12-15-1891

The WPI Volume 7 Issue 7, December 1891

Students of Worcester Technical Institute

Follow this and additional works at: http://digitalcommons.wpi.edu/wpi

Recommended Citation
http://digitalcommons.wpi.edu/wpi/39

This Book is brought to you for free and open access by the WPI Student Publications at DigitalCommons@WPI. It has been accepted for inclusion in The WPI All Issues by an authorized administrator of DigitalCommons@WPI.
CONTENTS.

Foot-ball Number, 24 pages.

<table>
<thead>
<tr>
<th>PAGE</th>
<th>Editorial...</th>
<th>131</th>
<th>The Historical Club...</th>
<th>142</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAGE</td>
<td>Tech Reference</td>
<td>134</td>
<td>Alternating Currents...</td>
<td>142</td>
</tr>
<tr>
<td>PAGE</td>
<td>Y. M. C. A.</td>
<td>135</td>
<td>Celebrates his Birthday</td>
<td>143</td>
</tr>
<tr>
<td>PAGE</td>
<td>The Camera Club Exhibition</td>
<td>135</td>
<td>A Plea for German</td>
<td>144</td>
</tr>
<tr>
<td>PAGE</td>
<td>Water Colors</td>
<td>135</td>
<td>Mortar Boards</td>
<td>145</td>
</tr>
<tr>
<td>PAGE</td>
<td>Phi Gamma Delta</td>
<td>136</td>
<td>Salisbury Sanitary Engineering Club</td>
<td>145</td>
</tr>
<tr>
<td>PAGE</td>
<td>Foot-ball</td>
<td>137</td>
<td>A Tech Senate</td>
<td>146</td>
</tr>
<tr>
<td>PAGE</td>
<td>Foot-ball Meeting</td>
<td>139</td>
<td>New Methods of Incandescent Lighting</td>
<td>147</td>
</tr>
<tr>
<td>PAGE</td>
<td>Foot-ball Reception</td>
<td>139</td>
<td>Personals</td>
<td>147</td>
</tr>
<tr>
<td>PAGE</td>
<td>The Socialists of '92</td>
<td>139</td>
<td>Technicalities</td>
<td>148</td>
</tr>
<tr>
<td>PAGE</td>
<td>Communications</td>
<td>140</td>
<td>College Notes</td>
<td>150</td>
</tr>
</tbody>
</table>

WORCESTER, MASS.

THE WORCESTER POLYTECHNIC INSTITUTE.
W. H. JOURDAN,
ANTHRACITE AND BITUMINOUS
COAL,
WHOLESALE AND RETAIL.
Fire Sand, Clay and Brick,
Offices: 356 Main St., and at Yard,
Green Street,
WORCESTER, MASS.

CHAS. F. HANSON & CO.,
317 Main Street, - Worcester, Mass.

The Best Place in the city for Fine
VIOLIN, GUITAR AND BANJO STRINGS.
VIOLIN OUTFITS a specialty, prices from $5.25
upwards. Fine Banjos and Guitars. We refund the
money if goods are not as represented.

FRED. W. WELLINGTON & CO.,
Wholesale and Retail Dealers in
COAL.
GENERAL OFFICE,
416 MAIN ST. - WORCESTER, MASS.
Branch Office, 600 MAIN STREET.
Coal Pockets,
NORWICH, - CONN.

BARNARD, SUMNER & CO.,
Dry Goods & Carpets.
The largest house devoted to legitimate Dry
Goods in New England. It grows with the
growth of Worcester County, because it is the
acknowledged Shopping Home of the Ladies,
and because all things are here that ought to be
here, and at the Fairest Prices.

Barnard, Sumner & Co.

THE HERCULES
TURBINE WATER WHEEL.

Best
Part-Gate
Efficiency of
Any Water
Wheel ever
made.

Manufactured by

HOLYOKE MACHINE CO.,
WORCESTER, MASS.

S. I. HOWARD,
CARPENTER AND BUILDER,
Estimates furnished on all kinds of work. Store
Fronts in Heavy Brick, Stone, or Iron Build-
ings a Specialty.

RESIDENCE 63 MAIN ST.,
WORCESTER, MASS.

FRANK H. RICE'S
Photographic Studio,
311 MAIN STREET,
Makes a specialty of Photographic Work of all
kinds and sizes.

Having received the generous patronage of former
students, I respectfully solicit the same in future from
the Institute this sheet represents.

Twenty-five per cent. discount to members
of the Institute.
T. D. GARD,
WORKER IN
GOLD & SILVER
MANUFACTURER OF REGALIAS, COLLEGE JEWELS, PINS, CHARMS, ETC.

"THE W. P. I. PIN" MADE & SOLD HERE.

310 MAIN STREET,    -    -    WORCESTER, MASS.

W. F. GILMAN, D.D.S.,
DENTAL OFFICE,
OFFICE HOURS: 9 A.M. to 1 P.M.; 2 to 5 P.M.

IMPROVED
WHEELOCK ENGINE.
50 to 3000 Horse Power. Built in all Forms.
CONDENSING, COMPOUND, TRIPLE EXPANSION.

WHEELOCK ENGINE COMPANY,
WORCESTER, MASS.


HOLLAND & HAVENER,
Successors to HILL & TOLMAN and LINCOLN HOLLAND & Co., Dealers in
Bicycles and Safeties, Athletic, Gymnasium & Gen'l Sporting Goods.
PRIVATE GYMNASIUM,    -    -    PROF. L. C. HAVENER, Instructor.
507 MAIN STREET,    -    -    WORCESTER, MASS.

CHAS. HAMILTON,
BOOK, JOB, CARD, POSTER AND NEWSPAPER PRINTER,
NO. 311 MAIN STREET,    -    -    WORCESTER, MASS.
THE DEANE

Steam Pumping Machinery,

FOR EVERY DUTY.

The DEANE STEAM PUMP CO.,
HOLYOKE, MASS.

New York, Boston, Chicago, Philadelphia, St. Louis. Send for Catalogue.

DAVIS & CO.,
286 MAIN STREET, 286

DEALERS IN

FINE READY-MADE CLOTHING,

Stylish Garments for Young Men a Specialty.

Those who prefer garments made to measure will find us prepared, at all times, to show seasonable goods of all grades and prices.

All Work Warranted Satisfactory. Prices Reasonable

Novelties in Furnishing Goods.

DAVIS & CO.
Opposite Bay State House.
FOR years, the desolate cry, "O! Club, where art thou? O! Society, what art thou like?" has been cast in the aching void of Tech life, and, re-echoing, if at all, has returned to its utterer in more unanswerable accents. But now, what a change! A tornado of clubs has struck the Institute, and plunged us into the dizzy vortex of scientific societies, literary societies, Greek Letter societies, social societies, societies with a name, and societies unmammable, combinations of every genus and variety. Our first thought on arrival at Boynton Hall is, "What's the latest bulletin board?" and our last on leaving, "Is there a society meeting to-night?" Some are for study, some for athletics, some for fame immortal, some for fun, some for—well, just for society, that's all. And yet, we haven't heard of a society for the relief and protection of Tech widows; but there may be one—we don't know. Whether this society craze is like a California boom, or not, we cannot say: certainly it is the fad at the Institute just at present.

But, seriously, social life is lacking, and opportunities for the development of the companionable side of man's nature are greatly to be appreciated. There is a great deal of benefit to be derived from many of these organizations, and so we welcome them in the hope of their possessing more staid and staying qualities than the western freaks of nature and civilization, to which we have likened them. But, while the boom is with us, we can only query, "What's next?"

The Foot-ball season is over and a genuine satisfaction in the revival of this sport at the Institute and speculations in regard to next year's prospects are all that remain to us in the colder days of mid-winter, and yet not all, as is shown by the report of the Foot-ball Manager as printed on another page. Mr. Smith not only deserves congratulations but in every respect he merits praise for the business-like and successful way in which he has conducted his department. Not a little of the success of a Foot-ball eleven is due to the business manager, indeed, very much of success is often due to his painstaking efforts.
The fact of a balance indicates the efficient work of this fall. Compared with many colleges the expense has been but small, but it has been manfully met and discharged by the students in their contributions which have been proportionate to the demand. And the measure of success attained is not so small either, when we realize that it has been the revival of a sport that for several years has been sleeping, apparently beyond power of awakening. Victory has not brooded over our standards, but clean, manly struggles have been engaged in, which have left the Institute better, and that bid us hope and work for large successes next fall. This year we did not know that an eleven would even be supported, now it is an established fact, and the work will be resumed with the greater assurance. The early election of next year’s captain is certainly wise, and all agree that Mr. Allen is the man of men to guide the fortunes of the next eleven. His work has received well merited praise from every quarter. Indeed, Captain Southgate and all the eleven have won the respect and esteem of all by their hard work and unfailing loyalty.

