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Owing to unavoidable delay in obtaining our outside contributions, we have to apologize to our readers for the lateness of this number.

The results of the two foot-ball games thus far played are, to say the least, most encouraging. No games like them were played last year. Last year's practice is beginning to tell and a little more patience on the part of the students will give us, sooner or later, a winning eleven. To-morrow's game promises to be a fine one and the chances of a Tech victory seem to be good. Everyone who possibly can, should go. Let us push the thing now that we are fairly started.

The recent action of the Faculty in revising the rules concerning physical examinations, will receive the endorsement of most fair-minded students. The Institute, morally at least, is more or less responsible to parents for the young men in its charge, and as the precautions against injury in athletic sports are removed, it is only right that the responsibility of such accidents should rest with the parents. The examination system just abolished, is like many other things, much better in theory than in practice, for of late it has degenerated into a mere farce which in many cases has been even worse than nothing.

To most students and citizens, the words, Clark University have had a vague and indefinite meaning. We realize that it is a big neighbor of our own institution, that it has a reputation and name known throughout the educated world, that it is a college for post-graduate students, but more than this, very little. So it is with no small degree of pleasure that the Editors of the W P I publish an article descriptive of this great University, an article prepared by a former member of our own Institute who has recently graduated from there, and which has the approval of President Hall. All, whether intending to later study there or not, will be interested in this which is, we believe, the best descriptive article of the University which has been published in the city.

In another column a full account is given of the first meeting for the year of the Washburn Mechanical Engineering Society. This society although founded only last spring is already making itself of great value to its members and promises to attract no small degree of attention in the future. One of the first papers read before it was afterwards presented to the American Society of Mechanical Engineers and drew comment and criticism from all over the country. The one which we publish this week contains the results of some very novel and interesting experiments in steel and will be read with interest by all Me-
The first meeting of the W. M. E. for the year, was held last Monday evening at the Laboratories, and was attended by about fifty members including a large per cent. of Alumni. Among the graduates present were, W. T. Hatch, '73; W. L. Chase, '77; Lyman Gordon, '81; H. W. Wyman, '81; W. W. Bird, '87; G. W. Booth, '91; B. A. Gibson, '91; E. L. Fish, '92; W. F. Cole, '83; C. D. Parker, '79; H. S. Downe, '82; also Mr. Carl A. Hubbell, Ass't Supt. of Simons Mfg. Co., Fitchburg, Mass., who was the guest of Mr. Downe.

Pres. Fish called the meeting to order. The Counsellors submitted the following list of dates for meetings, which was adopted: Nov. 21, Jan. 9, Feb. 13, March 21, May 8. Arrangements have been made for an address at the meeting for Jan. 9, by Mr. Geo. H. Babcock, of the firm of Babcock & Wilcox.

Everett E. Kent, '93, read a carefully prepared paper upon a design for a pump, which is soon to be made in the Shop, and which was designed last summer, by the Senior Mechanics. He also gave a summary of the comparative advantages of the different styles of revolving and plunger pumps.

W. T. Hatch, '73, of Providence, read an interesting paper upon the "Relations of Planing and Milling," in the machine business. This paper, which will be found quite instructive to students practising in the Shop, is held for lack of space until the next issue.

H. W. Wyman, '81, read the final paper for the evening, upon "Some Effects of Heating upon Steel." In connection with his paper he performed a novel experiment, that of welding together two pieces of freshly fractured steel in a Bunsen Burner, by only heating to a low yellow. The paper follows.

**Effects of Heating upon Steel.**

We always find something peculiarly attractive in mysteries, and to the mechanic the hardening of steel offers as interesting and mysterious a ground upon which the fancy can play and work as any of the problems of life, future or present, do to the metaphysicist—and the study seems almost as uncertain in its results. There have been, however, in a few years past, some experiments made, based on the more plausible theories, which seem to point towards bringing the question to a more certain basis than mere guesses. J. A. Brinnell, Manager of a Steel Works in Fagersta in Sweden, has made a long and exhaustive line of experiments based on the known effects of heat upon steel, which has done much towards giving us light on the subject, and I propose to give an outline of something of what he has done. The results of several investigators has led to a division of the states of carbon in steel into what they have termed cement and hardening carbon. Hardening carbon is the name given to carbon which is mostly found in hardened steel, and cement carbon to the carbon which is in soft or annealed steel. The changes which take place by heating are assumed as shown by the diagram:
The tendency is for the carbon in steel when heated to anything below \( v \) or a low red heat, to be cement, and when heated above \( w \) or a low yellow heat, to be hardening, while between \( v \) and \( w \) the carbon is changing in unknown proportions and ways. No change can occur in the cold and very slow results accompany the lower temperatures.

It is well known to any blacksmith that merely heating steel until it shows color and quenching it in water will not harden it. It must be heated as shown by our diagram, to a low yellow, at which point the carbon has changed from cement to hardening. Brinell’s experiments have been very extensive and conclusive, and in brief his results are as follows:

1st. The change from cement to hardening carbon does not occur below \( w \), but is sudden and complete at that point, and is shown by the experiments which I will endeavor to tell. In four cases, carbon is initially cement. On heating nearly to \( w \) (or low yellow) and quenching, it remains wholly cement and the steel does not harden, while if we heat just to \( w \) and quench, we find it wholly hardening. Again in six other cases, starting with carbon wholly hardening and heating to just below \( w \) and quenching, in three cases the carbon results in the cement state, while in the other three, by heating exactly to \( w \) and quenching, the carbon is hardening.

