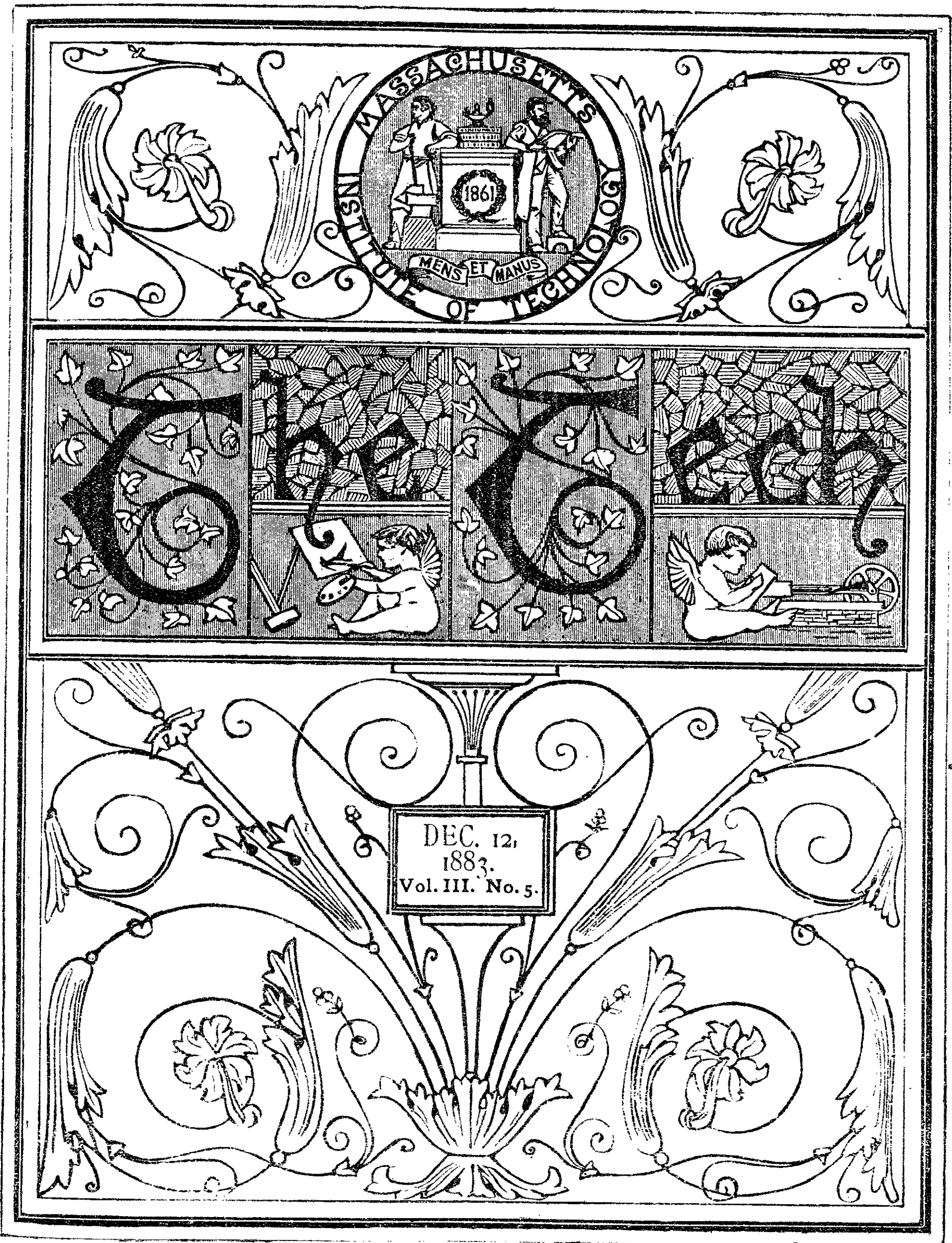




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The Tech.

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THE TECH.

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E regret to announce the resignation of Mr. S. M. Ilsley from the editorial board of THE TECH. Mr. Ilsley felt that he could not do justice to his editorial and his school work at the same time, and so was reluctantly compelled to hand in his resignation. Mr. Ilsley's successor will soon be appointed, and it is to be hoped that the editor's work may be so lightened by contributions from outside that hereafter no more need be required from any member of the board than he can do with perfect justice to himself and his school duties. The pressure of work, however, at the Institute is rapidly approaching the maximum limit, and it is already a question whether the conscientious student can stand the present strain, even though he is entirely unhampered by any outside work.

THE great complexity of mining claims in the West has given rise to a branch of law which is in itself almost a distinct profession, and offers a wide field of usefulness for clear-headed young lawyers. It is scarcely necessary to say how important it is that every mining engineer should be informed at least on the general forms to be gone through, in order to secure his claim and perfect his right to mineral lands, and the laws governing the following up of veins which encroach upon another claim. In the various States the existing laws are in some respects conspicuously different, and one may postpone the study of particular cases until the permanent seat of his labors has been found after graduation. But on the decisions and regulations of the Land Office every student of mining and surveying should not fail to post himself, on account of their very general application.

It is interesting, in this connection, to give a statement concerning the Land Office, which is: The General Land Office will neither supervise nor disregard the decisions of the courts in cases of conflicting claims to the possession of mining property which may have been submitted to them. That is to say, the courts are the expounders of the Land Office regulations.

An interesting decision came up in connection with the Mt. Diablo Mining and Milling Company (of which Mr. Shockley of '75 is superintendent) *vs.* Callison, in Nevada, which is worth citing. "Work done outside of any claim, for the purpose of prospecting or developing said claim, as in the case of tunnels, drifts, etc., is as available for holding the claim as if done within the boundaries of the claim itself. One general system may be found well adapted and intended to work several contiguous claims or lodes, and when such is the case, work in furtherance of the system is work on the claim

to be developed by it." This is eminently just and liberal, and the following shows that the construction put upon "work done" is broad enough to serve honest locators: "Labor and improvements within the meaning of the statutes are considered to have been had on a mining claim, whether it consists of one location or several, on which the labor is performed or the improvements are made for its development, that is, to facilitate the extraction of the metals it may contain; though in fact such labor and improvements may be on ground which originally constituted only one of the locations, as in sinking a shaft, or be at a distance from the claim itself, as when the labor is performed for the turning of a stream for the introduction of water, or when the improvement consists in the construction of a flume to carry off the *débris* or wash material. It would be absurd to require a shaft to be sunk on each location in a consolidated claim when one shaft would suffice for all the locations." In Pennsylvania the coal mines are required by law to sink two shafts at least in order to secure ventilation and as a means of safety for the workmen.

THE somewhat rapid changes of shade which the Institute colors, as represented upon the cover of THE TECH, have undergone, have been the result of the peculiar nomenclature governing the mixer of printer's ink. We have at last obtained an ink which promises now to print cardinal, although, in the language of the maker, it may be called pea-green, and we shall hereafter adopt it as our standard.

