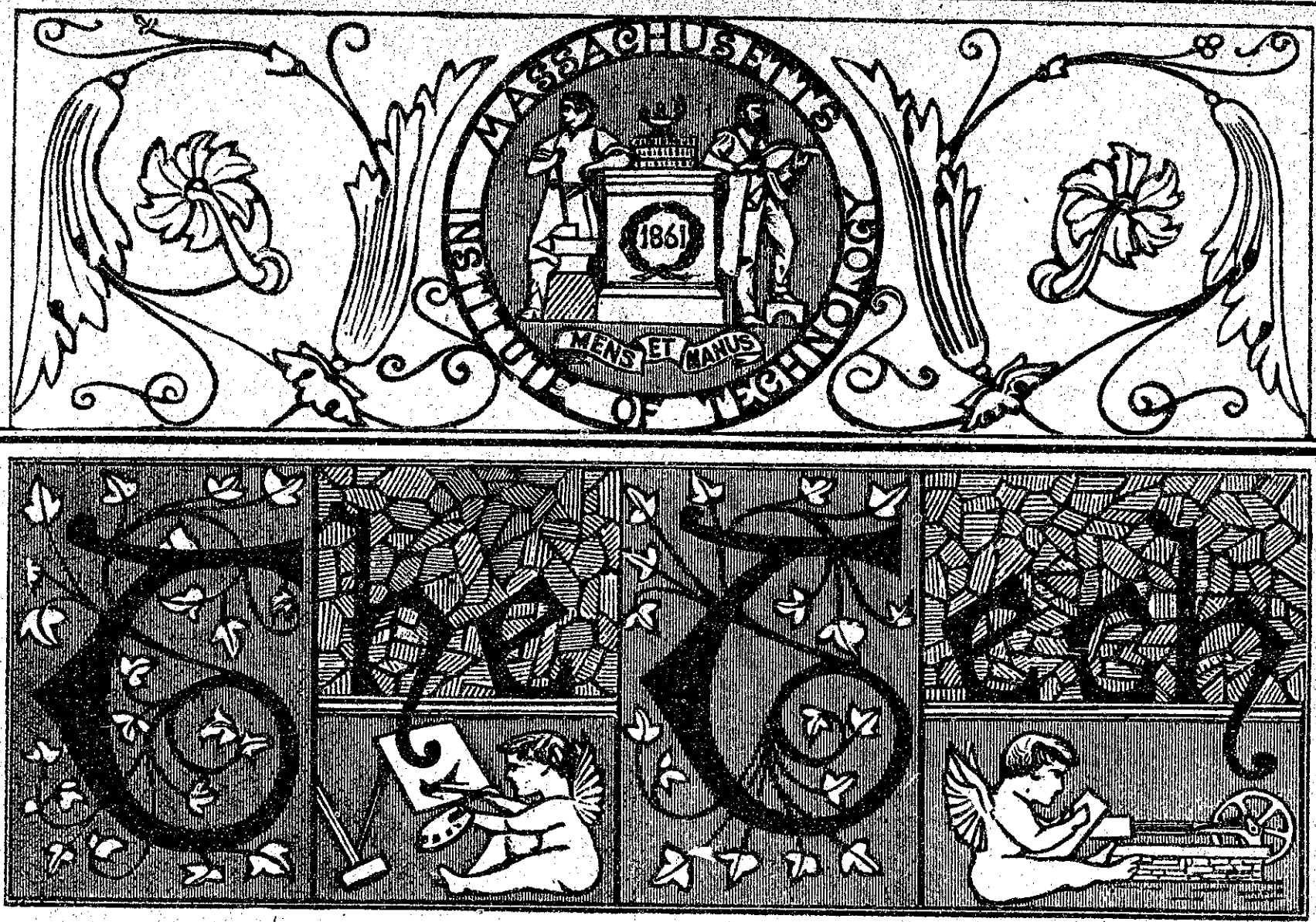

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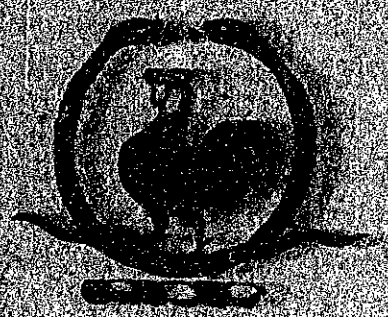

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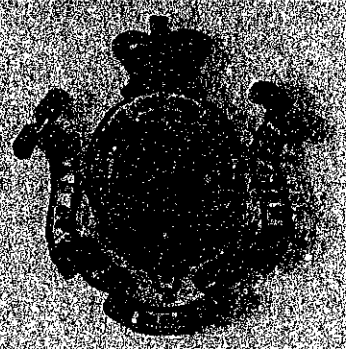

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The Tech.

VOL. II. BOSTON, NOVEMBER 22, 1882. NO. 4.

THE TECH.