2nd. That carbon remains in the hardening state at all temperatures above \( w \) is shown by the fact that, whenever steel is quenched after heating above \( w \), the result is hardening carbon. The experiments here show this to be true if quenched from a yellow heat, a bright yellow or bright white or above the melting point, and if preceded by a fall or a rise of temperature or if started in either hardening or cement condition.

3rd. That carbon tends to become only cement at temperatures between cold and \( w \) but not including \( w \) is shown by the following facts: If steel, containing hardening carbon, be long exposed to the range of temperature, its carbon becomes wholly cement. This occurs when steel cools slowly from \( w \) to cold, or when quenched from \( w \) to cold or if the heat oscillates and varies in any manner between \( v \) and cold. Sometimes when quenched from points between \( v \) and \( w \), it is partially hardening. When carbon is initially cement none of it can change to hardening from any effect of heat below \( w \), no matter how near it comes without touching that temperature. When it is initially all hardening, at least a part always becomes cement on exposure to temperatures between \( w \) and a brown tint of heat.

4th. That the change from hardening to cement carbon is always slow is shown by the fact that no cement carbon is found when steel passes rapidly—as in quenching, through the range of \( w \) to cold, and that if carbon be hardening, it does not change completely to cement unless long exposed to temperatures below \( w \).

5th. That the change from hardening to cement carbon is most rapid at \( v \), is probable, although not conclusively proved by a number of experiments.

We have thus located the critical temperatures: \( w \), a low yellow heat, and \( v \), a low red; at \( w \) and all points above the carbon becomes hardening instantly, at all points below \( w \) the carbon becomes cement slowly, and this latter change occurs most rapidly at \( v \).

Based on these results, Brinell has made experiments with fractures and proved them by means of analysis and the microscope, by which we can from examination of the fracture, judge the condition and composition of the steel fully as accurately as they can be determined by chemistry. These critical points of temperature and the ground between them, present many phenomena of great interest to the worker of steel.

Among the experiments on heat effects on steel at this temperature, Mr. J. Coffin, who most unfortunately lost his life while attending to his duty at the Cambria Iron Works in the Johnstown flood of three years ago, made some important discoveries. “Coffin’s Bend,” as described is thus: a steel bar was heated to above \( w \) and then without removing it from the furnace, supports were placed beneath its ends and the temperature held constant for thirty minutes, during which no perceptible deflection occurred. It was withdrawn, cooled and placed on supports in the hot furnace. When its temperature again reached \( w \), the bar began to deflect. A bar 4 ft. long, \( \frac{3}{8} \) in. square treated thus deflected about 1 in. in two minutes. It was then weighted in the middle and kept at the same heat without further deflection. A like bar, heated above \( w \) was placed on end supports outside of the furnace, loaded at the middle with 7½ lbs. and did not bend perceptibly. When cooled to \( w \) and during about \( \frac{1}{2} \) minute it bent \( 1 \frac{1}{2} \) in. Heavier weights were then applied but it would bend no further.

Evidently something more than softening by heat takes place at and immediately below \( w \), and it may be ascribed to the change of hardening, to cement carbon or vice versa.

While this change of structure of the steel is taking place, while the elements are changing their relative positions it is reasonable to suppose that they have not such close attraction, and the bar of steel being weaker, bends some-
what, but above or below the critical temperature the strength is not changed.

"Coffin's Weld" is explainable by the same reasoning. The experiment consists of breaking a bar of tool steel, say 3/4 in. square, and, placing the fresh fractures together again, heating the pieces in a Bunsen Burner flame to w. The elements of the steel being very close to each other and without any foreign substances between them, are, when the change of construction takes place, knit together as in one piece and the broken bar becomes welded together.

This principle of the "Coffin Bend" is used in straightening bars of steel which after finishing have been bent out of shape; and cutters and tools which have been warped in hardening are also brought back.

To the mechanic in the shop, adaptations of this peculiar property will suggest themselves, and explanation of some mysterious changes of shape from heating may perhaps be found here.

At its conclusion there was considerable discussion. Among other things, Mr. Wyman told of an old razor manufacturer who claimed that the dipping of a razor in hot water every time it was used, would in the course of years remove the temper; also of how in a manufactory of the "old country," when steel was on hand containing too great an amount of carbon, it was customary to bury it in a swamp for three years, at the end of which time the extra amount of carbon had disappeared. A student inquired why salt was put in water for tempering and hardening. This question received no satisfactory answer, though several suggestions were made. Mr. Hubbell said that at their works they had had considerable trouble from fire-cracks and that it was finally remedied by putting salt in the water.

