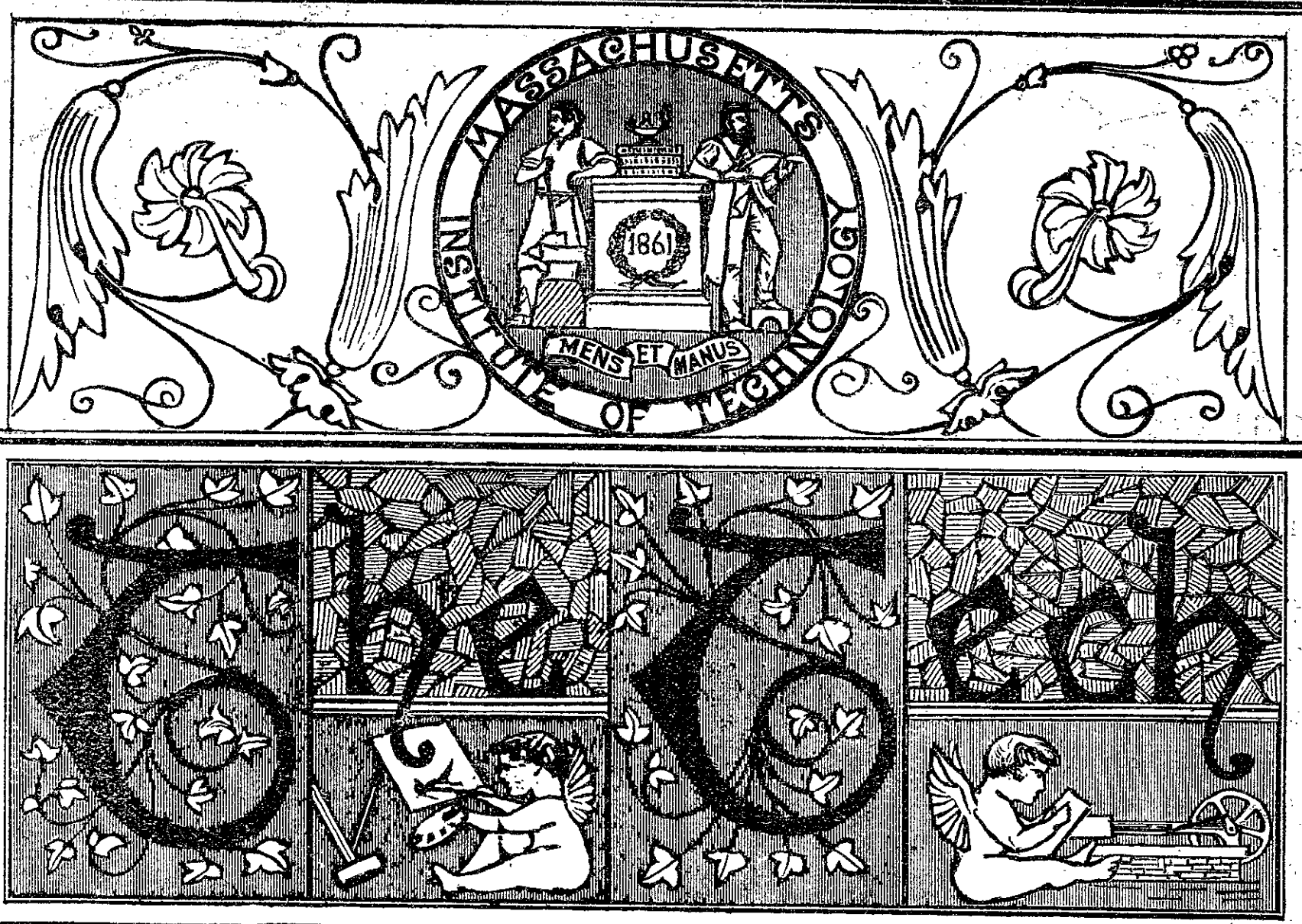


NOV. 19,
1884.
Vol. IV. No. 3.

Entered at the P. O. at Boston, Mass., as Second-Class matter.

The Tech.

VOL. IV. BOSTON, NOV. 19, 1884. No. 3.

THE TECH.

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

BOARD OF DIRECTORS, 1884-5.

ALEX. RICE McKIM, '85, *Pres.*
W. H. CHADBOURN, JR., '86, *Sec.*
JAS. E. SIMPSON, '86, *Treas.*
SIDNEY WILLIAMS, '85.
HOLLON C. SPAULDING, '87.
——— ———, '88.

EDITORS.

THOMAS W. FRY, '85, *Editor in Chief.*

HAMMOND V. HAYES, '85.
HUGH MacRAE, '85.
JOHN G. HOWARD, '86.
WALTER R. INGALLS, '86.
BENJAMIN C. LANE, '87.
F. MANTON WAKEFIELD, '87.

THEODORE STEBBINS, *Adv. Agt.*

Subscription, $2.00 per year in advance. Single copies, 15 cents each.

ALFRED MUDGE & SON, PRINTERS, 24 FRANKLIN STREET, BOSTON.

HARDLY four years have passed since the departure from the Institute of several young Chinamen who were studying here. During that time they have served in the Chinese army, and the announcement of the death, in the battle of Min, between the French and the Chinese, of three of them will give sincere pain to those who became acquainted with the young men during their stay in this country. One of them, Kang Wing Chung, entered the Institute with the class of '83, and the other two, Yang Sue Nam and Sik Yan Fook, with the class of '84, but were recalled by the Chinese government before graduating. They became lieutenants in the army, and in the battle of Min displayed great courage and manliness. Kang Wing Chung, whose superior officers had been destroyed by a French broadside, showed his spirit by firing a broadside at his deserting men, and another at the French, and sank with his vessel, in the act of levelling another gun at the enemy. Yang Sue Nam and Sik Yan Fook were killed on board the flagship "*Yang Woo*," which is reported, with one or two others, as having fought well.

These young men were much liked here, and found many friends among their classmates, who will hear without surprise of their noble conduct, though with sadness of their premature death.

THE Freshmen may not be aware that an editor of this paper will shortly be elected from their class. The man whom we think best qualified for the position will be chosen, and, in order that the choice shall be a wise one, we must have some contributions from which the relative merits can be judged. Articles should be written upon one side of the paper only, and accompanied by the writer's name, which will not be published if so desired. Contributions should be received by Wednesday afternoon, in order to appear in the next number of THE TECH.

This is as good a time as any to renew our oft-repeated requests for contributions from our subscribers. It is to be hoped that the time will come when the editors will not be compelled to write the whole paper. This is a great injustice to them, since it necessitates a sacrifice of the whole of their spare time, and often their studies. THE TECH is published by all of the students of the School of Industrial Science, and from them we have a right to expect assistance Too many, we are afraid, think that their share of the work is done when they have given us their subscriptions. THE TECH box in the hall is always ready to receive contributions. Let not the wish be vain that we could frequently find in it stories, locals, communications, and other items of interest.