AT a special meeting of the Board of Directors, held Dec. 3, a constitution was adopted to govern the officers of the paper.

ERRATUM. — In our editorial on "The Change to Standard Time," in the last TECH, we regret that owing to a typographical error, the Eastern standard time was printed as 15 minutes 44.05 seconds slower than Boston time, instead of *fifteen minutes forty-four and one half seconds slower*.

The New Photographic Laboratory.

THE Photographic Department of the Institute has been advancing very rapidly in importance since it was first opened in the spring of 1881. It then had one student, who was taking the Physics Course. The next year there were eight applicants who each had four hours' work in the department. Last year there were sixteen students, receiving from four to eight hours' instruction each, nearly all of whom were taking the course in Architecture or Chemistry. There were many applications from students in the other courses who wished to know something about photography, but the space and time at the disposal of the department were altogether too limited to permit of their favorable consideration, except in certain special cases. Indeed, if more time could have been at our disposal it would have been wiser to have devoted it to silver printing and kindred topics with the same students, rather than attempting to give merely general instruction to larger numbers.

With the present year, however, matters are entirely changed. In the new building in the southwest corner of the basement is a large room, which will be devoted chiefly to photographic studies and research. Two large, well-ventilated dark rooms have been partitioned off, and provided with sinks, shelves, and tables. These will be amply lighted by a gas jet, surrounded by red paper enclosed in a wooden frame placed between the two rooms. Besides the Architecture, Chemistry and Physics Courses, the Mechanical Engineering, Natural History, and general courses will be included in the plans for photographic instruction. Each student will have ten hours' work in the department, consisting of five days of two hours each. The work will be apportioned somewhat as follows:

First Day. Negative of engravings and apparatus.

Second Day. Interiors and buildings.

The student will then be permitted to borrow the camera and take a few interiors and landscapes outside.

Third Day. Development of these last, and

practice in blue prints, or in sensitizing of silver paper.

Fourth Day. Silver printing.

Fifth Day. Mounting and burnishing.

Two students will work together in each of the two dark rooms, and each student will thus obtain a complete knowledge of the principles of photography, from the taking of the negative to the completion of the silver print.

Besides the above arrangements, an advanced photographic course will also be established later on, for the benefit of students in particular departments. This will include Preparation of Emulsions, Hydrokinone, and Pyrogallol Development in its various forms, Platinotypes, Instantaneous Photography, Spectrum, Microscopic, and Solar photography, and measurements of the sensitiveness and contrast qualities of the various makes of dry plates.

It is also proposed another year to establish a short course of lectures on the various photographic processes, such as carbon printing, the Woodburytype, Artotype, Heliotype, etc. These will be open to all the courses, as it is considered to be a matter of general interest.

In providing for routine instruction, original photographic research has not been forgotten, and no pains have been spared to make the laboratory as thoroughly adapted for this class of work as the means at our disposal would permit. A solid brick pier has been erected between the larger dark room and the south window. This will be utilized for supporting the new heliostat, and the microscopes, spectroscopes, etc., to be used in advanced photographic work.

Tables, sinks, and cases will be constructed in the outside room, and all the more important photographic appliances will be provided, to make the instruction in the course as complete as possible.

As illustrative of the class of advanced work that it is intended to do in the department, the following researches have already been planned and partially executed. Mr. Holder, '84, has made some determinations of the absolute sensitiveness of photographic plates, by a new method which does not involve the use of a

standard light, and thereby avoids all the difficulties and uncertainties incident thereto. Mr. Doane, '84, has begun some work on spectrum photography, and it is expected that photographs will be taken of the extreme red and infra-red region, by a new method which was tried successfully for the first time, last year, in the Institute laboratories. Mr. Hovey, of the Biological Department, will undertake some experiments in photomicrography, and perhaps make some determinations of the value of different microscopic objectives for this class of work. Finally, Mr. Hutchings, '83, will attempt to repeat Prof. Huggins's experiments on photographing the solar corona without an eclipse, making use of a five-inch objective loaned for the purpose by the Harvard Observatory. It will thus be seen that the Photographic Department will not be idle the coming year. Some results have been already attained, and with the improved facilities now offered, there is no doubt but still more will be accomplished.

W. H. P.

The Correspondence University.

IN this age of rapid progress it often happens to one who has had a collegiate or a technical training to be called to a position for which he is in the main well fitted, but which includes some special requirement which did not find a place in his school curriculum. Also a business man may take up some new process of manufacturing which requires a knowledge of some branch of science new to him. Again, the professional man may have been five years on the frontier away from libraries and technical publications, and hence he feels himself rusty and behind the times.

For these, as well as for those who for any reason are debarred the privilege of a full course of study, there is now offered a chance of study under careful direction of experienced teachers, specialists, such as has heretofore been accessible to very few. The announcement says:—

The Correspondence University is an association of experienced instructors, who have been carefully selected, not only for their knowledge of the subjects assigned to them, but for their skill and ability in teaching. Its pur-

pose is to enable students to receive at their homes systematic instruction, at a moderate expense, in all subjects which can be taught by means of correspondence; whether the studies be collegiate, graduate, or professional, or preparatory for the higher institutions of learning.

Teachers and students, not wishing to take a systematic course of instruction, but desirous of occasional assistance on points of special difficulty in any subject, will receive the needed help on application to the secretary. The fee for services of this class will be from one dollar upwards, according to the extent and importance of the work, as estimated by experts on submission of the subject matter.

The names of thirty-two teachers appear on the list, and from private sources we learn that several distinguished professors in foreign universities have consented to become associated in the work.

One of the Institute graduates, Dr. C. S. Minot, is on the corps of teachers.

Women are admitted on the same footing as men, and Mrs. Franklin's name appears on the list of teachers in mathematics.

The success of the plan of teaching by correspondence as carried out by the well-known society to encourage studies at home leads to the confident belief that the new plan will be equally successful in its line. At any rate, it is worth a fair trial.

Some fifty courses are offered, and more are to be announced in December. The following, selected at random, will give an idea of the proposed branches of study:—

Charles E. Crandall, C. E., assistant professor of civil engineering in Cornell University, where he has taught nine years, will give instruction by correspondence in the following subjects:—

(1) *Linear Drawing*. No text-book required.

(2) *Land Surveying*. Gillespie's text-book. The students should be prepared in Trigonometry.

(3) *Roof Stresses and Construction*. Greene's text-book. The student should be prepared in Drawing and Trigonometry.

(4) *Bridge Stresses and Construction*. Greene's text-book. The student should be prepared in Mechanics (including strength and flexure of beams), Drawing, and Trigonometry.

The fee for four weeks' tuition in courses (1) and (2) is \$6.35; in courses (3) and (4), \$8.35.

Those desiring further information regarding the University may apply to the secretary, Lucien A. Wait, Ithaca, N. Y., who is also ready to receive applications for instruction.

Massachusetts Railroad Accidents.

FROM the returns of the railroads to the Railroad Commissioners the following figures regarding the number of persons killed and injured on the several roads centering in Boston for the year ending Sept 30, 1883, are taken. We are further indebted to the *Boston Herald* for some additional facts and deductions therefrom.

