

HATTERS,

English and American

**SILK DRESS HATS,
OPERA CRUSH HATS,
FELT and CLOTH HATS**
In Choice Shades.



FURRIERS.

**LEATHER HAT CASES,
CANES, UMBRELLAS,
and WALKING STICKS**
Variety Unsurpassed
For *STUDENTS' WEAR.*

Agents for Heath's, White's, and Lincoln, Bennett & Co.'s ENGLISH HATS.

COLLINS & FAIRBANKS, Successors to
D. P. ILSLEY & CO.,
No. 381 Washington Street, Opposite Franklin, Boston.

JAMES NOTMAN,

Photographer to Class of '85, Institute of Technology, and Harvard '80, '81, and '85.

Boston Studio, 99 BOYLSTON ST., Opp. Public Garden.

Harvard Studio, 400 HARVARD STREET, CAMBRIDGE.

RICHARD L. GAY COMPANY,

(RICHARD L. GAY, late of WARD & GAY.)

Will be pleased to see you at their

NEW RETAIL STORE,

332 Washington Street, - - - BOSTON,

Next Store South Transcript Building,

Where they offer the same complete assortment of goods with all the variety and special features of the old firm of WARD & GAY.

Paper by the Pound, Visiting Cards, Monogram, Crest, and Initial Engraving and Stamping.

They will soon open their Christmas Cards and Souvenirs, which will exceed anything heretofore shown.

Their new sample book of Papers and Envelopes sent upon application.

THE STAR SAFETY RAZOR

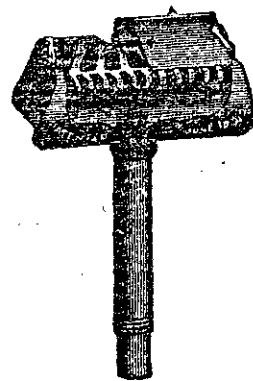
SELLING AGENTS,

Dame, Stoddard & Kendall,

Successors to Bradford & Anthony,

374 Washington St., Boston

Opposite Bromfield.



FISHING TACKLE.

FANCY HARDWARE,

AND
CUTLERY,

DEALERS IN

Requires no practice. Every man his own barber.

DERBYS. ——— SILK HATS.

BENT & BUSH,

Military Furnishers to the Institute,

387 WASHINGTON ST., BOSTON.

FURS.

THE

Massachusetts Institute of Technology,

BOYLSTON STREET, BOSTON.

FRANCIS A. WALKER, President.

THIS school is devoted to the teaching of science, as applied to the various engineering professions; viz., civil, mechanical, mining, and electrical engineering, as well as to architecture, chemistry, metallurgy, physics, and natural history.

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, and may be further pursued as optional studies.

Applicants for admission to the Institute are examined in English grammar, geography, French, arithmetic, algebra, modern history, 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, who have the necessary qualifications for entering the third-year class in any of the regular courses of the Institute, will be so admitted, provisionally, on the presentation of their diplomas, and will be given opportunity to make up all deficiencies in professional subjects.

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.

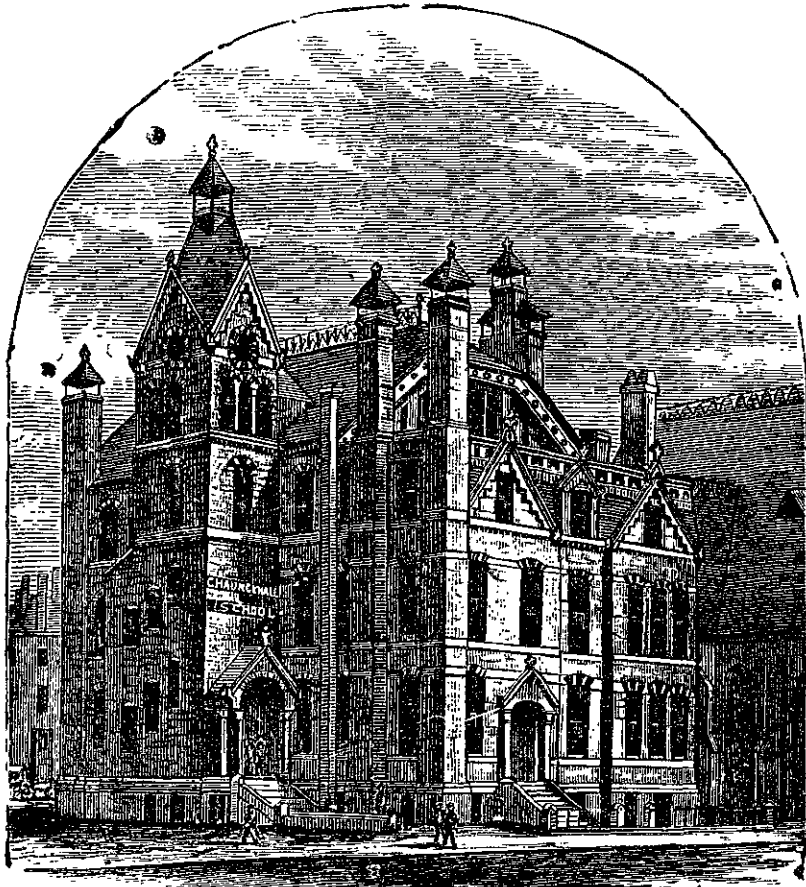
Surveying-instruments are provided for field-work in civil and topographical engineering. Extensive shops have been fitted up for the use of both hand and machine tools, and a laboratory of steam engineering has been established as a part of the instruction in mechanical engineering. Several steam-boilers and steam-engines of various types are available for experiments and tests, as well as a large amount of special apparatus for measuring power, for gauging the flow of water, for tests of belting, etc. The laboratory of applied mechanics contains two testing-machines,—one for ascertaining transverse strength, the other for tension and compression,—besides apparatus for time-tests on timber, for tests of mortars and cements, for tests of shafting, etc. 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 consist of a laboratory for general chemistry (288 places); a laboratory for analytical chemistry (108 places), together with a special room for volumetric analysis (20 places) and a balance-room with 22 balances; a laboratory for organic chemistry (30 places); a laboratory for sanitary chemistry (16 places); a laboratory for industrial chemistry (16 places); two convenient lecture-rooms; and a well-supplied library and reading-room. The laboratories are thoroughly equipped for the purposes of ordinary instruction, and they also possess excellent facilities for the promotion of original research. The Rogers Laboratory of Physics, the first laboratory in which instruction was systematically given to classes by means of elementary physical measurements conducted by the students themselves, is well provided with the needful facilities for laboratory instruction in both elementary and advanced technical physics, especially in the different branches of electrical engineering.

On the successful completion of any one of the four-year courses of the Institute, the degree of "Bachelor of Science" will be conferred. The degrees of "Master of Science," "Ph.D.," and "Doctor of Science" are open to persons pursuing advanced studies and conducting original researches. 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 fee for tuition 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.

For information, address JAS. P. MUNROE, Secretary.

PREPARATION FOR THE INSTITUTE OF TECHNOLOGY.



259 BOYLSTON STREET.

Wm. H. Ladd.

M. Grant Daniell.

REFERENCE

Is made to the President and Faculty of the Institute in regard to the thoroughness with which pupils are fitted at

**CHAUNCY-HALL SCHOOL,
BOSTON,**

not only for passing the entrance examinations, but also for pursuing successfully their subsequent work.

FITTING

for the Institute has long been a specialty at Chauncy Hall. Thorough preparation is made also for **Business and College.**

J. B. McALOON & Co

- Tailors -

Latest Styles.

First-Class Work.

SPECIAL PRICES

TO STUDENTS:

BOWDOIN SQUARE

EVERY STUDENT

Of Engineering should be a regular reader of the

AMERICAN MACHINIST.

Largest paid circulation of any strictly Mechanical Newspaper in the world.

PUBLISHED WEEKLY. SUBSCRIPTION PRICE, \$2.50 A YEAR.

AMERICAN MACHINIST PUBLISHING COMPANY,

96 FULTON ST., NEW YORK.

CAFÉ WAQUOIT,

249 Columbus Avenue.

SPECIAL RATES FOR STUDENTS.

21 Meal Ticket, \$4.00.

Lunch Ticket, \$1.25.

SIX O'CLOCK DINNERS.

Evening Lunches from 9 until 11.30 P. M., 25 cents.
Cold Meats, Sandwiches, Sardines, Lamb, Tongues, Pretzels, Saratoga Chips, Bologna Sausage, Baked Beans, Pie, and Crackers and Cheese.

BOSTON & PROVIDENCE R. I.

— CAFE —

PARK SQUARE AND COLUMBUS AVE.

EUROPEAN PLAN.

Open from 6 A. M. to 11.15 P. M.

☛ Six Dollar Students' Tickets, \$3.00

J. G. COOPER, PROPRIETOR.

OLD COINS AND STAMPS WANTED.

Send 10-cent Postage-Stamp for Coin Catalogue, giving all the dates and the prices we pay for them, to

JOHN C. SCHAYER, 147 Devonshire St., Boston, Mass.

Dealer in American and Foreign Coins and Medals, Confederate, Continental, and Colonial Notes, and U. S. Currency, Autographs, Old Newspapers, Relics, and Curios.

No letters of inquiry answered without stamp for reply.

GEORGE L. LANSING,

Thorough Instructor on Banjo and Mandolin

Agent for the Celebrated



**S. S. Stewart
Banjo.**

TREMONT TEMPLE ROOM 6

0.

k.

s.

E.

R.

are

ate,
obs,

in.

9.



JOHN A. LOWELL & CO.

161 Franklin Street,
BOSTON.

Engraving and Printing

Of every description.

COLLEGE & PARTY INVITATIONS,
VISITING & WEDDING CARDS,

Always the Latest Styles.

The Tech.

VOL. VI.

BOSTON, DECEMBER 30, 1886.

NO. 6.

THE TECH.

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

BOARD OF DIRECTORS, 1886-87.

T. W. SPRAGUE, '87, <i>Pres.</i>	H. C. SPAULDING, '87.
G. C. DEMPSEY, '88, <i>Sec.</i>	FRANKLIN W. HOBBS, '89.
W. L. DEARBORN, '88, <i>Treas.</i>	J. H. TOWNE, '90.

