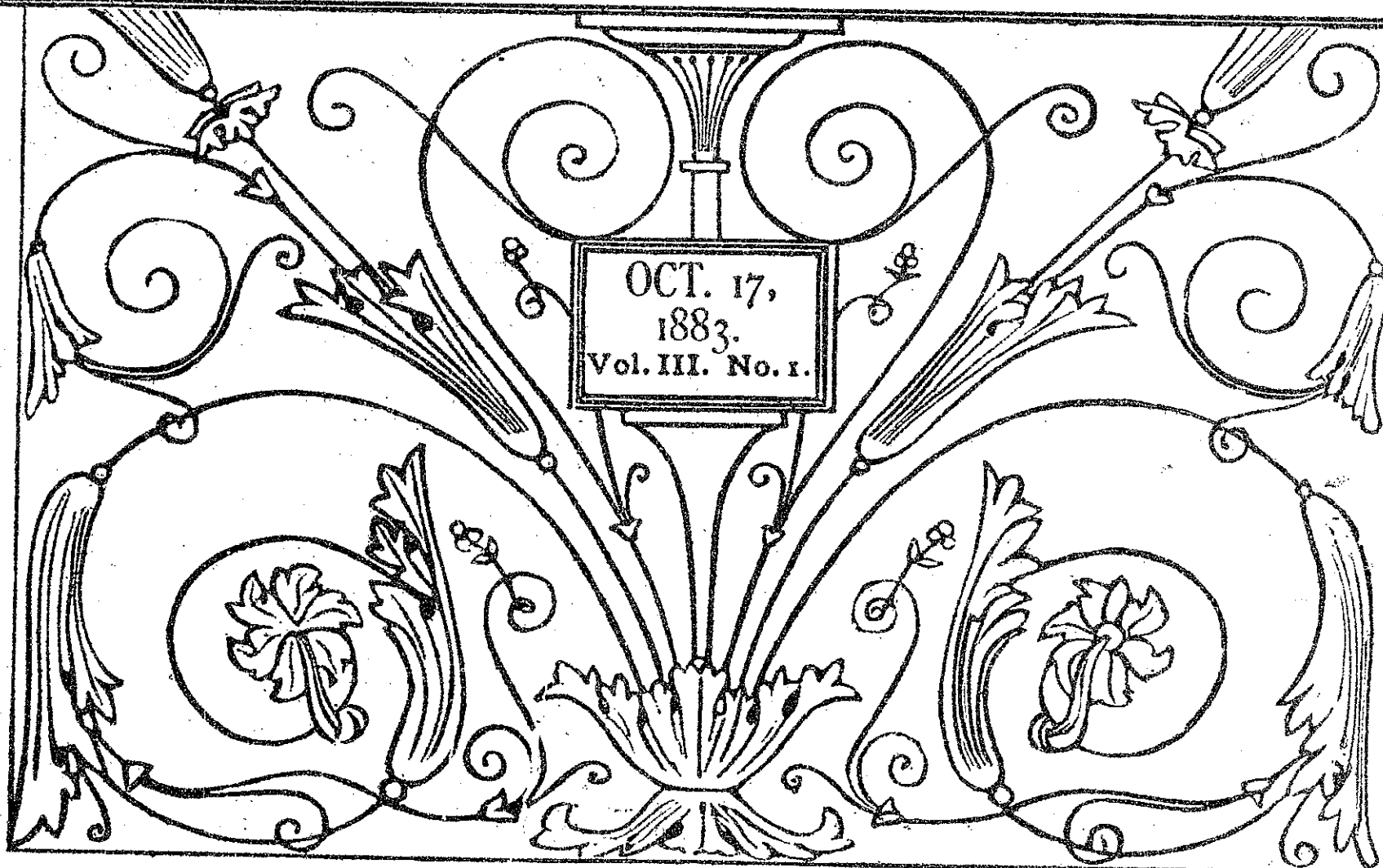
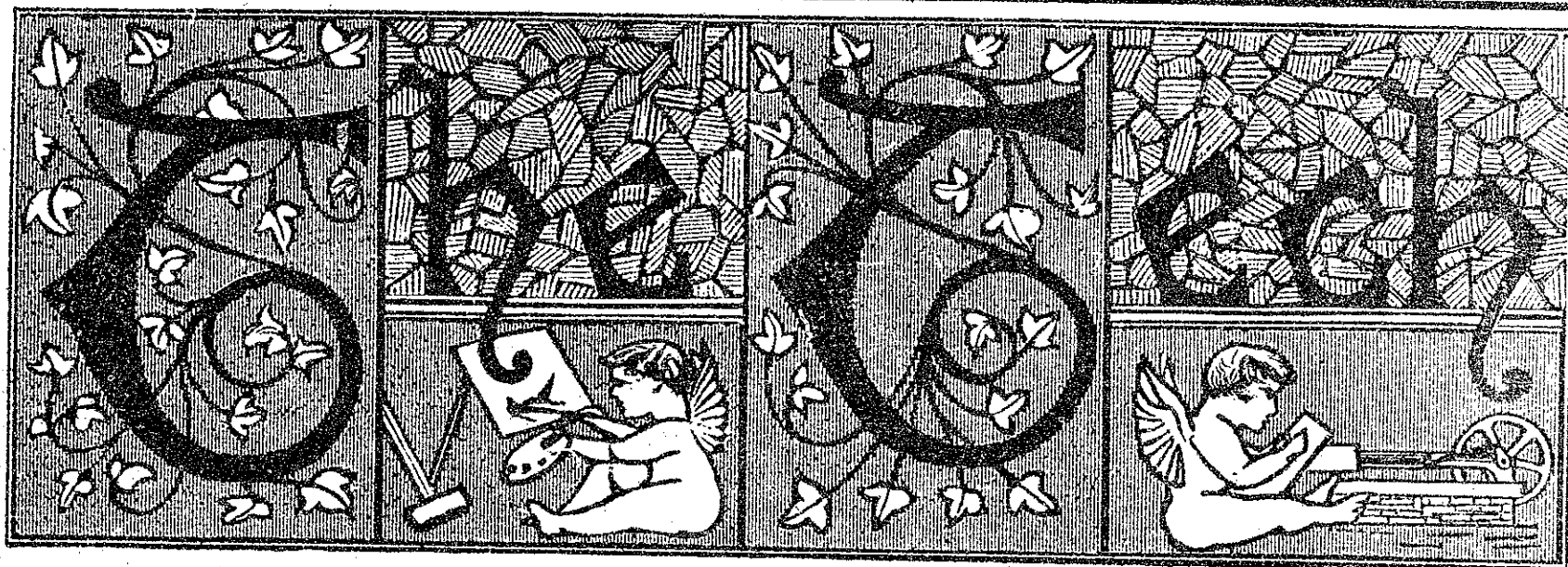
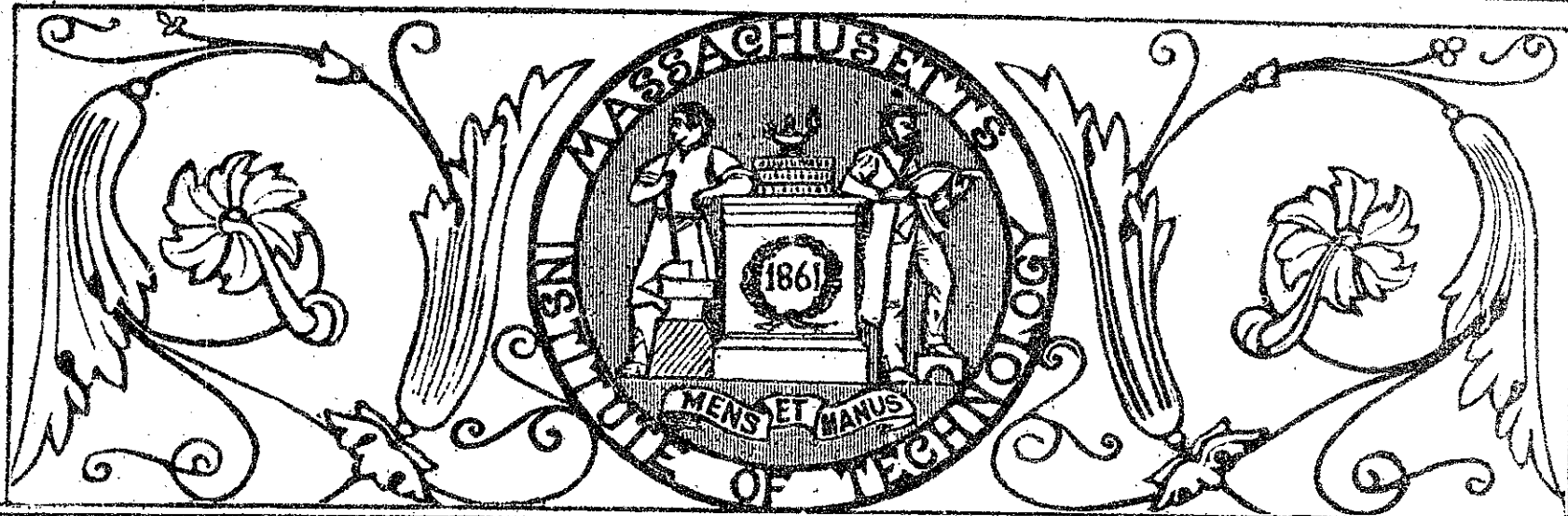