ROADS.	Passengers.		Employés.		All Others.		Total.	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
Boston & Albany.....	0	6	13	147	18	48	31	198
Boston & Lowell.....	1	1	7	6	9	2	17	9
Boston & Maine.....	3	1	4	5	6	8	13	14
Boston & Providence..	0	1	2	0	5	5	7	6
Eastern.....	7	3	6	10	15	10	28	23
Fitchburg.....	1	2	4	45	11	12	16	59
N. Y. & N. E.....	0	27	31	100	35	27	52	152
Old Colony	1	2	6	10	16	8	20	26
Totals.....	13	43	73	323	115	120	184	487

The large number of accidents to the employés is noticeable. It shows how careless men accustomed to danger become, and calls for new vigilance in the use of safety appliances, and the employment of fit persons. Two or three of the companies have had construction gangs at work along their lines this year, and it is a fact well known to railroad men that the Italians who, on the New York and New England, at least, largely constitute these gangs, are the most heedless set of men that can be found; in fact, they seem to have no idea of the danger of getting in front of a moving train, and it is believed that many of the accidents reported are to men of this class.

The Boston and Albany employs 5,200 men, the New York and New England about 4,000, and the Providence only 870. Last year the Boston and Albany was credited with operating 369 miles of track and owning 704 miles, if measured as

single track, while the New York and New England operated 385 miles, and owned 451 miles, if measured as single track. The relative mileage this year has not greatly changed. Thus from the above statistics one man out of 31 of the New York and New England employes was killed or injured, while one out of 33 of the Boston and Albany suffered. It will be seen, therefore, that the New York and New England, though frequently denounced as poorly managed, makes an excellent showing by the side of the Boston and Albany, which is universally regarded as a model road in every respect. The former is very largely a single-track road, while the Boston and Albany is almost wholly double track.

The Boston and Providence makes the best showing, with one casualty to 436 of its employes, but then it operates only 68 miles of road.

A Summer Episode.

UPON a shelving beach, the shore of a remote inlet of the New England coast, stands a hotel that has for fifty years or more been the resort of persons afflicted with throat and lung troubles. Around the cove, and for a mile or two back from the sea, are continuous pine woods; and the aroma from these forests, mingled with the bracing sea air, is supposed to be beneficial to such invalids. The spot is singularly adapted to those requiring rest; for it is far from any great travelling centre, and is unfrequented by the fashionable world, while everything is at hand which an invalid's heart could desire. In front of the hotel is a broad cove or harbor, shut in by high, bare rocks, save in one place, a couple of miles or so from the landing, where a rather narrow passage leads to the sea without.

It is seldom that the guests of the hotel are aught but invalids, and the house is thus a sort of exceedingly comfortable private hospital. Occasionally, however, a stranger wanders, or is directed here, who has some other object in coming than the preservation of his health. These persons are of course of meagre interest to the usual guests, since they are wont not to be deeply interested in the guests' ailments. When

strangers come, therefore, they are naturally thrown into each other's company much more than would be the case at an ordinary summer resort.

In a small boudoir at the angle of the building, looking westward to the pine woods and the sunset, and southward to the sea, stands a young woman. She is a stranger to the place, as you see at a glance, and is looking out into the darkening evening. In the west, masses of opal-tinted clouds are flung carelessly over a green expanse of sky, while golden gleams of light shoot from below the horizon, striking up through the rifts. The girl is talking to herself.

"Yes, this is the place, of all the world, where I can escape from the tiresome hurry of society. Here I shall have no calls from people for whom I care nothing; here I need do no shopping, — positively it will be refreshing to go without something I need. With my water colors and my reading, I can charm away dull moments, and — there is no good in denying it — I can be lazy to my heart's content. Ah! my dear little own self, you were infinitely wise when you hit upon this plan of getting an opportunity to be lazy. No one here will know anything about the rich Miss Isabel Clay, and if they do, no harm is done. I am safe from all german-dancing young men. Thank heaven! I shall not hear the word 'german' for a month, — that is, till I go back to Bar Harbor. How vexed Nettie will be when she finds I have come off, no one knows whither, and left all my trunks there at the hotel. Heigho! One must have some recreation. By the way, that was a queer specimen of humanity I saw as I came up from dinner. I was startled at first at seeing what seemed to be a healthy young man in this out-of-the-way place. But I need not have feared, for as soon as he turned his face to me I saw at once he was only a naturalist, with weak eyes, and such a queer, lanky beard. I shall count on his aid for amusement. I will get him to explain the Bacteria theory of disease, and so set him at his ease at once. He will have a delightful laboratory, and all his specimens of disease alive."

At about the same time in the evening, in a room on the upper floor,—a charming dormer-windowed room, looking over the harbor,—is the man of whom Miss Isabel Clay has just been speaking. He has drawn his chair to the window and is sitting astride it, with a cigar between his teeth, looking at the cold eastern sky. It is a coincidence, but he, too, is talking to himself, between the whiffs of smoking.

"Gad! that was a pretty woman I saw coming out from dinner. She looked surprised when I looked at her. I suppose it must have been this beard; it is a terror, to tell the truth." Hereupon he disengages it and throws it upon the bed. "But there is one good thing about it,—no one will recognize me in it, and that's what I want. That confounded jackass of a Thompkyns might have shut the story up about the bay mare. He must have known it would make it infernally hot for me at Saratoga, even if she beat. As it is, I am five thousand dollars out, and the governor politely declines to advance the necessary tin. Of course the best thing I could do was to disappear from the scene until father gets reconciled to the five thousand by my absence from his side. He'll want me back before long to take care of him. The joke of the matter is, here I am in the character of a seedy philosopher, fooling every one by wholesale. Of course I couldn't come here, except *incog.* because asthmatic old Mrs. Wheeler would let the governor know immediately. I'll risk her finding me out in these whiskers and eye-glasses. Ah! that pretty little girl will take off the dulness a bit; I must cultivate her acquaintance in the morning."

The following is a conversation which took place the next week, between Miss Isabel Clay and her maid, Miss Mary Dunlap. Miss Clay is bolstered up in bed and is looking very white and interesting

Miss Dunlap: "There, there now, Miss Isabel, lie still and rest; goodness knows you've been through enough to-day."

Miss Clay: "But, Dunlap, how can I keep still? Was n't it just the most providential thing that Mr. Johnson was on the rocks as the boat

capsized? How could I have been saved if he had not been there? And then he was 'so gentle and so kind' about it; I know I did n't faint till I was on dry land. While his arm supported me I never could have fainted, it was only when I lay on the grass that I lost myself. And to think that it should have been Mr. Johnson, too; why, all the week I have been teasing him about Bacteria and botany and every horrid thing, till he has been driven almost wild; and yet he ran just as fast to save me when he saw me in the water."

Miss Dunlap: "I s'pose he thought you were drowning, Miss Isabel."

