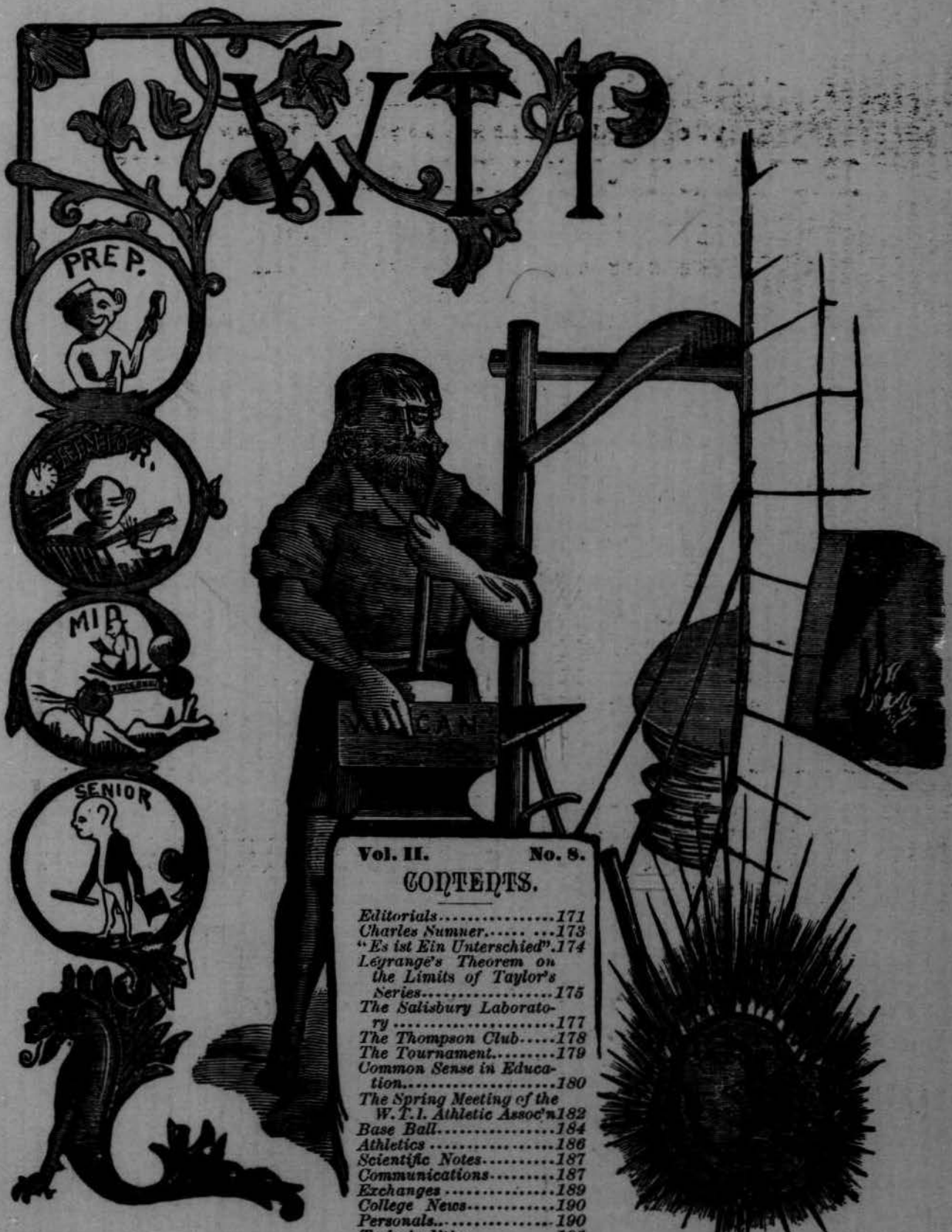

Vol. II. No. 8.

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W · T · I

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THE W T I.

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"Where frequent beauties strike the reader's view,
We must not quarrel for a blot or two;
But pardon equally to books or men,
The slips of human nature and the pen."

—*Byron.*

AS the end of the term approaches and a class is about leaving the school, the season seems a fitting one for the college press to indulge in a retrospective glance at the course about completed, moralize a little upon the shortcomings of the students and record the result of their musings for the benefit of those who remain. This for years has been the custom with college journals, and it is not ours to be an exception. No trouble is encountered in choosing a subject. Want of application, of punctuality, inattention, disrespect toward instructors, all these are fruitful themes, and will receive due attention at the hands of our contemporaries, so we will not venture upon them. Without then a desire of assuming the part of censor, you who will remain in the school allow us to speak of that of which we are convinced both from our own and the riper experience of others. We refer to the want of appreciation with which students listen to an opinion or an explanation of a professor upon a question connected with his specialty. The trouble we think is not so much from carelessness, as from an ignorance born of inexperience. An ignorance of the value of a lifelong labor in one branch of learning. Jacks-of-all-trades have had their day, and now when men who have made a single branch of science a life's study, speak, wise men listen.

We have repeatedly heard of graduates saying that could they again enter the lecture-room as a student, it would be with reverence for the men who have explored those avenues of learning and who now impart, perhaps to inattentive ears, the results of their rich experience.

Our men will not have been long graduated when they will find that good advice and instruction are scarce, and that the most valuable instruction they can receive, aside from that derived from personal effort, is to hear the experience of "one who knows." We do

not want to preach, but, fellows, look this thing square in the face. Exercise a judgment, if must be, beyond your years, and take the testimony of graduates who, like you, have dawdled away their time in the lecture-room while the professor has been forcing upon them what in their ignorance they failed to see was dollars and cents.

NOW that the season of out-door sports has opened, we again begin to hear of accidents to the men taking part in the different games. This is not to be wondered at, for, as a well known Worcester physician said on being called to such an accident: "If young men will take part in manly sports they must expect some mishap will happen. Constant vigilance and good training will keep them out of harm most of the time, but they will have some hard raps." This being the case, it is surprising that so few men know what to do in the event of an accident. If a man is hurt it is a bad plan to wait until the mob that always gathers around the unfortunate fellow has taken a vote on what is to be done, before trying to relieve him. We think that a school whose chief boast is "practicalness," could spare enough money from some less practical investments to enable the students to have a couple of lectures a year from a reliable physician on what to do in case of accidents.

THE time approaches when the voice of the graduate will be heard throughout the land. No hamlet is too small nor any city too large to help swell the chorus to the refrain, and now, my classmates, the city looks to us for a return for the privileges she has afforded, for the benefits we have received "at her hands," etc. Soon a large number of the youth of our country will shoulder a roll of paper bearing the legend "Passed the required examination," and, armed with this, will march forth to the music of their immortal class-songs to leisurely pluck the prizes of life, which are, of course, all within their grasp. Now we don't propose to give much advice to these applicants for diplomas, but we must indulge in a few reflections. In the first place, as you issue from the hall wherein you have soared to heights sublime in your oration or essay, you will find the old world looks much as it did when you entered the hall, and, as the days go by, it will become more and more evident that the general public has not been much impressed by your advent into its midst. And now comes the moral: Don't be discouraged by the frigidity of its reception of you. In time your merits and your faults will be discovered and requited. If you think the time has come for you to cease absorbing knowledge and to begin radiating, all well and good. At any rate, each member of a class becoming alumni will do well to remember that he should constitute, if possible, a centre from which intelligence shall radiate, for in this way is the lump of ignorance to be leavened.

SEVERAL weeks ago, the *Engineering News* contained an article on the advantage it is to an engineer to belong to one of the large engineering societies. The idea is an excellent one and

many arguments can be advanced in its favor. Some young men say that the fees for membership are so heavy that the advantages derived from the societies are more than counterbalanced by the cost, and also claim that they cannot afford the expense of attending the meetings. These arguments are not very good, for the expenses are small and the publications of the organizations keep the members, who cannot attend the meetings, informed as to the proceedings. The fact that a man is a member of one of these societies is a guarantee that he has done some good work in his profession, for only on account of meritorious work is a person admitted to membership. A good company wishing engineers always prefers men whom one of the large societies has designated as reliable persons in their departments.

CHARLES SUMNER.

