

The

# OPPI.



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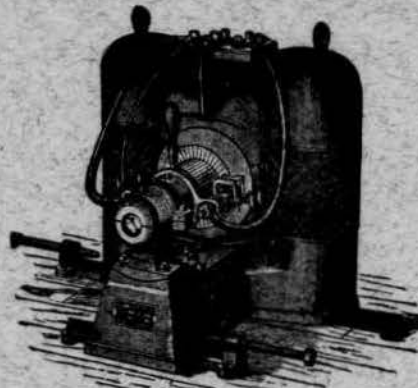
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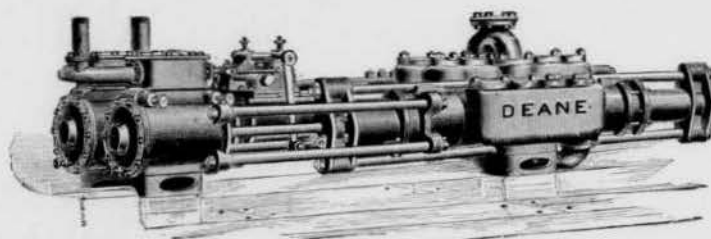
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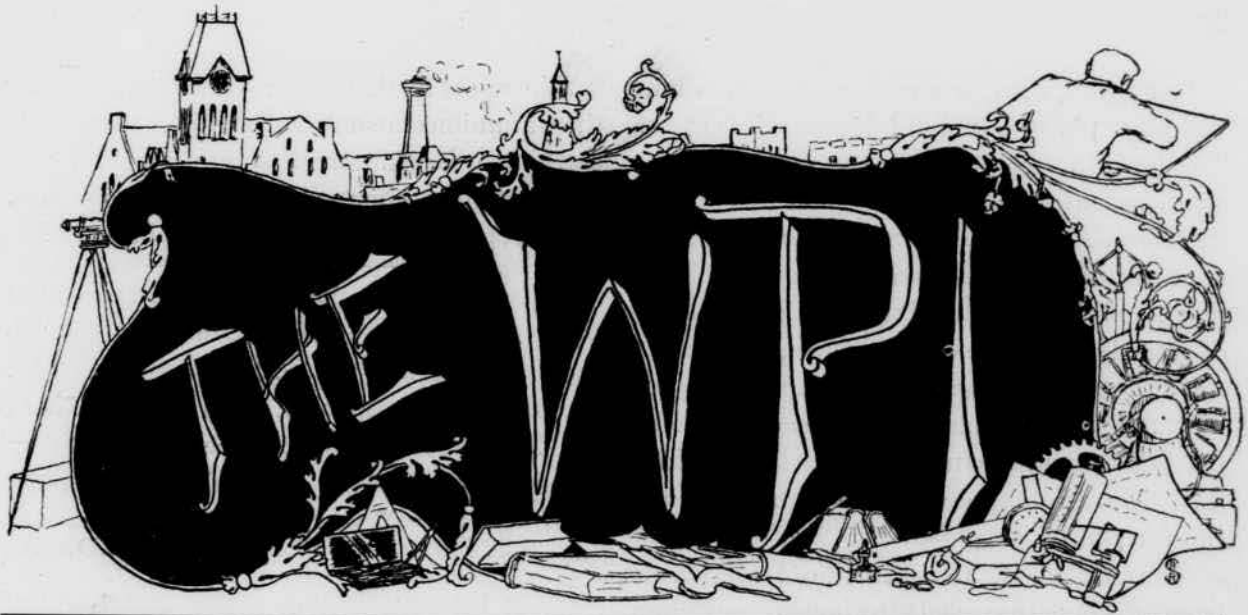
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WORCESTER, MAY 16, 1896.

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The W P I is published by the students of the Worcester Polytechnic Institute on alternate Saturdays during the Institute year. Items of interest are requested from students and alumni of the Institute. All matter must be accompanied by the name of the writer. Subscribers who do not receive their paper regularly, or who make any change of address, will confer a favor by immediately notifying the Business Manager.

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The May issue of the *Engineering Magazine* contains an article, "Quackery in Engineering Education" by Edgar Kidwell, which we cannot let pass without a brief notice. It might well be sent out side by side with the Institute Catalogue as an advertisement for our institution. The article is too long to quote here, but doubtless many of our readers have already seen it. We agree with most of Mr. Kidwell's remarks, but think he should have acknowledged that there are some technical institutions free from the many faults he points out. As an example of one of these, we should like to have Mr. Kidwell carefully examine the Institute Catalogue, seek information as to our Board of Trustees, and then, above all, spend a day in carefully going through the Worcester Polytechnic Institute.

The annual Field-day is a thing of the past. Did you "hear sumthin drap"? It is useless to deny that things were rather quiet, and the races somewhat slow. We believe it to be a great misfortune that the winners of most of the events on Tech field-days have a mortgage on the place, so to speak, and do not have to work to win. They simply foreclose. Still, to one who looks behind the scenes a little, there was much to arouse the interest of the Tech men. The off-hand way in which Vaughn, '96, won the 100 yds. dash in 10 $\frac{1}{2}$  s., the 220 in 24 s., and then, after competition in several events, finished his work in the team race by running a quarter in 54 s., as if he were simply trying to get a little exercise, stamps him as an athlete of whom any class or any college might well be proud.

Lundgren, also, is another man on whom we may place our fond hopes of scoring. The form in which he takes the high hurdles should secure him a place in that event at the Oval, May 23d. Those who saw Braman run the mile and two-mile events have not the slightest doubt but that he had lots of speed which he did not use, because it was not at all necessary. Besides this, you will not find a man who is ready to deny that Scott can do nearly a foot better than 9 ft. 6 in. in the pole vault when it comes time to do it.

Our advice is, to be at the Oval a week from to-day prepared to encourage your team, and see them win at least a point or two. Remember that there are also several men who did not start last Saturday, who will help gain the points next week. If any one tells you that Tech will not score, say nothing, but look wise.

