It is proposed to form an intercollegiate baseball league to include the Maine college nines. — *Colby Echo*.

LITTLE AH SID.

Little Ah Sid
Was a Christian kid, —
A cute little cuss, you'd declare,
With eyes full of fun,
And a nose that begun
Right up at the roots of his hair.

Jolly and fat
Was this frolicsome brat,
As he played through the long summer day,
And braided his cue
As his father used to
In Chinaland, far, far away.

Once, o'er a lawn
That Ah Sid played upon,
A bumble-bee flew in the spring.
"Melican butterfly!"
Said he, with winking eye;
"Me catchee and pull off um wing."

Then, with his cap,
He struck it a rap,
This innocent bumble-bee,
And put its remains
In the seat of his jeans;
For a pocket there had the Chinee.

Down on the green
Sat the little sardine
In a style that was strangely demure,
And said with a grin,
That was brimful of sin,
"Me mashee um butterfly sure."

Little Ah Sid
Was only a kid;
Nor could you expect him to guess
What kind of a bug
He was holding so snug
In the folds of his loose-fitting dress

"Ki-ya! Ki-yip-ye!"
Ah Sid cried, as he
Rose hurriedly up from that spot;
"Ki-ya! Suk-a-kan!
Damn um Melican man —
Um butterfly velly much hot!"

San Francisco Wasp.

THE TECH.

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RHAPSODY.

I passed a lonely maiden by,
Her profile saw a melting eye.
Ye gods, the favor don't deny,
Win me its glance, and let me die!

RECANTATION.

Upon her other side I passed,
And first impressions didn't last;
Perhaps, indeed, I judged too fast,
For — well, her other eye was cast.

— *Lampoon.*

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The third-year class in assaying is about to begin, under the charge of Mr. Duff.

Mr. Jarvis, '84, has just sailed for Mexico, having been employed by the Mexican Central Railroad.

We are glad to see that the young ladies remain loyal to the Institute. One of them appeared the other day in the Institute colors in quite large proportions.

Mr. Turner will continue his lessons on water-color sketching for a few weeks this term.

RICHMOND

Straight Cut No. 1

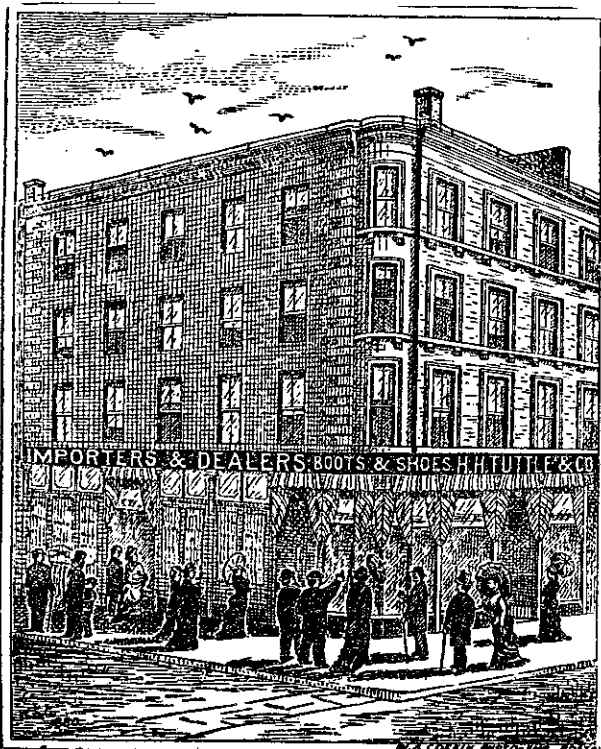
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We use the Genuine French Rice Paper of our own direct importation, which is made especially for us, water marked with the name of the brand, "Richmond Straight Cut No. 1," on each Cigarette, without which none are genuine. Base imitations of this brand have been put on sale, and Cigarette smokers are cautioned that this is the Old and Original brand, and to observe that each package or box of Richmond Straight Cut Cigarettes bears the signature of ALLEN & GINTER, Manufacturers, Richmond, Va.

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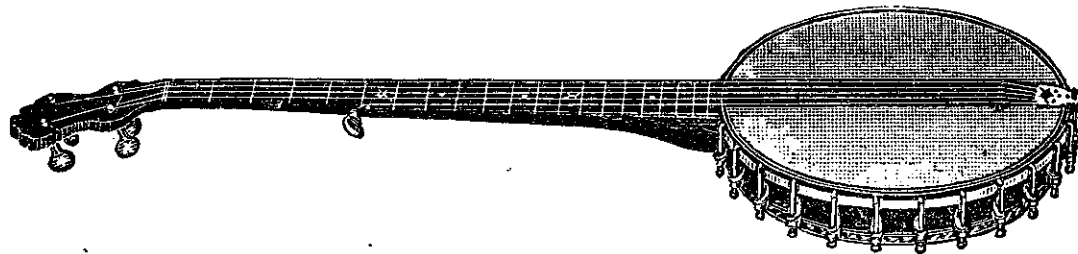
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 cided to adopt another business,
 in preference to the profession
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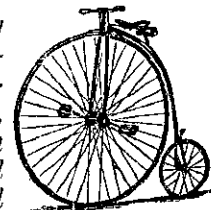
Did you "pass"?
The F. S. T. Society extend a vote of thanks to W. B. Fuller, '83, for the reception of examination papers of several years past.

The third-year Civils have at present recitations in railroad work, two hours long, two afternoons during the week.

Prof. W. R. Ware, of Columbia College, intends going abroad this spring. His tour will extend through Greece and Asia Minor, and he hopes to make a visit to Mr. Clark and Mr. Bacon, now excavating at Assos.

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President Walker, on account of his absence in Washington, will not give lectures on Political Economy to the third-year men this term

The evening lectures on Mediæval History, by Prof. Clark, will be given on Mondays and Wednesdays, instead of Tuesdays and Fridays, as before stated. The first lecture was given last Monday in room four.

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