Youngest and ablest of the second American Triumvirate, the other two members of which were Seward and Chase, was that grand exponent of a higher civilization, Charles Sumner, senator from Massachusetts. After graduating at Harvard he spent a few years abroad and returned to Boston to pursue the practice of his profession of law. The stirring political questions of the time soon drew him into the vortex of politics and despite the danger of losing his splendid practice at the bar, and the certain calamity of social ostracism, he deliberately cast all his weight of eloquence and learning into the balance for Abolition. After pronouncing his magnificent oration on "The True Grandeur of Nations" in Boston, on July 4, 1845, he found himself deserted by every notable man except Longfellow and Prescott. In 1848, he left the Whigs and joined the Free Soilers.

The Democrats and Free Soilers sent him to the Senate in 1851.

Here in 1852 he delivered the speech whose title became the watchword of the Abolitionists,—"Freedom National, Slavery Sectional." In 1856, he employed his incisive eloquence to arraign and expose the perpetrators of the "Crime against Kansas." The personalities that followed led up to the cowardly assault on Sumner made by Preston Brooks of South Carolina in 1856.

The injuries inflicted by his murderous assailant proved wellnigh fatal, and it was not until December, 1859, that Mr. Sumner was able to resume his place in the United States Senate.

In his official action in this body as well as in every thing else that he did he was at all times directed by the most inflexible and conscientious adherence to principle. Nothing could swerve him from the pursuance of a course that seemed to him to be marked out by duty. Parties might change, but Sumner, never. He had the courage of his convictions, and was never at a loss what course to take. He did not hesitate to differ from the leaders of his party whenever those leaders deviated from the straight and narrow political path that seemed to Sumner the only way to national honor and national probity. No wonder that the administrative actions of Grant were searchingly and severely criticised by a statesman who years before had ventured to question the policy of Abraham Lincoln.

Among all the numerous, warm-hearted friends of the Freedmen, probably none was abler, and certainly not one was more persistent in his efforts in their behalf, than was Charles Sumner. It was he that dared to stand alone in the United States Senate to hurl against the principle of property in man the ponderous mass of argument that he had gleaned from the ancient as well as the modern classics, and to heap upon the supporters of that principle the odium that has attached to slaveholders in all ages and in every clime. His speeches were prepared with great care. During the first seven years of his political life he never attempted an extemporaneous address.

A man of generous proportions, tall and stalwart, and of imposing presence, his bearing added greatly to the effect of his speech. In features he resembled Edmund Burke, and he liked to think that his speeches also were very similar to those of the great Commoner.

It was Sumner that first suggested Emancipation as a war measure, and it was Sumner also that never afterward allowed the matter to rest until President Lincoln issued his famous proclamation. The important measures of reconstruction times engaged Sumner's undivided attention. Here as usual he was constantly on the alert lest his colored protegés be swindled out of any of their inalienable rights. In this, as in everything else, he was always in earnest. His speeches contained no witticisms, no raillery, no wily, vote-catching flatteries; they grappled fairly with the question at issue and fought their way with stern, grim eloquence. Sumner was years in advance of his contemporaries. He was incomprehensible to the ordinary men of his time; even his own constituents could not understand his singleness of purpose, nor the motives that, for instance, could prompt him to fill forty-eight pages of the *Congressional Globe* with a speech which could not influence a single vote in the Senate.

With characteristic magnanimity he moved in 1862 that the name of Union victories be not inscribed on the regimental colors. For this he suffered the indignation of the North and the censure of the Massachusetts legislature. On his return to Boston he found the blinds of aristocratic Beacon street closed at the approach of his carriage. But when, ten years later, having solemnly charged Judge Hoar to "take good care of my Civil Rights Bill," Charles Sumner breathed his last, Boston went wild with grief, and Beacon street vied with the less pretentious thoroughfares in honoring the great man's memory.

"ES IST EIN UNTERSCHIED."

An apple twig while gazing from his seat
  Espied a little yellow flower;
"Aha!" he cried, "It is indeed a treat,
  To sit in this enchanting bower
And look down over earth's gay face,
  To see the often varied power,
It manifests in every place."

"How highly am I favored, yet, 'tis right,
  The noblest of all noble scions
May feel his worth and exercise his might
  O'er such as vulgar dandelions,
Whose numbers make them e'en a bore to sight.
  They're fit for childish play, and love,
But beauty lies still far above."

And Beauty heard the vain, unseemly speech
For toward the tree a maiden strolled,
She tried in vain the apple twig to reach,
Then standing back its beauty she extoll'd!
"If I may win thee, Fair one, 'tis by the cords of love,"
And gathering dandelions a tender chain she wove;
Upon the twig she tossed it, and gently drawing it down
She fashioned a wreath of the blossoms
That was worthy a queenly crown.

"There, children of beauty's kingdom
Your sovereign can appear
No fairer than thee, her subjects;
So harbor ye no fear.
And the haughty twig no longer
Repelled the yellow flower,
For beauty held both of them captive
And led them to her bower.

LEGRANGE'S THEOREM ON THE LIMITS OF TAYLOR'S SERIES.

WHILE the work used at the Institute as a text-book on the calculus subserves its end admirably in giving a brief and elementary treatment of the subject, it must still be remarked that the author, in his great desire to condense his matter within the required limits, has often suppressed facts which have a direct and fundamental bearing upon several of the subjects he has treated.

A case in hand is Taylor's well-known development of a function of the sum of two variables:

$$(1)\quad f(x+y)=f(x)+\tfrac{y}{1}f'(x)+\tfrac{y^2}{2!}f''(x)\ \ldots\ +\tfrac{y^{n-1}}{(n-1)!}f^{n-1}(x)+\ldots$$

This expansion is without doubt the most important one in the whole range of analysis, and it is therefore necessary that we should examine into the limits of its usefulness.

When there are an indefinite number of terms in the expansion of a function, as:

$$(x+y)^{-m},\ tan^{-1}\ mz,\ log\ (x+y),$$

it is at once evident that if the series is to hold true for any value of the variable, the terms of the series for that value must grow indefinitely small as n grows indefinitely large; that is, they must become evanescent. Now this is not always the case, and it was not until Legrange gave us the theorem which is the subject of this paper, that Taylor's series was placed upon a firm and unquestionable basis, and made the every-day tool of all mathematicians.

If in (1) we write X for $x+y$, we have:

$$(2)\quad f(X)=f(x)+\tfrac{X-x}{1!}f'(x)+\tfrac{(X-x)^2}{2!}f''(x)\ \ldots\ +\tfrac{(X-x)^{n-1}}{(n-1)!}f^{(n-1)}(x)+R_n$$

where R represents the remainder of the series after n terms.

Observing the form of the terms included in R we may write:

$$(3)\qquad R_n=\tfrac{(X-x)^n}{n!}P,$$

P being a function of X and x.

This replaced in (2) gives, after transposing:

$$(2a)\quad f(X)-\{f(x)+\tfrac{X-x}{1!}f'(x)+\ \ldots\ +\tfrac{(X-x)^{n-1}}{(n-1)!}f^{(n-1)}(x)+\tfrac{(X-x)^n}{n!}P\}=o$$

Without changing P, let us now replace every x in (2a) by z, where z has no connection whatever with x. We thus have an entirely new function, which we will call $F(z)$, then—

$$(2b)\quad F(z)=f(X)-\{f(z)+\tfrac{X-z}{1}f'(z)\ \ldots\ +\tfrac{(X-z)^n}{n!}P\}$$

Here we see that $F(z)=o$, for $z=$ X and from (2a) that $F(z)=o$ also, for $z=x$.

Thus $F(z)$ vanishes, for $z=x$ and

$z=X$, and we know from this $F'(z)$ vanishes for some value of z between x and X.

Let us then differentiate (2b), remembering that X is independent of z, and we have:

$$F'(z)=\frac{(X-z)^{n-1}}{(n-1)!}f^{(n)}(z)+\frac{(X-z)^{n-1}}{(n-1)!}P$$

Then for some value of z between x and X.

$$P=f^{(n)}(z)$$

Now we notice that the expression

$$x+\theta(X-x)$$

may be made to assume any value between x and X by giving θ some value between unity and zero. Then we may write for P:

$$P=f^{(n)}\{x+\theta(X-x)\}$$

where $\theta>0$ and <1.