OCT. 17,
1883.
Vol. III. No. 1.

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The Tech.

VOL. III.

BOSTON, OCT. 17, 1883.

No. 1.

THE TECH.

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

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THE opening of the third volume of THE TECH finds the paper occupying a high position among the college press, but, for the first time, it is with hardly a member of its original boards. Nearly

all of its prominent contributors have left the school; its first editor-in-chief, whose strong convictions and happy style did so much to fix its character; its first president, to whom it owes its inception, and whose energetic efforts long continued gave it a footing in the school: these have gone, and with them many others perhaps less prominently connected with the paper, but by whose patient labor, nevertheless, it reached the position it now holds.

THE TECH is not a story paper; it is not a comic one; sarcasm has termed it "pungent"; it has been called "bashful"; it is in the main "only a field for plain, honest work," and as

such has begun to be known and felt in the world outside as well as in the smaller sphere among the colleges, where it properly belongs.

Now, however, that it feels so keenly the lack of the support which it has, until this time, received, THE TECH starts upon its third volume, making no promises, but with every incentive for improvement.

Some attempts have been made in that direction in the present number, which is, however, sent out by its editors in the hope that its deficiencies may be overlooked or kindly attributed to inexperience.

THE alumni and friends of the M. I. T. will be glad to know that the present year finds the Institute better equipped than ever before in the history of the school. It has at its command greatly increased facilities for instruction in almost all of its various departments, and its financial condition is much improved. The shops which have just been completed and the large new building afford the long needed opportunity for expansion, and several new instructors have been engaged. The chemical department has removed to the commodious Kidder Laboratory, which contains every convenience and is fitted with desks for four hundred and twenty-six students. The mechanical engineers no longer have to "in-licate" in the dust and dark of the old steam laboratory, but are transferred to the new shops, where they have largely increased conveniences. There are now three steam engines in the Institute, all of which are utilized for the purposes of instruction. Professor Lanza is at the head of the department. The course in architecture has been considerably extended and otherwise improved. Dr W. T. Sedgwick, lately from the Johns Hopkins University, has been appointed assistant professor of biol-

ogy, and will teach, in addition, physiology and botany. The physical department is to occupy extensive quarters in the new building and the old physical laboratory is to be fitted up for the use of students in biology. THE TECH will give at its earliest opportunity a full account of the new buildings and will notice at length the numerous changes that have taken place.

THE Institute colors have been for years among the vague traditions of the school. There was a spasmodic attempt last year to bring them into prominence, and a few of the more energetic students mystified their classmates by appearing with scarfs and handkerchiefs of cardinal and gray. The large majority however frowned upon the innovation, and seemed with difficulty to realize the claim of the Institute upon any particular portion of the spectrum. Their state of mind was natural enough, for as each succeeding class went out into the world the ribbons tying their diplomas wore a different hue. It is indeed presumptuous to settle that upon which the Faculty disagree, but fools rush in where angels fear to tread, and here we are. We have at great trouble and expense accurately determined the wave lengths of the colors of the M. I. T. Having mislaid the memorandum we cannot state them at this moment, but we have embodied the result upon the present cover of THE TECH. To those conservative members of the Institute who may be inclined to resent the innovation, we can only say in all humility that a change, though possibly no improvement, is often a relief.

THE prizes offered by the Board of Directors for 1882-3 were awarded at the final meeting of the board, but too late for publication in the last number of THE TECH. The prize of forty dollars and a gold medal offered to the student doing the most to forward the interests of THE TECH by literary efforts during the year was very justly awarded to Mr. Harvey S. Chase, the editor-in-chief, for articles contributed outside of his regular editorial work. Mr.

Josiah Pierce, Jr., received the well-merited prize of twenty-five dollars and a gold medal for having contributed the best drawings and cartoons during the year. The prize of twenty-five dollars for an Institute song was not awarded, no one in the judgment of the directors having complied with the conditions.

THE TECH Minstrels demonstrated the existence in the Institute of plenty of musical talent of no mean order. The next step in the right direction is toward the formation of an Institute Glee Club, and should be taken without delay. There is little enough here to bring students together outside of the class rooms, and anything which will accomplish it under favorable conditions is to be encouraged. A well-organized glee club would contribute in no small degree to the pleasure and profit of all connected with it, while its concerts would doubtless repeat the well-remembered success of the Institute minstrel show. All that is necessary is for some energetic man to take the initiatory steps and we are confident that he will be well supported.

WE wish to call the attention of our readers to the advertisers in THE TECH. Great care has been displayed in their selection, and none but responsible firms which can be heartily recommended will be found among them. The paper depends upon them for its main financial support, and all students of the Institute can render THE TECH substantial service by patronizing its advertisers and mentioning its name.

WE recommend all Freshmen to read carefully the article in this number of THE TECH upon the Rogers Memorial and American Technical Schools. They can gain from them some idea of what the Institute owes its noble founder and dead president, and although they never came within the circle of his genial, kindly influence, they will be in a position to partly realize their own debt to him.

The Rogers Memorial.

THE tablet to the memory of the late Professor William Barton Rogers, founder and first president of the Institute, for which subscriptions were solicited last year from the students, is now on its way from Paris, where it was cast. The design for the tablet was awarded to the talented sculptor of this city, Mr. T. H. Bartlett. Many persons saw the study in clay and the plaster cast at his studio last spring, and we understand that Mrs. Rogers expressed herself as being well satisfied with the sculptor's efforts.