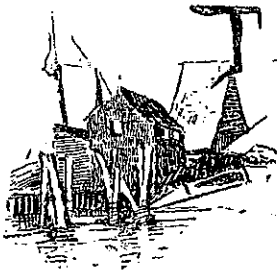
EDITORS.

SYDNEY WARREN, '88, <i>Editor-in-Chief.</i>	JAS. T. GREELEY, '88.
GEO. O. DRAPER, '87.	J. LAWRENCE MAURAN, '89.
QUINTARD PETERS, '87.	G. C. WALES, '89.
H. G. GROSS, '88.	

H. C. SPAULDING, *Advertising Agent.*

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

FRANK WOOD, PRINTER, 352 WASHINGTON STREET, BOSTON.



TECHNIQUE for '86 appeared the morning of the 23d, and within fifteen minutes the first lot of three hundred and sixty were sold out. This makes the outlook very encouraging.

In the general plan of its arrangement, it differs but slightly from that adopted by the '87 editors. A new and especially good feature adopted is the arrangement of the classes, in dividing them into their courses, and putting a man's first name first. A number of errors are noticeable in this, however; but this is mainly due to the fact that the names were taken from the Secretary's lists, which had not then been corrected. For a frontispiece there is a very good heliotype of Prof. Nichols.

In the arrangement of the local societies an unfortunate error has taken place, which, however, we learn is not entirely the fault of the editors. This is the putting of the K₂S Society at the head of the Local Societies. As this Society is the youngest one, its place should be last. '89 will do well to look out and not copy this error when it comes her time to issue the Annual.

Another department which has been much changed and bettered is the "grind" department. Most of the hits in this are especially good, and to the point.

A new idea has been introduced in the letters from each department. These are very well written, and some of the illustrations accompanying them are especially realistic and lifelike.

Undoubtedly the best features of the book lie in its cuts, the credit of which is mainly due to Messrs. Hoppin and Ray, though the whole Institute has contributed to them, also.

The most serious criticism to be made of it is in regard to its inaccuracies and omissions. Many of these could have been corrected easily; and as a work of this kind is intended as a correct and complete handbook, it is surprising that more care was not displayed here.

In regard to the cover we can say but little, except that we think it is an improvement over last year's. Of course it is impossible, with the present support, to get up anything so handsome and expensive as the leather cover of the Transit, but we think that the editors might have made a better choice.

As a whole we are very much pleased with the work, and consider it a credit alike to its editors, the Class of '88, and the whole Institute.

THE number of men who graduate from the Institute has always been small compared with the number who enter each year. This discrepancy is much greater than is usual at other colleges, and the causes which produce it should be analyzed, with a view toward remedying them, if possible. The usual idea is, that the courses of study are so hard as to shut out in time all those except the grinds or exceptionally bright men, and that fewer studies should be included, or the system re-arranged

in some manner. Although this may be an important factor in the case, there is another cause which seems to us to be just as effective. We think that mistaken choices of branches of study are very common, and have considerable to do with affecting the students' stay here. After a student has successfully passed through the general course of study of the first year, he has nine different courses of study before him, all scientific, but dealing with entirely different branches of science. Let us see what usually guides the students in his choice. It may happen that plans are all laid out for him, so that he knew when he entered what line of business he was to engage in on leaving, and so his choice is made for him. Another may know what branch he is most likely to secure a position in. Another may be influenced entirely by his tastes for certain work; while still another class have no decided preference, and base their decision on the easiness of certain courses, or what their friends are going to do, etc.

Now, the first two cases may find, after a trial, that the line of study they are pursuing is distasteful, or find that their abilities do not tend in that direction. If this is the case they had better drop out as soon as possible, and take something suited to them. In the fourth case it is merely a matter of guess-work, and may or may not be successful. We think that the number of graduates represents the men who chose the courses adapted to their tastes and abilities, and those who dropped out or became specials made mistakes in their choices. This may be rather a sweeping assertion to make, but it must be true for the main part.

It is plainly evident that more judgment should be used in the selection of a course of study. Once engaged in a certain direction, there is no other course open except by making a fresh start. As the aim of our different branches is to turn out specialists, the knowledge obtained all tends in one direction, and cannot be made useful in another line of business. Now, if a student is not perfectly sure about his decision, would it not be better

for him to take a course which combines many subjects and gives chances for options, thus going over a large amount of ground of a general character, all of the studies being practical and important? Such a course can be taken here, and a few students avail themselves of the chance. There is no doubt but that a man is better fitted for business not of a special character by a stock of universal knowledge of a practical character, than by a line of knowledge all running in one direction. There must be a large class of men here who are not going to be engineers or chemists, etc., and who are to engage in work which, though of a special character, in a sense, still requires diffused knowledge more than special. Of course if both could be combined, it might be more beneficial, but few of us have time enough to follow up both lines. Studies of a general character are introduced to some extent in the different courses, but form a small per cent of the whole. We think if more students took the general course there would be more graduates, and fewer disappointed hopes. There must be some cure for our existing evils, and we think that this idea would remedy some of them. We think that the general course will in time become one of the most popular, and succeed in drawing students here who now attend other colleges with the idea that this is but an engineer factory.

SMALL improvements often become of more general convenience or even necessity than most pretentious ones. We have songs — local and technical, class and social, without number, but no one seems to have had enterprise enough as yet to devise and introduce some short and useful combination of notes suitable for everyday communication and intercourse. What we now need is a college whistle. Something with which we can, although at a considerable distance, instantly arrest a classmate just about to enter the recitation-room until we can come up and extract from him an explanation of that

knotty point which our last night's efforts failed to elucidate. Who of us has not, on his way to the Institute, espied three or four blocks ahead, and walking like an excited ostrich, some long-legged fellow-student who owes us a little something which would come in particularly handy just then; and whistled with such soulful yearningness as to draw the attention of every small boy, pretty girl, herdic-driver and horse-car conductor within a furlong, but without reaching either the ear or understanding of our absorbed friend. Or perhaps the unresponsive one possesses our umbrella, German exercise, meal-ticket, "stylo," or other equally indispensable article, and is about to accost some feminine acquaintance just ahead, board a car, or elude us in some equally effective manner, while we ourselves have just forty seconds to ascend two flights and write down a black-board full of notes before lecture begins. A freshman or soph may yell, — the former out of his incurable freshness, the latter from his traditional recklessness of the proprieties; but the unfortunate senior or junior must grin, and internally curse; whereas one short, well-understood whistle might turn as one the heads of every "Tech" on the street and a gesture hold the attention of the right man. Surely some sort of a Tech whistle is bound to come, and it only remains for some energetic man to call a mass-meeting to consider the matter.

THE last number of the *Tuftonian* contains an article which is boiling over with indignation at what it calls a most successful exhibition of wire-pulling. This refers to the recent Foot-Ball Convention. We really fail to see where the wire-pulling comes in, unless it was that which Tufts and Williams engaged in, —and that could hardly be called successful. Amherst, Trinity, and Tech. invited Stevens Institute, Brown, and Dartmouth to form a league with them; and they did. That is the whole affair in a nutshell. The *Tuftonian* intimates that these last three colleges heard only one side of the question. When the Tech

delegates arrived in Springfield, they found the Stevens, Brown, and Dartmouth delegates closeted with the Tufts and Williams men; and it was only with considerable difficulty that they could be induced to come out and join Trinity, Amherst, and Tech. in forming the new league, so greatly had their sympathies been worked on. Then the first thing they did was to propose that Williams and Tufts should be asked to join in the formation, which motion was lost by a tie vote. The *Tuftonian's* idea of wire-pulling is certainly unique, but its statement that Stevens, Brown, and Dartmouth only heard one side of the question goes even further beyond.

"SMALL favors gratefully received!" At a college like the Institute, where no "cut" record is of much account, and students attend lectures and recitations because they need to, not because they have to, a suspension of lectures, etc., on the day before Christmas, has little influence on the plans of the students. Those who left for home over last Friday would have done so in any event; of those who did not, the smarter students put their time in laboratory or drawing-room, to get ahead of the others, and the slower ones put theirs in to keep up. As no mortal will pretend that laboratory work is easier than attending a lecture or recitation, the result of the vacation petition is simply that those students who were absent Friday, cut one kind of work instead of another, while most of the professors and instructors were relieved of their customary duties. In other words, five hundred students petition the Faculty for a holiday, and the Faculty give themselves one. "Blessed are the benevolent."

THE TECH feels that some apology is due its readers for not producing a Holiday number; but as this year the editorial work has fallen mainly on the editors from the Junior Class, who do not have as much option in the disposal of their time as the Seniors, it has been found impossible to do so.

A Mistake.

Adown the path she goes,
'Twixt pansy, pink and rose;
Her song is stilled,
Her eyes are filled
With unshed tears.

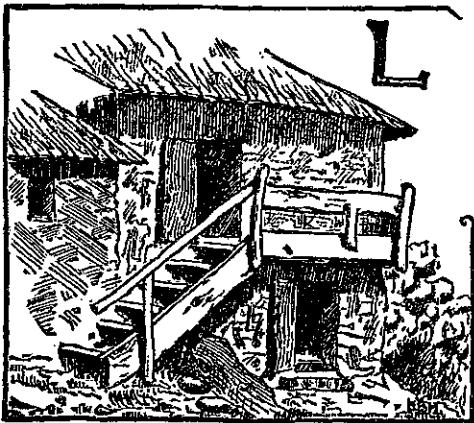
"Ah, it is better so
That he or she shall go;
They will forget
Their deep regret
In passing years."

She stoops and plucks two flowers,
Who from their perfumed bow'rs,
Have seemed to feel
Her eye's appeal,
Her sweet distress.
One flower is dark, and one
Is golden as the sun;
The dark will show
The answer "No!"
The yellow "Yes!"

And when he comes to-night,
Beneath the moon's soft light,
To him she'll throw
The answer, "No!"
And 'twill be done.
But when the time is come,
Her trembling hand is numb,
Her eyes grow dim,—
She throws to him
The yellow one.

—*Carl Ernst.*

From a Castle to a Cabin.