Replacing this value of P in (3) we have for the value of all the terms of the series after the n^{th}.

$$(4)\quad R_n=\frac{(X-x)^n}{n!}f^{(n)}\{x+\theta(X-x)\}$$

Again substituting this value of R_n in (2) and at the same time replacing X by its value $x+y$ we obtain:

$$(5)\quad f(x+y)=f(x)+\frac{y}{1}f'(x)+\frac{y^2}{2!}f''(x)+\ldots\frac{y^{n-1}}{(n-1)!}f^{(n-1)}(x)+\frac{y^n}{n!}f^{(n)}(x+\theta y)$$

which is Taylor's Theorem in its complete and most general form.

In order to adapt this form to Maclaurin's Theorem, we make $x=o$ and afterwards replace y by x, or

$$(6)\quad R_n=\frac{x^n}{n!}f^{(n)}(\theta x)\text{ and}$$

$$(7)\ f(x)=f(o)+\frac{x}{1}f'(o)+\frac{x^2}{2!}f''(o)+\ldots\frac{x^n}{n!}f^{(n)}(\theta x)$$

Cauchy, following Legrange, has shown that the remainder may be written:

$$(8)\quad R'_n=\frac{(1-\theta)^{n-1}}{(n-1)!}y^n f^{(n)}(x+\theta y)$$

For we observe that R'_n may be written thus:

$$(X-x)P'$$

Then pursuing precisely the same method as before, we arrive at the form given by Cauchy.

Schlömilch and others have obtained still different forms, which may sometimes be more advantageously used than the one given by Legrange. In any case, then, in order to examine our series with respect to its convergency, we have merely to substitute in one of these expressions for the remainder as given in (4), (5) or (6) and notice whether the expression becomes evanescent for large values of n. We will frequently see that for a certain range of values R_n evanesces, while for all other values of the variables it becomes infinite, and therefore for those values the expansion is of no use, as it is untrue.

We give, as an example, one instance only, and choose for that purpose the expansion of $(x+y)^m$, partly because as treated in Bowser it is incomplete, and partly because it employs both (4) and (8).

The expansion is here:

$$(x+y)^m=x^m+\frac{m}{1}x^{m-1}y+\frac{m(m-1)}{2!}x^{m-2}y+$$

When m is a positive integer, the series has a finite number of terms, but when m is fractional or negative, there are an indefinite number.

To facilitate matters we will first examine:

$$(1+x)^m=1+\frac{m}{1}x+\frac{m(m-1)}{2!}x^2$$

and consider m as fractional or negative.

Here, evidently, the series is divergent if $x > 1$.

Therefore the binomial expansion does not hold when x is greater than unity.

Next suppose x positive and less than unity, the remainder after n terms is found from (4), and is

$$\frac{m(m-1) \ . \ . \ . \ (m-n+1)}{1.2. \ . \ . \ . \ . \ n} x^n \ (1+\theta x)^{m-n}$$

or $$\frac{m(m-1) \ . \ . \ . \ (m-n+1)}{1.2. \ . \ . \ . \ n} \frac{x^n}{(1+\theta x)^{n-m}}$$

which becomes evanescent, for $n = \infty$, and the expansion holds in this case.

Next, suppose x is negative and less than unity.

Here we use (8) to obtain our remainder, which is:

$$(-1)^n \frac{m(m-1) \ . \ . \ . \ (m-n+1)x^n}{1.2 \ . \ . \ . \ (n-1)} (1-\theta)^{n-1}(1-\theta x)^{m-n}$$

$$\text{or}(-1)^n \frac{m(m-1) \ . \ . \ (m-n+1) \ (1-\theta)^{m-1}x^n}{1.2 \ . \ . \ (n-1)} \left\{\frac{1-\theta}{1-\theta x}\right\}^{n-m}$$

This also vanishes for $n = \infty$.

And the expansion holds for this case.

To sum up:

$(x+y)^m$ may be written either in the form:

$$x^m \left(1+\frac{y}{x}\right)^m = x^m + \frac{m}{1} x^{m-1} y +$$

$$\text{or } y^m \left(1+\frac{x}{y}\right)^m = y^m + \frac{m}{1} y^{m-1} x +$$

We have found that either of these expansions holds when m is a positive integer, but should m be fractional or negative, and $x > y$, that is $\frac{y}{x}$ a proper fraction, the first series will be true while the second will not.

Again, if $y > x$, or $\frac{x}{y}$ is a proper fraction, the second will be true while the first will not. Thus, in either case, the one or the other is right, but never both.

THE SALISBURY LABORATORY.

THE plans for the new laboratory building have practically been agreed upon. Prof. Kimball and Prof. Kinnicutt have recently returned from a tour of inspection among the various scientific schools of the country, and the faculty is well persuaded as to the best forms and plans for the new laboratories. Messrs. Kimball and Kinnicutt visited Johns Hopkins, Lehigh and Cornell Universities, and the scientific schools at Rochester, Boston and Cambridge. They saw much to admire, and each gentleman succeeded in adapting what he saw to the needs of the school and the purposes of Mr. Salisbury's generous gift. Accordingly, when the building committee met the faculty, the plans were speedily agreed upon. Mr. Stephen C. Earle, the architect, submitted a sketch which was altered in some details from the original form, and then adopted in its amended form. The alacrity with which all parties came to an agreement is somewhat remarkable.

The laboratory will be situated on the knoll, 120 feet north of the Washburn machine shop, and will be on a line with it, extending over a portion of the ground now occupied by the grove. The ground plan will have the shape of a carpenter's square. The east wing, fronting on Boynton street, will be about 100 feet long and 60 feet deep. The north wing will be 140 feet long and 60 feet deep. Though the principal features of the building, and the disposition of the laboratories, lecture rooms and apparatus rooms have been decided, a few

details yet remain for consideration and settlement, and probably all specifications cannot be prepared and the contracts placed earlier than next fall. The foundations may then be laid, and there will be fair reason for hoping that Mr. Salisbury may see the school busily at work in his laboratoty in the winter of 1888–9.

The facilities for teaching physics and chemistry at the Institute are not of the best. There is no room for practice in organic and sanitary chemistry, and the laboratory is utterly without means of ventilation. At present, it will accommodate a class of 30 or 35 members. The new laboratory will provide for double that number, and, when completed, the Institute will be as well equipped as any in the country. For the purposes of this institution, the Reynolds Memorial Laboratory at Rochester University, where Prof. Latimore is supreme, is thought to be the best model. In the present physical laboratory at the Institute, there is a general lack of room, and there is no space whatever for electrical work. The visiting committee thought that the physical laboratory at Cornell was the best adapted for their purposes. The new laboratory at New Haven is in process of construction, but the committee were furnished with the plans, and in fact they have more plans than they know what to do with. The new mechanical laboratory, which, with the physical laboratory, will share the first and second floors above the ample basement, will furnish every facility for testing engines and machinery, estimating horse-power, and for all the work that properly falls within the scope of this important and practical department. Profs. Kinnicutt and Kimball speak appreciatively of the treatment they everywhere received on their trip. Cornell University, Lehigh University (at Bethlehem, Pa.) and Lafayette College (at Easton, Pa.), they especially mention. Lehigh has the most expensive chemical laboratory in the country. The new laboratory at the Institute will be in the topmost story, where there will be perfect ventilation and no possibility of filling the remainder of the building with fumes from the retorts.

THE THOMPSON CLUB.

ON the evening of December 4, 1886, seven members of the class of '88 met together for the purpose of discussing a means of establishing a debating society among the students at the Tech.

After due consideration of the advantages and disadvantages in the formation of such a society, the gentlemen were united in the belief that it would be of great benefit to many members of the school, and steps were accordingly taken to frame a constitution.

A second meeting for the purpose of furthering the plans of organization was held a week later, when a suitable constitution was adopted, a name chosen, and officers elected. The "Thompson Club," named out of respect to the memory of our late principal, Charles Oliver Thompson, received the unanimous vote of the members present.

Since this time, meetings have been held regularly every other Saturday evening, and considerable interest has been manifested in the work taken up.

The object of the Club is the mental improvement of its members by means of various literary exercises. These exercises during the winter have consisted of regularly appointed debates, together with original talks on subjects of general interest to the students, such as "The Pneumatic Caisson," "Architecture as a Subject for General Reading," "The Manufacture of Gunpowder," "The Westinghouse Automatic Air Brake," "Our Large Guns," "Submarine Navigation," "The Manufacture of Paper," and "Photography." Such questions as the "Annexation of Canada to the United States," "Home Rule in Ireland," "Foreign Immigration," "Labor Unions," and others, while very familiar to many, have been discussed with renewed energy, and the valuable mental discipline gained, has proved ample remuneration for the time that has been spent.

