

# The M. A. C. Record.

VOLUME I.

LANSING, MICHIGAN, TUESDAY, DECEMBER 8, 1896.

NUMBER 44

## Annual Contest—M. A. C. Oratorical Association.

There are at the College eight societies and fraternities, five of which, the Columbian, the Eclectic, the Hesperian, the Olympic and the Union Literary, have combined to form what is known as the M. A. C. Oratorical Association. This association holds annually a contest at which one representative from each of the societies above named delivers an oration in competition for first and second prizes in the shape of handsome medals.

According to the program announced in our last issue, the contest for this year took place on Friday night last, Nov. 4, at the Congregational church in Lansing. In all respects it was a creditable performance, both to the young men who took part and to the societies that they represented. The music was furnished by Bristol's orchestra and was of excellent quality, if not abundant in quantity. The irritating delay at the outset which seems inseparable from occasions of this kind, and is especially chronic with our oratorical association, was present in unusually pronounced form. Now, even though there may have been good and sufficient reason for the lack of promptness in beginning, it would yet seem that the orchestra might have been utilized to fill in the painful pause. When, however, a beginning was once made, the work went on with delightful smoothness and the audience was well repaid for the wearisome delay.

The first speaker, Mr. E. Dwight Sanderson, of the Hesperian society, delivered a thoughtful and impressive oration on the present condition of the negro in the south and the duty growing out of that condition. He arraigned the south in unmeasured terms, pronounced the proposals of colonization, disfranchisement, etc., impractical and unstatesmanlike; and ended with a strong appeal for national aid in solving the problem.

Mr. S. H. Fulton, of the Columbian society, came next with a well-planned address on "International Arbitration." He showed the reasons for desiring arbitration, the progress that had been made in attaining it, the difficulties still to be overcome, and the especial opportunities lying open to the United States and Great Britain, by special effort to further the cause.

Mr. J. W. Rigterink, of the Union Literary society, chose a recondite subject and yet handled it in a felicitously popular way. "Individualism in Society" is no child's play, and the question between it and State initiative is one of the most profound and far-reaching relating to modern social organism. In the discussion Mr. Rigterink ably and convincingly advocated the dependence of the State upon individual initiative rather than upon the erratic dreams of socialism or the seductive schemes of fraternalism.

Mr. Clinton D. Butterfield, of the Eclectic society, dwelt upon "Memories connected with the Hellespont." Of these he chose three for elaboration and contrast—the siege of Troy, the expedition of Xerxes, and the Macedonian call of St. Paul. The first he regarded as embodying the idea of revenge; the second, that of conquest; and the third, that of love. Mr. But-

terfield's delivery was admitted by all to be exceedingly graceful, smooth and effective.

The last speaker, Mr. Hart, of the Olympic society, traced the "Evolution of the Nation." From the feeble beginnings along the Atlantic coast, he showed how its territory had spread, how its constitutional life had begun and developed along new lines under new forces and conditions, how in science, invention, and art the young nation was developing wonderful strength, and how in wealth, population and military power, it had already taken rank with the very greatest nations of the globe. Mr. Hart's theme was very happily developed and concluded with a fitting tribute to "Old Glory," with which the stage was draped.

The judges in the contest were: On composition, Dr. R. J. Boone, of Ypsilanti; Prof. R. C. Ford, of Albion; and Prof. T. C. Trueblood, of Ann Arbor; on delivery, Judge J. B. Moore, Rev. W. H. Osborne, and Rev. E. B. Allen, all of Lansing. Judge Moore, after paying a graceful tribute to all the speakers, announced that the decision of the judges awarded the first prize to Mr. Sanderson, and the second to Mr. Rigterink. The decision seemed to meet with general concurrence on the part of the audience.

One of the most difficult of tasks is the making of an original, apt, and graceful speech in presenting medals. It requires much art and tact. Miss Marguerite P. Scranton, who performed this duty, was more than equal to the occasion. Her voice was clear, steady and distinct, her demeanor was graceful and modest, and her little speeches met every requirement.

It seems pertinent at this point to inquire whether it is wise to continue holding these contests in Lansing. The attendance from the city was exceedingly light. It is doubtful if there were half a dozen persons in the audience who would not with greater convenience have attended at the College chapel. On the other hand, the College population was largely inconvenienced by the removal to town, and to many attendance was rendered out of the question. A small room, well filled, is much more inspiring to a speaker than the same number of persons lost in a vast area of vacant seats.

## A Promising Life Ended.

It becomes our sad duty to record the death of another alumnus, that of Ernest G. Lodeman, '89, assistant horticulturist in the experiment station at Ithaca, New York.

The Thursday morning Detroit Tribune contained the following self-explanatory item:

Rochester, N. Y., Dec. 2.

Overwork and anxiety for his personal success wore so on the mind of Prof. Ernest Lodeman, of the state agricultural experimental station at Ithaca, that he, late last night, committed suicide by shooting himself. He committed the deed at the Boyd hotel in the little village of Mexico. It was his second attempt. On November 30, at the same place he tried to end his life by drinking chloral. The doctors brought him around after he had been some hours unconscious. His father is Professor Lodeman, of the Ypsilanti, Mich., Normal School.

The Union Literary society, of which Prof. Lodeman was a member, met on Thursday evening and appointed a committee to send a letter of condolence to the parents of the deceased. At the Normal school all exercises were suspended on Friday, the day of the funeral.

For several years Mr. Lodeman has been Professor Bailey's right hand man, having immediate charge of many of the horticultural experiments both at the Cornell station and in various parts of the state. He has, in addition to his bulletin work, been correspondent for several agricultural and horticultural periodicals. His book, "The Spraying of Plants," has, in the short space of ten months, become the acknowledged authority on insecticides and fungicides, both as a history and as a working manual. In experiment and investigation he has proved himself a careful, conscientious and untiring worker—a student laboring for the public welfare.

Mr. Lodeman was also a scholar. His familiarity with French and German kept him in touch with the botanical investigations of Germany, and the horticultural art of France. His knowledge of these languages, his experience at home, and his horticultural researches among the orchards and gardens of Europe, together with his love for his profession, gave to his work in the class room an increased value—a value only those who were privileged to attend his lectures can estimate.

He was subject to occasional fits of melancholia in a mild form, was a victim of asthma, from which he suffered many years, and it is thought he had a visitation of both these maladies while run down from overwork. His demise not only robs Cornell University of an able instructor, a conscientious worker and a genial student, but leaves a vacancy in the horticultural ranks that will be hard to fill.