THERE seems to be a lack of interest on the part of most of our daily papers, in the affairs of the Institute, compared with that shown in the doings of our sister colleges. These, as older institutions, receive considerable attention, while Technology notes are few and far between. If the Institute were unimportant in the college world, there would be no cause for complaint; but this is not the case. Its reputation is not confined to the United States; its prosperity is constantly being increased by generous bequests; its entering classes are the largest; its graduates, though as yet few in number, are becoming known in their professions. Nor can there be lack of news among us; there are societies, class, musical, athletic and secret, with other affairs common to all colleges, which, with the transactions of the Lowell Institute and Society of Arts, would surely furnish items of interest to friends of the Institute of Technology and to general readers.

FOR a number of years, the charter of the city of Boston has been brought to notice as needing improvement. In its present state, the result of constant additions made to meet the demands of the growing city, it is one of great complexity, which, from its peculiar nature, might be a dangerous power in the hands of a corrupt set of city officials. Its weak point is chiefly the manner in which those in the city's service are selected, which is mainly by appointment by the city council or aldermen, very few being named by the mayor or voted for by the people. The result is the placing of responsibility upon boards or committees, instead of individuals, inviting carelessness and dishonesty, and causing, by lack of harmonious and economical management by the numerous independent departments, a high rate of taxation. Many similar cases have occurred, and during the last ten or fifteen years the subject of improvement in municipal government has received the attention of commissions in New York and Pennsylvania, and in a number of cities. The cause of the trouble seems to lie in this essential difference between city government and State or national rule, namely, the confounding, in the former, of legislative, executive, and judicial powers, which, in the latter, are always kept as distinct as possible, "that the government may be one of laws, not of men."

A committee appointed for the purpose, in this city, has lately proposed to the common council a remedy for existing evils, consisting of a revision of the charter, including a simplification of the method of appointments, placing the responsibility upon the mayor, and thus allowing the people an opportunity to approve or condemn, at the polls, his course; a reduction in the amount of work required of the council, thus permitting business men, who would be specially interested in the city's welfare, to take part in its government; and a separation of the three fundamental branches of government, now in such confusion. Starting thus anew, with a charter adapted to the needs of a large city, it is hoped that its affairs can be carried on more efficiently and more economically, reducing the high rate of taxation, which has increased in much greater proportion than the city's population and assessed value of property.

THE attention of readers of THE TECH is called to our advertisers. It is the intention to have the list include representative firms from each department of business in which students are buyers. Only thoroughly reliable firms will be found in our columns, and many of them make a specialty of student trade. They are the main stay in the financial support of the paper, and to ask each student to do his individual mite towards patronizing them, or at least to give them a trial is not unreasonable. Every student who will do this is rendering the paper a substantial benefit.

The attention of Freshmen is particularly called to the above. Many are strangers in the city, and, having to choose places at which to buy, cannot make a mistake by selecting from among the firms who advertise in our columns.

Night.

A TRANSLATION.

[*From the Latin. Æneid, Book IV.*]

'T was night;
And weary souls throughout earth's wide extent
Were wrapped in slumber calm, from heaven sent;
The murmuring wood and Neptune's vast domain
Lay hushed and still, beneath Night's starry train;
The fields partook of Nature's calm, and slept,
While o'er the quiet flocks and herds there crept
A soothing influence, and, bathed in sleep,
The myriad coursers of the air and deep,
Forgetful now of daily fear and care,
The priceless blessing of the goddess share.

F. M. W.

Torpedoing an Oil Well.

[*Extracts from Paper read before 2 G Society.*]

ON arriving at Bradford, Pa., the headquarters of the northern oil field, our little party was invited to see a torpedo put into a well which was being cleaned out.

Early in the morning, we left the city by one of the little narrow gauge railroads, which zigzag up over the hills, following contours to avoid cuts and trestles. This particular road, after about two miles of innumerable bends, comes back along the edge of the hill above the city, with the starting-place almost within stone's throw beneath our feet, then turns, and, twisting in and out, always rising, finally gains the level hill-top. Here, with increased speed, we rattled through the heavy forest, getting glimpses of tall derricks, looking like unfinished church spires, some new and clean, others discolored by patches of bluish clay, and many black and greasy.

At a stopping-place with pretentious name we left the train and slowly climbed the hill, following a wagon-trail deeply gullied by the heavy rains.

When we reached the well, we found things nearly ready for the "glycerine" man.

The well had been thoroughly cleaned out and drilled through the sand, *i. e.*, the strata bearing the oil. While the tools were coming up for the last time we had a chance to look about The derrick, or "rig," as it is commonly called, is a tall, slender, open tower, seventy-two feet high, twenty feet square at base, and tapering to four feet square at top. It is built throughout of plank, cross-braced, and is very light and strong, offering little surface to the wind. On one side are the engine-house and boiler, on the opposite a strong shaft with large wheels at each end. On this shaft is wound the cable on which the tools are hung. On a third side of the derrick is a ladder reaching to the top, and on the fourth side of the floor are bellows, forge and anvil, by which the drill is sharpened. This well, however, being "gassy," the forge had been removed into the bushes.

In one corner of the derrick stood the long joints of tubing, which reaches to the bottom of the well, and through which the oil flows, or is pumped. Each well has at least three sizes of pipe in it, one inside the other First and largest is the drive pipe (or wooden conductor box), which reaches from the top of the ground down through the drift to the solid rock. The drive pipe is of wrought iron, twelve inches internal diameter, in lengths of about twelve feet, screwed together by collars. Inside of this is the casing, five and five eighths inches in diameter, which reaches from the top of the well down below the water veins, a distance varying for each well, but in general from three hundred to six hundred feet. Its object is to shut off the water. It is put in as soon as the drill has reached these lowest water veins, and, if tight, is not removed until the well is abandoned. Inside of this is the two-inch tubing, which extends from the top to the bottom. This is taken out whenever it becomes clogged, or the well requires cleaning. With a good engine, two men can take out and put back a "string" of tubing in one half day.

While gaining this information, the cable was running rapidly out of the hole, up to the top of the derrick, and down around the shaft. Soon it began to drip and spray oil, and we quickly got to windward of the oily mist to watch for the tools. These, when out, were swung to one side, and the bailer was run once to show the owner that the well was clean.

While this was being done, the "glycerine"

man drove up, and began to unload, and some of the workmen and spectators, whose caution overcame their curiosity, started uphill at a lively gait to an elevated point at safe distance.

