The M. A. C. Record.

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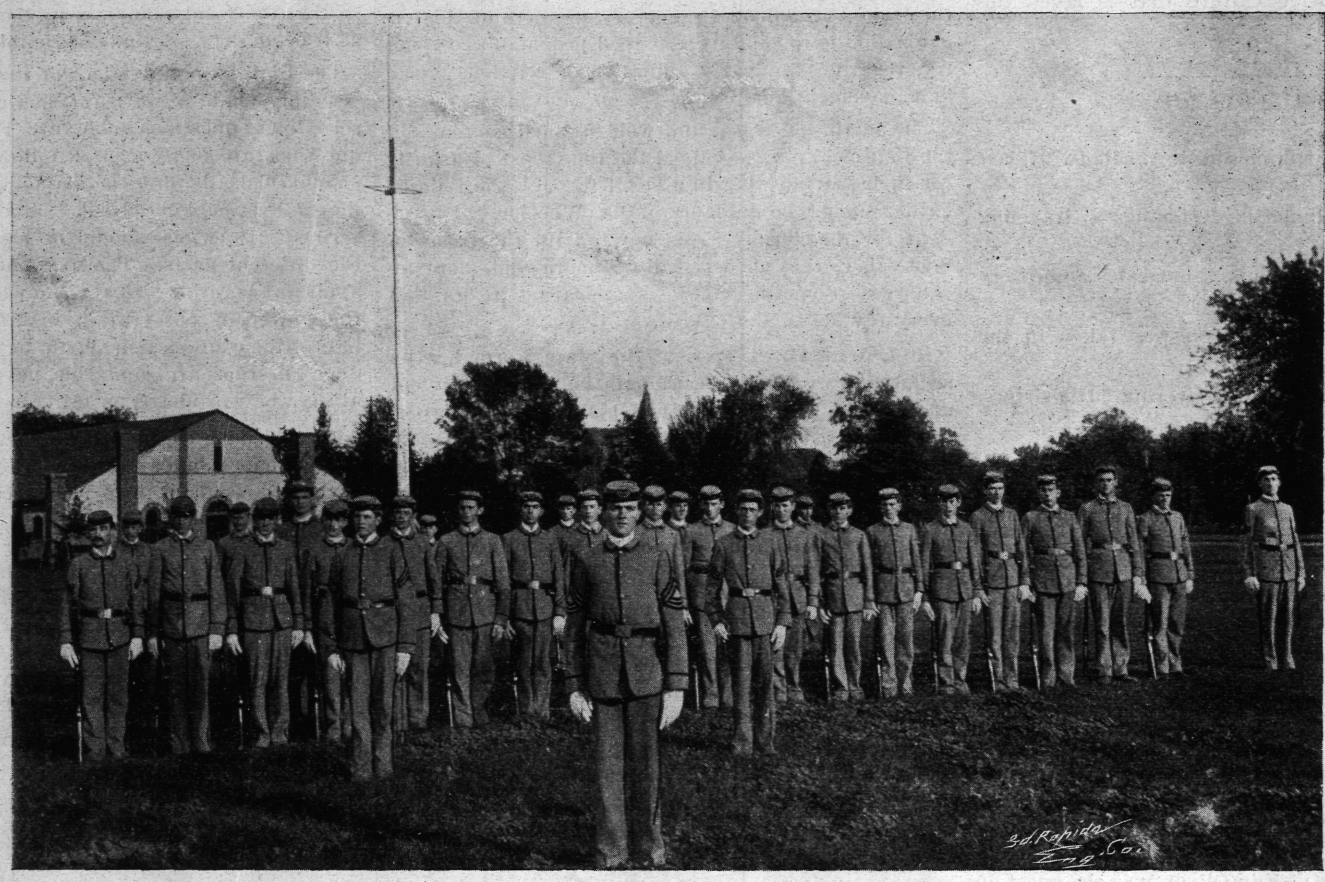

DEPARTMENT OF MILITARY SCIENCE AND TACTICS.

LIEUT. E. A. LEWIS.

The Department of Military Science and Tactics was established in 1884 by the State Legislature, in accepting and giving to this institution, certain public lands granted by Congres to the State, for specified educational purposes.

One of the requirements of this grant was that, in the Colleges receiving its benefit, military science and tactics should be taught.

The nature of the grant, the detail of an officer of the army at the school, the loan of arms to the College, and the supervision exercised by the government over the College, give to the institution a national character.

From the war of the Rebellion we learned that it is extremely difficult to properly officer large bodies of volunteer troops. Hence the requirement as to military training was placed in the grant. The government in a substantial way encourages public and private schools to adopt a military course. As a result, about 10,000 students each year receive training under army officers.

The result of their military training is plainly seen in the students, their erect figure and carriage, firm step, neat appearance, and manly, respectful bearing, at once distinguishing them as cadets.

In the moral education of the young men entrusted to its care, the department aims to impress on them the value of patriotism, honor, truthfulness, obedience to the law, and self-respect.

All able bodied students are enrolled as cadets. For purposes of drill they are organized into a Battalion of four companies and a band. The companies are commanded and officered by cadet officers, who are appointed for their general character, military record at the College and aptitude for positions of trust and command.

The equipment loaned to the College by the War Department is as follows:

One hundred and fifty rifles with belts and cartridge boxes, six swords and belts, four signal flags, and two heliographs. Two old fashioned wrought-iron cannon are also placed at the College. These will very soon be replaced by two steel cannon of modern pattern. In addition, the College owns seventeen swords and belts, flags, battalion standard, and a set of fine band instruments.

In the cut above we see a detachment of cadets immediately after the adjutant has formed them for guard duty. This cut was made from a photograph taken last fall, and shows well the erect figures and good bearing of the men.

Military Dept.

STATE HORTICULTURAL SOCIETY.

PROF. L. R. TAFT.

The summer meeting of the State Horticultural Society was held at St. Joseph, June 10 to 12.