In athletics, Ninety-six is pre-eminent. Ninety-seven, with only six men competing, made a good run for the place. The showing that Ninety-nine made was in every way a credit to their class. It was probably the best work ever done in track athletics by a Freshman class at the Institute. Of Ninety-eight, as a class, we do not care to speak. It may be a source of consolation to them to know that they could if they would. To our minds, however, it simply augments the disgrace.

Since our last issue, the bill relating to the free scholarships for the W. P. I. has been passed by the State Senate, and reported in the House by the Ways and Means Committee. The report was 7 to 4 in favor of the bill. Those interested in our institution are watching this piece of legislation with interest, and we trust the bill's present good fortune will stick to it to the last.

We wish to thank Mr. Gleason, '87, for the alumni news sent us for this issue. It is certain to be of interest to our readers, and we trust that others of our alumni, as well, will keep us informed of their doings.

We note with pleasure the appointment of Mr. Frank P. Goulding, of this city, to the Board of Trustees of the Institute. Mr. Goulding was appointed by the State Board of Education to fill the place left vacant by the death of the late Hon. W. W. Rice.

#### A NEW CHAIR ESTABLISHED.

Since the organization of the department of physics and electricity, here at the Tech, it has been under the direction of Prof. Kimball, and it has been developed by his efficient and successful management to a high degree of excellence.

During the last few years, electrical engineering has been making rapid progress all over the world, and more and more technical students are studying this branch. Of course Worcester Tech receives a proportional increase of electrical students, and the trustees seeing that the departments of physics and electricity must eventually be divided, took action, and established a new chair of electricity.

Prof. Kimball choosing to remain in charge of the department of physics, to which he has devoted much special attention during his connection with the Institute, it was necessary in creating the new department, to add a professor in charge, and Prof. H. B. Smith, of Purdue University, Lafayette, Ind., was elected to fill this position.

Prof. Smith is a graduate of Cornell University. He has had practical experience in electrical engineering work, having organized, equipped and put in operation the electrical engineering department of the State University of one of the south-western States. He has been head professor in electrical engineering and in charge of the department of physics at Purdue for two or three years. During his connection with this University he has developed the department in such a manner as to attract universal attention throughout the country, and has, besides, made many contributions to scientific journals. He is a young man, and is highly recommended for his enthusiasm in his work and his devotion to his specialty. He will probably arrive here about Commencement time, his work beginning on the 1st of July.



**WASHBURN ENGINEERING SOCIETY.**

The regular meeting of the Washburn Engineering Society was held in the Engineering Laboratory, Monday evening, May 4th, and was not as largely attended as have been the previous meetings.

A paper on Steam Engineering by W. H. Oakes, '86, was read by W. F. Cole in the absence of the author. The paper is given below. The second paper of the evening, which was to have been by George E. Kemp, the subject being Spring Tempering, was not read, as the accompanying drawings had not arrived. Secretary Alden gave a description of the mechanical apparatus which has recently been installed at the Institute, and suggested the meeting adjourn to give the alumni an opportunity to inspect the buildings and apparatus.

**A PAPER ON STEAM ENGINEERING.**

With the rapid advancement that is being made in nearly all departments of science, particularly that of electricity, the branch which made so many others possible is likely to be forgotten or at least momentarily overlooked.

The purpose of this paper is not to analyze and discuss any one distinctive feature of steam engineering, but to point out to you, and if possible, impress upon you in a general way, the magnitude of the field of work and how little that part of the field which comes under the head of Heating and Ventilation is filled by graduates of your Institute.

I do not know to what extent this branch of engineering is taught to you at the present time, but when I was a student here from 1883 to 1886, very little instruction was given in this, except a few lectures on the principles and construction of the steam engine.

We all come here having in mind that the education which we receive will the better enable us to enter the world of business and at once earn sufficient money, not merely to exist, but to live; and I believe, therefore, that anything that will assist us in attaining this end, should, in our student life, be pursued with earnestness.

Since my graduation in 1886, I have made this branch of engineering my study and my business. I was not long in finding out how sadly deficient I was as to knowledge of the subject; and as the years have passed, I can see how much easier my work would have been, had I as a student been taught more of this science.

My work has been confined to the warming and ventilating of all classes of buildings, both with steam and hot water, and the designing and erection of power plants. I have in this time had occasion to hire a number of assistants, and the salary that they have been able to command prompts me to assert that, from a lucrative standpoint, no field offers better inducements.

The scarcity of men really proficient in this line can only be realized by one who has been obliged to find them. At present, a very large percentage of those who claim to know their business is composed of men either wholly theoretical or wholly practical, and of the two, from my experience, the latter is to be preferred; but the men who combine the two, with

a good general education and the ability to superintend the making of working drawings, are most in demand, and are in a position to command and receive a handsome competency.

Now this Institute is the very place to create such men, and with the many improvements and extensions which have been made here of late years, I am satisfied that you cannot be lacking in facilities which will enable you to pursue this study along its different lines. You will see I am an enthusiast on this subject, and I trust it may not be inappropriate at this time for me to suggest that Steam Engineering be made a department co-existent and co-extensive with the department of Mechanical Engineering. I am sure it would prove both interesting and profitable.

I have been told on more than one occasion that it required no brains to heat a building; that all that was necessary was some treatise on the subject, and anyone could install the apparatus. Now, if ever there was an instance where a little knowledge is dangerous, this is one of them; and the failures which have come to my notice where plants have been installed upon principles laid down in these treatises, have been most successful in their completeness.

I do not mean to reflect upon these treatises in their entirety, for there is much information contained in them which is not only valuable but essential to the heating engineer, but if one will work out the formulæ given by so-called authorities and relating to the same general problem, the results which he obtains, if able to solve them at all, will differ so widely as to discourage him; and unless he has some practical experience to guide him, he will be greatly embarrassed.

In the matter of a heating apparatus for any particular building, conditions vary so that each one is a study in itself, and it does not always follow that exactly the same apparatus will do for two buildings built from the same plans, as the location and exposure of one may not be so favorable as the location and exposure of the other.

Take for instance, what we consider the simplest form of apparatus—that required for an ordinary residence. There are several kinds, but that which may be considered the simplest is either a direct steam or water apparatus; then comes an indirect apparatus; and third, a combination of one or both with hot air.

In either case, the first thing to be considered is the necessary amount of radiating surface.