The training which enables a man to talk intelligently upon his feet is something that has long been needed at the Tech, and it was with a desire to supply this need, that the "T. C." was organized.

To be sure, we have some drill in debating during the senior year, but the advantages from so short a period are few compared with those derived from a regular debating society, extending through the entire school course.

The work of each member of the club is so arranged that it need not interfere in the least with any of his school duties.

The club has finally been granted the use of a room in Boynton Hall, where they hope to be able to meet from now on.

The several gentlemen of the class of '87 who will sever their connection with the club this Spring, will leave quite a gap in its ranks, and it is to be hoped that they, even after a very short acquaintance with the club, will feel that they have gained from it something worth gaining. With a present membership of nearly twenty-five, and considering the interest that has already been shown, there seems to be no doubt of the future success of the "T. C."

THE TOURNAMENT.

SCARCE has the early-rising sun announced another day begun,
When at the warder's lowly call a banner floats from Boynton Hall;
Its folds disclose no clearer blue than decks the sky in azure hue,
As they, with coy and graceful ease, shun each caress of suing breeze.
Glad tidings does that ensign fling abroad on light's swift waving wing,
To many a chamber turret wide from Lancaster to Sunnyside,
From Salisbury's breast of placid sheen, far southward to fair Bowdoin Green;
For well each squire that signal knows, which summons all as friendly foes,
In close-contested tilt to meet and merit praise, or bear defeat.
Calm smiled the sun that afternoon; the day, as rare as days in June,
With cheerful skies and balmy air lent life alike to brave and fair.

The spacious courtyard thronged with knights, bold champions of a hundred fights;
And just without the inner space, reserved for feats of strength and grace,
Adorned by beauty, wealth or age, rolled many a stately equipage.
But 'mong those knights of chivalry, entire of heart and fancy free,
Were some whose glance was wont to wing its way from equipage or ring;
For on the outskirts of the court fair patrons of the manly sport

Reviewed with pleasure uncontrolled the actions
of the warriors bold.
From boisterous ring and list aloof, beneath the
raised pavilion's roof,
Endowed with wit, with beauty crowned, the
fair of all the country 'round,
Discussed in accents sweet and calm the future
bearer of the palm.

* * * * * * * * *

COMMON SENSE IN EDUCATION.

Though used ambiguously and loosely, everybody understands "common sense" to mean a reliable form of judgment which is both an educating power and a faculty to be educated. As an educating power it is an important factor in teaching, and essential in applying wisely the principles of education, whether they be intuitive or acquired. It leads a person to know why he teaches a given subject, when he does, and as he does.

I recently asked seventeen teachers why they taught geography. In fifteen cases it was evidently a question never before considered. The answers ranged all the way from an indifferent "Because it's required" and "It's always taught," to two cases in which the teachers gave evidence of having some reason besides fashion.

Although authorities differ as to subjects and their sequence, we should ask ourselves why we teach any branch as a whole, and consider the advantage of its various subtopics; and whether we arrive at satisfactory conclusions or not, it is profitable to study the relations of subjects to each other, and any teacher will be benefited who will compare, for instance, the advantage of actual measurements in compound numbers with the mere memorizing of tables. One's methods instinctively gain by such consideration. It is not common sense to be content with the parrot-like repetition so often accepted for mathematical demonstration, nor with the wordy explanation in physics in place of a simple, experimental demonstration. It is not common sense to be easily satisfied with our own work, to make a few struggles and then drop back into the ruts. It is not common sense to be deluded into using as an explanation that which is merely an illustration, as, for instance, the use of blocks in cube root; no more is it, to be so thorough as to be overparticular.

Teachers have been known to refuse a correct answer simply because it hadn't been "developed" according to some educational formula; the child must not know that d-o-g spells *dog*, because, forsooth, he must use the word-method; he must be prohibited from counting his fifteen chickens, because the first year's work should go no higher than ten; it must be considered rank heresy for him to understand a calendar, because he has no right to know figures above ten. Common sense is governed by circumstances and principles, and believes that the power to know a fact or process is of some value, although not developed after the pattern of Froebel, and that ability to teach is worth something, although unable to point to Rousseau or Pestalozzi as an ancestor. A method may be good for Miss A in the school at B, if it is not the ideal method, and it does not pay to lose the point of a lesson in the mere outward show attending its presentation. The teacher often has no one in authority with the courage to supervise his methods, but if he allow common sense to examine his work searchingly, though becoming painfully conscious of inefficient teaching, he will correct his errors and improve his methods.

What intelligent carpenter will contract to build a house without plan or computation? and yet how many teachers will go into school day after day with a mere outline of what they are to attempt? There are few things better calculated to produce success than a well considered plan, which by its very nature gives the subject the com-

prehensive view needed for efficient teaching. We know a teacher who has so many classes that he can't have a program(?). He hears what he can and skips the rest. In what other profession would this be tolerated?

The personality of the teacher plays an important part in his work, especially in the ungraded school. But there is always danger of teaching the subject in which he is interested, and slighting subjects that are less congenial to his tastes, though possibly more important.

The teacher's manner before his class is of no little moment, and common sense condemns the fretful and boisterous teacher continually rapping for order and continually failing to receive it. Every child recognizes fairness and justice, and common sense avails itself of this fact. If punctuality is demanded of the pupils, it must be illustrated by the teacher, and there must be the same conscientiousness in closing school as in opening. Pupils are not slow to appreciate a disposition to recognize their rights, and frank, square dealing with them will bring the same in return. Many times school would be improved were the school government not an absolute monarchy, but a democracy with extensive veto power.

Education cannot make natural capacity, but we can examine the influences bearing upon whatever capacity there is. A mistaken judgment is often the result of mistaken data, often resulting from confidence in some presumptuous charlatan,—weather-prophet, for instance,—whose bold assertions are more or less believed because we cannot dispute them. Common sense views a complex whole thoroughly and exhaustively, discriminating between the important and unimportant factors; it is a growth obtained from no one faculty alone, but comes as a result of severe mental discipline, embracing our entire range of study.

An agricultural fair shows what success catch-penny devices, which rely entirely upon the absence of common sense, may have. A "Living Mermaid," a fortune-teller, a patent medicine warranted to cure all the diseases flesh is heir to, etc., etc., enrich the owner because the world lacks common sense. Sensational papers are always advertising "Fifty visiting cards and an 18K solid rolled gold ring for eleven 2c. stamps," etc., for the benefit of people who lack common sense.

Can nothing be done to enlighten the community beyond the reach of petty impostors whose success depends upon this weakness?

Superstition and credulity are responsible for much of the folly, even among those who are credited with sense and education. We can perhaps forgive a child for a desire to secure the fowl's wishbone, but what can we say of a teacher that will nail an old horseshoe over his schoolroom door in hopes of,—well, what? Here is an able, intelligent man who dares not begin a piece of work on Friday, and an equally intelligent woman who goes without her Thanksgiving dinner because there are thirteen present. Multitudes of good people who don't believe in signs feel just a little better when they see the new moon over the right shoulder. Our curiosity "to see if it is so" ensures the quack's thrift, though we declare our non-belief.

The schoolroom can and must educate the conscience above all such things. The next generation must be above the ridiculousness of fortune-telling, the forked witch-hazel stick, the lottery, and quackery. Credulity and ignorance go hand in hand, hence general knowledge must be our base of supplies, but mere book-learning is not enough. The mind is influenced not only by the amount and character of the knowledge acquired, but by the manner and circumstances attending its acquisition. If we would have more common sense in our pupils, we must

have more common sense in our methods, in school superintending, in the visits of committees, school exhibitions, and examinations.— *W. H. Desper*, '79, *in Journal of Education*.

THE SPRING MEETING OF THE W. T. I. ATHLETIC ASSOCIATION.

The Spring meeting of the A. A., May 21st, was a success, and a greater success than even the most enthusiastic had looked for. The day was warm and propitious, a generous and appreciative audience was present, and young ladies everywhere showed their loyalty to the Tech by wearing their favorite class colors. In spite of the wretched condition of the track, some excellent running-records were made. Both curves of the track had been recently ploughed to make them softer for horses, and only a scraper had been run over the foot-track. The bicycle races were omitted on account of this. At the north end of the track, the sand was nearly over the tops of the runners' shoes.