The attendance from a distance was fully up to the average of June meetings, but the local attendance was smaller than was expected, owing to the fact that it was in the very midst of the strawberry picking. Nearly all of the papers presented related directly to commercial fruit culture, and as they were by men who are specialists in the lines treated by the papers, the report of the meeting will be a very valuable symposium. The methods that had been found successful in the culture of the apple, pear, peach, plum, and cherry, were explained by men who have spent years in growing them and are able to show a good balance on the right side. With every fruit it was noticeable that the speakers advised thorough cultivation, judicious pruning, manuring and spraying. Underneath all was the idea that we must use intensive culture and thus grow better fruit. All seemed to have the idea that it was desirable in the future to give more attention to the selection of varieties of a high quality.

The speakers were also unanimous that in shipping we should use packages of full size and pack them honestly. The statement was made that within five years the amount of fruit produced in the state would be four times what it is today. This will call for better transportation facilities, and in order to dispose of the vast increase it will be necessary to look for markets in distant states.

The following were the topics and speakers: "Can the Apple be made as Profitable as other Fruits?" R. H. Sherwood, Watervliet; "Pear Culture in Berrien County," Geo. F. Comings, St. Joseph; "Points in Successful Plum Culture," J. N. Stearns, South Haven; "The Future of Peach Growing in Michigan," F. J. Russell, Hart; "Cherry Culture," Stephen Cook, Benton Harbor; "Uniformity of Fruit Packages," R. D. Graham, Grand Rapids; and "Transportation of Fruits," President R. Morrill, Benton Harbor.

Among the other topics presented were "Advantages of Living on a Fruit Farm," J. A. Donaldson, St. Joseph; and "The Various Phases of Spraying," W. A. Smith, Benton Harbor. C. F. Wheeler, of the College, also was present and spoke on "Value of Botany to the Horticulturist." He claimed that to grow plants successfully one must have a knowledge of how they feed, propagate, and protect themselves against their insect and other enemies; and, whether this knowledge is obtained in school or college, or by long years of experience and observation, it is Botany. This knowledge aids us in preparing and cultivating the soil, in applying fertilizers, in selecting and planting our trees, and in developing new varieties.

The theme of Prof. Taft was "Pests, New and Old." Among those most to be feared were the San Jose scale and a closely allied species which have appeared in several of the eastern states, but have not yet obtained a foothold in Michigan, so far as is known. Newly set trees from eastern nurseries should be carefully examined and heroic measures taken for the destruction of the insects if they are found. In some counties peach trees are being killed by the root aphis, which has been brought in upon nursery stock from New Jersey and Delaware. Drenching the ground with strong tobacco water is about the best remedy. Trees from infested districts should be dipped in the same solution, before they are planted.

Reference was also made to the root-galls upon the peach, which have appeared in several places. The cause is not certainly known, but they are generally thought to be due to the action of frost. They have something of the appearance of the black knot of the plum, but no evidence of a fungous or bacterial nature can be found.

On Friday the society had as its guests some thirty-five members of the American Nurserymen's Association, which had just closed its session in Chicago. Through the public spirit and generosity of the Graham & Morton Transportation Co., the entire party was given a free ride to St. Joseph and return to Chicago.

On Friday forenoon the people of St. Joseph provided carriages and drove the members of the society and their guests through the orchards about that city and Benton Harbor. The apples, peaches, grapes and plums promise an abundant crop, but the pears and cherries will be light.

In addition to the extensive fruit orchards, we noticed large areas planted to peas, sweet corn, melons, and tomatoes for the Chicago market.

Many of the orchards were in a high state of cultivation and showed by their appearance that they had received intelligent care, but many of the others suffered by the contrast. Lack of cultivation, pruning, manuring, and spraying had produced its effect on the growth of the trees, and the prospect for a fruit crop. By all odds the best orchard visited was that of Roland Morrill, of Benton Harbor, the president of the society, which is in every respect a model.

The peach trees were loaded with fruit, although from 1,500 to 3,000 peaches had been removed from many of the trees. The methods advocated by Mr. Morrill in his talks at the farmers' institutes the past two years, and at various horticultural meetings, have been put into use in his own orchards, and only words of praise can be given. The financial returns more than justify the increased outlay that is necessitated by the intensive culture that is given the trees.

Horticultural Dept.

AT THE COLLEGE.

Dr. J. M. Elliott visited his son, J. A. Elliott, '97, last week.

Senior George Williams is designing a traveling crane for the foundry.

Notice a number of new ads. this week. Some very good bargains are offered.

The first "heat" of the season was taken in the foundry on Thursday last.

H. L. Becker, '98, is slowly recovering. His sisters, Jennie and Belle, are here caring for him.

Harry M. Goss is visiting friends at M. A. C. He rode over from Plainwell on his wheel last Friday.

On Thursday, some Lansing people brought their friends from Woodland, Barry county, to see the College.

The Mechanical Department has just completed a neat reducing motion for the taking of steam engine indicator cards.

Fred Morley, Professor of Civil Engineering in Purdue University, and his wife, were visitors at the College last week.

H. L. Hoffman, with '98 *m*, spent Sunday at M. A. C. Mr. Hoffman is engaged in the furniture and bicycle business at Dansville, Mich.

Miss Grace Gibson, a teacher in the Evart schools, on her way to make a visit in Olivet, was the guest of Prof. W. O. Hedrick last Friday.

Mr. and Mrs. Albert Glaspell, from Austin, Tex., are the guests of Professor and Mrs. P. M. Chamberlain. Mrs. Glaspell is Mrs. Chamberlain's sister.

The King's Daughters wish to cordially thank the ladies of the campus for so kindly responding to their request for contributions for the cyclone sufferers.

Visitors are always welcome, but they come in such numbers at all times of day that our busy professors and other employes can hardly spare the time to show them especial attention.

A young lady in a University somewhere in this country, when examined said *endogenous* plants are those grown in a greenhouse, *exogenous* plants those which are grown in the open air.

On Thursday, three farmers and their wives and children drove over from Ovid, Clinton county, and looked about the College. They expressed themselves as well pleasd with what they saw and learned.