Now, in proportioning the amount of radiating surface to the work to be accomplished (usually the heating of the rooms to seventy degrees Fahrenheit), it is very generally believed that all that is necessary is to divide the cubic contents of the room by sixty for steam and by thirty for water warming, and the quotient will be the proper amount required in each instance. To show you how erroneous this impression is, I have only to cite one case.

Take for example, a room 15'—0" x 10'—0", the contents of which are 1800 cubic feet—for the sake of argument, we will say that it is entirely encased—now, take a room of exactly the same dimensions and say that one, two or three sides, as the case may be, are exposed. I am sure that you will see at once that different amounts of surface would be required, and the same ratio used in all cases would give too much in one instance and too little in another; the fact is, that it is not judgment as to heating space but overcoming exposure that is most called for from the engineer; and just now, competition is so very sharp that, particularly in

large buildings, the contractor has to be able to take advantage of all favorable conditions and discount all seeming unfavorable conditions with exactness, in order that his estimate may be considered with that of his competitors. The man who confines himself either to rules of guess or theory wholly, is usually either so much higher or lower than the others that he is at once put down as incompetent. A variety of work confronts the heating engineer and he is called upon to exercise his every ability, both theoretical and practical.

In very large buildings, where power plants are installed for the purpose of furnishing power for driving the engines for elevators and dynamos, and the heating is done almost entirely by the exhaust steam, the engineer has abundant opportunity to show how much or how little he knows. The first thing to be determined is the size of boiler or boilers to supply economically the entire plant with steam, then the size of chimney, size and kind of the several boiler fixtures and grates, feed-pump, injector, feed-water heater, reducing valve, receiving tank, blow-off tank, grease extractor, exhaust head, back pressure valve, how many and what kind of traps required to take care of the several drips, gate valves, globe valves, check valves, damper regulator, size and kind of pipe and fittings for the several connections, and last but by no means least, the engineer must know the results to be obtained by the use of each and every piece of the apparatus and how to place and connect them properly.

In buildings which are heated by indirect radiation, either by natural or forced draft, it is necessary to determine the amount of air to be delivered and the amount of surface required to warm it in a certain definite period of time and to a specified degree of temperature, the size of fan to easily deliver said amount of air, the size of cold, warm and foul air conduits, size of warm air and ventilating registers, size of engine or motor for furnishing power to drive the fan, also size of coil necessary to remove the volume of foul air and size of the roof ventilator. All of these things have to be determined to a nicety to insure success, and in nearly every instance, it is desirable, if not absolutely necessary, to make drawings of the apparatus complete.

There is an immense amount of data which I would like to see worked up accurately, which I trust this paper may excite sufficient interest among some of the students to undertake. There is the measuring of the efficiency of radiating surface, both cast and wrought iron, under different pressures of steam and different conditions of outside and inside temperature; the percentage of saving by the use of pipe covering in both long and short connections; the determination of the proper size of warm and cold air flues, and the velocity and volume of air delivered both by natural draft and by a fan run at varying speeds, and the efficiency of heating coils, where the cold air is forced through them by the fan.

To be sure it would demand the expenditure of a little money to fit up for this kind of work, but I believe the results would justify the expense, and as thesis work, I am sure it would prove most beneficial.

You will appreciate that there are many systems and many appliances of which I have made no mention, but I trust I have said enough to show you that the field of Steam Engineering is one of importance and distinct in itself, and one which is entitled to your consideration.

WM. H. OAKES,  
Class 1886.

April 27, 1896.

### RAMBLER.

SO it is a settled thing that there is to be a game of ball between the Faculty and the Seniors. It will be a sight for gods and men. The Seniors are to be debarred from using 'Varsity players, while the Faculty, besides having the privilege of choosing the Senior pitcher, is to break down, for the occasion, the barriers severing it from the common herd, and take in all those in authority about the Institute, even down to the janitors for all we know; so that for the nonce, we shall have several new chairs established, including one, perhaps, of Theoretical and Applied House Cleaning. But we hope that in the selection of the Faculty nine, the Old Guard will not allow the younger members to take all the positions from them without a struggle. Personally, we believe that the success of the Faculty depends upon its putting in the field a nine composed of those whose longer experience and higher attainments would make success in anything so simple as a game of baseball mere boys' play to them. What chance, for instance, would the Seniors have against a team whose out-field was composed of mathematicians who could calculate the curve of every fly that came into their territory, and by methods of lightning integration between limits, determine just where it would drop? Or, perchance, being furnished with hydraulic elevators, could mount skyward with incredible rapidity, and clutch the flying sphere ere it attained the zenith of its path? Or against a nine whose pitcher, by a marvelous arrangement of mirrors in his hip-pocket, would cause the puzzled batsman to see a full score of virtual images of the ball and no one of them the real article? How invaluable would be a catcher who would be enabled on occasion to envelop himself, and the region about home-plate in an impenetrable cloud of blue smoke, in which the base runner would be hopelessly befogged and led out of his path should he attempt to score! Speaking seriously, however, Rambler believes that no event that has taken place about Tech these many moons ought to excite such general interest among the friends of the Institute as this. Such an event cannot but have a most beneficial effect on athletics; and we believe that a continuance of such instances of cordial, though dignified, intermingling with the student body on the part of the Faculty, will have effects of inestimable benefit on aspects of our college life that are more important than those of mere physical development.

Rambler culls the following from *Lasell Leaves*:  
"The Polytechnic, published by the Brook-



lyn Polytechnic, is one of our best exchanges. Unlike other Tech papers it contains matter of interest to others outside its own walls." Alas and alack! Then have we labored in vain. The judgment has been passed, and we are sent away to the left hand among the goats. We have failed to please where we fain would have been favorites. But condemn us not, we will yet mend our ways. There shall be fashion bazaars and cooking schools instituted in our midst, our political columns shall breath universal suffrage, and our editorials be the essence of emancipation. We will recognize nothing in athletics but basket-ball and bicycles. Our editor shall manage a column of "Snide Talks with Freshmen"; and our business manager shall sport a pug dog and chain. Purged shall our advertising columns be of all frivolous things, and only the revered countenances of Mme. Rupert, A. Medina, and Lydia Pinkham shall smile therein. We will repent. Huyler's is still quoted at eighty cents, and we are bound to please. So up, then, and prepare the way of the reformation. Again shall the sun of favor shine upon us. What ho, for the new edifice of our popularity. We greet its rise with Hurrah! Vive, Hoch! Whish, all Hail!

