Chrysanthemum Forcing With Chemicals.

PROF. L. R. TAFT, HORTICULTURIST.

The past twenty years have marked a great change in the methods used by florists in growing chrysanthemums for the production of cut blooms. Formerly they were grown in pots and the flowers were set out in the cold frames and here many a year the production of cut blooms failed. Formerly they were grown in pots and the flowers were set out in the cold frames and here many a year the production of cut blooms failed. Dyes were used for the production of cut blooms. Formerly they were grown in pots and the flowers were set out in the cold frames and here many a year the production of cut blooms failed. Dyes were used for the production of cut blooms.

While growing it was noticeable that the flowers grown with chemicals were of a firmer texture than those from the manure plots and the difference was even more noticeable after the blooms were cut, as those grown with stable manure wilted much sooner than the others. Although the experiment is not completed, it is very evident that as good flowers can be grown with chemicals as with stable manure, with less labor and little if any greater expense, while the firm growth that can be thus secured will greatly increase their value as cut blooms.

The same thing was noticeable at the recent chrysanthemum show at Chicago, where an exhibit grown by the use of chemicals remained in a presentable appearance much longer than the others which were largely if not entirely grown with stable manure.

Sodium nitrate, mildly acidulated ground bone and wood ashes, gave good results; but, especially for the liquid applications, nitrate of potash, phosphate of ammonia and sulphate of potash will be more readily applied and will give fully as good results.

Horticultural Courses.

One of our popular special courses last winter was the course in "Fruit Culture." The fruit interests of the State are of great and growing importance. Thousands of acres of excellent fruit land along the west shore remain as yet undeveloped, and here may be found the great fruit man will in the next few years make a start in fruit raising. For such of these as can not take a full college course at M. A. C., our special courses offer peculiar advantages. For six weeks, beginning January 5, the special course students who elect fruit growing will be given lectures and practical demonstrations on the various phases of nursery work, planting and care of the orchard, and small fruit culture. These lectures will be given by college men who have made a specialty of the subjects in their charge and by outside lecturers—leading fruit growers of the State who will give the students the results of their valuable experience.

Laboratory work will be an important feature of the course. It will include practice in grafting, budding, layering, making cuttings, etc. Considerable attention will be given to spraying machinery and other implements of the orchard.

Botany will be given considerable attention, as will also entomology and chemistry.

Fruit growers should know how insects eat and fly and breathe and live and how they multiply; when, where and how the eggs are laid; where and how they winter; what they appear and disappear so suddenly; and how to handle old

The flowers formed at the same time and were of equal size and fullness. When fully developed the flowers were cut and three of a variety from the different plots were photographed. They were then placed in a cool room to test their keeping qualities, and after a week or ten days were again photographed.

In order to secure this it has been found necessary to use in excess of the normal amount of potash. This was largely if not entirely grown with stable manure.

Commercial floriculture, and winter vegetable growing.

The College greenhouses will be used to illustrate each of the above subjects of construction of glass houses, commercial floriculture, and winter vegetable gardening. The College greenhouses will be used to afford practice work in the various methods of construction, and will contain all of the subjects in their charge and will be used to illustrate each of the above subjects of construction of glass houses, commercial floriculture, and winter vegetable gardening.
Erected as second-class matter at Lansing, Mich.

For various reasons the M. A. C. Record is occasionally sent by mail, free of charge. Such persons need have no hesitation about taking the paper from the post office, for no charge will be made for it.

The only way, however, to secure THE Record regularly is to subscribe.

THE M. A. C. RECORD.
PUBLISHED WEEKLY BY THE
MICHIGAN AGRICULTURAL COLLEGE.
EDITED BY THE FACULTY.
ASSISTED BY THE STUDENTS.

SUBSCRIPTIONS SHOULD BE SENT TO THE SECRETARY, AGRICULTURAL COLLEGE, MICH.

SUBSCRIPTION—$0.50 PER YEAR.

Send money by Postoffice, for no charge will be made for it. Money Order, Draft, Check, or Express for the paper. Such persons need have no hesitation about taking the paper from the post office, for no charge will be made for it.

The practice and instruction will be adapted to the wants of the beginner in dairy work who is an expert in the art and is capable of doing the work.

Two Valuable Special Courses.