Eight records were broken; viz.:— Pole vault, Running broad-jump, 220-yards dash, Standing high-jump, Mile run, Running high-jump, 440-yards dash, and the Hop, step and jump. One new record, throwing 16-lb. hammer, was made, and the record of throwing 16-lb. shot since the intercollegiate rules were adopted, was beaten.

The following is a review of the events, in their order:—

I. 120-yd. Hurdle race.
Contestants: Harvey, '87; Chadwick, '88. For some reason or another, the time-taking in this event was very deficient. Chadwick ran for a record and doubtless made one, but the time was announced as 19 secs. Harvey was second.

II. Throwing 16-lb. Hammer.
Contestants: Camp and Patterson, '88. The throwing by either man was not so good as when practising. Camp threw 59 ft. 3 in. Patterson second. This is the first time that the event has been constested at the Institute, and stands a great chance for improvement.

III. 100-yds. Dash.
Contestants: Harvey, '87; Doon, '88; Allen, '89; Faulkner, '90. The men started quite evenly, but Harvey and Allen went ahead before 20 yards were covered, Harvey slightly leading. This lead he maintained to the finish, gaining but a few inches on Allen, a close second. Time: 11$\frac{1}{5}$ secs.

IV. Pole Vault.
Contestants: Marshall, '88; Sessions, '89. Sessions failed to throw the pole back and fell out of the contest. Marshall then vaulted alone, clearing 9 ft. beating the record by 2 inches.

V. Running Broad-jump.
Contestants: Knight, '87; Jewett, Lovell and Hunting, '88; Andrews, '89. Jewett again broke his own record, clearing 20 ft. $\frac{1}{2}$ in. Former record, 18 ft. 9$\frac{3}{4}$ in. Andrews obtained second place.

VI. 220-yds. Dash.
Contestants: Harvey, '87; Allen, '89. Harvey led at the start but Allen went ahead at about 30 yds. At 175 yds., Harvey began to gain, and at the finish, Allen touched the tape less than a foot ahead. Time: 23$\frac{1}{5}$ secs. Previous record: 24$\frac{3}{5}$ secs.

VII. Standing High-jump.

Contestants: Chadwick and Cushman, '88; Sessions, '89. Chadwick cleared 4 ft. 6½ in. Cushman, 4 ft. 6 in. Previous record: 4 ft. 5¾ in.

VIII. Mile Run.

Contestants: Chittenden, '88; Bartlett, '89. Chittenden entered so as to give '88 the second place. Bartlett won by nearly a quarter. Time: 5 m. 11⅕ s.

IX. Throwing Base-ball.

Contestants: Griffin, Marshall and Paul, '88; Crosby, '90. Griffin threw the ball 328 ft. 10 in.; Paul second. The record is still far out of reach.

X. Running High-jump.

Contestants: Harvey, '87; Chadwick and Cushman, '88. Chadwick succeeded in breaking the record by nearly an inch, clearing 5 ft. 1⅕ in. Harvey second.

XI. Putting 16-lb. Shot.

Contestants: Camp and Patterson, '88. Camp, first, putting the shot 29 ft. 8 in., beating his previous record of 29 ft. but not breaking the school record.

XII. 440-yds. Dash.

Contestants: Doon, '88; White and Mills, '89. '88 was smilingly confident that Doon would win this race, but White breasted the tape first and Mills was a good second. White broke the school record, making the quarter in 58⅖ secs.

XIII. Hop, Step and Jump.

Contestants: Knight, '87; Chadwick and Jewett, '88. Jewett again broke his own record, clearing 42 ft. 8⅗ in. Chadwick second.

XIV. Tug-of-War, 88 vs. 90.

Emory was unable to pull on account of his lame ankle and Streeter also found he could not pull on field day, so the tug between '87 and '88 was omitted.

'88 was slightly ahead of '90 on the drop, and adding that to the fact that '90's anchor did not allow himself enough rope to drop with, '88 had 6 inches in their favor when the men were down. '90 kept the rope in about that position, until, toward the close, the string moved a little in their direction.

'88 gave a couple of heaves but had not regained anything when time was called. '90 has a strong team for their first entry, but it seems to us that their efforts could better be expended in another direction. Tug-of-War is a very uncertain thing and no record can be made on it.

XV. Standing Broad-jump.

Contestants: Knight '87; Chadwick, Griffin, '88. Chadwick secured first, jumping 9 ft. 11½ in.; Griffin, second.

XVI. Half-mile Run.

Contestants: Doon '88; White and Bartlett, '89.

The last event as is often the case proved to be the most interesting event of the day. '88, though disappointed in the previous races could not believe that '89 who is too tender to put a tug-of-war in the field could beat them in a race which required training and endurance.

Doon led at the start with Bartlett a close follower. White seemed indifferent, at least to spectators, as to who would win the race, and at the quarter while Doon and Bartlett were running a good pace, White was nearly 30 yds. behind. But as the men rounded the bend White spurted in fine style and, passing

both other men, came in first. Time 2 m. 15 secs. Doon second.

As the men came down the home stretch, the audience rose to their feet and shouted. It was a fitting wind-up to a successful day and every body went home pleased.

Out of 16 first prizes, '88 got 11, or 68¾ %; '89, 4, or 25 %; '87, 1, or 6¼ %.

Of 15 second prizes, '88 got 8, or 57+%; '89 and '87 each got 3, or 21+%.

'88 got 61+% of all prizes; '89, 22+%; '87, 16+%; '88 had 15 men entered in events, '87 had 9, '89 had 8 and '90, 7.

On the events at our A. A. meeting, '82 holds one record; '84 holds two records, and '82 and '84 each holds the same on the Hurdle race. '86 holds one record; '87 holds one; 88 holds eight records; 89 holds three records.

THE YALE-TECH BASE BALL GAME.

"THE game on Hampden park, yesterday, was one of the prettiest exhibitions of amateur ball playing ever seen in this city." So states the *Springfield Republican* of May 15, and truly the seven Techs who mustered sufficient capital and patriotism to support our nine by their presence on that day had every reason to feel proud of their colors, and despite the reputation of their opponents, had good reason for monopolizing the cheering.

The day was as perfect as could be desired for the game notwithstanding which not over a hundred spectators paid their admission fee, which fact is not surprising when the professional teams rarely draw over four hundred. When the Techs arrived the Yale men were already in the field and after a short delay the game was called at 2.45 P. M.

The Yales went first to the bat and started, in their good old style, to break the Techs up by vociferous yells and loud advice and encouragement. At first indeed it looked as if they had succeeded for Lancaster gave the first man his base on balls without a single strike, and gave the second man five in succession to the evident amusement of the Yales. But Walbridge then remarked in a low, confident tone, "Put them right over the base Barney, he'll never call a strike unless you do," and the amusement seemed to be on the other side when the Yale man fanned the air three times in rapid succession and a splendid throw to first caught the man there some three feet off his base.

And then when our boys led off with an earned run and added a second in the sixth inning against six ciphers for the Yales, to which collection the seventh and eighth innings added a couple more, it looked as if the breaking-up business was a bad failure, and our boys packed their bats with becoming modesty.

But unfortunately for us the Yale man's lungs are good for nine innings on any occasion and not easily discouraged, and in consequence the nine went to pieces with victory in their grasp and in the ninth inning allowed their opponents to score three unearned runs.

Though squarely defeated the Techs have every reason to feel proud of the game and when we consider the fact that the Yale boys on the next week

scored some eight runs more than the Harvard Freshmen it amounts almost to a victory. All of our boys did good work for us and no bad errors were made by either side. We quote again from the *Springfield Republican:* "The game was marked by steady rather than brilliant playing. Up to the last inning the Worcester Techs outplayed and shut out the New Haven lads, though it was nip and tuck between them; but in the last inning a wild pitch by Lancaster enabled two men to score and a wild throw by Hartwell allowed another and final run to be scored. Lancaster though wild at times was a very effective pitcher and Walbridge backed him up well. Strait and Wilson did good battery work also, and the fielding was evenly good.

The score by innings is as follows:—

YALE FRESHMEN.