\* \* \*

With the instincts of a true lover of athletic sport, Rambler is casting his eye about on the lookout for new records. As a hitherto unexplored field of observation, he has had his attention called to the coming athletes among the fair sex. At Vassar a flect-footed sprinter has recently placed the college record for the 100-yards dash at 12½ seconds.

From the current issue of *The Mount Holyoke* the following is clipped:

"The following records have been made in the running high-jump: Julia Stickney ('97), four feet; Louie Robinson ('99), three feet, ten inches; Elizabeth E. Stowell ('98), three feet, nine inches."

If the other colleges would only publish their records from time to time, an interesting table of records might be compiled. Rambler sincerely hopes the good work will go on, while he stands in awe of the end-of-the-century maid.

A Tech, one day, through a hole in his coat  
 Lost a brand-new ten-dollar bill.  
 North, south, east and west, through the length of  
 the town  
 He searched and he sought with a will.

Then he took down his text-book, and pencil and  
 pad,  
 And he smiled, did this wisest of Techs;  
 "For," he said, "the bill's lost, and since I know  
 (wh)y,  
 It will not take me long to find X. J.

## ATHLETIC.

### Successful Class Games. '96 Wins the Banner.

One more annual field-day of the W. P. I. A. A. has come and gone, and once more the athletes have covered themselves with glory. This year, as last, Old Sol was favorable and the very finest weather favored us. The track was in fine condition, and the audience though small was enthusiastic.

For the first time in some years the Senior class scored the largest number of points, thus securing again the banner won by them last year. The result was almost a foregone conclusion, as far as first place was concerned, but there was much rivalry between '97 and '99 for second, and there had been much quiet talk about Tech, which led many to believe that '99 would bring out some dark horses, and some even were willing to back their opinion that '99 would win the banner. '98 was heavily backed to win fourth place, inasmuch as there are not five classes in Tech.

The Seniors mustered more athletes than the other three classes together, and easily won first place, while after a few of the track events were run it was seen that '99 had no chance of beating out the Juniors for second. '98, with three men competing, fulfilled all expectations by scoring seven points. '97 scored eight more points than the Seniors in the track events, but were heavily handicapped in not having a man in the field events, where the strength of the Seniors lies.

The first event, the 120-yards hurdle, was called at 3 o'clock; in this Lundgren was a sure winner, and broke the tape in 16½ seconds. The race for second partook of the nature of a farce, the men being clearly unused to the high flights. Morse secured the place since he had the outer edge of the track and could run around the hurdles, while the best Harris could do was to duck under them. Edmands, '99, was the only other starter. The only starters in the mile run were Braman and Ellinwood, both '97. Braman won as he pleased in 5 m. 11 s.

The 100-yards dash was run in two trials and a final. In the first trial Warren, '96, and Lundgren, '97, ran a close heat, finishing in the order named. Time, 10½ s. The second trial was won by Vaughan, '96, with Smith, '98, second, in the same time as that of the first heat. In the final, Vaughan won easily in 10½ seconds, and Lundgren barely beat Warren for second place.

The 880-yards run brought out only three starters, Brown, '97, Goodrich, '96, and Davis, '99, who finished in the order named. The race was a decided surprise to the spectators, as it was supposed '96 was sure of first, but Brown

passed Goodrich by a plucky spurt on the stretch and won the race in 2 m. 12 $\frac{3}{5}$  s.

The 220-yards hurdle was run off in two trial heats and a final. In the first heat the honors went to Morse, '97, with Reed, '96, second. The second heat was won by Lundgren, '97, with Booth, '98, easily taking the second place. The final heat was easy for Morse, Lundgren taking second in a hot finish, with Booth third.

The 440-yards run was a disappointment, as only three men out of the eleven entries toed the mark. Vaughn and Goodrich merely trotted around as if for fun while Davis tagged hopelessly in the rear. The contest (?) wearied the spectators for 61 seconds.

The two-mile bicycle race was easily the most interesting event of the afternoon. The Freshmen were exceedingly confident of winning first in this race, as they had entered two riders of some local renown in Johnson and Knowlton, but they reckoned entirely without their host, as the speedy champion of last year, Perkins, '98, lay back and let the more inexperienced riders do the pacing, and then jumped in and won out handily in the stretch. In justice, however, to Johnson, who won second place, it should be said that he would doubtless have given Perkins a better contest had not his wheel slipped slightly on the last turn, thus retarding him at a time when he could least afford it. The time was 6 m. 9 sec., being nine seconds better than that of last year's race.

The mile walk, as usual, created considerable amusement as the styles of walking were as numerous as the contestants. There were four entries, Barbour, '96, Smith, '99, Southwick, '96, and Ross, '96, the latter dropping out after one lap. There was a very pretty race between Barbour and Smith, the former sustaining his claim to the championship, while Southwick jogged along a full lap in the rear, and finished in order to score a point for his class. The winner's time was 8 m. 13 sec.

The 220-yards dash caused lots of excitement, as some of Tech's prettiest runners entered. Vaughn, '96, Lundgren, '97, and Warren, '96, finished in this order with less than a yard between them. Curtis, '99, Davis, '99, and Walsh, '97, also made it interesting to each other, and gave the leaders no cinch. Time, 24 sec.

The two-mile run, like the mile, was simply a gift for Braman. He started off at a hot pace, and left his nearest competitor, Ellinwood, yards in the rear. Braman won as he liked in 11 m. 19 $\frac{2}{5}$  sec. Brown, '96, was third.