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

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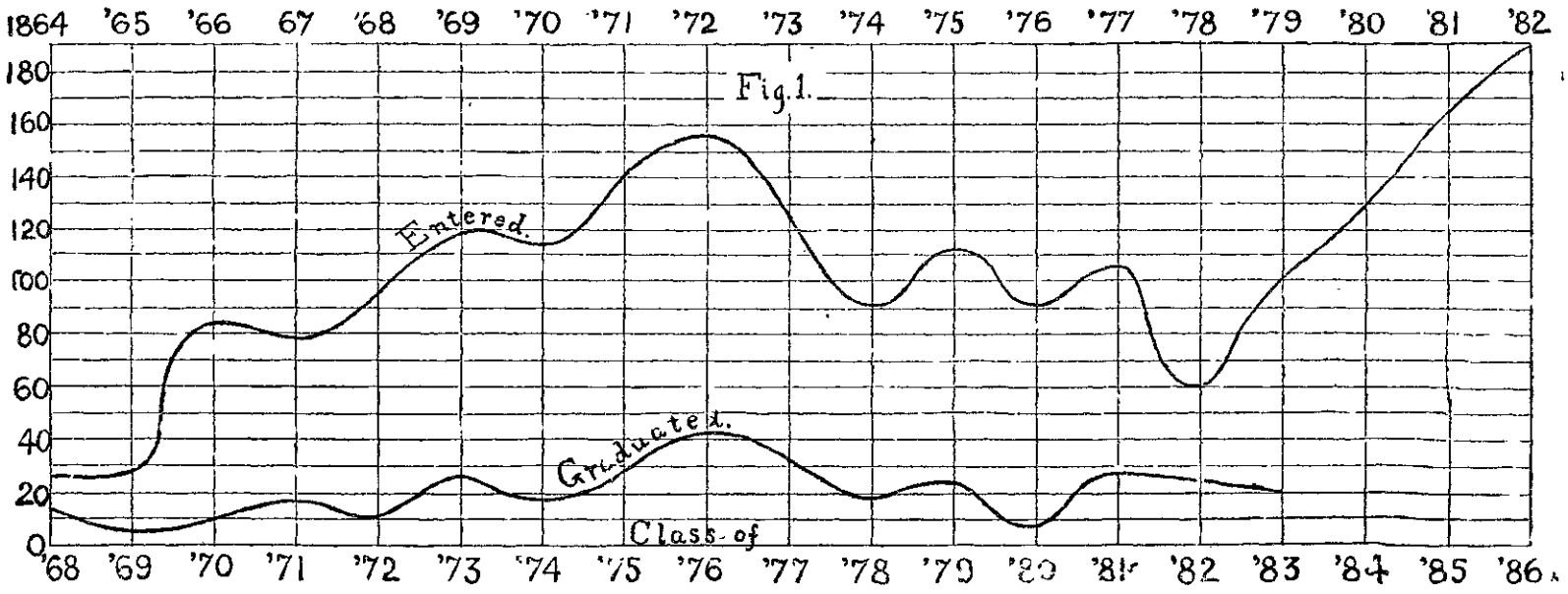
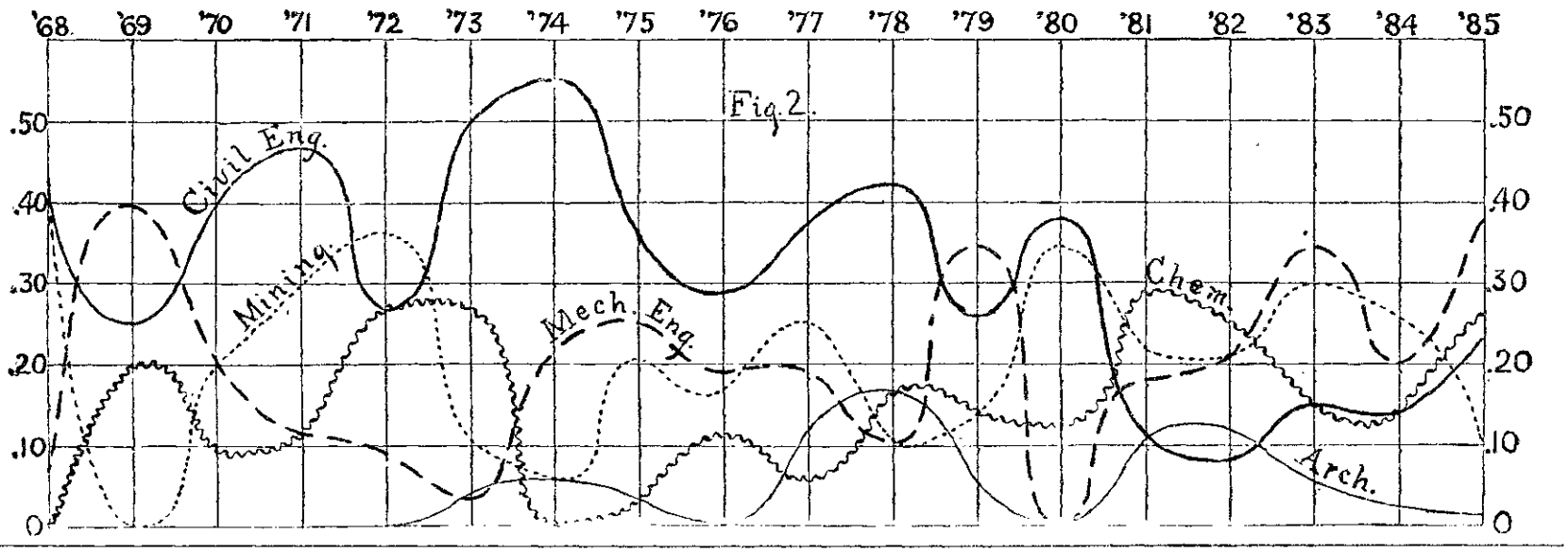
THINKING that it would be interesting to trace the rise and progress of our Institute by comparing the numbers of students that have entered its portals and gone out therefrom in the different years since the founding of the school, we have prepared the following statistics from the only available records, which consist of a complete file of the catalogues extending from the modest thirty-six page pamphlet of 1865–6, — issued just after the Institute was started, with ten officers of instruction and twenty-seven students, — to the modern and more elaborate affair, with whose glowing descriptions of present advantages all are familiar. As to these advantages, we may mention in passing the curious fact that at first each student was entitled to more than one third of an officer of instruction; whereas now the instructors have to be divided into much smaller portions in order to go around. However, we do not mean by this to detract in any way from the advantages aforesaid. We found our statistical researches a little more difficult than we had expected; but, by carefully comparing the lists from year to year, and checking names of "specials" appearing twice, we arrived at the results expressed graphically in Fig. 1. The vertical lines here represent successive years, and the height at which the upper curve cuts any one of these lines shows the whole number of students, regular and special, who entered the Institute during that year. The height at which the lower curve cuts the same ordinate represents the number of these students who appeared four years later as graduates.

The most striking peculiarity of these curves is their irregularity, showing that the attendance has not steadily increased, but that after 1872, when the number entering reached one hundred and fifty-six, there is a marked falling off, until in 1878 only sixty students were admitted. We are inclined to attribute this falling off rather to the "hard times" that prevailed during those years than to any change in the Institute itself. Another prominent feature is the relatively small number of entering students who graduate, the difference, denoted by the distance between the two curves, being the number of specials. The large number of unfortunates who drop out of the regular courses during the four years is evidence that to obtain a degree from the Institute of Technology is not an easy matter. The total number of young men and women who have been students here is found to be two thousand and twelve; and of these three hundred and five have graduated, — or a yearly average of twenty and one third. The largest graduating class was forty-two, in 1876, and the smallest, five, in 1869. The average number of the entering class is one





hundred and six, and of these, only twenty-one per cent, on an average, has enjoyed the supreme felicity of carrying off a diploma wherewith to decorate their rooms.

Fig. 2 was constructed to show the changing degrees of favor in which the various courses have been held in different years, as far as it can be shown by the distribution of the graduates among the five leading departments. The curves in this figure do not represent the number of students, but the *percentage* of each graduating class belonging to the separate departments. For the last three years the proportion of regular students now in each of the courses is given instead.

The total number of graduates from the different courses is as follows: civil engineering, 102; mining, 61; mechanical engineering, 54; chemistry, 43; and architecture, 17: or, of all the graduates of the Institute, the department of civil engineering may claim thirty-three per cent; mining, twenty per cent; mechanical, eighteen per cent: chemistry, fourteen per cent; and architecture, six per cent. The remaining nine per cent is scattering. This method of comparison is perhaps hardly fair to the architects, owing to the large number of "specials" in that course. It is plain that the department of civil engineering has in general enjoyed more popularity than any other, as far as can be judged from the number of graduates.

Referring to the curve, we see that in 1874 more than fifty per cent of the graduates were from this course, or more than from all the other courses together; but for the last five years the popularity of this course has declined, and it has been outstripped by mechanical engineering, mining, and chemistry. Mechanical engineering now leads the van, being credited with nearly forty per cent of the class of '85. It is expected that electrical engineering will come in for a share of '86.

