

THE SPECULUM.

VOLUME XIII.—No. 2. AGRICULTURAL COLLEGE, MICH., SEPT. 15, 1894. WHOLE NO. 80.

Address of President Daniel S. Strange Before the Alumni Association.

BROTHER ALUMNI—Again we have gathered to exchange kindly greeting, to grasp each other by the hand, to look each other in the eye, to scan the old familiar faces now marked by unfamiliar lines or fringed by looks of unfamiliar hue. We have gathered here amid the scenes which memory ever will recall as those amidst which happy days of youth were passed.

A few old buildings stand as landmarks of our day; the campus oaks are not much changed; the knolls and vales are where they were. But other things have changed. Stately halls adorn the grounds; the trees we planted in our youth are forests now; new shrubs and plants—quite like the old are everywhere. So of the friends we knew—only a few remain to bind with links of gold and hooks of steel our affections to the college of our youth. New forms and faces now adorn familiar chairs, but the spirit that pervades the whole, like the beauty and the fragrance of the flowers, is much the same as that we breathed and that which shaped our lives for good so many years ago.

The students friends we knew are now grown men. We gladly greet them here with scarcely more than time to say "How fare you now?"—then, "Fare you well!"—to ask after the friends of other days now scattered round the earth, of some we have not seen for years, of some we scarce can hope to see again, of others still whose forms will ne'er be seen by mortal eye.

We gladly now recall in this brief hour the memories of the past, our college pranks, our follies and our frailties as

well as the toilsome tasks we did and the lessons that we learned. With pleasure and with profit too, we spend an hour in the laboratories listening to our instructors of other days as they tell us of the triumphs they have won, of the new methods they have learned, of the new dresses, long and short, which infant science has donned since first she opened her eyes to smile into ours.

We have gathered here, no longer boys, but a band of educated men. Beyond the words of greeting and inquiry what themes should claim our thoughts for the brief hour that we remain? If some have won distinction in the realm of literature, poetry or art, it is well to hear from them in their especial fields of thought. If others have battled in the cause of right and won their spurs, we gladly hail them in their mount. If others have won distinction in research for truth we gladly learn of their discoveries. One alumni oration was but a thesis on the theme of "Storms," but it was by one of our number who knew more of storms than any other living man and proudly we listen at such a time.

But to me it seems unfit that we, assembled here, should glorify that which we should deprecate. College pranks may sometimes be excused, sometimes overlooked, their memory sometimes properly recalled. But theft is theft, and drunkenness at best is shame. An assembled band of educated men owing our education, in part, at least, directly to the kindness of our state and to the generosity of our nation, it were fitter far that we devote a little of our time to weighty questions of the state which now demand the thought of earnest men. One theme there is, above all other themes, which well may claim much of our thought, not only on triennial

days, but on all the days that lie between—the welfare of our Alma Mater.

A letter came to me recently, and doubtless copies to each one of you, asking for our best thought on themes such as these: "What do the farmers expect the college to do for them? For their boys? For their girls? Do they favor the mechanical course as an adjunct? Why do not more farmers' sons attend? Is the college course too long, expensive, or impracticable, or is a college course not thought to be essential? What changes can you suggest in the college course? In the policy of the college? Would a short and optional course of but two years be popular? What do you think of a short winter term of three months in dairying, stock-feeding or veterinary, or, once for all, a shorter question requiring answer covering all of these—what is the mission of our college?"

Lack of time forbids discussion now upon this theme, but take these questions with you to your homes to ponder there for three full years. I hope at our next meeting to hear these and kindred questions well discussed with earnest purpose in our souls.

Liberal Education and the State.

[Delivered by C. E. Smith, '84, before the Alumni Association. Reprinted from the Morenci Observer of Aug. 11, 1894.]

It is undoubtedly true that the average man does not receive the amount of direct benefit from a college education that the masses expect him to secure. The college man who engages in business or enters a profession very soon finds that he is unable to translate a Latin or Greek sentence, or solve a complex mathematical problem, and in the opinion of many the time spent in learning how to do these things that are afterward forgotten is thrown away. Those who take this view of education ignore the indirect effect of these years of training. They do not realize that the effort the student puts forth in solving the problems that were given him, the formation of the

habit of attention and study at an age when habits are easily formed, gives him a mental grasp which enables him to solve more readily the graver problems which come up in the affairs of life. He views mankind from a higher vantage ground and from this standpoint takes in a larger area. His standard as to how things ought to be done in the community at large has been raised.

There is employed throughout our land a vast army of talent in giving and directing the education of our young men and women. Millions of dollars are used in endowments and millions are paid out directly in furthering educational opportunities. Many of these institutions are supported by direct taxation and the question may well be asked, "Do the people receiving the benefit of this education return value received to the State for furnishing them these opportunities? Does it pay the State from a financial standpoint to support educational institutions?"

It is pertinent at this time, when portions of the country have been in a state bordering on anarchy, when all business has been stopped, when arson and riot have had full sway, when the honest laborer has been driven away from his work by force, when the governors in several of the States have been in open sympathy with the mob, when the loss of property has amounted to millions of dollars, to glance at some of the causes leading to this condition and see their relation to liberal education.

Our government is based upon the theory that it requires no especially educated class to administer its affairs. It was established with a belief that every man in the republic was qualified to fill any office to which he might be called. While this is not nor never has been true, the nation was fortunate in its early years in having for its leaders men of education, and the broad lines on which it was established show the effect of their wisdom. Many predicted that the republic would be a failure. Many hoped and plotted for its destruction. Movements and organizations of various kinds were inaugurated,

flourished for a time and passed away; but the republic lived.

We have a right to ask of any movement, "What has it done for man? Has it quickened the current of progress? Has it helped to advance man's social condition?" Our recent labor disturbances were brought about under the plea of advancing the cause of the man who toils.

The educated classes have the whole range of human history from which to reason and more naturally will draw correct conclusions regarding the effect of any political or social movement. They know that the expense of the recent disturbances will eventually be paid by the laborers themselves. Instead of helping their condition, it has placed upon them additional burdens. Had they been controlled by honest leaders, or had they numbered in their ranks a sufficient number belonging to the liberally educated classes, the whole trouble would have been avoided.

There are a class of demagogues who, having made a failure of life, seem to derive their only pleasure in arousing discontent and stirring up strife among the working classes. These parties become labor leaders and induce the workmen to believe that they are being ground down by the iron heel of capital. This talk in the man does no harm further than to arouse discontent and dissatisfaction. Very few believe in the anarchy that Santo practiced or that Herr Most preaches, but there is a kind of anarchy which these inflammatory speeches has aroused and that is the anarchy of persistently refusing to obey law. It is the anarchy illustrated during the recent railroad strikes when a mob jeers at the order of the United States court when it is being read to them. They have lost respect for law in the abstract, and not until companies of soldiers come to enforce the court's order do they obey. This is anarchy pure and simple, and it is even more pernicious, because it lacks the cheap frankness that carries the red flag and hurls the bomb. Of what avail is it to condole with France and Spain over the bloody crop of European anarchists that has grown up in their

midst if we support the American anarchy which masquerades among us under the lying disguise of labor agitation? Of what value are the lessons of history, of what value is our carefully perfected system of government, if license is to be substituted for liberty and labor is to go unprotected of law? We had to suffer the disgrace a few weeks ago, when all traffic was stopped in Chicago, of seeing the mayor go to Dictator Debs, at whose order all railroad men had quit work, and ask permission to run one train out of the stock yards. Think of it! The mayor of this great city, with all the police force and State troops at his back, instead of ordering the thing to be done and then seeing that his order was executed, goes to this self-constituted autocrat and asks permission to move a train, and why? Simply because the mayor thought by so doing that he could catch the labor vote which might be useful to him in carrying out his political ambitions; and this explains largely one of the causes of all the labor disturbances. The politicians toy and coquette with these people, overlooking minor offences for fear of losing votes, till by and by a crisis comes; then political party lines are dropped and we have to decide whether we shall stand with those who uphold law and order, or with those who are against it.

We say the politicians are at fault, and we may well ask who makes the politicians? The educated man pays too little attention to politics. He should make his influence felt in some political party. If the two great political parties could be led by their scholarly and thinking men many of the abuses of which we complain would cease. When a great painting is demanded the nation expects its geniuses to work at the canvas. When we wish to hear a song we must call on some one who can sing. If politics is the science of national life, national success, and happiness, each age should send into the field only its most capable men. Our nation has permitted its politics to become so degraded that the grossly ignorant oftentimes mistake themselves for statesmen. Unless

we who are not wage earners in the narrow sense, purify our methods of nominating, electing or appointing officials, or legislative bodies, we must not wonder at the use by the unscrupulous or reckless minority of wage workers of any weapons within their reach.

Some corporations are heartless and arrogant. They override law and it is not strange that their employes also lose respect for authority. It cannot be denied that the railroads have set examples of the boycott in the way some of them will band together to crush out a dangerous competitor. They openly violate the interstate commerce law and their relations to corrupt legislatures and assessors are open and notorious. Disregard of law on the part of railroads cannot be overlooked any more than on the part of rioters. Even-handed justice demands that both classes of offenders be punished.

The educated classes must stand as a bulwark against the inroads of anarchy. We had at a college commencement in a western State last summer the strange spectacle of a college professor attacking the very foundation of our social and political systems and preaching a refined anarchy. This was a proceeding so out of the ordinary that the governor of the State, who was present, felt called upon to reply to the pernicious doctrines set forth. The very fact that this episode was given such wide publicity shows that this professor was an exception and emphasizes the fact that society expects to find her educated classes solidly arrayed on the side of law and social order.