The class relay team race was entered by only three classes as '98 had not ambition enough to send out a team. The pole was won by '96, and Warren, '96, Lundgren, '97, and Vinal, '99,

ran the first relay. Vinal ran an excellent quarter and finished twenty yards ahead of Warren, with Lundgren close behind. Goodrich, '96, Morse, '97, and Edmands, '99, comprised the second relay. Both the upper classmen passed Edmands at the 220 pole, and they finished in the above order. Goodrich's relay was taken up by Reed, Walsh succeeded Morse and Davis relieved Edmands. Reed was passed by Walsh in the home stretch, with Davis some yards in the rear. Vaughn, '96, succeeded Reed and got after Brown, '97, who had gained some ten yards owing to his start, with a stride that naught could withstand and had the race well won before half the quarter was run. Scott, '99, ran a very plucky and quite a speedy lap, but was unable to catch Brown, who landed '97 in second place. Time 3m. 44 $\frac{1}{5}$ s.

The field events were run off while the track events were in progress; and while all the events were fairly well contested, not so much rivalry was shown in the field as on the track, and the spectators were less interested. The results will be found in the summary.

The officials of the day were as follows: Referee, Prof. Levi L. Conant; clerk of course, Prof. Zelotes W. Coombs; aids, J. B. Mayo, '96, G. W. Throop, '97, D. B. Dimick, '98, and C. F. Kenney, '99; track judges, Hon. F. A. Harrington, W. A. Lytle, R. James Tatman; field judges, A. M. Powell, Joseph Beals, 85, W. J. Delaney; starter, H. L. Dadmun; announcer, H. W. Jencks; judge of walking, W. J. Delaney; timers, M. H. Teehn, J. S. Aborn and L. W. Rawson, '93.

#### The Summary:

120-yards hurdle race—Won by O. W. Lundgren, '97; 2d, Morse, '97; 3d, Harris, '96. Time 16 $\frac{4}{5}$ s.

Mile run—Won by Braman, '97; 2d, Ellinwood, '97. Time 5 m. 11s.

100-yards dash, trial heats—1st heat, won by Warren, '96; 2d, Lundgren, '97. Time 10 $\frac{3}{5}$ s.

2d trial heat won by Vaughn, '96; 2d, L. Smith, '98. Time 10 $\frac{3}{5}$ s.

100-yards dash, final heat—Won by Vaughn, '96; 2d, Lundgren, '97; 3d, Warren, '96. Time 10 $\frac{2}{5}$ s.

880-yards run—Won by Brown, '97; 2d, Goodrich, '96; 3d, Davis, '99. Time 2m. 12 $\frac{3}{5}$ s.

220-yards hurdle race—1st trial heat won by Morse, '97; 2d, Reed, '96. Time 29 $\frac{4}{5}$ s.

2d trial heat won by Lundgren, '97; 2d, Booth, '98. Time 31s.

220-yards hurdle race, final heat—Won by Morse, '97; 2d, Lundgren, '97; 3d, Booth, '98. Time 29 $\frac{2}{5}$ s.

440-yards run—Won by Vaughn, '96; 2d, Goodrich, '96; 3d, Davis, '99. Time 61s.

2-mile bicycle race—Won by Perkins, '98; 2d, Johnson, '99; 3d, Knowlton, '99. Time 6m. 9s.

Mile walk—Won by Barbour, '96; 2d, Smith, '99; 3d, Southwick, '96. Time 8m. 13s.

220-yards dash—Won by Vaughn, '96; 2d, Lundgren, '97; 3d, Warren, '96. Time 54s.

2-mile run—Won by Braman, '97; 2d, Ellinwood, '97; 3d, Brown, '96. Time 11m. 19½s.

Relay team race, 1 mile—Won by '96, Warren, Goodrich, Reed, Vaughn; 2d, '97, Lundgren, Morse, Walsh, Brown; 3d, '99, Vinal, Edmands, Davis, Scott. Time 3m. 44½s.

**Field Events.**

Running high jump—Won by Zaeder, '96, 5ft. 2¼in.; 2d, Scott, '99, 5ft. 1in.; 3d, Bascom, '96, 5ft. ¼in.

Putting 16-pound shot—Won by Zaeder, '96, distance 32ft. 1in.; 2d, Vail, '99, distance 28ft. 2in.; 3d, Curtis, '99, 28ft. 1in.

Pole vault—Won by Scott, '99, 9ft. 6in.; 2d, Traill, '99, 8ft. 4½in.; 3d, Zaeder, '96, 8ft. 4½in.

Throwing 16-pound hammer—Won by Zaeder, '96, 66ft. 5 in.; 2d, Vail, '99, 65ft. 3in.; 3d, Willis, '99, 61ft. 5in.

Running broad jump—Won by Harris, '96, 19 ft. 3½in.; 2d, Zaeder, '96, 19ft. 1in.; 3d, Booth, '98, 17ft. 4½in.

**The Class Score is as follows:**

	'96	'97	'98	'99
120-yards hurdle race,	1	8		
1-mile run,		8		
100-yards dash,	6	3		
880-yards run,	3	5		1
220-yards hurdle race,		8	1	
440-yards run,	8			1
2-mile bicycle race,			5	4
1-mile walk,	6			3
220-yards dash,	6	3		
2-mile run,	1	8		
Team race,	10	6		
Running high jump,	6			3
Putting 16-lb. shot,	5			4
Pole Vault,	1			8
Throwing 16-lb. hammer,	5			4
Running broad jump,	8		1	
Totals,	66	49	7	30

**Harvard College Team Wins.**

On Saturday, May 2, the Tech team went to Cambridge and put up the worst game of the season against the Harvard College or second team. The game was played on Holmes Field, and the liveliness of the dirt diamond may account for some of Tech's errors, but it cannot be responsible for the poor playing of the out-field at critical times.

Worcester's base running was also decidedly off, men being put out between the bases with-

out the slightest excuse. Bunker seemed to have an off day, and was the chief offender, both in the field and on the bases. The best game for Worcester was played by Knowles, who pulled down several line hits in fine style and also made some difficult assists without an error. Smith led at the bat with two hot two-base hits over third, and a single; he also played his position well, as the score shows.

The Harvard team was composed chiefly of 'Varsity substitutes, Beale, of football fame, being captain. Gregory, Harvard's pitcher, seemed to be an easy mark for Tech's batters, but at critical times he was much steadier than Sanders, although about the same number of hits were made. Sanders seemed to have an off day, and he was hit freely all through the game, making only one strikeout.