Referring again to Fig. 1, it will be seen that during the past four years the number of entering students has risen to the highest point yet attained, the curve here becoming nearly a straight line. Never before has there been so rapid and steady an increase in the number of students, and we may look upon it as an omen of better times in the future. The Institute seems to be entering upon a new era of prosperity; and, with the promise of a new building and better facilities, we may predict that the number of students will continue to increase until it reaches a point far higher than any hitherto attained.

THE plan now under consideration for the establishment of a suitable memorial of President Rogers has the TECH's hearty approval, and it will have the cordial support of every student who is in any degree acquainted with the intimate connection of Prof. Rogers with the Institute. It is most fitting that this tribute to the memory of the one "who was, more than any other, the founder of our institution" should be rendered by those students who were members of the school at the time of his death; and especially should the class of '82, whose graduation day must ever be hallowed by that sad event, be permitted to have a full share in the establishment of a memorial which may express the feeling of all the students, and their just appreciation of the manliness and geniality of his life.

WE would call the attention of our subscribers, especially the students, to the advertisements in our columns, and advise our friends to examine them and, if possible, bestow their patronage on these firms.

The money derived from these advertisements is one of the principal means of support of the paper, and by contributing to the financial success of our advertisers they will be directly aiding a like success for the TECH.

THE title of the article in No. 3, on "The Geology of Lake Mohawk," should have read "Lake Mohonk."

Contributions.

Coefficient of Friction in Leather Belting.

IN a review of the various experimental methods of studying the change in the coefficient of friction between rubbing surfaces when the rate of sliding or slipping varies, it appeared that the slip of a belt over the surface of a pulley offered some special advantages over other methods. For by the rotation of the pulley under a fixed belt, the slipping may be made continuous and uniform for any desired length of time, the same surfaces may be repeatedly used, since the belt remains stationary, and the same portion of the pulley surface is presented once in each revolution; and, further, any desired rate of slipping could be readily obtained. The plan adopted was by no means wholly new, though it possessed some important new features, and was designed without acquaintance with previously used methods. The results thus far attained must be regarded as merely preliminary, and are given simply as suggestive of what a careful study in this direction may develop.

A pulley 13″ x 4″, mounted on a horizontal shaft, was so arranged that it could be turned at various uniform speeds, giving velocities of its surface of from 0.01 inch to 1000 inches per minute. Over the smooth iron face of the pulley was hung a leather belt, carrying at one end a weight of any amount up to 100 pounds., and secured to the floor at the other end with the intervention of a spring balance reading to 120 pounds. When the pulley was rotated so that its upper surface should turn from the weight towards the balance, the side of the belt carrying the weight corresponded to the tight side of a belt on a driving pulley, the balance side to the slack side. The reading of the balance and of the weight would thus furnish data for computing the coefficient of friction at any desired speed. The rotation of the shaft was automatically recorded.

The numerical results can here be stated only in a general way. With most of the belts used no uniform rate of slip below one inch per min-

ute could be maintained. At this speed a coefficient of friction of motion $f = 0.14$ was about the lowest found, smoother pulleys would give a lower coefficient; with $s = 25$ inches, $f = 0.28$; with $s = 100$, $f = 0.48$; with $s = 500$, $f = 0.76$. In a number of other cases the values were approximately

$s =$	1.5	12	25	50	100	1000
$f =$	.18	.25	.26	.29	.33	.76

This case was about that of an ordinary clean 3″ single belt, carrying 30 pounds. per linear inch of width and running over a fairly smooth pulley. The variation would be greater on a more highly polished pulley. The slow slip values of f being less, the high ones perhaps greater. In the case given in the table, the friction of repose was found to have values not exceeding about $f = 0.25$.

Without placing undue confidence in the results of these observations, it may be concluded that it is possible with a polished pulley to do work on a lathe, for instance, with the same belt at the same tension, which it would be impossible to do with a rough pulley of the same size and speed, owing to irregularity of action. They seem to indicate that on account of the well-known creep of the belt, the friction of repose must be almost an unknown quantity in the practice of belting with uncovered iron pulleys, and may be much greater than that actually called into play: that the coefficient of friction in any given belt at any given time is essentially different at different parts of the pulley, inasmuch as the rate of creep over the pulley varies from the tight to the loose side of the belt: in short, that whatever may be the correctness of the practice of belting, the principles involved are far from being fully understood. The use of leather-covered pulleys and the various kinds of belting opens a wide field for investigation in this subject; and the many instances in which the transmission of several hundred horse-power by one or more belts running from the fly-wheel on the prime mover to considerably smaller, iron-faced pulleys on the main line of shafting is sucessfully accomplished, afford ample opportunity for the satisfactory study of the practice in important cases. These pulley surfaces are always smooth, often highly polished. Aside from the recognized "creep" of the belt, the question arises whether there is or is not, in such cases, a definite slip of the belt (*i. e.*, relative motion of belt and pulley surface at the point of contact of the two on the slack side of the driven pulley or on the tight side of the driver), and whether the increase in rate of slip corresponds to the increase in the power transmitted.

Few of these cases have been satisfactorily studied and they offer abundant opportunities for investigation. S. W. H.

A MODERN JONAH,

— OR —

The New Twenty Thousand Leagues Under the Sea.

(CONTINUED.)

CHAPTER IV.

SEVERAL minutes elapsed before I could recover from my surprise, and Sam was even more stunned than myself. Meantime a crowd of sailors had gathered around us, all with unmistakably Jewish faces, and all uttering the most curious ejaculations that ever came from the lips of man. The crowd suddenly melted away, however, at the appearance of a patriarchal individual, whose long white beard fell down upon his chest. He regarded us steadily for a few moments, and then briefly said, "Gentlemen, your names."

"Scarabeus Bolton, sir," I replied, as I assisted Sam to rise; "professor of Natural History, lately of the Smithsonian Institution,—and Sam, my body-servant."

Sam was about to shake hands effusively, but I restrained him as our unknown interlocutor continued:—

"I had hoped never to have the world or its inhabitants brought before me again so vividly. I appreciate, however, the circumstances which brought you here, and under those circumstances you are welcome. I need not say that I know you well by reputation."

"But may I ask whom I have the honor to address?" I inquired.

"You may, sir; I am Sir John Franklin."

"Sir John Franklin!" I exclaimed; "why, you 've been dead these thirty years."

"You will permit me to know, sir, whether I am dead or not; and as you must be hungry after your adventures, you will please prepare for dinner."

With that he ushered us into a small apartment, where Sam and myself changed our wet garments for others of a coarse but soft texture. As I thought over my adventure, Sir John Franklin, the plesiosaurus, I burned with curiosity, and made such haste that I soon entered the saloon, where I was almost embarrassed by the magnificence about me. The walls were covered with pictures, among which I recognized a full-length portrait, life-size, by Meissonier, a picture of the Sea-Sons by Thompson, and several other marines by famous artists. The apartment received a soft light from a large electric lamp fixed in the ceiling, while at each end a great oval panel of glass allowed one to look out into the sea and upon the multitudinous forms of marine life attracted by the light.