M. G. K.

## Foot Ball.

Our football team has not won an important game this season, but this fact ought not to discourage its members. All but one or two were new players when the season began and some have never yet seen a football game except as active participants. They have had but little money and as a consequence have had to do without the services of a coach. Practice has been carried on under the most discouraging circumstances, not the least of which was the lack of any team to line up against. The only practice games they have had have been with a light high school team, so light that a habit of carelessness was the inevitable result.

In the face of all these difficulties is it any wonder that a stronger team has not been developed? Is it not wonderful that so much improvement has been shown? For, that the team has steadily improved in both offensive and defensive work with every game, cannot be denied.

Next year we should begin the season with a competent coach. There are several good reasons why, if we propose to put a good team in the field, we should have a coach at the beginning of the year. In the first place, the very presence of a coach in whom

we can place confidence will encourage more boys to get out for practice—more material to choose from. The rest follows naturally. Two teams can be organized. The reserves, anxious for a place on the team, will do their best—result, a stronger team than a high school team to line up with for practice; and, better yet, a team that will be on hand every day. A good coach ought to pay for himself in the added gate receipts that will result from having a winning team, and this suggests another crying need of the athletic association.

Athletics at this institution has always suffered from a lack of funds. Whatever argument there may be against playing football or baseball for money, it still remains true that it costs money to have such games, and we must either give up the games or supply the money in some way. There are few who advocate the abolishment of such games. How best to secure the money, then, becomes the problem. All will agree that this should be done with the least possible sacrifice on the part of the students and with the greatest obtainable outside aid. Some method of collecting from all outsiders who attend our games is what we want. Most people who attend football and baseball games would rather pay a reasonable amount to see a good game than to spend the time looking at a poor game, even though the latter be free. What shall be done? We can never make a success of collecting at the College entrance. Some one has suggested the purchase of a portable canvas fence to surround the gridiron or diamond. Another thinks we should purchase or lease for a long period the flat south of the entrance or a lot north of Howard Terrace, and fit up a good place for athletics of all kinds, and let future games pay for the improvements. These suggestions are worthy of consideration; and this is a good time to investigate the matter.

## The Military Hop.

The last social event of the term will be an informal hop given by the battalion of cadets in the armory, Friday evening, December 11.

The committee on arrangements are: Captain W. G. Amos, chairman; Captain H. E. Van Norman, reception; Captain I. L. Simmons, program; Captain H. W. Hart, floor; Adjutant T. A. Chittenden, invitation, and Quartermaster E. Shaw, finance.

The hop will be conducted on strict military principles, beginning at 8 o'clock sharp, and ending at 11:30. All members of the battalion who attend will be expected to appear in uniform. All members of the faculty, the alumni and students of M. A. C. are invited to attend. Admission to these, 25c. Outside participants will be charged a fee of 50 cents. Arrangements will be made with the street car company to furnish cars at the hour of going home, and busses will probably be ready to conduct all from the street car to the armory. Also, arrangements have been made with Miss McDermott to have the ladies' dressing-rooms at Abbot Hall.

As a military hop is something new in the line of social entertainment at the College, we look forward to it with anticipations of a good time. Lieutenant Bandholtz is business, and under his oversight we are sure it will be a success and add patriotism to military affairs at M. A. C.





### The Institutes.

Dr. Beal furnished us the following interesting notes from Gladwin:

Gladwin is a new county, the county seat containing 900 to 1,200 people. As a rule the people are not now gushing over with enthusiasm in regard to farming. Most of their time has been spent, with rare exceptions, in cutting and selling timber. It is extremely difficult to know just what you can do that shall please and benefit people of this class. The most hopeful sign, it seems to me, is to look out sharply for the lads and lasses coming on. There was at all our sessions a good proportion of these young persons. From the high school, there was a delegation of two to four, who came with books and pencils to take notes for a report. As the attendance was small at first, I took especial pains to tell them some plain facts about corn smut and black rot of tomato, which were well illustrated by Longyear's maps. I showed them our grasses, and in each case told them what notes to make. This part of the work at the same time seemed to interest the older people. Later, the school superintendent told me most of the delegates were children of farmers, that one report today was twelve minutes long and all were good.

#### THE MAN IN THE HOTEL LOBBY.

He was past the spring of life and owned a small farm well improved. He was smoking a clay pipe and looked rather discouraged. "You can't make anything at farming these times with potatoes at fifteen cents, corn twenty, beans fifty-five, wheat fifty cents. Ninety per cent of the farms of Michigan are heavily mortgaged. A while ago, I advised my son to sell his wheat at fifty cents and he did so. We couldn't see any prospect of its going higher, but it did, and I am now sorry I gave him this advice. The men in the department of agriculture must have known that there was a short crop in other countries and that wheat was going higher. They get good salaries, but they do not seem to care anything about the interest of the farmers. Why didn't they tell the farmers wheat was going to rise?"

Before all of this had been said, Mr. Crowman, our speaker from Grass Lake, had his interest aroused. "All I ever had, I have made off the farm, and there has been no year when I did not get ahead. The department of agriculture you speak of, sends out circulars giving the very information you blame them for not giving, and any one can get them who asks for them. Do you take an agricultural paper? You could get the Michigan Farmer for a dollar a year and that gives weekly the very information regarding the markets that you complain about."

Man with the pipe—"I take no agricultural paper, but I read a daily and it did not say anything about the prospect of higher wheat."

Crowman—"I look out for the markets; I kept my wheat till I sold it at ninety-five cents. I should not have

sold it then, but I needed the money to pay my help. If you had taken the Farmer, it would have saved you a hundred dollars this year in this very item."

The farmer—"You can't farm it according to science in this new country. A man has to build a house; he has to raise crops at once to pay his way."

An interrupter—"What is scientific farming? It is simply making the best of everything with the view of the greatest profits. It does not mean that you must pull all of the sound stumps that you may run plows and reapers unmolested."

In the hard-wood land you speak of, the scientific farmer would have an eye to economy; he would seed down the new land for a few years, turning on sheep, cattle and horses, and after many of the roots had rotted, plow for other crops."

Farmer—"But the man on a new farm hasn't much land cleared, and he can't wait; he needs wheat, corn and potatoes right away."

Interrupter—"On the land you speak of, he can simply clear the land and burn the brush and refuse logs; harrow well, sow wheat or plant corn and potatoes and they will do very well. This would be scientific farming. We simply have different notions of the meaning of the word scientific."