Messrs. W. H. Moulton, Albert P. Allen, '89, and Gumpei Kuwada, '93, were admitted to membership. The nominating committee reported the following list of officers for the ensuing year, and they were all elected:

President, Norman M. Paull, '93; Vice-presidents, ————, '94, Nathan Heard, '93, Prof. John E. Sinclair, Wm. L. Chase, '77, Victor N. Edwards, '83; Secretary, Prof. Geo. I. Alden; Treasurer, M. P. Higgins; Counsellors, Edwin T. Cleaves, '73, Edwin F. Simonds, '73, Alpheus B. Slater, Jr., '81, Clinton Alvord, '86, John W. Burke, '87.

The Academy eleven played a most unpleasant game against Cushing Academy last Saturday. It was evident that Cushing was the weaker team, but there was no excuse for the fistic work indulged in by the Worcester eleven.

CLARK UNIVERSITY AND ITS RELATION TO THE W. P. I.

As one reads the history of Worcester County he cannot fail to be impressed by the number of names of note with which he meets. There are familiar names of statesmen, soldiers, authors, educators, reformers, inventors—men with creative minds, originators of valuable ideas and contrivances—who have added their share to the world's resources. The county is noted for its useful mechanical inventions and for the extensive manner in which they have been practically developed and applied. These things betoken a high degree of intelligence in the community at large which is substantiated by the liberality that has established and that maintains the numerous institutions for mental development and culture. It is a significant fact that every town in the county has its library and these, with two exceptions, are public libraries. This happy combination of thrift and culture is well exemplified in the shire-town whose resources are well known to the reader.

As a natural result of the intelligent independence which characterizes its people there was established in the midst of this community, more than a score of years ago, an institution which in many respects was unique. It was designed to meet a want that was not satisfied by existing institutions, and well have the hopes of its founders been realized by its trustees and its faculty. "The Worcester County Free Institute of Industrial Science" long ago passed from the experimental state as is so forcibly shown by its alumni record.

Five years ago another innovation in the educational world was made in this city. By the munificence of another native of Worcester County, was laid the foundation of a University in which are to be wrought out the carefully matured plans of its founder. Three of its Trustees are also Trustees of the Worcester Polytechnic Institute. The two schools are in the same city and both depend for moral support upon the enlightened public opinion of the same community.

The graduates of the W. P. I. go forth well equipped to at once enter lucrative and responsible positions. But the studies which have been packed into the three years' course are of necessity largely "bread and butter" studies. This was the founder's aim: "to train the young for practical life." As the size of the classes increases, however, the number of graduates with inclination and means for further study increases; and the question arises, "How can I best supplement my undergraduate course?" To meet this growing demand among their students, the larger colleges have established postgraduate
schools, some of them with a separate faculty. In the Johns Hopkins University the greater part of its resources is devoted to postgraduate work.

Placed in the midst of the colleges of the East is Clark University. Its work is intended to supplement theirs, not to cover the same ground. In accordance with the plans of its founder, it is devoted to the improvement of the means "by which the highest culture of one generation is best transmitted to the ablest youths of the next," and to the enlargement of the "external conditions most favorable for increasing the sum of human knowledge." To this end the highest academic standards are to be maintained and special opportunities and inducements offered to research.

As an indication of what has already been done in these directions, an extract from Prest. Hall's address on Opening Day is quoted from the Spy of Oct. 2:

"We started with a group of closely related subjects in the field of science only. We have made these the best possible on the highest university plane. We have received none who were not graduates elsewhere, and of these we have admitted to our fellowships and scholarships only the few best, and 53 of those who have studied here now hold professorships or other high academic positions in nearly as many institutions elsewhere. In view of this, and considering the very few who have left us without accepting such positions, we have become, so far as this function goes, practically an institution for the training of professors. We greet with pride to-day this unique little body of alumni of Clark University, and we believe that every one of them would gladly send us to-day his hearty and ungrudging godspeed.

"The other feature of our work is original research. We have striven to add to the sum of human knowledge. During the three years of our existence, members of the university have already printed over 150 articles, memoirs or books. This does not include works not yet finished or not yet issued from the press. This work is the hardest, highest and most absorbing. It is incompatible with excessive teaching or examinations of large numbers. It tells the quality, determines the scientific character and standing of professors and it determines the career of the younger men to publish and submit their work thus to the ordeal of criticism of experts throughout the world. Work of this kind, if somewhat withdrawn from popular interest, is so because it is so fundamental. Nothing whatever can destroy what has already been accomplished here in this field. It would be a permanent acquisition of the race, though our funds were to be dissipated and though our very buildings were to be destroyed."

"What advantages are there at Clark University available to graduates of the W. P. I.?" "What inducements are offered by the University to those who have taken the Bachelor's degree?" "What is a "Docent," anyhow?" These are some of the questions that have been put to the writer. Questions, too, are frequently asked which show how little the work of this University is understood by the average citizen.

Its general aim and some of the results attained have been mentioned. The departments already established are: I. Mathematics. II. Physics, Experimental and Theoretical. III. Chemistry, Organic, Inorganic, Physical and Crystallography. IV. Biology, including Anatomy, Physiology and Paleontology. V. Psychology, including Neurology, Anthropology, Criminology, and History of Philosophy. VI. Education.