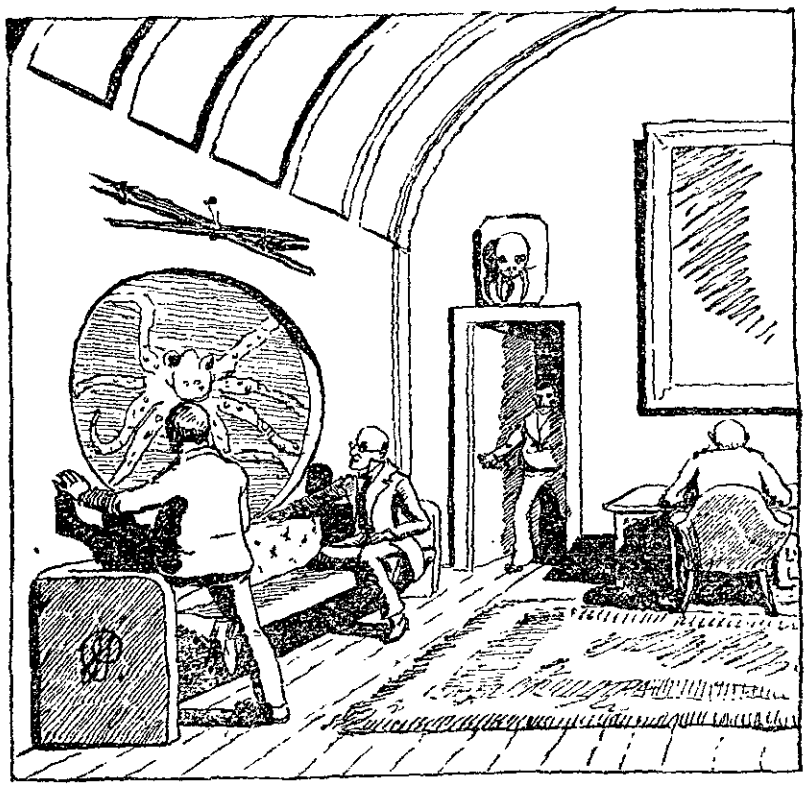
In the centre of the saloon a table was sumptuously set for three, and at a sign from our host Sam and myself sat down with him. At first little was said, as we devoted ourselves to an excellent *purée*, in which I recognized the flavor of hell-venders and hag-fish. My curiosity, however, soon got the better of me, and I opened the conversation.

"Your crew consists largely of Hebrews," I ventured.

"Yes," Sir John replied, "I have long ago forsworn the land and all connected with it. You are the first landsmen who have for years set foot upon my ship. My companions all belong to the Se-mitic race."

"I trust you will pardon my curiosity, Sir John, but I am burning to hear the account of your escape from the ice which, all the world thinks, has crushed you, and to learn the secret of this strange craft."

"I have not the least objection to making you acquainted with both, Professor, as you will never leave this boat to divulge my secret," replied Sir John as he lit a cigar made from some aromatic sea-weed. "You have, of course, as a scientific man, heard of those frequent discoveries in the Polar regions of frozen mammoths and other extinct animals, — animals which may have been dead for thousands of years, and yet whose flesh has been so perfectly preserved in that clear atmosphere that when the ice is chopped away the meat is found sweet and eatable. It was in New Devon, on the shores of Lancaster Sound, that I found this veritable plesiosaurus frozen fast in the ice and perfectly preserved. The 'Erebus' had sunk with all on board, many of my men were already dead, and our remaining ship, the 'Terror,' was fast going to pieces. An idea came to me then, which I lost no time in putting into practice. It was none other than to utilize those curious results of Broca's experiments, which have recently



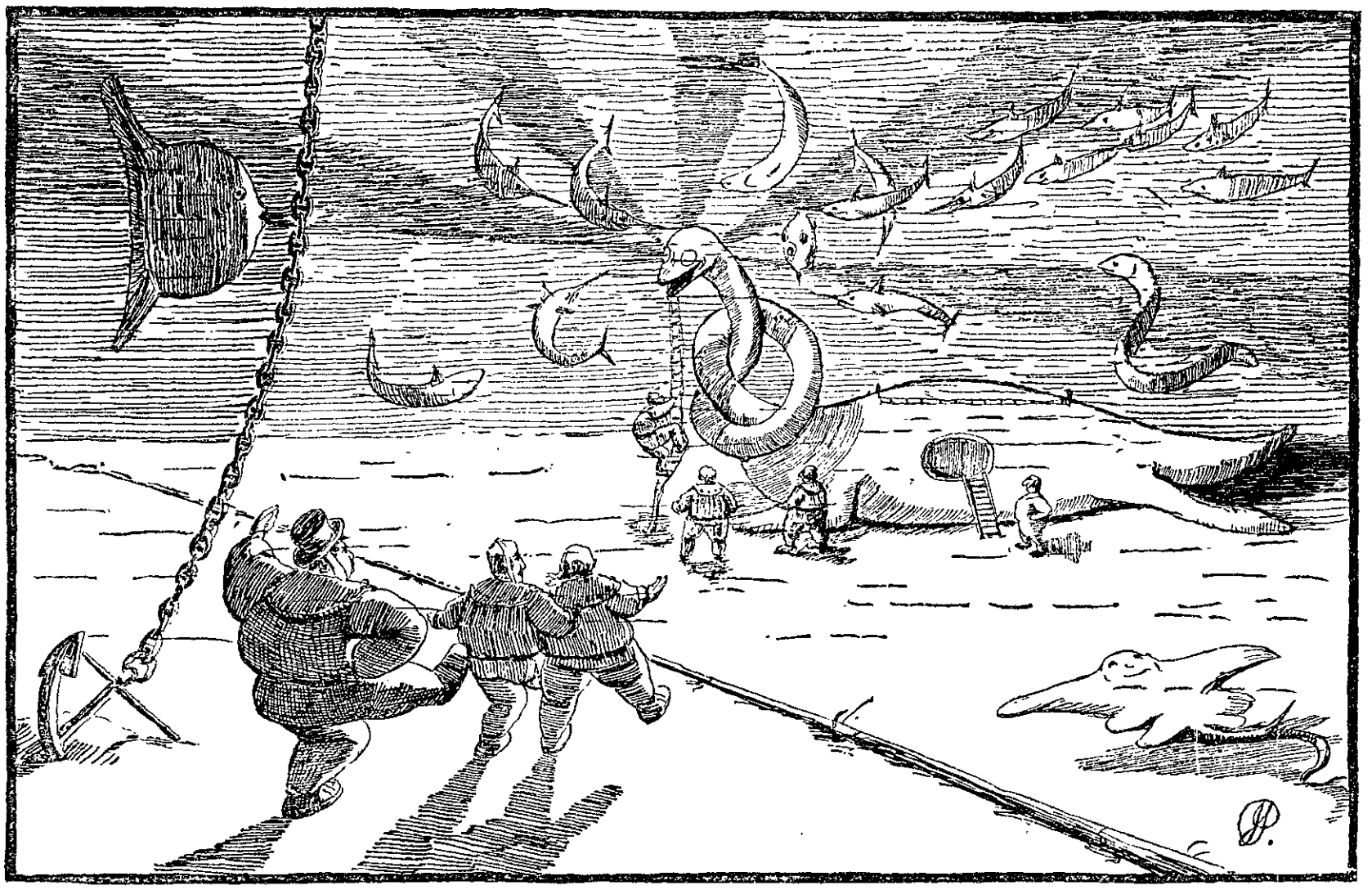
been extended by Fritsch and Hilzig. You of course remember that they divide the convolutions of the brain into three zones, the intellectual, motor, and sensitive, and that the various portions of these zones appear to exercise almost complete control over the muscular movement of different parts of the body, one small portion controlling the movement of the limbs, another that of the head and neck, and so on.