But when so much praise is merited by the work of the team and the splendid support of the students, we regret that there is still opportunity for criticism. We refer to the subscribers who have not paid their share and who give no indication of so doing. There is yet a considerable sum due from this source over and above all that has been received. We cannot believe that men would subscribe what they did not intend to pay, and we can see no reason for men subscribing more than their ability would warrant. If this be true then why do some men neglect to pay their share? It is as dishonorable for a man to neglect the payment of his subscription when he gives no excuse, as it would be to discredit any other honestly contracted debt. We trust that the present business manager will have no difficulty through the unreasonable delay of these subscribers.

We are in receipt, this month, of another communication from “Alumnus, ’88,” with more of his views on Buckle’s “History of Civilization.” In our October editorial, we incidentally mentioned that “we do not in all respects agree with the views of our contributor.” The repeated and forcible presentation of the claims of Buckle in the letter of the current issue, calls from us our own position on the matter of the availability of the “History of Civilization,” or, as it is in reality, the “History of Civilization in England,” for a text-book at the W. P. I.

We have no issue with “Alumnus,” but to his suggestion of Buckle we must take decided exceptions. Briefly stated, our position is: We do not believe the work of Henry Thomas Buckle is a desirable text-book for any general collegiate course, and least of all, for a scientific institution. Were we pursuing a course in historical philosophy and metaphysics, we might inspect Buckle, as we would Voltaire or Hegel, in order that we might acquaint ourselves with different schools of European thought, but not that we should make their max-
ims the rule of our lives. Henry Thomas Buckle was a follower of Thomas Hobbes, a philosopher of Malmesbury, and embodies in his work many of the views of Hobbes. Buckle's education was broad, and his brain was stored with a most varied collection of facts, which he used to establish the ideas which he held to be truth. His history is an immense collection of facts drawn from all phases of life, and strung together in a racy style, in the attempt to prove that intellectual power is the only great and civilizing force. He failed to define civilization, but leaves the reader to infer that it is the progress of knowledge. In belief, he was a necessitariian of the darkest hue and a pronounced skeptic. He fanatically upholds the doctrine of fatalism and unbelief. He maintains that man is a plant that grows and thinks; the products and methods of his thought are as far divorced from his own will as is the production of fruit separated from the choice of the tree. Food, soil and climate, and the general aspect of nature, are the uncontrollable forces that determine his being. All superstition, and in this he includes much that we term religion and the ethics of morality, are directly traceable to the overawing aspect of nature, to great mountains and impressive cataracts; but his proof is altogether one-sided, overlooking such cases as Iceland, where the people are not the least superstitious. His favorite maxim is that intellectual law is as fixed as gravitation, and may be reduced to formulas, like the laws of mathematics and chemical affinity. Were that so, it would indeed be an appropriate study for the Institute; but the absurdity of the proposition must be evident to even the High School boy, to whom "Alumnus" refers.

Although violently opposed to deductive reasoning, Buckle assumes his maxims, and then, from his vast storehouse of facts, proceeds to build up his demonstration. To prove the precision of intellectual law, he manipulates a long series of statistics of London suicides. He deals with averages, on the apparent principle that the mean result of two falsehoods is a truth. As he expresses it: "The magnificent idea is that everything which occurs is regulated by law, and that confusion and disorder are impossible." We devoutly wish the latter were true, then in what an economic paradise we would thrive!

In his estimate of moral forces, he separates himself from the greatest philosophers and purest thinkers of all time. He asserts that moral truths are stationary, while intellectual truths alone are progressive. We quote: "Disturbances produced by moral agencies are but aberrations, which, if we compare long periods of time, balance each other, and these in the total amount entirely disappear." He further enunciates the idea, that Religion is a positive curse, and that morality has done nothing for mankind. In crime, moral principles may affect the individual, but not the masses. Is this what we want for a text-book?

The work is extensive; and, in the space of an editorial, we can give but a very brief outline of its thoughts; but the following, from the North American Review of Oct., 1861, is much to the point:

"With considerable merit of literary
execution, it (Buckle's History) is characterized in a marked degree by arrogant pretensions, a dogmatic spirit, coarseness of expression, and a complete disregard of the feelings and opinions which a vast majority of the author's countrymen hold sacred. Under the guise of history, its only aim is to teach the preconceived conclusions of a false and debasing philosophy. If those conclusions were sound, man would be an animated machine, not accountable for his actions, and without either hopes or fears extending beyond this brief space of earthly existence. Rashness of assertion and inconsequence of reasoning are what we expect to find in the statement of such doctrine; and in this expectation we have not been disappointed."

We have discussed Buckle at this length, because his work is one with which but few here are acquainted. Doubtless the course in English will admit of improvement, but when our "Alumnus" suggests this work as an improved text-book, we must respectfully but decidedly beg leave to differ with him. Doubtless the boys would find it "most interesting"; but, as one of the boys, we must disclaim any desire to spend our time and talents in that direction. As regards one year's work in English at the beginning of the course being sufficient, we need have nothing to say. And if our experience at the Institute counts for anything—and we believe it to be that of the average Tech—it takes three years to acquire even a modicum of knowledge. And as for the "grand unification of the knowledge gained from the various departments," we are willing to leave that to the mature development of practical life.

Winter may be said to be fairly upon us. At least, the signs are here. The Seniors' new society is preparing for sleigh-rides, skating parties, and the like; the other classes are forming whist clubs, while almost everyone is engaged in overhauling last year's skates. The question has been asked by many: "Why don't we get up a few games of polo, on the ice?" That is so—why don't we? There should be no difficulty in forming a couple of teams. Almost everyone here can skate a little, and we surely can find enough places around Worcester in which to skate, if frost comes. There was one time, in the Institute's history, in which a first-rate team of polo players was maintained throughout the winter. Now, with two hundred men here, it is rather strange that something cannot be done in this direction. All needed, is some one to propose the scheme; and, if the remainder of the students show themselves one-half as interested as they should be, the thing should be as good as done. Besides, this would give our ball-players a little exercise.

TECH REFERENCE.

Nov. 20. Opening meeting of Historical Club.
Nov. 24. Students warned of their standing.
Nov. 25. Thanksgiving recess began at noon.
Nov. 28. Pi Iota Chapter chartered at Boston.
Nov. 30. School began again. No chapel exercises.
Dec. 2. Organization of the Socialists of '92.
THE WPI.

Dec. 5. Camera Club Exhibit.

Y. M. C. A.

Subjects for noon meetings:
Dec. 23, Nehemiah; Neh. 4:7-23.
Jan. 6, Daniel; Dan. 4:4-23.
Jan. 12, Peter; Acts 4:5-20.

The meetings are held in Room 3. All are invited.

THE CAMERA CLUB EXHIBITION.

The third annual exhibition of the Tech Camera Club was held at the Salisbury Laboratories on the afternoon and evening of Saturday, December 5. Great pains had been taken by the members of the club to make the occasion a success and much credit is due to the committee of arrangements that the exhibition proved such an enjoyable and creditable affair. The various exhibits of prints were gracefully arranged about the Mechanical Model Room and interpersed by palms and potted plants. Tasteful souvenirs were presented to each visitor, bearing a list of the officers and containing a list of the classes of views. At 3 o'clock in the afternoon visitors commenced to arrive and during the evening the number continually increased until at 8, when the lantern slide exhibition was announced, there were so many as to strain the capacity of the physical lecture room to its utmost.

The exhibit was much larger than those of previous years and elicited much favorable comment from the judges. The prizes for the different classes were awarded as follows: Landscapes, Higgins, '93 (1); Sinclair, '93 (2); marine views, Sinclair (1), Bracken, '92 (2); architecture, Coombs, '93 (1), Bracken (2); interiors, Davenport, '94 (1), Keith, '94 (2); animals, Bracken (1), Keith (2); instantaneous, Sinclair (1), Higgins (2); flash lights, Vaill, '93 (1), Higgins (2); portraits, Higgins (1), Keith (2); groups, Keith (1), Bracken (2); machinery, Sinclair (1), Higgins (2); blue prints, Keith (1), Higgins (2); copies, Bracken (1), Higgins (2); bromides, Keith (only exhibit) (1); novel effects, Higgins (1), Sinclair (2); clouds, Keith (1) and (2). Interesting collections "for exhibition only," were presented by Dr. Bemis and Mr. Osgood Plummer, honorary members, and by Mr. Everett Kimball. Mr. G. F. Freed, '92, also exhibited a large and interesting collection of views taken in New York, Philadelphia and Washington.

The judges were Alfred S. Roe, J. Chancellor Lyford and Dr. A. S. Kimball.

Mr. Bracken's exhibit was the most remarkable for artistic arrangement and good work of any individual display, and his mare and colt, which secured (1), for animals, was a most creditable picture.

Mr. Keith's group "classmates of W. H. S. '91," which secured (1) for groups, contained faces familiar to many and caused much interest.

Higgins' first prize "novel effect" was striking indeed, and Sinclair's (1) in machinery was well appreciated.

H. A. Coombs, '93, exhibited pictures which he took near his home in Switzerland during the summer, receiving (1) in architecture.

Nearly all the instantaneous pictures were taken by the "prize lens" and showed its effect.