Only graduate students or those of equivalent attainments are admitted. Generally speaking, those who have specialized in the undergraduate courses of the average New England college or technical school are prepared for the work of the University. No entrance examination is required but the applicant must convince the authorities that he has zeal and ability enough to work to advantage in his chosen field. A good reading knowledge of French and German is greatly desired, but the "Tech" will be pleased to know that Latin is not required even for the degrees conferred.

For the first three of the departments named, the preparation in the corresponding departments at the Institute is excellent. In some particulars the two sets of courses overlap, e.g., provision is made, in the higher course, for supplementing the ordinary college course in chemistry. The graduate from the fuller courses of the technical school could at once begin his preparation for research and before the end of the first year would be sufficiently advanced to begin an original investigation. This would probably yield sufficient material in one and a half or two years for a thesis. Meanwhile, the major and minor subjects can be gotten into shape for examination and the candidate is ready to present himself for the degree of Doctor of Philosophy.

The department of Education is open to those students who have taken the W. P. I. course in Physical and Political Science. Admission to the department of Biology and Psychology is, of course, out of the question for the "Tech," but certain branches in these departments might be pursued by students who are specializing in one of the remaining four.
In each department the requirements of the individual are studied and the instruction and apparatus are adapted to his needs. For this reason, little attention is given to arranging symmetrical courses of instruction or to making complete sets of apparatus. The courses of lectures vary greatly from year to year and the collection of apparatus is deficient in many common pieces. On the other hand no expense has been spared in providing abundant and costly equipments for the special investigations undertaken and lectures on advanced subjects are given as occasion requires. To derive full benefit from Clark University, the student must be thoroughly in earnest and sufficiently mature to know what he wants; then every possible assistance is afforded him to satisfy that want.

No clearly drawn line exists between students and instructors. Both take part in Journal Meetings and Seminaries and in their investigations do the same kind of work. The student who has well mastered a special line of work often gives lectures upon it which are attended by instructors. Numbered among the so-called students are professors from the faculties of collegiate institutions elsewhere.

The expenses at the University are somewhat more than at the Institute. As so many of the brightest men have exhausted their pecuniary resources at graduation, liberal inducements in the shape of Scholarships and Fellowships are provided by the founder of the University and his wife for thirty meritorious students.

The annual appointments consist of Scholars, Fellows and Docents. There were available this year: 10 Scholarships of $200 each, 10 Fellowships of $400, and 10 Fellowships of $600. Docents may receive assistance especially in the way of apparatus and supplies; and concessions of value may be granted in special cases to those not belonging to these three classes.

All three appointments are primarily honors and represent in general the approximation of the holder to the degree of Ph. D. The highest priced fellowships are intended for men within one year of that degree, while the title of Docent is reserved for a few men who, besides having taken their Ph. D. degree, have performed an acceptable amount of independent work and desire to continue in research. This class of men is especially desired by the University. The bestowal of this degree is the highest formal academic honor and is a recognition by the University of the fitness of the recipient for a college professorship.

Journal meetings and Seminaries are held regularly in the different departments. In the former, by means of abstracts, important current literature is economically followed up, while the latter is devoted more especially to a discussion of the work that is being done in the department.

As regards the special advantages offered at this University, the following statements express the opinions of men conversant with the different departments here and elsewhere. I quote freely from an unpublished article.

"The advantages offered at Clark to Instructors are exceptional. Having but a small number of students, and these advanced men, they may devote a very large proportion of their time to original research. They are spurred on too, in their investigations by their very students, who are in some cases but little behind their instructors.

"The small number is one of the strongest points for the student as he becomes a member of a group of men thoroughly in earnest in the cause of science. He not only meets them at lectures but sees a great deal of them in the laboratory, in the seminary, and at various other times. Should he desire to consult with either an instructor or even the President of the University he always meets a man who takes a deep interest in his problem. He not only receives help from such contact but, as one man expressed it after a long talk with the President 'I came out feeling that my difficulties were all removed and that I had received an inspiration which should last as long as my love for science.' This invaluable close personal contact can only be possible where the numbers are few and should Clark University ever become large in point of numbers it will lose one of its chief charms.

"Owing to the small number of men working in any one line, space in laboratories, sets of apparatus, books, etc., are much more available so that the conveniences of a private laboratory are closely approximated and a great saving of time is effected.

"The laboratory equipments are excellent.

"The Mathematical department is rich in the possession of full sets of thread and plaster models [for the demonstration of mathematical figures, conic sections, plane and spherical curves and the like] and in various reckoning and computing machines. In Physics a well trained mechanic, whose whole time is given to the department, supplements a laboratory particularly rich in research apparatus. In Chemistry the rooms of the convenient and commodious laboratory building are being equipped, as needed, in the best manner. A generous supply of fine balances, furnaces, pumps, and other apparatus is provided and a very complete stock of reagents and rare compounds, both inorganic and
organic, is conveniently arranged for use or comparison. Rooms for microscopic, spectroscopic, and crystallographic work are provided with the most approved instruments; and an almost complete library of chemical periodicals and works for reference is immediately accessible.

"For the advanced study of the Central Nervous System and for Physiological Psychology there is probably no better equipped laboratory in the world to-day. A recent writer* states that only two psychological laboratories in all Germany were equipped with the Balfzer Rymograph, 'one of the most important pieces of apparatus,' yet the laboratory at Clark possesses three of these instruments.