The seniors and juniors indulged in a game of ball Saturday afternoon, which resulted in a score of 20 to 17 in favor of the juniors. The feature of the game was the coaching of J. E. Tracy and C. K. Chapin.

Among the numerous plants of interest in the greenhouses, residents, students and visitors should not overlook the tall specimen of sugar cane, doubtless more slender than when well grown in the opn air in its favorite climate.

"What is that humming sound over in the dairy room near the barn, sounding a little like a small fanning mill in operation?" "That is our separator; after each milking the machine is turned for a time, the milk coming out of one spout, the cream from another."

Mrs. Thompson, of Lansing, and her daughter, Irma, visited the College last Thursday. Miss Thompson expects to enter College next September, and will take the Ladies' course. She will spend the most of her summer vacation at Lawrence, Van Buren county.

In these days every College and every class in College must have its yell; the high schools, the district schools follow suit. Here is the latest as recently heard in the vicinity of the big stone of '73:

Who are we, who are we?
We are the kids of M. A. C.

On Friday last, two small parties of farmers picnicked on the campus; one from St. Johns, the other from Victor, Clinton county. This is another demonstration of the fact that for a real tour of inspection of the College, small parties at any one time have the advantage over the larger ones.

On the low land, once a "cat-hole," between the farm house and the garden barn, is a nice patch of celery. This year, under a portion of the land, tiles are buried six to eight inches deep some twelve feet apart. The scheme is to water the plants through these tiles instead of irrigating the surface of the soil. It is called sub-earth irrigation.

Rev. John F. Brant, formerly of Cleveland, O., but now a resident of Lansing, gave a very interesting talk to the students, Sunday, June 14. He represents the Ohio Anti-Saloon League. The object of this organization is to combine the good people of the country, regardless of party affiliation or religious creed, in a movement against the saloon.

The small, but select and well satisfied members of the Botanical club, occupied the time most pleasantly for their last meeting in a stroll through the Botanic garden under the guidance of Mr. Wheeler, the president for this term. From now on till the frosts of September, this garden will be more and more attractive. Something new is appearing at its best every few days.

Prof. Wm. H. Sherzer, of the State Normal, after seeing our weed garden, thought he should start one at Ypsilanti for the benefit of his students. Two of the most conspicuous weeds now in flower in this garden are Ox-Eye Daisy and Purple Cone-flower, the former from Europe, the latter now common in the Eastern States, where it came from the West. Both have been introduced in seeds of grasses and clovers.

After supper one pleasant evening last week, the College brass band made a tour of the campus, playing "Yankee Doodle," "Marching Through Georgia," and other stirring tunes. The echoes from the trees and buildings, the sight of numerous groups engaged in various games, the callers sitting on the porches of the houses along Faculty Row, the children gathered about the "big stone of '73" all tend to make life pleasant at M. A. C.

Our corn crib was planned and built some time ago by the late C. L. Ingersoll, then Professor of Agriculture. In the bottom of the crib below the corn is an open floor of overlapping boards slanting toward the middle of the crib, where the corn is shoveled out. By this means the ears of corn in the crib are all moved every time a little is shoveled out at the bottom, thus making it a dangerous place for rats or mice. They keep out.

To facilitate the labor of instruction in practical surveying, as well as to better impress the methods of organization for actual work, the class is divided into squads of five or six each. Captains chosen from and by the class are placed in charge of the squads. Following are the names of the captains elected this term: Squad No. 1, F. W. Robison; No. 2, E. A. Calkins; No. 3, F. J. Kling; No. 4, F. T. Williams; No. 5, A. M. Patriarche; No. 6, G. F. Richmond.

C. S. Brooks attends well to the chickens and ducks, of which the yards now contain some 500 to 600, of thirteen or more different breeds. By the way, there is no notice of the poultry on the little cards handed out to visitors. There are many points of interest to lovers of poultry. To keep young ducks out of the watering trough, a coarse wire screen is placed over the top. Portions of the yards are devoted to growing corn, oats, lettuce, rye, sunflowers, mostly for shade and to furnish food in a green state.

A post-mortem was held last Monday on the cow College Victoria, the second of the lot condemned April 15. The animal was nearly dead from disease at the time she was killed, although one of the least affected apparently when the tuberculin test was first applied. Indeed, she was placed in the doubtful list at that time. A second test at a later date gave marked reaction. The disease seemed to have progressed very rapidly in the last few weeks. A possible inference from the case is that the application of the tuberculin test has the effect of hastening the development of the disease.

"Do you notice that a considerable portion of the 'pusley' in the garden this year has white blotches on it from which come forth a fine dust at certain times? The plants so affected are usually quite erect and look sickly. You hadn't noticed it, and yet you have been weeding onions for two hours?" "Oh, yes, I see it now, what is it?" "That is a little parasitic fungus which lives on and within the 'pusley,' which is known as the host plant. This fungus, *Cystopus candidus*, weakens the 'pusley' considerably, often preventing the production of seeds, but it is not vigorous enough to exterminate this vile weed. Do you not wish it were?"

It isn't the purpose of this short note to tell people how to exterminate Canada thistles; almost any farmer can tell you how to do that if you want to know. Dr. Beal, to save time in weeding in the botanic garden and weed garden, sinks in the soil a piece of an old smoke stack eighteen inches in diameter and two feet long. Here, within bounds, he successfully grows good samples for study and to show visitors. He thinks he has "coopered" the thistles. He is thinking of getting some wire netting, such as is used about poultry yards, to surround his patch of thrifty Russian thistles so that the wind cannot carry them away when ripe, as it often does all kinds of tumble weeds.

The State Superintendent of Public Instruction has certainly made a move in the right direction in the selection of questions in botany. Five out of ten of the questions are mentioned as follows: "The examiner should place before each applicant some plant, in flower if possible, and ask that it be botanically described. Drawings should be made to help describe the different parts. The examiner should mark the applicant according to the knowledge displayed and the power of observation manifested. This latter half of the examination should in no case be omitted." Such questions are admirable, never ending, and must always be considered as fair for the candidates.