Harvard scored one run in the first inning on two bases on balls and a single to centre. With the bases full, Tech rallied and retired the side by good fielding. Harvard scored three runs in the third on Hayes' homer in left field and a low throw through Zaeder which allowed two runs to come in. In the fourth Harvard got two more runs after the side should have been retired. In the seventh inning all Tech's hopes were blasted when, after errors by Sanders and Harris, Harvard batted out six runs, giving a total of twelve, which was the extent of their scoring. Up to the seventh, the game was fairly even; Tech made one run in the second on Smith's two-bagger followed by Sanders' single, and four in the third, three of which were earned. Tech scored again in the fifth on an error by Bouve and hits by Smith, Sanders and Bunker. In this inning Bunker was caught off first for the second time during the game. Tech's last run was made in the seventh on Smith's two-bagger and Gregory's wild throw of Sander's hit.

Following is the score:

	HARVARD, 2D.					
	a.b.	r.	b.	t.b.	p.o.	a. e.
Beale, r. f.	5	2	1	1	0	0 0
Chandler, l. f.	4	1	1	1	2	1 0
Martin, c. f.	5	2	2	2	1	0 0
Hayes, 3b.	6	3	2	5	1	6 1
Haskell, 2b.	4	1	1	1	0	0 1
Bouve, 1b.	4	1	2	3	15	0 1
Holt, s. s.	4	1	1	1	0	5 1
Morton, c.	5	1	3	3	8	1 0
Gregory, p.	5	0	1	1	0	3 0
Totals,	42	12	14	18	27	16 4

	WORCESTER POLYTECHNIC.					
	a.b.	r.	b.	t.b.	p.o.	a. e.
Zaeder, 3b.	5	1	2	3	0	3 2
Knowles, 2b.	5	1	1	1	6	4 0
Harris, c. f.	5	1	1	1	3	0 1
Cullen, s. s.	5	2	1	1	0	4 2
Smith, 1b.	5	2	3	5	12	0 0
Sanders, p.	5	0	2	2	1	2 1



Bunker, l. f.	3	0	2	2	1	0	0
Chamberlain, r. f.	3	0	0	0	1	0	0
Fisher, c.	3	0	0	0	3	0	0
Totals,	39	7	12	15	27	13	6
Innings,	1	2	3	4	5	6	7 8 9
Harvard, 2d,	1	0	3	2	0	0	6 0 0—12
Polytechnic,	0	1	4	0	1	0	1 0 0—7

Earned runs—Harvard, 4; Polytechnic, 4. Two-base hits—Bouve, Zaeder, Smith, 2. Three-base hit—Hayes. Home run—Hayes. Double plays—Zaeder to Knowles to Smith, Knowles to Cullen, Holt to Morton to Bouve. First base on balls—Bunker 1, Chamberlain 1, Fisher 1, Beale, Chandler, Haskell 2, Martin, Holt. Struck out—Beale, Chamberlain, Fisher, Smith 2, Harris, Knowles, Cullen, Bunker. Time of game—2 hrs. 30 min. Umpire—Tom Bond of Harvard.

H. L. Daniels, Ex-'97.

The Worcester *Spy* of May 11th, prints the following:

The work of Daniels, who represented Cornell in the Cornell-Pennsylvania games at Ithaca, last Saturday, came as a pleasant surprise to Worcester Tech men when they read of his performances, Sunday morning. Daniels finished second in the 100-yards dash, in 10 1-5 seconds, and won the 220-yards dash in 22 2-5 seconds, breaking the Cornell record for the distance.

Daniels was a student at the Tech last year, and did his first running in the indoor games a year ago last winter. He showed up well for a green man in the class sports, and ran for the Tech in the intercollegiate games. With Rockwell out of the race, it was thought that Daniels could win the quarter, but he tripped and fell in his trial heat.

"Pouch" Donovan, who trained the Tech intercollegiate team last year, predicted that Daniels would make a star runner with more experience, and so it proved. He would make a valuable man for Tech this year, and the students regret that circumstances were such that he went to Cornell instead of returning to Tech.

### NATIONAL ACADEMY OF SCIENCES.

At a meeting of the Physicists, Astronomers and Mathematicians of the National Academy of Sciences, held recently in Washington, Dr. Mendenhall was appointed chairman of a committee to prepare a congratulatory address to be sent to Lord Kelvin, on the fiftieth anniversary of his appointment to his professorship at the University of Glasgow. For half a century Lord Kelvin has actively maintained his professorship, and he is now seventy-two years old. After the drafting of the address it will be engrossed on parchment by a graduate of the Institute. Then, after being signed by twenty-five or thirty members, it will be forwarded to the famous professor.

The National Academy of Sciences in this country corresponds to the Royal Society of Great Britain and the French Academy of Sciences. There are at present eighty-nine eminent and scientific men who hold membership in the Academy, which is limited to one hundred.

### METRIC SYSTEM.

It is interesting to learn that before the French adopted the metric system, Thomas Jefferson devised, and proposed to Congress, a system almost identical with it, having all of its principal advantages, including that of being decimal in its character. His standard of length was about a foot. Congress, however, failed to grasp the opportunity, and thus the United States lost the honor of establishing a perfect system of weights and measures. This fact was brought out and emphasized by Dr. Mendenhall in a recent address before a special committee of the Senate, Senator Sherman, chairman, in behalf of the metric system. Dr. Mendenhall regards the prospect of Congress adopting the system in the near future as very bright.

### "POLY'S" BACK-TALKS TO STUDENTS.

Under this head "Poly" will answer, each week, all queries sent to "Poly," care of the W P I. Queries will be answered according to the best authority and judgment. Those sending questions are requested to sign their *nom de plume* only.

"99." Yes, it is really so. The person you mentioned is about to leave. If, as you say, you wish to be the last one to have a hand in a well established custom, there is a barn that should receive a coat of paint before July 1st. Horseless vehicles are fast coming into use, and then, too, decorative art may not be appreciated in the near future.

"Observer." Your conclusions are wrong. The library is run for the convenience of the students, not for the edification of visitors. As you suggest, it would, perhaps, be better appreciated, were it kept open at hours when the students were not obliged to be in recitations. Still, notwithstanding appearances, it *is* run for their convenience, be assured.