The views taken in Mexico, together with those of animals and children, seemed to arouse greatest interest in the lantern slide exhibition.

In all some four hundred and fifty different views were displayed and the Camera Club may well congratulate itself upon the success of the exhibition.

WATER COLORS.

I am very happy to comply with your request to furnish to your readers a résumé of the principles of color, and a few practical hints that will be useful to our students as they take up their practice of water color. This subject is so full, both in its theory and practice, that it will be impossible in the limits allowed me to present anything more than a few hints of the most elementary character. I trust a few words may lead many to a more
thorough and earnest study of this important branch.

A *primary* color is one that cannot be produced by the mixture of others. There are but three primaries,—yellow, red and blue. From these three colors all others may be produced by mixture.

By the mixture of yellow and red, we obtain orange; from yellow and blue we obtain green, and from red and blue, we obtain purple. Now we have what we term a *secondary* series, viz., orange, green and purple.

By combining these as follows: Orange and green, we have olive; orange and purple, we have brown; green and purple, we have gray. These combinations, olive, brown and gray, give us what we term the *tertiary* series.

This is but a bare statement of a few leading principles in the combination of colors. In practicing and applying these principles one will discover some of their almost infinite modifications. He who practices earnestly, and with a retentive memory will succeed in interpreting another, some of the beauties which exist in the color of the objects about him.

I will close this brief article with a few combinations which will be found useful to students who are engaged with their colors.

To produce chocolate brown, add carmine to burnt umber, or Indian red to black, and add yellow to bring about the desired shade.

Ordinary brown: red, three parts; black, two parts; yellow, one part.

Deep buff: yellow ochre, white and a little red.

Oak color: white, eight parts; yellow ochre, one part.

Stone color: white, five parts; yellow, two parts; raw umber, one part.

Straw yellow: yellow, five parts; white, two parts; red, one part.

Cream color: white, five parts; yellow, two parts; red, one part.

Grays: indigo and Indian red; indigo, carmine and gamboge; indigo, sepia and carmine. Greens: indigo and gamboge; indigo and gamboge, with either burnt sienna or light red.

Yours sincerely,

GEORGE E. GLADWIN.

---

**PHI GAMMA DELTA.**

The Institute has at last stepped into line with six hundred and thirty-eight other colleges in the United States, by the institution of a chapter of one of the Greek letter societies.

On Saturday, November 28, eight of the W. P. I. students were made charter members of the Pi Iota chapter of thePhi Gamma Delta Fraternity, under the auspices of the Iota Mu chapter of the M. I. T. Archibald McCullagh, Jr.,legate from the grand chapter, was the installing officer, and the exercises took place at the Quincy House in Boston. Delegates from Harvard, Cornell, Columbia, University of Pennsylvania, LaFayette, Washington, Pa., and the M. I. T. were present. A banquet followed the installation exercises. The following are the officers: President, A. E. Culley; Treasurer, H. M. Southgate; Secretary, F. E. Morse; Recording Secretary, William Nelson; Historian, W. N. Stark; Corresponding Editor, R. C. Cleveland. These gentlemen with W. F. Burleigh and Ralph Morgan constitute the charter members. Five more are already pledged and will be installed soon. The membership is limited to twenty.

These Greek Letter Fraternities hold a very prominent place in the college life of to-day and of the recent past. Although the membership is limited there are to-day over ninety-two thousand members of some twenty-eight national societies in six hundred and thirty-eight American colleges. Sixty-four chapters own houses of their own, more or less handsomely equipped and furnished.

The Phi Gamma Delta, the Alpha Delta Phi, the Delta Kappa Epsilon and the Phi Upsilon rank as the largest and most influential four and include in their ranks many of America's most distinguished and talented men.

The fraternity of the Phi Gamma Delta now has forty-four chapters with a membership of about six thousand, extending from Boston to San Francisco and through the southern as well as the northern colleges. The headquarters of the Grand Chapter are in New York.

The bonds of friendship formed at college are often of the strongest nature and last
all through life. And in the opportunities for making acquaintances among the students all are aware that the Institute is deficient. We have no dormitories, few social gatherings, little outside of study and recitation.

Societies of the nature of the Phi Gamma Delta differ a great deal in character in different chapters. As in any organization, their character is entirely determined by the class of men who constitute the membership. We may have one chapter devoting its time to card playing, smoking, drinking and to what is sometimes called a "general good time," while another seeks to bring together in a pleasant, social way men who would make congenial companions and to join in promises of mutual support and friendship.

A strong point of these fraternities is that one is sure to find in almost every place he may visit some well educated man, who will at once recognize him as a friend and seek to make things pleasant for him.

May our new organization have a long and successful career. May it and its members be a credit and a source of pride to the Institute.

American Foot-ball, a decidedly necessary step. At Hartford, a sumptuous feast was served at the Allyn House although Manager Smith and the press although Weslyan opened with the ball and a V swerving to the right gained 8 yards; Williams took a 20-yard gain around the left end, being finely blocked. Then Wesleyan's little trick, so often worked in the game, was begun. North passed to Newton who, facing to Pullman, dove forward into the centre with the little quarter after him. This was a sure gainer and against it was no hope.

Leo made 5 yards between the centre and tackle followed by Meredith who took the sphere 4 yards farther. Then Burly Newton was hurled against the centre, and scored a touchdown in exactly 3 minutes after time was called. Gordon failed on an easy kick.

Score 4-0

Tech ball.—On the opening V, Allen dodged out and made 4 yards. Southgate went between the guard and tackle on his left and pulled 4 yards. After two poor passes, Allen again cleared 4 yards by good dodging. Then Wesleyan soon owned the sphere again on four downs. Now Meredith is sent around the right with a

WESLEYAN, 38; W. P. I., 6.

On Saturday, Nov. 14, our team went to Middletown, Conn., for the express purpose of testing mettle with the Wesleyan team, although no one for a moment imagined that we would score against the much heavier Connecticut boys.

The team left the Union depot at 10.13 and the several members of the team amused themselves by guying porters, playing whist and reading Walter Camp's
10-yard gain, being well downed by Bartlett. Davison fails to gain, but Hall clears 5 yards in the centre. Williams, the Wesleyan sprinter, then starts again for the left end and cleverly dodging the backs, plants a second touchdown and again the try for goal is unsuccessful.

Score 8-0.

Allen fails to gain this time because of a fine tackle by Smith. Southgate then lost the ball on a fumble and Hall captured it. Williams gets over 8 yards of earth and Leo 2 more, and then Pullman chased himself around the left and scored another touchdown. This time Gordon kicked his goal.

Score 14-0.

Allen gained 8 yards on a V by skillful dodging and Southgate made 3 yards at the centre. Another V gave Allen 5 yards more and another buck credits Southgate with a similar gain. Allen's attempt to circle the end was futile and Lincoln punched. Gordon returned and gained 12 yards on the exchange. Alderman was hurt but continued to receive Leo's knee thrusts in the ribs without a murmur.

On four downs Tech industry was rewarded but no gains resulted and again Wesleyan's backs put in their work. This time it was Gordon who excelled and 20 yards was the amount of his sprinting. Then Tech ball on off side play, only to return on four downs, and to soon again change hands.

Southgate gained 6 yards and then a pass to Stoddard lost an equal amount, Hall being too quick. Lincoln punted and Pullman made a fair catch. Then Gordon punted and again Wesleyan had profited by 12 yards. Allen got a gain of 5 yards at the centre and Southgate 2 more. Then Allen fell when he had a clear field thus losing a clean chance at a touchdown. Meredith's run of 35 yards opened Worcester eyes and Newton bolted into the centre, scoring a touchdown. Gordon kicked a goal.

Wesleyan, 20; W. P. I., 0.

The ball began to go toward the Tech goal line but Williams and Meredith made bold steals of 12 and 45 yards respectively, the latter scoring another touchdown, and Gordon kicking goal.

Wesleyan, 26; W. P. I., 0.

Now the Worcester boys seemed to brace and Butterfield, Allen, and Southgate gained 4 yards apiece in turn. Then a foul tackle by Leo gave the Tech 25 yards and Southgate made 3 more. Alderman was severely injured here and forced to retire, Clapp taking his place. Allen gained 5 yards and pushed along by Butterfield, reliable as usual, wriggled through the centre and placed the ball just over the line. Southgate kicked goal.

Wesleyan 26; W. P. I., 6.

But this good work seemed to make us weak. Williams and Pullman made fine runs and the former finally ran half the field, scoring a touchdown. Gordon kicked goal.

Wesleyan, 32; W. P. I., 6.

On the Tech V, Allen gained 4 yards and then 3 yards more. Here the umpire gave a decision allowing that Hall tackled foul. The Wesleyans refused to play unless he repealed it, so he retired from the game. The decision was just and Umpire Morse deserved great credit for his firmness. Manager Smith took his place as umpire.

Allen gained 6 yards and Southgate 5 more. Then Meredith picked up the ball on Southgate's fumble and ran 35 yards before downed by Bartlett. Then fine work by Chase and Butterfield in getting through the line, backed by good back work gained the W. P. I. 35 yards before Wesleyan got the ball again.