An exceedingly interesting service was conducted in the chapel Sunday afternoon by Rev. Louis Esselstyn, a missionary who has recently returned from Teheran, Persia. The nature of the missionary field in Persia was strikingly given in estimating its area to equal a third of the United States, though with a population of but 9,000,000. Teheran, the capital, was graphically described. It is a walled city with nearly a quarter million of inhabitants. Its streets are narrow, its houses are largely of clay. The peculiar difficulties of Persian mission work are found in lack of traveling facilities over the great districts in so sparcely inhabited a country, the dense ignorance of the inhabitants, the entire lack of religious liberty under Persian law, and the social persecution put upon Christian converts. Mr. Esselstyn has seen much of Turkish misrule in Asia, and pronounces the one requisite for improvement to be the annihilation of the Turk.

FARM NOTES.

The second crop of alfalfa is nearly a foot high.

The pine trees set last spring along the west line of the farm are doing nicely.

The large grain barn is being overhauled and put in condition to receive the new crops.

The crops on the farm never looked better than now, possibly excepting the rather light meadows.

Field No. 16 is now all in crops for the first time. The last swamp was fitted and sowed to millet last week.

The crimson clover sown last spring is doing better than ever before. Some of it has already begun to blossom.

The "Success" or awnless barley now promises a fair yield. Last year it was ruined by drouth, while the ordinary 6-rowed variety was but little injured.

Several samples of orchard grass were recently received by the station from various parts of the state for identification. Evidently this grass is not as well known as it should be.

The flat pea is making a wonderful growth this season and visitors ask many questions regarding it. Enquirers will remember that when freshly cut or as ensilage, sheep and cattle dislike this pea.

One of the tests of fodder plants now beginning to be of interest is a series of half-acre plots sown last spring to the following sorts: Crimson clover, rape, oats and vetches, sweet corn, Kaffir corn, sorghum and field corn.

Have you noticed the winter oats in No. 6? The seed came from Virginia and was sown last fall. Some of our ordinary oats were sown at the same time, but these all died. A portion of the winter oats lived over and are now looking well.

The sheep on the pasture experiment in Field No. 14 have already consumed two plots of rye and one plot of oats and peas and are now in the second plot of oats and peas. Two plots of rape still await them before they start over the ground the second time. The first two plots eaten off have been resown to rape and sorghum. The series consists of six one-acre plots, the sheep being confined upon one plot at a time by movable hurdles. The object of the experiment is to determine how many sheep can be kept on a given area by means of such pasture crops.

"To drop the marking system would hurt no one; to keep it hurts all."—*J. A. Dart.*

COURSE OF STUDY FOR WOMEN AT M. A. C.

The figure after the subject indicates the number of hours per week to be given to this branch of study. As many of the classes in certain branches do not recite every day in the week, and as much of the work is done in the laboratories and thus does not require additional outside study. it is not difficult to arrange the program of daily recitations so that all these subjects will be properly represented and yet the student not be overworked.

(Instrumental Music elective throughout the whole course. Painting elective during the Junior and Senior years.)

FRESHMAN.

First term.	Second term.	Third term.
Algebra, 5.	Algebra, 5.	Geometry, 5.
English, 5.	Physics, 4.	Physics, 4.
Botany, 10.	English, 2.	Elementary chemistry, 6.
Cooking, 5.	Drawing, 10.	English, 4.
Mechanics, 2.	Cooking, 5.	Cooking, 5.
Calisthenics.	Laboratory, 2.	Chemical manipulation.
	Calisthenics.	Calisthenics.

SOPHOMORE.

First term.	Second term.	Third term.
Geometry, 5.	Physics, 3. Laboratory, 4.	Entomology, 5.
Analytical chemistry, 10.	Plant histology, 10.	Trees and shrubs, 3.
Anatomy, 2; laboratory, 4.	Organic chemistry, 5.	Vegetable and
English, 2.	English, 1.	landscape gardening, 5.
Household economy, 2.	Household economy, 2.	English, 2.
Sewing (plain), 4.	Cutting and fitting, 4.	Household economy, 2.
Drawing.	Drawing, 2.	Floriculture.
Calisthenics.	Calisthenics.	Drawing.
		Calisthenics.

JUNIORS.

First term.	Second term.	Third term.
Literature (American), 5.	Horticulture, 5.	History of art, 5.
English history, 5.	Rhetoric, 5.	Civics, 5.
German, 5.	German, 5.	German, 5.
Graphic art, 2.	Shakespeare, 1.	Shakespeare, 1.
Calisthenics.	Calisthenics.	Calisthenics.
(Elect one).	(Elect one).	(Elect one).
Floriculture.	Dairy.	Kitchen gardening.
Pomology.	Millinery.	Poultry raising.
	Pomology.	Floriculture.

SENIORS.

First term.	Second term.	Third term.
(Elect three).	(Elect three).	(Elect three).
Agriculture.	Agriculture.	Agriculture.
Horticulture.	Horticulture.	Horticulture.
Meteorology.	Economic zoology.	Political economy.
Logic. Bacteria.	English masterpieces.	Geology.
Physics.	Psychology.	Domestic engineering.
Constitutional history.	German.	German.
German. French.	French.	French.
(Elect one).	(Elect one).	(Elect one).
Floriculture.	Dairying.	Floriculture.
Pomology.	Floriculture.	Pomology.
Kitchen gardening.	Pomology.	Kitchen gardening.
		Poultry raising.

STATE INSPECTION OF COMMERCIAL FERTILIZERS.