Miss Clay: "Drowning, Dunlap. Of course he did; but I should think that would have been the thing he would wish most devotedly for. Oh! he is such a kind man, though he is so queer."

Miss Dunlap: "Law, Miss Isabel, you do talk to him all the time, though."

Miss Clay, pondering: "Do I, Dunlap? Yes, I suppose I do; but there is nothing else to do here. I really don't believe he is so very knowing, after all. He tells very funny stories sometimes."

This last is uttered in a sleepy tone, and soon after the patient drops asleep.

I give an extract from a letter from Mr. Johnson, otherwise Mr. Benjamin Southern, to Mr. Silas Thompkyns at Saratoga.

"Do you know, Tommie, I hardly care at present whether the governor gives in sooner or later; I think I hope he'll give in later, of the two, providing he gives in at last. . . . There is a tremendously pretty girl here, apparently in perfect health. All the rest of the boarders are infernally slow, what with their colds and their baths and their walks. But Miss Clay—I wonder if she can be the Miss Clay you told me about; though that can't be, for she was from Boston and this one is from somewhere else, I can't just make out where. Then that one was rich, if I remember what you said, and this one is as poor as a church mouse, and goes about in a shabby brown dress, and daubs the rocks,—on paper, of course I mean. She takes me for a professor of natural science or something of

that sort, and is always trying to worm something out of me about everything I never heard of. This beard that you recommended me is the hatefulest thing, — it makes the sweat pour from me like a house afire, — a mixed simile, but never mind. She's very pretty, nevertheless, and serves to make this monotonous life bearable, so that I should be really sorry to leave it yet. I hauled her out of the water to-day, for the first time; I have been expecting to be called upon for this kindly office for some time. She persisted in going out in the rickety old hotel boat, alone; and she knows nothing about managing a craft. You may imagine I kept as near as possible on the rocks in case of an emergency.

"Don't let what I have said deter you from doing your best to bring the old gentleman round as soon as possible.

"Yours, B. S."

Another week passed. Miss Clay recovered from her shock, and grew daily in health and strength. The few days of languor and weakness were an excellent time for cementing her friendship for Mr. Johnson. The morning walks, when she leant upon his arm, were charming to both of them. In the mean time Mr. Southern had heard nothing from his friend Mr. Thompkins.

Miss Clay had retired to her boudoir, and before going to bed writes thus in her journal:—

"Mr. Johnson is really a very interesting person, notwithstanding his funny looks and behavior. His description of the races at Saratoga was very interesting, this evening. I can't believe he is what he seems to be. His appearance is far from being that of a man of the world, but his conversation, without being insipid, is well-bred and pleasing. His voice, too, has touching vibrations in its lower tones, and his glasses cannot conceal the brilliancy of his eyes. He is a man of whose acquaintance I should be proud anywhere. I think I will tell him to-morrow how I happen to be here and ask him to call on me in Boston."

Mr. Johnson, on his part, has taken his cigar to smoke by his window in the roof. The cool

breeze from the water wafts the smoke into the chamber and makes the candle flutter and dance, keeping one ever in suspense lest it go out. But Benjamin Southern is not thinking of that, as his exclamations indicate.

"She sang that song divinely, to-night! Hang it, what if she is poor; I'd be willing to work hard for her; and if the old man doesn't like it, very well. If he wants to cut me off without a cent, he may and welcome. I'll do it! I'll tell her to-morrow just how I feel towards her, let the consequences be what they may. We can manage to scrape along somehow, I suppose. Whew! though, who's going to pay the five thousand! There's no use in talking, I must do it, and there's an end of the matter." Upon that he went to bed and slept the proverbially sound sleep of the lover.

The next morning Mr. Southern and Miss Clay met at breakfast. Miss Clay was unusually bright and entertaining, but Mr. Southern's face was very glum; he looked as if he had made up his mind to do a very disagreeable duty. He began well, if this was the case.

"Miss Clay," said he, "if I may have a moment with you after breakfast, I have a little psychological problem which I would like to explain to you."

"Oh, yes, Mr. Johnson; certainly!" said Miss Clay. "I, also, have something I wish to say to you."

"Indeed!" said he, surprised, "can it be possible!"

After breakfast they walked together along the pebbly shore. What was said on this occasion I have been unable to ascertain. They have always been reticent on the subject. What I can say, however, is that they came back looking very sober, — both of them. He handed her up-stairs with even greater deference than usual.

That evening, in the parlor, there was considerable tittering among the ladies over a bit of news that came from somewhere. It was said that Mr. Johnson and Miss Clay had made a match. It happened that this report was untrue at that time; but a little later in the evening, after the mail had come in, Mr. Johnson and

Miss Clay met, accidentally, of course, on the piazza at the side of the house.

Miss Clay, holding a letter in her hand, which she has just taken from Mr. Southern and read: "Oh! Jack! I shall always call you Jack now, may n't I? What is all this horrid stuff about betting? You won't bet any more, will you? But your father has yielded at last, has n't he?"

Mr. Southern, drawing her to him: "Yes, and just think, he makes as his condition that I shall settle down and marry Miss Isabel Clay, whom he hears is a sufficiently pleasing young lady, the daughter of his old friend, whom he now meets, after so many years, in Saratoga. Those are the very words you were just reading; do you not understand what they mean?"

Miss Clay: "Yes, Jack."

Mr. Johnson: "Take care, little one, or you will spoil my beard if you do that way. See, you have actually already pulled it all out by the roots. Alas! what is in store for me?"

Miss Clay, in amazement: "Oh, Jack! I shall have to fall in love with you all over again now. I had gotten you so nicely arranged just as you were, and now I have had all my trouble for nothing." She weeps; then, smiling through her tears. "Now, there will be no more talk about romantic cottages and daily bread, sir, will there? And you won't be too proud to accept money from your wife, will you? Don't say a word; you know you thought it this morning, if you did n't say it. Not a word, sir!" She holds up her finger, and presses it against his lips, and the curtain falls upon them standing thus.

J. G. H.

The value of clothing steam surfaces is illustrated by the experiment of Prof. Ordway, who says that a naked two-inch pipe, carrying sixty pounds steam, may condense 181 grammes per foot per hour, while a simple cheap covering may reduce this to $46\frac{1}{2}$ grammes. The total saving is equal to 2.96 pounds of steam per day of ten hours in a pipe one hundred feet long. This would amount to an economy of five tons of coal per year on one hundred feet of two-inch steam piping, and more in proportion in larger pipes.

List of Publications, M. I. T.

[In order to make this record as complete as possible, professors, alumni, and students of the Institute are requested to send us the titles of any books, pamphlets, or periodical articles which they may publish promptly as they appear.]

Barrus, Geo. H. ('74). The Tabor Indicator. Published by the Ashcroft M'f'g Co. [In press]

Barrows, W. B. ('76). — Birds of the Lower Uruguay. [Continued article.] *Bull. Nuttall Ornithol. Club*, VIII, Nos. 2, 3, 4.

Blodgett, A. D. ('76). — See Blodgett, G. W.

