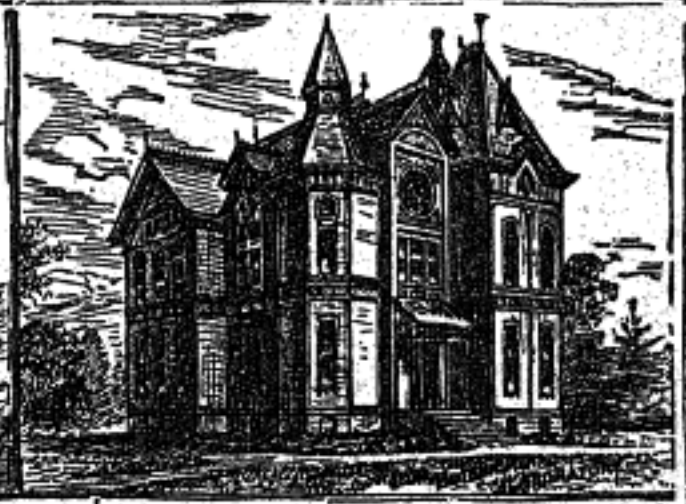


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# THE COLLEGE SPECULUM.

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WHOLE No. 26.

## The Command of Language.

K. L. BUTTERFIELD, ECLECTIC SOCIETY.

Language is power. And first, because it is a necessity to the human race. That physical endowment which enables us to communicate with our fellows in a varied and articulate manner is a privilege of mankind, and by exercise becomes a necessity. It is not only necessary in order to keep man on the higher level to which the faculty of speech has lifted him, but even his very existence as a rational being depends upon it. Yet the ability of mere communication, great as it may be, is but the first element of the power of language. Language is progressive. It is the expression of things and ideas, and, therefore, as the latter increase so must the speech be enlarged. As our age represents the highest civilization and advancement, so our language contains the choicest fragments of the languages of the past. But language is a means as well as a manifestation of growth, and therefore a higher element of the power of language is the opportunity it affords us for infinite development and progression. It lays at our feet all the treasures of the past. The experiences, the labors, and the results of human endeavor of those misty ages are all ours if we but lay hold on them and incorporate them in ourselves. We may be taught, or encouraged and inspired by the facts language thus brings to us. That is a grand thought which contemplates the accumulation of knowledge by reading and study and research, for we shall rise accordingly and reach a higher plane of living. Yet this is not all. Society has claims upon us that we can not ignore, and he who vindicates his right to the title of a useful being in this great world must be a positive force, not merely a passive treasure-house of knowledge. He must go farther than simply to accumulate; he must instruct and assist in the world's work. In other words, he must *do* something. Now though the adage, "Deeds are mightier than words," still is true, words may be a means of accomplishing a purpose and especially of influencing others to the desired end. Language then, may become an auxiliary of action. And as such would we attempt to show the value of language.

Language manifests itself under the different conditions of social converse, public speaking, and written articles. We should belong to society and exchange duties and benefits with it. Conversation is a link of connection in society, and as such demands our attention and study. It is an acquirement natural to some, but

capable of successful cultivation by all; an acquirement whose possessor not only becomes a power in society and a helper in doing good, but is himself elevated in strength of mind and force of character. He who can instruct by his intelligent conversation, amuse by his humor, or cheer by his pleasant and kindly greetings, is sure of sending an effective influence for good into the hearts of his fellows, and of raising himself in their estimation and respect. It has a value in itself beyond the fact of its being a pleasant accomplishment. It is a power. Speaking in public meetings, held for the purpose of every-day work, is of much importance. He who has a ready tongue to express the right thought will be eagerly listened to, and oftentimes eventually followed. In associations, in public meetings, in legislative halls, the powers of speech are recognized. The press is dimming the glory of the orator, but a short, pithy speech at a crisis of affairs will ever carry force. Writing holds a somewhat different position as the world moves on. Men of mind of the present are daily leaving legacies of written thought to future generations for their inspiration and instruction. Yet the tendency in writing of the present age is towards either the intensely practical, which lives but a few years, or the gossipy newspaper twaddle. Lasting literary monuments are being raised, but the proportion decreases as the diffusion of current literature increases. But in every profession and vocation occasions continually arise for the treatment of some special subject, or feature of a subject, with a written article. He who tells the world what new facts are being discovered, or what new ideas are being advanced, is the eminent man in his profession. In all these departments of language the benefit is reciprocal, or in Bacon's well known words, "Reading maketh a full man; conference a ready man; writing an exact man."

There are many essentials of effective language, all of which belong to the domain of rhetoric. But there is one thing of prime importance, an essential whose rules are commonly violated among even intelligent people, and that is simple correctness of speech. Incorrectness in speaking may not indicate ignorance, but it certainly shows a lack of education in a very important matter. The causes are found in the early habits and surroundings of the person. The remedy lies in careful training at home, more thorough correction and practice in the common and graded schools, and in self-correction. All who are receiving a college education should see to it that their language conforms to rule, not to habit. They are supposed to become leaders in

the world outside and they should not be handicapped by so primary a branch of education. Reading is useful, but practice is essential in self-correction, which must be the usual remedy until the millenium of education shall arrive. The various embellishments of language which add so much to its beauty and force, are obtained only by study, age, and experience. But the writer or speaker must not only know what forms are correct, what words are pure and precise and harmonious; he must not only have a good vocabulary and the knowledge of distinctions in words, but he must be able to bring this knowledge into play without too apparent an effort. This is true command of language. The ability to acquire it is natural to some, but that does not deter any from cultivating it. Practice will work wonders. In conversation the talk often hinges on pleasant-ries, on entertaining instruction, or on current topics. What to say on such occasions and how to say it, is an art, and must be acquired by mingling in society. The ability to speak extemporaneously must be cultivated in youth in order to produce the fruit of a ready speaker in manhood. Essays must be written in early life to prepare and develop the powers of literary work.

If, then, the command of language will raise us in position and power; if it will help us in assisting others to better ideas and a better life; in fine, if it will aid us in making ourselves more useful in our generation, it becomes our duty to make of it an earnest and conscientious study.

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### The Best Student.

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HARRY THURTELL, UNION LITERARY SOCIETY.

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The remark is sometimes heard, "That is the best student in his class," or "That is the best student in the college." The remark may be a just one and it may not. Before granting a person such an honor he should be considered in many different particulars.

A student is sometimes met with whose lessons are always carefully learned and who seldom fails to make a perfect recitation; yet take this very person and talk to him on subjects not treated of in his text book and he is often found to be woefully ignorant. The fault is he does not take time to read good books or even current events, and is behind the times. He is a brilliant scholar, so far as his text books will make him, and as such deserves honor, but he is not the best student.

Another man whom we sometimes meet, not only is a fine scholar but is also a great reader. His mind seems a great storehouse of facts. He is a regular encyclopedia of universal knowledge. No problem seems too hard for him, no process of reasoning too deep for him to follow. Yet in our acquaintance with him we feel that we miss something. We admire his brilliant intellect, his wonderful memory and his vast store of knowledge, yet there is lacking something that makes us feel disappointed in him. It is this; he lacks

sympathy with his fellows. In the cultivation of his mind he has kept himself too much alone. He has taken no interest in each day's local news, in class matters, or in college sports. Sympathy and common interest are the connecting links that bind man to man. We soon lose interest in a person who we find takes no interest in us, and a man who takes no interest in his fellow man soon becomes selfish, unpopular and narrow-minded.

Another student, with a desire to get through the course as cheaply as possible, spends too much time in work and not enough in study or reading. By him it is the reading mainly that is slighted. As a rule he is a boy who earns his own way, feels the cost of his education and knows the value of his time. But he has made a mistake. The time spent in reading good literature is not thrown away, and although a person may be able to keep up in his studies and work half the day, he is all the time robbing himself of his reading time. While pursuing a course at college, college work and college duties should occupy his mind.

A far worse and more foolish student is he whose mind has become so absorbed in sports and athletics that he strives to excel in these alone, and neglects study, reading, and work for what should be only a recreation. Sports and athletics have their uses, and no healthy, fun-loving student can afford to leave them entirely alone. They are the spice of our college life, and serve to vary the monotony of the daily routine of study and of work. But a student should never forget that the main purpose for which he is in college is to obtain an education. While at play he should be able to consider that he is but resting his mind that he may be the better able to do good work in the future.

The meanest and most contemptible man with whom we have to do, is he who never does well in class, in work, or in play. He is jealous of those who receive better marks than himself, and sneeringly says: "Well I don't work for 'marks.'" That has been evident from the beginning of his course, but what he has been working for he is ashamed to own. All he cares for is to get through the course as easily as he can, and does not scruple at the use of "ponies" in the accomplishment of this end. He is too lazy to study himself and tries to discourage those who do. Such as he are always the leaders in riots and disturbances. They are the "hoodlum" element of a college. They are the ones who, by their depredations, incense outsiders against a college and lead them to think that all college students are reckless, dissolute and profane.

The best student will be a good scholar. This is the main purpose of a college course and should never be under-estimated. The man who truly values the knowledge he is gaining of a study will try to obtain all the information he can about the subject, and he who thoroughly understands his lesson will seldom fail to make a good recitation. Let hoodlums sneer as they will, the "marks" do count for something and show

very plainly on a college record the path of the studious and painstaking as well as that of the careless and indolent.

The best student is not afraid to work. He sees that to be poor is no disgrace, and although honest labor soil his hands, it does not stain his manhood or make less noble his character. He will be an earnest, diligent reader. No one can afford to slight the advantages which are to be enjoyed in the use of a good library. He reads to keep up with the times and to learn current events. He reads that he may be able to think and talk intelligently upon the subjects which are of interest to the outside world.

The best student will be interested in all college affairs. He will lend a helping hand in all new schemes and improvements that are for the general good. He is interested in sports, though not necessarily an athlete. His mind is broad enough to comprehend the benefit of play or exercise in which he may be unable to take part. In short, he is interested in his fellows and is able to sympathize with all the passions and emotions of his fellow students. He is orderly, generous and manly, possessing a mind of his own, not easily turned from the right course by false counselors or evil companions.

The best student will be conscientious. "Ponies," in the student sense of the word, are used only by the "Chronic Failers," feeble-minded and disreputable students. The man who does his work faithfully and well, and stands or falls on his own merits is the one who can always be depended on. The student who makes the best use of his time is he who, whether working, studying or playing, "will do with his might what his hands find to do."

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### How to Make Our Prisons Tenantless.