The farmer attended the institute after this, and really seemed to take a brighter view of life. He asked several questions at the hotel and at the institute, not with a critical spirit, but really seemed to seek information for the good he could get out of it.

Mr. Crowman took the place of a man who failed to read his paper on making butter, and he was loaded with facts from his successful experience. "You must be very careful to make a good quality of butter, and always have it uniform. Find your customers and sell direct to them. Ashton salt was sold very cheaply and we tried a little. At once our customers reported that there was something wrong in the flavor. Something they weren't used to or did not like. We immediately returned to the Diamond Crystal—a Michigan product—and there was no more trouble."

"I am sowing plaster the year round, not directly on the field, but about the cow stables, where it absorbs the odors in a most wonderful manner."

"Our creamery, without expense to the owners, solders the cracks in all milk cans, that there may be no places to hold filth."

Some potatoes were exhibited that had been grown by Secretary Lampheare and President Clark from tubers of ten varieties, each furnished by the Agricultural College. The reports were received with attention.

In one instance we had to explain that the statement of a speaker was not well founded, when he complained that the farmers of the state were being heavily taxed to pay for a lot of worthless bulletins. He had seen but few of them, but they did not contain what he wanted. Uncle Sam pays for all of these bulletins.

I was more than ever impressed with the importance of exhibiting on the walls a lot of grasses, clovers, other forage plants and weeds; fine illustrations of some common smuts, rots, moulds, etc. It would be interesting if every hall should contain good outlines of type specimens of cattle, sheep, swine, horses, either of full size or slightly reduced. These things always interest farmers.

Some of us are thinking it may be better to omit the woman's sessions, for it is rather humiliating to have one

person in our company—and that one a woman—who shall conduct a meeting which draws a third more people than several of us "men-folks" are able to draw in the discussion of "practical matters of importance to the farmer."

At Gladwin, we were much assisted by Prof. H. C. Rankin, of Lapeer, temporarily in town. He had interested the teachers and others. Mr. Rankin, we remember some years ago, brought his high school classes into the institute at Leslie, where he was superintendent.

Of most of the other institutes held in the northern part of the State during the week, the Detroit Free Press has given excellent reports. In spite of bad weather in most of the places there has been in several places a good attendance and in all considerable enthusiasm. Hon. Wm. Ball, of Hamburg, seems to be a popular conductor wherever he goes. Prof. F. S. Kedzie's illustrated talks on "Keeping up soil fertility" awaken intense interest. Mrs. Mattie A. Kennedy's talks on "The life we live," and "What we farmers' wives need," are everywhere popular. A. E. Palmer has made a hit with his talk on "Silos and silage," and Prof. W. O. Hedrick has startled northern taxpayers with some of his ideas on "Taxation," especially with his plan for taxing professional men.

At Mancelona a blizzard made the attendance small on Tuesday, but with the milder weather next day came a fair-sized crowd. A fine fruit exhibit was one of the features of this institute. Ray Sessions, '79, presented a paper on "Benefits of the Agricultural College to Farmers." The correspondent says: "The good wishes of all go with Conductor Wm. Ball and his able assistants."

At Harbor Springs it was stormy. John Swift, '68 presided here. B. T. Halstead, of Petoskey, took an active part in the discussion of Prof. Hedrick's paper on "Taxation."

Midland had a fair attendance. The work of Prof. H. W. Mumford and Mr. Dean, of the College, was very favorably received.

An enthusiastic institute was held at Kalkaska. There was a good attendance both days in spite of the storm.

The Traverse City institute was well attended. J. S. Horton thinks it more profitable to sell hay than to raise stock. H. Voorheis takes a decided stand in favor of stock raising.

### The College Lands.

F. E. SKEELS, '78.

The following is an abstract of a report made to the State Board of Agriculture at its last meeting, Nov. 19, and which by resolution of the Board is furnished to the RECORD for publication:

It has been suggested that some notes relating to the lands belonging to the Michigan Agricultural College would be of interest to those who are readers of the RECORD and I have accordingly prepared a brief outline of the facts as found by me in the examination made for the purpose of reappraisal and offering for sale.

The lands are located in sixteen counties, and all lie in that part of the lower peninsula north of a line drawn east and west through Cadillac. The work was commenced in Manistee county and as comprehensive a report was made of each lot of forty acres as could be had by crossing each lot twice. The facts embraced in the reports have been, first, kind, quantity and quality of timber; second, nature

### At the College.

W. A. Bartholomew, '99m, is quite sick.

F. H. Ring, '00m, has been quite sick the past week.

Prof. Noble's mother has been visiting him for a week.

Several beautiful orchids are now in blossom in the greenhouse.

H. J. Packard, '00, entertained his older brother, November 20.

Mr. E. Crook, of Saginaw, visited R. J. Robb, '98sp, one day last week.

Geo. N. Gould, '99, who was sick several days last week, is able to be out again.

A. J. Weeks, '99m, entertained Misses Richmond and Titus and Mr. Titus, of Mason, last Friday.

Dr. Edwards spent Thursday in Grand Rapids, and in the evening attended a banquet of the Peninsular club.

Mrs. W. J. Beal returned Sunday evening, Nov. 29, from a six weeks' visit to her daughter, Mrs. R. S. Baker, in Chicago.

The King's Daughters will meet December 16, with Mrs. Barrows. Lesson, Luke XV; text, "Joy;" leader, Mrs. Barrows.

Last Thursday morning, by the sad intelligence of his brother's death, Professor Smith was called back to Washington, D. C., where he had but recently made such a pleasant visit.

Prof. Griffiths, director of the Detroit Art Museum, lectures in the College chapel, Wednesday evening, Dec. 9; subject, "Sunshine and Shadow." No admission will be charged.

'Tis said that extreme solicitude for two of his friends, who were calling in the city last Sunday evening, caused the handsome member of our sub-faculty to miss the last car and walk out.

R. J. Robb, F. W. Robison and A. J. Weeks attended the Teachers' League of Ingham county at Mason, last Saturday. Mr. Robison presented a paper on "Civil Government in Passing Events."

Beta, Phi Delta Theta held an informal reception in their hall, Friday evening, from 8:30 to 11:30. Several members of the faculty were present with their wives, and all spent a very pleasant evening.



of surface of the ground, with streams noted and character of soil; third, location, being nearness to railroads, lake ports or inland towns, rivers and highways; also schools and postoffices when any were near.

Much trespass has been committed on the College lands and as complete a report as could be had with the time taken has been made of the amount and kind of trespass and sent in to the state land office with each lot. This plan, adopted for Manistee county, has not been changed and is the system used in each county.