The shooter, or "glycerine" man, as he is sometimes called, rode in a light, open carriage, drawn by a span of horses, which seemed to us to be very spirited, considering the kind of load they drew. On one side of the carriage, strapped into light iron Y's, were the shells and anchorage. The shot ordered was to contain eighty quarts of nitro-glycerine, requiring four shells or sections, each ten feet long. The shells are of tin, about three inches in diameter, and usually from six feet to sixteen feet in length.

The seat of the carriage, when tipped back, showed fifteen small compartments, padded and lined with leather, into which the cans of nitro-glycerine just fitted. The nitro-glycerine comes from the factories situated in the woods around the city, in square cans, holding six quarts or twenty pounds each.

Behind the carriage are carried the reels holding the lowering and firing lines.

First, the lowering reel was bolted securely in place outside the derrick, then the end of the line was carried in through a pulley directly over the hole, and an open iron hook fastened to it. Meanwhile the shooter was preparing the anchorage. The first shell was to be placed ten feet from the bottom of the hole, so ten feet of small tin tube called the "anchor" was wired on to its lower end. The shell was then placed in the hole, and lowered until it projected a few nches above the floor, hooked into the lowering line, and, as additional security against accident while filling, was tied fast by cords. Then the shooter gently emptied into it can after can of nitro-glycerine until full. With two men steadying the reel, the cords were untied, and the lowering began, very slowly and carefully. This is, perhaps, the most dangerous part of the operation, from the liability of the nitro-glycerine to be exploded by the friction of the shell against the side of the hole, a liability increased if the shell should leak or any of the fluid run down on the outside. Another danger is of the shell catching for an instant on the ends of the casing of the well, the hook slipping, and then the shell falling. Another cause of accident in very gassy wells has been that the agitation caused by lowering the shells through the oil has caused the well to flow, throwing out the shot, which, exploding, in several instances has not only blown machinery and workmen to fragments, but has killed persons at a distance.

The shell at last safely down, the wire is lowered and raised a few times, to make sure that the hook is loosened, and then carefully wound up.

The next shell had forty-three feet of anchor to bring it up higher in the sand. It was filled and lowered as the first. The third shell rested directly upon the second, and the fourth upon the third, so that the shot when all in consisted of two divisions forty-three feet apart; twenty quarts in the bottom division and sixty quarts in the top.

The lowering reel was now removed, and in its place was put a smaller reel carrying a lighter round wire, to lower the squib which fires the shot. The squib is a very small shell, like a long tomato can, holding two quarts or more of nitro-glycerine. In the top are put four to six percussion caps on little anvils, one above the other, and above all a broad cast-iron disk. The squib line, after running over the pulley, and before it is fastened to the squib, is passed through a little tin tube one inch in diameter and sixteen inches long, on the bottom of which is a heavy annular piece of lead. A man holds this lead weight in his hand while the squib is being lowered. Meanwhile the workmen are picking up tools and loose pieces, stowing them away, putting out all fires, and warning the neighbors to do so; in short, preparing as for a storm.

All ready, we take refuge in the engine-house, or go up on the hill. At the command, "Let her go," the man in the derrick drops the lead weight and runs. We hear the weight jingling as it runs down on the wire, then a thud as it plunges into the oil, and in a moment a sudden jarring of the earth and a sharp report like a pistol tell us that two hundred and sixty-six pounds of

nitro-glycerine have exploded a third of a mile under our feet.

Now the gas, which had been rising in a little tremulous stream all the morning, begins to roll out, at first gently, and then with a low roar, while mutterings below begin to be heard, and increase until, with a loud hiss and rush, a small column of oil comes out about six feet, then for an instant subsides, but only for a new burst, which mounts nearly to the top of the derrick, then, falling back, is caught by the main flow, which, in a solid, black stream, pushes on steadily to the top of the derrick, where, broken and deflected, it expends its force against the planks, knocking off loose braces and sending smaller spurts, perhaps, fifty feet above. The wind catching the falling oil carries it in a glistening shower far down the hillside, drenching some of the houses of the little settlement below. Following in the rear of the clear oil, we hear the stones rattling in the derrick, and some are seen flying upward till out of sight; then the sudden bang of a stone on the roof, followed by a perfect fusillade of rocks, warns us to keep our heads indoors. Now the flow of oil has slackened, and some water comes out, quickly subsiding, and followed by spraying jets, and from the noisy turmoil below rolls out a sickening gas. This last is the product of the explosion, and is very poisonous, causing most severe nausea and headache, for which no remedy is known. It is dreaded by the men, as some of them have severe sickness after every shot.

Coming out of the engine-house, we find everything in the neighhorhood dripping with oil. The firing line hangs broken, caught in the derrick; small lumps of sandstone and shale are scattered around, and occasionally a bit of tin. We keep away from the well, getting to the windward of the noxious fumes. The shooter saves what he can of his firing line, packs up his tools, and drives off. The workmen hasten to put back the tubing into the well and make connections into the tank before another flow takes place, in order to save the oil. The first flow is usually allowed to go into the air, as the well cleans itself better than if the flow is confined.

The shot cannot have its greatest effect, unless there is tamping around and above it; so if the hole is not already full, it is filled with oil nearly up to the lower end of the casing, care being taken to keep the oil below this point, in order that it may not transmit the shock of explosion into the casing, and by so doing cause a leak.

Premature explosions by the well flowing are not rare. In one case, the shell when thrown out of the hole fell across a bar and was bent. The man who was doing the work hastened to pick it up, and, probably, in trying to straighten it, jarred or in some way gave it a shock, which caused an explosion, killing and almost annihilating all who were near enough to see distinctly what he did.

In a similar case, the shooter heard the shell coming up, and was fortunate enough to catch it, in all likelihood saving his own and helpers' lives. After the flow ceased, he put the shot back in and exploded it in the proper place.

The cans in which the nitro-glycerine is carried cannot be entirely emptied, but retain a few drops of the fluid, which stick to the sides and in the corners. These cans are often left in the woods, where they sometimes explode by spontaneous combustion, or by accidental shock. They are often found by boys, who delight to set them off.

Sometimes they are left until the Fourth of July, or some holiday, and then exploded by dozens. They make as much noise as a cannon. Twenty so-called empty cans have shattered window glass a third of a mile away. The safest way to explode them is by a rifle ball; but many are put on a brush-heap, which is then set on fire. Nearly as many men and boys have been killed by carelessly handling these cans as by transporting the material in bulk. It frequently happens that some reckless fellow, in spite of warnings, will kick or throw a stone at a can which he runs across in the woods, or perhaps try to clean it out to carry water in, thus adding another name to the list of mysterious disappearances or fatal accidents.

F. H. N.

Athletics.

SATURDAY, Nov. 8, was a cold and unpleasant day, with a blustering, northwest wind, and this doubtless was the reason of the small attendance at the fall outdoor athletic games, held on the Union grounds, under the auspices of the Athletic Club. A few of the fair sex braved the weather, and enlivened the grand stand by their presence. In every way but financially, the games were a success. There was a good number of entries, and most of them put in an appearance. One Institute record was broken, and nearly all were good.