The tablet is of bronze, about three feet wide by four feet high. The head is in bold relief and is a little larger than life. There is a simple inscription, and beneath is a palm-leaf. Permission has been granted by the corporation to place the tablet in the entrance hall of the old building, now called the "Rogers Building." The price agreed upon with the sculptor was between three and four hundred dollars, and three hundred and fifty dollars have been paid to Mr. Bartlett by the treasurer of the committee in charge of the memorial. Last year two hundred and eighty-one dollars were collected, distributed as follows among the several classes: '82, thirty-six dollars; '83, forty-one dollars; '84, seventy three dollars; '85, ninety-nine dollars; '86, forty dollars. This leaves a balance of sixty-one dollars to be subscribed to make up the debt incurred by the treasurer, besides the cost of setting the tablet in the wall, and doubtless this will be covered by further subscriptions. It will be seen from the above figures that the subscriptions of the classes, notably of '82 and '86, were in no wise proportional to the size of the classes. Subscriptions sent to A. Lawrence Rotch, '84, treasurer Rogers Memorial Committee, will be gladly received and acknowledged.

THE first International Electrical Exhibition ever held in America will be opened in Philadelphia, Sept. 2, 1884, under the auspices of the Franklin Institute of Pennsylvania.

The First American Technical Schools.

THE following facts are taken from a communication to the *Scientific American*:—

In 1843, Benjamin Silliman, Jr. (since Prof. Silliman), commenced to give instruction, on the plan of Leibig, to private pupils in analytical chemistry and in original research. The instruction was given in the old laboratory of Yale College, but it was entirely a private enterprise. In 1847 the college organized the Yale Scientific School, of which the Sheffield Scientific School is the successor, taking its name in consequence of the munificent liberality of Mr. Joseph Sheffield.

An endowment of \$50,000 in 1848 by Mr. Abbott Lawrence established the Lawrence Scientific School at Harvard, and Prof. Horsford was placed at its head. The institution has experienced a series of changes, but in the midst of them all has furnished a most valuable amount of instruction.

In 1864 the School of Mines was inaugurated in Columbia College under the charge of Dr. Chandler and Dr. Eggleston. And in 1864, also, the Technological Institute of Boston was originated and endowed. This was due in its inception and its completion to Prof. Wm. B. Rogers, for a long time one of its governing board and still later its president. He lived to see his great work yielding results which perhaps fully realized his highest anticipations, and, crowned with honors, he has, as we all so well remember, but recently passed away. One part of the plan which he elaborated involved thorough instruction in physical research, and the construction and fitting up of a laboratory thoroughly provided with the means for such instruction. This was done under the supervision of Prof. Pickering, who was placed at the head of that department. It is scarcely necessary to speak of what that institution has done. Like Lexington and Bunker Hill, there it is, "it speaks for itself."

THEY say the "German" has become a florist, as he has charge of some plants near Brockton.

Some Remarkable Railroad Trains.

IN THE TECH of Jan. 3, 1883, brief mention was made of the speed of the fast New York-Chicago trains. As there are no trains in the world which run so long a distance at such a high rate of speed, or with anything like the comforts of the Chicago limited expresses of the New York Central and Pennsylvania railroads, some details concerning them are here given.

The New York Central's "limited" runs from 42d Street depot to Chicago, nine hundred and seventy-seven miles, via the Lake Shore and Michigan Southern Railroad, in twenty-six hours and thirty-five minutes, or at a speed of 36.7 miles per hour, including stops. The Pennsylvania's "limited" goes over the Pittsburgh, Fort Wayne and Chicago Railroad from Pittsburgh, by which the distance is only nine hundred and twelve miles, but as the time occupied is the same as its rival's, it makes but 34.3 miles an hour. The run from Jersey City to Pittsburgh, four hundred and forty-three miles, is accomplished in eleven hours and fifty minutes, including three stops. On the New York Central the four hundred and thirty-nine miles between New York and Buffalo are done in eleven hours and nineteen minutes, with three regular stops, beside others for water. It will be seen from the above that the New York Central's train runs at the higher speed, notwithstanding the several enforced halts for water, which in the case of the Pennsylvania train is scooped up by the engine while running. The writer has made trips of two hundred miles on both these trains and noted the following facts:—

The Pennsylvania "limited" steamed out of the Jersey City station precisely on time. It consisted of six Pullman cars and was drawn by an engine of Class K, with eighteen by twenty-four inch cylinders and six and one half foot drivers. Their tenders hold 2,100 gallons, and are provided with a scoop for picking up water while running, from long narrow tanks laid between the rails. No stops were made between Jersey City and Philadelphia, a distance of 89 miles, the average speed being 43.8 miles per

hour. The run from Philadelphia to Harrisburg, 105.3 miles, was made with an engine having five and one fourth foot drivers and seventeen by twenty four inch cylinders, without a stop, at the rate of forty miles per hour. Grades of from fifty to eighty-four feet per mile probably accounted for the comparatively moderate speed, which, however, was quite uniform. The road bed, as is well known, is one of the best in the world.

The timing of the New York Central's "limited" was from Albany to Buffalo, a distance of 296.5 miles, covered in seven hours and twenty-five minutes. Two regular stops were made and four others for water. Like the Pennsylvania's, this train consisted entirely of Pullman cars, but it was somewhat lighter in weight. The engines used had eighteen by twenty-four inch cylinders, with six foot four inch drivers, and seventeen by twenty-four inch cylinders and five and one half foot drivers respectively. The average speed, deducting the stops, was forty-four miles per hour, and a maximum of sixty-two miles per hour was reached on a down grade. Both trains had luxurious drawing-room and dining cars, though it must be admitted that eating in the latter was a somewhat precarious process. Each train arrived at its destination a few seconds ahead of its schedule time.

The train known as the "Flying Yankee," which has run the past summer between St. John, N. B., and Boston, over the European and North American, Maine Central and Eastern Railroads, makes the distance of four hundred and forty-nine miles, from Carleton (opposite St. John) to Boston, in fifteen hours, which means a uniform speed of nearly thirty miles an hour. The delays at the custom-house are reduced to a minimum, and the train, which consists of about five cars, has proved a success.

The competition between the Canadian Pacific and Canada Atlantic Railways has recently resulted in the latter putting on a train which may dispute with the two fast trains of the Pennsylvania and Bound Brook routes between



SOME OF THE ADVANTAGES OF THE KEYLESS BOX.

Deacon Jones, of Pumpkinville, calls for an express wagon. The department, on its arrival, was obliged to confine itself to puns — there being nothing but words to play on.

Jersey City and Philadelphia the claim of "the fastest train in America." The Canadian train, according to its schedule, runs from Coteau to Ottawa, 78.4 miles, in one hour and thirty-four minutes, with three stops. This is at the rate of fifty miles an hour, and, indeed, the time allowed for a stretch of eleven miles necessitates the speed of a mile a minute.

Mining and Geological Excursion to Virginia and West Virginia.

I.

DURING the latter part of last term the students of the Mining and Chemical Department received invitations to become members of a party to visit the newly developed mining lands of Southwestern Virginia and West Virginia. The object of the excursion was to benefit the members by giving them chances to make a practical study of mines, smelting works, and

geology, and publishing results obtained. Whenever a mine or furnace was visited one member of the party was appointed captain, and it was his duty to see that each member of the party worked up and reported on some special topic connected with the subject. In this way very full reports of all places visited were obtained.

June 14 the following persons started: —

Prof. and Mrs. J. M. Ordway, Prof. and Mrs. R. H. Richards, W. S. Allen, W. H. Bunce, T. C. du Pont, F. M. Haines, G. H. Heywood, J. G. Holder, E. Morss, H. MacRae, T. W. Robinson, C. S. Robinson, E. T. Sturgis, D. Wesson, N. Ward.