#### LOCATION OF THE LANDS.

In Manistee county the College owned when the work was commenced 5,280 acres in four townships. These lands are all well located with regard to railroads, with perhaps the exception of thirty-six lots in T. 23 N. R. 13 W., and these are near the Manistee river. In general the timber in Manistee county is thrifty, being little damaged by fire except on lots immediately adjoining the railroads. The trespass is very extensive, and seventy-four of the one hundred and thirty-two lots have lost more or less value from timber thieves, the most having been taken from T. 24 N. R. 14 W. Nearly all the pine lying between Betsy river and Bear creek was cut about fifteen years ago.

The four townships which have College lands in Benzie county are nicely situated, being generally fertile, well watered by the Platte and Betsy rivers or their tributaries, and by numerous lakes, and lying near enough to the C. & W. M. R. R. or Lake Michigan to afford excellent shipping facilities. The tract in this county comprises 3,360 acres, and wherever farms have been established the results are all that can be asked for, fruit, especially, doing well and being singularly free from insects. Very little trespass was found in Benzie county, the timber being mostly a fine grade of maple or hemlock, with very little accessible pine.

There are only four lots in Grand Traverse county, two of them being in T. 25 N. R. 11 W. on Sec. 26. The other lots are near the northern part of the county in T. 27 N. R. 9 W.

The College lands in Antrim county are well scattered, the 2,440 acres being located in six townships and each lot lies in a locality noted for its thrifty timber and fertile soil, and near either the G. R. & I. or C. & W. M. R. R.'s. The lots in T. 32 N. R. 8 W. lie adjacent to both the C. & W. M. R. R. and Intermediate lake, the timber being thrifty and none of it cut. The N. E. ¼ N. W. ¼ Sec. 30, T. 29 N. R. 5 W. is the only lot in that township not owned by David Ward, and there is also but one lot in T. 29 N. R. 6 W. belonging to the College, the timber on this having been stripped by a former purchaser who paid ¼ down, cut the timber and let the lot revert to the College.

T. 31 N. R. 5 W. lies west of the village of Elmira on the G. R. & I. R. R., and the entire township is noted for its high hills and deep ravines, among which rise the Jordan and Boyne rivers. The College lands in this locality are no exception to the rule, and although the soil is first-class and the timber, except on the highest knobs, is excellent, the surface is in most instances very rough for agriculture. The lands in T. 31 N. R. 6 W. are of the same soil and timber as the preceding, but are more level and adjacent on the west to well tilled and productive farms.

The six townships of Wexford coun-

ty which contain College lots, had 13,240 acres, being mostly located south and east of the Manistee river. Most of these lots are also near the T. & A. A. R. R. There are 84 lots in T. 22 N. R. 11 W., the soil and timber ranging somewhat better than in the preceding town. Trespassers have worked on 24 lots, the timber being pine or cherry in each instance. The T. & A. A. R. R. crosses this town, having two stations, Boon and Harrietta, within the limits.

The 50 lots in T. 23 N. R. 12 W. have for the most part first-class soil and timber, and probably more value has been taken by trespassers than from any other township. The T. & A. A. R. R. crosses this town north and south, having two stations, Sherman and Yuma, within its borders. The Manistee river also crosses from the northeast corner to a point two miles north of the southwest corner of the township, thus affording easy transit for timber.

T. 22 N. R. 12 W. has 97 lots, the soil and timber being exceptionally fine, and most of the lots watered by fine springs. The T. & A. A. R. R., crosses the northeasterly part of this town, the village of Harrietta being partly in its eastern border on Secs. 12 and 13.

The lots in T. 23 N. R. 11 W. are but two in number. The one on Sec. 12 is a fine lot, well watered by springs and brooks. The lot on Sec. 24 was once sold and part of the timber cut; both these lots are quite distant from railroad.

T. 27 N. R. 12 W. has seven lots of rather poor quality of soil and timber and no trespass.

Missaukee county has 880 acres, located in two townships, nearly every lot having been badly damaged by fire. Generally speaking, the lands and timber which the College owned in Kalkaska county were of the first quality and many of the lots now owned are those which have been sold on contract and stripped after the usual first payment.

The College has lands in two townships in Otsego county, the two tracts comprising 1,160 acres. The lots in T. 30 N. R. 4 W. are somewhat below the average in quality of soil and timber, but are located near the G. R. & I. R. R., while the lands in T. 30 N. R. 1 W. are on the extreme easterly side of the county and in the belt of fine timber and good soil which prevails in that locality. David Ward and other large land owners have tracts of timber surrounding the College parcels and no trespass has been made, nor is there liable to be any until their timber is cut or some better facilities offered for getting the timber out.

Charlevoix county has College lands in only one township, being in T. 32 N. R. 4 W., the westerly line being about three miles east of the village of Boyne Falls on the G. R. & I. R. R. The tract has 2,200 acres, and very little timber has been cut around or near it. These lands are for the most part very rolling, of good soil, well watered, and covered with a good growth of maple, basswood, elm, hemlock and cedar.

Cheboygan county has 5,080 acres of land in eight townships. Of the 29 lots in T. 34 N. R. 2 W., 26 have been examined by parties looking for birds-eye maple and from one to twenty trees have been taken from each lot, while a majority of the trees have been hacked to test their quality.

The largest body of College land in Cheboygan county lies in T. 35 N. R. 1 W. and there are very few if any residents in the township, and very little timber has been cut. The lands in this

township are exceptionally fine, being level, fertile and well timbered, nearly every section having one or more spring brooks with small tracts of fine cedar scattered among the hardwood.

The tract in Montmorency county consists of 6,400 acres of generally first-class farming lands in T. 30 N. R. 1 E., lying on the elevation known as the divide. No streams cross this region but the springs and small lakes on the northerly side give rise to the Black or Rainy rivers while the Thunder Bay and Au Sable rivers get most of their waters from the same heads on the southerly side. These lands are destined to become some of the best farms of the state; the distance from good points of transportation will be overcome and a better market provided for the timber, the present stumpage value being very low.

The examination of the tracts in Alpena, Presque Isle, Oscoda, Alcona and Iosco counties is not yet completed, although a large portion of the last three has been looked over, enough to show that the College has over four thousand acres of good hardwood lands in Oscoda county and that millions of feet of first-class pine have been cut on the lands tributary to the Au Sable river.