- CREAMERY MANAGEMENT AND BUTTER-MAKING.

Both experience and technical knowledge are necessary to the success and management of a creamery. Something of the former and much of the latter can be secured in a special course arranged for by the third of January, 3, 1887, and continue six weeks.

The practice and instruction will be adapted to the wants of the beginner in dairy work who is anxious to fit himself rapidly and economically for the successful management of a creamery, and to the experienced butter-maker who has already served for one or many years at the business. The former will have daily experience in actual butter-making with the apparatus which he will be called upon to operate later in the factory; while the practical work of each can be greatly improved as the result of the study of the other. The course will include the study of the physics and chemistry of milk, the best methods of operating various styles of separators, and other dairy machinery and conveniences, the reasons for the various operations and the best methods of performing them, and finally the rules of business which should govern him in managing an enterprise of this kind.

The experienced butter-maker will have his attention called to many kinds of separators and their relative merits as shown by their actual work in the dairy room under the care of an expert; to the various methods of heating milk for separation, and the care of cream and ripening it; to the use of the combined churn and worker, and to the methods of performing the best of details that have to be gone over every day in the working of a creamery.

The course will include: (1) A course of lectures on methods of keeping books, illustrated daily by the business operations of the College dairy. (2) Daily practical work at butter-making, which will be the dominant feature of the course. (3) Creamery mechanics, which will include the study of, and practical work with, the machinery of the creamery. (4) Dairy chemistry.

The Possibilities of the Grand Traverse Region for Fruit Culture and Dairying.

Thirty years, yes, even as late as twenty years ago, the Grand Traverse region could be described as wild and barren; but, owing to its abundant natural resources, it has been developing rapidly and in some places it is becoming quite thickly settled. While the lumbering interests were being developed the most important industries, as farming, fruit raising and dairying were neglected. This has been the condition of northern Michigan in the past.

The lumbering industry while exhausting itself has practically been limited to the coasting line of the Great Lakes, which is not the way it was intended that it should be. There seems to be no reason why dairying and fruit raising will not, in the near future become two of the leading industries in this section of the State. Farther inland these industries are peculiarly adapted to the production of the forage crops. Much of the herd of cattle which have been stripped of their timber can be purchased at from two to five dollars an acre, and can easily be converted into pastures which will produce more than much of the land which is too rough for purposes of general farming, and, in many cases, the land can be made valuable as the more expensive flat lands.

In this way much of the land which would otherwise be a waste could be made valuable.

But if dairying is to be profitable, the dairymen must not only be able to produce cheaply, but must also have a good market for their products. The home consumption greatly exceeds the production and the demand for butter and milk is increasing every year.

One of the best points in favor of dairying in northern Michigan is that the greatest demand comes at a time when the farmers are most easily and cheaply produced. Ten or twelve years ago, it is true, fruit raising as an industry was yet in its infancy. But today it bids fair to become one of the leading agricultural pursuits; already thousands of bushels of ap-
The growing of the small fruits, as the berry fruits, has, as yet, received but little attention, and most fruits of this class are imported from other parts of the State. There is no necessity for this, however, because the same quality of fruit can be produced just as easily and equally as well at home, with good profits to the producer.

Wherever dairying and fruit raising have been tried in this section, they have proven profitable. Under the existing condition, and as the country becomes more thinly settled there is little doubt that these two branches of agriculture will become the two leading rural occupations of the Grand Traverse region.

At the College.

Mr. R. H. Petit is on the sick list.

Mrs. Cline returned from Chicago last week.

The contractors are wiring the library building.

The ceiling of the general museum is being redecorated.

L. E. Sago, '99, has been confined to his room for over a week.

Mr. and Mrs. H. E. Patterson of Chicago, are visiting Mr. and Mrs. C. C. Ferrell last week.

Messrs. Parks and Russell went from the Notre Dame football game to their homes.

Miss Grace McCuen of Mason, spent Sunday, November 21, with Miss Grace Melton, '01.

W. J. Minkert went from the Notre Dame game to Chicago, where he remained until Sunday afternoon.


Boarding club stewards for the winter term have been elected as follows: Club A—C. H. Chadsey; Club B—E. C. Davis; C—Mrs. Bacon; D—F. W. Robinson; E—H. L. Becker; F—W. K. Brainerd.