The first event in order was the first trial heat of the *one-hundred-yards dash.* L. R. Cobb, '86, Van Buskirk, '86, and S. Sturges, '87, were the contestants. Cobb won in 11⅗ seconds, with Van Buskirk close behind him.

One-mile Walk. — G. W. Farmer, '86, and A. G. Robbins, '86. Farmer took the lead at the start, and held it. The first quarter was made in the fast time of 1 m. 52 s.; mile, 8 m. 24 s.

Running High Jump. — S. Sturges, '87; J. L. Kimball, '85; W. L. Dearborn, '88. Sturges fell out at 5 ft. Kimball, who jumped in good form, but was not in practice, failed at 5 ft. 4 in., which was done by Dearborn. The latter made an attempt for an inch better, but did not succeed.

Half-mile Run. — N. Q. Stewart, '87, and H. F. Hill, '87. Stewart at first took the lead, but lost it in the last lap. Won by Hill. Time, 2.17¾.

Putting the Shot; 16 lbs. — P. R. Fletcher, '86, and F. R. Young, '86. Won by Young with 32 ft. 7½ in.; Fletcher's, 32 ft. 1¼ in. This was a disappointment, as both Young and Fletcher far from equalled their previous records.

One-hundred-yards Dash.—Second Trial Heat. — Won easily by F. R. Young, '86. Time, 10⅗ s. Second, J. R. Eliot, '87.

Mile Run. — The first prize in this event was a medal awarded by the Sigma Chi Society. It was won by E. L. Pierce, '86, who kept the lead from the beginning. First half, 2 m. 30 s.; mile, 5 m. 25 s. H. M. Steele, '87, was second.

Bicycle Race. — Two Miles. Although no remarkably fast time was made in this race, it was one of the most exciting of the day. It was won by H. Souther, '87, with J. V. Wright, '88, hardly a length behind. Time, 7 m. 55⅗ s. Much regret was expressed that Mr. S. Sturges, '87, who holds the amateur championship of Chicago, did not compete in this event.

Quarter-mile Run. — Won by L. R. Cobb, '86, in 58⅖ s. Van Buskirk, '86, second.

Throwing Base-ball. — W. B. Douglas, '87, 300.5 ft.; H. F. Hill, '87, 278 ft.; P. R. Fletcher, '86, 277 ft.

Running Broad Jump. — M. E. Cobb, '87, 17.45 ft.; Kimball, '85, 16.6 ft.; Van Buskirk, '86, 16.1 ft.; Sturges, '87, 15.6 ft.

Hurdle Race. — Won by Sturges, '87, in 19⅖ s.

Kicking Foot-ball. — Sturges, '87, 129 ft.; Fletcher, '86, 100 ft.

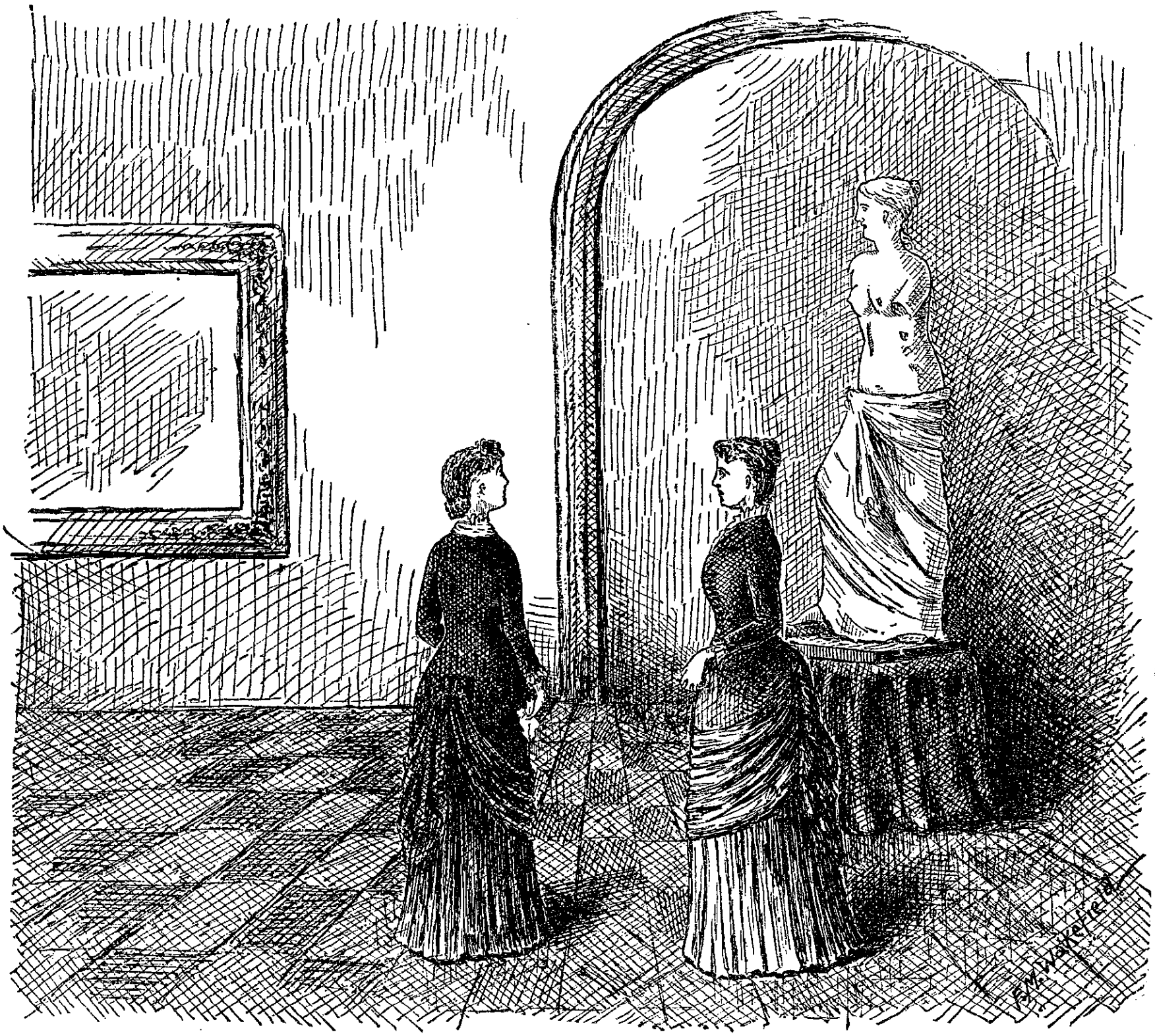
One-hundred-yards Dash. — Final Heat. This was between the first two men of each trial heat, and was the event of the day. It was won by F. R. Young, '86; L. R. Cobb, '86, second. Time, 10⅗ s. As this was better than the best previous Institute record, Young was awarded the medal and a life-membership in the Athletic Club. Young was not at all in training, and the track was in an abominable condition, a part of it being over gravel, and a part over turf. With a good track, we feel confident that he can run pretty close to the college record.