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E. A. HOLDEN, OLYMPIC SOCIETY.

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How to deal with criminals has, of late, attracted much attention. Contract labor has helped to agitate the matter. Legislators and statesmen are divided on many of the questions pertaining thereto; some hold that murder in the first degree should be punishable by hanging, while others with tenderer hearts would imprison for life. It seems impossible for them to unite on any remedy for crime.

A glance at facts will suggest the remedy. About one-eighth of our populace are foreign born, and from this one-eighth nearly one-fourth of our prisoners, one-third of our paupers, and one-fourth of the insane come. From our colored population, which is but one-eighth of the whole, nearly one-third of our prisoners are taken. It is a known fact that the immigrants are as a class, ignorant. Also, that the colored people, who were for so many years kept from their just rights by the laws of the country in which they were doomed to dwell, are quite ignorant too.

Then it is natural that to ignorance should be at-

tributed the cause of crime. Some would allot this crime to paupers, but ignorance is the ground-work of pauperism. Man has faculties, the greatest gift of God, which if cultivated, place him above the dumb animals. The wild plant in the uncultivated field is neither useful nor harmful; cultivate the field, sow the seeds of useful plants, and the wild plant becomes a weed, choking and crowding out the fruitful. At this stage let the horticulturist take the plant, cultivate it, and behold, a valuable addition to our garden plants, whose products are sold and bought in all the markets of the world. So with man, in the uncultivated state he little surpasses the brutes; in society he is a load to bear, tending to check the advancement of those about him. Place him under instructors, develop his faculties and a Washington or a Franklin is the result, a good to the present and coming generations. Watson wrote to the point when he said, "Ignorance is the negative of everything good and useful." Education may not accomplish all that is asked of it, but ignorance gives no ground for hope.

Enemies to education put up a straw man to knock down when they try to show that education is a damage, by pointing to the fanatic of the present and past. They take for example the mere book-worm. Sure there is no use for him—neither will it be claimed that he is the educated man. On the other hand, he is like the green-house plant, too delicate to propagate or thrive in open air. What he has is not education, but one-sided development. By our ideal education is meant that development and training of mind and body and discipline of character, which makes a person symmetrical; fitted for the duties of life.

The question now arises, how is this education to be accomplished. In this age of the world theory is considered of little worth unless it can be put into practice. Stop pauper immigration. There is no reason why our country should be the slop-hole of the world. It has inducements to offer, which will make the ennobled of other lands seek our shores. Set our home missionaries at work in good earnest. Too many are apt to think there is no chance for missionary work short of some foreign land. If they will look about them they will find plenty to do.

With the army thus marshaled and on the ground, the question how to proceed is paramount. Those who are instructors in the public schools should make the schools seminaries for education and not for learning; make them places where characters are made and not perpetuated. Editors should elevate the character of literature; make the papers, even the dailies, fit for the children to read and hear read. How many there are who were first fired by some Jesse James story, to lead romantic lives, the end of which was in the dark, cold cells of a penitentiary! Ministers should make the churches places for doing away with that awful disease, selfishness, the hidden cause of most unhappiness and indirectly of crime. Instead of making tirades on

theories held by ministers of other denominations, unite with them in doing the grand good, for which all Christendom is thirsting. Mothers and fathers should take care of the children. It makes one's heart ache to see the prattling ones thrown upon their own resources in the crowded street. Sacrifice not the children for money in the crowded mart, for money will not buy the son a noble character, nor lift him from a drunkard's grave.

Make education a qualification for franchise, thus making the incentive something more than that of a moral reason. There are statesmen who claim the government ought not to meddle with education, but if it is to deal with criminals, why not with education, the absence of which is the root upon which crime grows? Gladstone says, "The chief interest of the state is in the character of its citizens." What thinking man can, with a clear conscience, advocate that a government can not have a voice in what most closely concerns it; that a criminal shall not have a chance to make answer to charges brought against him.

Who would think to change the course of a river by damming up its mouth? Not less than this do our legislators try to do, when they seek to lessen crime by punishing the criminals. Labor not with the effect but with the cause. Steam up the river to near its source and make that the headquarters for operation; it will take some steam to get there, but the investment must be made before a dividend can be expected.

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### Benefits of Mechanical Courses.

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WILLIAM H. VAN DEVORT, DELTA TAU DELTA  
FRATERNITY.

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That a young man should pursue the art or profession which seems to best meet his inclinations, has long been demonstrated. If he takes an interest in agriculture, he should be a farmer; if in argument, he should be a lawyer; if in mathematics, the physical sciences and their application, he should be an engineer.

Regarding mechanical or technical courses, thoughtless persons are apt to say: "You cannot in the time allotted to the practical or shop work, become a master mechanic; the time thus spent might better be applied to your books, mastering theory." That this idea is erroneous is evident. As the education of a young man in any engineering course whether mechanical, civil or mining, cannot be complete with a mere knowledge of mathematics and of the physical sciences familiarized from standard text-books. He must understand the principles by which this text-book knowledge may be applied to that branch he is to follow. This is most strikingly shown by the extent to which these courses have been adopted in our most prominent institutions. True, there are some schools professing to teach engineering, that have nothing to do with pattern making, forging, welding, tempering and the general

manipulating of machine and bench tools. Such schools must consider the instruction received from master mechanics of an inferior quality to that gleaned from books and in the class room. They are turning out, not mechanics to construct, but engineers, rich in theory, to design. These same men when thrown into practical work will see that something is wanting, in a mechanical engineer, if the machines first designed by him, contain parts that cannot be cast or forged, or if cast or forged, cannot be fitted together. Can such persons expect to compete with men of experience? They cannot; and before they can they must go back and pick up those principles of construction neglected in their education.

What these courses are doing for this country is apparent. That civilization advances with education is a truism. Let us journey from the North to the South; from the Atlantic to the Pacific, our eyes will continually behold the wonderful achievements of our engineers and mechanics, accomplished under the greatest of difficulties. We cannot but notice and compare our present prosperous condition with that of fifty or one hundred years ago. How vast the difference between our present railway train flying through the country at forty or fifty miles per hour, and the lumbering old stage coach dragged along at a tenth of that velocity! Look at the Erie Canal passing as it does up hills and over rivers; look at the Brooklyn and Niagara bridges; at our present railway, navigation and telegraph systems. And ask yourself what this country would be without the engineering element! You may say that there are hundreds of important inventions being made annually by men who never thought of a college education. This, to a certain extent, is true. But it will be noticed that they are men who apply themselves closely to their art or trade and are perfected by their weekly scientific papers. They are seldom of that class of men who are ignorant of the fact that "it is difficult to get something out of nothing," who will spend the best part of their lives endeavoring to develop that long sought for impossibility, perpetual motion.

A young man when selecting his course of study at college should have foresight enough carefully to consider his chances of securing a good position when his course is completed. It is truly discouraging for the person who desires to follow one of the professions, to notice that our cities and towns are already crowded to overflowing with competitors. On the other hand look at the prospects for our young engineers. This is a country noted for its great resources, and for the general desire of its people to develop these resources, and thus place it on an equal footing with other countries in manufactures and improvements. Looking over the graduate lists from some of these courses, we notice with pleasure that a handsome percentage of these graduates secure good paying positions of honor and trust. As our producing and manufacturing interests

increase, so does the demand for engineers and educated workmen.

That these courses have contributed much towards our country's prosperous condition none can dispute; that they have yet much to do, all will agree. And it is to be hoped that both public and private aid and influence may be as freely bestowed upon them in the future as in the past.

### The Benefits of College Fraternities.

F. B. STOCKWELL, PHI DELTA THETA FRATERNITY.

Greek letter fraternities are situated at nearly all colleges of high standing throughout the country, varying in number at each according to the size and prominence of the institution. Most fraternities aim to establish chapters in every worthy institution where it is possible. The object of a few, however, is to plant representatives in a few of the most prominent colleges only, and in a particular section of the country. Some of the latter have as few as six chapters, while a few of the former have over sixty. The first fraternity was organized one hundred and eleven years ago at the College of William and Mary. This does not seem to have been very successful at first, for over forty years elapsed before another was created. Since that time they have increased very rapidly in favor and in numbers, until to-day there are more than fifty fraternities, seven of them being composed of ladies. Twenty-three exclusively fraternity journals are published, four of them in the interests of the ladies' organizations. Including alumni and undergraduates there are now more than one hundred and fifty thousand fraternity men in the United States. No college of high rank but some one or more of these societies is represented, excepting those few, where the faculty object to secret institutions. This objection was the principal reason why secret societies had so slow a growth at first; but happily as their workings began to be understood this objection disappeared, and now no college is complete without its "mystic brotherhood." These fraternities, scattered over a broad expanse of country and at the most prominent institutions of learning, have a marked effect on the thoughts and actions of a large number of people. There are duties that man owes to society in general other than legal. The miser, taking no interest in his fellow-men except as they bring money to him, fails in his duty to mankind though he may fulfill the letter of the law. The recluse, or the man who never mingles in the pleasures of social life, is recreant in his duty to himself and to humanity. He may say, "I take no interest in them or their doings. I mind my own business, and owe them nothing." But he does owe them something. It is a law of God that man shall affiliate with man. This is a world of associations; it is a social world. The man who neglects to form ties of a social nature is but half a man. At no time in life is a man

more liable to acquire the habit of withdrawing from social enjoyments than at college, especially if his social nature is not fully developed. This is more evident in institutions where the dormitory system does not prevail. The student may have a few confidential friends, but if separated from these, he is almost a stranger and will withdraw from any pleasures or social enjoyments. But if a member of a fraternity, his social nature is cultivated to its fullest extent. Any of his brother members is his fast friend. He becomes interested in the frequent meetings and takes his part. His mind is diverted from his studies. His knowledge of human nature is increased. He makes an effort to be a pleasant companion and becomes such. These social habits thus formed or strengthened follow him through life.

The closeness of connection between the members allows them the opportunity of improving themselves mentally by the study of each other. There is no study so fascinating as that of man. If a man is a good judge of men's motives and actions, success in some branches of business is assured. How few people there are that we really know. We may think we understand them perfectly, but suddenly some action or word reveals the fact that we are entirely ignorant of their inner life. Then, as there are few things about which we know less, or that are more important, the study of mankind should be one of our primary objects, and nowhere is a better opportunity afforded than in the fraternity.