The Farm Department has just sent the printers a valuable bulletin on "Feeding Dairy Cows." It contains a definition of terms used in feeding literature; a table of the composition of food stuffs; means of computing rations; and deduces from records of several years, a new feeding standard, which practically confirms and puts on a scientific standard the published by Prof. Woll of Wisconsin University. The bulletin contains also discussions and analyses of the food-stuffs used during the last three years, and describes the method here used of keeping cows in stables.

Michigan vs. New Mexico Sugar Beets.

From the Western Library.

The sugar beet is becoming an important agricultural product in many places in this country and in New Mexico. Recently the Liberal heard that a friend in Michigan had been analyzing sugar beets raised in that state, and had said they were the richest in sugar of any raised in the world. Not wanting the friend to publish the results of this, he could not be substantiated the Liberal wrote him telling that the beets raised in sugar were raised in the sun kissed valleys of New Mexico, and in proof thereof quoted to him the result of analyses made by Goss of the experiment station, who found from a series of analyses that the New Mexico beet produced from 15.5 to 20.3 per cent of sugar. In answer to this the following letter was received: "Don't prophesy unless you know. Do not say in your statements about sugar beets unless you are certain. The sun-slapped valleys of New Mexico may produce sugar beets with a percentage of sugar ranging from 15.5 to 20.3, but frost-nipped Michigan has produced sugar beets under the McKinley tariff that beats New Mexico. I have analyzed eight samples of the Vilmorin-Andrieux beet raised from 1909 per cent sugar to 22.53 per cent and with an average of 20.75 per cent purity of sugar; 88 also; eight samples of Klein Wanzeleeb that ranged from 19.06 per cent to 21.28 per cent sugar, with an average of 20.63 per cent, and purity 97. Go to Texas! New Mexico is nowhere!"

A Simple Method of Combining the Colors.

PROF. F. W. McNAIR.

The following very simple method of illustrating the reconstruction of the spectral colors into white light has some obvious advantages in the way of economy;

A rectangular refraction tank with glass ends is set up in front of the eastern, both being preferably upon a rotating stand. From a horizontal slit a beam is projected and the prism interposed in such a manner that there is sent down into the water the rays of the spectrum, their sides from red to violet changing lengthwise of the tank. A few drops of milk are mixed with the water, and with care a mixture may be obtained, which in a side view shows the separated rays clearly, while at the same time if viewed from the end of the tank it looks quite white. On cutting off either the violet or red end of the spectrum more color becomes observable. If a strong beam is available it is better to turn it backward toward the eastern by a reflector before sending it through the prism. This brings the violet rays which are least intense nearest the end, when they have a traverse at thinner stratum of the mixture. —Science.
News from Graduates and Students.

Notice that this column is mostly a record of marriages this week.

H. N. Jenner, '86, is a well-to-do druggist in Goshen, Indiana.

Carl Hoppough, with '00, spent a few hours at M. A. C. Wednesday.

Born, Tuesday, November 23, to Prof. and Mrs. F. M. Chamberlain, '88W, a daughter.

S. W. Keefer, with '97, is again in town having returned last week to take special work.

Don H. Kozie, '97, editor of the Western Liberal, has been appointed postmaster at Lordburg, New Mexico.

N. E. Dresser, with '92, is a nurseryman and fruit grower at Jonesville, Michigan. He has a very pleasant home, a wife and two bright children.

Witt D. Bingham, with '93, after leaving M. A. C. attended Yale and Harvard, and then went to Seattle, Washington, to engage in engineering business.

We've just found it out—sometimes enjoyed or enjoyed by the ne'er-do-wells of '93 men, Albert B. Chase, by name, was married to Miss Alta Bush of Gobleville, New Mexico.

John F. Costs, with '97, arrived at M. A. C. Sunday from Park City, Montana. He will take the special course in cheese making. He says a position is awaiting him in Park City. All that he needs is the necessary preparation.

Thursday evening the wedding of Mr. and Mrs. Daniel Binns, Woodstock, occurred the marriage of their daughter Ethel, to J. De Witt McLoath, '97. The young couple will reside on the old farm near Addison.