Blodgett, Geo. W. ('73). — Time Signals. *Journ. Assoc. Eng. Societies*, II- (1883).

— (With A. D. Blodgett.) Electric Signal Clock. *Journ. Frank. Inst.* (March, 1883).

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Department Notes.

The electrical exhibition to be held under the auspices of the Franklin Institute of Philadelphia is looked forward to with interest.

There are 294,943 Bell telephones in use in the United States.

A new proposition in connection with Arctic exploration has been promulgated by Prof. Jenkin, of Edinburgh University. The system is called "Telfherage," and consists of a parallel line of poles sunk in the ice, between which are stretched strong wire ropes. A motor engine running on the rope completes the circuit from a stationary electric machine on the vessel as a centre of supplies. Attached to the engine are small cars for the transportation of provisions and material.

This system will also provide the cheapest mode of inland conveyance for small quantities of goods, especially in new colonies, where the roads are not yet constructed, and in time of war forms a ready means of sending supplies to the front.

A communication in *Engineering* describes an interesting experiment recently tried at Birmingham. An incandescent light was placed in a sectional boiler, having a large reservoir and deflectors for separating the steam from the water. The action going on within the boiler was made visible, the cascades, currents, and miniature whirlpools being clearly observed. In this way the cause of priming and the most effective method of separating the steam from the water may be more thoroughly investigated.

Detonations of the Java eruption of Aug. 27 were distinctly heard throughout the Philippine Islands, some two thousand miles distant.

The *American Machinist*, of Dec. 8, contains a description of the Standard locomotives of the New York, West Shore and Buffalo Railroad, which are designed to operate heavy and fast passenger trains. They have cylinders 18 inches by 24 inches, driving wheels 68 inches diameter, and weigh 95,000 pounds. These engines are calculated to take a train of twelve of the heaviest coaches over a level track at a

speed of forty-five miles an hour, or a lighter train at a speed of sixty-five or seventy miles an hour. They were built by the Rogers Locomotive Works, at Paterson, N. J.

In London, not long since, there was a public exhibition of an electric motor for street cars. The accumulator which supplied the propelling force was placed under the seats. It is said that it occupied less than a cubic foot of space, and weighed only eighty pounds, although it was sufficiently powerful to propel a loaded car for seven hours at the rate of six miles an hour at only one quarter of the cost of horse power.

Correspondents of *Nature* describe the curious phenomenon of a green sun, as seen in India. Our own brilliant sunsets are not merely local, as they have been the subject of comment in papers from all parts of New England and New York. England has also experienced some remarkable afterglows recently.

Apropos of the big books of the Mechanicals on the Westinghouse brake, is a story of its invaluable worth.

On Nov. 11, an express train from Hull to Leeds (England), on the Northeastern Railway, when running over fifty miles an hour, was turned off the main line into a branch at Cross-gates, near Leeds, by a blundering signalman.

The brake was at once applied, and the train was coming to a stand, when, in taking another pair of points, it was thrown off the line, and separated into two or three portions; but thanks to the automatic nature of the brakes, each portion was separately stopped, and no one was injured.

Steps are being taken to hold an International Mining Exhibition in London next year. The arrangements are in the hands of Mr. A. Leehandelaar, who was awarded a diploma of honor at the Amsterdam Exhibition for his display of minerals from over four hundred mines in Utah, Montana, and Idaho, and it is intended as far as possible to bring together everything relating to mines and minerals in the world.

There are only four of the Fourth Year Mechanicals who take shop work.

Noticeable Articles.

ATLANTIC, December. "Mary Moody Emerson," from the papers of R. W. Emerson. "Luther and his Work," by Dr. Fred'k H. Hedge.

HARPER'S, December. "Alfred Tennyson," by Miss Thackeray, illustrated.

"The Register," a comedy by W. D. Howells.

BLACKWOOD & MACMILLAN, November. "Anthony Trollope." [Trollope's Autobiography as a picture of manly perseverance is well worth reading. It is published in Harper's Franklin Square Library, at twenty cents.]

CONTEMPORARY, November. "The New Birth of Christian Philosophy." "Whatever greatness the nineteenth century may claim will appear, on closely considering the state of the case, to arise from this, that it is a new beginning of the age of faith. . . . Insist, as you reasonably may, that the old religion and the new experimental sciences are pointing in the same direction, . . . and you will have helped the world to perceive that evolution is one thing and revolution is another."

"The Southern States since the War," by E. D. Godkin.

"Hereditary Conscience." [This may be read by those who are interested in the controversy about the foundation of morals, in connection with two papers in the May and June numbers, the first by "Vernon Lee" on the "Responsibility of Unbelief," the second in reply to it by that very able writer, Miss Frances Power Cobbe. "Vernon Lee" is Lady Florence Paget, the author of those very pleasant books, "Italian Studies of the Eighteenth Century" and "Belcaro."]

"The Future Prospects of Madagascar," by the Rev. G. A. Shaw. Mr. Shaw is the missionary who was imprisoned by the crazy French admiral.

QUARTERLY REVIEW, October. "Trade Routes to China, and French Occupation of Tonquin."

WESTMINSTER REVIEW, October. "Gold Fields, Ancient and Modern."

EDINBURGH REVIEW, October. "Russian Railways in Asia."

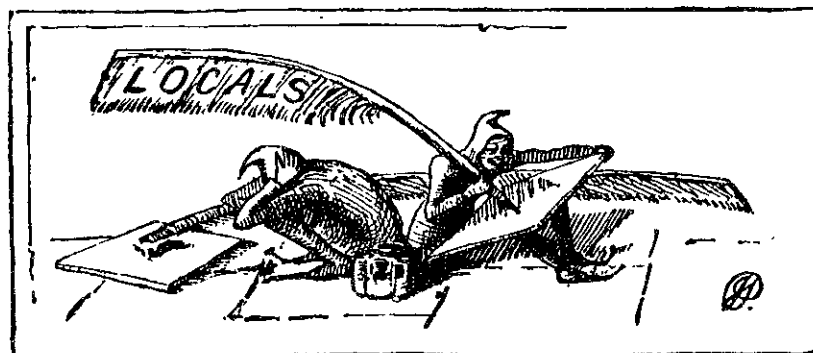
"Vicksburg and Gettysburg," by the Comte de Paris.

The reference to a work on trades unions in the last number should have read "The Trades Unions of England," by the Comte de Paris. W. P. A.

In the CHEMICAL NEWS for Oct. 19, 1883, is an interesting paper on "Methods for Coking Coal and Recovering the By-Products," by Watson Smith. W. S. A.

The Miners of fourth year are recommended to read in ENGINEERING AND MINING JOURNAL, Nov. 17, "Does Alumina act as a Base or an Acid in *Singulo Silicate Slags?*" H. M. Howe; and also the answers to the question by E. D. Peters and Geo. C. Stone, in Nov. 24, ENGINEERING AND MINING JOURNAL.