Then ensued a pretty struggle in which for a time Worcester held up her end but finally weight had to tell and the ball slowly approached Worcester's goal line, to which Meredith finally carried it after an 8-yard run. Gordon kicked the goal and the teams were called off to allow the Tech men to catch their train.

Wesleyan, 38; W. P. I., 6.

The work of the Tech team was favorably commented on. They were much lighter than their opponents, but at times showed great strength. Our season's work is over and we can congratulate ourselves on having resurrected foot-ball from among the ashes at Boynton Hall. Let next year see this year's work continued and we shall not have worked for naught.
FOOT-BALL MEETING.

A business meeting of the Foot-ball Association was held in the Chapel at noon, Thursday, Dec. 10. Business Manager Smith's report was submitted and accepted, and Mr. H. L. Phillips, '93, was elected his successor. Mr. Smith's report was as follows:

W. P. I. Foot-ball Association,
In Account With
Arthur H. Smith, Manager.

Cr. By
" Paid up Subscriptions, Students $155.50
" " Faculty 17.00
" Receipts from C. M. T. S. Game 18.75
" Guarantee " Harvard Freshmen 20.00
" " M. A. C. Game 10.50
" " Holy Cross 31.50
" " Brown 37.30
" Guarantee " Wesleyan F. B. A. 85.00

Dr. 379.55
To Expenses 352.65
Cash on Hand 26.90

Dr. To
" C. M. T. S. Guarantee 25.00
" Expenses Harvard Freshmen 29.23
" M. A. C. Guarantee 30.00
" L. C. Havener 72.10
" Holy Cross Guarantee 6.30
" Worcester Athletic Club 12.60
" George S. Davis, for Foot-ball 4.00
" Brown Univ., F. B. A. Guarantee 36.00
" A. A. Stagg, for services as coach 20.00
" Expenses of Wesleyan Game 87.40
" Advertising and Sundries 39.02

$352.65

FOOT-BALL RECEPTION.

On the invitation of Captain Southgate, the members of the First Eleven spent an enjoyable evening at his residence on May Street, Tuesday, Dec. 8.

The work of the team during the past season and the outlook for the future were discussed in brief remarks by Captain Southgate, Manager Smith, Mr. Bartlett, Mr. Tucker and Captain-Elect Allen. During the evening, ice cream and cake were served and all the gentlemen went away with bright hopes for the future success of the team.

THE SOCIALISTS OF '92.

Ever since the first issue of the W P I its editors have been continually harried on every side by articles from aspiring stu-
ried that the members of the Senior Class
form a social club. Sixteen men "signed
articles." A constitution was adopted and
a certain number of men, who for brevity
may be called officers, were chosen to ad-
ministrate the affairs of the society. As a
start-off the society voted to attend a per-
formance in the theatre and tickets for the
same were accordingly obtained.

The objects of the society may be nar-
rrowed down to one,—to provide for the so-
cial well-being of its members. Various
means will be taken to attain this object. If
time and New England climate permits,
sleighing and skating parties will be under-
taken. Theatre parties will be formed, in fact anything recommended by the commit-
tee on arrangements will be attempted. In
addition to this, regular meetings will be
held and the members will be entertained in
many ways. Variety is the watchword of this
"new departure." The society, though social
is not convivial. In other words its members
are not "howling swells," they are simply
men, who want to become a little more ac-
quainted with each other before the final
leave-taking in June. It is planned to hold
reunions of the society at the time of the
regular class reunion. There is no reason
why such an organization can not succeed;
there is also no reason why it should inter-
fere with regular school lessons. Not four-
fifths of the Seniors spend over three nights
a week on lessons, the remainder of the
evenings being utilized for the theatre,
whist parties, excursions and such like.
The society is expected to fill a void that
has been aching for company ever since the
'70's, and the action of the Seniors should
influence some of the lower classes.

COMMUNICATIONS.

TO THE EDITOR OF THE W P I:

In your last issue you had an editorial
upon the many disturbances during the
chapel exercises. Now I heartily agree
with your opinions upon that subject and I
think my views are shared by the majority of
the students. That such exercises should
be disturbed is to me hardly consistent
with my idea of the proper actions of gen-
tlemen. But it is not upon that editorial I
wish to speak. It is concerning the fre-
quent complaints of so much noise before
the exercises. The students, they say,

should come in orderly and should not con-
verse with one another lest too much noise
disturb the general sanctity. Now I ven-
ture to disagree in this matter. I certainly
do not advise the students to rush in like
children at play, give the "P. I." and a few
"Georges" and then commence to hurl
hymn books around. Most assuredly not,
but I think that the students should be al-
lowed to converse with one another, not
necessarily in a loud voice, until the exer-
cises commence. My reason for this is that
the interval before the exercises is almost
the only time in the day we can meet each
other. A man of one class might wish to
speak to one of a different class or division
and these few minutes will afford him just
the opportunity he desires. In the present
arrangement of recitation hours it is almost
impossible for one student to meet a man
of a different class unless by accident. I
can see no harm likely to result in this.
Generally speaking we are not school boys
and the Faculty may be sure that the older
students will never uphold acts of childish-
ness when performed by a few thoughtless
ones. I hope the Faculty will see some-
thing in this and not be inclined to think,
when a man dares to talk to another before
the exercises commence, that unless he is
promptly squelched by a general lecture,
discipline will go to the dogs.

STUDENT.

Nov. 30, 1891.

EDITOR OF THE W P I:

Dear Sir:—

The October and November numbers
of the W P I are at hand and
their perusal has afforded me much plea-
Sure. The letter from Mr. Goodell is very
much to the point, especially as regards
a Technical Department for the Paper.
Such a department should receive the
heartly encouragement of every Alumnus.

It would seem from his criticism of
Buckle's "Civilization," as being too heavy
for use as a text-book at the Polytechnic,
that he has but a poor opinion of the quality
of the minds which that institution labels
S. B. Is he not rather severe on his
Alma Mater?

I make no pretense at being a phœnix
myself, but I must certainly disclaim any
overwhelming difficulties in the way of a
clear understanding of the work. Indeed
I would venture to assert that for anyone who could arrive at an understanding of the Ellipse of Stress, or the principles of Cinematics, or the theory of the Magnetic Lines of Force, or the theory of Chemical Affinity, or the theory of the Protection of our Infant Industries as unfolded by "Andrews;" for such an one Buckle ought to be perfectly plain sailing. While Buckle deals with the largest and most general of truths, he does it in such a way that the average High School boy can understand. And the average Tech must be indeed an infant if it is beyond his comprehension.

If I had suggested the study of Herbert Spencer's "Synthetic Philosophy," or Hegel's "Philosophy of Religion," or Kant's "Pure Reason," or Adam Smith's "Wealth of Nations" or Butler's "Analogy," there might have been room for objection. I have noted several instances of a thorough understanding of the work by persons of no education, at all comparable with that of the average Tech.

The necessity for a thoroughly good English course in the training of engineers is not to be denied. But this should be looked to largely in the requirements for entrance to the Institute. One year of well organized, practical work, at the beginning of the course, ought to be sufficient to complete this study, if students come properly prepared. This would leave the balance of the course for the grand unification of the knowledge gained from the various departments. Under the present system the student graduates with a host of scattered threads of knowledge, but with very little idea of their general bearing towards one another or the business of life. With the aid of a competent, broad-minded professor the course of Buckle would supply this need, and I would venture to predict that when once adopted the boys would find it more interesting than the most interesting study they have ever known.

ALUMNUS, '88.

EDITOR OF THE W P I:

In one of the editorials of the October number, you ask: "Why, in the name of the college of which you are proud, we ask, do you not remember its paper with items, articles, yes, and with subscriptions?"

Well, I have remembered it with the last (annual) requisite to its existence ever since it was born, and at times when I have felt the spirit move within me, I have attempted to contribute to its pages matter which, in my humble opinion, would have interested a majority of its readers, only to find myself added to the ranks of those who are the victims of "rejected communications."

In this same October number, however, there appears a letter from one who vaunts himself as one of the parents of the W P I that arouses a spirit of indignation within me sufficient to ask you to let me be heard in reply, or in defense of the paper. Here we have the amusing spectacle of a self-acknowledged parent claiming a share of his child's earnings after he has ceased to care for and foster it and allowed it to be legally adopted by others. True, a parent is lawfully entitled to the savings of his minor children, but what parent would think of claiming even a small share of the earnings of his abandoned child, one that he had given up to others? Ought we not rather to expect the parent to support the child until of age, and then in turn let the full-grown child support the parent in his old age if necessary? Mr. Risteen will hardly deny that the W P I is still a minor child (only six years old), nor will he care to allow probably that he has reached "old age."