Hon. C. W. Garfield, '70, was married to Miss Jessie A. Smith of Grand Rapids, Wednesday evening of last week, being occurred at the residence of the bride's brother, Mr. J. R. Smith, in Denver, Colorado. Mr. and Mrs. Garfield will spend several weeks in Washington, D. C., returning to their Burton Farm home about the first of March.

Last Tuesday evening, at the home of the bride's uncle Mr. Hobart Payne, Owosso, Miss Addie D. McGilvra, with '97, and Charles B. Cook, '88, were united in marriage.

About 175 guests, including Misses Edith Smith and Catherine Watkins of M. A. C., attended the wedding. There were many beautiful and costly presents, among which was a chafing dish from the Abbot Hall girls. Mr. and Mrs. Cook will be at home after January 1 at Owosso, N. Y.

Thanksgiving Week.

The week was rather quiet at the College. Though but one day of vacation was given, those who desired to go home were excused from recitations on Friday, and many availed themselves of the opportunity.

Devotional exercises were held in the Y. M. C. A. rooms Thursday morning at 8 o'clock. Several social functions were indulged in by those who remained here.

Tuesday evening Prof. and Mrs. C. D. Smith gave a very pleasant entertainment to the "Bachelors" and their lady friends. Refreshments were served at small tables to twenty-six, the favors being white roses. Guessing contests and the reading of a skeleton story followed. In the freethread drawing contest, Mr. Ernest True won the honors, a copy of J. M. Barrie's Auld Licht Idylls. In guessing the contents of packages several were tied for first, but by casting lots Mr. Chace Newman secured the prize, a basket of fruit.

In the Abbot Hall kitchen laboratory, Thursday evening, a candy pull was in progress from eight till eleven o'clock. About twenty young women and as many young men, divided into five pulling gangs, made taffy of all degrees of stickiness and sweetness, some of which might well be called edible. It was the good time they were after, not the candy, and they had it.

Wednesday evening the Union Literary Society gave an informal Thanksgiving hop. Twenty men made up the program, which was thoroughly enjoyed by the thirty young people present.

About twenty young men and women enjoyed postball games and dancing in the Hesperian rooms Thursday afternoon.

Prof. and Mrs. C. D. Smith ate Thanksgiving turkey with Mr. and Mrs. John M. Corbin of Eaton Rapids.

Miss Amy Vaughn entertained Miss Lucy Moncrief at her home in Ionia during Thanksgiving.

Mr. Chace Newman spent Thanksgiving at his home in Portland.

In Mr. C. E. Hoyt's speech Thursday and Friday in Park City.

If a college girl hears of another girl being kissed she is horrified, but under favorable circumstances she will let the same thing happen right under her own nose.—Ex.

News from Graduates and Students.

The names in this Directory, as well as those of all our other advertisers, are of reliable parties. We hope that the faculty and students will take pains to patronize those who patronize us.

BOYS—Buck Sells Furniture Right.

All Goods Delivered to the College Free.

Best Woven Wire Cots, $1.25 . . . . Best Woven Wire Springs, $1.50

WE SELL EVERYTHING.

M. J. & B. M. BUCK.

OperEnger.

DIRECTORY

BLANK AND BAGGAGE LINES.

M. J. & B. M. BUCK, Proprietors.

WE SELL EVERYTHING.

S. RICHMOND—Journal, compositor, typesetter and compositor.

W. RAPLEY—Watchman, janitor, etc.

C. PRESTON—Typist.

N. W. CREAMER, Proprietor.

WE SELL EVERYTHING.

THE VAN GORDER PALACE LAUNDVY, 105 Grand St. South, Lansing Avenue S.

S. STAR LAUNDVY, 598 Michigan Avenue East, Lansing Avenue S.

LUMBER DEALERS.

W. REIKER—Lumber Dealer, Mill Street.

MERCHANT TAILORS.

WOODBURY & SAVAGE—Tailors, Student trade solicited, 308 Washington Avenue.

MUSIC AND MUSICAL INSTRUMENTS.

OLMES MUSIC STORE.—Pianos, Organs, Tinware, etc. Ill Washington Avenue N.

BARBERS.

H. WOOD—Barber, 116 Michigan Avenue E.

D. WOODBURY—Boots and Shoes.

T. A. MARTIN—Barber. 121 Washington Avenue S.

A. D. GATES—Barber. 106 Michigan Avenue E.

DRUGGISTS.