	A.B.	R.	P.O.	A.	E.	B.H.	S.B.
Calhoun, s.s,	4	0	1	4	1	1	0
Day, 1b.	4	0	12	0	0	0	2
Strait, p.	4	1	0	11	3	1	1
Bailey, l.f.	4	0	0	0	0	0	1
Howard, 3b.	4	1	1	0	0	2	1
Wilson, c.	4	1	8	3	2	1	1
Peter, 2b.	4	0	1	2	0	0	0
Morrison, r.f.	4	0	2	0	0	0	2
Traver, c.f.	3	0	2	1	1	0	0
Totals,	35	3	27	21	7	5	8

WORCESTER TECHS.

	A.B.	R.	B.H.	P.O	A.	E.	S.B.
Allen, '87, 1b.	4	0	1	7	0	0	1
Walbridge, c.	4	1	2	11	5	1	2
Lancaster, p.	4	0	1	1	11	7	1
Grimes, l.f.	4	1	1	1	0	0	2
Clifford, 3b.	3	0	1	2	3	2	1
Allen '89, r.f.	3	0	0	2	0	0	0
Hartwell, s.s.	3	0	0	0	2	1	0
Kimball, c.f.	3	0	1	0	0	0	0
Fairbanks, 2b.	3	0	0	3	2	1	0
Totals,	31	2	7	27	23	12	7

Score by innings:

	1	2	3	4	5	6	7	8	9	
Yales,	0	0	0	0	0	0	0	0	3	—3
Techs,	1	0	0	0	0	1	0	0	0	—2

Earned runs, Yales 0, Techs 1. Total bases, Yales 8, Techs 7. Stolen bases, Yales 8, Techs 7. First base on errors, Yales 7, Techs 2. Left on bases, Yales 3, Techs 6. Struck out, by Strait, 8, by Lancaster, 9. Double play, Walbridge, Clifford. Passed ball, Wilson. Wild pitches, Lancaster 4, Strait 1. Time 2 h. 10 m. Umpire, Charles C. Willard of Springfield.

TUFTS, 13; TECHS, 1.

After the easy walk-over which our nine had at Boston, its friends were looking for a close game with Tufts, but unhappily were disappointed. The game was uninteresting from beginning to end, no brilliant playing was done and on the other hand much time was lost in chasing wild throws. The playing was perhaps excusable, as it was not the real Tech team. Lancaster, Walbridge and Clifford were absent and Fairbanks had not been in the box before this year. After the first inning, the Tufts men easily found where Fairbanks put the ball, but Bascom's pitching improved steadily through the game. In the sixth inning, Warren made the only run for the Techs, aud that on Tufts' errors.

The following is the score:—

TUFTS COLLEGE.

	A. B.	R.	B.	S. B.	P. O.	A.	E.
Ames, 2b	4	3	2	2	4	1	1
Walker, 1b.	4	1	2	2	4	0	0
Cook, p.	4	0	0	0	0	12	3
Bascom, c.	4	2	0	1	9	4	2
Westland, s.s.	3	2	1	0	0	1	0
Lewis, l.f.	3	2	0	2	0	0	0
Prouty, r.f.	3	0	1	0	0	0	0
Durkee, 3b.	3	1	0	0	1	0	0
Chapman, c.f.	2	2	1	2	0	0	0
Totals,	30	13	7	9	18	18	6

WORCESTER TECHS.

	A. B.	R.	B.	S. B.	P. O.	A.	E.
Allen, '87, 1b., p., 1b.	3	0	1	1	10	2	5
Warren, 3b., 1b., 3b.	3	1	0	2	3	3	2
Grimes, r.f.	2	0	0	0	0	0	0
Fairbanks, p., 3b. p.	2	0	0	1	1	2	4
Kennedy, c.	3	0	0	0	2	1	3
Hartwell, s.s.	1	0	0	1	0	2	0
Fish, l.f.	2	0	0	0	0	1	3
Allen, '89, 2b.	2	0	0	0	0	2	1
Cook, c.f.	2	0	0	1	1	1	0
Totals,	20	1	1	6	*17	14	18

Innings,	1	2	3	4	5	6	
Tufts,	0	2	2	3	6	0	—13
Techs,	0	0	0	0	0	1	— 1

First base on balls—Westland, Lewis, Chapman, Grimes, Fairbanks, Hartwell. First base on errors—Tufts, 8; Techs, 2. Struck out—By Cook, 12; Allen, 2; Fairbanks, 1. Wild pitches—Allen, 4; Fairbanks, 1. Time—2h. Umpire—Kennedy of Holy Cross College.

*Hit by batted ball.

ATHLETICS.

INTERCOLLEGIATE RECORDS BROKEN.

At University of Pennsylvania, May 15, W. B. Page cleared 6 ft. 1 in. on running high-jump. Previous college record 6 ft. ¼ in.

At Yale, May 18.

Mile run was made in 4 m. 37 secs. Previous record 4 m. 37⅖ secs;

Yale, May 18, throwing hammer; 101 ft. 1½ in. beating previous records.

Tech' 90, 23; Highland Military Academy, 7.

May 14th, '90 beat the H. M. A., on the Bliss Field, 23 to 7. The game was loosely played, as the errors show. Treadway, Tech '90, struck out 12 men; Patterson, H. M. A., 3. Total bases: '90, 16; H. M. A, 12. Errors: '90, 13; H. M. A. 32.

Worcester Academy 18, Tech '90 1, in 5 innings. For a time after '90 won the game with the Military Academy, it seemed quite probable that Worcester would have to grow before it could support such a ball team as '90 *had*. But cruel experience is a sure teacher and for the time being '90 is squelched. The Worcester Academy nine played as if they meant to win, but '90—oh my! Six of '90's men struck out; three of the W. A. Total bases: '90, 3; W. A., 12. Errors: '90, 22; W. A., 2.

FOOTBALL VOCABULARY.

Goal—Sheepskin.

Poor Pass—Four conditions.

Half-back—Full-dress toilet.

Full-back—Return home at three a.m.

High Tackle—Five-dollar class assessment.

Touch-down—Freshman fondling his upper lip.

MAY 21. SPRING FIELD-DAY. 1887.

TABULATED RECORDS.

Event.	Winner.	Time, or Distance.	Second.	Time, or Distance.	Institute Record.	Time, or Distance.	College Record.	Time, or Distance.
120 Yds. Hurdle Race.	Chadwick '88	19 sec.	Harvey '87	19 2-5 sec.	Howes '82 Fuller '84 Stevens '84	18 3-8 sec.	Yale.	17 sec.
Throwing Hammer.†	Camp '88	59′ 3″	Patterson '88	52′ 8′			Yale.	101 ft. 1 1-2″
100 Yards Dash.	Harvey '87	11 1-5 sec.	Allen '89	11 2-5 sec.	Fuller '84	10 3-5 sec.	Harvard.	10 sec.
Pole Vault.*	Marshall '88	9 ft.			Gordon '86	8′ 10″	Princeton.	10′ 5″
Running Broad Jump.*	Jewett '88	20 ft. 1-2 in.	Andrews '89	17′ 9″ 3-5	Jewett '88	18′ 9″ 3-5		21′ 3″ 3-4
220 Yards Dash.*	Allen '89	23 1-5 sec.	Harvey '87	23 1-5 sec.†	Watkins '86	24 3-8 sec.	Harvard.	22 sec.
Standing High Jump.*	Chadwick '88	4′ 6 1-2″	Cushman '88	4′ 6″	Cushman '88	4′ 5″ 3-4	Harvard.	5′ 1-4″
Mile Run.*	Bartlett '89	5 m. 11 1-5 s.	Chittenden '88	6 m. 18 sec.	Bartlett '89	5 m. 12 1-5 s.	Yale.	4 m. 37 s.
Throwing Base Ball.	Griffin '88	328′ 10″	Paul '88	290′ 1″	Jordan '82	361′ 8″	Holy Cross.	387′ 8″
Running High Jump.*	Chadwick '88	5′ 1″ 1-5	Harvey '87	5′ 1-2″	Fairbanks '86 Gordon '86	5′ 1-2′	University of Penn.	6′ 1″
Putting 16 lb. Shot.	Camp '88	29′ 8″	Patterson '88	29′	Priest '84	34′ 4″	Harvard.	41′†
Hop, Step and Jump.*	Jewett '88	42′ 8″ 2-5	Chadwick '88	40′	Jewett '88	41′ 1″ 1-5		
Tug of War.	'88	6 in. in 3 min.	'90					
Standing Broad Jump.	Chadwick '88	9′ 11″ 1-2	Griffin '88	9′ 8″ 2-5	Fairbanks '86	10′ 2″ 1-2	Swarthmore.	10′ 6″ 1-4
Half-Mile Run.	White '89	2 m. 15 1-5 s.	Doon '88	2 m. 15 2-5 s.	Doon '88	2 m. 13 sec.	Harvard.	2 m. 1-5 s.
440 Yards Dash.*	White '89	58 2-5 sec.	Mills '89	58 4-5 sec.	Doon '88	58 3-4 sec.	Harvard.	47 3-4 s.