#### GENERAL CONDITION OF THESE LANDS.

To the casual observer from the train or wagon it would appear that these lands are barren except for the growth of jack pine, but a close examination will show that large tracts of fine pine were once growing where now is found only the smaller jack and

Norway. Were it not for the fires which have swept over these tracts for years these lands would for the most part be again covered with young Norway, and if some way could be devised to effectually stop them that condition might yet be obtained. In many localities the College lands border on the river and sometimes several lots will be of rich bottom lands covered with fine cedar and small pine, the larger pine having been cut wherever it could be reached. It is somewhat unfortunate that the State Board of Agriculture has not been in closer touch with the past management and condition of these lands. Many lots have been bought and the ¼ paid down by parties who never intended to pay anything more, and whose only object has been to strip the best timber from the tracts contracted for, letting the contract forfeit to the state. During the present administration an attempt has been made by the State Land Office to keep closer watch upon these part paid lands but through some irregularity in the contracts most of the offenders go unpunished.

(Concluded next week.)

## Homes Cheap!

Read our article on "College Lands" in this issue and next. Much of this land is now on the market.

# The Cost

of the salt you put in butter is a small matter; the effect poor salt has upon the quality of the butter is a big matter. The butter salt question will be settled for all time, for you, after you've once tried "The Salt that's all Salt!"

## DIAMOND CRYSTAL SALT.

The purest salt, and finest in quality and flavor. At all dealers in barrels (280 lbs.) and bags (56 lbs., 28 lbs. and 14 lbs.).

DIAMOND CRYSTAL SALT CO., St. Clair, Mich.



## THE MAPES CLOTHING CO.

207 and 209 WASHINGTON AVE., SOUTH.

**Our \$5.00 Suit and Overcoat Sale** was a big bid for business and last week's business demonstrated the fact that LOW PRICES and GOOD VALUES are great trade winners. We have sold more goods in the past 10 days, than, (considering the conditions of the times) we could expect to have sold in a month. We cannot stop this sale in the midst of a whirlwind of business, so will let the good work go on and continue this great profit crushing but business producing FIVE DOLLAR SUIT AND OVERCOAT SALE. We've got the goods and must have the money.

We are getting desperate and bound to make business if we don't make a cent and in our higher grades of Men's, Boys' and Children's Suits and Overcoats as well as

### FURNISHING GOODS

We are offering more solid inducements, more genuine and unmatchable bargains than any house in the state.

## The Mapes Clothing Co.,

207 and 209 WASHINGTON AVE., SOUTH



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For various reasons THE M. A. C. RECORD is occasionally sent to those who have not subscribed for the paper. Such persons need have no hesitation about taking the paper from the postoffice, for no charge will be made for it. The only way, however, to secure the RECORD regularly is to subscribe.

## A Danger and a Duty.

(First prize oration by E. Dwight Sanderson, '98, of the Hesperian Society.)

Thirty-one years ago ended the noblest war of history. In its battles half a million men laid down their lives to free the slave. Today, the freedman's condition seems a pitiful recompense for so great a sacrifice. He is subject to most galling, unjust restrictions, and his condition endangers the national well-being.

The Negro's personal rights are abridged. Common law debars him from public privileges. No matter if he be seven-eighths or ninety-nine one-hundredths white, he is still an outcast. "Part nigger, all nigger," is the law of the South. Senator Morgan says, "One drop of Negro blood known to exist in the veins of a woman in this country, draws her down to the social status of the Negro and impresses upon her whole life the stamp of the hateful Negro caste, though she may rival the Easter lily in the whiteness of her skin."

His civil rights are disregarded. The Fifteenth Amendment, guaranteeing him suffrage, is ignored. Negro voters are intimidated to vote with the solid South or their ballots are not counted. Southern leaders acknowledge that the Negro vote is systematically suppressed.

His education is discouraged. In the Black Belt, where half the population is Negro, only one-fourth of the school age attend school, and where there are not enough blacks or whites to support separate schools, children remain in ignorance rather than sit side by side. But, although both personal and civil rights are denied him, he has, through schools supported by Northern beneficence and by his own ability, made in a single generation the most rapid intellectual advancement of any race in history. But in his education the South has had little or no share; in fact, Florida now prohibits schools admitting both races.

The Negro is wronged; the Nation is imperiled.

The permanent enforcement of laws not sustained by public sentiment is impossible under a republican government. The enforcement of such laws in the South has proved a failure. Southern leaders frequently affirm that they accepted the Fifteenth Amendment from necessity and only until they could gather strength to repeal it. Today they are in every way trying to abolish or nullify it. In suppressing the Negro vote the South continually violates law and winks at

fraud. What will undermine a republican government more quickly than disregarding the voice of the majority? As our 8,000,000 Negroes become better educated, they will, if not granted their rights, become a serious menace to the peace of the South: minds capable of understanding, but not of reflecting, are as dynamite in the hands of unwise leaders. The safety of a republic is the education of its voters; its peril, their ignorance. Cries come from all sides for laws restricting foreign immigration, for it is said that such people are unfit for the duties of citizenship. Yet, in all the states of the Black Belt, the illiteracy is greater than in Ireland, the most ignorant country of Europe. How can an intelligent vote be secured with such conditions? Can aught but evil result from the Negro's improvidence and immorality? Why does the Agricultural South, which once depended upon black labor, now prefer the more profitable white? Is it not because the Negro lives only in the present and because his industry is merely spasmodic? And does it not result from this that our poorhouses contain a greatly disproportionate number of blacks? Economically, the Negro, retards the growth of industry. What of his moral condition? Does any class show a more depraved sense of personal purity? While the census gives one-ninth the population as Negro, does not the prison roll show one-third the criminals to be black? Sociologically, the depravity of the Negro is a disease infecting all society.

In prescribing for disease the physician must first understand its cause. Apologists of the treatment of the Negro fail to discern a remedy because they misunderstand the causes of his present condition.

The claim that the Negro is unfit for suffrage is untenable. Are the degraded whites better qualified? Does not the method of enforcing the educational qualification in South Carolina clearly discriminate against the blacks? Says Senator Tillman, "We intend no fraud, only unfairness, simply partiality. No white shall lose his vote."

The abridgment of the Negro's civil rights is justified, according to the South, by fear of his supremacy. It is not, however, fear of Negro supremacy, but of equality: the Southerner knows that with a black majority in only two states, such supremacy is impossible. But that result is not probable even with a black majority. The Negro asks only for freedom in his choice of rulers.