Travelling via New York, Philadelphia, and Harrisburg, Roanoke, Va., was reached. Here we attended a meeting of the mining engineers, who occupied the town to such an extent that we pushed on to Abingdon. Here we visited tobacco factories and brick works. A fifteen-

mile drive in springless wagons over the roughest roads in the country took the party to Shady Valley, Tenn. Here the night was passed in two log-cabins, one room each, without windows. The people entertained us as best they could, but sauerkraut and lettuce, with a dressing of buttermilk and onions, were too much for us. Families, visitors and all slept in same room. At "Shady" we saw in operation one of the few remaining Catalan forges. On a charcoal fire two feet square, driven by a water blast, iron was reduced directly from the ore, and by means of a rude trip-hammer made directly into bars. Two men make two hundred pounds per day, worth three cents per pound. Have to pay for use of forge, charcoal, ore, and time. Not much wealth in Shady.

From Abingdon next went to Johnson City, Tenn., whence a ride of thirty-four miles over a new narrow-gauge road, through magnificent scenery, brought us to the Cranberry mine, North Carolina. Here some of the finest magnetic ore in the country is obtained. The cuttings made by the road expose all the rocks from the Laurentian to the Calciferous. Weathering is shown on a tremendous scale, gneisses and diorites being decomposed often to a depth of two hundred feet, still showing all the plications of the strata and even the texture of the original rock, but crumbling at the touch.

Saltville was the next point of interest. Here salt-wells and evaporating furnaces, together with some gypsum quarries, took up our attention. We saw, also, palpable evidences of the war in the shape of old fortifications and dismantled cannon.

From Wytheville as a starting point we made a two-days' wagon journey to Wythe, visiting on the way the Ivanhoe furnace at Van Liew, and the remarkable limonite, ore beds, which supply it with material to turn out twenty-five tons per day of first class pig-iron. This furnace has hot blast and all modern improvements. At Wythe the famous lead-mine was visited. This mine supplied bullets to the soldiers of the Revolution, and more recently to those of the

Confederacy. A shaft two hundred and forty feet deep is used as a shot tower. Col. Raper, the superintendent, and his wife, entertained us splendidly. At Wytheville a day was spent resting under the hospitable roof of Col. Boyd, who made it one of our pleasantest stops.

The Bertha zinc works at Martins were the next inspected. Mr. Jones, the superintendent, seemed never tired of answering our questions, and gave us many points about zinc manufacture. We spent a very pleasant evening at his house. The next day, June 16, the Natural Bridge was visited, and Clifton Forge, the headquarters of the Chesapeake and Ohio Railroad, was reached.

The objects of note here are the miserable hotel and the Iron Gate, a magnificent broken anticlinal fold. What remains beyond the gate is best told in another article. D. W., '83.

The Broad Street Station.

THE new Broad Street station of the Pennsylvania Railroad is one of the most complete structures of its kind in this country. It is the terminus of the elevated viaduct of the Pennsylvania road, and is situated almost in the heart of the city. Eight tracks for passenger service are lead into this structure. About two hundred and fifty passenger trains arrive and depart from the station daily during the week, and fifty-one trains arrive and fifty five depart each Sunday.

It is obvious that the handling of this immense traffic, where human life is involved, must require a system of administration little short of perfection in order to insure safety. As regards the management of its passenger traffic this road has no peer on this continent.

The Philadelphia station has two stories for the accommodation of the public, and a third for its offices.

The ground floor contains two baggage rooms, a carriage court, and a large vestibule containing the ticket offices and entrance to the passenger elevator.

Passengers arriving in carriages or omnibuses are driven into the court, and alight under cover without the least inconvenience from rain or

snow, step into the vestibule and buy their tickets while Jehu is unloading their baggage, and in a moment it is checked to destination on the presentation of ticket, and the owner is ready to step into the elevator which lands him upon the upper floor or general waiting-room on a level with the railroad tracks.

On this floor there are the general waiting-room, women's waiting room, restaurant, lunch counter, barber shop, bath-room, and sanitary closets.

Large clocks running on standard Philadelphia mean solar time are in each waiting-room. A wide stairway leads from the vestibule below to the main room above. At the head of this stairway, visible from it as well as from the floor, are several of Boynton's patent train bulletins which give the uninformed the times of departure of all trains; tell whether they are express or accommodation trains, and the stations where they stop.

These bulletin boards are a new invention and for convenience and appearance are a great improvement upon the old sliding board affairs in general use.

Outside the general waiting-room is a broad platform which leads to the entrance and exit gates, to and from trains. These gates are distinguished by signs over them bearing the words "exit gate" or "entrance to trains." Smaller signs are hung near each entrance gate when a train is ready, indicating what train departs from the track opposite that gate. These are in fact abstracts of the train bulletins inside the main building.

So great is the number of passengers, and so innumerable the questions they ask the gate-men, that the company have endeavored to answer automatically the most frequent inquiries by putting large clocks, one in the middle and one at each end of this large platform, for the benefit of those who have just looked at the two clocks inside, and have placed bulletins upon which are noted the time each train is due, and whether it is "on time," or, if late, how many minutes.

Not content with this the company has two or three vocal acrobats who call all trains through the waiting rooms, giving the stations to which they go and answer inquiries from anxious itinerants.

In the middle of the main platform is a "bureau of information," where, seated opposite a small window, is a careworn individual who is being immolated upon the altar of the mighty and restless god of travel.

This man is in light attire, closely shaved, with clipped hair, and sharp features so as to present as little resisting surface as possible to the air batteries brought to bear upon him hour after hour, day after day. He is an encyclopædia of railway information; he knows every train on every road in the United States, when it goes, where it goes, when and where it will stop, how long it will take, what it will cost; in fact, he can tell you anything you ever heard, saw, read, or thought of about trains. He can tell you when you left home, how long you have been absent, where you have been, when you are going home, what train you will take, what it will cost you, and what your wife will say when she gets her clutches on you once more.

At one end of this platform is a freight elevator for outgoing baggage, at the other one for the incoming baggage. Three wide exit stairways lead directly from this platform to the street below. Fire alarms are sounded at irregular intervals day or night, which call out the employees for drill with apparatus, kept in the building for its protection. This prevents their absence from the building during their hours of duty or else leads to their detection. With such a system as they have at this station, an intelligent man could travel for months and need never ask a question. But it appears from experience that those who learn from the sense of sight are in the minority. The masses depend upon the sense of hearing, upon being told all things; preferring the evidence given by the coarser vibrations of aerial particles, to that given by æsthetic, infinitesimal excursions of the molecules of attenuated ether.

Department Notes.

The Stevens Institute of Technology at Hoboken, N. J., now has instruction in Electrical Engineering.

A full description of the Green Mountain (Mt. Desert) Railroad is given in the *Journal of the Franklin Institute* for September.

The Electrician is publishing an interesting series of articles on Steam Engines for Electric Lighting Plants, by Prof. R. H. Thurston.

There are now several electric railways in Great Britain, and an electric tramway in Paris, of which details are given in *The Electrician* of Sept. 8.

The Bower-Barff process of protecting iron and steel by oxidation is described in a paper by the inventor in recent numbers of the *American Engineer*.

Probably the strongest single electric light in the country is in front of the *Record* building in Philadelphia, ninety feet above the street. Its power is equal to that of ten thousand candles.

In regard to the standard time for railroads, the *Iron Age* has an article advocating the adoption of Greenwich time and the numbering of the hours from one to twenty-four. A correspondent of the *Railroad Gazette* elaborates a graphic time table, on which ordinates represent distances and abscissæ times. Then the diagonal lines will show the course of the trains and the times of their passing each other and the stations.