"Promoter." No, it would not be advisable to remove those "misfit stones" as you call them. You should remember that that there is only one of you, while there are two hundred of us others, and that some may find a use for them where they are. Besides, there is the new path which you might use.

"Inquisitive." Yes, I believe the charter of the Institute requires the Bible to be in daily use, or something to that effect. It is understood, however, that the librarian's taking it off the shelf once a day, conforms to all requirements of the law.

"Baseball." No, your understanding of the rule is not correct. In a friendly game of "scrub" the players do not advance in order through the positions. The one who secures

the place first, provided he is the "bigger man," is entitled to it.

"Friends of U. W. See." A new leader of chapel exercises will soon be chosen. Send your votes for favorite candidate to the W P I. "Vote early and often."

"W. H. C. and others." In answer to your question I take the following from No. 4, Vol. I., of the W T I:—

"Senior." No, dear boy, there is no truly logical reason why you should not support a high hat provided, of course, you are able to pay for it. Still, unless you are the proud possessor of a full beard, we would advise you to stifle this, in many respects, laudable ambition."

"Juniors." Yes; it is said that volunteers to aid the senior tests were not so numerous after the announcement that all omitted work would have to be made up. It was not that they loved the gas-engine test less, but that they hated special examinations more.

### TWO RESIGNATIONS.

A rumor that several changes in the management of the Tech Shops were soon to be made has been current for some time, but the exact nature and bearing of the changes have not been known to the student body. Not long ago it was decided that the elevator business must be moved from the Shops. This industry was sold to Superintendent Higgins, who is transferring it to shops near Barber's Crossing.

The elevator business was introduced into the Washburn Shops soon after they were built. This has been carried on with a considerable profit, but it has required the labor of several skilled journeymen, since only a small part has been done by the students. The manufacture of drawing-desks and models and other work, which allowed still more student labor, has been carried on in the Tech Shops.

This doing away with the manufacture of elevators at the Washburn Shops is the result of consideration, as how best to get rid of certain objectionable aspects of the commercial industry in the Institute. It is a change that has long been contemplated, and that will, most undoubtedly, lend greatly to the advance and prosperity of the Worcester Tech.

Thus it was no surprise to the students to see in the daily papers that Mr. M. P. Higgins, Superintendent of the Washburn Shops, had resigned his position. The resignation of Prof. George I. Alden, which was announced at the same time, was somewhat more surprising to many of the students. These two gentlemen, who have been connected with the Institute as heads of the mechanical departments since it was founded, are to sever their intimate connection with the Tech on July 1.

### ALUMNI NEWS.

Born on Friday, April, 24, 1896, the Pacific Coast Branch of the Worcester Polytechnic Institute Alumni Association.

To the Editor of the W P I:

When the '96 Catalogue came out with its new geographical arrangement, a number of the old Techs living around the Bay of San Francisco thought they might perhaps help along the cause of their Alma Mater, and at the same time enjoy some mutual benefits, by forming an association, with headquarters in San Francisco. Letters were sent to all Techs residing in California, Washington and Oregon, to learn how they felt in regard to the idea, and to call a meeting for organization.

The responses were very encouraging—all believing in it most heartily, and as many as possible attended.

So, on Friday evening, April 24, Edward S. Cobb, '79, C. W. Marwedel, '85, Ronald P. Gleason, '87, R. Eugene Eldridge, '88, F. A. Gardner, '90, H. Homer Tracy, '91, and Robert H. Taylor, '95, sat down to a banquet at the Occidental Hotel.

After a good dinner had been duly appreciated, and a generous amount of time spent in recalling by-gone episodes,—such as Dr. Thompson and the dictionary; the signs which mysteriously disappeared from the grove, where the new laboratories now stand, after the boys had spent a good part of the night in nailing them up; the '84 election parade and so on,—a permanent organization was effected with C. W. Marwedel, '85, of San Francisco as President; Edward I. Cobb, '79, Vice-President; and Ronald P. Gleason, '87, of Oakland, Secretary and Treasurer. Meetings are to be held at least four times a year. We hope if any of the Techs come this way, they will let us know, so that we can give them a true California welcome.

RONALD P. GLEASON, '87, Sec.

Born, April 26th; a daughter to Bradford A. Gibson, '91.

The engagement is announced of Mr. Edward H. Keith, '94, Superintendent of the Cereal Machine Co., of this city, to Miss Marion S. Willard.

The law of sines.—"Post no bills."

A problem of the times—The physical lecture-room clock.

"Where are you going, my pretty maid?"

"I'm going to ride my wheel," she said.

"May I go with you, my pretty maid?"

"It is n't built for two," she said.

## TECHNICALITIES.

The extraordinary statement was made in a Chemistry quiz recently, that in testing for a certain substance an "insoluble filtrate," was obtained.

Orders have been placed with the shops, for five new elevators.

We are evidently going to have a railroad of some kind up Tech hill,—you have probably noticed the ties.

Overheard at the games. She—"I thought this was a running match, I shouldn't think they'd let him walk."

The tower clock stopped last week and absolutely refused to go. Inquiry elicited the fact that it hadn't been cleaned for twelve years,—not even had its face and hands washed.

Prof. Conant, while trying to find out something of the history of a famous problem from one of his classes, asked what the principal industry of Greece was. The information was volunteered that the Greeks "raised dried currants" for a living.

Prof. (to student about to leave his room): "What recitation do you have next?"

Student: "German."

Prof.: "I'm sorry."

Practice for the baseball game between the Faculty and '96 has already begun. Judging from the skill exhibited during practice, '96 will have their hands full when the game comes off.

The new Wheelock engine is nearly set up, and the Putnam engine is promised to be ready before Commencement.

Exciting Class game last Saturday. Not a single class yell nor a "P. I.," and no cheering whatever except when "Joe" Beals threw the hammer, and when Southwick won 3d in the mile walk.

"Stop pushing, I'm all in a whirl," said the crank to the connecting rod.

"Oh, you'll come 'round all right," replied the rod.