Nor is there just ground for such odious discriminations against the individual Negro. A hideous chimera occupies Southern thought. The Negro is declared to be seeking social equality. Civil equality, regulated by the sovereign power of the state, is made synonymous with social equality, which can exist only in the mutual affection of individuals. The Negro does not desire race fusion and Southern leaders recognize its impossibility.

A familiar inquiry in the South is, "What's that nigger doing here?" and an all-sufficient reply is, "Oh, that's my boy Jim." Though spurned as an equal, he is welcome as a servant. The question for the Southerner is not of the Negro's fitness for suffrage, nor of his supremacy, nor even of his social qualification, but arises from tyrannical and baneful caste feeling.

Caste feeling demands consideration, but weakened vitality, decreased rate of reproduction, improvidence, low morality, growth of crime—to what are these due? Weakened vitality result-

ant from the infusion of white blood, decreased reproduction accompanying increased mortality, lack of thrift, immorality, crime—all indict the white man for his transgression,—slavery.

How, then, can the Negro be morally and industrially elevated; social antagonism overcome; and he fitted for citizenship? The South replies, as ever before, "Leave us, who best understand it, to solve the problem." For twenty years this solution has been attempted, and what has resulted? Ignorance and embittered caste feeling. Visionaries urge emigration, and as late as 1890 a bill was before congress to effect it. The scheme is absurdly impracticable. Not only would the whole industrial system of the South need to be reorganized, but the transportation of a race is physically impossible. Equally futile is the proposed disfranchisement of the Negro. It is a political impossibility, since the full representation of the South is dependent upon the Negro vote. Nor would disfranchisement be possible without reducing him to a condition worse than that of slavery.

If, then, he can neither be transported nor disfranchised, not only must his political equality be recognized, but maintained. If a law cannot be repealed, it should be enforced; and the antagonism of those who oppose its repeal should pledge them to its enforcement. History will vindicate the statesmanship evidenced by the author of the celebrated, but defeated Force Bill. During its discussion, Senator Walthall, of Mississippi, said, "Nothing can force the Southern white people to accept the results involved in unrestrained Negro suffrage." Yet this bill is essentially the same as that which purified the ballot of New York city. Its enforcement would divide both races along party lines; bring needed legislation to the Negro; and dispel all fear of his supremacy.

But a free vote alone would be of little value in removing caste prejudice or in elevating the race morally and industrially. In both the latter respects the modern Negro is inferior to the slave. He is, in fact, a spoiled child who has not learned self-reliance. When the Negro becomes a factor in the industrial world, his individual rights will be respected. Says the Washington of his race, "The black who holds mortgages on a dozen white men's houses will have no trouble in voting, nor will the black who pays \$10,000 a year in freight charges have difficulty in securing a seat in a railway car." Today the Negro is in most need of schools where he can earn a curse of manual and intellectual training that will fit him for society.

A few such institutions are already doing a grand work in this development, but they are far from supplying the need. This must be met by either an increase of private philanthropy, by an awakening of the Southern conscience to its duty and opportunity, or by government support. It is true a grant by the national government would favor a section of the country, but whatever benefits a part, benefits the whole, and the North is not guiltless for allowing forty-five per cent of illiteracy in the Black Belt. The nation cannot afford to permit one-fourth of the Electoral College and the Senate to be controlled by voters, half of whom cannot read the names on their ballots.

Although politicians may ward it off, the issue is a grave one. "By its side," says Prof. Bryce, "the tariff, monetary, and railroad questions dwindle into insignificance." These concern theo-

ries of economics upon which the keenest minds differ widely. The Negro problem involves the rights of one-ninth the population. As a question of finance it should receive immediate attention, for if the Negro's condition deteriorates and race extinction goes on, it will cost far more than his elevation. Ultimately, however a question of right must ever be of more real value to the life of the nation than one incident to greed for gain.

Our duty to the Negro is unquestioned. He has suffered a great wrong; we owe him reparation. By the enforcement of the suffrage and criminal laws and the support of industrial schools in the South, the Negro will secure not only his rights, but also his elevation, for although his personal rights have been disregarded, his civil rights denied, and his education neglected, yet these aids will enable him to overcome such obstacles and become the peer of the sturdy Anglo-Saxon in commerce, in education, and in morals.

Freed by the sacrifice of half a million lives, he stands with the broken shackles of slavery at his feet; close beside him is his former master, who, unrestrained, places upon him bonds more galling than those of abject slavery; in the distance is his liberator, now intent upon the aggrandizement of wealth; while the cry of the re-fettered freedman is heard imploring that aid which will make his future not only congenial to his own better nature, but acknowledged by all as contributing to the prosperity of his country. Can an enlightened nation at the dawn of the twentieth century refuse his petition?

## Value of Mathematics.

ORATION DELIVERED BEFORE THE UNION LITERARY SOCIETY, NOVEMBER 25, BY G. F. RICHMOND, '98.

In discussing the value of a given study, a person is by common consent allowed and in a certain sense by duty bound to exaggerate the importance of his subject, and to present it enlarged, as it were, through the magnifying power of a projecting lens, so that its value may be brought into more prominent view. The vast extent and universal adaptability of mathematical study, however, does not require any artificial development to make its general utility more manifest. The one comprehensive end of education is to prepare man to fulfill the purposes of human existence, and these purposes include the perfection of man's nature for his highest well-being and happiness, the acquisition of knowledge and his preparation for the right discharge of all the obligations and duties which spring from his relations with his fellow men. It follows, then, that the means to this comprehensive end should be such as would furnish, first, the development and training of man's mental powers; second, the acquisition of knowledge needed for guidance, growth and enjoyment; third, the acquisition of skill in the application of the power and knowledge to the purposes of life. These three important means, power, knowledge, and skill, may be considered as afforded by mathematical study.

Doubtless the common answer to the question, why should mathematics be pursued in our schools, would be, for the strengthening and training of the reasoning faculties. Mathematics is often called the exact science because it deals with universal truths, and being an exact science it necessitates an exact language. Every term is distinctly explained and has but one meaning



and thus all error in reasoning is prevented. The origin of the term mathematics is conclusive evidence that no other branch of study affords such mind discipline. In olden times mathematics embraced all the applied sciences, but subsequently the name was restricted to those branches which were acquired only by severe discipline, patient investigation, and exact reasoning. Algebra, geometry, and calculus were called mathematical or disciplinary branches, and persons who became especially proficient along these lines were called disciples. Yes mathematics is indeed a disciplinary study, and for that reason mainly is it taught in our schools and colleges of today. The instructor feels the utter hopelessness of initiating his pupils into this all absorbing realm of thought in the few brief months at their disposal. Thus it has come to pass that the study has been used simply as a form of mental discipline or intellectual gymnastics.