A law of the State requires that any person who shall sell, or offer for sale, in this State, any commercial fertilizer, the retail price of which exceeds $10 per ton, shall affix on the outside of every package containing such fertilizer, a plainly printed certificate, giving the name or trade-mark under which such article is sold, the name of the manufacturer, and the chemical analysis, stating the percentages of nitrogen, potash, and phosphoric acid. Before any such fertilizer is sold or offered for sale, the party who causes it to be sold must file with the Secretary of the State Board of Agriculture a certified copy of the analysis, and deposit in a sealed glass jar not less than two pounds of such fertilizer, with an affidavit that it is a fair sample of the article to be sold or offered for sale. He is also required to pay, annually, to the Secretary of the State Board of Agriculture, on or before the first day of May, a license fee of $20 for each and every brand of fertilizer he offers for sale in this State, unless the same has been paid by the manufacturer or importer of whom he may have purchased the fertilizer. All monies received for license fees are placed to the credit of the Experiment Station fund at the College. During the spring of each year, the chemist of the Station gathers samples of fertilizers wherever he may find them offered for sale in various parts of the State, and makes analyses of such fertilizers, comparing them with the samples deposited by the manufacturers or dealers, and these analyses, both claimed and found, are published annually in a bulletin issued by the Chemical Department of the Station. Up to this date the number of brands for which licenses have been issued for 1896 is fifty. This shows that the use of fertilizers is quite extensive in this state.

The M. A. C. Record.

PUBLISHED WEEKLY BY THE

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ASSISTED BY THE STUDENTS.

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BEFORE abandoning altogether the idea of making a living by tilling the soil, please look into the single long course and the four short agricultural courses offered at M. A. C. Many a young man has entered the agricultural course at the College with his mind fully made up not to engage later in any thing pertaining to that business, but, after pursuing his course for a time has thought better of farming.

There is a very broad field with a large number of special lines to select from, and success in any one of them, in the future, much more than in the past, will depend on the ability of the man. A man with mind well disciplined by study, especially in the direction of his chosen business or profession, assisted by skill in performing most kinds of farm work, will stand a much better chance than the man who lacks this preparation. Depend upon it, brains will tell in agriculture as in any other business.

The equipment at M. A. C. offers a man desiring to acquire knowledge and skill in many lines of agriculture, a great opportunity, a better chance than some of them fully appreciate. There are still large numbers in the State engaged in general agriculture or mixed husbandry, who are better off and better satisfied than others with equal capital and ability who live in town; while in certain lines of fruit growing, vegetable gardening, floriculture, there are many who are making money and who like the business.

While the courses in agriculture are especially planned from beginning to end to train men for farming in some direction or other, it is admitted by all that the long course, or any portion of it, is an excellent training to fit a man for success in almost any pursuit in life.

* * *

THE work in Mechanical Engineering at M. A. C. compares favorably with that done in the majority of our schools. An effort is made to keep in touch with the work and methods of the larger institutions, such as Lehigh and Cornell Universities, and the M. A. C. course covers the greater part of the work given at such places. Inspection of our catalog will convince one of the excellence of our shop and laboratory equipment, an equipment which has called forth expressions of praise and admiration on the part of visitors from all parts of the country.

Young men who have not had an extensive preparatory education, also those who are working in shops, and have been obliged to neglect theoretical work for a time, and who contemplate entering upon an engineering career will find this school an excellent place to take up such work, since the requirements for admission are of a very limited nature.

Emphasis, however, must be placed upon the fact that although the requirements are not extensive, nevertheless, thoroughness in preparation is demanded, and is a necessity for the successful pursuit of the studies of the Mechanical course.

Finally, we would note in our opinion, an engineering education is obtainable at M. A. C. at a minimum of cost.

* * *

DOES a young woman want a good substantial education of a practical nature, combined with a first class training in the sciences, English, French, German, music, etc.? There is no other College in the State where "domestic economy," in all that pertains to these two words, has a prominent place in the course. The subject is a popular one, attracting much attention in some portions of our country. There has long been an urgent demand for such a course at M. A. C., and lo! here it is, ready for you to begin in September. The cost is moderate; the equipment excellent; the instruction thorough. Look over the course and if you intend to come, apply early, as rooms at the College in Abbot Hall are limited to fifty persons, though others can find rooms in the city within twenty minutes of the class rooms at a cost of five cents for a trip in the electric car.

If it is your desire to prepare yourself for the profession of teaching and you have an ambition to get above the district school, this is certainly the course of study to take. Our high schools are anxious to find teachers who have taken a thorough course in the sciences such as are given at this College. There is a demand for teachers of cooking and allied subjects. It will be but a short time until cooking will be taught in all our western cities, as it is now in most of our eastern cities. Now is the time, and this is the place to prepare yourself for a position which will be seeking your services as soon as you are prepared for it.

* * *

By referring to the course of study for women as printed on another page of this paper, it will be seen that during the sophomore year there will be given a course in Household Economy. This will consist of a series of lectures, familiar talks and readings in which the common facts of science are correlated in their bearing upon household matters. While an outline of this course may seem rather commonplace, yet the instruction will be both interesting and useful, and will, we believe, be very much appreciated by all those who have the priviledge of receiving it. The subject is treated broadly under the following divisions:

1. *The House.*—Its site, construction, sanitation; heating, ventilating, lighting; water supply and drainage; disposal of waste; furnishing; cleaning and general care; administration of household affairs; the keeping of household accounts; the relation of income to expenditure; the significance of the "home"—its relation to the municipality.
2. *Foods.*—Their nature, composition, and nutritive value; discrimination in purchasing; preparation and physiological effects; foods for the sick; foods for the well; for growing people; for adults.
3. *The Preservation of Health.*—The functions of the body; the care of the body; diets for different periods and conditions of life; work and rest; sleep.
4. *Clothing.*—Features of healthy garments; sanitary considerations; night clothes; clothing for children and infants; dress materials; principles of construction of dress; artistic considerations of dress.
5. *Emergencies.*—A course of lessons in the application of the facts of anatomy and physiology, intended to fit one to render that "first aid" so often indispensable in cases of accident or sudden illness when there may be delay in summoning a physician.

WILLIAM KENT A. M., M. E.