Cotton, Wool, and Iron, for Sept. 29, contains a report of some comparative boiler tests made at Menlo Park, N. J., to determine the difference between burning cheap fuel with and without the Jarvis furnace. The test showed an economy of about twelve per cent in the cost of fuel for the same amount of water evaporated, and nearly fourteen per cent in the amount of water evaporated for the same cost of fuel.

A committee appointed by the Legislature of Georgia to investigate and report upon the advisability of establishing a school of industrial science in that State have visited a number of

such institutions in New York and New England, and, as a result, will unanimously report in favor of the proposition. The committee pay a well-merited compliment to the Massachusetts Institute of Technology. Technical education is attracting attention both here and abroad. A paper on the subject appears in the *American Machinist* of Sept. 29.

A new compound locomotive is in course of construction at Crewe, England. It has two high pressure cylinders thirteen inches in diameter, and one low-pressure cylinder of twenty-six inches. The valves of the high-pressure cylinders are placed beneath the cylinders, which, it is expected, will save friction when the engine is running without steam, by keeping the valves away from the seat. This engine is similar to the Webb compound locomotive of the London and Northwestern Railway which proved satisfactory. Several other British railways intend trying this type of engine, and it is also being experimented with on the Continent.

The architects live on hope, they say. It seems to be a light but nourishing food.

Each week it is, "Next week we will be in the new building and begin work." But we have n't begun.

The beautiful new desks are finished, they are models of elegance, and like the regulation gilt bamboo drawing-room chair, they are more for looks than for use. The drawers have been made just eleven inches long, a very convenient size for twelve-inch rules and scales, but a trifle large for pencils.

We are all very happy to be excused from exercise on the patent calf developer, for small legs are now the fashion, but we all agree that it is quite right that the new men fresh from the country should be taught that land in town is dear, and houses are often more than two stories high, and elevators are a new fangled, dangerous machine. But we hope the Freshmen understand it was simply from a hygienic point of view that they were put so high, for no reason but for exercise and pure air. The fine view is thrown in gratis.

To say that the architects have not begun work does not mean that they are idle, for an architect never idles.

We have one or two problems to work on.

A sketch for the six-column problem is to be handed in immediately, and sketches of five or six dormers are to be ready for use as soon as we are settled.

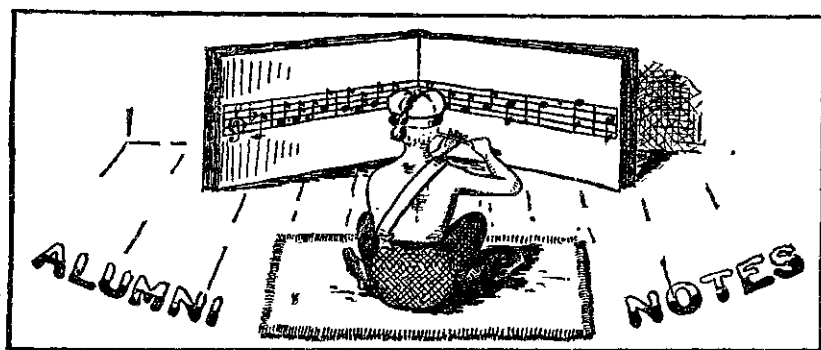
The six-column problem appears each year, as regularly as the reddened leaves and white frost, and each year the accumulated energies of vacation are expended upon it.

"A certain wealthy gentleman,"—that starts out with the promise of a good novel, but there is nothing novel about it; would that all our clients through life were as rich as those we meet with before we leave school. Is it not quite a dangerous practice for the professors to always hold rosy tinted glasses before our eyes,— "has six columns, ten feet long." We are left to conjecture where he got them; but then they are solid, tangible blocks of stone. Maybe he inherited them,—a very good way to get anything, for no man would be fool enough to buy such things, even at auction. Maybe some lady gave them to him for a birthday gift. (N. B.) To the ladies: This idea is copyrighted as quite original, so beware using without legal right.

"He wishes to use the columns, and wants a design for a fountain, gateway, monument, summer house, or boat house, or some building in which the columns will be the principal feature. Expense unlimited." Architect's fees twenty-five per cent. We think after this we will all agree that it must have been some lady friend who gave him the columns. For if he had inherited them, they would probably have lain in his back yard, in their boxes, untouched, with weeds and grass growing over them, till perhaps in clearing his yard to build an addition, in a fit of generosity he gives them to the town, which receives them with thanks, and uses them for a porch to the new jail in course of erection. But as we have assumed them to be a touching birth-

day gift from a dear friend, he naturally seeks to use them in a striking and beautiful manner, in appreciation of the delicate sentiment of the gift. So we young designers, in the innocence of our hearts, feel proud of the commission, and put the best of our stock of choice and poetical ideas into the work, hoping to please the "dear friend" with the original treatment of her present. But we can't help thinking that after a few years when the dear friend is somebody else, not such a dear friend, and is driving with our client under the arch, and he says, "My dear, see how much I thought of you a few short years ago." She will reply, "Yes, before I married you I could not say how hideous I thought the affair, so crude and academic, and I have always wondered how you could have employed Technology students to design so expensive a monument." But the problem is here, and the woman is n't, so let us brace!

The Washington Monument is still unfinished, but the view one gets from the top is well worth the elevator trip necessary to reach its summit. There can now be seen from the top, Round Top Mountain in Maryland, 40 miles north-north-west; Bull Run Mountains, foot-hills of the Blue Ridge Range, about 45 miles to the westward. The masonry is now 370 feet high and the iron work 30 feet higher. The engineers hope to have the stone work up to 400 feet before the snow flies. There are 168 blocks in one course of two feet, and it takes a month to cut three courses. When finished the monument will be 555 feet high. The engineer in charge estimates that it would take a globe about fifty feet in diameter representing the earth, for the monument when finished to be visible to the naked eye. For the benefit of the "Civils," who will soon have to make estimates on masonry, we give the following prices: The materials heretofore used have cost, marble \$1.35 per cubic foot, with 82 cents for cutting, and the granite 50 cents per cubic foot, with 75 cents for cutting. Under the last contract the marble cost \$1.50 per cubic foot.



[This department can be made complete only by continued contributions of items of general interest in connection with the lives and occupations of instructors, alumni, and former members of the Institute. We invite the co-operation of each alumnus, and ask for full and frequent contributions to the column.]

W. E. HOYT. — Formerly professor civil engineering at Institute, and on C. B. & Q. Railroad, is now chief engineer of Rochester & Pittsburg Railroad.

J. DUFF, JR., '81. — Big Lode Mine, Atlanta, Alturas Co., Idaho.

B. G. COLLINS. '81. — Quartermaster on a steamship running between New York and Rio Janeiro.

EDWARD F. ELY, '82. — Instructor in architecture, M. I. T.

HARRY A. FOSS, '82. — Law student, Boston University.

H. WARD LEONARD, '83. — Engineering department, Edison Electric Light Company, New York.

J. G. EPPENDORF, '83. — Assistant to Prof. Lanza, M. I. T.

GEO. R. UNDERWOOD, '83. — Assistant to Prof. Wing, M. I. T.

JOSIAH PIERCE, JR., '83. — Northern Transcontinental Survey. During summer is with Wilson's party, Montana; winters, Newport, R. I.

FRANK TENNEY, '83. — Chemist with Pennsylvania Steel Company, Steelton, Pa.