Standing Broad Jump. — H. F. Hill, '87, 9.2 ft.; Sturges, '87, 9 ft.; Cobb, '87, 8.85 ft.

Two-hundred-and-twenty-yards Dash. — This was a hotly contested race. Van Buskirk, '86, took the lead at first, but, near the finish, was passed by Cobb, '87, who, in turn, was passed by Steele, '85, the latter winning by about nine inches ahead of Cobb. Steele fouled Van Buskirk in passing; but, as no protest was entered, he was awarded the medal. Time, 26⅗ s.

The games were closed by a *three-legged* race, in which Hill, '87, and Pierce, '86, easily defeated Cobb, '86, and Eliot, '87. Time, 16 s.

Charles F. Spring, '85, officiated as clerk of course. F. C. Lister, B. Y. M. C. U., was referee; J. M. Smith, Jr., '86, and A. R. McKim, '85, judges; J. Lathrop and E. C. Lufkin, '86, time-keepers; David Baker, '85, starter.



MISS WELLESLEY, '88 [to her Sophomore friend, who is showing her about the building for the first time]: "*Why, Nellie, how did the statue get broken? I should think they'd have it mended.*" [Soph. faints.]

Communication.

[*The editors do not hold themselves responsible for opinions expressed by correspondents.*]

To the Editor of The Tech:

The following is a reprint, *verbatim et literatim*, of an editorial which appeared in *The American Architect and Building News*, in Sept., 1881:—

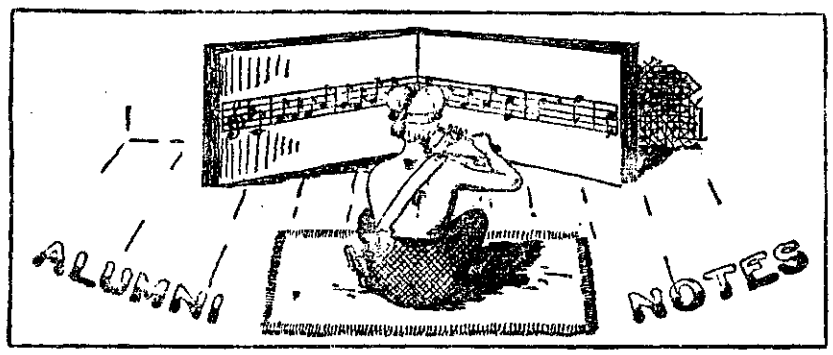
"The Architectural Department of the Massachusetts Institute of Technology will open its next academic year under a new organization, which, while retaining the main features of its former curriculum unchanged, is intended to enlarge its scope materially, and provides some important additional facilities for instruction. The work which until now has devolved on one professor will hereafter be divided, Mr. T. M. Clark, representing the general interests of the school as professor in charge, while Mr. W. P. P. Longfellow will act as Adjunct Professor of Architectural Design, aided in his department by Assistant Professor Létang. Mr. F .E. Kidder, S. B., will give instruction in a new department, to be known as the Architectural Laboratory, where the properties of materials will be studied by means of actual tests, and the theory of construction illustrated by practical exercises and experiments. The habit of free-hand sketching, which has always received much attention at the Institute, is to be still farther encouraged, and provision has been made for special instruction by some of the best architectural draughtsmen in Boston, in pencil sketching, pen-and-ink rendering, and perhaps in water-color drawing, of an advanced character. Through the good offices of the Boston Society of Architects, whose friendly interest has always been of much service to the school, the regular course of study in ornament and the arts allied to architecture will take the form of familiar lectures, delivered before the students by members of the society, and others. In this course for the ensuing year, Mr. Henry Van Brunt has consented to treat on the Theory of Ornament; Mr. Charles A. Cummings will give a series of lectures upon Interior Design; Mr. Arthur Rotch upon Decorative Painting; Mr. Longfellow on Stained Glass and Mosaic; and other gentlemen will consider certain related topics. In addition to the regular branches pursued at the school, the students will continue to enjoy the advantages which a close and friendly relation between the authorities of the Institute and those of the Museum of Fine Arts has hitherto afforded them, and which increases from year to year."

A following editorial then proceeds to some wise remarks concerning the excellence of the novelty of the "Architectural Laboratory."

How grateful, is one's first thought on reading this, ought the architects to be to their Alma Mater for her affectionate care and disinterested generosity! How, every day of their lives, ought they to congratulate themselves on the easy places in which their lines have fallen! But to the architect himself there is, in the article which is quoted above, a subtle source of amusement, — of amusement tainted by the bitterness of regret that the bright picture of what might have been his, is, through no fault of his own, entirely beyond his yearning reach. With what unconscious wisdom built the writer of that editorial! What depth of scorching sarcasm smoulders beneath that innocent covering of words! Wise advertising that. No doubt rich harvests of unsuspecting, because uninitiated, students were gathering from beneath that sickle. A tempting bait did that wise hook hold out to hungry fish.

Perhaps, however, for a few short hours these things did have existence; perhaps the fruits of that casting did enjoy, for "one transcendent moment," what they longed for. Happy they! But the bait was so small, after all, that the first nibble made way with it; and the new generations that come after have, to be sure, the questionable advantage of seeing the hook in all its blood-curdling nakedness, but for their dinner, though very hungry and thirsty, like some other people, have to put up with the scraps that are left floating about in the water, — very good scraps in their way, and very nutritious, but not enough for a full meal. The Alma Mater does truly make an excellent St. Paul.

An Architect.



Frank H. Briggs, vice-permanent secretary of the class of '81, 25 Hotel Berkeley, Boston.

Edmund H. Brown, '81, secretary of the Concord Axle Company, Penacook, N. H.

S. S. Dearborn, '84, with Nonantum Worsted Co., Newton, Mass.

H. G. Hammett, '84, superintendent, with F. W. Richardson, railroad supplies, Troy, N. Y.

Capt. David A. Lyle, U. S A., '84, inspector of ordnance, Boston ; member of board for testing rifled cannon, appointed by the President, under Act of Congress, July 5, 1884; member of board on life-saving appliances, under the Secretary of the Treasury ; engaged on lexicographic work for the Imperial Dictionary, which is being prepared by the Century Company ; etc., etc.

A. L. Mills, '76, will soon finish the work on the B. H. T. & W. Ry., which he has been engaged on for the last two years.