The lead workers will be interested in "Desilverization of Refined Lead," Nov. 3, 1883, ENGINEERING AND MINING JOURNAL, by G. T. Dougherty. R. F. R.



Recovered from your Thanksgiving dinner?

The Glee Club hopes to give an entertainment about New Year.

The roster of the Battalion was submitted to the Faculty last Wednesday.

If you wish to hear a tale of midnight toil, tell an '85 civil that he has a soft time.

A roller skating rink was opened a short time ago, in the Mechanics' Institute building.

Prof. Cross is now delivering a course of lectures on "Sound" before the Lowell Institute.

The large ventilating blower in the new building has been found to work very successfully.

The Rogers building will probably be enlarged by the addition of another story before next year.

Several Institute men took part in the gymnastic entertainment the other evening at the Y. M. C. A.

One of the instructors confides his despair of one of the upper classes ever becoming aware of the rules of propriety.

Some of the '85 men have realized vividly the meaning of "absolute zero," in heat, ever since a certain day last week.

Most of the Senior architects have solved the six-column problem. Some of them have made rather hard-looking solutions.

Noyes Brothers have just received from London a large assortment of scarfs, etc., in different styles made up in the Institute colors.

The most successful run of lead from copper residue in the records of the mining department was made Tuesday by the eighty-four miners.

Members of the F. S. T. now use silver gray Irish linen stationery with the design of the society pin stamped in cardinal on the upper right-hand corner.

The Sophomore civils and miners have finished field work for the term. The time thus far occupied in surveying will now be spent in the drawing rooms.

Several accidents have occurred lately in the carpentry shops. The tendency of the mechanicals seems to be toward turning the shops into dissecting-rooms.

An electric light has been placed in the laboratory of applied mechanics, and photographs of beams under stress can now be taken regardless of the weather.

If you'd have a regard for your health,
As you drink the Pierian dry,
Just take a professor's advice:

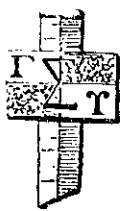
Beware of late study — and *pie* —!

Author of "Rot."

There are still a few vacant places on the parts in the Glee Club, especially on the tenors. Singers are requested to give their names to Mr. Thomas A. Fox, who will see that they are examined for admission.

The officers of '85 for the ensuing year are as follows: President, Charles R. Richards; vice-president, C. Stanley Robinson; secretary, Robert E. Richardson; gymnasium committee, Everett Morss, Sidney Williams.

It is hoped that when the old shops are torn down and the space turfed over, the grounds will be laid out with tennis courts. It will be an excellent place, and the tennis players' present accommodations in the Gymnasium are pitifully meagre.



The last regular meeting of the *F. S. T.* was held in the club room on Friday evening, Nov. 23. An interesting paper upon the East River Bridge was read by Mr. Sidney Williams, '85. The meeting then adjourned for refreshments.

Having just learned the meaning of "little house" in German, the Sophomore mechanicals have proceeded to give the idea embodiment in matter. The frame was to have been finished last week. Nails are not allowed in the construction, all the parts being mortised into each other.

The Michigan *Chronicle* publishes a list of the Freshmen classes in the prominent colleges of our country, giving the number of men in each.

We find, with the exception of Harvard and Yale, the number of men in our Freshman class exceeds that of any other college.

Several enterprising members of the different classes have made the necessary arrangements for a dance in the Gymnasium next Saturday afternoon. The orchestra of Baldwin's Cadet Band has been engaged, and the affair promises to be a very pleasant one. All should attend and insure its complete success.

Two new problems have been given out to the Senior architects; a stone well, to be situated between two gardens, which are at different levels, and to be equally accessible from either; — and a grand staircase to be constructed of stone or marble. Sketches for both of these problems have already been handed in.

Messrs. Fitch and Purinton are building model steam engines, with cylinders, one and a half inches by three, and two by four inches, respectively. The lathes are ready for use, and recently several new machine tools have been added to the machine shop. In the Steam Laboratory a series of test on the Harris-Corliss engine have been undertaken by the fourth year.

The architects visited the brick-yards at Somerville a few days ago. Those in charge were attentive to the party, and amply gratified the curiosity of the questioners. Although the day was dull and chilly, the livelier ones managed to scrape up a little brightness, especially at the expense of the irrepressible masher who accompanied them. The architects all feel now as if they could make bricks at a moment's notice if the materials be only supplied to them.

A late issue of the *Transcript* says: The article on "Money," in the latest volume of the *Encyclopædia Britannica*, adopts Gen. Francis A. Walker's definition of money *verbatim et literatim*, and pronounces his treatise on "Money" the most comprehensive work on the subject in English. The *Advertiser* to-day pronounces Gen. Walker's definition of money as marked a step onward in economic science as his wages theory, which, as Gen. Walker himself says, "is regarded by his American brethren as somewhat heretical."

Athletic Notes.

THE Gymnasium Committee have voted to add to the equipment of the "Gym" a pair of parallel bars and several sets of boxing gloves, in the hope of dissipating the loneliness of its interior.

The Executive Committee of the Athletic Club voted at their meeting Dec. 6, to have the fall meeting on Saturday, Dec. 22, at 2 o'clock P. M. Entries for the events must be handed in to Mr Bunce, '84, before Wednesday, Dec. 19, at one o'clock.

It was decided to have the following events, provided three or more entries were made in each. Class tugs-of-war, limit, six hundred pounds; pole vault, running high jump, standing high jump, running high kick, fence vault, putting the shot, fencing, sparring, light and middle weights, and wrestling.

Silver medals are to be awarded as first prizes in each event. Second prizes will be given only in events for which there are more than four entries. Music, which formed such a pleasant feature in the fall meeting of 1881, will add to the attractiveness of the occasion.

Members of the Athletic Club are requested to assist the officers, by making their entries as soon as possible. We hope that all, especially those from '87, will come forward and endeavor to make the sports this year an entire success.

Columbia Annex notes: The disgraceful actions of the Vassar team at the last Intercollegiate Gum Chew have been severely condemned by the Columbian ladies. — *Ex.*

NOTE. — With all modesty we would say to our friend, the 'Varsity, that it is the Boston Y. M. C. A. that has built the new and elegant building, with gymnasium complete, in the neighborhood of the Institute, and not the Y. M. C. A. of the Institute of Technology. Indeed, the existence of this latter society has not yet come to our knowledge.

The College World.

HARVARD. — In the report of John S. Dammell, inspector of buildings, upon the causes of the accident at the Harvard boat-house, no attempt is made to fix the responsibility, the light nature of the whole structure being merely pointed out, in consequence of which it is expected that a new boat-house will shortly be built. — Candidates for the Freshman crew are hard at work under their temporary captain, George S. Mumford, of Rochester, N. Y. — The *Advocate* thinks that the athletic committee may have been right in their decision in regard to the playing of foot-ball, but deplors the ill-chosen time for making their decision known. — The *Advocate* thinks that a proper system of giving advice with regard to the electives would materially aid the student in choosing the course best fitted for his ability, and would be far better than the present desultory method of selecting the studies for the year. — The shooting club is well organized and practising at Walnut Hill. — Prof. Oliver Wendell Holmes is engaged on a life of Emerson. — Among the Sophomore themes is this: Boston Streets on the Evening of Election Day. Some of the Techs might give them a few points on this subject. — Mr. Matthew Arnold recently lectured at Harvard. — The College library now contains over 200,000 volumes.