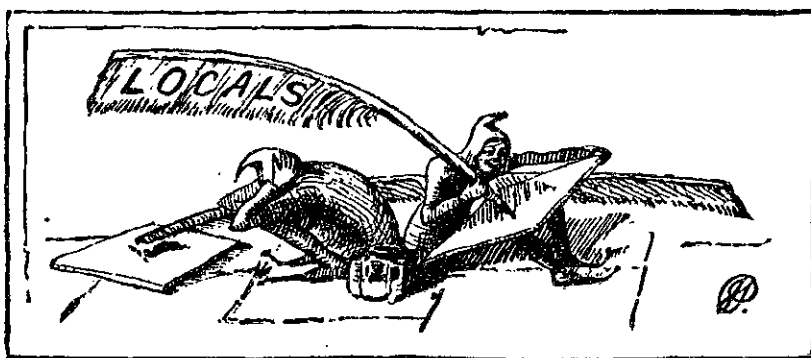
GEO. J. FORAN, '83. — Deane Steam Pump Company, Boston.

R. W. HARDIN, '83. — Louisville, Evansville & St. Louis Railroad, prospecting, and managing a coal mine.

RALPH H. DAMON, '84. — In a flannel mill, Westvale, Mass.

T. C. DUPONT, '84. — Coal mine, Central City, Ky.

E. C. HILLYER, '84. — Proprietor Warwick Iron Works, Newport News, Va.



Shake!

Hullo! '87.

Glad to see you back.

Now is the time to subscribe.

What is the name of the new building?

There is a very large class in as-aying. Now is the time to subscribe.

'83 contributes three assistants to the Institute this year.

The V. L. begins the year with seven members.

We learn that the 2 G is undergoing a re-organization.

The Freshmen have taken time by the forelock and organized a foot-ball team.

The chief advantage of the new building is that it would look just as pretty upside down.

'85 lost one of her most popular members by the failure of "Jim" Kimball to reappear.

It is rumored that the Freshmen are about to petition for brass buttons on their uniforms. "Hope springs eternal," etc.

Students are requested to call at the bursar's office for their term bills. Now is the time to subscribe.

Leonard was in town for a few days, "on business"; presumably to turn the Institute over to Pres. Walker.

The Institute is honored by the attendance of a Freshman who has "studied all the sciences but one."

Keys to the reading-room lockers will be redeemed at any time between one and two this week at Room 29.

The *Journal* kindly corrects "An Inquirer" who mistook a squad of '86 civils with their red and white poles for the class in easy shaving.

The new building may not be much on looks, but when you come to convenience and fitness for its use it's there every time.

We regret to learn that Mr. Fisk, of '83, has left the Institute. In his resignation the football team loses an excellent manager.

A-rig-a-"gig-gig" and away we go is now the song of the miners. Mr. Haines leads the chorus.

Owing to the fine weather the second-year civils are already well started in their field work.

Five minutes seems a short time to allow for going from the Freshman drawing-room in Rogers to the laboratory in the top of the new building.

Prof. Atkinson tells us there is to be the long-wished-for "Historical Laboratory" among the new things of the Institute. Now is the time to subscribe.

Why not formally open the new building with a hop? Let some energetic man take hold and talk the thing up. Now is the time to subscribe.

The Sunday *Herald* of August 19, in an article entitled "A Greek of Modern Life," devoted something over a column to the doings and characteristics of Pres. Walker.

The foot-ball team should have all the encouragement possible from the students. A second eleven should be formed for the regular team to practise against.

It is reported that one of the mechanicals was well-Nye swamped by the slipping of an eccentric in a steam yacht on one of our New England lakes during the past summer.

The work so far in the Laboratory of Applied Mechanics has been confined to testing steel boiler plates for the new boiler and also leather belting. The researches made in the latter by the fourth year mechanicals have been very interesting.

The many friends of Mr. Hollerith, formerly in the mechanical department, miss his genial company and the excellent instruction received from him last year. Mr. Hollerith has accepted

a position in the Patent Office at Washington and will not for a time at least return to the Institute.

F. M. Kimball, '85, and R. G. Gamwell, '86, elected editors in THE TECH, have resigned, the former having accepted a more lucrative position with the Am. Electric Light Co. of this city; the latter on account of his absence in Europe, where he is about to start on a bicycle tour.

At the last regular meeting of the *Γ. Σ. Υ.* the following officers were elected: Pres., Chas. C. Bothfeld, '84; Vice-pres., Geo. L. R. French, '84; Sec'y, A. R. McKim, '85; Treas., C. J. Carver, '84; Com on membership, G. L. R. French, H. D. Bennett, '84, Sidney Williams, '85.

The senior mechanicals are indebted to Capt. D. A. Lyle of the Ordnance Department, U. S. A., now at the Institute, for copies of a government report on the "Manufacture and Uses of Files and Rasps," by Capt. D. A. Lyle and S. W. Porter. The volume is profusely illustrated and treats the subject exhaustively.

A Boston gentleman was heard to remark to a stranger standing on the Brunswick steps, that "The large new building accross the way belongs to the Institute of Technology and was designed by the students." "Indeed —" But we won't finish, for fear of flattering architectural students, or perhaps offending the architect.

The following shows the increase in the number of students in the year '83-84 over that of '82-83: —

		'83-'84	'82-'83.
Reg. 1st year		150	114
" 2d year		65	57
" 3d year		39	29
" 4th year		28	19
Special		135	149
Spec. arch. . . .		26	
Mechanic arts, reg.		30	37
" spec. . . .		24	
		497	405

The numbers in the first column are liable to further increase. The total number of new students is two hundred. Now is the time to subscribe.

List of Publications, M. I. T.

[In 1882, Professor Nichols compiled his "Publications of the M. I. T. and of its Officers, Students, and Alumni." THE TECH has undertaken to publish from time to time a continuation of this list. In order to make the record as complete as possible, professors, alumni, and students are requested to send us as promptly as possible the titles of any books, pamphlets, or periodical articles which they may publish.]

Mass. Institute of Technology. — In memory of Prof. William Barton Rogers, LL. D. [Circular with reference to the Rogers Building], pp. 3, May, 1883.

— [Circulars of Information.] Course II., Mechanical Engineering. Course IV., Architecture. Course VII., Natural History. Each pp. 3-4. 1883.

— Circular referring to the Lowell School of Design, dated May 21, 1883. 8vo, pp. 4.

Society of Arts. — Abstract of Proceedings for the twenty-first year, 1882-83. Pph. 8vo, pp. 129. Boston, 1883.

Alumni Association. — Constitution, list of officers, etc., 1883. Pph. 8vo, pp. 12. Boston, 1883.

Class of 1881. — Class directory, list of officers, etc. Pph. 12mo, pp. 8. 1883.

Atkinson, W. P. (Prof.) — Remarks on the late President Rogers. *Proc. Soc. Arts, M. I. T.*, 1882-83, 7-9.

Barrows, Walter B. ('76). — Flight of the Flying-Fish. *Science*, I. (1883), 603.

Blodgett, Geo. W. ('73). — Electric Signal Clock. *Proc. Soc. Arts, M. I. T.*, 1882-83, 54.

Burton, A. E. (Instr.) — Topographical Methods of the U. S. Coast and Geodetic Survey. *Proc. Soc. Arts, M. I. T.*, 1882-83, 109.

Crosby, W. O. ('76). — Elevated Coral Reefs of Cuba. *Proc. Bost. Soc. Nat. Hist.*, 1883. Abstract in *Am. Jour. Sci.*, XXVI. (1883), 148.

Cross, Chas. R. ('70). — Remarks on the late President Rogers. *Proc. Soc. Arts, M. I. T.*, 1882-83, 24-28.