WE SELL EVERYTHING.

---ALWAYS ON TOP--

DAVIS—THE CLOTHIER

Fine Clothing

Furnishings and Hats

Football Pants

Sweaters, Supporters

The King Pant

We are Up to Date on Men's Wear.

ONE PRICE—THE RIGHT PRICE.

104 Washington Avenue North.

NOVEMBER 30, 1897.

THE M.A.C. RECORD.

BOYS—Buck Sells Furniture Right.

All Goods Delivered to the College Free.

Best Woven Wire Cots, $1.25 . . . . Best Woven Wire Springs, $1.50

WE SELL EVERYTHING.

M. J. & B. M. BUCK.

OperEnger.

DIRECTORY

BLANK AND BAGGAGE LINES.

M. J. & B. M. BUCK, Proprietors.

WE SELL EVERYTHING.

S. RICHMOND—Journal, compositor, typesetter and compositor.

W. RAPLEY—Watchman, janitor, etc.

C. PRESTON—Typist.

N. W. CREAMER, Proprietor.

WE SELL EVERYTHING.

THE VAN GORDER PALACE LAUNDVY, 105 Grand St. South, Lansing Avenue S.

S. STAR LAUNDVY, 598 Michigan Avenue East, Lansing Avenue S.

LUMBER DEALERS.

W. REIKER—Lumber Dealer, Mill Street.

MERCHANT TAILORS.

WOODBURY & SAVAGE—Tailors, Student trade solicited, 308 Washington Avenue.

MUSIC AND MUSICAL INSTRUMENTS.

OLMES MUSIC STORE.—Pianos, Organs, Tinware, etc. Ill Washington Avenue N.

BARBERS.

H. WOOD—Barber, 116 Michigan Avenue E.

D. WOODBURY—Boots and Shoes.

T. A. MARTIN—Barber. 121 Washington Avenue S.

A. D. GATES—Barber. 106 Michigan Avenue E.

DRUGGISTS.


WE SELL EVERYTHING.

---ALWAYS ON TOP--

DAVIS—THE CLOTHIER

Fine Clothing

Furnishings and Hats

Football Pants

Sweaters, Supporters

The King Pant

We are Up to Date on Men's Wear.

ONE PRICE—THE RIGHT PRICE.

104 Washington Avenue North.

NOVEMBER 30, 1897.

THE M.A.C. RECORD.

BOYS—Buck Sells Furniture Right.

All Goods Delivered to the College Free.

Best Woven Wire Cots, $1.25 . . . . Best Woven Wire Springs, $1.50

WE SELL EVERYTHING.

M. J. & B. M. BUCK.

OperEnger.

DIRECTORY

BLANK AND BAGGAGE LINES.

M. J. & B. M. BUCK, Proprietors.

WE SELL EVERYTHING.

S. RICHMOND—Journal, compositor, typesetter and compositor.

W. RAPLEY—Watchman, janitor, etc.

C. PRESTON—Typist.

N. W. CREAMER, Proprietor.

WE SELL EVERYTHING.

THE VAN GORDER PALACE LAUNDVY, 105 Grand St. South, Lansing Avenue S.

S. STAR LAUNDVY, 598 Michigan Avenue East, Lansing Avenue S.

LUMBER DEALERS.

W. REIKER—Lumber Dealer, Mill Street.

MERCHANT TAILORS.

WOODBURY & SAVAGE—Tailors, Student trade solicited, 308 Washington Avenue.

MUSIC AND MUSICAL INSTRUMENTS.

OLMES MUSIC STORE.—Pianos, Organs, Tinware, etc. Ill Washington Avenue N.

BARBERS.

H. WOOD—Barber, 116 Michigan Avenue E.

D. WOODBURY—Boots and Shoes.

T. A. MARTIN—Barber. 121 Washington Avenue S.

A. D. GATES—Barber. 106 Michigan Avenue E.

DRUGGISTS.


WE SELL EVERYTHING.

---ALWAYS ON TOP--

DAVIS—THE CLOTHIER

Fine Clothing

Furnishings and Hats

Football Pants

Sweaters, Supporters

The King Pant

We are Up to Date on Men's Wear.

ONE PRICE—THE RIGHT PRICE.

104 Washington Avenue North.