Now, as to the value of mathematics as a means of acquiring knowledge. Let us suppose a student who despises, as many of them do, these cold and passionless abstractions; yet he loves knowledge; he would explore nature and know the reason of things, but he would do it without the aid of this rigid, measuring, calculating science. He begins with astronomy, but he finds at once that it is intimately connected with geometry; that in astronomical calculations it is found necessary to determine the arc of a circle by means of its chord, and that all the observations of the heavenly bodies can be stated only in geometrical language.

He would next investigate the laws of falling bodies, and moving fluids, and would know why their motion is accelerated at different periods, and upon what their momentum depends. But roots and squares, lines, angles and curves float before him in the mazy dance of a disturbed intellect. The very first proposition is a mystery and he soon discovers that mechanical philosophy is little better than mathematics itself.

Affrighted, but not discouraged, in this search for knowledge, he next tries botany and is soon enveloped in the mysteries of that fascinating science. Everything goes smoothly on, but presently he comes to microscopic botany, a study of plant structure. He finds that each plant is made of countless minute cells. Then comes the study of the contents of those cells. One day he discovers a minute particle which, on further investigation, proves to be a crystal and that crystal assumes the dreaded form of geometry. Crystallization allures him on, but as he goes cubes and hexagons, pyramids and dodecahedrons arise before him in beautiful array.

But there are sciences, he thinks, which will better suit his taste. He next turns his attention to meteorology, but in no phase of this broad science can he do without mathematics. Every storm that moves across the country takes on the form of a clearly defined circle or ellipse, and the accompanying winds move in certain angles in regard to those storms. As he pursues the subject further the drafting of weather maps completely disheartens him. Here he finds the isobaric and isothermal lines describing nearly every conceivable kind of geometric figure, and the condition of the weather in any particular locality depending upon the kind of figure those lines describe.

And where shall this student of nature go for his knowledge? Is it to

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chemistry? Even here he is not safe. For awhile he goes gloriously on, illuminated by the yellow and purple lights of sodium and potassium, but soon he comes to compound bodies, to the composition of the elements around him, and he finds them all in fixed relations. Then starts up the whole theory of chemical equivalents and mathematics again stares him in the face.

And so on through the long list of arts and sciences he finds each and every one more or less intimately connected and dependent upon mathematics.

Now let us take another student, with whom mathematics is neither despised or neglected. He sees in it the means of past success to others. He reads in its history the progress of universal improvement, and he believes that what has contributed so much to the civilization of the world may perhaps be useful to his own intellectual development. He picks up a volume of geometry and steadily pursues its abstractions from the definition of a right angled triangle to finds a chain of unbroken reasoning, the theorem of Pythagoras, and he finds a chain of unbroken reasoning connecting each successive step. As he pursues the subject further he realizes that a knowledge of its laws will be of use to him in after life. And as he goes out to battle with the world he finds that the time employed in mathematical study was not spent in vain. He looks up on society and wherever he turns arts, sciences, and their results, from carpentry to domestic economy, from geological formation to farm management, from the ingenious steam gauge at the boiler house to the heat radiation in this room, disclose their operations no longer mysterious to his enlightened understanding. Go where he will this student finds mathematical science the handmaid of success, and a knowledge of its laws a constant aid in whatever he undertakes. Let us not, therefore, discourage the advancement of this valuable study, but rather do what we can to extend the period of study devoted to it; knowing, as we do, that all which goes to develop the ability of youth to see possibilities and ideals, goes to make him a more practical laborer in the field of industry.

Our printers have been moving this week; hence the RECORD is unavoidably delayed.

"No one would take me for a very learned person," he mused. "And yet"—a pale smile spread over his features—"in but a little while I shall occupy the chair of applied electricity in this institution." Even as he spoke the executioner approached.—N. Y. World.

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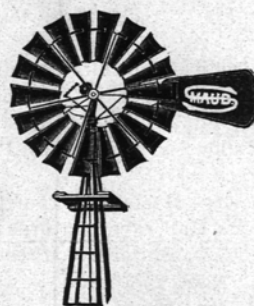
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## News from Graduates and Students.

O. P. West, '95, is superintendent of a stock farm at Lisbon, Illinois.

C. B. Cook, '89, and A. B. Cook, '93, are in attendance at the State Grange.

C. A. Jewell, '95, is principal of schools at Addison, Lenawee county, Mich.

F. W. Herbert, with '96m, began work again in the Wyckes Bros.' machine shops, Saginaw, last week.

W. M. McGrath, with '93, is with Hawley & P. routy, attorneys, Security building, 188 Madison street, Chicago.

Among the former students who were in attendance at the Oratorical contest we noticed M. G. Kains, '95, E. E. Gallup, with '96, and H. B. Gunnison, with '98m.

T. L. Hankinson, '98, will read a paper on the "Advancement of ornithological science," before the Ornithological society in Grand Rapids next Friday evening.

Albert A. Crane, '75, died at his home in Gaylord, Friday, December 4. Mr. Crane was a prominent lawyer and banker and president of the village. A wife and three children mourn his death. At College he was a member of the Phi Delta Theta fraternity.

## Camp-in-the-Mountains.

The following is an extract from a letter written by O. C. Hollister, '89, in camp near Cora, Wyoming, where he has been surveying for the state during the past season:

I have had a busy summer, and, after finishing work, rode horseback to Saratoga and back here for a little recreation. We are camped about on the forty-third parallel and one mile east of Fremont's Lake and about 9,000 feet above the sea. This altitude is from a pocket aneroid and the average of several days. On three sides the mountain rises abruptly for more than a thousand feet and then slopes gradually upward to the foot of the peaks, some eight miles northeast and close to the timber line, which here is between 10,800 and 11,100 feet. The peaks rise above this plateau from 2,000 to 3,000 feet. In THE RECORD of September 29 I see that Mr. Reynolds speaks of giving the College yell 11,000 feet above the sea. Here, as in most instances, the man telling the first story is out of luck, for in our work one of our lines ran over the crest of the range, and from the top of one peak, 13,325 feet high (boy again) I gave the M. A. C. yell and joined with one of my party, who had been a college student, in the yell of his college. We also built a large mound as a landmark, and beneath the stones we placed a copy of the Chicago Inter-Ocean, the M. A. C. RECORD (I believe it was the number with Miss McDermott's picture), and a list of the names of the party and elevation. It was a perfect day and the view from the summit was beyond description.