W. M. Whitney, '84, with Baxter D. Whitney, wood-working machinery, Winchendon, Mass.

The Glee Club and Orchestra are so fortunate as to have secured a room in the Institute for holding their rehearsals this year. The room in the basement of the new building, occupied by the architects as a studio for water-color sketching and life class, and as a recitation-room, is to be heated and lighted, and, through the kindness of President Walker, the musical societies will be permitted to place a piano there, and at certain hours to hold rehearsals. The great advantages of having a room in the Institute itself are apparent, and these, together with the fact of the far greater interest felt by the students this year than that which was shown last, give a bright prospect of success.

Department Notes.

Recent experimenters have succeeded in photographing a pistol bullet in its flight, the air streams over a Bunsen burner placed in the sunlight, and waves of sound.

An important acquisition to the laboratory of applied mechanics is an Olsen testing machine, by means of which a specimen not over two feet long can be subjected to a tension or compression of fifty thousand pounds.

The following assignments of work in the mining laboratory have been made among the fourth-year miners: Mr. Morss, Vershire copper ore; Mr. MacRae, jeweller's sweepings; Mr. Baker, gold-bearing arsenical pyrites and argentiferous manganese ore; Mr. Robinson, arsenical pyrites; Mr. Randall, calumet black jack ; Mr. Goodrich, calumet coarse sand.

The senior mechanicals are designing a boiler for Mr. Fisher, and will soon begin a link-motion for Mr. Peabody. The Juniors have finished a problem in link-motion, and are completing their details of a Putnam lathe. The Sophomores are making drawings of bearings and pulleys. Shop-work was begun promptly at the first of the term, with some improvements in methods and apparatus.

The senior architects have finished the problem of a small museum, and are working up a problem of a railroad station. A greater degree of freedom is noticeable in the treatment of this problem than has heretofore been encouraged in the department. The powerful influence of the Romanesque style has asserted itself, and for once the classic orders are in a beautifully small minority. Several of the second-year men, having finished in advance their two problems of a house and dormers, are taking this problem, while most of the class are still working on the regular ones. The first-year men are still engaged on the proportions of the classic orders, and, as usual, no problem in design will be assigned to them until later in the year.

Experiments show that sparks due to the electricity generated by rapidly running belts may have caused some of the mysterious explosions of flour mills.

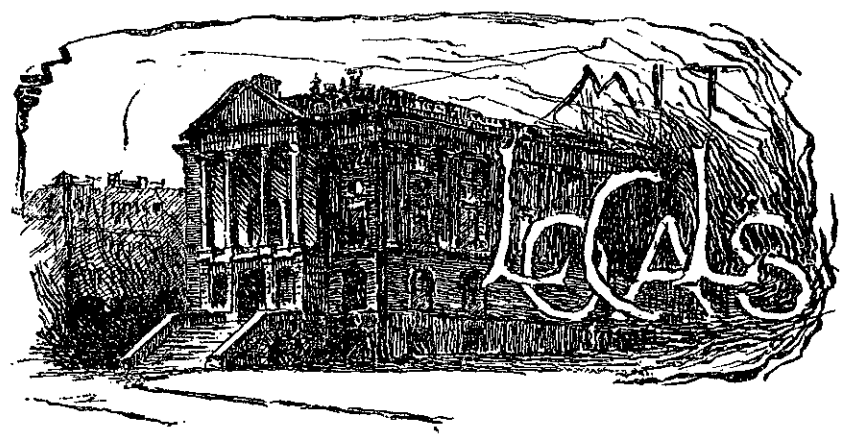
A correspondent of the Boston *Herald*, speaking of the success of recent experiments in aerial locomotion, quotes Mr. E. C. Stedman as follows: "I believe that within twenty-five years, visionary as my ideas may seem, aerial navigation will be an every-day fact. When this occurs, every remote inland village will be an airport town, and a total rearrangement of our political, social, and economic conditions will follow."

The miners have recently discovered that "Ruddle" ($Fe_2O_3 + H_2O$), besides making a very good paint for marking crucibles and scorrifiers, possesses some very distinct and peculiar medical properties. As a hair restorer and beard exhilarator, it has no equal. When mixed in the right proportion with "salt nacle," and allowed to run down the spinal column of a victim, the effect is miraculous. The patient (?) blushes, looks wildly about, takes in as much slack as he can in the seat of his breeches, and plunges over desks, chairs, etc., until he has caught his tormentor, who, for the next ten minutes, answers the combined purposes of an anvil and broom. After this stage, the patient, who ten minutes before could have walked into a muffle furnace without feeling any difference in temperature, soon cools down to cherry redness, and recovers rapidly. The maddening property of this mixture has as yet been put to no beneficial use; but Seniors who are anxious to raise a beard on short notice would do well to try the first-named preparation. For *testy*-monials, apply to "Ranney" and "N. G," Mining Lab.

N. B. — No '88 need apply.

Noticeable Articles.

There is a paper on the Antiseptic Treatment of Timber in Vol. LXXVIII (1883–84) of the Proceedings of the Institution of Civil Engineers, London. The author of the paper, Samuel B. Boulton, is a member of a firm which has been engaged for more than thirty years in the preservation of timber, and gives the results of a long experience. W. R. N.



Alas!

A ride, and by my side,
A lass to me so dear.
Next day the bill I pay,
Alas, to me so dear.

H. '88.

One week to Thanksgiving!

Indications point to a good Institute nine for next spring.

Why do not the Juniors form a class society, like '85 and '87?

The foot-ball eleven will play Dartmouth next Saturday, in Hanover.

Mr. E. B. Homer, '85, has been elected musical director of the Glee Club

A new water-jacket smelting furnace has been placed in the mining laboratory.

The battalion will this year be commanded by Major Frank E. Shepard, '87.

A new clock has been put up in the analytical laboratory, in place of the former ornament.

Fifteen members of '87 attended the first of the Lowell course of lectures on Analytic Geometry.

Thirty-nine large cases of glassware and apparatus for the chemical laboratories recently arrived from Germany.

Mr. Fernando Smith, assistant in the Freshman laboratory, has been obliged to leave the Institute on account of ill health.

An interesting examination for the promotion of locomotive firemen to engineers is printed in the *Railway Review* for Oct. 25.

Harry P. Barr, '85, is with the Amoskeag Manufacturing Co., at Manchester, N. H, not, as incorrectly stated in our last issue, in the Manchester Cotton Mills.

Freshmen will please not mistake the letter-box in the hall for THE TECH box, and drop their contributions into the former.

David Baker, '85, T. W. Sprague, '87, N. Q. Stewart, '87, and Granger Whitney, have been elected members of the 2 G Society.

A committee on the nomination of candidates for the school committee of Boston is endeavoring to secure the services of President Walker in that body.

Mr. Woodbridge's lecture on the heating and ventilation of the new building is being reprinted as a series of papers in the *Sanitary Engineer* of New York.