Our commencement speaker for 1896 is one of the foremost consulting engineers of this country, and one whose presence at the College should not fail to attract to our graduating exercises all in this vicinity who are interested in engineering education and the relation of engineering work to agriculture. In addition to conducting an extensive engineering practice Mr. Kent holds a responsible position on the editorial staff of the *Engineering News*. Mr. Kent has been, for some time, prominent in the work of the American Society of Mechanical Engineers, of which society he was for a time vice president, and is also a member of the American Institute of Mining Engineers. Kent's Mechanical Engineers' Pocket-Book, is a work that is generally conceded to be far superior to anything of the kind thus far produced. Mr. Kent takes an active interest in technical education and has acted as trustee of the Stevens Institute of Technology, of which institution he is a graduate.

RECEPTION TO LIEUT. AND MRS. LEWIS.

A most pleasing social affair was the reception tendered by the Faculty and ladies of the campus to Lieutenant and Mrs. Lewis last Friday evening. The lieutenant and his family have been members of our little community for four years, and their stay with us has been so congenial that all regret that they must soon return to garrison life.

The two suites occupied by Professors Holdsworth and Wheeler were thrown open to the guests, who gathered in groups about the tastily decorated rooms and gave themselves up to the enjoyment of the hour, while from the corridors above came sweet strains of music furnished by the Partridge brothers and Messrs. Berry and Eastman.

Later in the evening the guests repaired to the rooms of Prof. Noble, where Misses Lilian and Fay Wheeler and Essa Singleton served light refreshments—where delicate ices cooled the ardor of domestic and political discussion, and the conversation turned to lighter veins—soon after which the guests retired to their homes.

SPONTANEOUS COMBUSTION.

DR. R. C. KEDZIE.

St. Joseph, Mich., June 16, 1896.

Prof. R. C. Kedzie:

Dear Sir:—A mysterious fire occurred here, and I thought that you might explain it.

A large upholstered chair made with steel springs and stuffed with material resembling flax or hemp, was found to be burning inside. The people had been smelling something like burning cloth for about an hour, when flames burst forth from the chair and it was found that the combustible material was nearly all consumed. Spontaneous combustion has been suggested, and also that the sudden movement of the springs might have ignited the stuffing. Will you please give your opinion. J. S. D.

This is plainly a case of spontaneous combustion, and the possibility of the occurence of so serious an accident demands consideration. Many fires supposed to be of incendiary origin are caused by spontaneous combustion. In a very dry season many years ago, when everyone was fearing the outbreak of fire in Lansing, I saw Mr. Lapham rush out of his planing mill with a box of smoking sawdust in his hands, and when he dashed it into the middle of the street the sawdust burst into flames. A painter had wiped some paint off his hands by rubbing them with the dry pine sawdust in the box, and the rapid oxidation of the oil of the paint had set the sawdust on fire, and it was only by promptly carrying out the box of smoking sawdust that the mill was saved from fire.

Spontaneous combustion is liable to take place in masses of rags or cotton soiled with oil or varnish. The rapid oxidation of the oil or varnish raises the temperature sufficiently to set it on fire. If these greasy materials are in compact form the heat is concentrated into a smaller bulk and the danger of spontaneous combustion is increased. In upholstering the chair the workman may have wiped the oil or varnish from his hands on other objects, and used this material in stuffing the chair.

Masses of mineral coal containing much sulphur if wet are in danger of taking fire from oxidation of the sulphur. The Kansas State Agricultural College had the coal in its coal pit set on fire by putting in some wet coal. The condition is shown by the following quotation from the last *Industrialist*, June 6:

"The sulphurous fumes that have prevaded the shop's atmosphere for the past few days are not due to any inherent evil in employes or students meeting its punishment, but came from the coal pit—150 tons of coal were piled in the pit, filling it to the roof. The last loads being wet when put in, became heated, and took fire. The whole mass has been wheeled out and still persists in burning."

Chemical Dept.

THE DAVENPORT PLOTS.

A. A. CROZIER.

Many have no doubt noticed the double row of plots in field No. 5, north of the river, each plot having at one end a little well formed of large sewer tile covered with a numbered cap. These plots, 72 in all, were planned and laid out in 1890 by Eugene Davenport, then Professor of Agriculture, for the purpose of permanent experiments with fertilizers and systems of rotation. Each plot contains one-tenth of an acre and is marked at each corner by a section of iron gas pipe sunk below the reach of the plow. With a few exceptions occasioned by the lay of the land, each plot is provided with a separate drain, opening into one of the little wells already mentioned, by means of which the water from any plot can be collected for analysis. The water from these individual drains is taken by larger drains and carried to the river.

It was the original plan that for four or five years all the plots should be cropped alike without fertilizer and a careful record kept of the yield of each plot in order that when the experiments proper should begin the natural differences in fertility between the plots should be known. This plan has with some modification been carried out. In the fall of 1895 it was believed that this preliminary cropping had been continued long enough, particularly as repeated sowing to the same crop had considerably reduced the

fertility of the soil. Accordingly on a number of the plots rotation experiments were begun, while the remaining plots were left under the old system until such time as they might be needed. The rotations already started are as follows:

Wheat, clover.
Wheat, clover, corn.
Wheat, clover, potatoes.
Wheat, grass two years, corn, oats.
Wheat continuously.
Corn continuously.
Clover continuously.
Grass continuously.
Bare fallow continuously.
Beans continuously with rye turned under each year.

The chief object in testing these various rotations is to determine the effect of each on the fertility of the soil. All the rotations are being tested in duplicate, some of them on more than one kind of soil. The results will be looked for with interest in years to come.

Experiment Station.

EVERY MAN FOR HIS BUSINESS.

We were asked by Mr. Gunson, the florist of the College, to call and see a beautiful plant in the greenhouse. You could scarcely guess which one of the thousand or more kinds he referred to, so we will tell you at once that it was a raceme of gorgeous orange-yellow flowers borne on a pseudo-bulb a foot long, of a terrestrial epiphyte, one of the orchids familiarly known as *Dendrobium densiflorum*. This language is all as easily understood by a florist or botanist as the different parts of a harness are by the plowboy, or the details of a steam engine are by the man who runs a locomotive. The florist, the botanist, the plowman, the engineer, if well versed in his business, is each a useful member of society.

THE FERTILIZATION OF FLOWERS.