LAST Thursday a party of hunters returning from a trip across Bear Ridge, called at the Hermitage. The Hermit could not be found, and they were about to push on, when one of their number stumbled across a half-imbedded substance that was partially disinterred by the act, and revealed a boot. The men all set to work and soon tore away the light covering of

leaves and straw, and brought to light the stiffened corpse of Bill Grey, as he was commonly called. His body has been brought to town, and will be interred this afternoon. He came among us many years ago, and has led the life of a recluse ever since. Nothing is known of his history."

The above extract appeared in a Potter County, Penn., newspaper the other week, and brought back to the writer the memory of an autumn expedition among the hills of Northern Pennsylvania, and an interview with the unknown dead.

I had taken up my headquarters at a ramshackled farm-house, kept by a one-half hunting, one-half farming individual, who, among other virtues, kept a pack of hounds, and was a warm friend of anyone who possessed a gun and knew how to use it.

My host, after directing me to all the best localities for a shot, and throwing in some valuable reflections of his own on sportsmanship in general, told me of a "character" that had "fetched up in these parts," the excellence of whose shot and unsociableness of life had created a good deal of talk. "Don't yer put a word to him no-a-ways; yer won't git as much as beans for an answer, and yer mought as well start for hum ef yer cum 'cross him, fur thar's no luck arterwards. Iv'e bin thar."

Game was plenty, the weather fine, and the unerring shot and his general uncanniness did not again trouble my brain, until one particular Saturday, when the fates seemed to have opened all their batteries.

I started from the house after an early breakfast, with a comfortable luncheon stowed away in my pocket, intending to make a day of it. The weather promised fair enough, and I strolled on with a careful eye to the main chance, pausing now and again to admire the beauty of the forest scene, but no luck. I had been so fortunate before, that I was beginning to grumble over the time it took for a first shot, when I heard the low rumble of thunder, and looking up, found the sky completely overcast.

Though no "fair-weather sportsman," a soli-

tary night in the woods, in a pelting rain, did not hold sufficient inducements for continuing my course, so I turned to retrace.

How I lost my head sufficiently to miss my path, I have never been able to solve; but six hours' hard work amid low underbrush and a saturating drizzle convinced me that such was the case, and that it was time to look around for a spot to camp.

In this condition I discovered an ascending column of smoke, issuing from a high ledge, not many yards ahead of me. Pushing through the brush in the direction of the smoke, it was not many minutes before I stood in front of a cave-like structure, the opening of which was partially barred with hemlock boughs.

The first thing that greeted my eye on entering was a large fire in the back of the cave, that cast a ruddy light over wall and ceiling; before it, reclining on a mat, was stretched a man, who arose on his elbow and looked toward me, aroused by the noise I made in entering. I pleaded the sacredness of hospitality, related my plight, and even endeavored to soothe the savage breast by quoting James Fitz James' plea for shelter, food and fire, although I but humbly asked for the first.

In reply to all this he vouchsafed not a word, but, after a vigorous stretch, arose, walked to the mouth of the cave, and took a look outside; after which he returned, and pointed to a seat of one-half bench and stool.

My host was a man of about five feet ten inches, the owner of a well-built frame, full beard, dirty face, and clothed in a leather patched cardigan jacket, buckskin trousers,—the worse for wear,—and a pair of home-made moccasins. These, with the addition of a short black pipe, complete the photograph.

From sticks thrust into the walls of the cave hung trophies of his gun, in the shape of birds and venison, fit for an epicure's palate,—if the doctrine that a slight taint is an added luxury, is true. A pile of not-over-cleanly skins occupied one corner, on which, in lieu of a shelf, rested a lot of ancient-looking tinware. My host produced a tin pail from some receptacle hidden

from my sight, and placed it on the glowing coals, which soon brought the contents to a boil, and filled the room with the most agreeable odor of stewed meat and vegetables. My afternoon's scramble had produced an aching void, that I had expected to carry to bed,—and in fact, after becoming acquainted with the non-hydropathic views of my landlord, desired to; but the persuasive effects of the ascending steam were such, that when a tin dish of the compound was passed me, I was soon busily engaged in its mysteries, spearing bits of meat and potatoes with my knife and transferring them to my mouth. The cook did not stop for such trifles as a knife and fork, but, on the principle that fingers were made before either, began, as soon as practicable, to grapple the contents with both hands, ending by tipping his plate to an angle of 45°,—an operation which soon cleansed it.

He then produced a pipe that might have been a brother to his own, a paper of tobacco, and a long black bottle. Handing me the smoking-materials, we both commenced to load.

I had determined to have an interview, if possible; and knowing that the weed was said to have a remarkable power over the human heart, not to speak of the bottle, I was ready to endure, if necessary, suffer, to attain my object. The tobacco I could manage, but when it came to the bottle—a forty-rod Jersey-lightning affair—my resolution flickered. I managed, however, to elude his vigilance by lifting the bottle high in air and gluing my lips to its orifice, at the same time making a fictitious swallowing sound, and conveying to my features an expression of ecstatic bliss. As he had the bottle all to himself, and it passed rapidly, it began after a time to assert itself, and after some introductory conversation, I found myself listening to the story of Henry Eskine Templeton, alias "Bill Grey's" life,

Born in Chester, England, the youngest son of Sir Phillip Eskine Templeton, K. C. B., he was sent, at an early age, to Rugby, and from there to Oxford, where he graduated. He lost his mother the day after this event, and

hastened home to condole with his father, but was received with a chilling coolness, and informed that, owing to financial troubles, it would not be possible to do more than pay over his mother's inheritance, and that in future the two had better live apart. Eskine (as he was called) had been brought up to believe himself the son of a man of wealth, and had lived a life in accordance; and when he found himself suddenly dismissed with £6,000, invested in 3 per cents, his temper got the better of his discretion, and brought forth a war of words, that ended by his being shown the door.

He learned afterward that the reason for getting rid of him was on account of a certain spinster, of means, but not birth, who, at even that early day had been interviewed as to a change of name.

His income not being sufficient to meet his requirements, he was induced by an old college friend, who had taken to city life, to sell out his 3 per cents, and allow him to invest it at a higher rate. He did so, and had the pleasure, one morning, of finding out that his friend had made a bad failure, and decamped with the £6,000 just placed in his hands. Hurriedly realizing on everything disposable, he immediately got on his track; followed him to Paris, thence to Florence and Berlin, where he lost all trace. The Russo-Turkish war was then at its height, and his pockets contained just enough to carry him to Russia, where he volunteered in a German regiment. He fought at Bartoum and Shipka Pass, where he was wounded by a Bashi Baouk in the arm, but not severely. At the close of the war he made his way to Bordeaux, and shipped on a vessel bound for Callao. There he left the vessel and drifted to Lima, where he found employment with an English firm. On a trip to the mines he discovered signs of silver ore on the hacienda of a Peruvian officer. He associated himself with a party of Frenchmen and bought the estate, mortgaging it to the English firm for means to work it, who were only too glad to make the advance when they found how rich the deposit was.

They were very successful, even beyond their

anticipations; but the country was cursed with revolutions, and they were continually taxed, first by one party and then by another, not to speak of the insecurity of life, and the perpetual legal struggle of the original owner of the property to recover it, when he found what a treasure he had disposed of.

All these worries induced him to sell out his interest to his partners, from which he realized 30,000 sols. Part of this he was forced to take in silver, and the rest in bills on the Government Bank at Lima. The silver was in ingots, and had to be conveyed across the plains of Casse. Hiring a party of soldiers he set out on his journey, and had nearly passed the worst of the trip, when he was set upon by a party calling themselves "Independents," but really bandits, who dispersed his guards, captured his mule train, and robbed him of both coin and drafts. He succeeded in getting to Lima, and laid his case before the English Consul, but the Government was not able to do anything about it.

He stayed long enough to learn that the Peruvian officer, then high in power, who originally owned the hacienda containing the mine, had been successful in overthrowing his title; after which he embarked on board an American ship bound for Philadelphia, and from there drifted to Potter County.

When I awoke in the morning, there stood the empty bottle, and near it reposed the short, stubby pipe, but Henry Eskine Templeton, alias "Bill Grey," had gone.

French Chemical Nomenclature.

THE study of the French chemical nomenclature should be of great interest to us; for we have adopted *in toto* a vast number of French chemical names, without obliging them to undergo the slightest change; and the greater part of the rules which govern their use and combination, come from the same source.

Until the latter part of the eighteenth century, chemical nomenclature had originated with the

medical chemists, and contained a multiplicity of unwieldy, unmeaning, and even absurd terms. It answered the purpose of chemists tolerably well when the science was in its infancy, but the number of new substances and compounds brought into light in this century had become so great that the old names could not be applied to them without the utmost straining; and the chemical terms in use were so little systematic that it would have required the memory of a Macaulay to have retained them.

The crying necessity for a new nomenclature was universally acknowledged, and various attempts were made to construct one.

Bugman had contrived a new nomenclature, confined chiefly to the salts, and adapted to the Latin.

Dr. Blak had done the same thing, though more elegantly and neatly. But it is to the great Lavoisier that we must look for the first radical change in the system of naming compounds. In fact it was with the greatest difficulty that he could make himself understood in the old nomenclature, which was so entirely conformable with the phlogistic theory. Thus Lavoisier, in company with Mervean, Berthollet, and Fourcroy, at l'Académie des Sciences, in 1787, fixed the rules which govern, not only the French, but our own and many other nomenclatures to this day.

Thus it may be said that our own, so-called English, chemical language was born in France.

The extraordinary rapidity with which Lavoisier's nomenclature came into use was due, principally, to the defective state of the old nomenclature; for, although in consequence of the prodigious progress which the science has made since the time of Lavoisier, his nomenclature is entirely inadequate to express our ideas; yet, at the time of its nativity, its superiority over the old nomenclature was so great that it was soon accepted throughout all Europe.

The antiphlogistic theory, and the new language in which it was clothed, were not, however, accepted without a struggle.

In France there were few who still adhered to the old theory; Mucquer was dead, Baumé

was very old, and his chemical skill had never been accurate. Mounet was about closing his laborious career—in fact, all France was soon antiphlogistian.

In Germany Lavoisier was opposed by Greu and Wiegleb; but Martin Henry Klaproth became a convert in 1792, together with the Academie des Sciences at Berlin (of which he was a member) and all Germany.