The literary work also, is of great benefit. The power of expressing our knowledge or thoughts in a clear and logical manner will be of immense value to us. The ability to wield the pen effectively cannot be underrated. The pen is Archimides' lever and the press is his fulcrum. With this lever long enough nothing is impossible, as the fulcrum is ready. One great help to good literary work is criticism. There are very few persons capable of judging their own productions correctly, and still fewer who will express their exact opinions about another's, until it has appeared and it is too late for correction. The constant literary work required in most fraternities, and the closeness of criticism which the existing intimacy allows, are of great service to their members.

The fraternity is an agent for good if its character and purpose are noble. There is some prejudice against secret societies in colleges, principally because they are secret. Their purpose seems to be forgotten or unknown. The attainment of the highest standard of social, mental, and moral life is such an aim that no institution or society can have a loftier. To have a high ideal, though you do not quite attain to it, is better than an ideal nearer your own state, and consequently easier of attainment. In some institutions where the members of the secret societies live in their chapter houses there might be a source of evil but for the love borne for the fraternity, and the constant efforts to improve

its reputation and prestige by the closest observance of moral law.

The wide extent of country from which the fraternity draws its men allows the largest scope for the extension of knowledge. The journals devoted to the interests of the society alone, containing articles by members from all parts of the country, expressing their thought and the general feeling in their respective colleges, are of great benefit. Through these brother members in other colleges a wide knowledge of life is obtained.

In college life we are behind the scenes; in actual life, hereafter, the curtains are drawn. The experience gained behind the scenes prepares us for the public performance later. The play is the same in public, but we attain self-possession and self-control by our practice in private. Thus the wide knowledge we may gain of college life and college men is of vast service to us; and in no other way can such a wide spread knowledge of college life be obtained as through the fraternity. Again, if a member becomes a student at any institution where his fraternity has a chapter, he is at once sought out and made to feel that he is among friends. The first few months of loneliness are gone in a day. At such institutions as the University where the dormitory system does not prevail, acquaintances and friends are not made so soon or so easily as where that system is in vogue, and to find true friends immediately lightens the hardest part of college life.

There is that "intangible something" about fraternities by which the members are drawn together. The love for the secret society exceeds anything else at college. Members will work for its honor and welfare as they work for nothing else. Its secrecy must be the reason for this. There is a power in mystery over all men. Man's peculiar love for anything secret is in accordance with his nature. One great reason why fraternities are so beneficial is because their members take such an interest in them, and nothing so commands this interest as their secrecy. Though secret, there is not one that is not working for some great moral principle; and when a large body of earnest men, bound together by those closest of ties, common interests and brotherly love, backed by the best institutions of learning in the land, are pushing with a common aim, their object is sure of attainment. The principles for which fraternities are working are grand, and are such that, when attained, they will be of the highest benefit to mankind.

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## SCIENTIFIC.

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### Celestial Photography.

Among the recent developments in astronomy is the astronomical photographer, who, instead of spending his time in laborious measurement of minute distances, waiting perhaps weeks or months for times when the atmosphere satisfies his critical needs, now places the

sensitive plate at the telescope and lets it record in a few minutes details that it would take years to produce by the old methods. Its record may then be studied at leisure.

Photography has an incomparable advantage over the eye because it presents no limit to the faintness of the objects it records. The eye requires the light to be of a certain intensity before it will act, and if an object be too faint to be seen, no amount of looking will render it visible. The eye has not the power to accumulate the light that might come from a faint object and render the visual impressions more vivid. But the photographic plate has the valuable property of treasuring the rays that may fall upon it, and of being impressed not solely by the intensity of the rays, but by the accumulated effect of all that may have fallen upon it. A faint object therefore with long exposure may approach in effect a brilliant object with short exposure and objects that are invisible to the eye may be rendered visible in the photograph by a long enough exposure.

The advantage of photography in its own field is strikingly shown by a comparison of the results of the two methods with a well known group of stars, the Pleades, or Seven Sisters. An able observer spent over three years of assiduous work in the last decade in charting all the stars of that cluster. He charted 671 and believed his chart contained all there were in that portion of the universe. Yet in an hour's time at the same observatory this group was photographed and showed 1421 stars in the same space—over twice as many as the eye had seen with a greater instrument—and with an accuracy of position, that no direct measurement could rival. But this is not all. The first photograph showed a stain. A second and third is taken before they are convinced that it is a nebula and not a defect in the plates. But the instrument at that observatory would show the nebula. But two instruments in the world have done so, one at Pulkowa, the largest mounted instrument in the world, and one under the clear skies of Italy.

In the development of astronomical photography American astronomers have played a leading part. Draper was not only the first to take a photograph of the moon, but of the solar spectrum also; and Rutherford's photographs of the moon, (some of which may be seen in class room B) have never been equalled. Rowland of Johns Hopkins is publishing a photograph ten feet in length of the solar spectrum. Draper, the younger, successfully photographed the spectrum of Vega in 1871, and his photograph of the nebulae of Orion led the way to the more recent work of Common and Roberts. Double star and stellar photography began with Bond and Whipple at Harvard College thirty years ago. Alexander was the first to get a good image of the corona. Photographic photometry has been almost exclusively an American branch, and Pickering has already made seven hundred plates of the thousand necessary to cover the northern hemisphere.



Photography has some difficulties that will prevent its taking the place of the observer, but where it may be applied it will undoubtedly occupy the field exclusively. The most recent applications are due to the French. Besides the physical study of the sun and moon and planets it promises to be of the greatest use in the study of the heavens and the mapping of the stars. At present the best chart shows 324,000 stars, but we may now expect maps showing millions. Such charts will lead to a more complete study of the distribution of the stars, and the constitution of the universe than has ever been possible and in a few decades or centuries a comparison of photographs will show the changes of position of stars, and will give more definite data for the determination of the amount and direction of the motion of the solar system. Photography will give means for studying double and multiple stars and the revolution of one sun about another, stellar parallax, physical features of the moon and planets, the discovery of asteroids, and may lead to the discovery of the suspected trans-Nep-tunian planet.

The possibilities contained in its many applications, rendered possible by the gelatine plates, promise to change the traditional work of the observatory, and may indicate the beginning of an era second in importance only to that brought in by the telescope.

L. G. CARPENTER.

### Parasites of the White Ant.

In various parts of the United States a white ant, a species of Termite, is frequently to be found in and about decaying pine stumps. Though to the eye of the casual observer there is nothing marking these creatures as in any way especially interesting or peculiar, yet to the naturalist and microscopists they are of the very highest interest, from the fact that they afford, perhaps the most wonderful instance known of parasitic life.

Suppose a few taken home for examination. Arriving there the microscope is arranged with a power of perhaps 100 diameters, while a little slightly salt water and the usual glass slips and covers are provided. One of the ants is then taken and the intestinal tract dissected out. This will appear as a somewhat irregular elongated brownish tube, perhaps a fourth of an inch or more in length and varying from one-twentieth to one-fiftieth of an inch in diameter. This is placed on a slip in a drop of the water, and the cover glass placed in position. Placing the slip then on the stage of the microscope, and bringing to a focus, we shall, if our specimen is a good one, have before us a most wonderful and startling spectacle.

We shall see issuing from the open end of the tract a perfectly innumerable swarm of minute creatures. They pour out something like a vast multitude from an overcrowded theatre or public building, and like such a crowd, the instant they are free they disperse as rapidly as possible in all directions, while behind the same countless stream pours on as though inexhaustible.

Many of them are of exceedingly beautiful and wierd forms, and no words can properly express the beauty, grace and strangeness of their appearance as they crowd and roll along, each as though bent on his own particular business.

After a general examination with this power, we can, with advantage, put on a higher objective, preferably a one-fifth or one-sixth. This will enable us to study them more in detail, and note their great diversity in appearance and structure. Notwithstanding this diversity most of them have been grouped under three types. The first is known as *Trichonympha Agilis*. The usual form of an adult member of this type is that of a rather elongated spindle somewhat blunter at one end than at the other, the latter for convenience being called the head. The length is usually from three to four thousandths of an inch, while the diameter is from one-half to one-quarter the length. From the head something having the appearance of a long tuft of delicate hair flows backward, forming a kind of misty veil or garment for the body, extending back beyond the tail in graceful curves as the creature twists and turns in its course. The color is a pale, partly transparent gray, with usually a darker portion near the head. The movements are smooth and stately when uninterrupted, though occasionally they are seen to roll and turn about, these latter motions causing the coma to assume momentarily the most graceful and fantastic shapes.

Occasionally one of them will be seen head on. In this case the appearance will be that of a nucleus with a more or less widely spreading delicate coma, giving the effect of a hub with innumerable delicate spokes. Various other forms will be seen differing considerably from this adult type, and yet believed to be immature forms in various stages of growth.

The distinguishing feature of these is a more or less distinct spiral structure. In some there will be an appearance as of dark spots or overlapping plates, arranged in several spiral rows on the body. In others there will be the appearance of a more or less cylindrical body with spiral lines or grooves running along and around it.

The next type is known as *Pyrsonympha Verteus*. The representative individual of this group is of a somewhat tapering form from base to top. The outline is wavy and continually changing, while, as a whole the creature sways back and forth through an arc of 90° or moves about a somewhat changeable point in the lower part of the body. The appearance and movement are exceedingly wierd. As a rule it does not, as a whole, move about much, but keeps up its swaying back and forth while ripples and waves are constantly running along its outline, making the exact grasps of its appearance at any one instant, an exceedingly difficult matter. The color of this type is similar to that of *Trichonympha*, though rather lighter.

The third type is known as *Dinenympha Gracilis*. The characteristic structure is that of a flat ribbon or

band twisted into a spiral with a somewhat pointed head and tail. On the spiral, and running longitudinally, are alternate light and dark bands or striae. Individuals of this type are relatively rare, of smaller size than the preceding types, and quick and graceful in their movements.

These parasites received their first notice from a French naturalist. He simply noted the fact of their existence, promising to return to them in detail at some future time—a promise apparently never fulfilled.

Some few years later they were independently discovered by Leidy, who, after making them the subject of careful study, wrote a monograph on the subject, which is probably their most extended notice. The main points of their life history—how they reproduce, feed, grow, transform, etc., seem to be wrapped in considerable obscurity, as well as just the precise position in the scale of organized beings which they should occupy. They possess some analogies with the Gregarinidae, some with certain larval forms of some of the lower orders of Vermes, and some with the Infusoria. Leidy is inclined to link them with the Infusoria, as on the whole, they seem to be more nearly related to that group than to either of the others.