I expect to return east about the 20th of December.

## Tau Beta Pi Association.

The first initiation of the year was held on Thursday evening, December 3. The "Bent" was conferred upon Mr. I. L. Simmons, the remaining eligible member of the class of '97 and on Mr. F. V. Warren, who ranked highest among the class of '98 at the opening of the year. The program for the evening was furnished by Mr. H. E. Smith, of the Mechanical Department, who lectured on experiments of Nikola Tesla.

## Official Directory.

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

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.

Y. W. C. A. regular weekly meetings for all ladies on the campus Tuesday evenings at 8 o'clock, in the ladies' parlors. Meetings on Sunday evenings with the Y. M. C. A.; Miss Edith F. McDermott, President; Miss Alice Georgia, Cor. Secretary.

M. A. C. Grange—Meets every three weeks on Tuesday evening in the Columbian Society rooms. Prof. C. D. Smith, Master. H. W. Hart, Secretary.

Natural History Society—Regular meeting second Friday evening of each month in the chapel at 7:00. H. C. Skeels, President. W. R. Kedzie, Secretary.

Botanical Club—Meets first and third Friday of each month in the Botanical Laboratory at 6:30. T. Gunson, President. W. R. Kedzie, Secretary.

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

M. A. C. Athletic Association—C. B. Laitner, President. G. B. Wells, Secretary.

Columbian Literary Society—Regular meeting every Saturday evening in their rooms in the middle ward of Wells Hall, at 7:00. E. H. Sedgwick, President. C. F. Austin, Secretary.

Delta Tau Delta Fraternity—Meets Friday evenings in the chapter rooms on fourth floor of Williams Hall, at 7:00. E. A. Baker, President. C. P. Wykes, Secretary.

Eclectic Society—Meets on fourth floor of Williams Hall every Saturday at 7:30 p. m. C. D. Butterfield, President. Manning Agnew, Secretary.

Feronian Society—Meets every Friday afternoon at 1:00 in Hesperian rooms. Miss Sadie Champion, President. Miss Marie Belliss, Secretary.

Hesperian Society—Meetings held every Saturday evening in the society rooms in the west ward of Wells Hall

at 7:00. J. D. McLouth, President. R. H. Osborne, Secretary.

Olympic Society—Meets on fourth floor of Williams Hall every Saturday evening at 7:00. H. W. Hart, President. C. J. Perry, Secretary.

Phi Delta Theta Fraternity—Meets on Friday evening in chapter rooms in Wells Hall, at 7:00. W. G. Amos, President. F. H. Smith, Secretary.

Union Literary Society—Meetings held in their hall every Saturday evening at 7:00. E. A. Robinson, President. S. F. Edwards, Secretary.

Tau Beta Pi Fraternity—Meets every two weeks on Thursday evening in the tower room of Mechanical Laboratory. G. A. Parker, President. E. H. Sedgwick, Secretary.

Club Boarding Association—I. L. Simmons, President. H. A. Dibble, Secretary.

Try and Trust Circle of King's Daughters—Meets every alternate Wednesday. Mrs. C. L. Weil, President. Mrs. J. L. Snyder, Secretary.

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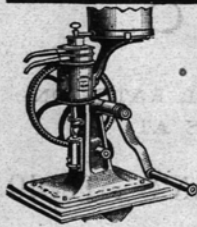
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## ASH OF ORCHIDS ONCE MORE.

DR. R. C. KEDZIE.

East Orange, N. J., Nov. 11, 1896.

Dear Doctor—By this mail I forward you for analysis four specimens of orchids, viz.:

## EPIPHYTES.

1. Cattleya Trianae.
2. Cattleya Citrinae.
3. Laelia Autumnalis.

These three have never been under artificial culture, being just as they were in their native habitat so far as mineral constituents are concerned.

Then, as a means of comparing the quantity of mineral elements in the ash, I send some leaves of several varieties of cypripediums that are terrestrial orchids, and which have been under artificial culture with fertilization, probably of cow-dung water.

I remind you of our correspondence of last summer relative to the presence of mineral elements in epiphytal orchids, and as to whether such elements are necessary for their growth. I have spoken to a number of expert orchid growers since in relation to the matter, and they think mineral elemental fertilization is harmful. One English grower had had good success with soot in the culture of cattleyas. Are there any particular elements in soot that would explain a superior nourishment? Another had got four-fold growth from the addition of a little ammonia to the water given the plants.

I trust that you agree with me that the subject is very interesting and that you will pursue it to the scientific end.

Yours very truly,

J. M. W. K.

The orchids were received in due time, dried and burned and the amount of ash determined, and from the ash both the potash and phosphoric acid were separated and weighed in the usual manner. The following results were obtained in this way:

No. 1, Cattleya Trianae—5.86 grains of dry matter when burned left, .57 grains of ash, or 9.9 per cent of ash, from which 100 milligrams of potash were recovered, and 19 milligrams of phosphoric acid.

No. 2, Cattleya Citrinae—Gave 12.85 per cent ash, from which 125 milligrams of potash and 38 milligrams of phosphoric acid were extracted.

No. 3, Laelia Autumnalis—Gave results similar to No. 1, but, unfortunately, the notes have been mislaid and I cannot give the exact figures.

In all these epiphytal orchids the presence of ash, corresponding in some degree to that of terrestrial plants, and especially the presence of potash and phosphoric acid in what might be called normal amount, are the striking features of this investigation. Epiphytal orchids in their original innocence and unfallen state still contain potash and phosphoric acid.

No. 4, leaves of Cypripedium—gave 9.3 per cent of ash (.29 gram), and from this 23 milligrams of potash and 9 milligrams of phosphoric acid. The terrestrial orchids have no larger per cent of ash than epiphytes.

The ash of No. 2 had a sensible amount of soil adhering to the plant, which was made very evident by the grains of sand found in the ash. This may explain the larger per cent of ash found in this orchid.

## SOOT.

The composition of soot varies somewhat with the kind of fuel used. The soot from wood is richer in potash and phosphoric acid than that from bituminous coal. The coal soot is rich in

sulphate of ammonia and contains a small amount of potash and phosphoric acid. I have just obtained these materials in sensible quantity from coal soot.

That soot should promote the growth of epiphytal orchids might naturally be expected since it contains nitrogen, potash and phosphorus, the tripod of plant growth. The invariable presence of potash and phosphoric acid in plants of every class, even where it is difficult to explain how such plants get their supply of these mineral elements, strengthens the conviction that they are absolutely essential to the life of plants.

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