"The biological laboratory is equipped with the best Zeiss microscopes, costing $300 to $400, and each student has had one. A student in this department had for a year the sole use of one which cost $450. At a noted institution $30 microscopes are supplied to students. This laboratory has also the best and newest apparatus for injecting, section cutting and wax modelling for anatomical investigation. A collection of these models has been begun which is intended to show the form and microscopic structure of the nervous system and sense organs of a comparative series of animals.

"The library (like the University itself) is not large in point of numbers, containing only about 15,000 vols., but probably no University library was ever selected with greater care. The books were selected by the various heads of departments with a view solely to the postgraduate studies pursued here. Thus the 15,000 vols. represent to the advanced Scientific student far more than the ordinary University or College library having three or four times as many vols.; and books are always directly accessible to the student.

"The University has a most generous system of Scholarships and Fellowships and to the student desiring to advance in any of the departments of Science established here there is no better place in this country. But let me not be misunderstood. This is no place for poorly trained young men to get something for nothing (what so many people seem to be looking for in these days.) The man who enters Clark must come with the determination to devote himself to scientific work of the highest order, with all powers of his mind. To such an one it offers the liberal education that comes from personal intimate contact with a group of scientific men drawn here from the best schools of this and other lands."

THOMAS H. CLARK.

Allen did not play as he was quite anxious to watch the men.

Brown opened up with the ball and made short gains with a V, then lost the ball on a fumble. Worcester gained her lost ground mostly by bucking Brown's line, then she also lost the ball on a fumble. Brown tried to go around Worcester's end several times and made good tackle. Chase and Southgate made excellent tackles. Worcester then recovered the lost ground by letting Andrews out of a V and pushing Brigham between right guard and tackle. Southgate gained twenty-five yards by a punt. Worcester lost the ball on four downs and then Brown worked it slowly towards Worcester's goal by plays around the ends. Worcester got it again on four downs and had gained a little when time was called.

Second Half.

Worcester gained eight yards by her old trick, starting in with a V and letting Andrews out, after the V was stopped. Davis gained three yards around left end. Andrews came out of a V again and, blocked by Southgate and Davis, made a touchdown. Southgate failed to kick the goal. Score, W. P. I. 4, Brown 0.

Brown gained five and then nine yards by the V, then lost five by Chase's excellent tackle. Gains of three, eleven, and ten yards were made by Brown through Worcester's line, then Worcester got the ball on a fumble and carried it to ten-yard line. Worcester lost the ball on four downs, then Brown fumbled. Southgate punted but lost ground. Brown scored a touchdown but failed to kick a goal.

Worcester gained eight yards, then Southgate gained ten more. Brown got the ball on a fumble but lost ground. Worcester got the ball and made short gains, then lost the ball and Brown steadily pushed it to Worcester's goal line but failed on the trial for goal. Score, Brown 8, W. P. I. 4.

There is more to be said in praise than in criticism of the work of the team, yet there are some bad faults that must be corrected before it will be a winning one.

In the first place, the play is too slow both when carrying the ball and when trying to stop it; it being quite noticeable that Brown lined up quicker almost every time than W. P. I. Again, the team must learn to play together more; good individual work never gains ground like steady team work where the whole team push as a unit. In the same line, the blocking, though better than ever before was far from good; the blockers do not keep close enough to the man with the ball and there are not enough blockers start with the runner. It was especially noticeable, that every time the guard play was tried, no blocker was sent through the line ahead of the guard, hence he was tackled as soon as he struck the line and could gain ground only by pushing. The men need to learn too, to drop after they have tackled if they cannot drop at the instant they tackle. There was little trouble from high tackling, but in several instances the runner was not downed as soon as he should have been after the tackle was made.

As concerns individuals, there is little comment. There is a little tendency yet to fumbling among the backs and they do not work well together in blocking; but each gained ground when the ball was passed to him and more practice will do a great deal to overcome these faults. Chase especially played a fine game; his tackling being the wonder of all Browns. Andrews made his usual good gains when he got the ball and Davis and Southgate did their full share in ground gaining. Southgate stands too near the line when punting. The man on the ends of the line need more snap and trickiness in their play and should break through quicker on a punt. The centre men, ordinarily, should be more careful about getting off side as it is a dangerous thing to do in most games. The line held their men well and did well when the circumstances are considered.

Of the other players:

Brooks, no fault. Ware does not break through quite soon enough. Stone, too slow; does not break through soon enough; does not block carefully. Southgate, fumbles some. Davis, good gains. Andrews, a little inclined to fumble.

The team needs to play together more and especially in the matter of blocking. The men need also to think to use their hands to brush off when running with the ball.

Altogether the team showed itself capable of first-class work; with the proper coaching which it is hoped soon to have, the outlook is good for a record in foot-ball this season of which the Institute may be proud.

The team has been very unfortunate in obtaining a coach. Last spring Lake agreed to come to Worcester for three days each week, but his services have been required at Cambridge, and he has been unable to get away. Last Saturday, Southgate went to Boston and tried to get Newell, but the latter is busy with Harvard Freshmen. No one else could be found, and it now looks as if our eleven would have to do entirely without coaching.