The occasional clashes of the forces of capital and labor are doubtless symptoms of evolution rather than revolution. The march of humanity has ever been onward and upward. Sometimes through bitterness, oftentimes through strife and bloodshed, but ever forward. We have faith to believe that the movement is still onward and will so continue.

The more widely we can disseminate the opportunities for liberal education, the more rapid will the march of progress be. Every well directed effort in this direction

is hastening the adjustment of these perplexed social questions. The education of the poor and middle classes is the thing most needed. A child who has never learned the lesson of obedience or respect for authority nearly always grows up to be a law-breaker. He cannot be otherwise. Unless he has had to obey at home, or has learned that lesson at school, he never learns it except by bitter experiences of life. With 79 per cent of a great city like Chicago of foreign parentage, with 44 per cent of our recent immigration coming from Russia, Poland, Austria, Hungary and Italy, where the standards of living are low and self-government hardly known, we place a tremendous problem before our public schools. There is no doubt but that our immigration laws should be revised and more strictly enforced. This would keep out many undesirable immigrants and lessen the menace to the republic from this source, but even then the burden is upon the public schools to bring these foreign born children into sympathy with American ideas. We have recently established in this country a national day known as flag day, thereby associating patriotism more closely with our school and making it essentially a part of a common school education. Humanity in general does not appreciate the responsibility that rests upon the public school teacher and the influence that he exerts in directing the thought of children. If there is any one duty more than another resting upon the educated classes, it is to use their influence in seeing that fitness is the main qualification to enable a teacher to secure a position or to be advanced to a higher one. It is a lamentable fact that many a time a teacher forces himself into a position through political maneuvering or treachery that would put to shame the methods employed in securing political positions in the depraved wards of our large cities. We all know the influence of a teacher in moulding the lives of the children about him. He should stand before them as an ideal of all that is noble and grand and true. Many a man can certify to

impulses received from such teachers that had changed the whole current of life. Think of the influence of a teacher unfit for the position to begin with, who secures and holds his position by means of political pulls. Can boards of control of our educational institutions never learn that the incalculable difference between a man of this class and one dowered with the divine power of sustained effort, one who can inspire others to do their best, who loves to work over ideas, and who has a sure calling and election to the intellectual life? No educated man can do a greater service for the State than by using his influence in seeing that the true teacher is recognized and promoted, and that those incapable of performing the teacher's duties are driven out of the profession. It is a pernicious doctrine that permits children or grown people to be taught that they have been robbed because some men have grown rich. Every invention, even though it may make the inventor enormously rich, contributes to the great fund of wealth, and every one has been benefited by it. The dissatisfaction and unrest which the pestilent social agitators are continually trying to arouse by an appeal to the destructive impulses of human nature has no place in a country like ours. There is no social condition so low that men have not risen from it, and they can still rise from it. With few exceptions the private wealth of our country has been accumulated by those who now possess it. Most of them began poor and humble, and by thrift, industry, economy and self-denial, they toiled up the ascent to present success. That road is still open. A large per cent of the men who will be rich fifty years hence are now poor, or they will be the sons of men now poor. It is only laggards, cowards and malcontents who would destroy or obstruct the way by which their children or they themselves might rise.

We see the republic at the close of a most momentous century in the history of human progress secure upon the sta-

ble foundation upon which it was formed. We have so far met every difficulty and triumphed over every danger, but the generations that have passed away have not exhausted the fields. There are still problems to be met and solved. Prosperity cannot exist among one class unless it exists among the others. The man who toils with his hands and the man who toils with his brain have a common interest. There are perhaps three things which are more likely to undermine the foundation of the republic than any others, and these are sectional jealousy, conflict of social classes and distrust of creeds. No nation can flourish if one part is hostile to another part. There can be no north, no south, no east, no west, but a united effort for the advancement of the interests of our common country. A liberal education will tend to develop a true and devoted American spirit. It will rise above narrow partisan views. It will develop intelligence in thought and action, both within and without political party lines. It will not permit social caste or religious creed to be the basis of a man's fitness for office, or of his devotion to American ideas. It compels him to realize that political organizations must be without regard to whether their associates were born here or abroad, whether they are Catholic or Protestant, Jew or Gentile, bankers or bakers, professional men or artisans. The man with a liberal education is bound to hate bigotry wherever it lifts its head, but he will not lend himself to a movement that would proclaim every man a bigot because he embraces a certain religious faith.

A liberal education impresses the responsibility of the individual. If less energy were expended on the part of social reformers and their sympathizers in trying to transform all the world at once and each individual would exercise what influence he could in bringing about a better condition of affairs in his own little circle of acquaintance and influence, an impulse would be given to advancement

in social conditions that would bring about a social revolution. The Christian religion emphasized the emancipation of the individual and its central thought is the idea of stewardship, "I gave thee so many talents, what hast thou done with them?" In the divine economy, I see no reason why some men may not be as divinely called to make money as to lead nations or command armies or conduct great social reforms. The manner in which they use their wealth is the thing for which they will be held responsible. The earth was made for man, but it is not necessary that it should be exactly the same to each one, nor is it required that the earth and the fullness thereof should be equally divided among all its inhabitants.

There was given to man in the beginning a very simple world, but its possibilities were infinite. We must therefore conceive of man as marching from one to infinity.

New ideas must come each day. There can be no such thing as a fixed social life or politics or religion. The world will make new thoughts. Kings have attempted to make the human race stand still, but not all the power of empires has availed to keep crowns from falling and liberty from springing up from the dust. The Calvinists attempted to make their creed perpetual, but what flourished so triumphantly in a past century dies suddenly in this period. The Roman Catholic church is carried along by the same irresistible growth of the race and boasting of being founded on a rock still finds that the rock moves. The laws of the universe do not know any difference between the Catholic and the Protestant, the Republican and Democratic. It cries out to all, march on, and all the powers of money, church and state cannot shackle the human intellect or bind the brain of man in chains.

The state has nought to fear if she keeps her citizens liberally educated and she can make no better investment than to aid in every possible way in increasing the opportunities for education. It is

from the ignorant and depraved classes, in the main, that the foes of human liberty arise. It is the problem of our age to find that politics, that morals, that social philosophy, that religion that shall give the greatest aid in man's development. Let us study these problems. Let us remember that our institutions are on trial and can be preserved only by a free and intelligent people. There was inscribed on that magnificent peristyle in the beautiful Court of Honor at the World's Fair an old prophecy, which, by honest and earnest efforts on the part of all good citizens, will in the evolution of the years become more and more a reality, "Ye shall know the truth and the truth shall make you free."

S C I E N T I F I C.

Rambling Notes on Plant Breeding.

BY W. M. MUNSON, CLASS OF '88.

(Professor of Horticulture in the Maine State College.)

Previous to the beginning of the seventeenth century, little was known about the phenomena of plant life save that which may be learned from dealing with plants in the practical operations of general agriculture and gardening. It was known, for instance, that roots serve to fix the plants in the soil and to supply them with food; that buds develop into shoots and that blossoms precede fruits and seeds. But so far as known there was only a very indistinct notion as to the connection between the essential organs of flowers and the formation of perfect seeds.

Since the time of Aristotle, comparisons have been drawn between vegetable and animal life. Most of the older philosophers and botanists, however, regarded the production of seed as a mere process of development, analogous to the production of leaves. In the time of Pliny naturalists recognized a sexual difference in

plants; but this difference was not associated with the process of reproduction. Plants were distinguished as male and female but because of the teleological view of the nature of organs held at this time, the comparison with animal reproduction was not drawn to its logical conclusion.

To Rudolph Jacob Camerarius we are indebted for the establishment by careful experiment (1691-94,) of the fact of true sexuality in plants. The work of Camerarius was verified by Kœlreuter and Sprengel some eighty years later; but these men were in advance of their time and received little encouragement. In spite of the conclusions of Kœlreuter and Sprengel, of Knight, of Herbert, and of Joseph Gärtner many able botanists doubted the general prevalence of sexuality in plants even so late as 1830.

Just a century ago, in 1793, Konrad Sprengel published a work on the "Fertilization of Flowers," in which the principle afterwards more fully worked out by Darwin, that nature as a rule provides for cross-fertilization, was suggested; but not until the appearance of Darwin's admirable work on "Cross and Self-Fertilization in the Vegetable Kingdom," in 1876, was the importance of cross-fertilization and of the proper selection of male and female parents realized to any great extent. Not until that time were there any important systematic efforts made to apply the principles of selection with a view to transmitting certain definite qualities to offspring.

There are about 107,000 species of flowering plants, and of these 4,233 species are known to have furnished food for man at some time—either habitually or during famine periods. Of this number about one-fourth, or more than 1,000 species, are or have at sometime been cultivated for human food. At the present time there are about 300 different species under cultivation to an important extent. But many of these species present varieties almost without number, *e. g.* the apple and pear have each given more than 3,000 named varieties; the potato nearly 1,000 varieties; wheat 400; corn 200; cabbage

200; pea and bean each 150, and other species from 10 to 100 or more.