Fletcher, C. R. ('76). — Cause of a peculiar Condition of some American Water Supplies. *The Analyst*, VIII. (1883), 134.

Hall, Francis P. ('82). — Action of Vegetable Acids on Lead and Tin. Also, *Chem. News*, XLVII. (1883), 290-291, 300-302.

Hollerith, H. (Instr.) — Two Forms of Dynamometer. *Proc. Soc. Arts, M. I. T.*, 1882-83, 56.

Kinnicutt, L. P. ('75). — (With J. U. Nef.) The Volumetric Determination of Combined Nitrous Acid. *Proc. Am. Acad.*, XVIII. (1883), 275-76.

— (With G. M. Palmer.) The β -Phenyltribromopropionic Acid. *Id.*, XVIII. (1883), 277-281.

— "Rex Magnus." *Science*, II. (1883), 345.

Minot, Charles Sedgwick ('72). — Researches on the Dicyemidæ. *Science*, I. (1883), 392.

— Early Development of Reptiles. *Id.*, I. (1883) 15, 11.

— Composition of the Mesoderm. *Id.*, II. (1883), 11.

Noticeable Articles.

NINETEENTH CENTURY, June. "Why Send more Irish to America?" by Prof. Goldwin Smith; and in the July number, "Why Send more Irish out of Ireland?" by A. M. Sullivan.

"The Fortress Prison of St. Petersburg," by Prince Krapotkin, who has been inside of it. Prince Krapotkin is a man of great scientific ability, but a violent radical. He is now in prison for political offences in France.

"Wallenstein," by H. Schütz Wilson.

NINETEENTH CENTURY, July. "Whither shall I send my Son?" by Major-Gen. Fielding.

"House-Lighting by Electricity," by Viscount Bury.

NINETEENTH CENTURY, August. "A Leaf from the Real Life of Lord Byron," by J. A. Froude; and in the *Fortnightly*, for August, "Byron and his Biographers," by C. S. Venables, Q. C. These articles were occasioned by the publication of Jeaffreson's book, "The Real Lord Byron." Though the atrocious charges of Mrs. Stowe have long been refuted, yet the character of Byron as a man and a gentleman is not raised by these new discussions.

"The Locust-War in Cyprus," by Miss Constance F. Gordon Cumming. A curious account. Miss C. is the author of entertaining volumes of travel in the South Seas, India, and elsewhere. She almost rivals Miss Bird.

FORTNIGHTLY, June. "The Poetry of Arthur Hugh Clough," by R. H. Hutton. Let readers who are not already acquainted with it read Clough's charming college poem, "The Bothie of Tober-na-Vuolich, a Long-Vacation Pastoral."

"Robert Browning, Writer of Plays," by W. L. Courtney.

CONTEMPORARY, July. "Luther," by J. A. Froude. Concluded in the August number. Written with Mr. Froude's usual force. The "Life of Luther," by Köstlin, which is reviewed, is about to be translated, and will, apparently, be far better than anything we now have in English about the great reformer, the four hundredth anniversary of whose birth will be celebrated in Germany next month.

"Count Rumford," by Prof. Tyndall; an interesting account, based upon the life, written for the American Academy, by the Rev. Geo. E. Ellis, of that remarkable Yankee, Benjamin Thompson, of Woburn, Mass., Lieutenant-Colonel Commandant of Horse Dragoons, and Count of the Holy Roman Empire.

MACMILLAN, June. "W. R. Greg, a Sketch" of a very remarkable writer.

"The Old Virginian Gentleman," a pleasant account of an old Virginia plantation since the war.

"Francis Garnier, the daring French Explorer," who was the remote occasion of the French war in Tonkin.

W. P. A.

The College World.

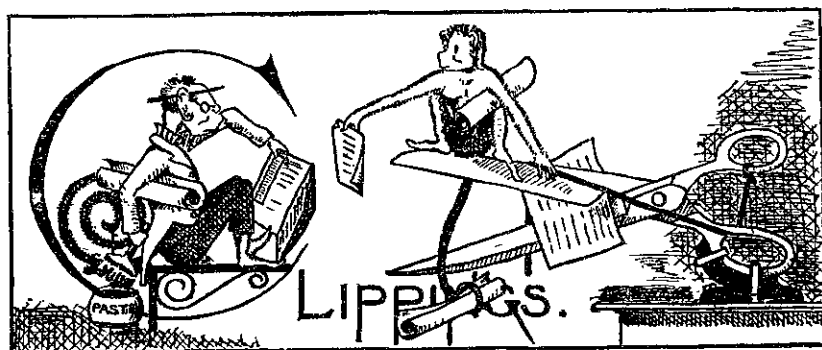
THE editors have thought it advisable to dis-
continue the exchange column of THE
TECH for the reasons set forth in the last num-
ber of Volume II. We shall hereafter endeavor
in this new department to keep our readers in-
formed of the more important doings and hap-
penings in the college world, and when
necessary or desirable we shall supplement the
simple items by more or less extended editorial
comment.

COLUMBIA. — Ninety-two Freshmen. Hard outlook for athletics. Only three of the old crew left. An Indian entered in '87. Several new instructors. A college lunch-room, always desired, at last provided.

AMHERST. -- Work begun on the new gymnasium. It is to contain a billiard room for the use of the students. Sixty-five in the Freshman class. Great interest in tennis. The Freshmen show little interest in athletics. Unusually good prospect for base-ball.

HARVARD. — Law students are in the new building, although it is not yet completed. Most of the members of last year's winning crew have returned. A new steward at Memorial Hall. 'Varsity crew said to row in finer form than any previous crew in college. Physical laboratory is well under way. Very good outlook for the foot-ball team. Lacrosse team has begun work. Rev. Edward Everett Hale conducts morning prayers; a boy choir has been introduced. Tennis is at a discount. Three hundred and seven Freshmen have registered. Six hundred boarders at Memorial Hall.

ELSEWHERE. — Yale has a new surgical laboratory; new chemical lab. in prospect. — Cornell is to have a regular department in physical culture. — The Princeton *Tiger* could not survive the departure of '83. — A \$3,000 prize goes to the Freshman who passed the best entrance examination at Brown. — The University Shooting Club at Ann Arbor is flourishing.



TAKEN FROM "LIFE."

A stuck-up cuss—the man in the moon.

“ But yet a woman ” — Dr. Mary Walker.

A dark horse — the night-mare.

It's a cold day when an Arctic expedition gets left.

A novel idea — the plot of the story.

The paternal achers — the gov'nor's teeth.

One way to give a man a chance to rise in the world
— knock him down.

Spectrum analysis reveals dark lines in butter.

No intelligent lawyer will take the will for the deed.

Dr. Mary Walker says she will go on the Greely relief expedition. It can be seen from this that Lieut. Greely is really in great danger.

The weakening of the chemical market has enabled the telegraph companies to reduce their nitrates.

A little peach in an orchard grew,
Of emerald hue — so rare,
Our baby on that peach did chew
And climbed the golden stair.

Mr. Trulala (to barber, after enjoying a hair cut and his first shave and receiving his check): I think you've made a mistake. Is n't a shave twenty cents?

Barber (*deprecatingly*): Really, I could n't think of charging for that, sir.

NIHILIST SONG.

Twinkle, twinkle, little Czar;
Now I wonder how you are!
Up above the world you shy,
Light with dynamite — Oh! my!

Younger sister: "Miss Jones told us to-day in school that young people who read Byron lose all their freshness. Have we a copy in the house, Mary?"

Mary (doubtfully): "Yes, Clara, why?"

