DEPARTMENT OF MILITARY SCIENCE AND TACTICS.

LIEUT. E. A. LEWIS.

The Department of Military Science and Tactics was established in 1864 by the State Legislature, in accepting and giving to this institution, certain public-lands granted by Congress 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 bolts and cartridge boxes, six swords and belts, four signal flags, and two telescopes. 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 was supplied with rifles and bolts, flags, hussar stalked, 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, marring 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:

"The Apple be made as Profitable as other Fruits?" E. H. Sherwood.

"Pests, New and Old." Reference was also made to the root-galls upon the plum, but no evidence of a fungous or bacterial nature can be found.

On Friday the society had as its guests 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, pears, grapes and plums promised an abundant crop, but the peaches 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, feeding, spraying 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 pound to 2 pounds had been removed from many of the trees. The methods advocated by Mr. Merrill in his talks at the farmers' institutes past two years, to root out all the thistles and make the soil nourishing, have been put into use in his own orchard, and only words of praise can be given. The financial returns from this fall season will clearly show that the system thus was justified by the intensive culture that is given the trees.

**Horticultural Dept.**

**AT THE COLLEGE.**

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

Senior George Williams is designing a traveling cabinet for practical use.

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. Heckman, is slowly recovering. His sisters, Jennie and Belle, are here caring for him.

Barry M. Goss is visiting friends at M. A. C. He rode over from Flatwell 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 new diagram for the lecture on the steam engine indicator card, by Prof. Morley, Professor of Civil Engineering in Purdue University, and his wife, were visitors at the college last week.

Mr. and Mrs. Albert Glaspell, from Austin, Tex., are residing in the President's house, and Mrs. Glaspell is Mrs. Chamberlain's sister.

The King's Daughters wish to cordially thank the industries of the college, both faculty and students, for their request for contributions for the clydesfor suffrages.

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

A young lady in a University somewhere in this country, when examined said endgrowing plants are those known as in a greenhouse, to the corybiaceous plants these which are grown in the open air.

On Thursday, three farmers and their wives and children drove over from Ovid, Clinton county, and had an enjoyable time. They expressed themselves as well pleased with what they saw and learned.

The seniors and juniors indulged in a game of ball Saturday afternoon, which reached in a score of 20 to 13, for the seniors. The teams were composed of the members of the class. The game was the coaching of J. E. Tracy and C. K. Chapin.

Among the numerous plants of interest in the greenhouse and laboratory, students and visitors should not overlook the tall specimen of sugar cane, doubtless more stringent than when well grown in the open 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 separator is turned out, and the cream is drawn off from the milk; it is drawn off from one spoon, the cream from another."—Mrs. Thompson, of Lansing, and her daughter, Irma, visited the College last Thursday. Miss Thompson and her son are students at the College. Next September, and will take the Ladies' course. She will spend the most of her summer vacation at Lawrence, Van Buren county.

In those days every college and every class in College must have a plot; 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 are the kids of M. A. C.

On Friday last, two small parties of farmers picked the campus; one from St. Johns, the other from East Lansing. 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 large ones.

On the low bank, once a "cat-hole," between the farm house and the garden barn, is a nice patch of clover.

This year, under a portion of the land, tills are buried parallel to each other at a distance of 18 inches. This scheme is to water the plants through these tills instead of irrigating the surface of the soil. It is called sub-surface irrigation.

Rev. John W. and Mrs. Glaspell, 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 Agricultural College. 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 please for their last meeting in a stroll through the Botanic garden under the guidance of Mr. Wheeler, the present custodian for the last two years. The floor of September, this garden will be more and more attractive. Nothing new is appearing at its best every few days.

Prof. Wm. H. Sherzer, of the State Normal, after seeking 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 the garden are Ox-Eye Daisy and Purple Clover-flower, the former from Europe, the latter now common in the Eastern States, where it came. Both have been kept as varieties of grasses and crows.