YALE. — William G. Sumner, professor of political economy at Yale, has been attacked by Thomas H. Dudley, of New Jersey, in an address delivered in New York on "The American System of Protection," in which Mr. Sumner is charged, as a member of the Cobden Free Trade Club of England, with awarding the Cobden prizes for free-trade essays only. Mr. Sumner, with Pres. Walker of our Institute and many other professors of political economy, is a member of the Cobden Club, and get much information through its publications, which would otherwise be inaccessible, but to Mr. Dudley's charge that he is paid by the Cobden Club to teach free trade, he replies that he hardly cares to insult himself by denying the

statement. — The will of the late Mr. Farnam bequeaths to Yale property the estimated aggregate value of which is placed at \$4,000,000. — *Columbia Spectator*. — The text-book of Prof. Sumner of political economy is a book containing 350 questions relative to the subject, with references bearing on these questions. — A week has been added to the summer vacation and deducted from the Christmas recess. — The Navy is the only branch of college athletics which depends entirely on voluntary subscriptions.

COLUMBIA. — At a recent meeting of the board of trustees, graduates of the School of Mines were bestowed with Fellowships. — *The Acta Columbiana* is raking the foot-ball team over the coals for its non-appearance at the Polo grounds to play Princeton as was agreed upon. — Columbia has been elected to the Intercollegiate Lawn Tennis Association. — Union College, N. Y., has given the important office of registrar to a woman. — The Columbia eleven has been expelled from the Football League. — The *Spectator* trustees have declared a dividend of seventy-five per cent on capital stock. — A banjo club has been formed. — 350 students in the Columbia Law School. — The Bicycle club has been revived.

Only those are admitted to the School of Political Science at Columbia who have pursued a course of three years' study at some first-class college.

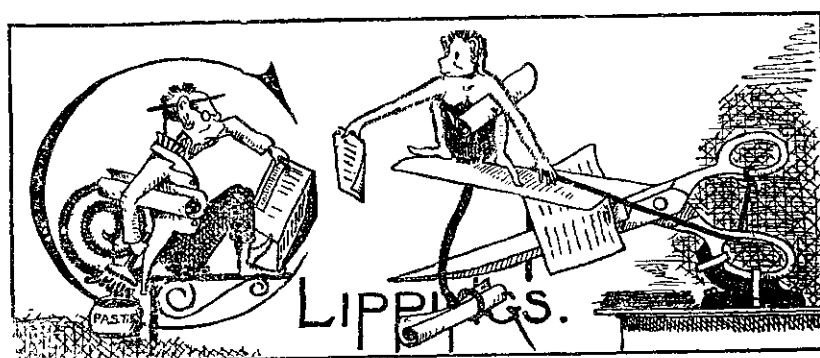
ELSEWHERE. — Bowdoin has been beaten by the Columbia Chess Club.

Mr. James Russell Lowell has been recently elected to the Rectorship of St. Andrew's University, England, a most unusual honor for a foreigner.

The damage to the Institute at Troy by the late rush has been repaired at an expense of about \$50.

A Druidic university has been established in New York City for the purpose of instruction in the arts, sciences, and philosophy of the ancient Druids.

The meeting of the Intercollegiate Press Association will occur next month at Cambridge.



Huitain.

The sweetest queen of all coquettes
Has made me make a solemn vow,
To swear off smoking cigarettes.
She hates tobacco smoke, an' now
And then, with scorn she tells me how
It scents my coat. My scheme is ripe.
My every wish to hers must bow,
So, after this I smoke a pipe.

Williams Athenæum.

SCENE: JUNIOR HISTORY. — *Prof.*: "Mr Smith, what was the influence of the church upon the laity at this time?" *S.*: "Hem — ah — that's in the review, ain't it? I was absent." (The dodge had always worked hitherto.) *Prof.*: "Ah, I had failed to credit you with that absence. I will do so now."

Another idol shattered. — *Ex.*

The headquarters of American mashery — Masherchusetts. — *Punch.*

The melon grew in a sunny clime,
Where the air is sweet with the breath of thyme.
A boy saw life by the Northern tide,
Where the sea's wild waves o'er the Maine coast glide,
They were buried together — the melon inside. — *Ex.*

CATCHING A WEASEL ASLEEP. *Mrs. Ponsonby de Tomkyns* (pointing to her books) — "There are not many, Lord Adolphus, but they are all friends — dear old friends!" *Noble Poet* (taking down a copy of his own poems and finding the leaves uncut) — "Ah! hum! I'm glad to find that you don't cut all your old friends, Mrs. de Tomkyns!" (Mrs. de T. is a loss for once) — *Punch.*

Professor of Chemistry: "Suppose you were called to a patient who had swallowed a heavy dose of oxalic acid, what would you administer?" *K.* (who is preparing for the ministry, and who only takes chemistry because it is compulsory): "I would administer the Sacrament." — *Ex.*



Conductor: "Smith Street! Smith Street!"

Smith (who is about half seas over, aroused from his nap by the accusation): "Sic, say old man, guess 's my treat last!"

The rule of three — Third person to clear out. — *Ex.*

Ambition.

He had his sheep's skin in his hand,
And musingly he said, —
"I'll now go forth into the world,
To win me fame and bread.

"I'll struggle hard for human good,
And by my genius — yea —
Transport mankind from darkness to
The brilliancy of day."

Ten years have flown, and there he stands,
On yonder corner — see?
He's kept his word, as sure as fate —
A lamplighter is he. — *Illini.*

We see a notice of Theoretical Blowpiping in the *Columbia Spectator*. An extraordinary kind of blowpiping for the School of Mines.

Lines to a Bull-Chased Man.

Linger not, brother,
There on the lea,
E'en though fair flowerets
Be tempting thee,
Though their aroma, their beauty, their grace,
Tempt thee to dwell in that sweet-scented place.

Linger not brother,
E'en though the view —
N., S., and E. —
Presents grandeur to you ;
E'en though a lake in the distance is seen
With valleys and hills and bold crags in between.

Linger not, brother,
With dreamy air :
Castles in Spain
Are out of place there.
Stop not to murmur some beautiful rhyme :
Wordsworth and Keats 'll do some other time.

Life.

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Students of Fourth Year Mechanics will find two papers, relating to their recent studies, in *Van Nostrand's*, for November. One is a paper by Weynauch on "Various Methods of Determining Dimensions," and the other is a discussion of "Long Column Formulae." In the December number of the same magazine there is an account of some tests made at the Stevens Institute, on "The Strength and Other Properties of Cuban Woods," which should also interest Prof. Lanza's class.