"They also found, if you remember, that if these particular portions of the brain were irritated by an electric current, even after death, the same muscular contraction would take place."

"Ah! Sir John, I anticipate your plan," I cried, as I awoke Sam, who had fallen asleep during the conversation, "but, pray forgive the interruption."

"The rest is soon told," he continued; "we thawed the creature out and carefully washed him with the preservatives we had on board the 'Terror.' Then, removing everything from the gigantic abdomen and thorax, taking pains to injure none of the principal nerves and muscles, we fitted up the cavity much as you see it now, although my pictures and similar decorations were of course added later."

"If you will step over here," he continued, as he left his seat and went to a small covered cabinet, which had for some time attracted my attention, "I will show you how I put my idea into practice. This cabinet," he said, drawing the cloth from the top and disclosing a curious arrangement of knobs and wires, — "this cabinet contains all my motive power and all my machinery. Inside it is a powerful secondary battery, after Faure's type, and which has only to be changed at long intervals. By these knobs I can turn the current through any pair of these wires, which lead to different parts of the brain; touch this one and that



portion of the brain is irritated which causes the plesiosaurus to glide along with a snake-like movement; touch others and he swims or dives."

"Admirable!" I cried. "What is impossible to science?"

"Ah! but this is not all," replied Sir John; "this same electricity lights and warms my craft, and even cooks for me."

"But how do you see where you are going?" I asked.

To which Sir John answered, "By means of an invention of my own. In each eye-socket is a powerful electric lamp, whose rays, even in the water, penetrate far ahead. Just above the eyes is a metallic mirror, chemically prepared, from every point of which proceeds a fine wire leading to a like point on another mirror similarly prepared and fastened in my cabin. The variations in intensity of the rays of light falling on the chemical surface of the first mirror influence the electrical conductivity of the wires, which then exercise a reverse influence on the second mirror, causing it to reproduce what is reflected in the first. Are there any questions here? If not you will permit me to say 'good-night,' as you must need rest after your adventures."

Chapter V.

Two or three weeks had gone by and Sam and myself had become quite at home on board, when one day Sir John asked me how I would like a submarine picnic.

"I should like nothing better," I replied, "although it seems as if a picnic, where one can eat nothing, will be something of an anomaly."

"Leave that to me," said Sir John, "and be ready to start in the morning."

"That night, therefore, the plesiosaurus sank slowly down until it rested upon the broad and level bottom of the Atlantic. Early the next morning I was shown with Sam into a small water-tight compartment, where I found Sir John already waiting for us, clad in an inflated suit of rubber, which left head and hands free, and wearing upon his nose a large spring clothes-pin. His feet were covered with heavy leaden shoes. Under his direction we were soon similarly equipped, when I ventured to ask how we were to breathe.

"Breathe! you are n't going to breathe," said Sir John, while at the same minute the cabin boy entered with a tray bearing several glasses and a bottle.

"This," continued Sir John, as he opened the bottle, "is an allotropic form of hydrogen dioxide, discovered by myself. It has the same formula, $H_2 O_2$, and when drunk it enters into the circulation, where it slowly decomposes into free oxygen and water. The oxygen is of course carried over the body by the blood, and we do away with the need for respiration."

I was anxious to test the virtues of the new com-

pound and drank two glassfuls, which was enough, Sir John said, to act all day. It was nearly tasteless, and its only effect was to raise the spirits and increase the vivacity of us all. Then, after we had carefully adjusted the clothes-pins to our noses, and a modification of the microphone to our ears, the door communicating with the ocean was opened, the water rushed in, and we soon found ourselves walking along the bottom. Our inflated rubber suits relieved us from all inconvenience from pressure, and our leaden shoes seemed light as slippers.

Sir John and myself went in front, while Sam followed with the baskets containing our picnic dinner. We went on in this way for an hour or more over a plain as level as a parlor floor and formed of tiny shells, loosely compacted I had begun to tire of the monotony of our walk, when a dark mass loomed up before us. In response to my inquiries, Sir John said : —

"We are nearing one of my submarine forests, the base of a minor Sargasso Sea. I am hoping to find a pleasant place to picnic there, for I am hungry already."

A walk of a few minutes brought us to the edge of the forest, and we were soon wandering through the curious growth. The heavy pressure of the water caused every trunk and branch and leaf to grow directly upwards, giving an absurdly perpendicular aspect to the whole.

Naturalist as I was, I should have been less than human if my heart had not beat fast as we passed among these rigid trunks. Algæ and sea-weed of many species, richly colored zoöphytes of varieties quite unknown, and sponges of every size and shape, were scattered about on every hand. Fishes of strange form passed in and out among the branches like those curious winged monsters, found only now as fossils, and gave to the whole the aspect of a forest in some long past geological epoch. I wandered about in the happiest state of mind, classifying everything I met, until a shout from Sam reminded me that I was almost consumed with hunger.

I retraced my steps without difficulty in the direction of the voice and came out into a little open space, where Sam was about to arrange our dinner while Sir John watched the operation with interest from a seat upon a huge sponge. I was just seating myself beside Sir John when a sudden cry from him made me look up just in time to see the contents of our first basket mount toward the surface. Bottles of a very refreshing liquor made from the fermented milk of the sea-cow, salads, preserved sea-peaches, all followed one another in quick succession and disappeared above our heads. At the same moment Sam made a frantic grab as a bottle passed him, and in so doing knocked the clothes-pin from his nose, so that, for the moment, his position was quite precarious. I rushed to him, however, and held his nostrils tightly, while Sir John, with great presence of mind, whittled another pin from the handle of our empty basket.

As soon as the excitement was over, I looked to ascertain the cause of the loss of so large a portion of our dinner, and immediately saw that Sam, in defiance of all the laws of hydrostatics, had opened the basket with its mouth upwards, so that the food, being lighter than the water, had of course risen to the surface. Luckily, however, we had the second basket, and Sam, with many protestations of regret, opened it in the proper manner, with mouth downwards, and we began our meal.

It was some time before I could accustom myself to the precautions which were rendered necessary by variations in specific gravity. Almost all the food, the liquid portion especially, was considerably lighter than the surrounding water, and as a consequence it was not only necessary to have the baskets weighted with lead, but to decant all the liquids upwards into glasses held and kept upside down. Even the salads and similar dishes, with which Sir John's foresight had provided us, had to be eaten off the under side of the plates, and "There 's many a slip 'twixt the cup and the lip" acquired a new significance.