As to how they feed, little is known. Occasionally dark particles are to be seen within them, though they do not seem to have ever been observed in the act of swallowing. Perhaps the most likely view is that they absorb their nutriment directly through the general surface in a liquid form, or by a species of dialysis. Many of them, especially of the *Trichonympha*, seem to be provided with a kind of vesicle somewhat similar to the pulsating vesicle of Infusoria and Rhizopods, though its pulsations are very slow and indistinct.

One of the most astonishing considerations in connection with these creatures is their vast numbers, and the fact that the intestinal tract of the ant is so nearly filled with them as to almost exclude the presence of ordinary good particles. The average capacity of this tract is perhaps not far from .000,25 cubic inches, while the average size of the parasites is somewhat under .00,000,000,25. There would then be room for something over 100,000 individuals in this volume, but making some allowance for food particles and unoccupied space, we may probably safely say that 100,000 individuals would not be an unusual number for a fair sized ant. In actual size they vary from three or four thousandths of an inch in length to one thousandth and occasionally less, while in diameter they range from one or two thousandths to one ten-thousandth. Thus we may say roughly that the range in size is somewhat similar to that from a cow to a cat.

Just what office these creatures perform in the life economy of the ant is not known. The ants live in decaying wood, and seem to use this, at least principally, as their food. Small particles of it, accompanied by a brownish liquid, are usually found with the parasites, but whether the latter serve in some unknown way to

partially prepare the crude food for absorption by the ant, or whether they are truly parasitic—drawing their sustenance from the juices of the host—seems to be a question involved in much obscurity. Be it as it may, their presence seems in no way to inconvenience their host; for the livelier and stronger individuals seems to be as much infested as the weaker.

The great abundance of these parasites renders their observation very easy when the ants are once obtained. In fact, as found in New Jersey, Pennsylvania, and Virginia, one can hardly miss them, though occasionally an ant is found with few or none.

In addition to the slightly saline water referred to above as a medium of observation, a tear from the eye, serum, or the white of an egg may be used. Not the least interesting fact in connection with the geographical range of these parasites is the fact that in New Zealand a white ant is found somewhat similar to the one found in this country, and infested with the same series of parasites.

The thought that within this humble ant, so small that hundreds could be crushed with the foot, lives a community of perhaps one hundred thousand creatures of the most wonderful forms and habits, and in the greatest variety of size, shape, and general appearance is sufficient to give us a new, though still faint idea of the infinity of Nature, and of how much beyond the reach of our unaided senses there may be all about us in the humblest of objects.

W. F. DURAND.

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DR. BEAL hands us the following communication recently received from C. C. Georgeson, of '78, now Professor of Agriculture in the Agricultural College at Komaba, Tokio, Japan:

I am at present staying among the mountains near the active volcano, Asama Yama. I ascended said volcano a couple of weeks ago. The inclosed specimen of grass grows on the uppermost limit of vegetation, some 7,000 feet above sea level. This and a polygala were the only conspicuous plants at that height. The soil is a scoria made up of coarse cinders and pumice stone, into which the roots of the grass penetrate two or three feet deep. Frequent thunder storms on the mountain prevent it from drying up.

I will thank you to name the inclosed specimen of raspberry if it reaches you in a condition to permit of identification. Is it a new species or has it been named before? I shall attempt to introduce it in the United States. If it will grow there I feel satisfied it will be a decided acquisition to your list of small fruits. I have found only a few bushes of it, and this at an altitude of between 2,000 and 4,000 feet. It is just beginning to ripen now (Aug. 16th.) and will continue till about the 10th of September. It is exceedingly prolific, and has a large, bright, red fruit, of a flavor between that of the red raspberry and the black-cap. It would be later than any now in cultivation. But this is not the only

point. It flowers without opening the bud. You will perceive that the sepals clasp the young berry tightly. They grow with the berry and do not open till it is full grown. This point, in conjunction with the pubescence and viscid character of the calyx, prevents the attack of insects. I have never found a "wormy" berry in this species, although three other species growing side by side with it have a "worm" in nearly every berry they produce. The young canes are erect, four to six feet high. The bearing canes bend almost to the ground with the weight of the fruit, which is produced in clusters on auxiliary shoots. The inclosed is one of the smallest I could find. The pricklers are few and weak, canes very hairy throughout, foliage small to medium, light green above, white beneath. Have found it only in open places by road-sides.

Sincerely yours,

CHARLES C. GEORGESON.

Agricultural College, Kamoba, Tokio, Japan.

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## THE COLLEGE SPECULUM.

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PUBLISHED QUARTERLY—AUGUST, OCTOBER, APRIL AND JUNE.  
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AGRICULTURAL COLLEGE, MICH., OCTOBER 1, 1887.

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THE SPECULUM has no desire to add new fuel to the literary blaze which has illumined the pages of the Detroit and Lansing papers during their recent discussion of affairs at this College. We do desire to correct a few mistaken notions that have crept into print, and to place the College and her students in a true light before the public.

The most prominent notion in the minds of those writers who oppose the students, seems to be that there has been an organized effort made to destroy the department of practical agriculture or compel it to take a

subordinate position in the college curriculum. Several of the writers in the *Michigan Farmer* make the folly of such an undertaking their only argument, and then proceed to lecture the faculty for not suppressing so infamous a design. That such a plan has ever been proposed is news to those of our students who have been here during the past three years, and who have watched the course of events during that time. Their only explanation of the origin of such an idea in the minds of so many people in different parts of the State and at the same time, is that it was suggested by the perusal of a communication which appeared in the *Lansing Journal* of Aug. 11th, over the name of the professor at the head of the department in question.

That article contained a reaffirmation of the belief of its writer that the societies and fraternities connected with the College had worked to accomplish the ruin of his department. It was a reply to a denial of the same charge against the societies, published in the *Lansing Journal* of Aug. 4th, and written by a committee appointed by the various societies. Extra copies of this article were struck off and sent by an interested party to the parents of students and to prominent farmers throughout the State. With that view of the matter before them it is not surprising that friends of the College should be alarmed for its future. Had there been any foundation for the charge, it would, indeed, have demanded prompt and radical treatment. The weak point in the case is this: There has been no action taken by any society or class that can be construed as an attack on the department named, nor has society influence had any thing to do with causing the present dissatisfaction.

There is no desire on the part of the students to belittle or injure in any way the department of practical agriculture. That department is the one which, more than any other, is peculiar to the agricultural college, and it should, therefore, be well sustained and properly managed. Because in the minds of the students it has not been so conducted in the past, the recent dissatisfaction arose, and not because there was any feeling of opposition to the department.

The attack on the president and faculty made by Judge Marston in the *Michigan Farmer*, is entirely unwarranted. The charge that they have permitted gross violations of College rules to go unpunished, is doubtless true, for the fact was disclosed by the investigation made in the summer of 1886, that various misdemeanors committed in the agricultural class room had never been reported to the faculty by the professor in charge. That they did not punish students for misdemeanors not brought to their notice by the proper authority, and which they had no other legitimate means of discovering, is not strange. Since that disclosure was made their course has certainly not been too lenient. The professor was at one time authorized to suspend from class any student who refused to obey him in any particular, and under this authority several

suspensions were made. The truth of the matter is, that of the suspensions made during the past two years at least three-fourths can be traced to difficulties originating in trouble between the students and this particular professor. Had this same condition of affairs existed in every department and the same course been followed, we should now know from actual experience what it is to have a "studentless college," as the Judge is pleased to style it.

The charge that the present management has sacrificed quality to quantity in their efforts to secure new students, requires no other answer than an inspection of the work now done by students in field, shop, and classroom. We venture the statement that at no time during the past five years has there been a more earnest working spirit manifested than during the year just ended. The morals of the institution has greatly improved. Conduct which, at one time, would have gone unpunished, would now lead to immediate suspension or expulsion. Though no special instruction in manners and morals has been given, we think the students of this College will not suffer by being compared with students of other colleges. They can perhaps give pointers in legal etiquette to some gentlemen who hold high rank in the legal profession. They certainly would not conduct a case where the opposite side were denied the privilege of having counsel, and they would be sure of having heard both sides of a case before rushing into print with an opinion concerning it.

The notion that the students have been running the Agricultural College, the faculty and the State Board, is a mistaken one, and until that idea is understood by newspaper writers they will accomplish no good purpose by filling the State press with advice to the faculty and State board.

THE street railway scheme of which so much has been said and written during the past five years seems to have assumed a definite shape and will doubtless be perfected in the near future. The president of the Lansing Street Railway Company has been investigating the feasibility of building the road and is so well pleased with the prospect that the order for its construction has been issued. The plan adopted by the company includes the purchase of a dummy engine for the route. The road is to be ready for business within a year. Cars will run to the college at intervals of two hours during the day and the run each way is to be made in fifteen minutes.

This solves the difficult question of how to provide accommodations for the increasing number of students, for with cheap and speedy transportation they can board in the city and yet have most of the advantages enjoyed by those living on the College grounds. Such an arrangement need not conflict with either work or military drill, for meals can be secured at the various boarding clubs and the whole day be spent at the college when necessary.

Some contend that easier communication with the city will cause the college to lose its distinctive rural features and that the temptations offered by the attractions of the city will have an injurious effect on students. While this may prove true to a certain extent, we see no reason why the going to town can not be as easily controlled as under the present system of 'bus and stage travel. The advantages offered far outweigh any possible injury from that cause.

At least half of the time now spent in going to and from the city can be saved. Travel will be free from the interruption caused by stormy weather in the spring and fall terms. Visitors to the capital city will find it a convenient and inexpensive way of visiting the college and the institution will thus be advertised in the best possible manner. The work done here will be better understood and more highly appreciated after a personal inspection of it than by any other means of obtaining information concerning it. In short the new enterprise cannot fail to be of great benefit to the college.

The impression seems general that one of the first effects of the completion of the road will be to largely increase the attendance of ladies and the friends of co-education are jubilant over the prospect. With a few additions and changes the course of study now pursued can be so arranged as to compare very favorably with the ladies' course found in other colleges, and which will be vastly superior to most of them in its scientific departments. With the addition of vocal and instrumental music, a further development of the course in drawing, and the addition of German to the French already in the course we think that a large attendance of ladies could be secured. The SPECULUM hopes to see some move made toward making such a change during the next year.

WHY not make French an elective study in the Agricultural course? The benefit derived from an ability to read scientific works in this language is admitted by all who have given the subject any attention. The facilities for giving instruction are at hand, and that many students desire to study the language is shown by the number who now take it as an extra study. Experience has shown that to secure the best results not more than three studies should be taken by the average student. With the present arrangement those who wish to continue their work in this branch must carry an extra study during the remainder of the year.