Now the development of this great number of varieties and forms has been the gradual outgrowth, in many cases, of centuries of care and selection on the part of man. The apple, the pear, the bean, the cabbage, wheat and some others are known to have been under cultivation for more than 4,000 years; while most of our cultivated fruits and vegetables have been cultivated for from 500 to 2,000 years.

In the progress of civilization the beginnings are necessarily limited. There are many steps between the half savage custom of gathering roots and wild fruits and the intelligent culture of the plants producing edible parts. Through all the ages nature has been producing plants best fitted to meet the struggle for existence. She has been developing plants of the strongest constitutions and with organs best fitted for self-perpetuation, regardless of other features. It remained for man to develop those organs best suited to his needs; and this he has done, regardless of the natural requirements of the species, to such an extent that some species would be utterly incapable of existence if dropped from cultivation.

Very few plants now cultivated appear worthy of cultivation in the wild state, *e. g.* the radish in its wild state closely resembles the wild charlock—*raphanus raphanistrum*—a serious pest in the fields throughout New England. The potato in its wild state gives hardly a suggestion of the White Elephants or the Hebrons or the Burbanks of to-day. The tomato, long grown as a curiosity and called even within the memory of some now living, the "love apple," is very small and insignificant in its wild state; while the apple is scarcely larger than a wild cherry.

The first step in the improvement of plants was the observation by man that certain plants were good for food. Darwin says man was first attracted to edible plants by observing that the apes used them for food. Necessity is an important factor in directing the first step. The transfer of edible plants to the place of

habitation was a very natural second step. Usually the plants were those growing in the immediate vicinity, so that this step consisted simply in affording better environment. In some cases, however, plants were obtained from relatively distant places, thus involving the principal of *acclimatization*, which, at the present day, is regarded as of the greatest importance.

The selection of the best individual plants constituted the next step in the scale of improvement; and until a comparatively recent date this was the highest point reached. But during the last twenty years a marked advance has been made in the application of the laws of heredity to the production of improved types.

Breeders of fine stock are not unmindful of the importance of pedigree. A Sunol and a Nancy Hanks are not the chance product of the prairie. They are the result of careful crossing and selection with a definite end in view. The phenomenal dairy cows of the present day have been obtained in similar ways, and we know that very different methods are followed in producing different types. So in the vegetable kingdom, crossing and selection, combined with suitable environment and intelligent culture—in other words, careful *breeding*—with certain fixed types in view, afford a fascinating field for investigation and one of the highest importance in its bearing upon practical agriculture.

It is perhaps unnecessary at this time to go into details concerning the act of pollination or the process of fertilization. Suffice it to say in the mechanical operation of crossing plants, the first act is to emasculate the flower intended as the female parent. This done, the flower is covered with a paper or muslin bag till the stigma matures, when pollen from the individual designed as the male parent is applied and the flower is again covered to await development of fruit. (In careful work the male parent is also covered with a bag to prevent any admixture of foreign pollen.) If one-half

of the pollinations made are effective in producing fruit, even with those plants which cross very readily, the results are highly satisfactory.

It is well proved, as stated by Bailey in a recent lecture, "that crossing is good for the resulting offspring because the differences between the parents carry over new combinations of characters, or at least new powers into the crosses. It is a process of revitalization." Darwin was the first to show the value of this revitalizing of offspring and that this is the ultimate end of cross-fertilization. He showed that "self-fertilization tends to weaken the offspring as compared with its natural condition; that crossing between different plants of the same variety gives stronger and more productive offspring than arises from self-fertilization; that crossing between stocks of the same variety grown in different places or under different conditions gives better offspring than crossing between different plants grown in the same place or under similar conditions." He also showed that as a rule flowers are arranged so as to provide for cross-fertilization. In fact the whole matter is summed up in the one aphorism used by Darwin: "Nature abhors perpetual self-fertilization."

The limits to which cross-breeding is either possible or profitable are not yet well understood. We have accepted the principle that occasional crossing of closely related plants—plants of the same species—is beneficial in strengthening the offspring; but crossing plants of different species tends to produce variable offspring, and if the difference in the parents is wide, the offspring is often weakened. So the famous aphorism of Darwin is changed by Bailey to read: "Nature abhors both perpetual self-fertilization and hybridization."

Some of the most valued products of garden and conservatory are the results of hybridization—crossing between different species. In some groups of plants, however, hybrids are very rare and difficult to obtain, while in others hybrids are frequent. For example, the mustard

family, which includes some of the most important garden vegetables, has very few hybrids, while the different species of the orchid family cross very freely.

As a rule, closely related species will cross readily, while widely different species cross with difficulty. But here again is a rule which has very marked exceptions. It seems impossible to cross any of the varieties of the winter squash—*Cucurbita maxima*—such as Hubbard, Sibley, etc., with varieties of summer squash or with the pumpkin—*Cucurbita pepo*; while we feel safe in saying the cucumber and the musk melon cannot be crossed. In common with animals, cultivated plants cross much more readily than do wild plants of the same species. An illustration of this fact is the successful cross between the peach and the plum—but the offspring of this union was a mule (i. e. a sterile hybrid).

Any one can perform the mechanical operation of crossing plants, but the haphazard uniting of individuals is of little value. To breed plants intelligently I have said we must have a distinct type in mind and work toward our ideal. In order to do this, we must have some conception of the effects likely to be produced. The effects of crossing may be considered under three distinct groups: Immediate effect on the parent fruit; seminal effect, or the effect on offspring; secondary effects, including all other manifestations of influence.

Immediate effect of pollen on the parent fruit may properly be considered a secondary effect of crossing, since the prime object of all pollination is the production of seed; but because of its importance it is usually considered as a distinct question. There has long been a warm discussion as to whether there are any immediate external effects of crossing. The evidence at hand at the present time would indicate that within certain restricted limits there is an immediate visible effect of pollen—as seen in the pea, the bean and Indian corn. On the other hand, it is equally certain that the greater portion of food plants which

have received special study do not exhibit immediate effects of pollen, while other species are in dispute. Thus the question remains one of the “unsolved problems.”

The most prominent effects of crossing, as would be expected, are seen in the offspring; and it is of the greatest importance that care be used in the selection of parents. If the parents are very different in character the offspring will probably be weak. In other words, beyond certain limits, the more violent the cross the weaker the offspring. But as before stated, the converse is also true; a cross between closely related species or races is more vigorous than its parent.

In breeding plants, as with animals the same general rule holds: Never breed for more than one character at once. If breeding for color and it is wished to retain size and form, it is important that there should be no contradiction of these characters in the parents.

In selecting parents the question naturally arises as to which shall be made the male and which the female parent in order to produce certain probable results. It was formally held that in case of a hybrid the female parent gives constitution and vigor, while the male parent gives form, size, color, etc. At the present time, however, it is generally conceded that the results will approximately the same, no matter which is used as the male or the female parent. It is not always possible, however, to select our male and female parents at will. In other words, reciprocal crosses are not always possible. For example, I may cross a yellow bush scalloped squash with the summer crook-neck, but I have never yet been able to cross the crook-neck with the bush scalloped. Other cases of a similar nature are not infrequent. Why this failure? Is it due to a constitutional peculiarity; to the form of the ovarium; to a weakness of the pollen of the one species or variety, or what may be the underlying cause? Here again is an unsolved problem.

I might speak of some of the secondary

effects of pollination; of the effect on form and size of fruit; of the stimulating effect of pollen; of the possibility of superfoetation; and other related questions which seem of much importance in the study of plant breeding, but these rambling notes are already far too extended.

But what is the significance of all this talk about breeding? From the earliest times, by conscious and by unconscious selection; by natural and by artificial intercrossing; by culture; by protection; by care—in other words by *breeding*, our cultivated plants have been brought to their present state. They now demand the same watchful care on the part of the grower, as is required from the breeder of the better classes of horses, sheep and cattle. Well bred plants, as is true of well bred animals, can not stand neglect as well as can native stock.

As before noted, the highest step in the improvement of plants—that of cross-breeding—is of comparatively recent origin. It is the climax of all effort in this direction, and to it we must look in our endeavors to secure hardy or otherwise desirable sorts of fruits and vegetables in the shortest possible time. In this way we may hope to unite the quality of more southern varieties with the hardiness and productiveness of our northern sorts.

The field is new and promising. The expense as compared with that attending stock-breeding is slight; while the results are more quickly known and are far-reaching in their value. To insure the best results, however, we must first learn more of the laws obtaining in this branch of science; we must know more of the relations between cause and effect, that we may proceed along the most profitable lines. But in the search after laws we may follow the principles already established, and may use those plants which are of economic importance, that perchance the preliminary work may not be without immediate practical value.

The freshman class has sixty-seven members, four of which are ladies.

THE SPECULUM.

PUBLISHED MONTHLY DURING THE COLLEGE YEAR,
BY THE STUDENTS
OF THE MICHIGAN STATE AGRICULTURAL COLLEGE.

TERMS, 75 CENTS A YEAR; SINGLE NUMBERS, 10 CENTS
ADVERTISING RATES MADE KNOWN ON APPLICATION.

All subscriptions will be regarded as continued, unless we are notified to the contrary.

BOARD OF CONTROL.

W. C. BAGLEY, Phi Delta Theta Fraternity,
Editor-in-Chief.

ASSOCIATE EDITORS.

F. L. REYNOLDS, Delta Tau Delta Fraternity.	C. P. CLOSE, Olympic Society.
G. MASSELINK, Union Literary Society.	H. F. LAKE, Hesperian Society.
W. C. STEBBINS, Eclectic Society.	S. H. FULTON, Columbian Society.