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 callers, the setting on the porches of the homes of the Coles. The moonlight, the west, both have been kept as varieties of grasses and crows.

Our corn crib was planned and built some time ago by the late C. L. Ingraham, then Professor of Agricult-

In the bottom of the crib below the corn is an open door of overlapping boards slanting toward the middle of the crib, when the corn is shoveved out. By this means the ears of corn in the crib are all moved every time a little is shoveved 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 impresses the methods of organization for actual work, the class is divided into squads of six, with each a chosen foreman, and by the class are placed in charge of the squads. Following are the names of the captains elected this term: Squad No. 1, T. W. Robison; No. 2, C. K. Oak-

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A. M. Patriarche; No. 6, G. F. Richmond.

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

An exceedingly interesting service was conducted in the chapel Sunday afternoon by Rev. Louis Besel-

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 corn for the first time. The last swmap was fitted and sowed to millet last month.

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

The field corn is still in bloom. The "Success" or awnless barley now promises a fair yield. Last year it was ruined by drought, while the ordinary 6-rowed variety was but little injured.

Several samples of orchard grass were recently collected on the station in 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 a salad, sheep and cattle dislike this pea.

One of the tests of fodder plants now beginning to come in is seen in the growth of the winter oats last spring to the following sorts: Crimson clover, oats and vetches, sweet corn, Kafir corn, sorghum and clover.

Have you noticed the winter oats in No. 67? 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. Two plots of rape still await them before they start over the ground the second time. Two other plots eaten by the sheep are in lack and sorghum. The series consists of six o'ncoreae, the sheep being confined upon one plot at a time by movable hurdles. The object of the experiment is to determine how many of the species given area are ofkinds of pasture crops.

"To drop the macking system would hurt no one; to keep it hurts all."

J. A. Burt.
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 meet 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.

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

**FRESHMEN.**
- First term.
  - English, 5.
  - Botany, 10.
  - Drawing, 4.
  - Callisthenics.

**Second term.**
- French, 5.
- Drawing, 5.
- Callisthenics.

**JUNIORS.**
- First term.
  - Literature (American), 5.
  - German, 5.
  - Drawn.
  - Callisthenics.

**Second term.**
- French, 5.
- Drawing, 5.
- Callisthenics.

**SENIORS.**
- First term.
  - Agriculture.
  - Horticulture.
  - Meteorology.
  - Log. Bacteria.
  - Physics.

**Second term.**
- Agricultural economics.
- Horticulture.
- Economic geography.
- English masterpieces.
- Psychology.

**Third term.**
- History of art, 5.
- Civics, 5.
- Shakespeare, 1.

**Fitting, Style, Durability.**

**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 of 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 the same 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 in 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 which he may find offered for sale in various parts of the State, and makes analyses of such fertilizers, comparing them with the samples deposit-ed 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 which licenses have been issued for 1896 is fifty. This shows that the use of fertilizers is quite extensive in this state.

**STATE REPUBLICAN FOR PRICES.**

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We carry all grades. Repairing done.

**FRED SHUBEL.**

**FOR SALE AT SPRING BROOK STOCK FARM.**

Choice Shorthorns, Shropshire and Merino Sheep, Poland China Swine.

We are Headquarters for all Kinds of Home-Made Sausage.

Describe closely what you want and satisfaction guaranteed.

Phone connections with farm.

W. E. BOYDEN PROPRIETOR.

DELHI MILLS.

Phone 192.
New Phone 76.

J. G. REUTER, 322 Wash. Ave. S.

Fresh and Salt Meats
Fine Chicago Beef a Specialty.