Most colleges granting the degree of Bachelor of Science include either French or German in some part of the course or at least make those languages elective. For a number of years it was in the regular course here but was apparently dropped in the effort to make the college instruction wholly English. Without going into any discussion of the value of the study of language as a means of mental discipline, we think that the benefit to be derived from it in a scientific point of view would justify its being made an elective study in the senior year of the agricultural course.

THE only important change in the agricultural course this year is the transfer of logic from the senior spring term to the junior spring term. It takes the place of one hour of laboratory work in analytical chemistry. The junior spring term has been the easiest one in the course, because it has contained but one study that required preparation outside of the hours set apart for recitation. The change gives students more work to do in that term, and at the same time provides for a study which the student should take before his essays and speeches are so nearly finished as they are when the senior spring term is reached.

In the mechanical course the most important changes have been the transfer of first rhetoric from the sophomore summer term to the freshman summer term, the insertion of the second rhetoric of the regular course in place of book-keeping and business law in the sophomore spring term, the latter studies being transferred to the senior spring term, and the addition of public orations during the junior and senior years.

The mechanical course now provides for the same amount of public speaking and essay writing as the regular course, and is much improved by the change. Master mechanics, draughtsmen and civil engineers should have as well trained a power of expression as farmers, and we look for excellent results from the course as now arranged.

ONE of the College organizations that is not as highly appreciated by students as it should be, is the Natural History Society. The value of the opportunities offered by this society to the student of science, by giving him a chance to present in public the results of original investigation, can hardly be over-estimated. Many of its former members who now occupy prominent positions as teachers of science, testify to its value in this respect. A glance at a list of its members discloses the fact that at least fifteen of them are professors or instructors in the scientific departments in various colleges. To secure the best results its programs should be largely made up of papers and talks by students. The student will find that he derives more benefit from the work and study necessary in the preparation of a subject intended for presentation before an audience than from the more scholarly and accurate address by one of the professors. Too much of this work has been left to members of the faculty of late, and not enough has been done by students. Every one interested in science should become a member, and having joined the society should attend the meetings and do his share of the work necessary to keep it in a flourishing condition.

THE *Harrow*, whose publication was announced in our last issue, was ready for distribution Sept. 1 and seems to meet with hearty approval. Its showing of college organizations is complete, its fun is pure and the illustration and typographical work are well done.

It compares very favorably with the annuals issued at older and much larger colleges.

From the fact that it is a pioneer in this line of publication here the expense necessary to issue it has been large and a number of copies must yet be disposed of before this expense can be met. As the continuance of such a publication depends largely on the success of this one, the SPECULUM hopes that it will have a wide sale among our alumni. Many of them have already ordered it, and any others who desire it can obtain it of the secretary of the college at one dollar per copy, post paid. Send for a *Harrow*.

WE desire to secure the following numbers of the SPECULUM: Whole numbers 3, 4, 10, 14, 15, 18. Any one having these numbers can secure twenty-five cents each for them by notifying the business manager.

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## COLLEGE NEWS.

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Four "co-eds" in the freshman class.

There are three new Japanese students at the college.

The weather was most favorable for Commencement week.

Many of the rooms have three students in them; this is crowding too closely.

There has been an increase of 750 volumes in the library during the last year.

The work done in the wood-shop is much better this term than former terms.

Secretary Reynolds gave an interesting lecture Sept. 7 on, "What I saw in Germany."

Prof. R. C. Carpenter and P. B. Woodworth will spend the winter vacation at Cornell.

The low ground north of the library is being tile-drained by the Horticultural department.

Miss Hooker '91 and Ray Baker '89, are making a title catalogue for the use of the students in the library.

The library and reading room are assuming a tasty appearance under the skillful hands of Miss Linkletter.

The addition to the Horticultural barn is completed. This gives storage for the larger tools used on the department.

Prof. and Mrs. L. G. Carpenter will spend the winter at Baltimore. They expect to start at the close of the fall term.

Robert Bruce, Dr. Kedzie's big, black horse died Aug. 19. He was 22 years old and had been owned by the Doctor for 20 years.

A new tubular boiler and a 12-horse power engine has been put in by the Farm department to afford sufficient power to run the machinery at the barn.

The junior mechanics in drawing are working on a plate of worm and bevel gearing. Their next plate will be a design for a head-stock to an engine lathe.

The base ball diamond has been greatly improved. The lines between the bases have been dug out to the depth of a foot and filled in with clay well rammed down.

A large crowd, about 200, of picnickers from Aurelius was on the college grounds on the 17th of September. They brought a base ball team with them to show the boys how to play the game.

The water works along Faculty avenue are nearly completed. This will give fire protection and furnish water for lawns in dry times. The large tank will be kept full all winter. It will be kept from freezing by a coal stove in the tower.

The Lansing Railway Company intend to have a line from the city to the College completed by next summer. This will be of benefit to the College and will also enable visitors from the city to come much oftener than they do now.

A large silo has been built at the north end of the cattle barn. Its capacity is about 125 tons. It has been filled with corn ensilage. Much of the field corn was cut up and put in, as no calculation had been made to fill so large a silo. The silo in the grain barn has been filled with clover ensilage.

The Horticultural department is giving much practical instruction in budding and in making cuttings. The students are also sowing seeds of cabbage and cauliflower. The object is to see if it is practicable for the average farmer to start such plants and winter them in cold frames so as to have extra early plants the next spring.

The money for the purchase of books for the coming year has been apportioned among the several departments. Each professor will have about \$150 to expend in books for his department. The books will be purchased this fall and be in their places for next term.

None of the new buildings, except the apiary and the extension to the machine shops, will be built this fall. The foundation for the latter has been put in. The inside woodwork will be done by Mr. Campbell and the students in the woodworking department, as the appropriation was not sufficient to finish the building.

The Senior class-day exercises were held in the College chapel. The chapel was filled to its utmost capacity by the friends of the class and visitors from the city. The music was given by Speil's orchestra. The opening overture "Pique Dance," was a fine selection. The class history was given by G. J. Hume. This was a history of many trying times and of successes. There was special mention made of their connection with last year's trials. The class poem by C. L. Himebaugh was a view of the class in the past and present, and a prediction of its future success. W. W. Diehl was the class orator; his subject, "Our National Character," was given in an entertaining manner. Class statistics were given by Guy Arnold. The average expenses of the class were \$938. Average age 22 years. Fourteen of the twenty two graduates are natives of Michigan; all but five have been teachers. The prophecy was presented by I. B. Bates. President's address by F. R. Smith. After the close of the literary program the class and their friends went to the banquet hall, here a bounteous spread awaited them. In response to the toast master, H. W. McArdle, the following toasts were given. Our College Days, J. C. Duffey. Our Absent Classmates, F. R. Smith. The Faculty, A. A. Abbott. Response by President Willits. Our Sophomore Year, I. B. Bates. The Ladies, G. C. Crandall.

Commencement exercises were held in the chapel on Wednesday, Aug. 17. Every available space was packed some time before the notes of the orchestra told the waiting class that they were soon to be numbered among the alumni. The platform was decorated with palms, ferns, and flowers in a most tasty manner. On the stage sat President Willits, Professor J. Estabrook, Louis McLouth president of Dakota Agricultural College, Rev. Mr. Hall of Oviatt, Governor Luce and the State Board of Agriculture. The exercises were opened with prayer by Rev. Mr. Hall, this was followed by a musical selection by Speil's orchestra. E. A. Burnett was the first to speak. His subject, Culture from the Study of Science, was presented in a forcible manner. Mr. Burnett was followed by H. L. Chapin whose subject was Our Need of Industrial Education. Music by the orchestra. Mrs. Carrie M. French spoke from the subject, Knowledge comes but Wisdom Lingers. W. C. Hall told of the work of the Federal Convention. This was followed by music. E. W. Redman spoke upon the problem of Forestry. W. C. Sanson gave Lessons from History. H. H. Winder's subject was Too Great Freedom of Utterance. The last oration was by C. B. Waldron whose subject was First Pure then Peaceable. After music by the orchestra, the President's address and conferring of degrees, the class of '87 separated to take up their individual tasks in the work shop. In the evening the President's reception was held at his residence and the commencement exercises were ended.

We are indebted to R. S. Baker for the following report of the meeting of the Natural History Society held Sept. 8, 1887: The meeting was opened with an address by Prof. L. H. Bailey on "The Effect of Cultivation on Seed Production." We have nearly the wild type of tomato in cultivation. From this type we have nearly regular variations to the Trophy—the best variety at the present time. Several tomatoes of each of four or five varieties were

selected, and the seeds carefully counted. From 100 fruits of the Red Cherry tomato, the poorest variety, 7,242 seeds were obtained, while from three fruits of the Trophy tomato 839 seeds were obtained. The average number of seeds in the Red Cherry tomato would, therefore, be 72.25, while in the Trophy we have an average of 279½ seeds to the fruit. The difference in bulk between these two selections was not great, while the difference in the number of seeds was very great. From this we draw the conclusion that seed production does not develop as fast as the fruit grows in size.

An experiment was also made with the Crab and Northern Spy apples. It was found by counting that the Crab averaged 6½ seeds to each fruit, while the Northern Spy averaged 12 seeds to each fruit. In this we see an increase of seed by cultivation. The production of seeds by plants may be divided into four general classes. First, those which produce seeds alone, as peas and beans. In these we can get no great increase. Second, those plants cultivated for fruits, which are inseparable from the seeds, as the cereals. In these the increase of the fruit means the increase of seeds. The third class includes those which have other means of re-production than by seeds. The seeds, therefore, gradually diminish in number, and at last disappear entirely, as in some varieties of potatoes and in bananas. The reason for this is that the energy of the plant goes rather to the production of good fruits or tubers than to forming seeds. Class fourth includes the true fruits, like apples, which are cultivated for the pulpy parts. From these experiments we find that the production of seeds bears no constant ratio with the cultivation of the fruit. All seedless fruits are simply sports, although these sports may sometimes be perpetuated by judicious selection.

Mr. Redman read a paper on "Mosquitoes," and showed some very good blackboard drawings illustrating it. The mosquito lays about 500 eggs, which are stuck together and left floating in a boat-shaped mass on the water. In the larva state the head is large and the eyes prominent. On the end of the larva are two flat projections used for locomotion, and the head is always downward in the water. The pupa is curled in a peculiar position—the head, which is doubled under, having two long respiratory tubes extending from it. It floats on the surface, and is covered by a skin which gradually breaks near the head and the mosquito begins to come out. The male mosquito has hairy antennae, and always stays in swamps or near damp places. The females are the only ones from which we ever suffer.