M. W. FULTON,	Business Manager.
I. L. SIMMONS,	Asst. Business Manager.
SEC. I. H. BUTTERFIELD,	Treasurer.

AGRICULTURAL COLLEGE, SEPT. 15, 1894.

Notice to Subscribers.

The business management has found it necessary to require all subscriptions to be paid in advance hereafter. If you are in arrears with your subscription please attend to the matter at once, otherwise your names will be dropped from our subscription list. Address all business communications to

M. W. FULTON,
Business Manager.

ANOTHER college year with its round of work and pleasure is upon us,—dull, monotonous work, with but little time for enjoyment, it may seem to some—to others it may be a work full of life and interest, the performance of which is pleasure in itself, but whatever it may be, whatever the year before us may have in store, we have done our part, if with strong, united effort, we strive for the prosperity of the college and the welfare of those which it shelters. Discord—

whether between students and faculty, or within the ranks of either—discord can never fail to work evil. If the goal is to be reached, there must be harmony—harmony of will, harmony of spirit, harmony of purpose. This alone, is the condition of progress.

THE SPECULUM would call attention to the remarks made by Dr. Edwards at a recent meeting of the Bible class as indicative of a sentiment which exists in the mind of every self-respecting student. Hazing, in any form, is a relic of that past which we would all forget. While the incoming student should neither be fawned upon nor toadied to by the upper classmen, yet he demands, and in most instances (unfortunately there are some exceptions) he deserves the treatment accorded to a gentleman. The peculiar ethics of college life require a somewhat extended course of study before they can be mastered by the novice, and until such knowledge can be gained, at least, the experienced should be lenient with the failings of the initiate. Even the traditional sophomore should be able to do this without sacrificing a great deal of his characteristic dignity.

THROUGH the wisdom of the powers that be, our campus is now partially relieved from the mediæval gloom, which was wont, after nightfall, to envelop it like a curtain. While we appreciate this evidence of wisdom, it seems to us that a little better judgment might have been exercised in the distribution of the lamps. Why the neighborhood back of the green house is so brilliantly illuminated when the main drive from the West Gate to College Hall is in almost total darkness; why a double row of lights adorns Faculty Row, when, between the five principal college buildings, the nightly wanderer must still guide his course by the stars—these are questions, which, to the chance observer, are puzzling, to say the least.

THE new arrangement of the library hours seems most unfortunate. Under the system which was in operation until this term, the library was open from seven in the morning until twelve at noon, from half past twelve until six in the afternoon and from half past six until half past nine in the evening. These were hours that could accommodate everyone. To be sure they were longer than in most college libraries, but it must be remembered that the time of students here is taken up during the day almost entirely by classes, farm and shop labor, and laboratory work, so that practically the only time that can be spent in the library consists of the spare moments just before chapel, directly after dinner and before study hours in the evening. By the new arrangement the library is closed during just these periods. Another change, seemingly unwise, is the closing of the library on Sunday morning. The library is used more during this period than at any other, save, perhaps, during the afternoon of the same day. Upon what plea changes so deleterious to the college could have been made is hard to imagine. It is to be hoped that the old system will soon be revived.

THE *Union Lit* takes exception to the remarks made in the last issue of THE SPECULUM concerning society publications. "In the various societies," says the *Union Lit*, "there was a demand which THE SPECULUM did not and could not meet. * * * Its managers would not, could not, in justice to the whole college, publish matters of a private nature." THE SPECULUM has already conceded the latter statement and suggested a remedy by which such matters could be published without injury to anyone. This point was conceded not because we considered such matter unworthy of publication, but because we considered it of such nature as would forbid its being made public. In case such matter can be made public it may appear in THE SPECULUM with as much propriety as in any other paper of open circulation.

The *Union Lit* next makes the statement that THE SPECULUM has not lost a U. L. S. member from its mailing list since the first publication of their paper. It might be well to remark in this connection that several subscribers to THE SPECULUM, while they still appear on our lists are in arrears for their subscriptions, and evidently have their wants supplied elsewhere. Be that as it may, the *Union Lit* is entirely evading the point in making this statement, as THE SPECULUM in criticising the society publications was not attempting to defend itself so much from present dangers as from those which are likely to threaten it in the future. It cannot be denied that the Alumnus who receives all the important news of the college and that portion of the Alumni in which he is most interested, by means of his society paper, can after a time find it possible to get along without THE SPECULUM.

COLLEGE NEWS.

FROM BOTANICAL LABORATORY.

There is an extra class in botany at 5 o'clock, to accommodate juniors who are back in that subject.

The addition to the botanic garden is now ready for the setting out of plants. The seed for the grass walks has already been sown.

NOTES FROM THE HORTICULTURAL DEPARTMENT.

Mr. H. F. Dunning will be assistant superintendent in the poultry department at the State fair.

The demand for the July *Raspberry Bulletin* has been so great that the supply, 8,500 copies, is exhausted. A second edition of 2,000 copies has been ordered.

One of the important needs of the college, demonstrated by this summer's drought, is a sufficient supply of water with which to water the lawns, and the vegetables and fruit trees of the gardens.

The poultry house and yards are completed and will be stocked with birds about Oct. 1. Incubators will be running by that time. At present there are on hand seven of the leading varieties of chickens.

Prof. S. B. Heiges, chief of the Division of Pomology of the Department of Agriculture at Washington, visited the college Saturday, Aug. 26. The professor attended the State Horticultural Society meeting at South Haven and made a trip through the peach growing section of the State.

Professors Taft and Davis attended the summer

meeting of the State Horticultural Society at South Haven, Aug. 21-23. Several subjects of discussion were, Injurious Insects, Diseases of Fruits and the Necessity and Methods of Irrigation. The fruit growers of the lake shore were present in large numbers and nearly all took occasion to visit the sub-experiment station. They expressed satisfaction with the work being done there.

The Horticultural Department will make quite an exhibit at the State fair in the line of wax fruits, models of vegetables, garden seeds, novelties in vegetables grown this year in the gardens, and new varieties of apples and pears. There will also be shown methods of pruning fruit trees, methods of grafting and budding, drawings illustrating propagation of plants, methods of greenhouse construction, and the more common diseases of fruits and vegetables together with insecticides and fungicides.

ABOUT THE CAMPUS.

Who said the faculty was leaky?

The sheds for visitors' horses are completed.

The roof of the observatory is being repaired.

We are pleased to hear that Mrs. Weil is rapidly recovering.

The total number of classification cards taken out this term is 250.

Miss Lillian Wheeler expects to start for California the first of next month.

The annual report of the State Board of Agriculture for 1893 has been published.

Professor Smith's mother started for New York State, Aug. 23d, on a vacation trip.

Mr. and Mrs. William Kedzie were the guests of their brother, Dr. Kedzie, last week.

Miss Bertha Holdsworth, niece of Prof. Holdsworth, has entered the regular college work.

Mrs. Woodward, of Evanston, Ill., is staying with her daughter, Mrs. P. M. Chamberlain.

Mrs. Philip B. Woodworth and her son, Paul, are visiting the Woodworth family at Centreville.

Mrs. Nellie Kedzie, Professor of domestic economy, at the Kansas Agricultural College has returned to her home.

All of the old rubbish stored in Abbott Hall basement has been removed and consecrated to the flames.

Mr. and Mrs. Barclay, who spent the summer here with their daughter, Mrs. Noble, have returned to their home in Iowa.

Professor Vedder attended the August meeting of the Society for the Promotion of Engineering Education held at Brooklyn, N. Y.

Prof. G. C. Davis attended the Convention of the American Association of Economic Entomologists at Brooklyn during vacation.

Mr. Etheridge, of Chicago, Mrs. Snell, of St. Johns-

ville, N. Y., and Miss Dorothea Vedder, of Ithaca, N. Y., are the guests of Prof. and Mrs. Vedder.

The entire heating system of Abbot Hall has been taken out and the library furnace with a new system of pipes and radiators is being put in.

The class rooms on the second floor of College Hall are being wired for electric lights. They will be operated from the experimental Brush dynamo.

L. C. Brooks will have charge of the mechanical and horticultural exhibits at the State Fair. H. E. Van Norman will have charge of the dairy exhibit.

Numbers four and five of the series of press bulletins were issued during August. Number four is on the "Stinking Smut of Wheat." Number five treats of "The Russian Thistle."

The Street Car Company will furnish wire and current and the college will furnish poles and lamps to light about sixty rods of the road from the entrance toward the president's house.

At the greenhouse are several semi-tropical plants in fruit—the *Musa cavendishii* or dwarf banana; the *Musa sapientum* or regular banana of commerce; a guava, and a pomegranate.

President Gorton and Professor Smith attended the Tri-State Grange picnic at Bawbeese Park near Hillsdale, on Aug. 22. President Gorton gave an address on Agricultural Education.

About 160 of the college population attended the Y. M. C. A. reception. A well prepared program was rendered, after which the remainder of the evening was spent in social games and conversation.

Dr. Kedzie has lately received a Fairbanks patent improved grain tester for ascertaining the exact weight of a bushel of any kind of grain and the percentage of dirt or foul seed in the grain.

An effort is being made to get the Michigan Weather Bureau transferred to Lansing and placed under the control of the State Board of Agriculture. The object is to make the bureau of more service to farmers.