Among those who fought the most valiantly in Great Britain against the new theory and nomenclature might be mentioned Mr. Cavendish, Mr. Priestly, Mr. Kirwan and Mr. Black. After Mr. Priestly had fled the country, Mr. Cavendish had retired from public life, Mr. Black had died, and Mr. Kirwan had been converted to the anti-phlogistic theory, the nomenclature of Lavoisier was accepted in England.

The naming of simple substances has always been left entirely to the caprice of the discoverer. In many cases the name was given to a substance with a view of indicating its constituents, or some property which was peculiar to it. Unhappily, almost every-body thus named bears the stigma of the theoretic ideas of the age in which it originated. We need not look far for examples. Oxygen comes from the Greek word *γεννέω*, (I produce,) that is, which produces acids. It was believed at the epoch when its name was chosen that it was the only body capable of producing acids; but now we know of many others possessing the same property. Azote (nitrogen) comes from another Greek word, *ξωη* (life), or that which deprives of life. But to-day other and numerous are the bodies known to exercise an even more deadly influence upon the economy.

From these and many other examples we may conclude that the least significant names are the most appropriate for chemical substances.

It was more particularly for the naming of compound substances that Lavoisier invented his nomenclature. All the rules and regulations which were then drawn up for this purpose are far too numerous to be discussed in a paper like this, but by taking our law and following it through all its various modifications

and changes from Lavoisier's day to the present, we may be able to see the analogy existing between the French and English compound chemical names, and at the same time gain a very fair idea of the present state of the two chemical languages.

At the time of which we have just been speaking it was believed that the same substance could not form more than two compounds with oxygen, and in naming them it was agreed that the word *acide* should be followed by the name of the substance, with its termination changed to *eux* for those containing the least oxygen, and into *ique* for the others. Thus the two compounds of sulphur and oxygen then known were called *acide sulfureux*, and *acide sulfurique*, corresponding to the *ic* and *ous* compounds in English.

Later on, two more compounds of sulphur and oxygen, one containing less oxygen than *acide sulfureux*, and the other a little more, but not as much as *l'acide sulfurique*, were discovered. The first was called *acide hypo-sulfureux*, and the second *acide hypo-sulfurique*. Similar English names were given to these compounds, that is, the prefix *μπo* was adopted.

The difficulty was for the moment evaded, but in these later years three more compounds of sulphur and oxygen have been discovered, all of which contain more oxygen than *acide hypo sulfureux* and less than *acide sulfureux*. In order to name these new compounds it would be necessary to establish a new system of nomenclature. It is upon this point that the French chemists, and also those of other nations, are now disputing.

This is only one example, but others would only confirm the conclusions which we are able to draw from this; thus each would show us some defect in the nomenclature of Lavoisier, and indicate the pressing necessity for a new one. Many of them would present more striking analogies to the English than the one we have just discussed.

It is a remarkable and interesting fact that the French and English, which are in every other regard so widely separated, should coincide

to such a wonderful extent, not only upon the rules of chemical nomenclature, but upon most of the chemical names themselves. The latter resemblance is so perfect that a person acquainted but slightly with the French would have almost no difficulty in distinguishing the different names of chemical compounds, and of nearly all the simple substances.

The word chemistry itself is nearly identical; the third letter being changed to *i*, and a French termination added, *chimie*. An *f* takes the place of *ph* in sulphur; arsenic, zinc, bismuth, cobalt, carbon, and many others do not differ at all.

There are a great number of chemical names which differ so slightly in the two languages that the analogy between them and the corresponding English word is at once seen.

There are some words which, having been named before they were known to be chemical compounds, or coming from different sources are radically different. Among this class might be mentioned:—

Iron— <i>fer</i> .	Lime— <i>chaux</i> .
Copper— <i>cuiru</i> .	Nitrogen— <i>azote</i> .
Silver— <i>argent</i> .	Lead— <i>plomb</i> .
Tin— <i>etain</i> .	Water— <i>eau</i> .

And a few more which are not difficult to commit to memory, and easy to retain, and differ only because they belong to two very different languages.

Noticeable Articles.

A FEW months ago there appeared a little anonymous volume of essays entitled "Obiter Dicta," whose excellence was at once recognized by all lovers of good writing. The new writer's name turns out to be Augustin Birrell, but further of him I know not. Whoever he may be, his contributions to the magazines are always worth reading, and in the August number of *Macmillan's* are a few discriminating pages by him on the perennially interesting subject of Charles Lamb, and the new edition of his delightful writings, by Mr. Aingier. Lamb has heretofore been unfortunate in his editors, but in Mr. Aingier, he has found a careful, and sympathetic and painstaking one, and the two vol-

umes he has already published and the two of Lamb's delightful letters about to appear, are probably the best shape in which the quaint little man's writings can be had,—and who that loves good English books can do without them? Mr. Ainger's life of him, it may be added, in "English Men of Letters," is his best biography.

In the same number is a capital paper entitled, "The Terrific Diction." The phrase is taken from Dr. Johnson, the "Great Unread," as the writer calls him, who yet "as a personality, is probably the most familiar to us of all dead men," and about whom he says some excellent things; and the terrific diction in question is that of the Swinburne poet and critic, especially as it appears in his last volume of miscellanies. Terrific, indeed, his diction is, in the voluminous amplitude of its interminable sentences—the present writer recently noted one twenty-three lines long—and still more terrific when he pours out his wrath or his contempt upon his enemies, in a whole copious vocabulary of foul words, and fouler images. The same man, who disgusts all right-minded readers by impudent abuse of everything they hold sacred, and gross defiance of everything that is pure, writes *Atalanta in Calydon*, and criticism that, when it is good, is of the very best. "One might say of him that when he treats himself fairly, he never praises wrong." Since Byron, there has not been such another mixture of mind and force. His critic, after quoting a passage that would be disgusting if it were not, happily, to most readers unintelligible, quotes the following from him about Lamb: "All men worthy to know him would seem always to have loved him in proportion to their worthiness; and this inevitable affection would seem again to have given them for a time, the very qualities most wanting to their usual habit of mind. It fixed the inconstancy of Coleridge; it softened the austerity of Wordsworth. It withdrew for a moment the author of the 'Friend' from the contemplation of metaphysics, and the author of the 'Prelude' from the contemplation of himself." "Was ever Lamb praised more finely?" he adds. The author of the 'Prelude' is too great to be harmed by the allusion to his only weakness.

The November number of the same magazine has an article entitled, "An Alexandrian Age," which contains some good remarks on the same subject of prose style. The writer takes a very despondent view of the literature of these times, which

he likens to that of Greece in its decline, when Alexandria, not Athens, was the intellectual center; but whatever may be thought of this, his notions about style are sound and good. And it is odd what very vague ideas people otherwise sensible have on this subject. One writer says very sensibly: "To endeavor to teach the art of writing, as David Ramsay taught his lads to take a watch to pieces and put it together again, strikes us as about as hopeless a task as Isaak Walton owned it was 'to make a man that was none, to be an angler by a book.'" Yet there are plenty of good people who think that the acquirement of a good prose style is simply a matter of learning the rules of a Rhetoric, and teachers are blamed for not turning their pupils out good writers, as they turn them out masters of their multiplication-tables. They might as well be blamed for not turning them out good sculptors or good musicians. Everybody knows that to become a good musician one must combine a native aptitude, with months and years of practice, and the case is much the same with skill on the difficult instrument, language. There go three things to the making of a good writer,—mental discipline, which is the net result of good training, real familiarity with good models, and steady and long-continued practice. If a writer's style is confused, it is because he has never learned to think; if he has no command of language, it is because he has not been a reader; if his thoughts do not readily take form in writing, it is because he lacks practice. One thing is certain, that the stupidest of all ways of learning to write is to set about imitating other writers; let every man, after due preparation, write like himself. In all great writers there are characteristics that are peculiar and uncommunicable. It does us good to read them, but no good to mimic them.

W. P. A.

A new arrival in a Chinese homestead has been christened "Ah There."—*Ex.*

"You would likes to know, may pe," said Schneider to the inquisitive tourist, "why ve calls our poy Hans?" "Ah, yes, indeed I should, I am sure," was the reply; "it must be an interesting story." "Vell, pecause dot ish his name."—*Ex.*

Eastern Inter-Collegiate Foot-ball Association.

THE date set for the formation of the new league, was Tuesday, Dec. 14th; and accordingly there assembled at the Warwick House, Springfield, that evening, representatives from the Massachusetts Institute of Technology, Amherst, Trinity, Brown and Dartmouth colleges, Stevens Institute of Technology, and Williams and Tufts colleges. The delegates from Brown, Dartmouth, and Stevens Institute were invited to join with Technology, Amherst, and Trinity in forming the league. Before organizing, a motion was made that Williams and Tufts should be invited to join in the organization, which was lost. The six clubs then proceeded to form the league.

A constitution was presented by Mr. Morgan, of Trinity, which was adopted, with some modifications and amendments. This constitution is so drawn up that the disputes and protests characteristic of the old league will be done away with. Its main features are as follows: That the name of the organization should be the Eastern Inter-Collegiate Foot-Ball Association, and that its objects should be the encouragement of the game of foot-ball in the colleges having membership in the Association; that W. C. Camp's rules should be adopted, with modifications to be made at the next meeting; that the referee in each game must be mutually agreed upon by the two contesting colleges, and there can be no protest from his decision; that a motion can only be carried by a majority vote; that there should be an annual assessment of ten dollars from each club; that the championship should be decided by the percentage of games won to games won and lost; and there should be two regular meetings held each year on the first Wednesday in October and December, respectively.

The schedule will be arranged at the next meeting in October, and probably each club will play one game with each other; so that one year a club will play three games at home and two away, and the next year two games at home and

three away. These officers were elected:— President, G. C. Dempsey, of Technology; Vice-President, C. S. Houghton, of Amherst; Secretary, M. F. Morgan, Jr., of Trinity; Treasurer, B. F. Hart, of Stevens Institute.

The feeling among the delegates was that Williams, on account of her causing so much dissension in the league this year, should be left out for a year at least, and that Tufts was not wanted in the Association at all. Wesleyan decided to remain in the American Inter-Collegiate Association. The prospects are that a series of exciting contests will be witnessed next season, with perfect harmony existing among the clubs.