In reply to another request of Captain Allen for a game with the Academy, the following laconic reply was received:

Dear Sir:—The decision of my last letter was final [!!]. Respectfully, CARLETON MACY.
The first victory for the Institute foot-ball men was won last Friday afternoon on the hubbles of Dewey's field, the second eleven defeating the High School.

**Tech. 2nd.**

<table>
<thead>
<tr>
<th>W. H. S.</th>
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<tbody>
<tr>
<td>Hale, right-end, (Capt.) Cunningham (Edy)</td>
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<tr>
<td>Harrington, right-tackle.</td>
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<tr>
<td>Metcalf, right-guard, Herbert</td>
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<tr>
<td>Boyden, centre, Headman</td>
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<tr>
<td>Proctor, left-guard, Walker</td>
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<td>Nelson, left-tackle, Larkin</td>
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<tr>
<td>Rollins (Goodrich.) left-end, Davis</td>
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<td>Burt, quarter-back, Knowles</td>
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<td>Lincoln, right-half-back, Bigelow</td>
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<tr>
<td>Stone, left-half-back, Zeader</td>
</tr>
<tr>
<td>Harris (Capt.), full-back, Nelson</td>
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</tbody>
</table>

Umpire, M. C. Allen, '94. Referee, W. H. Morse, '95. 1st half, 25 minutes, second half, 20 minutes.

Tech started off with the ball but soon lost it to High School. Two good runs by Bigelow and Nelson's bucking at the centre brought the ball within ten yards of the goal line. It looked like a sure touch-down for High School, when they lost the ball on a fumble. Tech then pushed it back to the centre of the field by bucking the centre and by wedges. Time was called with the ball in High School territory. Score 0-0. In the second half Rollins was replaced by Goodrich. High School lost the ball almost at the start-off. The High School's weak point was the centre, and at this the Techs directed their efforts. Stone and Lincoln bucked successfully, and then a run around the left-end by Stone brought the ball within two yards of the goal line. A V was formed and the ball passed to Harris, who instead of entering the V, ran around the end and made a touch-down. Lincoln tried for a goal, which was a very difficult one, and failed. Score, Tech 4, High School 0. Thus once more, even as last year, the second eleven rolls up the victories and the first eleven—needs a coach.

**TECHS AT THE OVAL.**

The W. P. I. A. A. was well represented at the games of the Worcester Athletic Club last Saturday. There were three contestants from the Tech: Gallagher in the 880 yards' run; Dyer in the 440 yards' dash; and Adams in the mile bicycle. However, Adams was unfortunate and received a bad fall at the beginning of the third lap. In the half-mile our crack athlete, Gallagher, started from the twenty-three yard mark, and ran a plucky race. He cut down the large field before him and finished strongly in second place. Dyer's work in the 440 yards' dash was very creditable. From the thirty-yard mark he ran a fine race and was never headed. The work of the Tech athletes was appreciated by the fifty or more students who occupied seats in the grand-stand, and a rousing "Polly Wolly" and "P I" was given the winner as he crossed the line. The prizes consisted of gold watches for first, and silver watches for second. Dyer now attends chapel punctually on time and Gallagher's watch shakes hands with each editor as he enters a meeting of the Board.

**TELEPHONE AT THE OVAL.**

The annual fall tournament of the Tennis Association is finished. The Lansing cup has changed hands and Jesse J. Coburn, '95, is the present possessor.

Hugh M. Southgate, who has held the cup for the past two years, was defeated by Coburn, the challenger of this year. Had Southgate defeated Coburn he would have become the owner of the cup, as it becomes personal property when won by the same person three successive years.

It was the general opinion that Southgate would successfully defend his title, which he might have done had he been at his best. He has done very little playing this year, as was shown by his erratic lobbing and poor placing.

Coburn played strong in every way. He took the lead from the first and at no time lost it, defeating his opponent in three straight sets.

Southgate's playing was unsteady from the start, but had he been in good form a close and exciting match would have resulted. The following scores give the result of the sets.

**FIRST SET.**

Coburn 1 1 0 0
Southgate 0 0 1 1

**SECOND SET.**

Coburn 1 1 0 0
Southgate 0 0 1 1

**THIRD SET.**

Coburn 0 1 0 1 1 1 1
Southgate 1 0 1 0 0 0 1 0 3

The doubles were won by Joseph A. Derby, '93, and Pelham W. Lincoln, '93, who receive the two sweaters, offered as prizes. The final match was with C. H. Dwinell, '94, and G. M. Eaton, '94, winning in four sets, 6-2, 4-6, 6-1, 6-3. This leaves the single championship with Ninety-five and the double with Ninety-three.

**THE Y. M. C. A. RECEPTION.**

Last Friday night, the Laboratories were again the scene of what has come to be the annual Y. M. C. A. reception. The Mechanical Model Room was prettily festooned with Ninety-three's colors unceremoniously "borrowed" for the occasion, while white bunting, presumably
in token of innocence, formed the numerals '95 upon the wall. A number of frames from the Rogue's Gallery in the Boynton Hall reading-room together with rugs and potted plants helped to decorate the room. In the Mechanical Drawing room opposite, a caterer had set up his outfit and late in the evening dispensed cake and ice-cream to the hungry Juniors within, and still hungrier Seniors who hung about the dressing-rooms. Most of the new Juniors were present, but the other attractions on the street kept the attendance smaller than a year ago.