Among the questions for the examination of teachers for the common school, not long ago, there was one asking how certain flowers were fertilized. After the trial was over, one of the candidates asked one of our alumni what was meant by such a question, saying: "I didn't know as there was but one way to fertilize flowers; that is to spread the stuff around the roots and rake it in."

It is needless to say, that was not the meaning intended by the question.

Among the bound volumes of students' work in botany that were sent to the Exposition in Chicago, was one prepared by the freshmen in the year 1879, on the *Fertilization of Flowers*. Each member of the class, as has often been the case with other classes before and since that time, was given a certain plant in flower to study and state the results of his observations in the form of a short descriptive essay, often accompanied by drawings, sometimes by dried specimens of plants or parts of plants. The professor of botany has for many years acted on the principle that it was much better for young students to gather their own facts in this way than to draw on their imaginations for most of the materials for an essay, and, for a portion of their essays at any rate, better than gleaning facts from books. Again, making free use of plants in this way is equivalent to greatly enlarging the school library. As an illustration of this kind of work, we copy a short essay prepared in 1879—fifteen years ago. The plants referred to are common weeds, known as plantains, the former one as ribbed grass, the other as broad-leaved plantain.

HOW PLANTAGO LANCEOLATA AND P. MAJOR ARE FERTILIZED. By Fred E. Delano, '82.

In *P. lanceolata* the flower stalk often grows to the height of a foot or more, but when it attains the height of five or six inches the flowers on the lower part of the spike put out their hairy pistils which appear slowly in the flowers just above until they reach the top of the spike. In two or three days the lower pistils wither, the corolla opens and the stamens, which have folded filaments, extend their anthers out from the flower about a quarter of an inch by the straightening of the filaments. The anthers on these long slender filaments are freely moved by the least breath of air. [Illustrations were made and referred to in the text.]

As the pistils appeared first at the lower part of the spike, so do the first stamens, which follow the pistils in order toward the apex.

No flower puts out its stamens until it is past the time of being receptive to pollen, hence all the live pistils are above the stamens. At the time the stamens appear the anthers are ready to discharge their dry, light and fine pollen. Some of the stamens reach up, thus bringing their young anthers charged with mature pollen, in contact with some stigma receptive of pollen above; others reach outward, and discharge their pollen, which being dry is driven in every direction on to other spikes near by.

I have observed honey bees and other wild bees around this plantain, but as they always work around the stamens and below the pistils, they evidently do not aid cross-fertilization at all; hence, as it is not fertilized by bees, it must be fertilized by the wind.

P. major is cross-fertilized in a manner altogether similar to the *P. lanceolata*; but, as the spikes are much longer than the preceding species, and have a great many more flowers to fertilize, I think this is one reason why many of the flowers fail to produce seeds, on account of pollen not falling on all the pistils. Some of the flowers are imperfect, some without pistils, some without stamens, and some perfect, all on the same spike.

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Y. M. C. A.—Holds regular meetings every Thursday evening at 6:30 and Sunday evenings at 7:30. S. H. Fulton, President. C. W. Loomis, Cor. Secretary.

Natural History Society—Regular meeting second Friday evening of each month in the chapel at 7:30. L. R. Love, President. J. W. Rigterink, Secretary.

Botanical Club—Meets first and third Friday of each month in Botanical Laboratory at 7:30. C. F. Wheeler President. B. Barlow, Secretary.

Dante Club—Meets every Wednesday evening at 7:30 in Prof. W. O. Hedrick's office, College Hall. Prof. A. B. Noble, President.

Students' Organization—S. H. Fulton, Vice-President. H. L. Becker, Secretary.

Columbian Literary Society—Regular meeting every Saturday evening in their rooms in the middle ward of Wells Hall, at 7:30. F. N. Jaques, President. T. C. Chittenden, Secretary.

Delta Tau Delta Fraternity—Meets Friday evenings in the chapter rooms on fourth floor of Williams Hall, at 7:30. A. C. Krentel, President. J. M. Barnay, Secretary.

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Feronian Society—Meets every Friday afternoon at 2:30 in U. L. S. Hall. Miss Bertha Baker, President. Miss Ellen Vaughn, Secretary.

Hesperian Society—Meetings held every Saturday evening in the society rooms in the west ward of Wells Hall at 7:30. W. T. Barnum, President. D. J. Hale, Secretary.

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Union Literary Society—Meetings held in their Hall every Saturday evening at 7:30. J. T. Berry, President. F. V. Warren, Secretary.

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NEWS FROM GRADUATES AND STUDENTS.

L. C. Brooks, '92 *m*, is engaged temporarily as draughtsman with Gilbert Wilkes & Co., consulting engineers, Detroit.

W. D. Groesbeck, '92 *m*, writes that he will make a lake trip to Detroit next month and will probably come as far as M. A. C. again.

The many friends of L. C. Gibbs, with '92, will be sorry to learn of the death of his father, Col. E. P. Gibbs, who died in Lansing, June 12, after a long illness.

B. T. Halstead, '73, Petoskey, was in Lansing last week pleading a case before the supreme court. His son, B. H. Halstead, with '97, now of the University of Indiana, is visiting M. A. C. friends for a few days.

Prof. Eugene Davenport, '78, Dean of the College of Agriculture and Professor of Animal Husbandry in the University of Illinois, informs the RECORD that the Board of Trustees have recently taken measures to again strengthen the College of Agriculture, by providing for the election of a Professor of Agricultural Physics and a Professor of Dairy Manufactures, both likely to be filled before the opening of the fall term.

A class reunion on a small scale was held in Grand Rapids on Memorial Day, when C. Harry Watson of Milwaukee, Wis., George B. Craw, of Lowell, Mich., and R. Justin Rote, of Muskegon, Mich, all with '95, were the guests of W. A. Ansorage, also with '95. A very enjoyable time was had and all departed for their homes declaring College friendships pre-eminent.