The Technology delegates were Messrs. Dempsey, '88, Dearborn, '88, and Herrick, '88; and to them is due the credit for the prominent part that Technology took in the proceedings.

M. I. T. A. C.

THE meeting of the Athletic Club was very successful in drawing spectators, and a great interest was taken in the different events. The events were in the following order:—

Putting the shot.—J. C. E. de Bullet and D. D. Kerns, both of '90. De Bullet won, with a put of 30 feet 2 inches.

Fence vault.—G. A. Armington, '87, H. G. Gross, '88, and R. Devens, '88. All cleared 6 feet 6½ inches. Gross won, having a handicap of 1 inch from Armington, and 3 inches from Devens.

Fencing.—J. B. Loewenthal, '87, and W. S. Aldrich, '88. This was a very poor exhibition of the art, and was awarded to Loewenthal by one point.

Standing high jump.—M. E. Cobb, '87, Devens, '88, Armington, '87, Gross, '88, and Wason, '90. Wason won, with a record of 4 feet 7¼ inches, with Devens second, 4 feet 6¼ inches.

Running high kick.—Armington, '87, and F. B. Choate, '90. Armington won, with a record of 8 feet 1½ inches, which was very well, considering his height.

Running high jump.—Devens, '88, and Wason, '90. Devens' ankle gave way on the first trial, so Wason won, clearing the bar at its starting point, 4 feet 6 inches, as a matter of form.

Standing high kick.—Armington, '87, and Choate, '90.—G. M. Basford, '89, and J. P. Heywood, '90, entered, supposing this to be a stretch kick, and gave a pretty exhibition of the Black Crook style. Armington won at 7 feet 7 inches.

Tug-of-war.—'89 team: F. L. Pierce, anchor, G. D. Marcy, H. W. Clement, B. W. Guppy. '90 team: J. C. E. de Bullet, anchor, D. D. Kerns, S. F. Tuckerman, P. H. Tracy. '89 won the drop by $1\frac{1}{2}$ inches, and then by a succession of heaves won the tug by $8\frac{1}{2}$ inches. Their classmates were very jubilant, though the result was by no means unexpected. A banner of the classcolors was unfurled by some ingenious mechanism, and hung from one of the beams.

Feather-weight sparring.—F. E. Ellis was the only entry who showed up, and he obtained permission from the other contestants to enter for the light weight.

Light-weight sparring.—G. Whitney, '87, G. O. Draper, '87, J. Ray, '88, R. C. Williams, '89, and F. E. Ellis, '88. The first bout was between Draper and Williams. This was the hardest of the series, and very close, five rounds being necessary to decide it. Williams was declared winner. Whitney and Ray then contested. Ray was quick, and rushed considerably. Whitney lead well, and stood his ground, but did not follow up an advantage as he should, which probably lost him the bout.

Williams and Ellis then appeared. Williams did well the first round, but was exhausted by his previous encounter, and could not reach Ellis, or guard his left-handers. Ellis won.

After a short intermission Ellis and Ray fought the last bout. Ray was fully fifteen pounds heavier than Ellis, but could not deal with his opponent's superior quickness and wind. Ellis thus won the event, which was in a heavier weight than he entered for. His cool-

ness and excellent judgment elicited much applause.

'87 won three events, '88 three, '89 one, and '90 three. '89 now holds the championship for the tug-of-war. The two upper classes showed great lack of enterprise in failing to enter teams.

There were no records broken or approached; but as most of the men competed for the first time, this is not surprising. The sparring was more of an event than is usual at our first games, and no doubt was effective in awakening outside interest. The tug-of-war was probably responsible for the large attendance from the two lower classes.

The officers of the meeting were: Referee, C. P. Daniels; Clerk of course, T. D. Brainerd, '87; Referee of sparring, W. A. Morrison; Judges of sparring, C. D. Fillebrown and J. M. Smith; Stewards, W. T. Sears, R. Robb, W. C. Fish, G. C. Dempsey, W. L. Dearborn and N. Durfee.

The President's Reception.

IT was a pleasant change to the tired Techs to find the halls and reading-rooms, which they associated with study only, so metamorphosed by the Christmas decorations on the occasion of President and Mrs. Walker's reception. The physical laboratory, library, and lecture-rooms were cleared of their usual contents, and an orchestra furnished music for those who wished to dance. The architects' library was also decorated with the first and second mentions of their recent problems. The Tech Glee Club was on hand, and, as usual, proved what an acquisition it was to the Institute. Among those present were Professor and Mrs. Otis, and Dr. and Mrs. Dewey. This was one of the pleasantest social gatherings ever had at the Institute, and will long be remembered by all those present. The thanks of all are due to President and Mrs. Walker for their kindness. It is only to be regretted that there were not more present.



“Point!”

Have you a “Technique?”

Henry Souther, '87, is still quite ill at home with typhoid fever.

The Juniors, and some Sophomores are having photography.

The Institute was left \$100,000 by the will of the late Richard Perkins.

Mr. F. B. Meade, '88, has become a member of the *Sigma Chi* fraternity.

Normal Q. Stewart, (formerly '87) was at the Institute last week, meeting his old classmates.

Hon. Marshall P. Wilder of the Corporation, died at his home, Dec. 16th.

Only two weeks before the examinations. Now is the time to grind.

Mr. John H. Towne, '90 has been initiated into the C B₃ A Society.

About sixty Seniors visited the Watertown arsenal Dec. 11th, with Professor Lanza.

For the first time in its history the Athletic Club has cleared expenses on its first indoor meeting.

The Society of '89 has adopted a pin of very pretty design. It is a monogram of the letters M. I. T. and '89, in gold.

The Senior miners have been having a three-days' agglomeration run. It is no wonder that they all look so tired.

THE TECH will furnish shingles to its editors and directors. Take notice '90, and send in contributions.

Messrs. F. C. Weld, G. L. Heath and J. P. Gilbert have been elected members of the K₂S, and were initiated Dec. 17th.

Frederick P. Gulliver, '87, on account of ill health, will be unable to return to the Institute this year, as he expected.

'90 has followed the example set by '89, and has changed her class colors. They are now dark blue and silver gray.

In the recent atheletic games, '87, '88, and '90 each won three first prizes, while '89 only got one. What's the matter with '89?

B., '89., says he attended the last atheletic sports, and that he now knows who “young Sniggins, 90,” is, who was mentioned in the last Tech.

The Society of '87 will see the year of 1887 in to-morrow night at Parker's. An enjoyable evening is expected, and it is hoped that there will be a full attendance.

In the last Tech it was printed that Mr. La Rose was elected “Beacon” of the Society of '89 when it should have been “Deacon.” The mistake was natural, as Mr. La Rose is well fitted to fill either position.

'89 has won the tug-of-war championship and '90 the foot-ball game between the two classes. A base-ball game next spring will have to settle the question of supremacy. Or why not play a game of polo on the ice?

An attempt is being made to form a Society of '90. It is hoped that the freshmen will follow the lead of the other classes in this respect, as these societies do much to bring the members of the classes together.

Messrs. Bartlett, '87 and Warren, '88 have been forced to resign from the quarterly editorial board on account of the pressure of studies. Messrs. Shepard and Thomas, '87 have been added to the board.

A three days' agglomeration run is in progress in the mining laboratory. Tuesday evening, Dec. 21st, the night shift was honored by a call from some ladies who were duly impressed with the activity and picturesqueness of the department.

The Hammer and Tongs Club dined at Young's last Saturday night. Mr. C. M. Wilder, '86,

was present. Messrs. Kimball, '87, Bulkley, '89, and Davis, '89, who were initiated into the club that evening were the source of much merriment.

A private subscription party is to be given on Friday evening, Feb. 9, 1887, in Berkeley Hall, under the management of G. K. Fay and C. W. Sabin, Jr., formerly of the Tech. A limited number of tickets can be obtained from either of the above or from F. W. Hobbs, '89.

The Society of Arts met Dec. 23d, with a full attendance. Prof. E. C. Pickering, of Harvard University, read an interesting paper on stellar photography. The students should take advantage of these meetings when they can, as they are usually very interesting.

The tennis tournament was finished Dec. 15th, on the indoor courts at the Mechanics' Building, through the courtesy of the West End Tennis Club. For first place in doubles Chase, '88, and Johnson, '90, defeated Beals, '90, and May, '89, by the scores 6-1, 6-3, 4-6, 5-7, and 14-12.

The K₂S met at Young's Friday evening, Dec. 17th. Messrs. F. C. Weld, G. L. Heath, and J. P. Gilbert were initiated, and Mr. J. W. Cartwright was elected to the office of treasurer, in place of E. O. Jordan, resigned. An able paper on the Determination of Sulphur in Sulphides, by Mr. A. J. Conner, was read, and the meeting adjourned to the supper table.

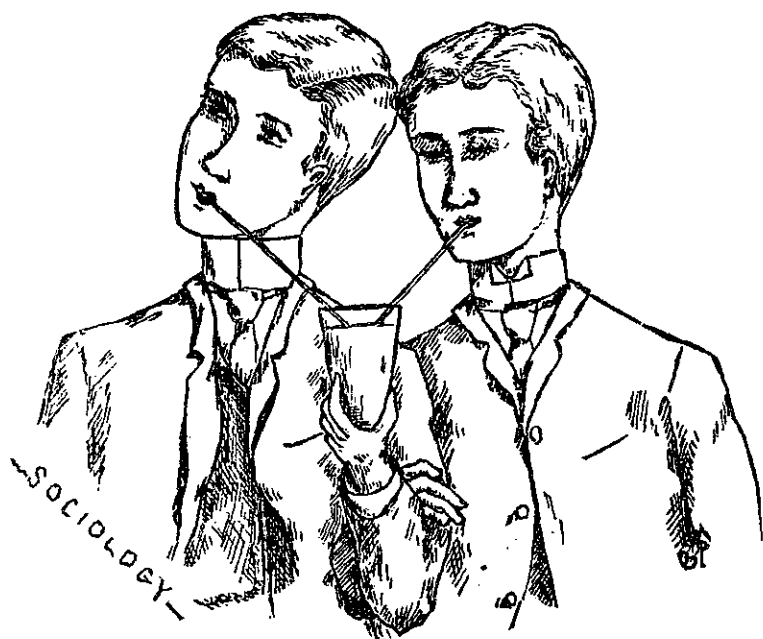
The following mentions have been given in the Architectural Department: Monumental Gateway to a City Park: 1st mention, Messrs. Shattuck and Bigelow; 2d, Proctor, F. A. Moore and Gay; 3d, Parker, Carleton and Aldrick. For the Egyptian Ornament the mentions were: 1st, Messrs. Hodgkins and Parker; 2d, Farwell and Gay; 3d, Meade, Ray and Chandler.