When I had partially satisfied my hunger under these novel conditions, I remembered that Sir John had not yet told me how we happened to be so suddenly precipitated into the interior of the plesiosaurus. In response to my inquiry, he said, as he drew a cigar from his pocket and lit it with a sodium match: —

"I had been for some time absent from my cabin and so was quite unacquainted with the events which had taken place so near me. The plesiosaurus had been for several hours under water and the air on board was becoming foul. I therefore ordered the hatchways to be opened, and was quite as much surprised at the result as yourself."

I was about to ask Sam to get a little more of the salad from the basket, but looked around in vain for him. I was quite alarmed, and Sir John and myself immediately started to find him. We had gone but a few steps before we saw him sitting behind a huge trunk looking as white and forlorn as can be imagined.

He seemed very loath to tell us what the matter was, but finally said that as he was eating a piece of pickled sea-cucumber, he had swallowed a quantity of sea-water with very exhausting effect. I gave him a large dose of our fermented drink, but he was so weak that we concluded to leave the baskets and what remained of their contents, and return to the plesiosaurus. We had gone but a short distance before Sam's spirits seemed to rise. He shouted and sang and talked garrulously about himself in spite of my continued reproofs. I was not long at a loss to account for this sudden and unwonted exhilaration; it was plainly a case

of oxygen intoxication. The fermented liquor I had given him was acting on the hydrogen dioxide, which he had taken before starting, and was decomposing it with great rapidity. I called Sir John's attention to the fact, and, quickening our pace, we soon saw the lights of the plesiosaurus. As we drew near, it became evident that an occurrence of no usual nature had taken place, for the neck of the animal was seen to be tied in an unmistakable knot, which all on board were endeavoring to undo.

(TO BE CONTINUED.)

Athletics.

A GAME of foot-ball was played between the Institute eleven and a team composed of Harvard Alumni, Nov. 11, on the base-ball grounds, South End. The match was the result of a challenge from the graduates, and excited considerable attention in consequence of the comparative closeness of a former game between the Alumni and the 'Varsity eleven. The foggy and disagreeable weather, however, rendered the attendance small, but an agreeable surprise was the presence of President Walker among the spectators. Game was called at 4 o'clock, Harvard having the kick-off. At the very outset Haines, by a brilliant run, succeeded in making the first touchdown for the M. I. T., but failed to kick a goal. This was soon followed by another touchdown for M. I. T. through a fine catch and run by Richards; no goal, however, being obtained. After the next kick-off the ball was for the first time carried well towards the Tech goal by a good run of N. M. Francis, only to be sent back and touched down the third by du Pont, from which a goal was kicked. In the second three quarters the M. I. T. from the start forced the game and kept the ball in close proximity to their opponent's goal, though Harvard, by desperate playing and successive safeties, managed to keep the score down, Richards, by a beautiful catch, making the only touchdown made in the innings. The end of the game found the score one goal, three touchdowns to nothing in favor of Inst. The M. I. T. played a stronger game than when it last played with the Harvard eleven, the rushing and following having noticeably improved. The rather rash remarks of the *Herald* as regards Technology's playing off side can perhaps be explained by the fact of the reporter, who was a Harvard graduate, acting as umpire for the graduates. In regard to his remarks concerning the un_entlemanly conduct of *certain* of the Institute men, we would replace the *certain* by *one*, and that one we hope will remember that rough conduct under such circumstances brings opprobrium upon his fellow-players as well as on himself. Umpires for Technology, Mr. J. G. Billings; for Alumni, Mr. J. C. Morse. Referee, Mr. F. H. Briggs.

Arrangements have been made for a series of matches between the British Foot-Ball Club of New York City, and the Britannia Club of Montreal, the present champions of Canada. These will be the first games played in America as foot-ball is played in England, and will probably excite considerable attention as a means of testing the individual merits of the American and British game.

Lacrosse is meeting with considerable favor at Harvard. A meeting of Freshmen was held a short time since to consider the advisability of forming a Freshman team. Much interest was manifested, and it was decided to go to work at once. They will probably arrange games with the fitting schools in New England, which are taking so much interest in the game.

The foot-ball game between Princeton and Columbia, Nov. 7, resulted in a victory for Princeton by a score of eight goals and three touchdowns to nothing.

The Civil Society.

FOR some time past the civil engineers at the Institute have been agitating the question of forming a society, it being apparent to all that there should be more social life in connection with our four years' hard study.

The students of each class of this department see one another every day at their regular routine of study, but this is all. Now would it not be pleasant to meet together occasionally in order to spend an evening in social enjoyment, and establish an intimacy among us which shall continue through after years?

The members of the class of '84 in this department, having decided that such an intimacy was desirable, commenced in earnest the work of forming a society. The result of their efforts has been the organization of one to be known as the $\Gamma\,\Sigma\,\Upsilon$, to which any regu'ar civil, or any special making civil engineering his principal study, is eligible for membership. A meeting

was held on the 11th at the rooms of Mr. Smith, and, after the adoption of the constitution, elected the following officers for the present year: F. L. Smith, president; G. L. R. French, vice-president; W. F. Carr, secretary; C. A. Bothfeld, treasurer; W. J. Luther and F. M. Stuart, committee of eligibility.

It was also decided at this meeting that certain transactions of the society should be kept secret.

Department Notes.

THERE was $34,000,000 worth of gold and $43,000,000 of silver produced in the United States in 1881.

We expect the chemical laboratory in the new building will be perfection, and will surpass anything in the country. Considerable time is now being spent in preparing the plans for it.

Mansfield, '83, has just begun his theses work. It consists of refining all the old copper products that have accumulated in the laboratories. With good luck he should realize two or three hundred pounds of refined copper.

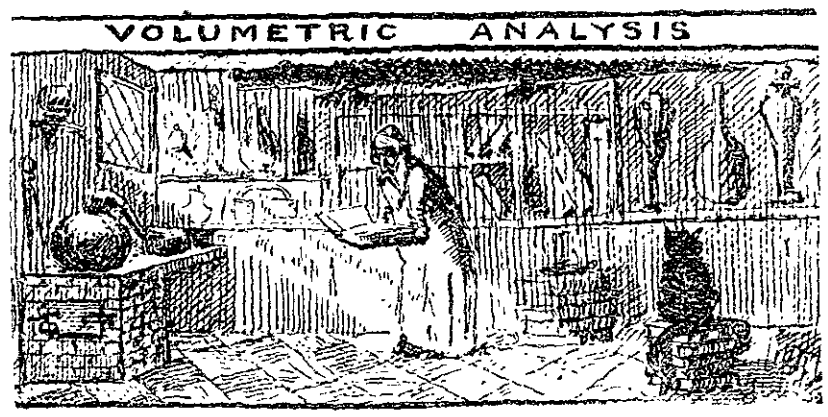
Tompkins, '83, began on his ore last week. It is zinc blend, an ore that has never been tried in the metallurgical laboratory before this year, and, consequently, there is considerable interest in the results. Tuesday was spent in roasting to drive off the sulphur.

The problem of the billiard hall was handed in last Thursday. Prof. Clark will give the mention some day this week.

The architects have sent in a petition to the Faculty that they may take water-color sketches this term instead of next.