† Record. * Breaking Record.

Scientific Notes.

A well-known scientist proposes an absolutely invariable unit of time, which, as independent of every astronomical hypothesis, would serve as a check on the universally adopted unit, the second. The proposed measure of time is the specific resistance of mercury in electrostatic units. The constancy of this resistance, the fact that it is indifferent what units of length and mass are used, and the high degree of accuracy that the available experimental methods for its determination promise, may all be cited in its favor.

Mr. Isaac Roberts communicates an account of the successful photographing of the minor planet Sappho. Scarcely any observations of this planet had been published since 1872, and hence Mr. Bryant, who is engaged in determining its orbit, appealed to Mr. Roberts to find the planet if possible by photography. The planet is, however, not only of the eleventh magnitude in brightness, but its motion in an hour is equal to about 4.2 times its photographic diameter, and the trail left does not exceed in density that of a thirteenth-magnitude star. With an exposure of one hour the trail of the planet was distinctly recognized and the error of the ephemeris deduced from the photographs is in close agreement with several meridian observations made about the same time at Deurecht. This is probably the first instance in which photography has been successfully applied for this purpose. It proves that asteroids of the eleventh magnitude leave strong trails on the photographic plates. Mr. Roberts thinks that one astronomer could, in about three years' time, photographically discover all the asteroids existing down to the fourteenth magnitude.

M. Ferdinand de Lesseps, speaking of the progress being made in cutting the Panama Canal, says that it has been decided to work night and day in order to complete the canal in three years. The electric light will be required to turn night into day.

"He is most successful as a scientific lecturer who describes the phenomena with which he deals in the language most familiar to his audience. For this reason, probably, the principal of a technical college defines the results of certain experiments as coming out 'all very fine and large,' and describes to his electrical class the peroxide plate of an accumulator as resembling in color 'Ruddygore.'"

According to the New York *Electrical Review*, some inventive genius has devised a means whereby the present form of wire bustles can be made useful as well as ornamental. In short, the bustle is provided with two binding nuts from which leads are carried to an incandescent electric lamp on the head of the wearer. The bustle serves as a sort of secondary transformer, and it is only necessary to approach an electrical conductor to have the lamp glow brilliantly. The claim is for the combination of the girl, the bustle and the lamp.

Communications.

MR. EDITOR:—

There has been so much said about chapel for the last one or two weeks that a letter on the subject would seem pertinent now. The object of this letter is to start an open discussion with a view to some improvement, however small, in our chapel exercises. The writer is in full sympathy with the spirit which leads to chapel exercises, and thoroughly believes in compulsory attendance. There is no intention of discussing the pros and cons of compulsory attendance; the question here is this: we have daily chapel exercises which we must attend, or give proper excuse

for non-attendance; how can they be made more interesting and *beneficial* to the students who are thus compelled to be present.

For one who daily attends our chapel to say that the exercises are models of chapel exercises, or are even what they can easily be made under the circumstances, is to be wilfully blind to facts, and ignorant of what might be. Why is it that with a faculty of twelve, it is the exception when more than one is present? Why should the singing be done by a third of the students when nearly all can sing? Why is proper and well-meant applause suppressed at its very beginning? Why is there groaning, intentional pushing of chairs, and dropping of books by the students during the devotional exercises? And why almost numberless other things which can be named?

The old saying, "What 's sauce for the goose, etc.," can well be applied to the faculty of the Institute. If it is right and proper for the students to attend chapel, why is it not for the professors? It may not be possible for all of the faculty to attend chapel every day, but it would at least create a better feeling among the students to know, by some pretension to attendance, that it is not considered by them as a nuisance from which they will absent themselves as much as possible. If more of the faculty attended, it would give a chance for a continual change of the conductor of the devotional exercises. This would relieve the burden, now placed wholly upon one, and would add a zest and interest which would be enjoyed by every one.

There are times when applause, either by clapping or by snapping the fingers, is perfectly proper as an act of respect or of appreciation of what has been said or done. Of course stamping is wholly out of the question since it has no place in a respectable audience. To say that there should be no applause in chapel because the place is sacred is almost sheer nonsense. A place which is the scene of examinations lasting from eight o'clock until one, lacks several elements of sacredness. On the same principle the office is a sacred place, because prayer-meetings are held in it every Sunday. Why cannot some form of applause like clapping or snapping the fingers be authorized and the students trusted to use it properly?

It would be much more pleasant to write upon this subject, if the question of groaning and intentional disturbance did not come in. The question is only touched to say that such things should be, and are, deprecated. The student who groans, when any remarks are offered by a professor, not only shows that he has not the first principles of gentlemanly conduct in him, but also compromises the training in politeness which he has received at the hands of his parents. With regard to intentional disturbances, it is not too much to say that any person, even though he is not a Christian, should have respect enough for the God who created and sustains him to be at least silent when prayer is offered. How can such things be stopped, by quizzing and suspension? No; but by making the exercises such that the opinion and action of the larger part of the students will shame manhood, or at least silence, into those who are bent on disturbances.

What student would not be interested by a few words from the persons of note who occasionally visit our chapel exercises? What are the five minutes cut off from mechanics, calculus, or algebra compared to the pleasure, the profit, and the cheer of a few words under such circumstances. In closing it should be said that new singing books would be appreciated, or at least there should be enough of the old ones provided so that there should be no scrambling in order to obtain a book from which to sing.

E. F. H.

Exchanges.

The words of a Harvard professor, to the effect that Dickens's works are losing their popularity, has aroused an admirer of that author to write in the *Adelphian* an article in his defence. She refutes the statement and gives her reasons for thinking that Dickens's works are more widely read than ever and that their popularity is extending.

We welcome this month the *Purdue* from Lafayette, Ind. The editors being representatives of the three literary societies of the college we could expect no more than what we find—a journal devoting considerable attention to the editorial and literary departments while not neglecting college news of local and general interest.

The *Lehigh Burr* contains the best paraphrase of "She" we have yet seen.

We were extremely interested in reading in the *Hanover Monthly* a clipping from "Men and Books" entitled "One-Sided Development." The article called attention to the effect of developing one member or faculty to the exclusion of another, and states that through the "right-hand habit of body," a person lost in a forest, insensibly moves in a circle to the left through the instinct of the right side to take the lead of the left. The article concludes as follows: "Beware of your favorites in anything —your favorite author, your favorite preacher, your favorite instructor, the head of your sect, the originator of your school of philosophy, the leading expounder of your type of theology, the representative man in your beau ideal of culture. Stand off, and measure them all. Wait awhile; let your judgment of them take years in the forming. Receive trustfully and gratefully whatever they give you which satisfies the varied cravings of your nature, and helps your culture to an even balance, but hold in suspense for a time any influence from them which surfeits some taste and leaves others to starve."

To those of our panting, weary students whose efforts to keep up in the race seem all but fruitless, the following from the editorial columns of the *Tech*, will probably need no explanation:—

"There is nothing more discouraging, nothing more deadening to all desire for mastery of a subject, than the feeling that the lessons embrace more than could be properly read in three times the allotted time. The principle of 'hopefulness in labor' applies not alone to coal-heavers and potato-diggers."

The article on "The Thwarting of Talent" made the last number of the *Niagara Index* the best we have seen for some months.

On account of the frequency of its issuance, and the strength and vigor which its appearance evinced, the paper we formerly received from Williams was called the *Fort*nightly. For some unaccountable reason, like Goliah shorn of his hair, it has lost its strength and we now receive a weekly, frail little journal without a resemblance to its robust ancestor of a few months ago. The *Williams Weekly* will have to fill its columns with something more substantial than local events and college news if it would aspire to fill the void left by our esteemed *Fortnightly*.