The Architectural Society held its regular meeting Dec. 18th, in the reading room of the Rogers building. The society has established a well-organized system of tracing and blue-printing, and is making arrangements to have each set of drawings made in the Architectural Department, photographed. At this meeting papers were read by Messrs. Case and Perkins

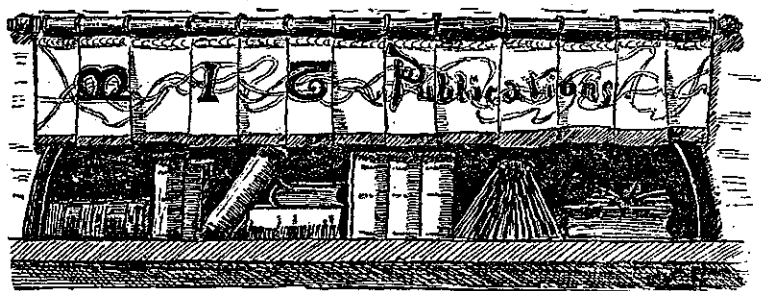
on the subjects of Assyrian and Persian architecture, respectively.

The Tech has been unable to keep its promise of having a heliotype of the foot-ball team in this number. It is hoped, however, that the pictures can be prepared in time for the next. Besides those which will be bound in the Tech, there will be for sale a limited number of the heliotypes, in the Tech office. These will have a wider margin than those bound, and will be very suitable for framing. The price of these will be twenty-five cents each, the proceeds to go to the Foot-ball Association.

The class of '75 has recently published a class history written by Mr. E. A. W. Hammatt, of Boston. On glancing through it one is struck with the spirit shown by the class during its career at the Tech. The *Spectrum*, the first paper published at the Institute was started by some '75 men, and the subject of an Institute color was first brought up by this class (lilac was first proposed). In its senior year the class held seven meetings for the discussion of class photographs; also in this year the subject of class-day exercises was discussed, but no exercises seem to have been held.



"IN THE GENERAL COURSE THE INTRODUCTION OF CERTAIN SUBJECTS HAS BEEN TRIED, FOR WHICH NO ROOM COULD BE FOUND IN THE PROFESSIONAL COURSES, BUT A KNOWLEDGE OF WHICH IS USEFUL AS A MEANS OF GENERAL CULTURE."—*M. I. T. Catalogue.*



MASS. INSTITUTE OF TECHNOLOGY.—Twenty-second Annual Catalogue of the Officers and Students, with a Statement of the Courses of Instruction, and a list of the Alumni. Pph., 8vo. pp. 162. Boston, 1886.

BARRUS, G. H. ('74). A New Form of Steam Calorimeter. *Trans. Am. Soc. Mech. Eng.*, VII., 178.

— Another New Steam Engine Indicator. *Trans. Am. Soc. Mech. Eng.*, VII., 519.

— Substituted Steam. *Trans. Am. Soc. Mech. Eng.*, VII., 731.

— Smoke-Preventing Furnaces. *Trans. Am. Soc. Mech. Eng.*, VII., 796.

— The New Calorimeter. *Trans. Am. Soc. Mech. Eng.*, VIII.

LANZA, G. (Prof.). Strength of Shafting Subjected to both Twisting and Bending. *Trans. Am. Soc. Mech. Eng.*, VIII.

LEWIS, W. ('75). Experiments on the Transmission of Power by Gearing. *Trans. Am. Soc. Mech. Eng.*, VIII., 273.

— Experiments on the Transmission of Power by Belting. *Trans. Am. Soc. Mech. Eng.*, VII., 549.

— Loads on Tires. *Trans. Am. Soc. Mech. Eng.*, VII., 634.

— Valve Dynamometers. *Trans. Am. Soc. Mech. Eng.*, VII., 643.

MAIN, C. T. ('76). Notes on Mill Construction. Prepared for the use of Students in the Mass. Institute of Technology. Pph., 8vo, pp. 60. Boston, 1886.

— Relative Cost of Steam and Water-Power. Prepared for the use of Students in Mass. Institute of Technology. Pph., 8vo, pp. 8. Boston, 1886.

RICHARDS, R. H. ('68). American Mining Schools. *Trans. Am. Soc. Min. Eng.*, May, 1886.

SMITH, C. A. ('68). Permanent Transmitting Dynamometer. *Trans. Am. Soc. Civil Eng.* (1886), 357.

THE COLLEGE WORLD.

HARVARD.—A banjo club has been organized in the freshman class. It consists of four banjos, three guitars, and three mandolins. They intend soon to give some public exhibitions.—The catalogue was very late in appearing this year, Dec. 18th.—There are twenty-one new candidates for '88's crew.—Of the best American college records up to Oct. 1st, Harvard hold 10, Yale 3, University of Penn. 2, Columbia 1, Dartmouth 1, Lafayette 1, Princeton 1.—The *Index* presents a very creditable appearance this year. The exterior is particularly attractive, and the book is larger by twenty or thirty pages than last year.—A German Society has been formed, under the name of Deutscher Verein.—By the death of E. Price Greenleaf, Harvard will soon come into possession of over \$300,000.—Nichols, '86, is studying medicine in the Harvard Medical Department, and will probably play in the team next season.—It is stated that the editors of the new Harvard song-book are to be prosecuted at law for publishing copyrighted songs.

YALE.—An '89 man was solicited to accept the nomination for councilman on the Democratic city ticket at the recent elections.—Cross, last year's third-baseman, will play in the field next year.—George A. Watkinson, Yale's famous half-back, died at New Haven, Dec. 14th, from the effects of typhoid-malarial fever, contracted at the Yale-Princeton game. Wakeman, another member of the team, has been very sick from the same trouble, resulting from exposure at the same game. Beecher, '88, quarter-back, was also sick at his home in Brooklyn for a short time.—Several men have recently received twenty marks for snow-balling (*Yale News*).—Over 600 copies of the *Banner* have already been sold.—President Barnard, of Columbia, used to play on the Yale foot-ball team.—\$20,000 is annually spent on Yale athletics.—Over a hundred students were losers by the fire in Forsyth's Laundry, Dec. 12th.

PRINCETON. — The *Princetonian* suspended publication during examination period.—A toboggan slide is to be constructed on the field this side of the University Athletic Grounds. The slide will be 40 feet high and 160 feet long.—Ames, half-back on the Princeton team, took the prize offered to the Princeton man who made the most touch-downs in the championship games. He made seven in all.—A Princeton Alumni Association was formed in New York, Dec. 16th.—The plan proposed by President McCosh for a conference of college presidents to take action in regard to the regulations of athletic sports, is not met favorably by President Barnard, of Columbia, and President Webb, of the College of the City of New York.—*Bric-a-Brac* came out Dec. 10th.

COLUMBIA.—There are thirty men trying for the freshman crew.—F. H. Ware contested in the mile-walk at the Seventh Regiment games. He did not win in walking, but afterwards in the 100-yards dash he took second prize.

EXETER ACADEMY has received from the late Francis E. Parker \$90,000, largely in first-class securities.

AMHERST.—Twenty-five men have gone into training for the nine, under the direction of Captain Phillips, '88. Four batteries are in training.

UNIVERSITY OF PENN.—The class crews, under the coaching of Ellis Ward, have begun training. There are six crews,—four academic and two medical.

WELLESLEY COLLEGE has just received \$50,000 by a legacy, and Bates College has received \$35,000 from the same source.

MADISON COLLEGE has a regulation prohibiting marriage during the college course.—The college has adopted maroon and orange as college colors.

DARTMOUTH.—H. Quackenboss has been elected captain of the nine.—Viau, '88, who pitched for the Concords last year, has signed with the St. Paul's for next season, at a salary of \$225 per month.—The first college paper

published in America was the *Dartmouth Gazette*, of which Daniel Webster was an editor.

CORNELL.—A lacrosse team has been organized.—The freshmen have adopted as a class hat, a black Tam o' Shanter with a green top-knot.—The *Sun* suspended publication during examinations.

UNIVERSITY OF MICHIGAN.—The senior class tried from 10 A. M. until 5 P. M. to elect a class orator, without being able to reach a decisive ballot.

BROWN COLLEGE.—Candidates for the nine have already begun training, under the direction of Professor Smith, of the Providence Gymnasium.

CHICAGO UNIVERSITY is about to be re-established on a non-sectarian basis; several wealthy residents have signified their willingness to assist.

WILLIAMS.—The ball-field will hereafter be known as the Weston Field, in honor of Ex-Lieut.-Governor Weston, who gave \$5,300 for improving the field.—Williams has made application for admission to the Inter-Collegiate Foot-Ball League.

The salaries paid by the Detroit Base-Ball Association aggregate \$46,000.