What if all the editors, save himself and one other, "have received something by way of compensation," whose fault was it that there were no available assets at the time his connection with the paper was severed? Don't cry "baby" if your management of the paper failed to make it a success, while your "heirs, successors and assigns" have been more fortunate with it. The fault certainly cannot be with the paper itself. No, Mr. R.—don't kick because the succeeding Boards of Editors (most of whom probably do not know you from any other alumni) want you to pay your regular subscription to the W P I, but rather stand up and be counted as one who contributes his little cart-wheel dollar to its support annually, as every alumnus should do.

And Mr. Editor, do frame his letter as he requests, so that all subsequent Boards of Editors and all alumni can readily know the one of its number who wants the paper free
"gratis," "for nothing," "for value received" in "services rendered."

Since writing the above I have read the letter of Mr. Goodell, '88, in the November number, and have only to add that it seems to me if Mr. Bisteen "cheerfully gave his genuine hard work" for the paper in its early years, he should not be complaining now that the paper owes him something.

Yours truly,

F. E. Appleton, '74.

Lowell, Mass., Nov. 23, 1891.

THE HISTORICAL CLUB.

The Club, after a long vacation, has commenced its regular meetings and is now fully prepared for the winter season. Last year the study of early English history was commenced and continued down to the reign of King John. This portion of the work, though perhaps necessary for a complete understanding of the gradual rise of English literature, was not very interesting and for that reason the number of members was comparatively small. Again, the meetings were held Thursdays at 4:30. Thus coming directly after the regular lesson, these meetings were felt by the students to be little less than extra study hours.

But now everything is different. The time of meeting has been changed to Friday evening at 7:30 and English history as portrayed in Shakespeare has been taken up by the Club. It is well to state here that the purpose of the Club is to study English history as illustrated in literature, especially the dramas of Shakespeare. Besides the reading of the dramas by the members, there will be essays, short addresses, papers by guests of the Club, and extemporaneous reading of special passages.

At the first regular meeting, November 20, two acts of King John were read by different men to whom were assigned the various characters of the play. This scheme proved highly successful and will be continued. In addition to this Prof. Cutler read a very instructive and scholarly paper on "Chivalry in the Days of King John."

At the second meeting held two weeks later, December 4, papers were read by Messrs. A. H. Smith and M. J. Lyden, giving a brief account of England's history from the landing of Julius Caesar in Britain to the accession of "Good King John." Mr. Z. W. Coombs read two selected portions of the play, after which the third act was read by the Club. A very enjoyable evening was spent and it is safe to say that scarcely anyone regretted having come out in the heavy rain even if it did entail the danger of wet feet.

The change from dry history to Shakespeare is giving wonderful results. At the first meeting there were presented to the society the names of thirteen new men, while at the last meeting five new names were handed in. Prof. Smith's duties have been considerably lightened by the accession to the Club of Prof. Cutler, Mr. Z. W. Coombs and Mr. A. L. Smith. These gentlemen have entered with firm resolve to aid in all possible ways the progress of the society. A most pleasing feature, instituted by Prof. Smith and Cutler, is the custom of having the members write out whatever questions, upon the play, they might wish answered and of handing them to the executive committee. Much in Shakespeare is obscure to the uninitiated and can be explained only by considerable research among authorities. This fact would deter many from looking up the origin of quaint words or phrases, and it is for these men that the executive committee promises to find all such information for those who ask for it.

It now really seems as though the success of this project is assured. Much enthusiasm is manifested by the members, and the work, instead of being regarded as arduous is considered in the light of a pleasing diversion. In a previous issue of the paper we strongly urged the students to support this praiseworthy literary attempt, and the present state of affairs warrants us in believing that there are some here who know a good thing when they see it.

ALTERNATING CURRENTS.

Edited by the Tech Elect.

Five or six years ago the public generally regarded the incandescent electric light as an accomplished fact, and concluded that it never could be produced with such economy as to entirely take the place of gas. Then only what are now designated as low tension currents could be used, and such
immense quantities of current were necessary to give a sufficient energy, that it was practically impossible to provide wires large enough to transmit the currents to even moderately remote points. Consequently only sections in the immediate vicinity of the station where the current was generated, could be provided with the incandescent light.

In the meantime, men had been at work and succeeded in producing a system which could furnish light at a great distance and still compete with gas. This is known as the alternating transformer or converter system. It consists of a dynamo which, instead of having a commutator to rectify the currents generated, has two collecting rings which send the currents into the line in the same direction in which they are generated. The currents are therefore, alternating. The field magnets of the machine are excited by a separate direct current machine, or the alternating currents are rectified.

These alternate currents are of a high potential and in producing the same amount of energy as in the low tension system, the current in amperes is proportionally less. This high tension current is carried along the street either underground or overhead, and where lights are wanted it passes through a converter, which consists of two coils of wire, one of many and the other of a few combinations having no connection with each other.

The high pressure enters the first wire coil and currents of low tension are induced in the second wire coil. These induced currents are even of less potential than the direct low tension system and are therefore safer. The converters and lamps are connected in multiple the same as the lamps in the other system.

The comparatively small currents required in the mains on the high tension alternate system give it many advantages over all low tension systems; for instance, the smallness of the conductors and consequently the great distance at which lights can be supplied.

A M.

CELEBRATES HIS BIRTHDAY.

Geo. A. Mitchell Safely Passes 45.

George A. Mitchell can be safely set down as a true friend to the student at all times and all places. He is also popular with his shopmates. By way of showing their appreciation of his merit, at the suggestion of some one in the office, these men subscribed enough to present him with 45 79-cent pieces and a French clock on the anniversary of his birthday, as well as his wedding day, which occurred November 24.

We made a rush on his centre when he didn't expect it, and accompanied by Odd Ladies, and friends and neighbors of the family, we broke through his front door, by force of superior weight. We gave the "P. I." in his honor before entering. By the way, the yell seemed strange to many of the crowd. What a benighted state! It isn't our fault though that everybody in Worcester doesn't know it.

Two hours were passed in social chat and in listening to a varied program, which consisted of a banjo solo, readings and songs. The Techs contributed to the entertainment by rendering several college songs in "the usual taking manner." "Oh, Solomon Levi," and "Homeward Bound" seemed to create the best impression on the audience.

A collation was then served of which all received bountifully. Two of '93's promising German scholars struck a Mädelchen about this time, who was "little, but oh my." She tied them all in a knot on Dutch, but she didn't call them up on syntax. One of them thinks the only good his Dutch ever was to him, was in scraping acquaintance with this fair one.

A few minutes after the repast had been conquered in an uneven conflict, Rev. Mr. Lansing, who had come in from the campus, called Mr. Mitchell into the centre of the dining room and presented him with the gifts from the Tech, also with articles of silver from friends and neighbors, the Odd Ladies, and from Mr. Mitchell's mother. The "Professor" was completely overcome, being unable to say a great deal in response. Mr. Lansing neatly relieved his embarrassment, by asking him: "Do you believe in Free Coinage of Silver?" No one present could doubt, however, that the recipients were deeply grateful, and their silence was more abundant proof of this than a formal speech.

It is remarked that the reason a clock was given Mr. Mitchell was to prevent that worn out excuse that his "clock was slow."
Mr. and Mrs. Walls and Mrs. Higgins were among the guests. Mrs. Higgins was active in getting the boys to sing and accompanied them on the piano. Mr. Higgins came in after the caucus.

The company dispersed at a seasonable hour, wishing the host and hostess many happy returns of the day.

---

**A PLEA FOR GERMAN.**

The recent criticism of the method of teaching German in the Institute, though answered to a great extent by the excellent letter of J. M. Goodell, '88, may yet furnish the text for a few points of general interest.

Set over against the system now in use, is the so-called natural method taught by native teachers. It is an inviting way of learning a language, or trying to learn one, and there is much in it that, under proper conditions, would be good. It is based on a correct theory but in the average school or college it is perfectly impracticable. Why? Because it claims to offset in one hour a day devoted to the study according to the natural method, he will not learn the language in any length of time which a school can devote to the study. Instead, he will learn a few parrot-like phrases which are firmly fixed in memory from constant repetition, but are of no practical value. To be sure, he may have learned the sound of the language, but if he knows not the meaning of the words, and if he cannot answer if spoken to, because he has no words at command save those he has learned by rote, he is helpless. The writer once had this brought to mind very forcibly. He taught for two months a class which had been trained according to the natural method. The pupils understood the stock questions and readily gave the stock answers. But any variation in the question threw them entirely off the track. It was his experience then that the pupils learned absolutely nothing of permanent value until they had been put on to the grammar and thoroughly drilled in word form and inflection.

This is the result if the student of the natural method essays a conversation. And if he reads, his plight is worse. But how many of our graduates will even be called upon to carry on a conversation off-hand or even listen to lectures in German? Very few, but those who are so called on will acquit themselves better than the disciple of natural training.

German as taught in the Institute is of threefold value: it gives a general language training; it gives a thorough knowledge of the grammar and a fair vocabulary of the language itself; it opens to the student in his second year the field of German literature and introduces him to periods of history of which the average student in the Institute is ignorant, and which he studies with interest and pleasure. For the hack-work of grammar and composition has given way to a study which brings its own reward. No one can deny either of these points and granting them our students are fitted to make a practical use of the language if called upon. *

Nine of our graduates out of ten, when they need German, need it to translate from a text-book, journal or work of reference. Those who have gone to higher institutions tell us that their German is in a form to use and that they find themselves far in advance of the average college graduate who has had a two years' course of German.