E. L. Smith, for two years with '85, is traveling salesman for the A. Y. McDonald Co., of Chicago, manufacturers of plumbing and steam fitting supplies. His territory is Southern Michigan and Northern Indiana, but his home address is Lansing, Mich. Last week he paid the College a business visit to press the sale of sanitary appliances for Wells and Williams Halls.

H. W. Collingwood, '83, managing editor of the *Rural New Yorker*, usually has some verses on the editorial page of the paper. The following is from the number for June 12:

"I'm glad ye got back, Mary—yes, I done the best I could
To keep things runnin' smooth while you was gone;
But there ain't no gettin' 'round it—run as easy as I could,
This home, when you ain't in it, is forlorn.
It's awful good to see ye—settin' over in yer place
With baby—yes, I'm awful glad you've come;
It's mighty good to read it, shinin' right out of yer face,
The best part of a visit's gettin' home!

The days went sorter draggin'—sorter creepin', crawlin' through,
The evenin's was so lonesome, I can say,
To set here jest a thinkin', an' a wearyin' fer you,
An' countin' up yer comin' day by day;
But now the visit's over, an' we got ye home at last,
Ye look more like a sweetheart than a wife;
An' baby's growd so cunnin', an' he's put on flesh so fast!
I never was so happy in my life!"

HARDSHIPS OF THE JOB.

"How did the weather man get such a lame back?"

"He had to hold off a cyclone until the date for which he had billed it."—*Chicago Record.*

TUMBLE MUSTARD.

C. F. WHEELER.

A new weed has just entered Michigan at Benton Harbor. It is known to botanists as *Sisymbrium altissimm L.* It is a native of Europe and was first noticed in Canada, in 1885. Prof. J. Macoun called the attention of residents of Assiniboia to this weed and advised its extermination. Nothing was done, however, and in 1895, 1,200 acres of it were plowed under. Since this time it has spread into Minnesota and adjoining states. On June 13, the writer discovered over 100 luxuriant plants growing near the salt warehouse of the Big Four railroad company at Benton Harbor. Specimens were shown to the members of the State Horticultural Society, then in session at St. Joseph, and the proper authorities were advised to exterminate it. This is the worst "tumble weed" in this country, more to be dreaded even than the Russian thistle.

Experiment Station.

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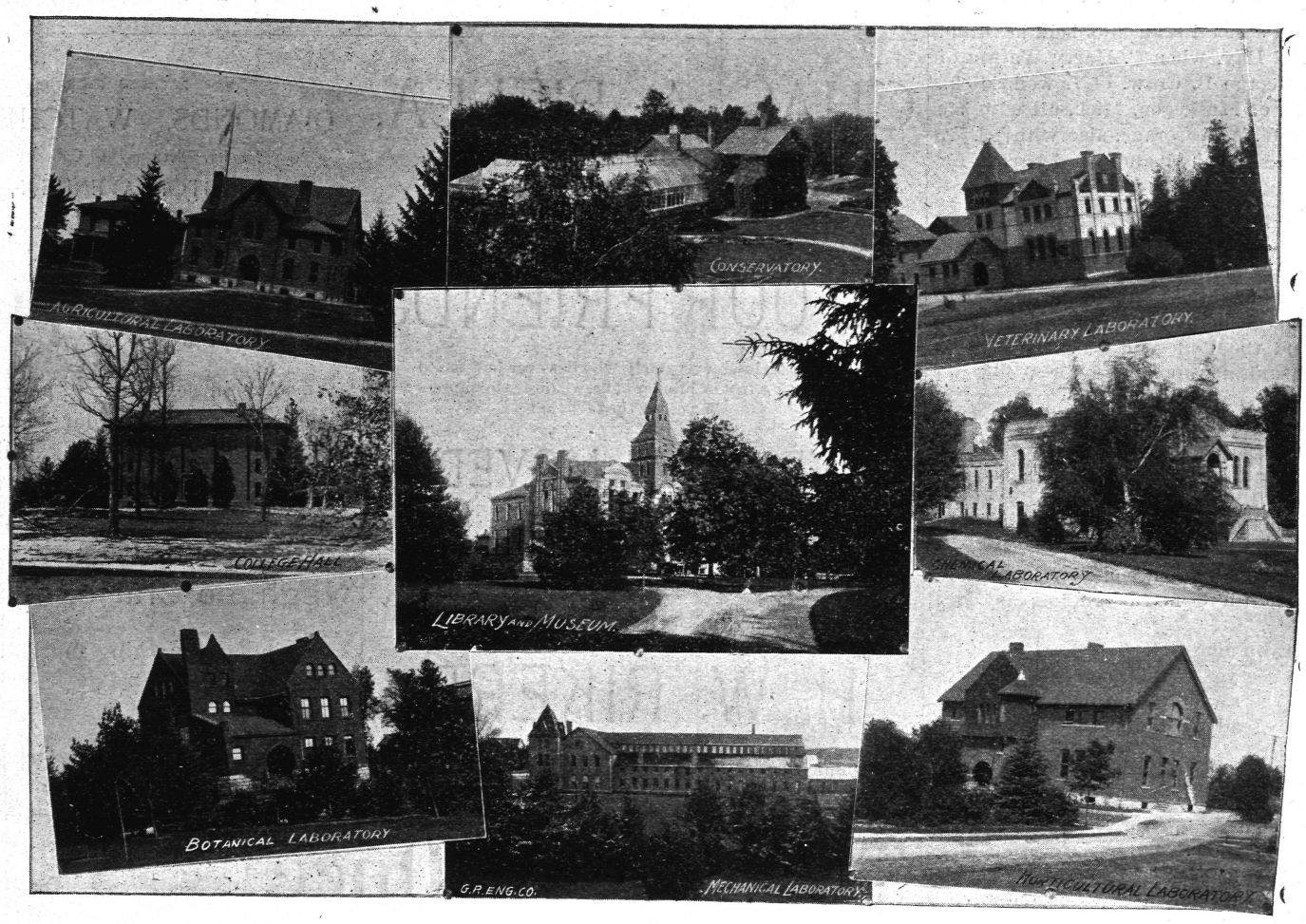

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