A meeting of the A. A. M. I. T., now called the Boston Association of Architects, held a meeting last Wednesday evening in the Art Museum. The meeting was called to consider the by-laws of the new constitution.

The next problem will be that of a railroad station.



ANDREW JACKSON. By Prof. Wm. Graham Sumner. Boston: Houghton, Mifflin & Co.

This volume, number four in the American Statesmen Series, is hardly a biography, and yet in many senses it is more than a biography. Personal details are not lacking; they are sufficiently numerous to indicate the character of the man as he was — sturdy and fearless, but with many human foibles. It is, however, with Jackson in his relations to the politics of the time, that the author chi fly concerns himself. The policy of the government, and that of the various parties, in foreign and internal affairs, is clearly indicated, and the book is a valuable addition to the political science of America. Prof. Sumner's position as a social scientist renders him peculiarly fitted to deal with his subject, while his terse and happy style is thoroughly readable.

TRAVELS IN SOUTH KENSINGTON, with Notes on Decorative Art and Architecture in England. By Moncure D. Conway. New York: Harper Bros.

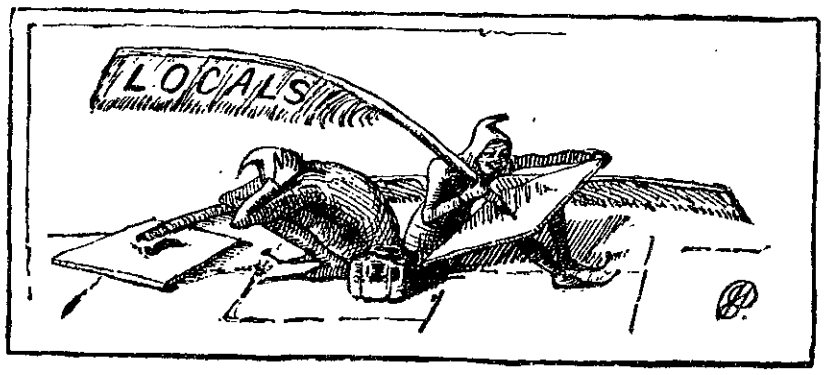
To art students this book is of special interest, for it not only gives a history of that shrine of decorative art, but describes its collections of objects and its educational or art method and character. It is the privilege of America to profit by the history of England, and to judge what is a necessary factor in art and architecture, and what is merely an experiment; but until a school can be supported in America corresponding, in some degree at least, to that at South Kensington, our students of art must go abroad, and we cannot realize the full measure of our possible advantages.

In giving the details of many of the more important objects in the museum, Mr. Conway has avoided the catalogue style, and, by weaving in bits of history connected with the institution, has made an entertaining book for the general reader.

WE have also received from Ginn & Heath, Boston, a mathematical series, comprising the following: —

Practical Arithmetic	$1.10
Elementary Algebra	1 25
Complete Algebra	1.55
Plane Geometry	.85
Plane and Solid Geometry	1.40
Geometry and Trigonometry	1.55
Trigonometry and Tables	1.25
Logarithmic Tables	.65

This carefully graded series is from the pen of Prof. Wentworth, of Phillips Exeter Academy, who is assisted in one or two volumes by Ex-Pres. Hill, of Harvard, and G. A. Hill. The Geometry, which pays especial attention to the Theory of Limits, is in many respects a model, while the arrangement of the entire series is excellent.



NOW is the time to get your Gym. boxes.

Chip Chapman, '85, has returned.

Ask Hardon how he broke his hat.

Mr. French, '82, was at the Institute Wednesday last.

The English department will have a reference library next year.

A new instrument for gauging the velocity of streams — a pistol tube.

Many of the Freshmen are dissatisfied with the roster for the present year.

Would not a tonsorial artist strike a bonanza by calling on the civil department?

At the meeting of the 2 G. Society, on the 14th, two members from '85 were initiated.

Now that Chapman has returned, we will probably hear from the Sigma Chis again.

We are informed, by reading a notice on the bulletin-board, that the lock-ups are now ready.

The Sophs were condoling with one another last Friday, after the first examination in physics.

We notice that the *Journal* proposes the name of Gen. F. A. Walker for senator from Massachusetts.

The Senior class in mechanics will soon be broken up into divisions composed of the different departments.

One of the Sigma Gazelles tried to remove an obstruction in the Neponset River the other day by the use of the Cornell stroke.

We understand Cupid has again been at work at the Institute. This time a chemist has succumbed. He will probably survive.

'86 has chosen the following class officers for the ensuing year: *Pres.* Roland G. Gamwell; *Vice-Pres'ts* Frank L. Locke, F. Richardson; *Sec.* A. M. Getchell; *Treas.* A. E. Leach.

Many are inquiring about the Tennis Club and whether arrangements for playing are to be made for the coming winter.

The exchanges in the library have a fine appearance now with the new labels on their covers. There are about sixty exchanges in all.

Amherst's new gymnasium will be one of the finest in the country when finished. It will be modelled and finished in a style similar to the Harvard gymnasium.

Many of the students availed themselves of the invitation extended by the managers of the Olympian Club to visit the skating rink last Friday and Saturday afternoons.

The Freshmen had their first drill on Wednesday last. The number and appearance of the men on that and the succeeding day promise well for the success of the drill this year.

The reason that a certain Institute man gives for not subscribing for the TECH is that he can find every issue in the binders. Verily, is frankness here a virtue? We call it cheek.

The Senior mechanicals have been removed to new quarters for drawing, viz., Room 22, the doorway between this room and the old mechanical drawing-room having been reopened.

The mechanical drawing-room is so crowded at present that the door between it and the second civil room has been taken down, and some of the mechanicals will have desks in the civil room.

Crush hats and ten-acre collars are not conducive to one's finances; and, remembering some assessments shortly due, we would advise a certain miner not to be so Hard on the present styles in future.

Ritz and Hastings have been chosen as the photographers for '83. Those desirous of having their portraits taken will please hand in their names to the committee, Eppendorff, Underwood, and Davis.

Through the kindness of the Olympian Club managers, the Institute men were given free tickets on Friday and Saturday last. A large number availed themselves of the privilege, in order to practice skating for the fancy dress party, which takes place Thanksgiving evening.

Alumni Column.

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

'79. F. B. Knapp, at present superintendent of buildings at Harvard University, has just been appointed instructor in drawing and surveying at the Lawrence Scientific School.

'79. C. S. Gooding has resigned his position as instructor in the Holy Communion College, Charleston, S. C., and gone into the manufacturing business in this city.

'79. F. R. Loring has gone to Cornell as assistant in the Chemical Laboratory.

'79. R. W. Lodge has returned from Nevada and will spend the winter in Boston.

'79. W. W. McFarlane, last year's assistant in the Freshman laboratory, has accepted a position as chemist in the Quaker City Dye Works, Philadelphia.

'81. Frank E. Came has the position of first assistant engineer of the Toledo, Cincinnati and St. Louis R. R.

'81. Herbert A. Young has the position of second assistant engineer on the same railroad.

'82. Fred Darrow is draughtsman for Prof. T. M. Clark.