You will find the Largest Assortment of Fine Boots & Shoes

**SIMONS DRY GOODS CO.**

**UNLOADING PRICE REDUCTION SALE**

OF DRY GOODS AND CARPETS

FROM JUNE 24 TO JULY 24

$25,000 worth of Dress Goods, Silks, Wash Goods, Embroideries, Lace, Hosiery, Underwear, Corsets, Linens, Gloves, Shirts, Waists, Cottons, Carpets, Curtains, Cases, Jackets, Etc., at 25 to 50 PER CENT REDUCTION IN PRICE FOR THIRTY DAYS.

SEE STATE REPUBLICAN FOR PRICES.
MICHIGAN AGRICULTURAL COLLEGE

Edited by the Faculty.

An exercise in the College was continued long enough, particularly as repeated sowing to the same crop had considerably reduced the yield of each plot in the first year. It was believed that this preliminary cropping had its punishment, but came from the coal pit—150 tons of coal were piled in the pit, filling it to the roof. The condition is shown by the following:

<table>
<thead>
<tr>
<th>Period</th>
<th>Condition</th>
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<tr>
<td>Winter</td>
<td>Wet coal.</td>
<td>Leakage of gas into the coal pit.</td>
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<tr>
<td>Winter</td>
<td>Coal set on fire by putting in some 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.</td>
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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 guessing facts from books. Again, making free use of plants in this way is equivalent to greatly enlarging the school library. As an illustrative and practical method 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. MAJORE ARE FERTILIZED. By Fred B. Delano, '92.

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 receptacle 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 just 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 pollen, but none 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 to other stamens 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, since it is not fertilized by bees, it must be fertilized by the wind.

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W. R. GOODWIN
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FERTILITY of the soil. Accrding to a number of the plot 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, peas.
Wheat, grass two years, corn, oats.
Wheat continuously.
Corn continuously.
Clover continuously.
Grass continuously.
Rye fallow continuously.
Beans continuously with rye turned under each year.

THE EFFECT OF SODDING. The plants referred to are common weeds, the other as broad-leaved plantain.

THE FERTILIZATION OF FLOWERS.

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 anthers, and some perfect, all on the same spike.

P. lanceolata; in order toward the apex.
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CHAPEL SERVICES.

Sunday Chapel Service—Preaching at 2:30 p. m.

Y. M. C. A.—Hold regular meetings every Thursday evening at 6:30 and Sunday evening services 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. E. R. Lowe, President. J. W. Eltigarn, 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-Presi
dent. H. L. Becker, Secretary.

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

Delta Tau Delta Fraternity—Meets Friday evenings on the fourth floor of Williams Hall. Prof. J. J. Machine, Secretary.

Olympic Society—Meets on fourth floor of Williams Hall every Saturday at 7:30 p.m. President. W. W. Vandervan, Secretary.

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

Stadium Committee—Meets on the fourth floor of Williams Hall every Saturday at 7:30. A. A. Crozier, President. W. T. Barrow, Secretary.

Hesperian Society—Meetings held every Saturday evening at 7:30 in Prof. A. A. Crozier's office, College Hall. Prof. A. A. Crozier, President.

Phi Delta Theta Fraternity—Meets on the fourth floor of Williams Hall every Saturday at 7:30. C. A. Jewell, President. P. J. Kling, Secretary.

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Polish Union—Meetings held in the dormitory of the University Historical Society.

Friday evening in the chapel at 7:30. W. T. Barnum, President. D. J. Hale, Secretary.

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NEWS FROM GRADUATES AND STUDENTS.

L. C. Brooks, '82, is engaged temporarily as draughtsman with Gilbert Wilkes & Co., consulting engineers, Detroit.

W. D. Groseclose, '32, 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 Illinois, informs the RECORDER that he was the guest of W. A. Auerbach, also with '92. A very enjoyable time was had and all departed for their homes declaring College friendships pre-eminent.

E. L. Smith, for two years with '83, 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. Collington, '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 house, when you ain't in it, is forlorn.
It's awful good to see ye—settin' over in yer place again,
But now the visit's over, an' we got ye home at last,
To Close at Once!

TO OUR FRIENDS

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