We advise all miners to read the description of the Poetsch system of sinking through quicksand, in the *Engineering and Mining Journal*, of Dec. 1. It is the method by freezing lately referred to by Prof. Richards.

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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 for 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, gingham, and other woven goods. A weaving department with a variety of looms is connected with this school. No charge for instruction is made.

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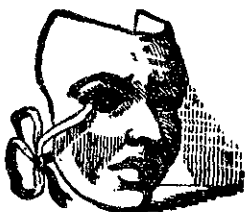
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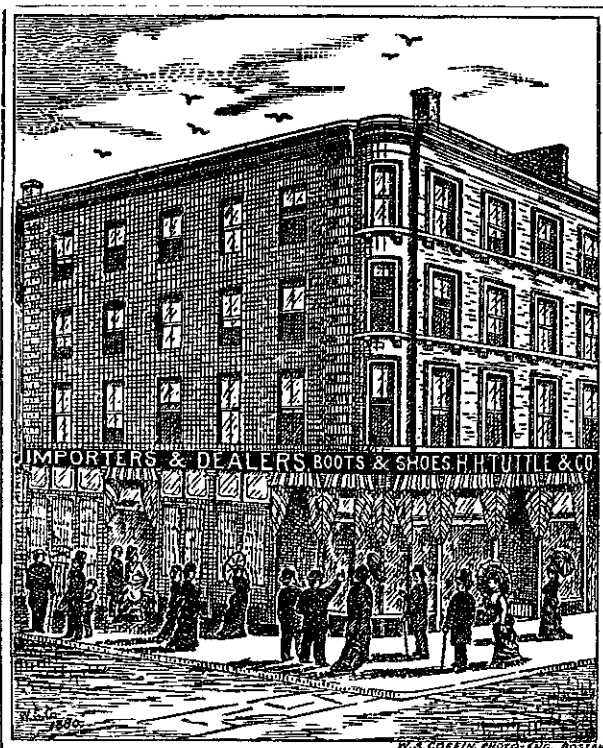
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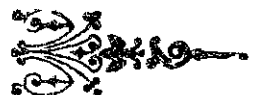
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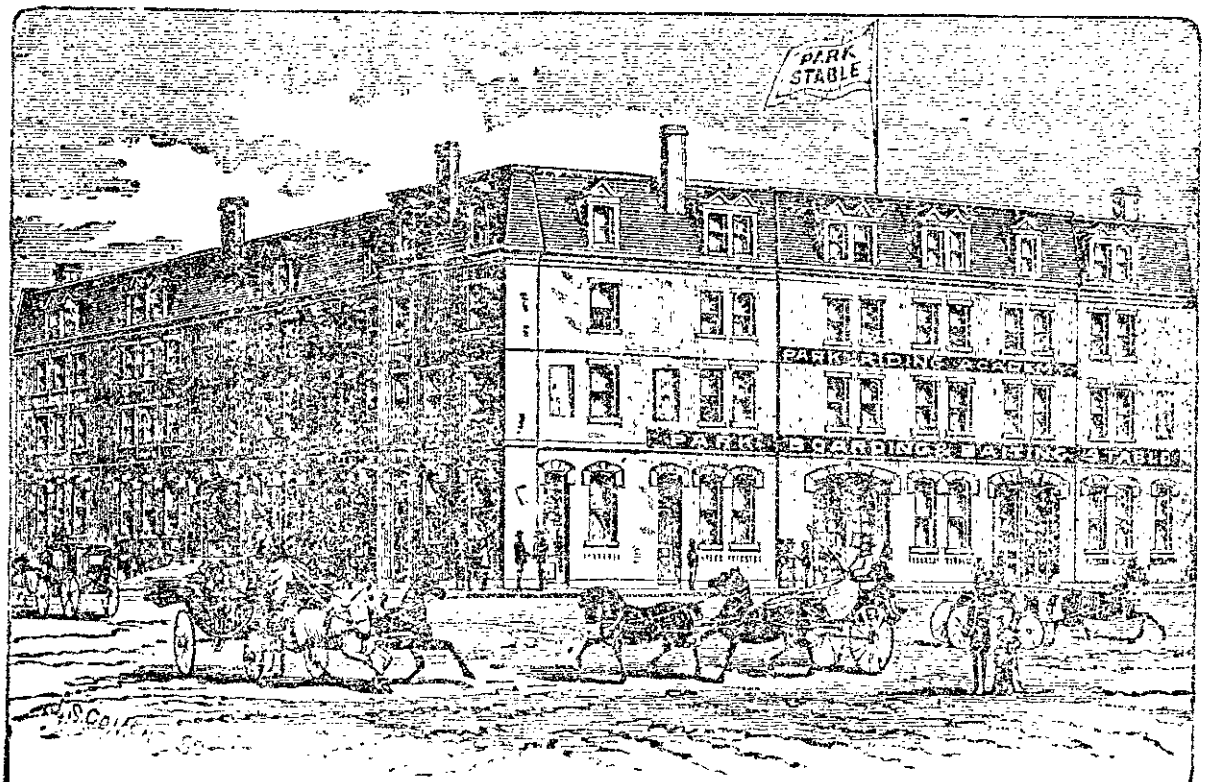
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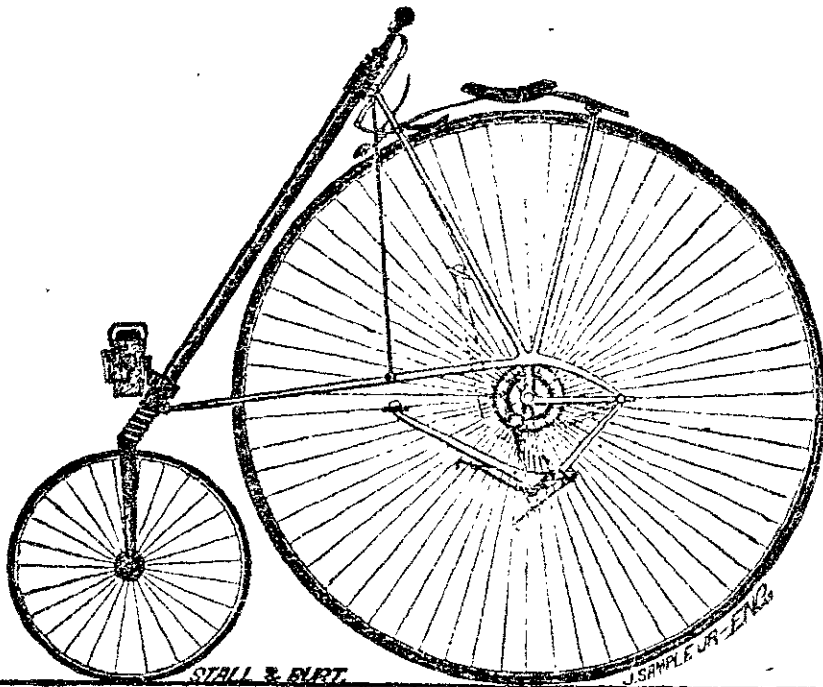
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