Such testimony could be given by the writer from his own experience in one of the leading New England colleges. And here it may be noted that the leading colleges and technical schools of the country follow in the main the system we employ here, all conversational work, if granted as an elective, being left to the advanced student.

Again, taking the tenth case, the graduate goes abroad and wishes to learn the language for conversation or for hearing lectures. Thoroughly trained in grammar and word uses and inflections, with a fair vocabulary, he picks up the art of speaking

*At the same time the language can be taught as well by an American instructor as by a foreigner, and generally much better, as experience has more than once shown.
and of understanding the spoken language in a very short time. To be sure his language is at first bookish but it is correct and comprehensible, and the angular, stilted constructions soon wear off in an atmosphere of German.

So we may safely conclude that German, as taught in the Institute, is a good means of general training for men who are seldom well fitted in language and grammar work at entrance. At the same time the language if faithfully studied is in a form to be readily utilized for either translation or conversation.

Z. W. COOMBS.

MORTAR BOARDS.

At a recent meeting of the Junior Class the advisability of adopting some cap indicative of college life was considered at some length. A committee of five was appointed to consider the matter and to recommend action to the class. It was also decided before any definite action should be taken to confer with the other classes.

The cap and gown graced the graduation at Yale last year, and in all probability the custom will be followed by this year's senior class. At Princeton the question has for some time been agitated and lately the cap was adopted in that college. In view of the favor with which the innovation has been received at Brown, Trinity, Williams, Toronto and numerous other institutions of learning, all of which have taken up the custom in more or less of the original English usage, the Junior class has been led to take this interest in a subject that is certainly new at the W. P. I.

The Junior class wonders that the subject has not already been brought before the Seniors, but as it has never even occurred to that august body that such things existed as the cap and the gown, the lower classmen feel under no obligation to wait for the older classes to take the initiative. The Juniors believe that the hat should be adopted by all the classes, the only difference being in the color of the tassel which would indicate the class. They hold that because the college is technical, it does not preclude the possibility of its acceptance in the least. The class seems to be very sanguine of its adoption.

SALISBURY SANITARY ENGINEERING CLUB.

The first meeting of the term was held Tuesday, December 8, in the Chemical Lecture Room, with a very good attendance. It was decided to hold the regular meetings once a week, at 4:45 Tuesday afternoon in the same place.

The Club listened to a very interesting description of the Worcester Precipitation Works, by Mr. H. P. Eddy, W. P. I. '91, who has charge of the works. Mr. Eddy spoke particularly of the recent improvements in the manner of treating the sewage and in the preparation of the chemicals for this use. The lime is now slacked to a considerable extent before it is thrown into the sewage instead of it being ground fine and thrown in as oxide, as formerly. In this way about 33 per cent. is saved on the lime and about 24 horse-power by the suspension of the operation of grinding. By storing in one or two of the tanks the iron salts which come down at certain periods of the day, enough iron salt is always present to eliminate the necessity of using alumina, a further saving being thus effected.

Mr. Eddy also outlined the interesting experiments with sludge furnaces, which were carried on during the summer, and spoke particularly of the difficulties incident to the proper disposal of the sludge. About 6,000,000 gallons of sewage are now treated daily and plans are already being made for the enlargement of the plant.

The second meeting of the Club, Dec. 15th, was largely attended. Dr. Kinnicutt read a very instructive paper on the Webster Electrolysis Process of Sewage Disposal, and illustrated its operation by the treatment of a sample of Worcester sewage. The sewage was placed in a jar, into which were introduced a series of iron plates, which were placed side by side and separated from each other by only small spaces. These plates were insulated from each other where they were bound together, and alternate plates were positive and negative. When the current was passed through, electrolytic decomposition of the water took place, accompanied by other chemical reactions, which precipitated the organic matter. In a remarkably short time, a very clear effluent was obtained. This method
gives a very high oxidizing power. Extensive experiments, which are said to be very successful, are being carried on at Salford, Eng. In the Webster process a very large power and an expensive plant are required; and large quantities of iron are consumed in the formation of Iron Hydrate, which acts as a precipitant.

The following are topics assigned for the next few weeks:


Membership in the Club is at present limited to students and instructors in the departments of Civil Engineering, Chemistry and Social and Political Science. All members of the Institute are cordially invited to the meetings. The Club is devoted to the study of the sanitary problems of the day and the meetings are occupied by the reading and general discussion of papers, which are assigned by a committee in charge of the work.

Occasionally there will be addresses by engineers and chemists from outside of the Institute. The Club takes this opportunity to extend its invitation to all students, and especially to members of the Junior Class.

---

**A TECH SENATE.**

**The Need of One Discussed.**

Whoever has been thoroughly faithful to his duties as a member of the student body, has attended whenever possible the meetings of the various school associations, and watched the general flow of student life and thought, cannot but have noticed that, among all our organizations, including everything from the entire Institute to single divisions, and formed with objects ranging all the way from sewers to sociability, there is still lacking one to unite the whole and stand for the whole: an organization that shall be in the interests of the general student, and not of the athletic, the sportive or the literary alone. We need a medium of intercommunication between the several classes; something to hold them together as a unit and express the expression of "The Students."

The nearest approach to this that has yet been reached, was the mass-meetings held in Chapel last spring, at the time of the adoption of the Institute Pin. But, as a general thing, such meetings are not to be thought of for the economical transaction of business. What is needed is a small body composed of three or four representatives from each class, and which shall be authorized to act in behalf of the school. We do not mean, by this, a college senate, of such as Amherst and Bowdoin boast, having authority over school discipline and management. This would probably be neither possible nor desirable. We mean an organization, or senate, or body, that shall take up students' affairs among themselves, and dispose of them. Such, for instance, as the Institute Pin, just mentioned, or the question of a college hat, now under consideration.

The latter furnishes an excellent example of our point. Certain '94 men felt that such a cap was needed. Instead of making the suggestion to a member of the body which we claim is needed, a meeting of '94 is held, the matter voted upon, a committee appointed, and a communication to '93 prepared. Then '93 holds a meeting and listens to what '94 has to say,—a few spits, and another committee is appointed. There the matter rests, at the time of writing. These two committees must hold a series of deliberations, and, when a decision is made, the whole thing must again be gone through with, in the separate class meetings. Can anything more cumbersome be imagined?

If the senate did nothing but propose, without having authority to act, still would it be of great use, for, when its propositions came before the several classes, all the preliminary work would have been done, and a vote of yes or no only would be required.

If such an organization had been in existence last spring, it would have afforded an answer to the oft-repeated question, "Why don't we get special rates to Springfield?" If it were in existence now, it might, among other things, draw up a model constitution for the different classes. '92, '93 and '94 elect officers and do business, but without by-laws. It is hardly worth while to prepare a set for each separate class; but, were there a model code, each entering class could at once adopt it, with a few alterations. It might arrange
for magazines in the reading-room, or for a course of lectures, such as was suggested in the last W P I; and when a petition is to be presented to the Faculty, there would be some one to start it and see that it was properly circulated. But to-day, all these things, with perhaps the exception of the last, must be done by a complicated series of class meetings and committee sittings. The W P I, the only board common to the whole Institute, has no authority and can only suggest, and that, too, but once a month.

All these ideas doubtless at first sight seem extremely foolish. He who could abruptly submit an entirely novel proposition to a class meeting and have it received with murmurs of approval, instead of grunts of sarcasm, would indeed be a diplomat. And the same is true in this case. It is expected. Nevertheless, we still venture to hope that this article may be the means of the organization of an Institute Senate, and that, too, at a not very distant date.

NEW METHODS OF INCANDESCENT LIGHTING.

A lecture of unusual interest, on the discovery of new methods of illumination, with alternating currents of very high frequency, was recently delivered before the American Institute of Electrical Engineers by Nikola Tesla, revealing a new departure in that branch of modern research.

Mr. Tesla reasoned that the ordinary induction coil, usually operated with a current of about 200 alternations a second, would give more powerful results, if the frequency of the current and its potential were increased. For this purpose, by increasing the number of poles and the speed, he obtained a machine, which gave as high as 35,000 reversals per second.

This current, passed through the primary circuit of the coil, induced in the secondary circuit a current which possessed different qualities, according to its frequency; the spark changing from the ordinary thread-like form, until with the higher vibrations, a dissipating discharge took place, in the form of a hot flame, several inches in length at each knob, a suggestion of future methods of heating by the rapid attraction and repulsion of air molecules, no material being consumed.

Mr. Tesla found that an exhausted globe, containing a button of refractory substance, attached merely to one terminal of the secondary, by a single wire, glowed brightly, while with both wires from the coil conducted to buttons within one bulb, sufficient heat was produced to volatize ordinary carbon.