On Thursday, Sept. 6, President Gorton and Doctors Kedzie and Beal attended the funeral of Helen Wells, daughter of Hon. Franklin Wells, of Constantine. A beautiful floral tribute was sent from the college.

Lieutenant E. A. Lewis is at Fort Leavenworth, Kansas, attending the examinations for promotion. The lieutenant is the only man in the division of the army to which he is assigned, who is taking the examination.

Arsenti Ovsyankin, of Verkhné-Udinsk, near Lake Baikal, Siberia, who was a student here two months, has left for Hamburg, Germany, on his way home to Siberia. Mr. Ovsyankin is an old schoolmate of V. Sobennikoff's.

Two weeks ago Dr. Grange was called to Manistee to investigate a reported outbreak of foot and mouth disease among cattle at that place. While the disease

resembled the foot and mouth disease of Europe yet it was not the same. Late reports state that the affected animals, about twenty in all, are cured.

The faculty, out of the innate kindness of its heart, excused students from all college duties on the afternoon of Labor Day, Sept. 3. Many of the students availed themselves of the opportunity to attend the races at the fair grounds. Several of the boys participated and were successful in winning prizes.

Prof. Crozier has made some observations in regard to the production of seed in the Canada thistle. In some patches of thistles the flowers are all staminate, in other patches they are all pistillate. In the neighborhood of the college only two patches have been found that have perfect flowers and will produce seed.

The *Northwestern Farmer* published at Winnipeg, Manitoba, has considered the veterinary bulletin, No. 110, by Dr. E. A. A. Grange of sufficient importance to be published entire in its columns. It has even gone to the expense of making cuts showing the points of interest in the horse exactly as is shown in the bulletin.

Hon. Alpha Messer, lecturer of the National Grange, made the college a second visit on Monday, Aug. 27. Mr. Messer is also master of the State Grange of Vermont and is intimately acquainted with the work done in agriculture in the colleges of New England. He expressed himself as highly pleased, both with the equipment of M. A. C. in agriculture and horticulture, and with the methods of instruction. He took special note of the student labor and regarded that system as one of the most important features of our college. He noted also the many improvements made since his former visit in 1887 and thought they indicated a healthy growth.

FARM DEPARTMENT NOTES.

Fifty-eight acres of oats on the farm gave a yield of 2,400 bushels.

The first crop of *Lathyrus silvestris* produced an abundance of hay, but little or no seed. The second crop produced good seed.

The variety test of wheat gave the following yields per acre: Poole, 38 bu.; Egyptian, 38 bu.; Rudy, 36 bu.; Deihl Mediterranean, 36 bu.; Clawson, 34 bu.; and Early Red Clawson, 32 bu.

Sparks from an engine on the D. L. & N. Railroad started a fire which burned over about one-half of field No. 16. Fire has also been raging in the south woods where one-half mile of rail fence has been burned.

Ninety bushels of golden shaft seed wheat from Canada has been received by the Agricultural Department, and has been distributed to farmers of the State. Three bushels of Currell wheat has been received from Kansas, and will be sown for experiment on the farm.

A comparative feeding experiment with pigs is being conducted to test the relative value of ground

and unground wheat, with a limited amount of fresh skim milk. The pigs are divided into two lots of five each. The object is to ascertain what the value of wheat is for fattening swine at the present low price of the grain.

The Angoumois grain moth is creating quite a disturbance in the agricultural museum. The world's fair grain exhibit, both in the little boxes and the large cases, is being badly eaten and filled with the web and dirt made by the little caterpillar. This grain moth is a serious pest in the south, but it seldom comes this far north. Undoubtedly it was brought to the agricultural building in the exhibit from some other state, and was then brought with our exhibit when it returned from Chicago. Several students are now busily at work on the exhibit with bisulphide of carbon and corrosive sublimate and no doubt will soon banish the intruder.

FROM OUR MECHANICAL DEPARTMENT.

The foundry, blacksmith shop, testing room, turning room, and wash room have recently been painted.

During vacation the machinery was overhauled, and some uncompleted machines were brought very near completion.

Mr. Bender has resigned his position as foreman in the wood shop. Mr. C. E. Hoyt of Wayland, Michigan, has been temporarily appointed to fill the vacancy.

In the wood shop students are working entirely from blue prints as in actual practice. This has been the custom to some extent in the machine shop, and the number of available drawings for this purpose has been enlarged. A similar set of drawings has been gotten out for blacksmith shop work.

The Mechanical Department now has quite a complete equipment of patterns and drawings for electric motors and dynamos. Prof. Woodworth, on a recent trip, seeing an excellent opportunity to purchase such an equipment, made known the fact to this department and advantage was taken of the opportunity.

FROM THE BOTANICAL LABORATORY.

Harper's Weekly of August 15 is doubly interesting to its readers at M. A. C. from the fact of its containing excellent likenesses of Prof. W. J. Beal of the Agricultural College and Dr. Manley Miles of Lansing. They are taken in a group of American scientists, the occasion being the annual meeting of the American Association for the Advancement of Science held at Brooklyn, N. Y., August 15.

During vacation Dr. Beal attended the American Association for Advancement of Science at Brooklyn, and read a paper on "The Sugar Maples of Central Michigan." At the meeting of the Botanical Club of the above named association he read a paper on "Artificial Keys for Grasses." Before the Society for the Promotion of Agricultural Science, the doctor read a paper on "The Vitality of Clover Seed" and "Seed of Weeds Buried in the Soil Fifteen years."

Professor Wheeler was sent to Charlevoix by the station council to investigate a report of the presence Russian thistle at that place. The genuine Russian thistle is there, but is confined to a space of about two hundred feet along one of the principal streets of the village. It was probably introduced by means of bailed hay shipped in from the northwest where the thistle is prevalent. The professor brought back thirty-five plants which have been pressed and will be sent to different towns along the eastern shore of Lake Michigan for the purpose of giving people an idea of the appearance of the pest, that they may recognize it should it appear.

A FARMERS' PICNIC.

The tri-county farmers' picnic held at M. A. C. on Friday, August 24th, was a complete success. The jolly picnickers began to arrive at 7 o'clock A. M. and soon hundreds were scattered over the campus visiting all points of interest. The management states that 3,500 people attended the picnic. Everything was arranged to accommodate the crowd as far as possible. Guides were all about the buildings and grounds to show things of interest to visitors and a check room in the armory was provided for their accommodation.

Some of the people were taken in by a practical joke which several students could not resist playing. Signs setting forth the wonders of a museum of wax figures were posted about one of the entrances of Wells hall. About 250 people climbed three long flights of stairs to find nothing but an empty hall-way with a row of locked doors on each side. Most of them returned smiling, while a few "couldn't see anything funny about it."

Dinner was served at noon and by 1 o'clock all was in readiness for the toasts which were to be given in the armory. The armory was crowded with people, and yet it seemed to make no diminution in the crowd outside which was scattered about the campus.

F. A. Osborne responded to "The Farmer as a Spoke in the Political Wheel;" Mrs. Amanda Gunnison responded to "Co-education at M. A. C.;" G. Carpenter responded to "A typical Hen's nest;" Mrs. H. C. Everette to "Fresh air;" and Jerome Dell to "The Gates Ajar."

After a short intermission the Eclectic Society orchestra rendered a selection which was followed by an address of welcome by President L. G. Gorton. The Union Literary Society string quartet entertained the audience with a selection, and Hon. O. G. Pennell was called upon to respond to President Gorton's welcome. George Fisher of the college sang a solo, after which the Hon. Alpha Messer, Lecturer the National Grange, spoke on "The Grange."

At four o'clock the visitors assembled on the drill ground to see the cadets drill, after which they went their several ways home.

PERSONALS.

We desire the earnest co-operation of every person who has ever been connected with the college in trying to make this department an interesting one. Let every alumnus and every person who has been with classes here send in news to the editor of the department, often, thus making his work much easier and the department more interesting to all.

REUNION NOTES.

The triennial reunion of 1894 will long be remembered by those who were present as the most successful and happiest reunion ever held at the college. The "old boys" came from all over the United States to visit at least once more their Alma Mater and to shake hands with friends who had become almost as dear as brothers while working for a common cause during their stay at M. A. C. The hearty laugh was passed around frequently and all had a pleasant and profitable time.

The alumni dinner was served in College hall on Friday at 2 P. M. Tables were spread in the chapel for 300 and still more than 100 more compelled to eat on the lawn. The toastmaster for the occasion was Hon. Chas. Garfield. The toasts were interesting, well rendered, and brought back to mind many incidents of former days.

After dinner, about 5 P. M., the alumni adjourned to the chemical laboratory and transacted the necessary business of the association.

A proposition to publish a scientific quarterly was discussed to some extent but nothing definite was decided.

The following officers were elected:

Business Officers--President, M. D. Chatterton, '61; vice president, C. J. Foreman, '94; secretary, F. S. Kedzie, '77; treasurer, P. B. Woodworth, '86.

Literary officers--Orator, J. W. Beaumont, '82; alternate, C. B. Collingwood, '85.

Poet--J. E. Hammond, '87; alternate, Chas. H. Hoyt, '85.

Historian--W. Babcock, '89; alternate, Jas. Satterlee, '69.

After some discussion on matters of local importance, the association adjourned until 1897.

At 8 o'clock the alumni program was rendered in the armory. The program was an excellent one in every respect. It showed that the graduates of M. A. C. possess literary as well as business abilities.