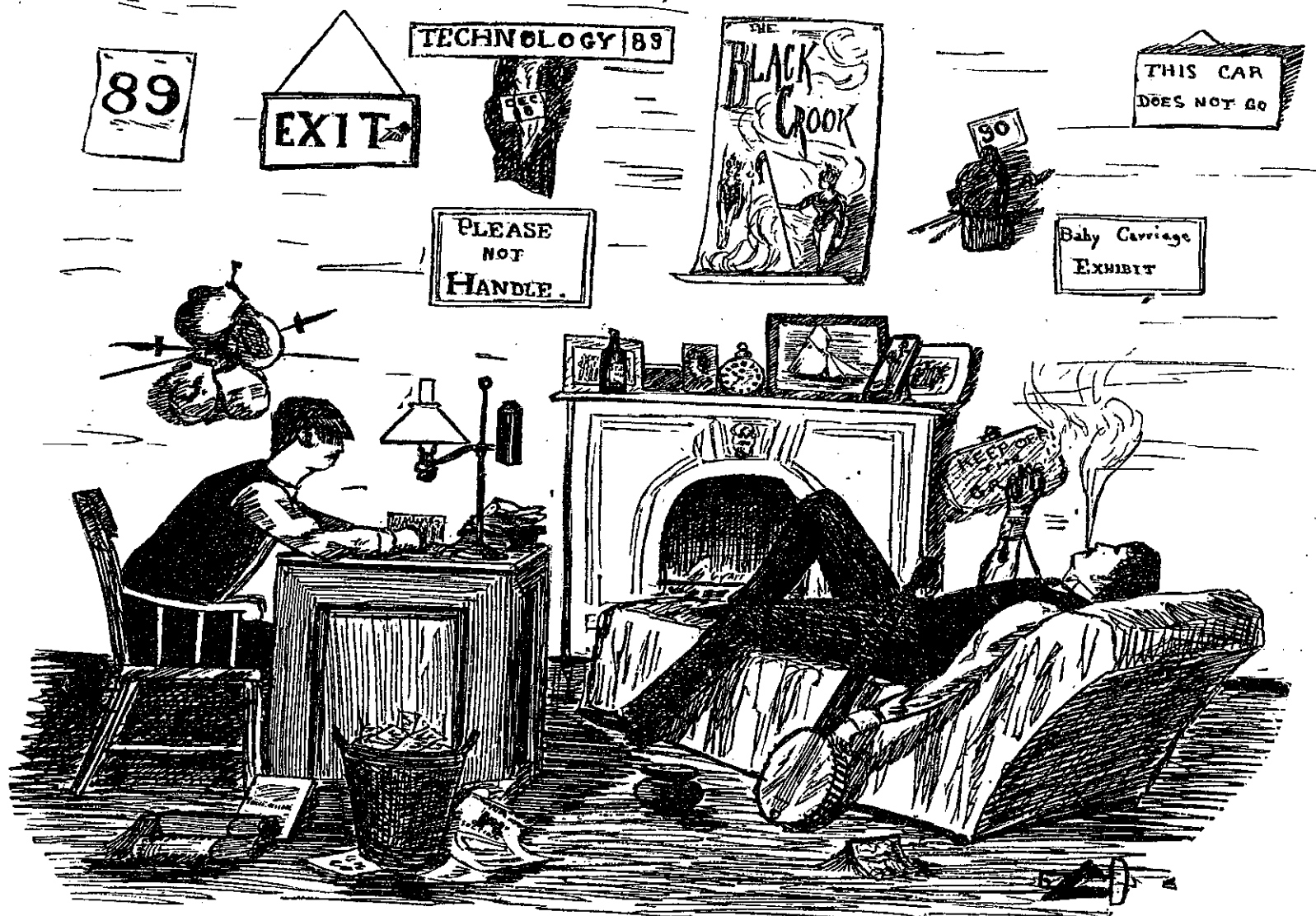
Umpire Grant, of the Inter-Collegiate Association, is manager of the Lawrence (Mass.) Opera House.

ANDOVER THEOLOGICAL SEMINARY.—Prof. John W. Burgess, of the Columbia Law School, has been appointed Winkley Lecturer for the present year.

Thomas Stevens, the *Outing* correspondent, who is making a tour of the world on a bicycle, has not been heard of since October 1st, and fears are entertained for his safety.

Professor Barnard, of VANDERBILT UNIVERSITY, has discovered six comets in the past four years.

VASSAR.—The wife of the Mikado of Japan is a Vassar graduate.



X. (who is grinding for the Semi's, and who finds that his time is too limited to do all his work in): "I TELL YOU WHAT IT IS, OLD MAN, THE FACULTY WHEN THEY ASSIGN OUR WORK HAVE NO IDEA OF WHAT TIME IS."
 T., '89 (who takes a "snap" special course): "NO; AND THEY DON'T KNOW WHAT THE 'SHEOL' OF A TIME IS, EITHER."

CAUGHT.

Hidden within a soft arm-chair,
 With straggling locks of sunny hair,
 I know them well:
 The sandaled feet perched on the grate,
 I steal behind—O horror great!
 Blue smoke! 'Tis Isabel!

Caught in the act, my pretty maid,
 The forfeit now to me be paid,
 'Tis customary.

What's this, a pipe? No, cigarette?
 Well, this beats all the tales told yet,
 True or legendary.

Since I have spied thee, charming fay,
 A secret kiss, the forfeit pay
 Unknown to all.

The head turns round; a grin I spy!
 From masqueraded man I fly
 Enrobed for fancy ball.

—Yale Courant.

In 16,000,000 years not a drop of water will remain on the surface of the earth.—R. A. Proctor. The outlook for the Prohibitionists grows gloomier every day.—*Life*.

Miss Chaucer, an English ballet dancer, has recently received favorable notice. She is said to be a daughter of the poet.—*Life*.

Mrs. Iklestein.—"Ron mit der doctor, kerwick, Solomon; ter baby ist swallowt a silfer tollar!"

Mr. I.—"Vos it dot von I lefd on ter dable?"

Mrs. I.—"Yes, dot vas it; hurry mit der doctor."

Mr. I.—"Don'd ged oxcited, Rajel; it vas gounderveid."—*Life*.

DRESS SHIRTS,

For Weddings, for Receptions, for Dinner Parties, with Collars, Cuffs, and Cravats, in the latest English styles.

**Plain French Bosoms,
Fine Spots, Plaits and Cords.**

Jurors' award for beauty of workmanship and design, and distinguished excellence in the manufacture of shirts.

NOYES BROS.,
Washington and Summer Streets,
BOSTON, U. S. A.

BLANKET WRAPS

For Men, Women, and Children, for the House, the Bath, or the Sick-Room. Those having occasion to be up nights will find them indispensable. \$3.75 to \$75.00.

Lambs' Wool Abdominal Bands, a positive cure for all Bowel Troubles, Ladies' and Men's, at Noyes Bros.'

Underwear and Hosiery in Pure Silk, Lambs' Wool, Merino, Balbriggan, and English Cotton, for early fall wear, at Noyes Bros.'

English Flannel Pajamas, Long Flannel Night Shirts and Wraps, for steamer and railway traveling, at Noyes Bros.'

Dress Shirts, with the New French Cords, Spots, and Fine Plaited Bosoms, elegantly made by Messrs. Noyes Bros.'

English Mackintosh Coats for Ladies and Gentlemen, at Noyes Bros.'

— ENGLISH —

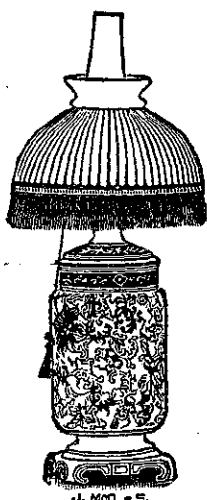
DRESSING GOWNS, JACKETS, AND WRAPS.
English Cheviots,

ENGLISH AND FRENCH FLANNELS,
Silk and Wool, and Pure Silk Shirtings,

For Lawn Tennis, for Steamer Traveling, for Hunting and Fishing, for Railway and Yachting, always in stock or made to special measure.

ENGLISH NECKWEAR.
London Tan Street Gloves, warranted, \$1.35.

NOYES BROS.,
Washington and Summer Streets,
BOSTON, U. S. A.



Fine Pottery, Glass, and Lamps.

THE subscribers invite attention to their stock of the above branches, which we dare say is not excelled on this continent. One of our firm visits the Potteries of England, France, Germany, China, and Japan, seeking the best products from original sources. We have also specimens from the best home manufacturers, comprising desirable exhibits of useful and ornamental wares, to which we INVITE INSPECTION. Six floors, wholesale and retail.

JONES, McDUFFEE & STRATTON,
120 Franklin Street, corner Federal.

N. B. — Our exhibit of Lamps, Bed-room Sets, Smokers' Sets, and choice Gems in Cut Glass and China for Wedding Gifts, is extraordinary. From the old Wedgwood Pottery we have Plaques, Plates, Mugs, Jugs, Tiles, and Coffees, decorated (under glaze) with Boston scenes (including cut of the Tech Institute), which may be found desirable as souvenirs.

HENRY H. TUTTLE & CO.

Would call the attention of Students
to their stock of

Seasonable Foot Wear,

NEW AND NOVEL STYLES,

Some of which are *exclusive with us.*

Prices as low as consistent with
good stock and workmanship.

435 Washington Street,
BOSTON.

**STUDENTS'
SUPPLIES.**

A FULL LINE OF

Mathematical Goods, Blank Books,
Figuring Blocks, Stylographic
Pens, etc., and all varieties
of Drawing Papers.

Also, the LATEST NOVELTIES in

CHOCOLATES, BON-BONS, and GLACÉ FRUITS.

C. M. & J. W. COX,

Wholesale and Retail Dealers in

Artists' Materials and Fine Stationery,

214 CLARENDON STREET, BOSTON, MASS.

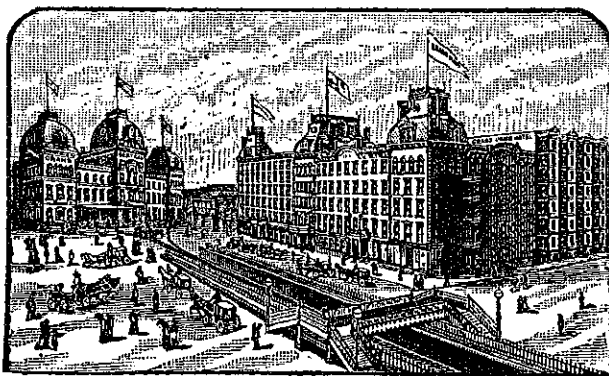
Menus and Orders for Class Suppers and Dances.

GRAND UNION HOTEL, NEW YORK CITY.

OPPOSITE GRAND CENTRAL DEPOT.

GUESTS' BAGGAGE TO AND FROM
GRAND CENTRAL DEPOT FREE.

Over 600 handsomely furnished
rooms at \$1.00 per day and upward.
European Plan.