An '87 chemist of considerable experience as cook to camping-out parties confesses that ever since he first saw the heaters in the analytical laboratory he has been longing for a chance to fry griddle-cakes upon them!

Instructor (examining geometrical figures on the board): "I don't understand these constructions." Student: "Very well, I 'll see you after recitation, and explain them to you."

At the athletic games a week ago last Saturday, '85 won one event, '86 won seven, '87 won seven, and '88 won one. What is the matter with the Seniors? There was only one entry from their class.

A miner, last week, carelessly poured some molten metal into a vessel containing water. The result was an explosion, which left considerable metal on the walls and ceiling. Fortunately, no one was injured.

During an experiment in the laboratory of applied mechanics, a few days ago, a rod in Prof. Lanza's testing machine, supporting the lever by which the load is applied to speci mens, suddenly gave way. ["Broke at umpsti pounds."]

A party of one hundred, from all classes but the Senior, assembled on the steps of Rogers Building election night and marched down town for the purpose of ——. A number of good-natured rushes with the crowds in front of the newspaper offices were indulged in, in most of which the Techs were victorious.

Mr. George W. Blodgett, '73, electrician to Boston and Albany Railroad, is delivering to the Senior electricals and civils a series of Tuesday-evening lectures on "The Application of Electricity to Railway Signals." The lectures will be supplemented by excursions of observation on the Boston and Albany Railroad.

It is getting to be a difficult matter to supply the wants of the Freshmen in the chemical laboratory. One recently asked at the supply-room for a "glowing splinter" with which to do an oxygen experiment; another wanted a *lighted* candle; and a third an iron bar, with which to make some iron-filings.

We several times last year spoke of the necessity of a knowledge of surveying in a miner's education. The Faculty, in their revision of the courses last year, recognized this, and more than doubled the amount of surveying in the mining course. The second-year miners are now at work four afternoons a week upon their plotting and transit work.

A competition among the second-year architects for a design for a bulletin board, to be placed in the drawing-room of the department, was opened, but has not been formally decided, because of the small number of designs submitted. Another competition has been opened for a letter rack for the architects, who are to have their mail distributed in the drawing-room, instead of in the hall of Rogers.

The committees of the corporation for the ensuing year are as follows: Executive committee, Francis A. Walker, John Cummings (*ex officio*), Augustus Lowell, Alexander S. Wheeler, Lewis William Tappan, Jr., Francis H. Williams, Henry B. Rogers; finance committee, William Endicott, Jr., Samuel C. Cobb, David R. Whitney, John M. Forbes, Henry P. Kidder; auditing committee, Frederick W. Lincoln, Moses Williams, Henry D Hyde; committee on Society of Arts, Howard A. Carson, Lewis William Tappan, Jr., Edward Atkinson, Francis H. Williams, J. C. Hoadley; committee on nominations, Augustus Lowell, Alexander H. Rice, John Cummings, Samuel C. Cobb, James P. Tolman.

The College World.

HARVARD. — The customary rush between the Freshmen and Sophomores after the Republican torchlight was this year given up by order of the Faculty, who threatened to expel the marshals if it occurred. — A club has been formed for the advancement of the study of elocution. In addition to lectures by distinguished men, and informal readings, public declamations by its members will be given at stated periods. Mr. H. D. Jones, instructor in elocution, is the president of this society. — The Shooting Club begins the year well with a successful field meeting. — The Boating Association is $1,450 in debt. — This year there are eleven candidates for the degree of A. M., thirty for Ph. D., and five for S. D. — One year in every seven is given to Harvard professors for private study. — The uniform of the base-ball nine has been changed from crimson and gray to crimson and black, similar to that of the lacrosse team. The prospects of the nine are very good, since most of last year's men remain in college.

CORNELL. — Athletics at Cornell are at a very low ebb. The Base-Ball Association and Navy are both deply in debt. — The *Era* complains that not enough prominence is given to the literary courses in the advertisements of the college. — The Senior class is having trouble about the election of class officers. — President White has delivered his annual address. He is doing all in his power to discourage rushing. Among other things, he requests that students shall not smoke on the campus. — A statue to Ezra Cornell, the founder of the university, is to be erected.

PRINCETON. — It is said that Princeton never had a better foot-ball eleven than this year. It is hoped that Moffat, the great half-back, who has returned to college, can be induced to play in the Yale game. — The new chair of Fine Arts has been endowed with $60,000. — Over seventy students are pursuing post-graduate courses. — *Ex.*

IN GENERAL. — Dartmouth is to have a special instructor in gymnastics, whose duties outside the gymnasium will consist of lectures on hygiene. *Ex.* — There is great enthusiasm over foot-ball at Dartmouth. — Brown University has been offered thirteen acres of land for the establishment of a botanic garden. *Cornell Era.* — Prof. Simon Newcomb, the distinguished mathematician and astronomer, is to fill the chair of Mathematics at Johns Hopkins, recently vacated by Prof. Sylvester. — Twenty men are to be coached at Brown this winter, from whom the nine will be selected. — The Christmas vacation at Yale will be three weeks this year. — The Yale and Amherst Glee Clubs are to give a series of joint concerts in the large Western cities this winter. — Prof. Hitchcock, professor of gymnastics at Amherst, will soon publish "A Gymnastic Manual." — A club for the study of Greek Literature has been formed at Amherst. — *Chaff*, of the University of Pennsylvania, has suspended publication.

We have received a copy of the *Beacon*, published at the Boston University, accompanied by a circular which states that it "prides itself in having the most tastefully printed sheet among all the college press." A glance over the first number of the present volume is all the refutation of this absurd claim required. It is no exaggeration to say that it looks as though it had been made up from the galley-proof without correction. We suggest that our neighbors employ a proof-reader.

There is war between the *Yale Courant* and the *Princetonian*. Both papers seem to have fallen into the cheap campaign talk of the daily papers, and are busily throwing mud at each other. The cause of the trouble is this: It seems that the *Courant* replied in a sharp editorial to an article in the *Vassar Misc.* on "Yale Sand." The *Princetonian* chivalrously took up arms in defence of the *Misc.*, and hence the trouble. If we are not mistaken, the *Misc.* will speak for itself when its next number appears.

THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY,

BOYLSTON STREET, BOSTON.

THIS school of industrial science was opened in February, 1865. The first class graduated in 1868. The school is devoted to the teaching of science as applied to the various engineering professions: viz., civil, mechanical, and mining engineering, as well as to architecture, chemistry, and natural history, physics and electrical engineering, and metallurgy.

Besides the above distinctly professional courses, the Institute offers scientific courses of a less technical character, designed to give students a preparation for business callings. A four years' course in biology, chemistry, and physics has been established, as preparatory to the professional study of medicine.