Clara: "I want to read some to Tom before he goes back to college." — *Chaff.*

Our professor of chemistry explains that CO₂ “raises the biscuit.” — *Phoenix*.

WANTED. — Some one to love. Best city references required. No Irish need apply. X. X. X., *Lampoon* office.



Our friend Hadley, who rooms on Boylston Street, after repeated lectures from his landlady for disturbing the house at unseasonable hours, determines that it shall not occur this time, and carefully removes his shoes as soon as he strikes the public garden.

HER PICTURE.

Sunlight falls on her pictured face,
Rimmed in a frame of gold;
The self-same pose of a careless grace
That I remember of old.
'T was here we stood long years ago,
She in that very dress!
And I heard this syllable, sweet and low,
From her rose-red mouth, 't was — yes!

So many years! and yet, I'll swear,
Now, standing in this place,
I can smell the rose she hath in her hair,
While I look upon her face!
I feel the clasp of her slender hand,
Gentle, yet clinging fast,
And I almost feel I am young again,
Though so many years have passed;

And yet, could I live over the space
Of those Indian summer days,
Bring back to my life this sweet, fair face
The canvas here portrays,
Were it wise to lose the peace that is mine
For the restless hopes that have fled?
Not so; whatever is — is best;
“Let the dead past bury its dead.”

Ex.

It is put up or shut up with an umbrella.

Students (after a sumptuous repast, to host): “Our compliments to your kitchen and cellar. We have agreed to have a running match, and the one who comes out last will pay the bill. Will you kindly give us the signal to start?” The beaming host slowly counts one, two, three; the students disappear round the corner and are seen no more. — *Fleigende Blätter.*

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Washington Street.

A Terror.

WHAT wild alarm rings through the
calm night air?

Sounds it a knell of death or grim
despair?

What frightful terror can there be
abroad,

To wake these clanging bells to such
discord?

They ring and rant within my very
room,

They fill my ears with sounds of
coming doom,

'Till, numb with terror and with wild
affright,

I spring from bed to glare into the
night.

And then I find what made the
grand uproar;

It was a sound you all have heard
before, —

A little clock which said, between
its ticks,

"Get up, my slothful friend, 't is
half past six." XED.

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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.

FRANCIS A. WALKER, President.

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In order to cancel our obligation to the mother country on account of the English sparrow, suppose we export a few million New Jersey mosquitoes.

The adulteration of food has actually gone so far that they are serving up Cochituate water in some of the hotels and calling it consommé soup.

It is rumored that an '85 man who has reappeared at the Institute has taken unto himself a wife. If so, we congratulate him on having so successfully solved the problem of coeducation.

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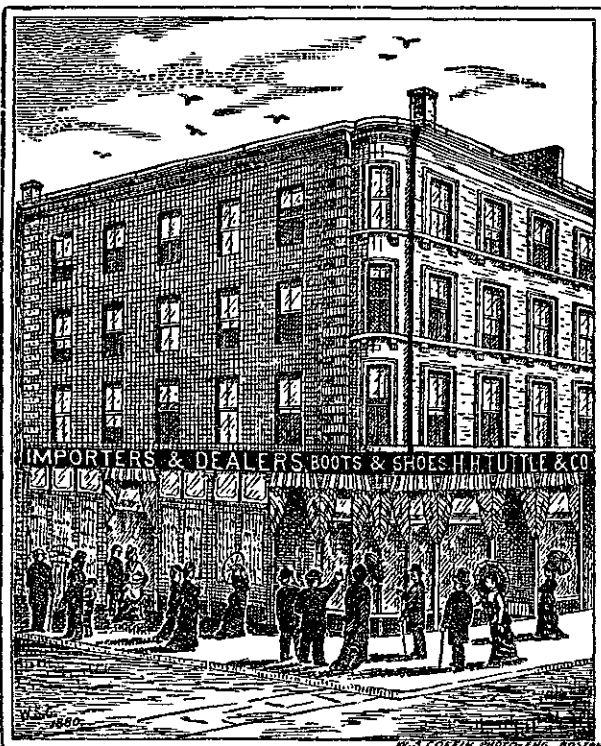
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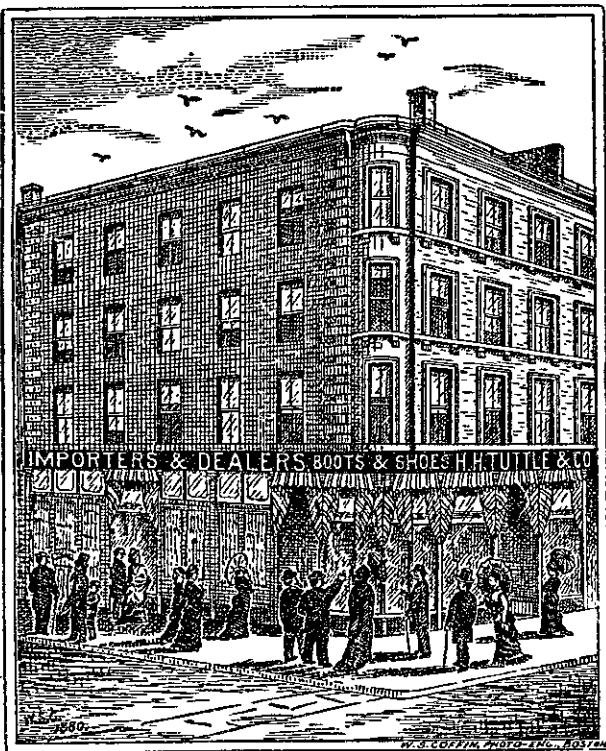
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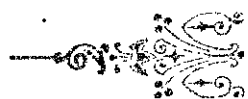
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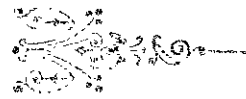
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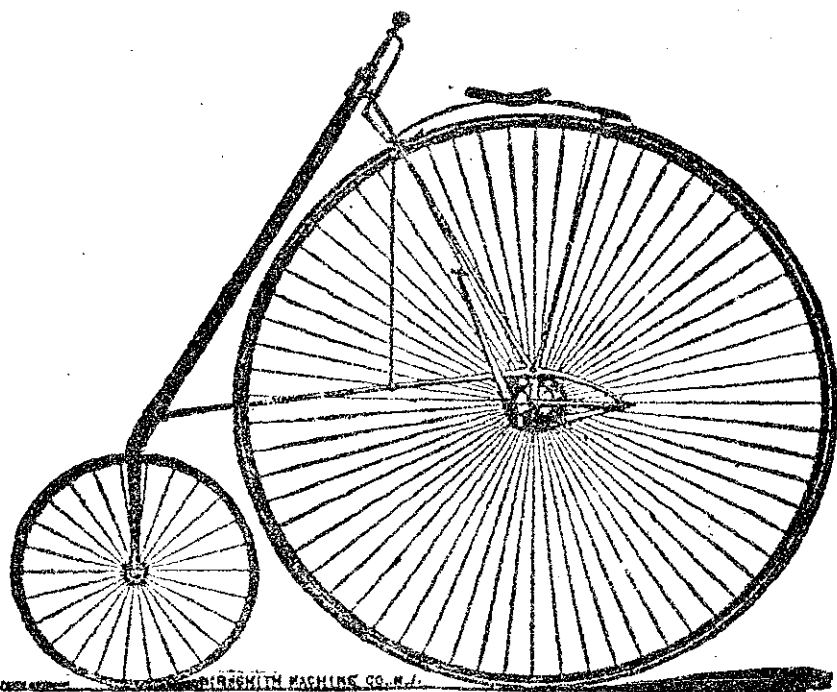
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