## THE FREEDOM OF THE PRESS.

A newspaper man was he,  
And he sat with a girl on his knee,  
As he held her tight,  
"You appear to-night  
To believe in Free Press," said she.  
—*Vassar Miscellany.*

We're glad that they took the needed steps  
A stairway on Tech hill to lay,  
But we're sorry we can't take the needed steps  
For we find that we're not built that way.

J.

## COLLEGE NOTES.

Yale's boating crew has been invited by the president of the Hamburg, Germany, Regatta Company, to participate in the regatta to be held there July 17 and 18.

The University of California track athletic team started on May 9, on its eastern tour. The Californians will compete with the Harvard athletes on May 23. The team will also take part in the intercollegiate and Pennsylvania events on May 30 and June 3 respectively.

The students of the Ohio Wesleyan University recently went on a grand strike. A thousand students massed before the chapel entrance and then deliberately marched away. They did not like the way the Faculty had treated the Glee Club.

Harvard Freshmen won first place in the annual class races on the Charles. This was a great surprise as six 'Varsity men pulled for the Seniors. The Freshman eight lowered the record by ten seconds.

During practice Harry Cross, Yale, threw the hammer 143 feet. This beats Hickok's record by eight feet, and practically gives Yale the championship in the intercollegiate hammer throw.

Dartmouth, with her winning team of last year, expects to get first place at the Oval, May 23.

## TAKE WARNING!

Listen, my friends, I've a story to tell,  
Of a fellow-student you all know well;  
Of a long-haired man, so straight and tall,  
Who is often seen in Boynton Hall.  
So that well you may understand  
Some of the dangers of midnight land,  
He's a student who will never sleep,  
And he's never seen upon the street,  
But "plugs," 't is said, from dark 'til dawn.  
Thus it's not strange that an early morn  
Found this young man in a peculiar plight,  
After "plugging" the whole long night.  
Slumbering by his books, as is seldom the case,  
When a very bright light gleamed on his face.  
"Fire," he cried, and his pitcher damp  
He hurled full force upon his lamp.  
When the inmates of the house had been told of the  
fire,  
The student decided in the dark to retire.

\* \* \* \* \*  
Now, comrades, you see you had better take warning,  
And not follow too closely this "grind" all night;  
For such as study 'til the early morning,  
Are sure to meet some similar fright. C. W. K.



## SCIENTIFIC NOTES.

A striking example of the saying that "There is nothing new under the sun," was brought out by Dr. Mendenhall in a recent lecture in one of the churches in this city.

He said that while visiting a very old hut in Japan, his attention was attracted by a peculiar contrivance which held up a large iron pot over the fire. On questioning the inhabitants of the hut he found that it was a device used in raising and lowering the pot, to make the water boil slower or faster; and on examination he found it to be almost identical with the clutch which is used to lower the carbon in an arc light. This discovery was the more interesting from the fact that two Americans were, at that time, fighting as to which of them invented this clutch, while the old pot had been hanging from the same device for hundreds of years.

**Compressed Air Motors.**

Already several prominent engineers in this country, and in Europe, have made extensive experiments with compressed air motors. These experimenters have met with various degrees of success. But as yet no perfected machine of this nature has been put upon the market.

At present very elaborate and extensive experiments are being made by a Worcester firm. The tests are not sufficiently matured to allow a correct estimate of their value. But it is given out that the results of the test are of a most pleasing nature.

It is expected to substitute, at some near date, compressed air motor cars for the trolley street cars now in use. This substitution would do away with the overhead wires and their dangers, as well as with return currents, which are such a menace to water and gas conduits.

**Electrical Notes.**

A set of condensers arranged to show the speed of message transmission in the Atlantic cables was one of the most interesting pieces of apparatus shown in the National Electric Light Exposition, recently held in New York City. Many interesting exhibits were shown, including Prof. Henry's own experimental induction coil; papers, models, relics and medals of Prof. S. F. B. Morse; two buoys for channel lighting, similar to those at Sandy Hook; and the long distance telephone set with which Prof. Alexander Graham Bell opened the New York-Chicago line a few years ago. One of the most interesting features of the exhibition was the transmission of Niagara's roar over 462 miles to New York by the long distance wires of the American Telegraph and Telephone Co.

It is now possible to make a complete journey

by electric railway from Nashua, N. H. to Brockton, Mass., by way of Boston.

A book on the Röntgen Rays will soon be published by the Van Nostrand Co. The author is Mr. E. P. Thompson and his collaborators are Prof. W. A. Anthony, L. M. Piolet, and Ludwig Gutmann.

An excellent cut of the Worcester Electric Light Station dynamo room appears in the *Electrical Engineer* of May 6.

The output of a single electric light company in New York or Chicago exceeds the combined output of all the stations of Paris.

The first central station in this country was established about seventeen years ago. To-day there are 2500 electric light companies in the United States, about 200 municipal plants, and 7500 isolated plants.

At present there are about 900 electric railways in this country, against less than 100 in all Europe, operating 25,000 cars over 11,000 miles of track.

200,000,000 arc light carbons are burned yearly in the United States.

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 THE GOLDEN RULE.
 

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I asked of my love in the gloaming  
 What made her so good and so true,  
 And she answered me then softly smiling,—  
 "An evil you never can do  
 If you would do unto others  
 As you would they should do unto you."

I kissed my sweet love in the gloaming;  
 It could not be sinful you see,  
 Since I only did unto another  
 What I would she would do unto me.

—Dartmouth Lit.

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 A DISCOVERY IN BIOLOGY.
 

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I think I know what Cupid is,  
*Bacteria Amoris*;  
 And when he's fairly at his work  
 He causes *dolor cordis*.  
 So if you'd like, for this disease,  
 A remedy specific,  
 Prepare an antitoxine, please,  
 By methods scientific.  
 Inoculate another heart  
 With germs of this affection  
 Apply this culture to your own,  
 'T will heal you to perfection.

—The Vassar Miscellany.

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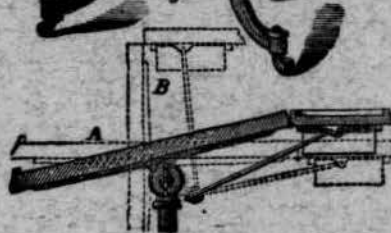
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Fig 1



Fig 2



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