This form, he tells us, is far more efficient than the ordinary incandescent lamp.

These experiments led him to place two metallic screens opposite one another, each being a terminal of the secondary coil. He found that a highly exhausted tube, without wires, placed anywhere within the electric field between the screens, easily furnished sufficient light for reading. The modern application of this principle would be to have metallic paper on opposite sides of a room, connected as above, when the tubes would give light in any position in the room, currents of such high frequency being harmless.

The alternating obtained not having sufficient rapidity for a large field of force, Mr. Tesla determined to increase them still higher. The terminals of a secondary were conducted to a Leyden jar, and a continual spark discharge was kept up by separating a short distance the knobs leading from the jar. It is known that the electric spark vibrates many million times a second, thus giving him this great frequency in the practically closed circuit of the secondary.

The reduced potential was increased by operating another induction coil with this current. Mr. Tesla has not yet related his experiments with the latter method. Aside from lighting, these currents are of great value as producers of ozone. The possibilities of the future in this department look bright. His next report will be read with interest by many.

PERSONALS.

Prof. George I. Alden was recently elected vice-president of the American Society of Mechanical Engineers.
'88; P. J. McFadden is located with the Edison General Electric Co., 175 Adams Street, Chicago, Ill.

'89; Arthur J. Bean has accepted a position as an instructor in LaGrange, Ill.

A. W. Gilbert is engaged in the construction of the M. C. S. G. & A. Street Railway and is located at Shenandoah, Pa. The road is being built by the Thomson-Houston Electric Co. and will be the longest electric railroad in the United States. The continuous length of the line will be 18 miles.

'90; George W. Perry was married to Miss Jennie G. Fisher at Putnam, Ct., Sept. 3. Mr. Perry is employed by the Washburn & Moen Co., at Waukegan, Ill.

'93; Mr. J. P. Coghlin has devoted some of his spare time recently to constructing a small dynamo that has shown excellent efficiency. The fields are made of Norway iron, the bearings have an automatic oiling arrangement and the armature is a Gramme ring. It is a 2,500-watt machine. When used as a dynamo at 110 volts it will light fifty sixteen-candle-power lamps, when used as a motor at 110 volts it will give two and three-fourths horse power. Its commercial efficiency of 80 per cent. proves Mr Coghlin to be a most skillful amateur.

'94; Mr. Raphael Hernandez, of the class of '93, Cornell, is expecting to enter the W. P. I. in January as a member of '94. Mr. H. played guard on the 'Varsity Eleven, and will doubtless be a valuable addition to our athletic forces.

---

**TECHNICALITIES.**

Is Mr. Nye's motion seconded?

McAllister and the Four Hundred.

Pol Econ. Recitation: "What is meant by form value and give an illustration?"

"Form value—well, form value is chiefly found in Staturay."

Who was George Washington? The cause of the Stamp Act of course.

The "Tech Elect", might adopt as its motto "Mackay while the sun shines."

We trust the boys will not "whoop her up" at certain passages in the hymn book.

Judging from Martin Luther's picture what a centre rusher he would have made.

Some of the best pictures at the Camera Club had Vaills over them.

"Strong, will you give a solution?"

Query. Was it a strong solution?

"Smith, did you stop the clock by looking at it?"

Haw, Haw, He, He.

At the Labs, it is affirmed that C. E. equals Watts. How about Watt Goodrich as a substitute for William Nigh?

"The odor of H₃P is between that of a swamp and something else." Do you think you'll always recognize it, boys?

It looks as though the Historical Club was on the road leading to success. Already a public meeting is being talked of.

Smith, '92, is in the soup again. He was caught by "Lije" in the act of eloping with an Egyptian Princess recently.

Oh, the wonders of the deutsche sprache! "Many were thrown down into the boiling ice-stream."

Professor: "Case of that noun?" '93:

"Singular." We've heard of singular cases before, but think this beats the record.

Ph-l-ps, '93, would be a good man for guard, but they don't allow Holden in the rush line.

The way the printer reads us: "All got a gain of 5 yards at the centre and Southgate swore." We wrote it "2 more."

In German we are told that the word for moon is masculine because, like all men, he is out so much nights.

We hear that all the great foot-ball players of the country will flock to the Institute next year. This is a place of rumors.

Visitor-to-city going through Summer Street: "I wonder if that's what I mistook for the Tech?" '93: "I think very likely, it's an insane asylum."

Our Henry George advocates evidently believe that land should be well planted. It should be ceded to the government and seeded for the people. Well, perhaps so.

The Senior Civils expect to have quite a time in the laboratories next term, Prof. White having made arrangements for their reception there.

Junior "showing off" to his bestest: "Was ist los mit Ihnen?" Bestest, who isn't stuck on Dutch: "What is the matter with you?"

Junior: "That's exactly the thought."
The Middlers are kept on the jump to such an extent that mould is appearing on many upper lips as the result of constant perspiration.

Prof. Cutler will be in the library from 9 to 10 A. M. Mondays, Tuesdays and Saturdays for the benefit of the members of the Historical Club and all others in search of information.

The “E. P. S” form of the storage battery has, strange as it may seem, no connection with the W. P. I., but is manufactured by the Electrical Power Storage Company.

Middle “C” is reported to be making marked improvements under the instructions of the Second Assistant in Mechanical Drawing, S-ncl-r. It is also said that his services are rendered free gratis.

We are told that by winding a wire around a hen’s egg and maintaining a suitable current we can hatch the young rooster in about a week. No more old-fashioned methods then—it takes a hen three weeks to do it.

’93 in Descript: “I’ve just commenced this one, but I’ve got almost through.” This is in the line of a translation made by our Professor in German. “Luther was required to give a round, flat, square answer on the next day.”

In spite of the fact that the sanitary arrangements of Boynton Hall seem to be first class, the dislike of the study known as “English” seems to be an epidemic disease. (Respectfully referred to the S. S. E. C.)

Some of the Normal School girls have a ouija board which they use in foretelling exams. Good scheme, get one, boys. They cost only seventy-five cents, and think of the advantage.

“C-g-l-n, You endanger your character and reputation as well as your mental standing, if you indulge in such thieving as using words without knowing their force.” This is more impressive when delivered at the rate of four words per minute.

“Racer Thayer further deposed that he was present at a cock fight in the basement of the new city hall out Leicester way. . . Witness further said the following were present at the fight, Prof. Fuller of the W. P. I.,” etc., etc.—Worcester Spy.

With the rush of clubs comes a new aggregation of bulletin boards. It makes us look forward to the time when our corridor shall be lined with these tokens of society life and enthusiasm. They do remind a man a little of grave-stones, in form only, but we hope they will have no occasion to bear epitaphs of deceased organizations.

No wonder our “Assistant Professor” admires the author of the volume which is now amusing ’93. He (the author) is fond of adverbs. He gets nearly forty-eight into one sentence. This is about the way a literal translation runs: “Henceforth, nevertheless, he now called himself only just even the Emperor of Austria.”

The time for theses has come. The Civil learns from a circular that thesis drawings are marked on the care taken, the excellence of the work, etc., and at the end of the year finds that the man who has spent about thirty hours upon the plan and elevation of something presumably practical, necessarily mechanical, takes the prize, otherwise A.

The paper published in the Worcester Academy takes umbrage at the attitude of the W P I concerning the game between the two schools. In support of the action of Academy’s captain in withdrawing his men just as the W. P. I. men were beginning to score, the W. A. directs us to the perusal of an eight-column trance written in a non-partisan (?) way by one of its own editors. Nonsense, neighbor, don’t be puerile.

It does seem as though the embryo mineralogists of ’93 might be furnished with test tube cleaners. Those with sponges on the end are very handy and there is little danger of breaking the tube. Most of the men would be willing to pay, if necessary, to secure them. Our test tubes now have striations of various colors from “hair brown” to “grayish green red.” Can’t the presiding genius of the laboratory grant us this small favor?

In explanation of the article last month about certain privileges granted by the trustees of Clark University, it may be said that while, of course, our students are not fitted to pursue any regular course at the University, yet in some cases classes, or divisions, may attend lectures there. And as there are some courses here which are
not pursued at the University, out of courtesy the trustees of the W. P. I. gave the students there the privilege of attending them.

An interesting study has been made at Amherst of the effects of smoking upon the members of the graduating class. In this class 71 per cent. have increased in their physical measurements and tests during the four years, while 29 per cent. have remained stationary or fallen off. Separating the smokers from the non-smokers, it appears that those who do not use tobacco have gained 24 per cent. in weight more than the smokers, 37 per cent. more in height and 42 per cent. more in chest girth, while in lung capacity there is a difference of 8.36 cubic inches in favor of the non-smokers.—The Nation.

One morning, not long since, tiny flames were seen curling around the scored blades of last year’s grass, spreading in an ever widening circle till at last we realized that our campus, our beloved campus, was all afire. “What should be done?” “Call in an alarm!” “Call the police!” These were the exclamations of the crowd of Seniors waiting in breathless suspense. At last delivery was at hand. A Smith, a broom. Here’s to the rescue, and a sturdy representative of our family, broom in hand, swept the flamelets into smoke and the vacant air. This is our only bonfire this year to date. What would we do without a Smith?