Prof. Beal then talked on the "Variation of Grasses." He had several large charts illustrating the variations of different parts of several specimens of the same variety. He also displayed some fine drawings of root stocks, and advised students in making collections never to leave the root stocks out of their herbaria.

Prof. Cook displayed some large ink drawings, showing the antennae cleaners of different bees. Things change to match their environments. Darwin says that things have a tendency to vary. Nature selects those things which vary in the right way, and the parts which are most used are those which vary the most. If we take a wasp and sprinkle some chalk on his antennae he will throw his legs over them and draw the antennae through a little notch in the legs, thus thoroughly cleaning them. The antennae are used for feeling and smelling, and so must be kept clean, hence, by continual wear and use the notch has been worn in the legs, thus making an effectual antennae cleaner.

Mr. Dewey then showed some beautiful colored drawings of the apple tree silk moth. This moth works on apple, pear, and plum trees and hazel bushes. It is one of the largest moths we have, and it richly deserves the name some naturalists have given it, the "American silk moth." The larva is large, green and very beautiful. The worm has seven pairs of legs and a row of formidable spines up and down its back. The larvae are heavy eaters, and grow uneasy as the time comes to go into cocoon. The moth lays its eggs in June, and the larva hatch in eight or ten days and work until August, when they go into cocoon and remain all winter. Mr. Mellet then made some observations on the ovaries of the rose, and the meeting adjourned.

At a meeting of the Union Literary Society held Sept. 24th, the following resolutions were adopted:

WHEREAS, An all wise Providence has removed our brother, Truman L. Parker, who died at Elsie, Mich., Sept. 18, 1887,

*Resolved*, That by Mr. Parker's death we lose a friend, who, in all his intercourse with us, proved himself an industrious student, a faithful society member, and one who always had the welfare of his fellow students at heart.

*Resolved*, That we tender to his bereaved wife our heartfelt sympathy in this her great affliction.

*Resolved*, That a copy of these resolutions be sent to the bereaved wife, and that they be furnished to the COLLEGE SPECULUM for publication.

W. A. TAYLOR,

H. B. CANNON,

G. F. STOW,

Committee of U. L. S.

Dr. Beal, at the request of the State Board of Agriculture, attended the meeting of the Forestry Congress, recently held in Springfield, Ill.

The Cadets and a number of other students, attended the State fair at Jackson, Sept. 23d and 24th. They report having a splendid time while there.

We clip the following from the Jackson Patriot for Sept. 24. "The Cadets from the Agricultural College accompanied by Lieut. Lockwood arrived on a special train from Lansing about 9 o'clock yesterday forenoon, and were at once assigned quarters in Guard hall. Soon after the command went to the drill ground for an hour or two of practice. The Cadet company was about forty five men strong, and dressed in the neat blue, close fitting uniform with regulation fatigue cap and regulation U. S. belts and cartridge boxes and Springfield breech loading rifles, presented a very neat appearance. The company is exceedingly well drilled and ought to take high rank among companies that pretend to excel. Capt. Dale A. Smith has been in command but four weeks, and the way he handled his company yesterday shows he has the true military ring in his make-up." \* \* \* \* \*

"At 2:45 the Cadets appeared on the track in front of the grand stand ready for the drill. The arrival was greeted with applause and it was merited. For twenty five minutes military evolutions were performed, comprehending manual of arms, evolutions and the setting up drill. Then the Guard took a hand and for thirty minutes held the attention of the spectators. Lieut. Neskem did not keep a full score as the Lansing company failed to furnish a schedule of movements. He only scored errors. At the conclusion Col. Devlin announced that the Jackson company was the victor. The weather was too cool for good work hence some errors were placed against the Jackson company and presumably against the other, that would not have occurred under more favorable conditions." The score, as announced, stood 75 to 85. The Guards declined to accept the challenge to hold an individual competitive drill, sent them by the Cadet company.

## PERSONALS.

It is our aim to make the personal department of the SPECULUM a means by which old students and graduates of the M. A. C. may hear of those with whom they were acquainted while here. That it may fulfill its purpose we request Alumni and others, to notify us of any matters of interest which properly belong to its columns.

### CLASS '61.

Albert N. Prentiss and wife spent their summer vacation in Europe.

### CLASS '64.

Lewis J. Gibson teaches in Lyons nine months of the year and spends his summer vacations on his farm near Wacousta.

### CLASS '65.

C. E. Hollister was one of those who, in his college days, helped cut out the tops of many of the large trees on these grounds.

### CLASS '67.

We see by the *Industrialist* that W. W. Tracy has recently visited the Kansas Agricultural College.

### CLASS '68.

John Swift practices surveying and landscape gardening in summer and canvasses for standard books during the winter. He was

on both tickets for Justice of the Peace at Harbor Springs last spring and was elected. He has six children.

### CLASS '69.

Dr. C. E. Bessey is Professor of Botany and Horticulture, and Dean of the Industrial College in the University of Nebraska. He was one of the five M. A. C. graduates who had papers read before the A. A. A. S. this year. He also sent a paper to the Society for the Promotion of Agricultural Science. He is botanist to the Nebraska State Agricultural Society, and during the summer vacation visited the Black Hills of Dakota, where he collected many botanical specimens.

### CLASS '70.

Chas. W. Garfield was re-elected Secretary of the American Pomological Society, which is no small compliment considering that the Vice President is also a Michigan man.

### CLASS '71.

Prof. E. M. Shelton has decided to remain at the Kansas Agricultural College despite the attractive offer made by Iowa.

Geo. D. Morse, farmer, Medina, is feeding a herd of cats, and if their hides turns out well he and his wife may attend the triennial reunion next summer.

### CLASS '73.

J. P. Finley has written a new book on tornadoes, which is published by a New York insurance company. He recently visited his home in Michigan.

J. L. Morrice made the College a visit recently, and brought with him two or three new students.

Benjamin T. Halstead is a practicing attorney at Harbor Springs. He recently spent some time visiting in New York and at his former home in New Jersey. He graduated from the law department of the Indiana University in 1876, and that institution conferred upon him the degree of M. A. this summer. This is probably the first degree of M. A. conferred on a graduate of this College.

### CLASS '74.

Dr. J. K. Gailey presented an able paper before the last meeting of the State Medical Society.

Henry A. Haigh is still employed as counsellor at law in Detroit. His book on "Farm Law" is now under the control of Darling Bros. & Co., Detroit. It is used as a text book in this and several other agricultural colleges, and is highly commended by many who are competent to judge.

### CLASS '75.

C. S. Ingersoll, President of the Colorado Agricultural College, reports their institution in a better condition than ever before.

W. L. Carpenter is one of the brightest local practitioner of law in Detroit, and is regarded as one of the rapidly rising members of the Michigan bar.

William H. Smith is a prosperous farmer living north of Grand Rapids, and is looking for a larger farm. He recently read a paper upon "Tariff for Farmers" before the West Michigan Farmers' Club.

B. A. Nevins is a member of the firm of Nevins & Lindsey, manufacturers of fanning mills, step ladders, and other wooden utensils at Otsego, and has quite an extensive trade, especially in the South and Southeast.

### CLASS '77.

W. S. Holdsworth is again teaching drawing at this College.

Lyman A. Lilly is farming in Allegan county. He has three children.

Frank E. Robson is selling great "big chunks" of law from his office in Lansing.

F. E. Skeels is with C. W. Garfield at Grand Rapids, engaged in horticultural pursuits.

R. T. McNaughton is still engaged as per catalogue. He is an active member of their local horticultural society.

C. D. Strang is managing the Rider Farm at Silver Creek, Cass county. He says he is too heterodox for orthodoxy and too orthodox for heterodoxy.

Will Prudden, captain of the famous "Nine Spots" ball club, is selling "diamonds" of real estate to support his increasing family.

A. B. Peebles is pastor of the Plymouth Congregational church of Fargo, Dak. He has not forgotten his alma mater and hopes to be present at the alumni reunion next summer.

Harry Emmons went down to business one morning recently, and found that he had been burned out during the night. With his characteristic energy he was in business again at noon.

H. F. Buskirk is living on a fine farm near Bradley, Allegan Co. He raises raspberries and other fruit, and does quite a business shipping milk to Grand Rapids. He has one son and one daughter.

E. O. Ladd is partner with his father on a 200 acre farm near Old Mission. They raise orchard fruit and potatoes in considerable quantities. He is Master of the local and the county Grange, and chairman of the board of school inspectors of Peninsula township.

James Troop, Professor of Horticulture and Entomology at Purdue University, and his wife visited friends in Western New York during the summer vacation. The serious drought of the summer rendered his experiments with commercial fertilizers on potatoes and other vegetables almost worthless. He attended the American Forestry Congress at Springfield, Ill., Sept. 14-16, as a delegate from the University.

C. C. Georgeson, Professor of Agriculture and Horticulture in the Imperial Agricultural College of Japan, has been spending his summer in the mountains, near the active volcano, Asama Yama, which he climbed early in August. He describes it as follows: "It is the largest active volcano in Japan. The crater is an abyss covering twenty three acres. I measured it. I spent the night there by the crater. It was a sublime experience.—8,000 feet high, not a sound could be heard but the roar of the crater, which is almost like Niagara in quality, but not nearly as loud. The fire could be seen distinctly in the crater."

## CLASS '79.

C. W. Gammon and wife, of California, recently visited the College.

M. S. Thomas has rented his farm, taken up as a homestead claim near Bramhall, Hyde Co., Dak., and expects soon to return to Decatur, Mich., where he will engage in farming.

C. F. Gage, two years with '79, is quite plump, and a great rider of the wheel. While going from Springfield, Mass., to New Haven, Conn., following the railroad bed between the tracks, he took a fearful header and narrowly escaped being run over by the express. He was married a few weeks ago.

A. A. Crozier is busily engaged as the trusted assistant of Prof. Vasey, of the U. S. Department of Agriculture. He was present at the meetings of the A. A. A. S., and S. P. A. S., and made reports of them for publication. He was made Secretary pro tempore of the last meeting of the American Pomological Society, which was held in Boston.