FIRST-CLASS Restaurant, Dining-
Rooms, Café, and Lunch Counter,
a la carte, at moderate prices.
Travelers can live well at the

GRAND UNION
for less money than at any other
first-class hotel in New York.

W. D. GARRISON,
Manager.

NEW ART GALLERIES

79—BOYLSTON ST.—79

WILLIAMS & EVERETT

INVITE ATTENTION TO THEIR EXTENSIVE AND
CAREFULLY SELECTED STOCK OF

PAINTINGS,

FINE ETCHINGS,

RARE ENGRAVINGS, CARBONS,
PHOTOGRAPHS, ETC., ETC.

SPECIAL ATTENTION TO ARTISTIC FRAMING.

OLD PICTURES RESTORED: OLD FRAMES RE-GILT.

79 BOYLSTON ST., BOSTON.

AGENTS FOR ROGERS' GROUPS.

BOSTON FOREIGN BOOK-STORE.

CARL SCHOENHOF.

144 TREMONT STREET, BOSTON.

AMATEUR PHOTO-OUTFITS.

DISCOUNT TO STUDENTS.

Send for lists to

CHANNING R. SELEE,
56 Bromfield Street, Boston.

Hardy **P** **Photographic Studio,**
493 WASHINGTON ST.
Cor. Temple Place.

By having your Holiday Orders filled
now you can avoid the usual
Christmas rush.

You are respectfully invited to call
and examine our large variety of
superior photographic novelties.

Life Size Camera Portraits, only \$15. Duplicates, \$5 each.

SMOKE

RICHMOND STRAIGHT CUT

CIGARETTES.

TOOL DEPOT.

CALL AND EXAMINE THE LARGEST ASSORTMENT
—OF—

MACHINISTS' TOOLS

AND SUPPLIES

To be found in New England.

A. J. WILKINSON & CO.

184 and 188 Washington Street, Boston, Mass.

Art Photographs,

MOUNTED AND UNMOUNTED,

FOR ART ALBUMS AND COLLECTIONS.

MANY SPECIALTIES FOR

THE HOLIDAYS.

Framed Photographs, Colored Photographs,
Circles, Panels, &c., &c.

SOULE PHOTOGRAPH CO.

338 WASHINGTON STREET.

WALTER C. BROOKS & CO.

TAILORS

8 UNION STREET, - - - - BOSTON.

Stock selected Particularly for Young Men's Wear.

GERLACH & STEUER

(Formerly Jacob Gerlach),

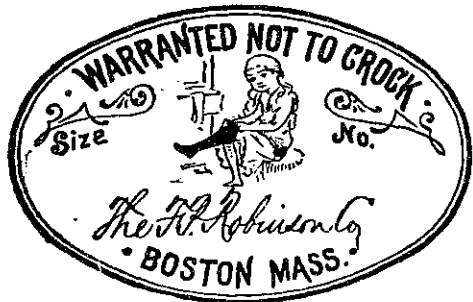
Ladies' and Gents' Hair Cutting.

54 TEMPLE PLACE,

BOSTON.

Manufacturer of Ventilating or Gossamer wigs and toupees.

Ladies' Hair Work of every variety. Children's Hair cut in the neatest style.



Black Stockings

Money refunded if they stain the feet. Every pair stamped with our warrant.

THE F. P. ROBINSON CO.,

49 West Street, Boston.

FALL RIVER LINE TO NEW YORK

Alas!

THERE was a young maiden of Worcester,
Who wanted to kill a fine rorchester;
The bird took a tree, —
Immediately,
The maid got a small boy to borchester.

The biped began now to laugh,
But he wasn't so tickled by haugh,
When she stripped off his feathers
'Spite all his endeavors,
And cooked him with fillets de caught.

FALL RIVER LINE TO NEW YORK

D. TOY,

* TAILOR *

-11-

Charles Street,

NEAR BEACON ST.

A large Stock of Foreign and Domestic Goods always on hand. Agent for Winchester, Son, & Flowers, 17 Maddox Street, and Whitaker & Co., 43 Conduit Street, London, W.

THE ASSOCIATION GYMNASIUM,

Corner Boylston and Berkeley Streets.

R. J. ROBERTS, Superintendent.

H. L. CHADWICK, Assistant Superintendent.

L. F. SMALL, Clerk.

CORPS OF COMPETENT VOLUNTEER INSTRUCTORS.

Classes Morning, Afternoon, and Evening.

Special Attention to Members not in Classes.

The newest and most complete Gymnasium in regard to Apparatus and all other appointments.

Terms, including Box, Measurements, Personal and Class Instruction, \$8.00 per year; for three months, \$5.00.

Young men purposing to join a Gymnasium are invited to inspect this Gymnasium thoroughly.



London Trouser-Stretcher.

Takes bagging out of knees and restores pantaloons to original shape. Price, \$2.50. AGENTS WANTED. Send for Circular. The best Present you can make to any gentleman. Sole Wholesale Agents in the United States,

G. W. SIMMONS & CO.,

32 North Street, Boston, Mass.

BRUNSWICK HAIR-DRESSING ROOMS

ROBERT LINK, Proprietor.

Six Shaving Tickets for \$1.00.

DAVID MYERS,
TAILOR
 175 Tremont St.

*I have a Large and Well-Selected
 Stock of ENGLISH CLOTHS for*

BUSINESS SUITS,
 DRESS SUITS,
 FANCY WAISTCOATS,
 TROUSERS, and
 OVERCOATS.

Special Prices to Students.

THE:
BRUNSWICK

BOSTON'S

Grandest Hotel

BARNES & DUNKLEE,

Proprietors.



NEAR the Public Garden, Common, and Public Library, Museum of Fine Arts, New Old South, Trinity (Phillips Brooks's) Church, and OPPOSITE INSTITUTE of TECHNOLOGY.

Beacon, Dartmouth Street, and Huntington Avenue, and all Back Bay Cars, pass the Hotel for either up or down town, every three minutes.

LUX ENGRAVING Co.

OFFICE, 31 EXCHANGE ST., BOSTON.

Designing and **E**ngraving

of every description, for Schools and Colleges, by our new Photo-Engraving method, and on Wood.

STYLISH NECKWEAR,

COLLARS AND CUFFS FOR YOUNG MEN.

F. W. SEAVEY, - - - - 53 WEST STREET.

C. H. CODMAN & CO.

Manufacturers and Wholesale Dealers in every variety of

Photographers' Materials, Dry-Plate Amateur Outfits.

Sole Agents for the New Ortho-panatic Lens.

34 Bromfield St., Boston, Mass.

Frank Wood,
Printer,

352 Washington Street, Boston.

JOSEPH GILLOTT'S
Steel Pens

JOSEPH GILLOTT & SONS, 91 John Street, New York, HENRY HOE, Sole Agent.

FOR ARTISTIC USE in fine drawing,
Nos. 659 (the celebrated Crowquill), 290 and 291.
FOR FINE WRITING, Nos. 1, and 303 and Ladies', 170.
FOR BROAD WRITING,

Nos. 294, 389 and Stub Point, 849.
FOR GENERAL WRITING, Nos. 332, 404, 390 and 604.

Sold by ALL DEALERS throughout the World.

GOLD MEDAL PARIS EXPOSITION, 1878.

PREPARATION for the INSTITUTE of TECHNOLOGY,
and for HARVARD COLLEGE without Greek.

Private School, 18 Boylston Pl., Boston.

ALBERT HALE.

For 1887. CALENDARS AND DIARIES,
ELEGANT STATIONERY,

THE BIJOU DIRECTORY,
(Beacon Hill, Back Bay, and South End.)

CAPEN'S GEOLOGY OF NEW ENGLAND,
Folio, with superb Colored Illustrations.

For 1887.

C. E. RIDLER, Corner Boylston and Berkeley Sts., Boston.

PRIVATE SCHOOL FOR BOYS,
165 Tremont Street, Boston.

Preparation for College, INSTITUTE OF TECHNOLOGY, and
Business. Thorough Instruction given in Elementary
English Studies.

Native French and German Teachers.

LEROY Z. COLLINS.

JOHN EARLE & CO.,

Tailors to the Co-operative Society,

330 WASHINGTON ST., BOSTON.

Dress Suits loaned for occasions:

Note Books and Students' Supplies,

At lowest possible prices.

FRED W. BARRY,

108 and 110 Washington Street, Boston.

Corner of Elm Street.

BOSTON MUSEUM.

HELD BY THE ENEMY!

R. M. FIELD, - - - MANAGER.

FROST & ADAMS,

IMPORTERS OF

Drawing Instruments

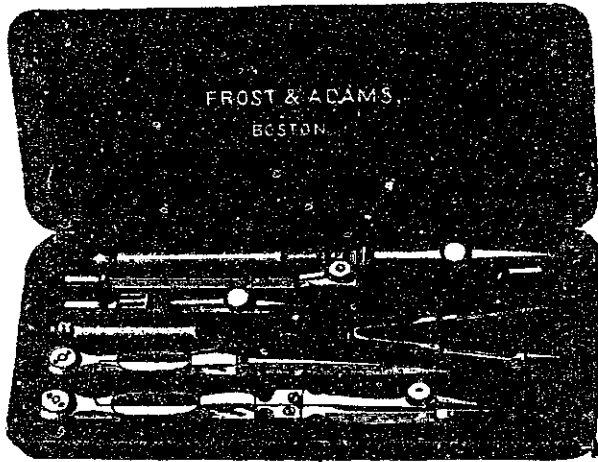
AND

Supplies for Students, Architects, and Engineers.

Designers' Colors a Specialty.

SEND FOR ILLUSTRATED CATALOGUE.

No. 37 Cornhill, - - - BOSTON.



J. C. LITTLEFIELD,

Chambers,

✦ FINE TAILORING ✦

2A Beacon St.

The Latest Novelties of the Season.

DRESS SUITS A SPECIALTY.

HARRINGTON

JOHN R. FARRELL,

✦ TAILOR ✦

No. 14 Boylston Hall, Boston, Mass.

Finest line of Foreign and Domestic Fabrics constantly on hand, to be made in the best styles, at reasonable prices.

MILITARY SCHOOL JACKETS, CHEVRONS, and UNIFORMS.