'81. E. M. Welch, special architect, is draughtsman at Rotch & Tilden's office in this city.

'84. E. C. Hillyer is draughtsman at the Patapsco Bridge and Iron Company's works in Baltimore, Md.

'84. F. F. Johnson, a former editor of the TECH, is with his father in the surveyor-general's office, Denver, Col.

'84. A. S. Pratt is employed in the Bank of North America on Franklin Street.

'85. R. B. Moore is attending a business college in Poughkeepsie, N. Y.

'85. B. F. Copeland is with the firm of Peabody & Co., Commercial Wharf.

THE '*Varsity* has always seemed to us rather as a comet appeared to the ancients. It has several of the characteristics of those gaseous exhalations, so far above the rest of us, which undertook to frighten everybody and run the world in general. A previous number of this luminary contains a very readable poem on "Quebec," which took some prize or other. The last stanza of the poem refers to the possibility of Canadian independence; and thus the critic of the '*Varsity* improves his opportunity: —

The aspiration for Independence is, at least, not unnatural or dishonorable, and, instead of carping at it, we prefer to congratulate our poet because he has not turned his pen to more ignoble use and hymned the praises of annexation. 'It would be strange indeed if the same poem which sung of Wolfe — the soldier who aspired to be a poet — should have ended in a panegyric of a nation in which persons of the stamp of Gen. Grant are the most conspicuous figures. Not that the nation is not a theme for song, but the singer should seek his inspiration from the Muse of Comedy. Under her guidance what might he not sing? He might tell of the purity of their public life, of the noble thirst of their members of Congress, of the bills which they sent in for spirituous liquors consumed at their leader's funeral, for flowers cast upon his coffin. Or the serenity of their firesides might fire his tongue, and he would recount with pride how, in the facilities for bills of divorcement and the hardness of their hearts, they had "whipped" the Israelites of old; in passing, he would glance also at the superior calibre of their children, at the extinction among them of such old-world follies as childishness, simplicity, and obedience. Or, winging a higher flight, he might aspire to paint (a second time) their beautiful women, and tell with what heat of stoves and furnaces, with what feasts of iced-water and candy, with what appliances of Saratoga-waves and horsehair, they have succeeded in diminishing their stature, in coloring their faces to the fashionable shade of yellow-green, and in removing the last lingering signs of nature's grace. Finally, after tracing some of the triumphs of which life is capable in such a land, he might not inaptly revert to the inspiring scenes which attend its close; and now would the supreme efforts of the panting muse be invoked to show in what a wealth of crape the widow hides her sorrows

from the world, like a Pharisee with an enlarged phylactery at a street corner; and, last of all, in what a sumptuous resting place, as high as the highest dog kennel, and not less elegant in structure, she deposits the costly "casket" of the departed; and so ending his poem, might he not call it the apotheosis of a people without taste?

Of course, as Americans, we are very sorry that we don't quite suit the '*Varsity*, and we hasten to quiet the somewhat premature fears of its critic. The United States, we think, has no desire to annex itself to Canada. Canada is too great a financial success. The Dominion, too, is doubtless more at home in the family of that noble power which spends its time and money in slapping small boys, like Egypt, on the face. We have no desire to refute the charges of the '*Varsity*.

The unfortunate effect of the tendency in this country to found a dozen "universities" with the money necessary to maintain one good college is painfully illustrated in the majority of papers we receive from the West. From time to time there appears in the box a wad which calls itself the *Occidental Mirror*. It is rather smaller than the average one-cent newspaper, — but then it is published once a month. Its case is perhaps an extreme one, but, with the few well-known exceptions, all the Western college publications have this same forlorn aspect. While the West is so sparsely settled, it is perhaps necessary to have as many universities as trees; but what is the use of publishing papers whose influence is oftener predjudicial than to the benefit of their supporters?

Foot-ball is at present occupying a large share of the collegian's attention. Yale has undoubtedly a stronger team than any of the other colleges, and will probably have no difficulty in defeating Harvard, Columbia, and Princeton. The *Harvard Advocate*, however, considers the outlook encouraging.

We have received and duly admired the *Vassar Mis.* If Vassar would only become co-educational, what a rush there 'd be.

The *Lasell Leaves* comes to hand with an interesting article on table etiquette, and two on "How to Get a Husband."

THE fishery question. — Got a bite? — *Puck.*

Princeton's lacrosse team has twice beaten Yale.

The members of '83 are to receive graduated diplomas at Amherst.

There are thirty-two candidates for the '86 class crew at Harvard.

Harvard has one hundred and sixty-four electives open to students.

The rabbit may be timid, but no cook can make him quail. — *Ex.*

The Sophomore class at Lafayette gave a supper to the Freshmen.

A daily paper is to be published at Dartmouth. — *Princetonian.*

Trinity won in the recent tennis tournament with Amherst and has challenged Yale.

To get up a dinner of great variety, cooks should be allowed a wide range. — *Ex.*

Oscar Wilde was the first to discover that there are greenbacks to sunflowers. — *Commercial Bulletin.*

Something new has been instituted in our midst, namely, a young ladies' foot-ball club. — *Lasell Leaves.*

"A Paternal Freebooter" is said to have been written as a sequel to "What I saw Under a Poke Bonnet." — *Ex.*

The catalogue of the University of Michigan reports five hundred and thirteen students in the collegiate department, and one thousand and twenty-one in the professional schools.

Why is a torn umbrella like a small circus? A torn umbrella makes a display of ribs, and a display of ribs is a side show, and a side show is a small circus. — *Yale News.*

The Intercollegiate Press Association is meeting with general approval.

$\Gamma\ \Sigma\ \Upsilon$ meeting at the Parker House, Friday evening, Nov. 24, at 7.30 P. M.

When the button comes off the back of a man's shirt his choler begins to rise. — *Commercial Bulletin.*

We stood by Kenilworth Castle old
That beautiful night in the month of June,
And the walls of the ruin, so gray and cold,
Were silvered o'er by the light of the moon.

And I thought of all I had heard and read
Of the lover so false and the maid so true,
When the girl by my side squeezed my arm and said,
It must have been *lovely* when it was new.

Crimson.

The Massachusetts Institute of Technology.

BOYLSTON STREET, BOSTON.

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

Besides the above distinctly professional courses, the Institute offers scientific courses of a less technical character, designed to give students a preparation for business callings through the medium of a scientific training.

Modern languages are taught so far as is needed for the ready and accurate reading of scientific works and periodicals, and may, at the option of the student, 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. Shops fitted up for the use of both hand and machine tools and a laboratory of steam engineering have been established as a part of the instruction in mechanical engineering. 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. Extensive laboratories are provided for students in chemistry and in natural history, as well as laboratories in physics and applied mechanics, for the use alike of special students in these departments and of the students of the several regular courses.

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 Institute is also empowered to confer the degree of doctor of science.

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 fees for tuition of students taking the full course is $200.00 a year. Besides this, $25.00 or $30.00 per year 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 $150.00 a year. The Lowell School teaches the making of designs for prints, carpets, wall-papers, laces, ginghams and other woven goods. A weaving department with a variety of looms is connected with this school. No charge for instruction is made.

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