## CLASS '80.

C. T. Crandall has, if rumors be true, become interested in the development of an iron mine.

Prof. F. A. Gulley and wife, made the College a flying visit at the beginning of the term. It does one good to see them. He recently received a flattering offer to become Professor of Agriculture in the University of Tennessee at Knoxville, but the experience of agricultural departments of State Universities has been such that he prefers to remain where his is the leading chair.

## CLASS '81.

C. W. Clark is studying medicine at Orion. His family now numbers three.

W. H. Burgess was married recently to Miss E. M. Fenton, of Croswell, his present home.

R. B. Barlow, for three years with '81, has spent most of the past few years in the investigation of ink. He has discovered some excellent inks and expects to go South this winter to begin their manufacture.

Howard M. Holmes, member of the State Board of Health, had an article in the issue of the *Sanitary News* of Sept. 3d, setting

forth the advantages the new hygienic laboratory at the University to the people. He also recently read an article on cremation before the U. and I. club.

## CLASS '82.

W. H. Coffron is at present studying in Johns Hopkins University.

Prof. L. H. Bailey, Jr., attended the Michigan State Fair and took with him numerous specimens of fruit and vegetables.

Erwin N. Ball is proving a worthy son of his father as stock raiser. He exhibited some of the finest stock at the late State fair.

## CLASS '83.

A. C. Redding was granted the degree of M. S. at the last commencement.

H. W. Collingwood is writing an interesting serial story for the *Rural New Yorker*.

C. E. Weed, assistant to the State Entomologist in Illinois, spent part of his vacation at his home in Lansing.

C. P. Gillette is much relied upon by the *Rural New Yorker* to furnish opinions on entomological subjects.

H. W. Baird, assistant secretary and postmaster, having taken two fearful headers from his wheel, has sold it and forsworn bicycling.

Arthur F. Kinnan was married the 31st of August to Miss Ida M. Traphagen. He is engaged to become superintendent of schools in Big Springs, Texas, a flourishing four year old town of 2,500 inhabitants.

Herbert Collingwood, managing editor of the *Rural New Yorker*, was met by Dr. Beal and Prof. Cook at the A. A. A. S. They report him as looking healthier than ever before. He lives thirty miles from his work; goes back and forth each day, and is well pleased with his position.

## CLASS '84.

J. J. Bush has left the bank in Lansing.

Fred Herrington is practicing law in Pontiac.

O. L. Hershiser is very successful as an apiarist. During the present summer he has had charge of one of the largest apiaries in the State of New York.

E. E. Vance is living on his farm near Pewamo. Has been playing in the Northern Michigan Base Ball League this summer. Is the happy father of an eleven pound boy.

## CLASS '85.

C. W. Hoyt was present at commencement exercises.

Geo. E. Sprang is in the stationery business at Alma.

F. L. Chappell is teaching school at Cooper, Kalamazoo county.

C. B. Collingwood recently married a sister of W. A. Thomas, with '85.

P. G. Towar, J. D. Towar, and Jennie Towar, '86, are engaged in the restaurant and dairy business at Lansing.

It is with much regret that we are called upon to note the death of T. L. Parker, Sept. 20th, at Elsie, where he has been teaching. He was buried just four weeks after his marriage, and is mourned by many sincere friends.

T. D. Himebauch is apparently doing a thriving business at Vicksburg, and is to deliver a twelve weeks course of lectures on veterinary science at Purdue University. He received from this College the degree of M.S. this summer.

E. S. Antisdale denies keeping "bach," as stated in our previous issue. Remember, Ed. that we should always avoid the appearances of evil. He is now living with his father and sister on his father's farm. Though he denies being a model farmer we have reason to believe that he will be one sometime if he continues in the occupation.

Geo. W. Parks, Fannettsburg, Pa., although very busy feels that success is rewarding his efforts. He has a good trade in flower seeds, and has good prospects of soon becoming one of the most extensive retail dealers in flower seeds in this country. He expects to spend a month in Philadelphia this fall.



CLASS '86.

W. E. Gammon is farming at Richland, Cal.

W. S. Launstein, shipping clerk for a Milwaukee firm, is probably doing as well financially as any member of the class.

E. A. Whitney visited the College recently. He is studying law at St. Louis, Mich., and expects to be examined for admission to the bar next month.

W. A. Kinnan made the College a short visit recently. He has been employed as clerk in the pension department at Washington, where he expected to return.

J. J. Jakway, for three years with '86, is on his father's farm at Benton Harbor. Expects to enter DePauw University at Greencastle, Ind., this fall on his standing at this College. He made the College a visit recently, and we are sorry he is not intending to complete the course.

CLASS '87.

W. C. Hall is teaching school at DeWitt.

J. C. Duffey is teaching school near Homer.

Guy Arnold is rustivating in the North woods.

O. C. Wheeler is busily engaged on his father's farm.

C. B. Waldron will go to California to practice surveying.

I. B. Bates is in the employment of the Michigan Car Co., at Detroit. He goes well recommended and we wish him success.

H. L. Chapin has been surveying and leveling near his home, St. Louis, Gratiot county. He expects soon to procure instruments of his own.

A. L. Marhoff, with '87, was present at commencement exercises this summer. He is now teaching at Climax, but expects to return to the M. A. C. next spring.

Guy Drew, with '87, is cashier of a bank in San Bernardino, Cal. He resigned his position as superintendent of construction on the California Southern Railroad, after building fifty miles of the road.

CLASS '88.

A. B. Ide is principal of the Delta school.

B. B. Smith is at Mayville, Trail Co., Dak.

J. A. Thompson left for San Diego, Cal., Sept. 28th.

Herbert Thurtell has engaged to teach school for a year in the village of Allonez, in the Upper Peninsula.

WITH '89.

O. B. Knapp visited the grounds recently. He expects to teach this winter.

ATHLETICS.

Cold weather fails to put a stop to athletic sports, and every afternoon between the hours of four and six can be seen the numerous ball teams practicing-up for some great game in the near future.

The wielders of the tennis rackets may still be seen striving for the "deuce" but getting only "love."

The ball team have a number of new men in their nine, and are doing some very good work. A. B. Cordley has been elected captain.

We print the following scores, two of which were crowded out of the last number:

June 18th.

M. A. C.	R	1B	PO	A	E	CASS.	R	1B	PO	A	E
Bates, l. f.	1	1	2	0	0	Stark, s. s.	2	2	3	1	2
Smith, c.	1	2	8	0	0	Guinea, 3b.	1	1	2	3	0
Chase, c. f.	2	1	2	0	0	Quest, 2b.	2	0	3	4	0
Cordley, r. f.	0	1	0	1	0	Pelou'e, l. f.	0	0	2	0	0
Canfield, 3b.	1	1	0	2	0	Weiss, p.	2	3	0	5	0
Yerkes, p.	1	1	11	0	0	Day, 1b.	1	2	8	1	0
Howe, 1b.	1	0	12	0	1	Pierson, c.	0	0	7	1	0
Shepard, s. s.	0	3	0	1	2	Rittenberg, c. f.	0	1	2	0	0
Bulson, 2b.	0	1	2	0	1	McArthur, r. f.	1	1	0	0	0
	6	11	27	15	4		9	10	27	15	2

1 2 3 4 5 6 7 8 9 R  
Cass.....3 2 0 0 0 0 0 4 0-9  
M. A. C.....3 0 0 1 0 1 1 0 0-6

Bases on balls—Day, McArthur, Chase, Bulson. Earned runs—M. A. C. 3; Cass, 2. Two base hits—Day. Double play—Day and Quest, Stark, Quest and Day. Hit by pitched ball—By Weiss, 3. Wild pitches—Yerkes, 3. Struck out—By Yerkes, 5; by Weiss, 3. Passed balls—Pierson, 1; Smith, 2. Time of game—Two hours. Umpire—George Frank.

June 25th.

M. A. C.	AB	R	BH	TB	PO	A	E	IONIA.	AB	R	BH	TB	PO	A	E
Bates, c. f.	6	1	3	3	4	0	2	Shau'h'y, c. f.	6	1	3	3	1	2	3
Smith, c.	6	2	3	3	3	5	1	Smith, 3b.	5	2	3	4	3	4	1
Chase, s. a.	6	3	2	2	2	4	1	O'Connor, 1b.	6	2	2	3	12	0	0
Cordley, l. f.	5	0	2	2	1	0	1	Delaney* 2b.	6	4	4	4	1	9	1
Canfield, 3b.	5	1	2	2	0	1	0	Lund, l. f.	6	2	2	2	0	2	1
Yerkes, p.	5	1	2	2	0	8	0	Hubbard, c. f.	6	1	3	4	1	1	1
Learned, 1b.	5	2	1	2	11	0	1	Punches, r. f.	6	2	1	1	0	0	0
Bulson, 2b.	5	2	2	2	5	3	2	Dayton, 2b, c.	6	1	3	3	4	0	0
Cooney, r. f.	5	0	0	0	1	0	0	Gordon, † p.	3	2	2	2	0	3	1
	48	12	17	18	27	21	8	Reid, c.	2	1	1	2	5	0	0
									53	18	24	20	27	21	8

\*Pitched after fifth inning. †Taken sick the fifth inning.

1 2 3 4 5 6 7 8 9 R  
M. A. C.....1 0 1 4 0 0 0 1 2-12  
Ionia.....0 2 2 1 3 1 0 2 7-18

Earned runs—M. A. C., 4; Ionia, 6. First base on called balls—Off Yerkes 2; Delaney, 7. Left on bases—M. A. C., 9; Ionia, 7. Struck out—By Yerkes Punches, Lund, Hubbard; by Gordon, Canfield, Yerkes, Cooney 3; by Delaney, Bates, Learned, Smith, O'Connor, Hubbard, Reid. Passed balls—Dayton, 3; Smith, 5. Wild pitches—Yerkes, 1; Gordon 3; Delaney 3. Time of game—2:15. Umpire—Hemphill. Scorer—O. C. Hollister.

Sept. 17th.