Since the last WPI, the changes in the wood-room of the Shop have been nearly completed. All the new shafting is up and running. By inquiry at the office, we learned the principal elevator orders of the month to be as follows: A freight elevator for the Washburn and Moen Mfg Co. at Wankegan, Ill., to be used in hoisting yard engines, and another for the Builders’ Iron Foundry. Also a small freight elevator for T. M. Rogers on Pleasant Street. The Shop will put in a fine 60-ft. run, five-story passenger elevator and steam pumping plant for the new Odd Fellows’ Building in Lowell. A new grind-stone has been purchased and set up!!!

We recommend to all students interested in electricity or economics an article in the August number of the Engineering Magazine, a copy of which Prof. Kimball will doubtless gladly show any one so desiring, on the Advantages of the Electric Railway, written by Harry B. Prindle, a graduate of the W. P. I. in the class of ’85, who has since been connected with the Thomson-Houston Co. in Boston. Mr. Prindle is one who has the ability and experience to speak on his subject and his paper based on actual running statistics is a powerful argument for the Electric Railway. In addition we may say that each issue of this magazine is valuable and may be seen at the Free Public Library.

---

**COLLEGE NOTES.**

Freshman year:—“Comedy of Errors.”
Sophomore year:—“Much Ado about Nothing.”
Junior year:—“As You Like It.”
Senior year:—“All’s Well that Ends Well.”

Ex.

At the Yale-Harvard game three speculators were arrested with a number of counterfeit tickets in their possession and several such tickets were taken in at the gate.

Brown University has opened a woman’s department. Students in this department receive no classification or diploma.

The “Amherst Student” in its report of the opinion of the college in regard to compulsory church attendance, gives 76 per cent. as the representative of those opposed to the present system. The most earnest advocates of voluntary attendance are the active Christian workers of the college.

The Sheffield Scientific School has recently received from London a machine which performs the most intricate mathematical calculations. On a long problem the saving of time is very great and the result is absolutely sure.

Dr. E. B. Andrews President of Brown University recently said in a lecture, “No teacher but a coward will ever use sarcasm toward a student, for thus he deals a blow on one who is unable to strike back.”

A. A. Stagg has resigned his position as instructor of athletics in the Chicago University to take charge of the new department of physical culture at Yale.

Cornell received gifts to the amount of over $5,000,000 last year.
The Ware-Pratt Company

Invite attention to an extensive display of Fine Clothing for Men, Boys and Children. The latest Fashions, Exclusive Styles from our own workshops, Honest Goods and the Lowest Prices, Grade and Quality considered.

Our Custom Department is teeming with the Newest Styles, Colorings and Materials, which go to make up the finest lines we have ever shown.

THE WARE-PRATT CO.,
MANUFACTURERS AND RETAILERS,
408 & 412 Main Street., Worcester.

F. H. Kendrick, D. D. S.,
518 Main St., Knowles' Block,
WORCESTER, MASS.

Gold Fillings a Specialty.
Gas and Vapor Administered.

Teeth made on Best Rubber for $7, $8 and $10.

Teeth Extracted Without Pain for 25 Cts.

Office Hours: 9 to 12 and 1.30 to 6.

10 per cent Discount to Tech Students.

The Richmond Straight Cut No. 1

CIGARETTES

are made from the brightest, most delicately flavored, and highest cost GOLD LEAF grown in Virginia. This is the OLD AND ORIGINAL BRAND OF STRAIGHT CUT Cigarettes, and was brought out by us in the year 1875. Beware of Imitations, and observe that the FIRM NAME, as below, is on every package.

ALLEN & GINTER, Manufs.,
RICHMOND, VIRGINIA.

J. C. WHITE,
DEALER IN
MATHEMATICAL INSTRUMENTS
And Artist Materials.
Also, Full Line of
Paints, Oils, Glass and Varnishes.
12 Pearl Street, Opp. Post Office.

P. L. RIDER’S Rubber Store,
336 MAIN ST., WORCESTER.
Also the largest and best line of MACKINTOSHES in the city.

LOUIS W. SOUTHGATE,
Late Examiner U. S. Patent Office, formerly head Draftsman Pond Machine Tool Co.,
COUNSELLOR-AT-LAW
AND SOLICITOR
OF
PATENTS,
W. P. I. Class, ’85.
Room 18, Burnside Building,
339 Main St., Worcester, Mass.
THE WPI

1885.

CHAS. H. PAGE & CO.,
CONSTRUCTING ELECTRICIANS.
DEALERS IN ELECTRIC SUPPLIES.
28 PEARL ST., WORCESTER, MASS. (2 Doors above Y. M. C. A. Building.) Telephone 45-5.

EDWARD B. CLAPP,
Fashionable Hat, Fine Furnishing
and Athletic House.
365 MAIN STREET, WORCESTER.

C. C. FULLER,
MANUFACTURER OF
REGALIAS, COSTUMES, BANNERS and SOCIETY GOODS.
ATHLETIC BADGES A SPECIALTY.
OFFICE AND MANUFACTORY, 377 Main Street, WORCESTER, Mass.

THE
STRONG & CARROLL
$6.00
CordovaV Shoe

Is the best ever made for the money. Try a pair.
Good for any kind of weather.

Men's Shoes 436 Main St., Boys' Shoes
MEN'S & BOY'S SHOE HOUSE
FROM $3.00 up. W. N. BROOKS, Mgr. $2.00 up.

A. F. BRAGG,
HOT AND COLD DRINKS.
Lunch, Confectionery,
AND CIGARS.

L. M. ALEXANDER,
Formerly with HILL & TOLMAN,
DEALER IN
Bicycles & Safeties

Repairs of all kinds a specialty.
Machines Remodeled with Pneumatic or Cushion Tires.
Brazing, Enameling and Nickeling
Done in the best manner at short notice.
Agency for the Hickory.

Hall's Block, 195 Front St., Worcester, Mass.

REBBOLI,
Confectioner and Caterer,
6 AND 8 PLEASANT STREET, WORCESTER, MASS.
C. B. EATON & CO.,
*STATIONERS, PRINTERS*
And Blank Book Manufacturers. Fine Office Work a Specialty.
Cards, Fancy Goods and Novelties.
No. 505 MAIN STREET, WORCESTER, MASS. Telephone 278-4.

BAY STATE HOUSE.
Under the new management this Hotel has been thoroughly reorganized and will be conducted on a
First-Class Basis
In every particular. We solicit a trial of our hospitality.

DOUGLASS & BROWN,
Proprietors.

CHAS. D. THAYER,
FLORIST.
Warersoms, 336 Main Street.

IN ORDERING CALL ATTENTION TO YOUR BEING A "TECH" AND GET DISCOUNT.

JOHN A. SNOW,
Is Prepared to do all kinds of
BOOT AND SHOE REPAIRING,
326 MAIN STREET,
Opposite Mechanics Hall, up one flight of Stairs,
Room 2.

Ladies' and Gents' Sewed Work a Specialty.
Back and Front Stays and Toe Tips.

"DISCOUNT TO TECHS!"

Ladies and Gentlemen Looking for Fun and a Good Healthful Exercise,
CAN FIND IT AT

J. P. WHITE'S
TEN PIN, BILLIARD & POOL ROOM,
37 Pearl Street, Worcester, Mass. Hours for Ladies: 9 A. M. to 4 P. M.

A. E. DAVIS,
PHOTOGRAPHER.
The LATEST and MOST NOVEL THINGS in Photographic Work.
Special Inducements to Graduating Classes.
CORNER OF MAIN AND PARK STREETS.

PATENT ADJUSTABLE STAND.

WASHBURN MACHINE SHOP,
WORCESTER, MASS. M. P. HIGGS, Superintendent.
FINE CLOTHIERS AND CUSTOM TAILORS,
409 MAIN STREET.
A special feature of our stock at this time is
a very nobby line of
OVERCOATS & SUITS
FOR YOUNG MEN. AT PRICES RANGING FROM
$8.00 to $25.00.

WORCESTER
POLYTECHNIC INSTITUTE,
WORCESTER, MASS.

Offers courses of study in CHEMISTRY, CIVIL, MECHANICAL and ELECTRICAL ENGINEERING and PHYSICAL and POLITICAL SCIENCE. And gives opportunities under certain conditions for pursuing Special Studies.

ADMISSION.
Candidates must be sixteen years of age and must be well prepared in Arithmetic, Geography, Grammar, U. S. History, French, Plane Geometry, and Algebra as far as quadratic equations.

EXPENSES.
Tuition, per year, $150. Scholarships for a limited number of students who are residents of Massachusetts.
Expenses for board, books and incidentals, vary from $200 to $350 per year. Good rooms and board in private families.
For Catalogue containing other information, including list of graduates and their occupations, manufactures of Washburn Shops, etc., apply to
HOMER T. FULLER, Ph.D., President of Faculty.