Dr. and Mrs. Fuller with Prof. and Mrs. Cutler received, standing at the right of the entrance. About 9:30 o'clock, A.D. Butterfield, '93, President of the Association, made a brief address of welcome, to which Dr. Fuller responded. The entertainment for the evening was then opened by Baldwin, '94, who gave a cornet solo with good effect; he was followed by Burdick, '94, who gave a baritone solo and on an encore, sang, "Out on the Deep." The third selection was another cornet solo by Baldwin and then Taylor, '95, was heartily applauded and encored after a flute solo. The exercises closed with violin duet rendered by Messrs. Marshall and Clark of the Senior Class.

Among those present were Dr. and Mrs. Fuller, Prof. and Mrs. Cutler, Prof. and Mrs. White, Prof. and Mrs. Sinclair, Mrs. Alden, Mrs. Higgins, Mr. and Mrs. Mitchell, Miss Alice Sinclair, Miss Louise Sinclair, Miss Emma Gladwin, Miss Adele Poore, Miss May Lovell, Miss Lucy Weatherbee, Miss Lucy Day, Miss Florence Armsby, Miss Maud Armsby, Miss Soule of Stamford, Conn., Miss May White, Miss Abby Clark, Miss Flora Clark, Miss Jennie Wheeler, Miss Mae Lawrence, Miss Ida Blake, Miss Bessie Lawrence, Miss Josie Harrington, Miss Eva H. Smith, Miss Sarah Smith, Miss Edith Smith of Cherry Valley, Miss Draper, Miss Alice Tucker, Miss Annie Tucker, Miss Peacock, Miss Fay, Miss Brown, Miss Ensworth, Miss Fanny Smith, Miss Cummings.

**NOTICES.**

Next week at the U. C. M's, the program is as follows:

- **Tuesday, 7:30 P.M.:** Friday, 7:30 P.M., Dramatic and Literary Entertainments, Concerts, etc.
- **Thursday, 7:30 P.M.:** Athletic Tournaments.
- **Sunday, 3 P.M.:** Discussion of Labor Problems, by members of the Central Labor Union and well known Capitalists.

One billiard and one pool table for the especial use of Techs. Restaurant open all hours of day and night.


Oct. 15. Foot-ball at Oval 3:00 P.M., Amherst Aggies vs. W. P. L.

Oct. 17. Cross country run to Barber's Crossing, 5 P.M. Y. M. C. A. educational classes open.


Oct. 20. Republican Rally at Mechanics Hall. The speakers will be Hon. H. C. Lodge of Nahant, Hon. W. W. Crapo of New Bedford, and J. L. Dodge, Prest. Harvard University Republican Club, 8 P.M.


Oct. 24. Cross country run to Coes Square, 5 P.M.

Oct. 27. Opening concert Y. M. C. A. in Mechanics Hall.

The Y. P. S. C. E. of Piedmont Church and the Pilgrim Cadets each intend to give entertainments next week, but as yet the dates are not determined. These entertainments will be advertised in the dailies.

**PERSONALS.**

'89. H. C. Armstrong is draughting with Washburn and Moen, Grove St., Worcester.

'90. W. L. Smith is assistant engineer on the Bellefontaine Bridge across the Missouri River near Alton, Ill. His post-office address is Box 9, Alton, Ill.

'90. Since our last number went to press, we have received a copy of the Cleveland Leader, containing an account of the wedding of Windsor T. White and Miss Delia B. Holden, at the summer residence of the bride's parents, Glenville, near Cleveland, Ohio.

The extensive grounds, which border on the Lake front, were beautifully decorated with Chinese lanterns, and were thronged with guests during the evening. The house and art gallery near by were profusely adorned with palms and other tropical plants, while the parlor had in addition quantities of white marguerite and smilax. A large bell of roses hung directly over the couple.

At 7 o'clock the ceremony took place. Everett J. Lake, '90, and Mr. Edward Cady, entered first, followed by the two brothers of the groom. After them came the bridesmaids and flower girls, and finally the bride. As she entered the room, she was met by the groom who had come in at the side door attended by his best man, Mr. Albert F. Holden, and the two stepped to the altar where the ceremony was performed. Afterwards a brilliant reception was held, over a thousand invitations having been issued. The beautiful art gallery was transformed into a ball-room, and until a late hour was filled with elegantly attired couples. After an extended tour, Mr. and Mrs. White will reside at No. 366 East Prospect St., Cleveland.

'91. C. H. Stearns is at the head of the Manual
Training and Drawing Department in the Indiana State Normal School, Indiana, Pa.

'92. Roscoe Clark is surveying for a branch railroad at Minot, Me.

F. E. Hammond is with Mr. Lock, civil engineer at North Adams.

E. L. Mundin left Worcester on the 28th ult. for Trenton, N. J. where he enters the draughting department of the New Jersey Steel and Iron Co.