The president's address by D. Strange of '67 called attention to the many changes that had been wrought in the institution during the last few years. It proposed some important questions as to the changes in the course of study, such as a shorter course and special courses in dairying and veterinary.

The historian, O. C. Howe, of '83, began with some pleasing references to the first days in college. He gave a very thorough and complete sketch of the nine graduates who had died since 1891.

"Education and its Relation to the State" was the subject of an oration by C. E. Smith of '84. Among

other things, he gave a good exposition of the recent labor troubles and cited as the main cause the lack of a liberal education. He particularly emphasized the influence of the teacher on the future citizens of our nation. The address is published in full in another part of THE SPECULUM.

A poem written by H. W. Collingwood of '83 and read by C. B. Collingwood of '85, was an excellent tribute to old college days. Old stories, yet ever new, were presented in an attractive and very interesting manner.

The invitation, "Come, and trip it as ye go, on the light fantastic toe" was accepted by many and kept up till a late hour.

The next day nearly all went home well satisfied, and with the feeling that the bonds of friendship and patriotism which connects them with their Alma Mater had been renewed and strengthened.

The following alumni registered at the physical laboratory:

Chas. E. Hollister.	'61.
M. D. Chatterton, A. Gunnison.	WITH '61.
S. M. Millard.	'64.
W. B. Cobb, D. Strange, H. H. Jennison.	'67.
Geo. T. Beasley.	'68.
J. S. Strange.	'69.
B. E. Benedict and wife.	WITH '69.
C. W. Garfield.	'70.
J. Sessions and wife.	'74.
Chas. Goodwin.	'75.
Jas. Brassington, C. B. Fiskbangs, G. M. Morse, J. D. Stannard, Ira B. Gage.	'76.
Z. Beverly.	WITH '76.
F. S. Kedzie and wife, C. I. Goodwin and wife, W. C. Latta.	'77.
W. K. Pruden, G. E. Buck, A. A. Robinson, J. Troop, E. Daveport and wife, W. S. Holdsworth and wife, E. O. Ladd and wife.	'78.
C. E. Summer, A. A. Crozier.	'79.
D. S. Lincoln, A. Sherwood.	'81.
E. A. Murphy, J. W. Beaumont, J. E. Coulter, Mrs. J. E. Coulter.	'82.
A. C. Bird and wife, A. C. Redding, O. C. Howe.	'83.
C. P. Bush.	WITH '83.

'84.

W. G. Stryker, H. E. Thomas, W. B. Kirby, C. E. Smith, J. I. Brick, W. A. Dothany and wife.

WITH '84.

M. A. Jones and wife.

'85.

G. C. Lawrence and wife, C. B. Collingwood and wife, C. H. Hoyt, J. J. Bush, H. M. Wells, J. D. Towar, R. M. Bates.

WITH '85.

A. T. Miller.

'86.

H. N. Jenner, Mrs. C. Whitmore, J. E. Hammond and wife, P. B. Woodworth.

'87.

H. W. McArdle, F. R. Smith, E. A. Burnett, I. B. Bates and wife, C. Whitmore, O. C. Wheeler.

WITH '87.

H. L. Hutchinson.

'88.

L. A. Bregar, P. M. Chamberlain, H. E. Harron, F. J. Free, W. M. Munson.

'89.

A. G. Wilson, A. L. Marhoff and wife, W. L. Rossman and wife, W. E. Palmer, R. S. Baker, W. H. Vandervoort, R. H. Wilson, G. J. Jenks, G. C. Davis and wife.

WITH '89.

C. D. Beecher, E. L. Bullen and wife.

'90.

Jessie I. Beal, R. J. Cleland, B. F. Simons, L. W. Spaulding, E. J. Rowley, O. A. Turner, W. Babcock and wife, F. G. Clark, H. Z. Ward, G. R. McColl.

'91.

G. C. Monroe, Marian Weed, C. F. Wheeler and wife, C. B. Cook, Grace Fuller, H. W. Mumford, Arthur Kneen, E. P. Safford, C. P. Locke, K. L. Butterfield, G. A. Waterman, W. O. Hedrick, F. B. Mumford, A. T. Sweeny.

'92.

H. N. Peck, B. W. Peet, L. C. Brooks, H. B. Baker, D. W. Trine, H. B. Fuller, W. P. Hawley, A. H. Gillette, C. M. Connor, D. N. Stowell, A. N. Bateman.

'93.

E. C. Peters, Whitney Watkins, C. B. Chapman, J. B. Dimmick, W. G. Smith, W. W. Parker, S. J. Blake, A. B. Chase, R. B. Pickett, A. C. Burnham, V. J. Willey and wife, D. J. Crosby, R. C. Bristol, L. J. Briggs, W. W. Tracy, A. B. Cook, A. T. Stevens, U. P. Hedrick, Lillian Wheeler, D. S. Cole, E. N. Thayer, W. L. Cummings, L. A. Baker, Mrs. P. B. Woodworth.

WITH '93.

W. G. Merrit.

'62.

Prof. A. J. Cook is becoming a popular lecturer in Southern California. After the college work is over for the week, he answers a call to lecture in some town or city on Saturday evening, and very often preaches in the same place the next morning. He has been engaged as instructor at the California Assembly for next year.

'67.

H. H. Jennison was present at the reunion. The fact is remarkable since it was the first reunion he attended in 20 years.

WITH '69.

Lewis G. Palmer, formerly State Senator, afterwards the U. S. District Attorney of Western District of Michigan, is conducting a successful law business in Big Rapids, Mich.

'76.

James Brassington, lawyer at Hart, Mich., has chosen for his avocation the management of an extensive fruit farm.

C. B. F. Bangs still continues at his old trade, that of druggist, but has moved from Arcata, California, to Grand Ledge, Mich.

W. W. Bemis visited the college August 30.

Ira B. Gage attended the reunion for the first time since graduation. He is not married but is the mayor of Dowagiac, Mich.

'77.

Prof. W. C. Latta took in the reunion and at the same time examined the horticultural and agricultural laboratories, with a view of building similar structures at Purdue University, Ind.

WITH '77.

Zebedee Beverly has been renominated, without opposition, for register of deeds of Cass county, Mich.

'78.

A. A. Crozier's bulletin on "The Raspberry" is in such demand that he has issued a second and somewhat enlarged edition.

F. E. Skeels is secretary of the Kent county agricultural society and chairman of the board of supervisors of Grand Rapids, Mich.

WITH '78.

Dr. Corcoran has an extensive medical practice in Huron county, Mich.

WITH '80.

H. H. Mills holds the position of captain in the Whittier State Reform School at Whittier, Cal.

WITH '83.

W. S. Kirby conducts a jewelry business at Lansing, Mich.

Mr. Beaman has a flourishing drug establishment at Charlevoix, Mich.

'87.

F. B. Bates has accepted a fine position with Mober & Co. of Detroit.

WITH '87.

H. R. Case spent the summer months at Port Austin, Mich.

'88.

F. H. Hall, clerk in war department at Washington, D. C., has had a raise in salary.

'89.

Married, at the bride's home, Sept. 5, Prof. How.

ard Evarts Weed, of the Mississippi Agricultural College, to Miss Edith Estella Freeman of Lansing. THE SPECULUM extends congratulations and wishes them a long and happy life.

Prof. G. C. Davis described a new species of mealy bugs that lives on the clover root before a meeting of the American Association for the Advancement of Science recently held at Brooklyn, N. Y. He also read a paper on "New Insects of the Season."

WITH '89.

Dr. J. J. Howard has a steadily increasing practice as physician and surgeon at Byron, Mich.

'90.

Dr. J. H. Mullett and Miss Clare Pemberton stepped into the sacred boat of wedded life, Aug. 22. THE SPECULUM wishes them a long and successful voyage.

B. F. Simons has taken the entire management of the firm, B. F. Simons & Co. of Lansing, Mich.

WITH '90.

Paul Woodworth, U. of M., '93, is practicing law in Huron Co., and is also deputy prosecuting attorney of the same county.

'91.

Prof. C. F. Baker of Fort Collins, Col., made a mountain trip during his vacation. He encountered many difficulties but accomplished his purpose in finding many bugs and in picking up several new species of plants. He found some arctic willows two inches high, at an elevation of 12,000 feet.

Shortly after writing the above, we received the announcement of the marriage of C. F. Baker and Miss Ninette Evans of Fort Collins, Col. The ceremony occurred August 29. THE SPECULUM extends congratulations.

G. A. Goodnough visited his home at Davison during commencement, but failed to call at the college.

K. L. Butterfield is doing excellent work as editor of the *Grange Visitor*. The "Our Work" edition of Aug. 16 is especially interesting and instructive.

Edwin DeBarr is professor of chemistry and physics in the University of Oklahoma.

'92.

D. W. Trine will not return to the Maine Agricultural College, but will engage in fruit culture at Springport, Mich.

WITH '92.

C. Percival recently divided his time between the college and the young ladies of Lansing. He was on his return trip from the bicycle meet in Colorado, where he represented the *Boston Journal* and the *American Wheelman*. He has had the offer of the editorship of the only English paper in Siam.

'93.

A. C. Burnham has secured a position as instructor in mechanical engineering at the University of Illinois with a salary of \$800.

Emile Smith, M. E. Cornell, '94, is doing special work in electrical engineering.

WITH '93.

E. H. Polhemus is reported to be in very poor health.

'94.