Modern languages are taught so far as is needed for the ready and accurate reading of scientific works and periodicals, and may be further pursued as a means of general training.

The constitutional and political history of England and the United States, political economy, and international law are taught, in a measure, to the students of all regular courses.

Applicants for admission to the Institute are examined in English grammar, geography, French, arithmetic, algebra, and geometry. A fuller statement of the requirements for admission will be found in the catalogue, which will be sent without charge on application.

A clear admission paper from any college of recognized character will be accepted as evidence of preparation, in place of an examination.

Graduates of colleges conferring degrees are presumed to have the necessary qualifications for entering the third-year class in any of the regular courses of the Institute, and will be so admitted provisionally, on the presentation of their diplomas.

The feature of instruction which has been most largely developed in the school is laboratory training, shop-work and field practice, to supplement, to illustrate, and to emphasize the instruction of the recitation and lecture room.

Surveying instruments are provided for field work in civil and topographical engineering. Extensive shops have been fitted up for the use of both hand and machine tools; and a laboratory of steam engineering has been established as a part of the instruction in mechanical engineering. Several steam boilers and steam engines of various types are available for experiments and tests. The department of mining engineering and metallurgy has the use of laboratories in which the milling and smelting of lead, copper, silver, and other ores, in economic quantities, are regularly performed by the students themselves. The classes in architecture supplement the work of the drawing and designing rooms by the examination of structures completed or in course of erection, and by practical experiment in the laboratory of applied mechanics, testing the strength of materials and working out problems in construction. The Kidder Chemical Laboratories, just completed, contain desks for four hundred and twenty-six students, and afford the best modern facilities for the study of general, analytical, and organic chemistry. The Rogers Physical Laboratory has been greatly extended in every department during the past year, especially in respect to facilities for instruction and research in electrical science.

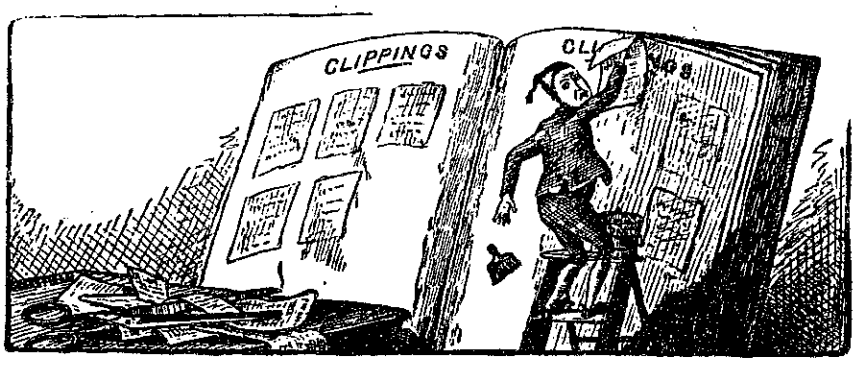
On the successful completion of any one of the four-year courses of the Institute, a degree of bachelor of science will be conferred. The Institute is also empowered to confer the degree of doctor of science. Special students are allowed to enter special divisions of any of the courses, on giving evidence that they are prepared to pursue with advantage the studies selected.

The Institute of Technology, as a recipient of a portion of the United States grant to colleges of agriculture and the mechanic arts, gives instruction in military tactics.

The fee for tuition of students taking the full course is $200 a year. Besides this, $25 or $30 are needed for books and instruments. There are no separate laboratory fees. Only payment of articles broken is required.

Attached to the Institute are also two special schools: viz., the "School of Mechanic Arts," and the "Lowell School of Industrial Design." The former gives a training in the use of tools, together with elementary mathematics and drawing. English, French, and geography are also taught in this school. The fees for tuition are $150 a year. The Lowell School teaches the making of designs for prints, carpets, wall-papers, laces, ginghams, and other woven goods. A weaving department with a variety of looms is connected with this school. No charge for instruction is made.

FRANCIS A. WALKER, President.



Confession.

"Tell me this," he softly murmured:
"Do you love me true?"
And she answered, shyly blushing,
"Love you? Yes, I do."

Turning then his glance upon her,
Solemnly and slow,
"Thanks," he answered absently, —
"I only wished to know."

Polytechnic.

A smoke-stack — a bunch of cigarettes. — *Ex.*

A little boy who had been used to receive his elder brother's old toys and clothes recently remarked, "Ma, shall I have to marry his widow when he dies?" — *Ex.*

The election being over, the next great national question to be settled is, whether Yale can disable Princeton at foot-ball before Princeton can paralyze Yale. — *Puck.*

Teacher.—"Feminine of friar?" *First Bright Boy.* — "Has n't any." *Second Bright Boy.* — "Nun." *Teacher.*—"That 's right." *First Bright Boy* (indignantly).—"That 's just what I said."— *Harper's.*

"What do you think of Fielding?" asked a Boston girl of a Harvard graduate.

"Oh! it 's important, of course; but it don't amount to anything without good batting" — *The Collegian.*

Mr. Smith.—"Don't you think Miss Fay very quiet?"

Miss Jones. — "Oh no! she is so with stupid people, I know — ah — I mean with persons she does not like — ah —" — *Acta Columbiana.*

"What is more awful to contemplate," said a lecturer, glaring about him, "than the relentless power of the maelstrom?" And a henpecked-looking man in the rear of the building softly replied, "The female-strom." — *Ex.*

Servants' Suavity.

Mistress. — "Bridget, I don't like the idea of having all those men down-stairs"

Bridget. — "Divil a man here, mum; they all be gintlemin; but I will ax thim upstairs if ye loikes." — *Puck.*

Young Richling from the West. — "Is n't that young girl over there very much painted?"

Miss B., fresh from school. — "Pas-du-tout."

Young R. — "What! Powdered, too? You don't say!" — *Life.*

They were discussing their natatorial capacity. "Swim? dive? Why, I can remain under water twenty minutes at a time."

"Only twenty minutes? Why, the other day I stayed under water a whole hour. To be sure, it was because I fell into a doze and overslept myself, but still —" (The other liar faints.) — *French Joke.*

Mrs. Jackson — "Yes, since dem mis'ble Chinezers hez come in, we poo' whites hez to scratch fur a livin'. An' do yo' know, Missus Mufy, my boy ez goes to school was tellin' me all the people in Chanee walked with th' heads down an' 'er feet up?" *Mrs. Murphy*—"Laws! yer dohn say. Oi knowed th' Choinees menz warre bad uns; but shure Oi thought th' ladies was mohr genteel 'n ter do that." — *Life*

"Hello, Smith!" said one enthusiastic sportsman, greeting another; "did you go quail shooting on the first?"

"You bet."

"Have good sport?"

"Well, I should say so; emptied three flasks myself."

"Emptied three flasks of powder? By Jove!"

"No, not powder — whiskey." — *Puck.*