M. A. C.	AB	R	BH	SB	PO	A	E	AURELIUS	AB	R	BH	SB	PO	A	E
Burnett, p.	6	4	3	5	1	9	0	Edgar, 1b.	5	1	2	1	6	0	2
Smith, c.	6	3	3	2	2	1	0	L. Davis, 2b.	5	1	3	0	4	5	1
Chase, s. a.	6	3	3	2	3	2	3	Lo Edgar 3b.	5	1	1	0	3	1	4
Cordley, 2b.	6	3	3	1	6	1	2	Freeman, r. f.	5	2	1	0	0	0	0
Canfield, r. f.	6	2	1	0	0	0	0	Cooke, c. f.	5	0	1	0	1	0	1
Stack, 3b.	6	1	1	1	1	2	3	L. Pre'm'n, l. f.	5	1	0	0	4	0	1
Stockwell, c. f.	6	3	2	5	2	0	1	A. Edgar, c. 5	0	1	0	4	2	0	
Rittenger, 1b.	5	2	1	0	12	0	1	L. Edgar, p.	5	1	2	0	1	1	1
Thurtell, l. f.	5	3	3	0	0	0	1	Eckhart, s. s.	4	1	0	0	1	0	4
	52	24	20	14	27	15	11		44	8	11	1	24	9	14

1 2 3 4 5 6 7 8 9 R  
M. A. C.....2 3 8 0 6 5 0 0 \*-24  
Aurelius.....0 0 0 2 0 0 1 0 5-8

Earned runs—M. A. C., 10; Aurelius, 3. Struck out—L. Edgar. Left on bases—M. A. C., 5; Aurelius, 8. Passed balls—Edgar, 7. Wild pitches—L. Edgar, 1. Hit by pitched ball—Rittenger. Two base hit—Smith, L. Davis, Freeman. Three base hit—Burnett, Smith, Chase. First base on errors—Off M. A. C., 5; Aurelius, 7. Time—Two hours. Umpire—Manassau.

Sept. 23d.

M. A. C.	AB	R	BH	SB	PO	A	E	NO'TH'VE	AB	R	BH	SB	PO	A	E
Burnett, 3b.	6	3	3	0	3	3	0	W. Yerkes, 1b.	5	1	2	0	8	0	4
Smith, c.	6	3	3	0	7	2	0	Harman, 2b.	5	0	0	1	1	0	1
Chase, s. a.	6	0	2	1	3	1	0	P. Wait, c.	5	1	2	1	5	1	0
Cordley, 2b.	5	2	2	1	2	1	0	D. Yerkes, 3b.	5	0	2	0	3	2	2
Stack, l. f.	5	1	1	0	0	0	0	Baker, r. f.	4	0	2	0	0	0	0
Canfield, p.	5	2	1	1	2	8	0	G. Yerkes, c. f.	4	2	2	0	3	0	0
Stockwell, c. f.	5	1	2	0	2	0	0	Rowe, l. f.	4	0	2	0	2	0	0
Rittenger, 1b.	5	3	2	0	7	0	1	Beal, s. s.	4	1	2	0	1	2	1
Thurtell, r. f.	5	2	4	0	1	0	0	H. Wait, p.	4	1	1	0	1	2	1
	48	17	20	3	27	14	1		40	6	15	2	24	7	9

1 2 3 4 5 6 7 8 9 R  
M. A. C.....6 2 0 0 3 0 3 3 \*-17  
Northville.....0 0 0 0 3 1 1 0 1-6

Base on balls—Canfield, 1; H. Wait, 5. Struck out—By Canfield, 5; By H. Wait, 4. Passed Balls—Smith, 3; P. Wait, 7. Wild pitches—H. Wait, 1. Time of game—Two hours. Umpire—Cole.

COLLEGES.

Ohio has 45 colleges.

Cornell has a class in Malayan.

The Oxford University has an annual income of one million dollars.

Hillsdale graduating class observed class day for the first time in five years.

One hundred and twenty-four students are working their way through Harvard.

It is said that Daniel Webster edited the first college paper—the Dartmouth Gazette.

The first degree of L.L.D. conferred by Harvard, was upon Geo. Washington, in 1776.

Will Carleton, of poetical fame, has been elected one of the trustees of Hillsdale College.

The English University custom of wearing caps and gowns has been acclimatized at the University of Pennsylvania.

The oldest college in America is the College of Mexico, which was founded fifty years before Harvard.

The University of Pennsylvania contains students from nineteen foreign countries, and has representatives from twenty-nine of the United States.

Out of every one hundred Freshmen who enter Yale, seventy-five graduate; at Harvard, seventy-four.

Harvard college was founded in 1636, with an appropriation of £800, six years after the settlement of the colony.

It is said on good authority that at least one half of the athletes in the English Universities never intend to take degrees.

The \$100,000 library building presented to Yale by S. B. Chittenden, will be of red sandstone, four stories high and in the shape of a cross.

The United States has the largest number of representatives at Berlin University. The University of Virginia has more sons there than any other American college.

A Harvard Senior proposes to have a composite picture of his class, and one of the Senior class, at Wellesley made into one, which he will exhibit as a good type of the coming American.

Olivet College graduated a class of twenty-one, twelve ladies and nine gentlemen, eight of whom intend to enter the ministry. The incoming class has thirty or more, a large proportion of whom take the B. A. course.

Of the nineteen New England Colleges, the buildings, grounds, etc., are valued at \$9,647,500, whilst the ninety-seven Southern Colleges have buildings, etc., to the amount of \$8,016,750. The New England States pay per capita for college buildings and endowments \$5.51, and the Southern States \$1.91 per capita for the same purposes.

Congress has appropriated \$100,000 for the erection of a new astronomical observatory near Washington, with the understanding that the total cost is not to exceed \$400,000. Mr. Hunt, of New York, the architect appointed by the Secretary of the Navy, has been in Washington examining the site, and it is understood he is now at work upon the designs.

Carey, Harvard '85, who is at present taking a post graduate course there, has recently given \$25,000 for the purpose of erecting swimming baths in connection with the Hemenway Gymnasium. The tank is to be one hundred feet long by sixty wide. The building is also to be provided with one thousand lockers, and racket courts for court tennis.

## EXCHANGES.

*The Simpsonian* from Indianola, Ia., is a very creditable journal, but seems to lack systematic arrangement of contributions.

The Oberlin *Review* sends out an index for Vol. 14, which is completed with the June number. This college journal is one of the best, and the editorial and literary departments are well prepared, showing for the most part a desire to excel rather than to dispatch some unpleasant piece of work as quickly as possible.

The local column in a college paper is a very proper and important adjunct but the choice of items in some of our exchanges could be improved. For instance: *The Central Collegian*, of Fayette, Mo., could perhaps find more entertaining locals than the following: "Good-bye—hush—and Megrow—hush, I tell you—twinin'—whack—all right we will hush." "Jabug says if he wants to play 'horse-shoes' during study hours he is going to play." "Horn wants to join the W. C. T. U."

We clip the following from an humorous description of a visit to the Dakota Agricultural College. The entire article would be interesting but our space will permit but a small portion: "The many friends of Dr. McLouth will be pleased to read the following from the *Dakota Bell*: 'We had the pleasure one day this week of visiting the territorial agricultural college at Brookings. We found the president of the institution carefully examining a flax seed with a microscope under the impression that it was a chinch bug 'playing possum' on him. He grasped our hand warmly and invited us out to the experimental farm. 'The force at work is hardly so large as usual,' explained the president, 'owing to the fact that I have several of them locked up in the cellar for refusing to work digging the great holes necessary to plant the pumpkins. I reasoned like this: If they objected now, what will they do next Fall when it becomes necessary to dig the pumpkins, with, perhaps fifteen or twenty in a hill?'"—*The Moderator*.

*The Aurora* from the Iowa State Agricultural College, contains an article on "Does a College Education Pay?" which is a great credit to the journal and the author. It is written in a straightforward, clear and modest manner, at the same time presenting the author's views without apology. Under the head of "Percent of College Graduates" he presents these official records:

Presidents of the United States, 65 per cent have been graduates. Vice Presidents of the United States, 50 per cent have been graduates. Speakers of House of Representatives of the United States 61 per cent. Members of the United States Senate, 46 are graduates. Associate Justices of the Supreme Court, 73 per cent have been graduates. Chief Justices of the Supreme Court, 83 per cent. Cabinet officers, 54 per cent. General average of the above officers 59 per cent. have been graduates.

## REVIEWS.

### First Lessons in Agriculture.

Within the past few years, there has been much said in reference to the need of introducing agriculture into the common schools. Several elementary works have appeared from time to time. The task of writing a book suitable for an elementary text book in agriculture is doubtless very great. We have just received a copy of a little volume of 118 pages, with the above title, written and published by the author, at a cost of 75 cents. The successful man is F. A. Gulley, M. S., class of '80, Professor of Agriculture in the Mississippi Agricultural College. It is an excellent work, well suited to elementary classes, and by far the best of its kind that has come to our notice. The work is well done. It might, perhaps, be profitably enlarged by giving numerous examples to illustrate the brief parts or statements made, but we know that this would be well done by the author while using the book in his classes. We take a just pride in noticing the fact that Professor Gulley is a graduate of the Michigan Agricultural College, and that he has met with such eminent success in his chosen field of agriculture. The fact is, he was chosen for this work before he had completed his course in 1880. His success has been all that his friends predicted.

The following is the table of contents: Composition of matter, origin and formation of soils, composition of soil, composition of the plant, plant food in the soil, mechanical condition of the soil, effect of water on the soil and crop, farm drainage, preparation of the land for the crop, how plants grow, fertilization of the seed, improvement of varieties, cultivation of the crop, manure, commercial fertilizers, care of manure-composting, rotation of crops, farm live stock, diversified farming, food and manure value of crops.

We take the following notice from the *Breeders' Gazette*:

"The Mississippi Agricultural College at Starkville is taking high rank among the institutions of its class in this country on account of the good work being performed in the various branches receiving the attention of the very efficient faculty at that college. A large share of the reputation the school has earned seems due to Prof. F. A. Gulley, and we take pleasure in acknowledging the receipt of one of the most valuable little volumes connected with the literature of the farm that has ever come beneath our notice—"First Lessons in Agriculture," from Prof. Gulley's pen. In the brief space of 100 pages the Professor has laid down all the essential scientific principles underlying progressive farming in this country, and he is to be congratulated upon having compressed so much valuable matter into such small space." W. J. B.

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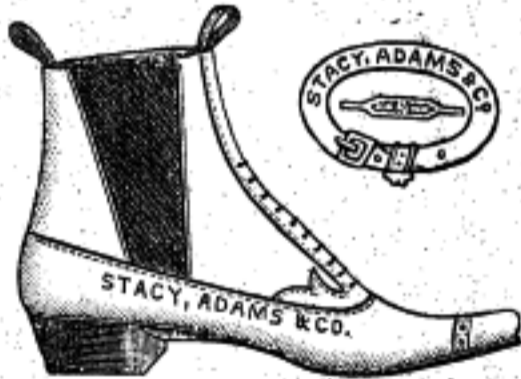
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