C. J. Foreman has received the appointment of assistant librarian.

C. C. Pashby succeeds Mr. Hatch as instructor in mathematics.

E. V. Newell will act as foreman of the machine shops for the fall term.

H. W. Tracy is in Maine working for D. M. Ferry & Co.

R. S. Campbell and wife stopped a few hours at the college Aug. 28, while on their way to Saranac, where Mr. Campbell will commence his work as superintendent of the schools.

Reports are encouraging as to the health of R. S. Woodworth. He is taking charge of one of his father's farms.

WITH '94.

Haskins, the runner, is still on the track. He won the race at Imlay City and claims to "have scooped \$125."

WITH '95.

H. D. Baker writes: "I have been working for various real estate concerns ever since leaving college, in various capacities from 'Swipes' to manager—sometimes including all the intermediate stages."

ATHLETICS.

With the departure of the class of '94, the college loses two of her best athletes and most popular men, Mr. F. R. Poss and Mr. John W. Rittinger. They will be hard to replace, but perhaps by next year some new ones will be developed. That is, if the state board allows us to take part in the Inter-Collegiate contests.

The class of '97 is now preparing to win the laurels that are waiting for them on the base ball field. Mr. F. W. Kramer is manager for the ensuing year, and has begun to hustle already. He has the boys out practicing every afternoon, with a view to selecting the best stock in the class. On Sept. 1st they played a practice game with a nine picked from the other classes in the college. '97 was defeated by a score of 19 to 6.

M. A. C. won her share of the prizes on Labor Day, considering the number of contestants from the college. Mr. H. C. Gaudern won first in the half-mile run. Time 2:15. This is but three seconds more than the time made by Tracy, at Ypsilanti. The race was a very close one, Mr. Gaudern winning by about a foot. Gaudern also won first in the 100 yards obstruction race.

Mark Thompson took second in the mile bicycle. Rork also was entered in this race, but his wheel tip-

ped over on the start. He had a similar misfortune in the quarter mile. When on the home stretch, he was run into by another man, and somewhat hurt.

Rock got through the two-mile handicap, however, without any mishaps, and was rewarded by getting the second prize.

The local field day this term will be different from any ever before held at the college. It will be on the plan of the Inter-collegiate, but with the different classes to take the place of the different colleges. A sort of inter-class field day, so to speak.

The date set for the sports is Sept. 29. The qualifications for entries, for the all-round medal, will probably be a little less than those required by the M. I. A. A. With Mr. Anson as manager, we need not fear for the success of the occasion.

The Sophomores played the Seniors base ball on Sept. 8. The Sophomores were defeated, but they could hardly be expected, with as little practice as they have had, to play a team like the Seniors.

Following is the score, by innings:

Innings	1	2	3	4	5	6	7
Seniors	4	5	3	7	1	2	2-24
Sophomores	5	0	2	0	0	1	0-8

The Junior foot-ball team is now in training and the members are practicing every afternoon. We may expect some good games this term, as they have an excellent team.

COLLEGES AND EXCHANGES.

Centre College, in Kentucky, of which Vice President Stevenson is an alumnus, has graduated in the last fifty years, two vice presidents, fourteen United States senators and one justice of the supreme court.—*The Ossarist.*

The University of Michigan has enrolled two Chinese women as students.—*College Index.*

We return thanks to President Gorton of the Agricultural College for an invitation to the commencement exercises recently held. For a practical, thorough scientific education there is no institution in the United States superior to our own Agricultural College.—*South Haven Index.*

Chicago University has discarded the title of "Prof." the members of the faculty being addressed as "Mr."—*Ex.*

"To whom much is given much is required," this applies to opportunity as well as to other things. What a grand opportunity is offered by the literary societies of the college for the cultivation of the best that is in us, and how wantonly this opportunity is cast aside.—*Bethany Collegian.*

"Seek nothing, decline nothing, but strive to be worthy of anything," is the motto of one of the leading Methodist preachers in Texas. This motto is well worth the careful consideration of every one.—*Alamo and San Jacinto Monthly.*

It is said that there is no better purchasing class than the readers of religious publications. They are intelligent, industrious and generally free from extravagance or dissipation.—*Printer's Ink.*

We have very few exchanges this month as only a few of the colleges have issued their paper since the beginning of the fall term.—*Ed.*

Prof. Turner of Edinburgh, receives \$20,000 salary which is the largest remuneration of any college professor in the world.—*Ex.*

The public free schools of the United States are at present educating 13,250,000 children.—*Ex.*

"Pray answer me this
What shape is a kiss
O maiden most charming and fickle."
"Why sir," answered she
"It seemeth to me
That I surely should call it
A lip-tickle."—*Ex.*

In Prussia teaching is a life business, and the teacher is a State officer, who receives a pension when he becomes incapacitated by age for profitable labor.—*College Tidings.*

Open Day and Night. Martin W. Hudson, Proprietor.

HUDSON'S

Dairy Lunch

—AND—

Oyster House.

121 Washington Ave. S., Lansing, Mich.

TRY

Jimmie Markey

FOR

106 and 108 Wash-
taw street east.

LIVERY

CROTTY BROS.,

Books and Stationery,

Washington Avenue North.

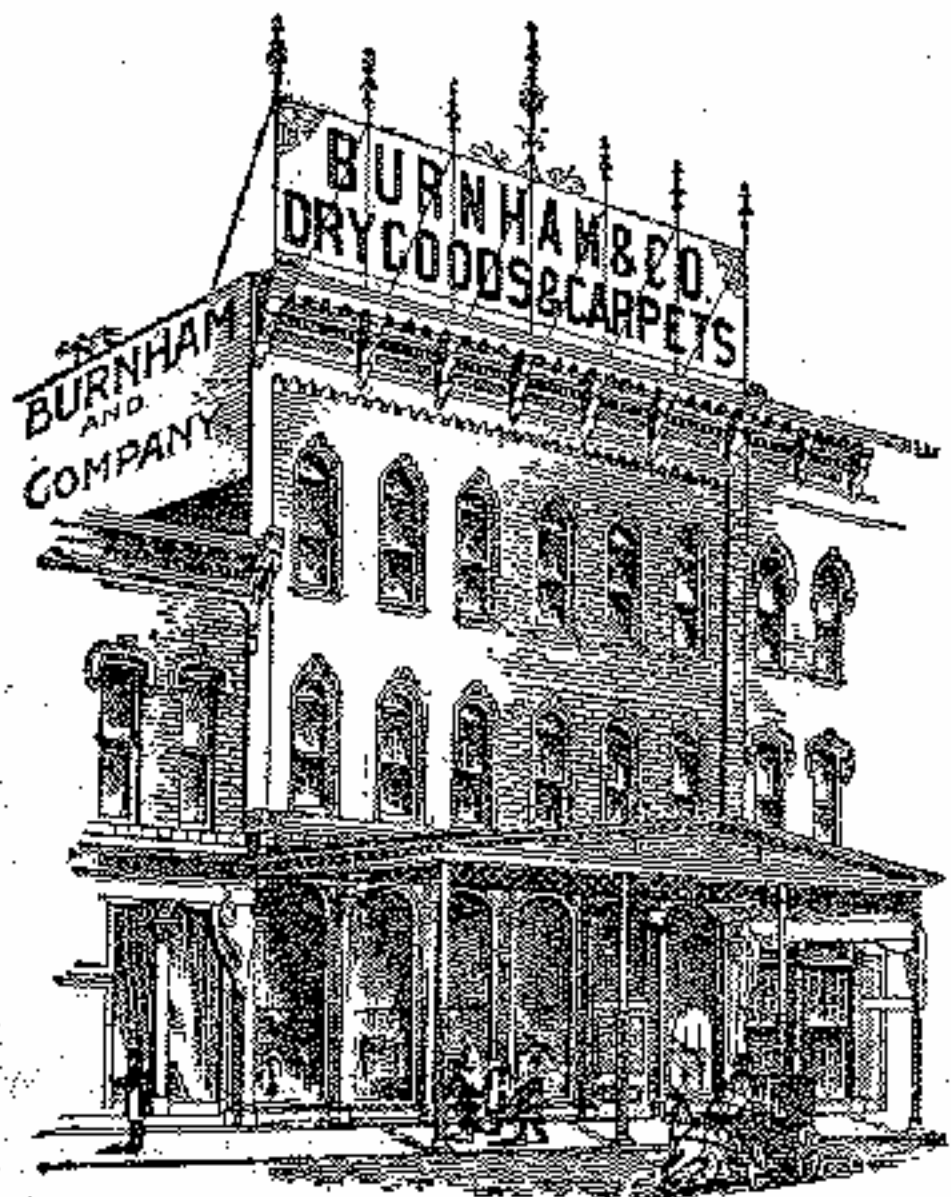
JOHN KERN,

Dealer in all kinds of Fresh, Salt and
Smoked

MEATS

POULTRY and SAUSAGE.

328 Washington Ave. N.



STUDENTS . . .

Will find the largest stock of Carpets, Curtains, Blankets, Bed Spreads, Ready-made Sheets and Pillow Cases and all House-furnishing Goods, at

BURNHAM & CO.'S.

Prices always the cheapest.



THE ONLY →

Photo Supplies

DEPOT IN CENTRAL MICHIGAN.

The choicest selection in PERFUMES, TOILET ARTICLES and general drug line in Lansing.

We buy and sell more goods than any other drug firm in the city.