In its last number, the *Haverfordian* contained an article on "Picturesque Haverford" illustrated by no less than six photo-engravings. This is the first attempt at an extensive illustration of an article we have yet seen in a college paper. Occasionally an exchange will have a cut on its "funny page" but it has been left to our unprogressive(?) Quaker friends to take the initiative. With the many processes of photo-engraving—and they are vastly cheaper than wood engraving—little stands in the way of the college paper of the near

future publishing with every issue, illustrations of college buildings, a successful crew or team, an instantaneous view of a game in progress, a portrait to accompany a biography or a hundred other subjects which by this means would give snap and interest to the paper as perhaps nothing else can. All honor then to our Pennsylvania friends who thus show the feasibility of such a plan in so attractive a manner.

College News.

Entrance examinations for Harvard are held in Paris.

The accumulated libraries of two literary societies at Dickinson, aggregate over 21,129 volumes.—*N. T. U. Quarterly.*

The University of Paris, the oldest in the world, was founded six years before Oxford, that is, in 1200; while the college of the city of Mexico is the oldest in America, having been founded fifty years before Harvard.

A telegraph company, known as a Princeton College Telegraph Co., has been organized, with stations in all the dormitories.

The faculty at Oberlin place knee-breeches in the same category as low-necked dresses and short sleeves, and have forbidden the students to wear them.—*Ex.*

In the United States every two hundredth man takes a college course; in England every five hundredth; in Scotland, every six hundredth; and in Germany every two hundred and thirteenth.—*Ex.*

A professorship of physical culture, with an endowment of fifty thousand dollars, is to be established at Amherst as a memorial of Henry Ward Beecher.

The authorship of that popular melody, "It was my last Cigar," is not generally known. The lines were written by a Yale student named Condit and were suggested by an actual experience. Condit one day handed them to a fellow-student, J. M. Hubbard, with the request that he set them to music for the college boys. The melody was composed that day at a single sitting.—*Ex.*

The following list of eleven leading colleges of the United States will give an idea of the importance of a gymnasium in the estimation of the best educational institutions in the country:

Colleges.	Cost of Gymnasium.
Harvard,	$110,000
Yale,	*125,000
Princeton,	38,000
Tufts,	20,000
Amherst,	65,000
Columbia,	*156,000
Williams,	50,000
Cornell,	40,000
Lehigh,	40,000
University of Minnesota,	34,000
Dartmouth,	25,000

*Now building.

—*Ex.*

Pres. McCosh has written an apology concerning his action at the Harvard celebration and admits that he put a wrong construction upon Dr. Holmes' poem.—*Ex.*

Personals.

Prof. T. E. N. Eaton has taken his degree of Ph.D., at Boston University. Prof. Eaton's thesis was on "The Relation of Christianity to Socialism."

S. S. Jennison, '71, for the Executive Committee of the Alumni Association, has issued a circular to the effect that the annual meeting and supper of that association will occur at Insurance Hall, June 29th.

W. L. Chase, '77, formerly with the Chase Turbine Mfg. Co. of Orange, and

Crompton Loom Works, in this city, as draftsman, has entered the service of the Knowles Loom Works.

Jas. Griffin, '85, at present holds the position of Foreman of the Gas House at the Steel Works in this city.

H. C. Hawks, '86, is filling the position of topographer for the Chicago, Santa Fé & California Ry. at Chicago, and C. F. Hunt, '86, is in the employ of the same company, his address being Bucklin, Mo.

A. T. Rogers, '86, is draughting for Lord's Manufacturing Co. at Irvington-on-the-Hudson.

Technicalities.

A recent number of the *Daily Telegram* contained a flattering notice of '88's crew at the lake.

The increased interest in athletic sports this season is a most hopeful sign. With better health, better work can be expected in studies. Since the graduation of '84, the school seemed to be declining, but the healthy look on the faces now seen in chapel points to a brighter outlook in the future. We must confess that the average student a year and a half ago was not up to the standard of health demanded by the severe course of study.

We notice with pleasure the interest taken by some of the students in tramping over the hills and valleys around Worcester. The exercise is excellent and we would be pleased to see some of the long tramps of the Germans copied here.

The senior civils may like to know the thesis subjects of their Boston friends. The list is as follows: "Fine Grinding of Cement, Sewerage of Brockton, Economic arrangement of the Kinzua Viaduct and Design for a Different Arrangement, Review of the New York Water Supply and Quaker Bridge Dam, Location of a Narrow Guage Railway from Davis Mine to Claremont, Location of a Railroad from Medway to Stoneham."

Young lady at field-day sports: "Mr. R., where is Mr. B.? I don't see him anywhere."

Mr. R.: "That is he walking down the track with that runner:"

Young lady: "Oh is he the one with clothes on?"

The following despatch from the State House is self-explanatory:—

BOSTON, May 20.—The amendment to the Worcester Institution bill has been concurred in by both branches, so that it is hereafter to be called the "Worcester Polytechnic Institute."

The bill in its original form asked that the name be changed from the "Worcester County Free Institute of Industrial Science" to the "Worcester Technical Institute," but, owing perhaps to a fit of magnanimity on the part of our legislators, or to some other cause or causes unkown to your scribe, the bill was amended as noted above. This order of the General Court goes into effect July 1, 1887.

We noticed last Fall that '88 was very ready and even anxious to care for its men on field-day, especially in the races, but this year their racers were not quite so fortunate and '88's ardent supporters left the men to take care of themselves, as though they were cast-off shoes. We hope it was an oversight on '88's part, but from observations it seems that it was not an oversight with some of them. When a man has run a race he needs rubbing down, and will give the class ample pay for the little service they can do toward making him fresh for the next race.

Prof.: "Do you see the brownish red, with a yellowish tinge, of this bead, Mr. X, as I hold it in the flame?"

Mr. X.: "Yes, professor, I've often noticed that when anything is heated it's apt to be red."

Dr. and Mrs. Fuller gave a reception to the Middle and Junior classes on the 20th. Nearly fifty were present, and the evening was passed very pleasantly.

Prof. of Mechanics: "Well, some of you say that the sliding and the rolling body will reach the foot of the plane at the same time, and some say they will not. Mr. B., what do you think about it?"

Mr. B.: "I think they'll get there just the same."

On May 23, the mechanics and civils of the Senior class, under the direction of Profs. Alden and Durand, made an eight-hour test of the straight-line engine and of the south boiler at the shop. The notes are being "worked up" by the students as part of their regular steam engineering work.

Prof. of chemistry: "Can you tell us anything further as to the properties and uses of toluol?"

Student: "No sir;" (in stage whisper) "I've toluol I know about it."

Mr. John A. Chamberlin will deliver the valedictory at Mechanics Hall on behalf of the graduating class. For class-tree orator, the seniors have selected Mr. J. W. Burke, who is also the class poet.

Museum of Antiquity.

THERE was a young lady of Fla.
Whose conduct grew horrid and ha.
Till her mother said Jane,
I see it is plain
You will go to a place that is ta.

Teacher: "Give an example of color-blindness." Scholar: "Well, some editors think their papers are read when they are not."

FAREWELL.

YOU'VE been a warm, true friend to me
These many, many years;
But now the last sad hour has come—
I part from you with tears.

Well I remember, long ago,
One snowy winter's night,
The time I proudly brought you home,
Pressed to my bosom tight.

Alas! that all your grace should flee,
And all the perfect charms;
Yet happy moments I have known
In those once shapely arms.

You used to wear a modest look,
But now are seedy quite;
You have a dissipated air
Of roaming late at night.

Now arm in arm to walk with you
I feel ashamed and shy;
It's really best that we should part,
Good-by, old coat—good-by.

Professor: "What is the aurora?" Student, hesitatingly: "Professor, I did know, but I have forgotten." Professor: "That is sad, very sad; the only man in the world that ever knew has forgotten!"

THERE'S a book with the label Ganot,
In which is contained condensed wot,
Which each Junior must keep
(Though the fact makes him weep;)
Yes, friend, all these sad facts are sot.

Agent (to woman at the door:) "Have you one of our patent double-back-action catch-'em quick burglar alarms in your house, madam?" Woman: "No, sir. We had one awhile ago, but a burglar broke in one night and stole it."

What killed Cæsar? Too many Roman *punches*.