J. H. Wallace who has been Second Assistant U. S. Light House Surveyor for the coast of Me., N. H., and Mass., since the first of July, has just been promoted to the position of First Assistant. He is now engaged in making maps and tidal observations on the Maine coast.

THE SPRINGFIELD SPORTS.

The Springfield Bicycle Club sent last summer a statement to E. H. Fish, '92, Pres. W. P. I. A. A. giving the financial results of the games last May. It shows a balance (one-half the profits) to the N. E. I. A. A. of but $67.18.

The gate receipts were $997, which means an attendance of not quite 2000 people aside from contestants, and $110 more were received from refreshment privileges and programs. The principal items of expense were as follows:—

- Printing: $140.10
- Engravings, Prospectus: 29.60
- Distribution, show-cards: 45.04
- Photos., contestants: 8.58
- Advertising: 57.80
- Band Concert, May 24th: 25.00
- Manhattan Judges, expenses: 55.00
- Announcer: 10.00
- Entertaining judges: 34.35
- Chair rent for boxes: 21.20
- Ticket takers and sellers: 22.00
- Police: 32.00
- Band: 50.00
- Medals: 209.00
- Preparing grounds and track: 100.00
- Rent of grounds: 50.00
- Amherst Pennant: 50.00

This report will be a good deal of a surprise to those who had looked for a profit to the Association amounting to two or three hundred dollars. If divided by eight the share of each college will be hardly worth mentioning, when in the case of the smaller colleges it ought to approach the expenses of sending a team. The report has not as yet been acted upon by the Executive Committee, but it is likely some of the items will be questioned when it does come up, though just what can be done about it is a problem for solution. At any rate, the Association is not "in the hole," though unpleasantly near it. Would the Worcester Athletic Club have shown as small a balance?

COLLEGE NOTES.

Yale's new gymnasium is nearly completed and will be in use before long. It contains among other things over one thousand lockers, swimming pool, twenty-one shower baths costing five hundred dollars each and numerous Turkish and Russian baths. All of the locks used throughout the building are combination locks.

The old "Gym" at Yale has been remodelled and fitted up as a dining hall. It will accommodate over four hundred students and is to be run on a plan similar to that of Harvard Memorial Hall.

Harvard has made application for seven thousand square feet of space for its intended exhibit at the World's fair. Ex.

The first college paper ever printed came into existence at Dartmouth College with Daniel Webster as Editor-in-chief.

Cornell offers this year a course in Russian language and literature.

The Republican nominees for President and Vice President are both graduates of Miami University.

The Amherst Academic eleven defeated the Aggies early this fall by a score of 58 to 10 and a few days ago, again, by a score of only 4 to 0.

COMMUNICATION.

Ed. W P I:

In your last issue, comment was made upon the Institute's present policy in the matter of assistant instructors. Could not many of the objections there raised be overcome by giving the young men selected from a graduating class the advantage of a year's post-graduate work in some sister institute? And could not some arrangement for such exchange of courtesies be made between our polytechnic schools which would reduce the expense to each institute to a minimum? It has been said that he who points out a fault should suggest a remedy. The above may not prove to be practicable, but I hope it may suggest to wiser heads than ours some method of correcting this objectionable practice.

SENIOR.

TECHNICALITIES.

Where is the Institute flag this fall?

Br—ham is far sighted, putting in excuses for future absences.

"Brigham's all gone!" "You bet he's a goer when he's once started."

"Generally, almost always, as a rule," remarked one of our professors a few days ago.
Last year's Preps are now advanced enough to raise eyebrows. Some fair samples are the result.

A certain Junior says that Dr. Kinnicutt will not accept the definition that "Chemistry is anything you can see."

Si Cloyed thinks that Unwin has gone back to the time of Noah in his machine design, page 310, for he commands the student "to step off the arc."

Within a week, Dr. Fuller has received applications for four civil engineers and three draughtsmen. The demand for graduates seems to be improved just at present.

Some of the Seniors claim to have observed that if they had J. Stuart Mill's Political Economy instead of F. A. Walker's, they would then have notes of the lectures on economics in very convenient form.

Student to Landlady: "Is this house haunted?"

Landlady: "Why of course not, what makes you think so?"

Student: "Oh, nothing only when I went to my room last night I saw the bed spring."

The instructor read, "Although formerly but little used, the gas-engine is now coming forward," and then with the stately dignity of one born to command, with head erect and eyes beaming with benedictions and intelligence, slowly and majestically Bill Nye advanced to the front.

Hereafter, the Physical Examination system is to be considerably modified. By a rule of the Faculty adopted Sept. 7th, 1892, every student who is a minor must obtain the written consent of his parents before entering an athletic contest. Students of age may enter at their own discretion. In either case, a physical examination is strongly urged.

"I plan to be here when convenient and if you are not here, you are absent. I don't grant excuses unless a man is dead, and if he is tardy on that account I mark him absent; manifestly I'm an uncommon sort of a man; the W P I says so.

"These last abstracts were better than the first, but I haven't marked many of them above A. I know what I don't want, but you don't know what I do want. Some of these abstracts would furnish amusement for the gods, of whom I am one.

"Please don't print your titles, I can read writing although I may not look it; write on both sides of the paper and then write across in red ink. I know how much paper costs on account of the McKinley Bill."

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