TRAT THOMPSON

THE PROGRESSIVE DRUGGIST.

117 Michigan Ave. E.

104 — Washington Avenue North — 104

DAVIS & CO.

The One Price Clothiers and Furnishers.

— WE ARE AGENTS FOR THE —

Celebrated Perfect-Fitting KING PANT.

Come and see our 50c Sweater.

Full Line of Football Goods. Football Rules, 10 cents.

104 — Washington Avenue North — 104

RIVERSIDE GREENHOUSES, - LANSING, MICH.

SOLES FOR SALE.

SOME made thin and light, for ease and comfort; others medium weight and heavy as the occasion demands,—*all attached to uppers* of as good materials as are known to the modern art of shoe making; some of fine *Kangaroo*; many of the popular *French patent calf stock*; others of *Russia leather* in tan color and black, made up in pretty styles, serviceable and long wearing.

Have added to our already popular M. A. C. line a new shoe known as the *Needle Point*, or the *late razor toe style*; somewhat lighter stock and finer finish than usual, with *Goodyear welt soles*, which are identical with hand-sewed shoes. We offer these at \$3.50 per pair.

Thanking you for your liberal patronage, we wish you a pleasant vacation and will be pleased to see you all next term.

103 WASHINGTON AVE. SOUTH.

C. D. WOODBURY.

Photographs

Of every description and of the finest quality are made by

S. & E. SHARPSTEEN

Photographers,

Corner Wash. and Mich. Aves. (Successors to Cassey & Co.)

We are always ready to make views or groups. No poor work allowed to leave our gallery.

PHOTOS ON YOUR WATCH.

Photos on Porcelain, Silk or Linen.

Special rates to M. A. C. people.

W. E. TRAGER,

DEALER IN

FRESH and SALT MEATS.

509 Michigan Avenue East.

"FARMING CORPORATIONS,"

A system of business farming, is a book farmers ought to have and gladly buy.

STUDENTS can make money selling it.

Write to W. ALDRICH & Co.,
120 Broadway, New York City.

RIVERSIDE GREENHOUSES,

LANSING, MICH.

Business Men

FIND THAT IT PAYS
TO ADVERTISE IN

The Speculum.

All College People, Students and Faculty, patronize our advertisers.

Mackintoshes

Are essential garments in this climate, and if you think of owning one I fancy it will be to your advantage to see what I am showing in that way before making your purchase. There is nothing in the way of a top coat that will afford you the same pleasure and comfort as a first-class Mackintosh. My Wool Coats are all cemented, strapped and sewn on, and guaranteed water-proof.

Nothing Nicer

On the market, at the price, than the Men's Underwear I offer at ONE DOLLAR per suit. Carry all the different grades in the finer qualities, and at right prices.

Complete lines of Hats, Caps, Canes, Umbrellas, Neckwear, Shirts, Hosiery, Handkerchiefs. Students' patronage respectfully solicited.

Elgin Mifflin.

RIVERSIDE GREENHOUSES, - LANSING, MICH.

RENSSELAER POLYTECHNIC INSTITUTE,

TROY, NEW YORK.

A SCHOOL OF ENGINEERING. ESTABLISHED 1824.

Local examinations for entrance provided for. Send for a catalogue to the Director.

CHAS. A. PIELLA, — FINE LINE OF — Diamonds, Watches, Clocks

Repairing of Fine Watches and Jewelry
a specialty.

Jewelry, Silverware and Optical Goods on hand.

. Lansing, Mich.

PARMELEE & JESSOP, FINE SHOES AND RUBBER GOODS

HOLLISTER BLOCK.

SPECIAL RATES TO COLLEGE STUDENTS.

COLLEGE BOYS

Make A. M. Emery's Book Store your headquarters while you "wait for the wagon."

College Text Books and Stationery,
Gold Pens,
Wirt's Fountain Pens,
Picture Frames and Wall Paper
constantly on hand.
Reduced Rates to Students.

A Large Stock of
Miscellaneous Books, Albums,
Paintings and Engravings.
*Prof. MacEwan's \$100 Library
in Stock.*

113
Michigan Ave. **A. M. EMERY.**

TRY

Jimmie Markey

FOR

LIVERY

106 and 108 Wash-
haw street east.

SEVERANCE BROS.,

**BAKERY,
RESTAURANT,
CONFECTIONERY.**

**OYSTERS
AND
ICE CREAM.**

226 Washington Avenue South.

LANSING, MICH.

F. M. PRAY, R. D., Glasses Carefully and Accurately

EYE SPECIALIST.

Fitted.

OFFICE IN HOLLISTER BLOCK,

HOURS—9 to 12 A. M., and 1:30 to 5 P. M.

LANSING, MICH.

RIVERSIDE GREENHOUSES, — LANSING, MICH.

Hasty's Gem Lunch

..... 117 Washington Ave. South.

LEADING LUNCH COUNTER

IN THE CITY.

Good COFFEE, OYSTERS, PIE, SOUP, Etc.

Open until midnight.

NORTHWESTERN UNIVERSITY MEDICAL SCHOOL,

(CHICAGO MEDICAL COLLEGE)

N. S. DAVIS, M. D., LL. D., Dean.

Offers a carefully graded course of four years. Graduates in the University courses, which are specially preparatory to the study of medicine, take advanced standing.

The new separate buildings for laboratory and clinical work, and additions to Mercy Hospital, very greatly increase the teaching facilities of the College.

For circulars of information address the secretary,

DR. FRANK BILLINGS,

235 State St., Chicago.

College of Physicians and Surgeons,

Opposite Cook County Hospital, Chicago, Ill.

The Winter term begins September, 1894, and ends April, 1895. Total fees, \$105 each Winter term, and a laboratory deposit, which is returnable. Four annual graded courses, with advanced standing for graduates in pharmacy and university preparatory courses prior to the study of medicine. Clinical and laboratory facilities unsurpassed. For annual circular of information apply to

W. E. QUINE, M. D.,

Pres. of the Faculty,

813 W. Harrison St., Chicago.

PATENTS

Procured in the U. S. and all foreign countries upon the most reasonable terms; trade-marks, copyrights and labels registered and patent business of every description promptly and skillfully attended to: 25 years' experience. We report whether invention is patentable or not free of charge. Our fee not due until patent is allowed. 32-page book free. H. B. WILLSON & Co., Patent Lawyers, Washington, D. C.

THE NAME TO REMEMBER
when buying a BICYCLE



A. W. GUMP
& CO.,
Dayton, Ohio.

\$39.00 to \$50.00 saved on many new and second-hand Bicycles. Lists free. Over 2,000 in stock. Cash or time. AGENTS WANTED.

STUDENTS

We would be pleased to show you our Fall and Winter

Tailor Made Suits

OVERCOATS, HATS, CAPS,
SHIRTS, COLLARS,
TIES, SOCKS, JEWELRY.

H. KOSITCHEK & BROS.,

The Reliable Clothiers.

O. N. STONE & CO.,

THE

LEADING

GROCERS

Are headquarters for Staple and Fancy Groceries and Provisions. Fruits and vegetables in their season. Choice Butter and Fresh Eggs always on hand. Give us a call.

319 WASHINGTON AVE., NORTH.

EYES TESTED FREE,

Whether you buy glasses or not. My time and skill is at your service.

FRANK N. BOVEE,

OPTICIAN,

At Brackett's Jewelry Store, Hollister Block.

The College Yell

Is no louder than the praises lavished on the Perfumes and Toilet Articles we are selling at prices which make them no longer a luxury, they are so cheap.

We are headquarters for everything in the DRUG line in Lansing.

E. Alsdorf & Son
The Druggists.

Capital City Eye Works

106 Washtenaw Street West.

Ladies' and Gents' Garments
Cleaned and Dyed in the
Best Style.

Kid Gloves Cleaned and Dyed.
Ostrich Feathers Dyed.

French Dye Cleaning
a Specialty.

All orders promptly attended to.

A. G. BISHOP, Prop'r.



Merely to Announce

That we WANT the College trade,
and will give all there is in it FOR IT.
"We've got the Goods," with the
Style, Fit, and Price—Right.

PARK SHOE HOUSE,

J. A. Park.
Dean Park.

107 Wash. Ave. N.

WELLS & MORGAN

Offer nearly every day special bargains in **Watches, Jewelry and Novelties.**

In these goods they are able to give their customers the advantages of the latest styles at wholesale prices.

In the art of WATCH REPAIRING we have no superiors.

WELLS & MORGAN.

STUDENTS KNOW THE VALUE OF **PURE CHEMICALS** AND THE SAME RULE HOLDS GOOD WITH **PURE DRUGS**

When you want the latest novelties in reading matter, or the finest quality of pure drugs and chemicals in your prescriptions, call on . . .

235 WASHINGTON AVE. SOUTH.

F. B. RAYNALE, PH. C.

CROTTY BROS.,

Books and Stationery,

Washington Avenue North.

HUDSON HOUSE

Barber Shop & Bath Rooms.

FOUR FIRST-CLASS ARTISTS.

209 Washington Ave. S.,
LANSING, MICH.

J. W. CAREY,
Proprietor.

JOHN KERN,

Dealer in all kinds of Fresh, Salt and
Smoked

MEATS

POULTRY and SAUSAGE.

328 Washington Ave. N.

JOHN HERRMANN,

TAILOR,

218 WASHINGTON AVE. N.

RIVERSIDE GREENHOUSES, - LANSING, MICH.